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AUTHOR Bagozzi, Richard P.; Van Loo, M. Frances
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ABSTRACT

The paper describes a research project to determine fertility-related family decision making processes. Fertility-related decisions are interpreted as all ultimate choices made by spouses concerning the number and spacing of children they will have. Specifically, the research investigated how factors such as the desire for more or less egalitarian role status between husband and wife, socio-economic influences, and individual needs and desires led spouses to arrive at a decision as to family size. The hypothesis is that choice of family size is influenced directly by social psychological processes within the household and indirectly by social and economic variables. Social psychological processes are based on attitudes, personalities, and interpersonal orientations of the husband and wife. A sample of 229 married couples was interviewed concerning desired and intended family size. Findings generally supported the hypothesis. The conclusion is that social exchange processes within the family are major determinants of family size and that these processes are influenced by social and economic variables. (DB)

Decision Making and Fertility: A Theory of Exchange in the Family*

Richard P. Bagozzi
and
M. Frances Van Loo

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It is possible to identify at least four paradigms that conceptualize fertility as a decision-making process. Economists view fertility as a family decision process wherein households choose a family size that maximizes satisfaction, given total income and the relative prices of commodities (Becker, 1960, 1965; Willis, 1973). Sociologists and demographers, on the other hand, tend to see fertility as a social response to norms (Blake, 1968, Goldberg, 1975). The economic and social paradigms are similar in the sense that the actual causal mechanism intervening between stimulus in the environment (e.g., reference group pressure, price changes) and fertility response (e.g., desired family size) are not explicitly modeled, but rather are presumed operative. Thus, microeconomic theories of fertility assume that households maximize utility subject to a budget constraint and sociological theories assume that people respond to normative imperatives based on an implicit, internal calculus learned through socialization. From this perspective, the two paradigms represent variants of situational determinism.

From a philosophy of science standpoint, situational determinism may fall short of providing valid explanations for human behavior, in general, and fertility, in particular, because the theory is largely untestable as it stands. This is because confirmation of predictions from the theory is not tied formally to the causal mechanisms linking antecedent and consequent events.[1] The problem arises in fertility research

[1]It should be noted that this criticism of situational determinism proceeds from the assumption that the causal explanation of all social behavior requires, what Weber (1947, p. 88) terms, "the interpretive understanding of social action." For Weber, "Action is social in so far as, by virtue of the subjective meaning attached to it by the acting individual (or individuals), it takes account of the behavior of others, and

because economists and sociologists use social facts to explain individual human behavior. To test the causal mechanisms in the theory, it would be necessary to explicitly connect at least some theoretical concepts to operationalizations through what philosophers of science term correspondence rules. For example, this would entail actually modeling family decision making processes in economic theories and human judgment processes in sociological theories. These processes provide the formal links between social facts and the behavior of individuals (for further discussion of the limitations of situational determinism, see Bagozzi and Van Loo, 1979).

Psychologists posit a third paradigm, which claims that individual characteristics of the husband or wife are the determinants of family size (Rainwater, 1960, 1965; Fawcett, 1973; Davidson and Jaccard, 1975). This perspective may be termed psychological determinism to distinguish it from the situational determinism of the economic and sociological approaches. Psychological determinism begins with the needs, motives, or other mental events of people and then models these as the primary antecedents of fertility. Although mental events are inferred from observable behavior, the structure of theory in psychological determinism is such as to require that the laws binding theoretical variables be taken as assumed hypotheses. Typically, these are based on inductive reasoning and include empirical laws of association as evidence for theoretical laws, as in classical conditioning or operant theory, to give specific examples. However, the logical status of these laws is similar to that in situational determinism even though they generally have received greater empirical support. That is, psychological laws are non-observational propositions assumed to provide the rationale

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is thereby oriented in its course." Thus, if fertility is to be regarded as a product of social exchange, as argued herein, one must model both the meaning of certain acts for the decision makers and the hypothesized cause-and-effect events which constitute the observed aspects of the exchange. Philosophers of science term this aspect of scientific inquiry "the double process of interpretation" (cf., Kaplan, 1964, p. 32) and claim that it is the defining characteristic separating the natural from the behavioral sciences. If, however, one assumes that the natural and behavioral sciences differ in degree and not kind, then one does not have to model the subjective meanings of the actors to achieve explanation. This alternative viewpoint is basically the assumption of situational determinism and finds its most well developed arguments in the sociological positivism of Durkheim (1958).

for hypothesizing links between particular mental events as independent variables and the dependent variable of fertility.

It is tempting to propose that fertility can be explained as both a socioeconomic process and a psychological process by combining elements of situational and psychological determinism. The appeal of such a proposal lies in the fact that the mechanisms assumed in the former are actually modeled by the latter. Such a procedure, however, implies acceptance of the doctrine of reductionism, a controversial programme not yet resolved in the philosophy of science. That is, to combine situational and psychological determinism into a single theoretical framework explaining fertility, one must make the psychological level a primary one and the social a secondary one. In so doing, the social must be reduced by some analytical method to the psychological. Yet, because no generally accepted mechanisms linking the social and psychological levels have been identified and because the formal procedures for representing these mechansims are not without controversy (Webster, 1973), an alternative framework which takes the dyadic relationship as the unit of analysis would seem appropriate.

The theory developed in this article makes no assumption that social or economic behavior can be reduced to the psychology of individuals but rather takes the husband-and-wife relationship as the unit of analysis. In this sense, the approach is more representative of interactionism and is a variant of social psychological theory. Specifically, as shown in Figure 1, the theory views fertility decisions as an outcome of social psychological processes within the family. The attitudes, personality, and interpersonal orientations of the husband and wife are seen as interacting with their social exchanges. The nature of these exchanges is represented by the degree of role egalitarianism and social influence between husband and wife. Social and economic variables are then viewed as constraints on the husband's and wife's attitudes and their social exchanges. In this way, they constitute the setting or contingencies for fertility decisions. Overall, the approach synthesizes recent developments in theories of fertility in economics and sociology and extends the research into gender roles and social exchange within the family.

The discussion is organized as follows. First, a theory of exchange in the family is developed. Next, the data and methodology for testing the theory are described. Included are a specification of the causal models representing the theory and the criteria used to evaluate the tests. Following this, the findings are presented. The article then ends with a discussion of the results and implications for future

research.

Fertility and Social Exchange in the Family

Fertility decisions are regarded as outcomes of give-and-take and sharing between the husband and wife. Building upon the theories of Blau (1964) and Homans (1974), the husband-and-wife relationship is conceptualized as one of social exchange where joint satisfaction is achieved through the transfer and mutual experiencing of rewards and punishments. Rewards and punishments may be social (e.g., status, prejudice), psychic (e.g., love, praise, anxiety), or physical (e.g., money, gifts). In any case, rewards and punishments serve as a "social currency" or a medium whereby the needs and desires of the spouses are communicated to each other and common outcomes are negotiated.

Children constitute a special type of social currency in at least three senses. First, children directly provide rewards and punishments to the couple. These might be benefits such as love, companionship, or fulfillment, on the one hand, or losses such as emotional strain, physical pain, or financial hardships, on the other hand (Fawcett and Arnold, 1973). Second, children may indirectly serve as vehicles for rewards and punishments. For example, having children may lead to a strengthening of the bond between husband and wife, social and financial insurance in old age, or the attainment of social status. On the other hand, children often imply restrictions on one's freedom and other indirect disadvantages. A third way in which children serve as a type of social currency in the marital exchange is through their impact on the consumption of goods and services by the family. Not only are goods and services consumed directly as a consequence of their use in the prevention of childbirth or the bearing and raising of children, but they enter family decision processes as considerations requiring trade-offs as they vie for the household's scarce time and money. From this perspective, the desire for children and the activities surrounding their care both affect and are affected by everyday economic choices (Bagozzi and Van Loo, 1978a).

The nature of family exchange is represented by the social influence transpiring between husband and wife. Four modes of influence have been identified: threats, promises, warnings, and mendations (Tedeschi et al. 1973). These are typically communicated in the marital relationship using social currency, of which children are one form. Individual characteristics of the husband and wife and socioeconomic constraints surrounding the marital relationship are viewed as

influencing the nature of family exchanges, through which they in turn influence fertility. The nature of each of these three main determinants of fertility will now be examined in greater detail.

Social Influence

In order to satisfy individual needs and reach mutual accommodations in their daily lives, the husband and wife engage in a web of exchanges which are often implicit and nonconscious but which nevertheless comprise the basis for interaction and sharing within the household. To briefly describe the modes of social influence and how they serve as channels of communication facilitating the transfer of rewards and punishments, consider the case of children as a social currency.[2] When either spouse actually delivers a positive or negative reinforcer without trying to conceal these attempts, the mode of influence is termed (1) a threat if a punishment is sent or (2) a promise if a reward is transmitted. For example, if during the course of an interchange between two spouses one asserts "I will not have children unless you share equally in child care," then the message would be perceived as a threat by the second if he or she desired children but expected not to share equally in the burden of raising them. Similarly, if one spouse used an implicative statement of the form "I will raise and care for the children so that you can pursue a career," then the message would be perceived as a promise by the other spouse, assuming he or she saw the offer as facilitating important career goals. In general, threats and promises may be either contingent ("If you do--or do not do-- Y, I will do X) or noncontingent ("I will do X"). Moreover, they may differ as to the specificity/nonspecificity of requests and consequences. Notice, finally, that, in all cases, it is the ability of children to provide rewards and/or punishments and the unique bargain(s) implied in the marital relationship that provide the content of social influence attempts. This is what is meant by social currency serving as the medium of exchange in

[2] Although the discussion uses the rewards and punishments associated with children to illustrate the role of social currency and social influence in the marital exchange, it should be stressed that fertility decisions will also entail the exchange of other forms of social currency such as gifts, verbal praise, interpersonal conflict, the withholding of affection, and so on. The example of children as a social currency is chosen here for simplicity. For a full discussion of the theory of social influence including supporting research, the reader is referred to Tedeschi et al. (1973) and Rubin and Brown (1975).

the husband-and-wife dyad.

The other two modes of influence are less manipulatory in their connotations to the spouses. When either spouse does not actually deliver positive or negative reinforcers and no attempt is made to conceal the influence, the mode is termed (1) a warning if a punishment is implied or (2) a mendation if a reward is implied. Persuasion is perhaps the best instance of influence in both senses. For example, if one spouse attempts to convince the other that failing to have children will cause the other considerable pain and regret in later years, then he or she would be employing a warning. Notice that the spouse giving the warning does not actually deliver the punishment (as in the case of a threat), but rather, the action or inaction of the spouse receiving the message is considered to be the mechanism leading to avoidance of pain. Similarly, if one spouse suggests that having children would be rewarding and lead to specific gains, then he or she would be employing a mendation. Again, it is not the spouse making the mendation who delivers the reward, but rather the decision of the receiver of the message. As with threats and promises, warnings and mendations can be contingent or noncontingent, and request- and consequences-specific or nonspecific. Further, other modes of influence such as information and reinforcement control may be used in marital exchanges, though for simplicity they will not be discussed here (cf. Tedeschi et al. 1973).

Although social influence in exchanges is probably best represented through the actual transfer of messages between spouses over time, this is not often feasible in naturalistic field research. Consequently, the empirical research in this study operationalizes social influence through the degree of role egalitarianism within the family. The premise is that the husband and wife assume a set of roles within the marital relationship in order to better meet individual and joint needs. Thus, it is posited that the spouses incur the costs of role specialization and enactment in order to achieve the benefits resulting from such relationships. Depending on the couple's needs and the outcome of social exchange, the marital relationship will exhibit more-or-less egalitarian role statuses in one or more of eight capacities: provider, housekeeper, child care, child socialization, sexual satisfaction, recreation, therapy, and kinship (Nye, 1976). The assumption is that, in those marriages in which social influence is relatively bilateral (as opposed to those that are unilateral), the set of role relationships between husband and wife will tend to be more egalitarian. Role egalitarianism is operationalized through the amount of subordination of the wife vis à vis the husband, the balance in decision making between

the spouses, the degree of legitimate authority of the husband, and other dimensions of the marital relationship (see discussion below on methodology).

In general, it is hypothesized that the more egalitarian the marital relationship, the greater the possibility for both the husband and wife to pursue independent careers and the higher the level of satisfaction with sexual relations, companionship and sharing, and other aspects of married life (Miller, 1976; Chadwick et al. 1976). These qualities of husband and wife relationships tend to create life styles in which personal development and social and recreational activities are traded off for large families. Specifically, with respect to fertility decisions, the following propositions are made (cf. Scanzoni, 1976):

1. The greater that the husband and wife desire the rewards associated with more egalitarian marriages, the less they will desire the benefits that accompany additional children.

2. Similarly, the more willing that the husband and wife are to accept the costs associated with more egalitarian marriages, the less they will be able to assume the costs of additional children.

In sum, egalitarianism in the marital relationship is hypothesized to be inversely related to family size: the greater the egalitarianism, the smaller the desired and intended number of children. The rationale behind the hypothesis is one of social exchange between the spouses. That is, given their individual needs and desires, the spouses are assumed to negotiate mutual accommodations as to the balance of role obligations in the marriage. The degree of egalitarianism achieved is posited to be determined by the particular pattern of social influence transpiring between the spouses. Thus, rewards and punishments are exchanged until a temporary equilibrium is reached. By employing various social currencies as media of exchange (including the idea of children), the spouses arrive at a decision as to final family size.

The Characteristics of the Husband and Wife

The course and outcome of exchanges are hypothesized to depend on and to influence individual characteristics of the spouses. Attitudes are one generic class of characteristics. It is claimed that the husband and wife have needs, expectations, and preferences as to family size and related child-rearing practices (which are reflected in their attitudes) and that these variables influence and are influenced by the

particular social exchanges occurring between the spouses. Fertility is posited to be a direct function of these attitudes and exchanges, subject to certain economic and social constraints discussed below.

The attitudes of family members may be thought to exhibit three conceptually distinct characteristics, each affecting fertility in a different way. The affective component represents the emotional content of attitudes, particularly as manifest in the feelings family members have toward the idea of having children, providing child care, and the like. Emotional reactions toward children may be positive or negative, and they typically vary in intensity from one individual to another. It is hypothesized that the more positive the affect, feelings, and desire to have children, the greater the likelihood the family will have them, ceteris paribus. The behavioral or conative component of attitudes depicts the actions and choices family members make, or intend to make, that are closely related to the decision to have children. For example, the opening of a bank account for the education of a planned child would be a behavioral indicator of a positive attitude toward having a family, while the decision of both spouses to pursue independent careers could be a measure of the desire to keep the size of the family smaller than would have been the case had only the husband chosen to work. Finally, the cognitive component of attitudes captures the beliefs that family members have as to particular outcomes that would accrue to them should they decide to have children or not. An example of these perceived means-ends relationships might be the anticipated financial and psychic burden (or gain) from a given family size. The more spouses perceive children to be sources of satisfaction, for instance, the greater the chances that they will have a family.

Psychologists have modeled fertility attitudes in a number of ways. Fishbein (1972), for example, suggests that three variables--attitudes toward specific fertility acts, normative beliefs, and the motivation to comply with these beliefs--can be used to explain various family planning practices as well as the demand for children. Empirical findings provide some support for the author's approach (Fishbein and Jaccard, 1973; Davidson and Jaccard, 1975). In addition, Hass (1974) has developed a three-stage decision model where attitudes toward conception, pregnancy, and childrearing form the key explanatory concepts for fertility, although her overall model has not yet been tested. In general, positive attitudes towards children and negative attitudes towards contraception are hypothesized as being positively related to large family size.

The personalities of the husband and wife are the second class of individual characteristics which interact with the exchange process. Operationalized as source and receiver characteristics (McGuire, 1969), these personality characteristics operate on the communication process and social influence occurring between husband and wife. Source characteristics include such variables as interpersonal attraction, similarity, expertise, prestige, trustworthiness, and status (authority). Receiver characteristics entail such variables as self-esteem, personality traits, and cognitive styles. Because one is usually both a source and receiver of messages, all of the characteristics may come into play in any particular transaction. In general, source and receiver characteristics influence exchanges through their ability to authenticate or deauthenticate the subjective expected utility associated with communicated threats, promises, warnings, or mendations (for a discussion of the processes and supporting evidence, see McGuire, 1972, pp. 108-141, and Tedeschi et al. 1973, pp. 65-83). For example, research shows that the degree of interpersonal attraction affects influence. That is, the promises and mendations of a liked source tend to be authenticated (i.e., believed more), while those from a disliked source tend to be deauthenticated.

In general, the effects of source or receiver characteristics on fertility will depend on their interaction with the individual attitudes of the spouses and with the nature of their role relationship. For example, if the spouses participate in highly unequal role relationships with their partners, then the attitudes of the more powerful spouse toward children and contraceptives will dominate decision making. The influence will be transmitted through threats, promises, warnings, or mendations; and the relative efficacy of each will be a function of the unique source and receiver characteristics of the spouses. If, on the other hand, the role relationships between the spouses are characterized by mutuality and equality, then shared, joint attitudes toward children and contraceptives will likely arise through social negotiation processes. The shared attitudes will be somewhere between the attitudes of each individual spouse. Again, the outcome will depend on the source and receiver characteristics of the spouses and on the social influence transpiring between them.

A final way in which the characteristics of the spouses influence exchanges is through the motivational and interpersonal orientations these actors bring to an exchange. Research in bargaining and negotiation (Rubin and Brown, 1975, pp. 197-213, 233-258) shows that the outcomes of exchanges depend on the degree to which the parties: (1) have a

positive interest in the welfare of the other; (2) are not oriented toward doing better than the other; (3) strive to achieve mutual as opposed to individual gains; and/or (4) are sensitive to interpersonal aspects of relationships with the other. Not only do spouses bring perconceived orientations to the exchange relationships they enter, but through external pressures and the changing conditions in any particular exchange, these orientations ebb and flow in predictable ways with predictable impact on the exchange (Rubin and Brown; 1975). For example, one might expect a marriage wherein the spouses have a relatively selfish as opposed to empathetic orientation toward each other to be less egalitarian in role relationships.

Socioeconomic Constraints

As a final proposition, socioeconomic variables are hypothesized to be determinants of fertility, but rather than operating directly upon the ultimate choice for the number of children as is implicitly assumed by some sociologists and economists, they are taken here to first influence and constrain social psychological processes within the family. It is hypothesized that socioeconomic variables serve as indicators of exposure to pronatalist or antinatalist norms, peer and reference group pressure, and other group influences (Blake, 1968; LeMasters, 1974). The implcation is that these factors influence both the attitudes of spouses and the experienced degree of role egalitarianism. For example, some research exists showing attitudinal orientations of wives toward engaging in career and outside activities and feeling that housework and child care should be equally shared to be a positive function of education (Tobin, 1976). Similarly, other research indicates that the higher the education of the spouses, the greater the favorability of the husband's attitudes toward the wife working, the higher the wife's work motivation, and the more likely she is to work (Scanzoni, 1975, 1976). Further, the greater the socioeconomic status of the family (as measured by the education of the spouses, their father's education, and other background variables), the longer that spouses tend to stay in school, the later they marry, and the more egalizatian are their marital role orientations (Blau and Duncan, 1967; Sewell and Hauser, 1975; Scanzoni, 1976). Overall, although research into the processes of how socioeconomic variables affect family life is sketchy, enough evidence exists to establish the presence of such relationships, and one purpose of the present investigation is to model these variables as they impact upon the family and fertility decisions. (For further discussion and evidence on the socioeconomic determinants of fertility, see Bagozzi and Van Loo, 1978b.)

Data and Methodology

The overall theory was tested through a reanalysis of data reported in Scanzoni (1976). The data consist of part of a larger sample survey in which both the husband and wife were interviewed:

> The sample was drawn from the metropolitan areas of the five states comprising the east north-central region of the United States, and can briefly be described as 'a probability selection of respondents within these areas.' Persons in the sample were living with spouse at the time of the interview and had only ever been married to that spouse. (Scanzoni, 1976, p. 678.)

The primary sample consists of $N_1 = 157$ households, and a secondary sample of $N_2 = 72$ households was formed from this larger sample. The latter subsample contains only households in which the wife worked full-time. The hypothesis is that gender role norms will be more egalitarian for these families, with a corresponding stronger impact on fertility. In both samples, N_1 and N_2, wives were aged 18-24. For a discussion of the format of the questionnaire, sampling and survey procedures, and further information on the sample itself, the reader is referred to Scanzoni (1975, 1976). Discussion here will be limited to a description of the variables, their operationalization, and their relationship to the theory. The actual causal models tested are presented at the end of this section.

Variables

The primary dependent variable in the study, fertility, was measured in two ways: stated desires and stated intentions with regard to family size. A household indicator of fertility on both measures was formed by adding the responses of husband and wife on each, computing means, and using the results as the family birth desires and intentions (Scanzoni, 1976).

Gender role egalitarianism was indicated by two constructs: junior-partner status and equal-partner status. The former variable is comprised of four role dimensions (traditional wife role, traditional husband role, religious legitimation of mother role, and traditional mother role), each measured by a number of "strongly agree" to "strongly disagree" Likert-type questions. Briefly, the junior-partner status variable measures to what degree the wife's "interests

remain ultimately subordinate to those of husband and children." Subordination occurs in the form of the ability to have a career, the center of power with regard to decision making, the degree of legitimate authority residing in the husband, religious orientations, and "autonomy or independence of thought, speech, and behavior." In contrast, the equal-partner status construct consists of three role dimensions (wife's self-actualization, problematic husband alterations, and institutionalized equality), each measured with Likert indices. The equal-partner status variable measures the extent to which the "individualistic interest (including occupational achievement) of the wife are on a par with the interests of husband and children." To form a household score on each gender role egalitarianism construct, the responses of the husband and wife were added together on each role dimension, means were computed, and the results were used as the joint scores (Scanzoni, 1976).

The socioeconomic constraints on the family are represented through the wife's education and the husband's education. Specifically, a socioeconomic status variable for each household is constructed as a function of the spouses' education levels, using the causal modeling methodology developed below. While it would have been desirable to have a more comprehensive measure of socioeconomic status, the fact that past research indicates that education is a key measure of the concept that the correlations of education with alternative measures is usually high justifies using education as a first approximation to socioeconomic status (Blau and Duncan, 1967; Sewell and Hauser, 1975).

Finally, although the data do not permit operationalization of the full range of attitudinal characteristics of the spouses, a belief variable measuring "expectations for contraceptive success in avoiding an unwanted pregnancy" was constructed as an indicator of family cognitions with respect to fertility decision making. The hypothesis is that the stronger the belief that contraceptives are efficacious, the greater the likelihood of planning and the lower the desired and intended family size. This hypothesis is consistent with research in economics, sociology, and psychology (Becker, 1960; Scanzoni, 1975; Davidson and Jaccard, 1975). Table 1 presents the Pearson correlations for the variables in both samples.

Table 1. Pearson Correlation Matri[a]

		1	2	3	4	5	6	7
1.	Junior-Partner Status[b]	1.00	.60	.43	.48	-.30	-.14	.04
2.	Equal-Partner Status[b]	.66	1.00	.17	.19	-.28	-.20	.09
3.	Wife's Education	.49	.20	1.00	.64	-.24	-.05	.01
4.	Husband's Education	.57	.28	.73	1.00	-.12	-.05	.06
5.	Births Intended	-.31	-.41	-.24	-.17	1.00	.71	-.21
6.	Births Desired	-.20	-.35	-.16	-.06	.69	1.00	-.22
7.	Expected Contraceptive Success	.11	.19	.00	.00	-.22	-.33	1.00

(a) Above diagonal is for sample N_1, and below diagonal is for sample N_2.

(b) The higher the score, the stronger the preference for gender role egalitarianism.

The Causal Models

In order to test the theory, five hypotheses were investigated:

Hypothesis 1. Gender role egalitarianism will be a function of the socioeconomic status of the household. The higher the socioeconomic status, the greater the egalitarianism. As a corollary, the relationship is predicted to be stronger for the households in which the wives work full time.

Hypothesis 2. Fertility will be a function of gender role egalitarianism in the family. The greater the egalitarianism, the smaller the desired and intended family size. As a corollary, the relationship is predicted to be stronger for the households in which the wives work full time.

Hypothesis 3. The wife's attitudes toward role egalitarianism in the family will be a function of her education and age at first marriage. The greater the education and the higher the age at first marriage, the more egalitarian her attitudes.[3]

Hypothesis 4. Fertility will be a direct function of gender role egalitarianism and an indirect function of the socioeconomic status of the household. Fertility will not be a direct function of socioeconomic status. Rather, socioeconomic status will affect role egalitarianism which, in turn, will influence fertility. As a corollary, the relationships are posited to be stronger for the households in which the wives work full time.

Hypothesis 5. Fertility will be a direct function of both gender role egalitarianism and expected success of contraceptive usage. The greater the egalitarianism and expected success of contraceptive usage, the smaller the desired and intended family size. As a corollary, the relationships are hypothesized to be stronger for households in which the wives work full time.

Hypothesis 1 will be tested with the causal model as shown in Figure 2. In this model, gender role egalitarianism (RE) is represented as a function of the socioeconomic status (SES) of the household. The RE factor is measured by the junior-partner status (JPS) and the equal-partner status (EPS) composite scales. Similarly, SES is represented by a construct comprised of the education of the wife (WE) and the education of the husband (HE). The system of equations for the model of Figure 2 can be expressed algebraically as follows:

$$RE = \gamma(SES) + \zeta \tag{1}$$

$$\begin{bmatrix} WE \\ HE \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} (SES) + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix} \tag{2}$$

$$\begin{bmatrix} JPS \\ EPS \end{bmatrix} = \begin{bmatrix} \alpha_3 \\ \alpha_4 \end{bmatrix} (RE) + \begin{bmatrix} \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \tag{3}$$

[3]Because wife's age at first marriage was not available in a separate form for sample N_2, the hypothesis of model 3 is tested only on sample N_1.

where equation (1) depicts the hypothesized causal relation from SES to RE, and equations (2) and (3) represent the measurement functions relating SES and RE to their respective operationalizations. For this system of equations, it is assumed that all variables are expressed as deviations from their means and that all disturbances (i.e., ζ, $\varepsilon_1 - \varepsilon_4$) are mutually independent and are independent of their corresponding explanatory variables. Letting z = vector of observations, $\alpha_a = (\alpha_3\alpha_4)'$, $\alpha_b = (\alpha_1\alpha_2)'$, ϕ = var(SES), ψ = var (ζ), $\theta^2_{\varepsilon_a}$ = var(JPS EPS), and $\theta^2_{\varepsilon_b}$ = var(WE HE), one may write the overall variance-covariance matrix of observations as follows:

$$E(zz') = \begin{bmatrix} \alpha_a(\gamma\phi\gamma' + \psi)\alpha_a' + \theta^2_{\varepsilon_a} & \alpha_a\gamma\phi\alpha_b' \\ \alpha_b\phi\gamma\alpha_a & \alpha_b\phi\alpha_b' + \theta^2_{\varepsilon_b} \end{bmatrix} \quad (4)$$

Hypothesis 2 will be tested with the causal model illustrated in Figure 3. In this model, fertility (F) is shown as a function of RE. Fertility is measured by desired family size (DFS) and intended family size (IFS). The system of equations implied by Figure 3 can be written as:

$$F = \gamma(RE) + \zeta \quad (5)$$

$$\begin{bmatrix} JPS \\ EPS \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix}(RE) + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix} \quad (6)$$

$$\begin{bmatrix} DFS \\ IFS \end{bmatrix} = \begin{bmatrix} \alpha_3 \\ \alpha_4 \end{bmatrix}(F) + \begin{bmatrix} \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \quad (7)$$

where similar assumptions are made here as with equations (1)-(3). Moreover, the variance-covariance matrix of observations is parallel to that expressed in equation (4).

Hypothesis 3 can be tested with the causal model depicted in Figure 4. In this model, the wife's attitude toward role egalitarianism (WRE) is shown as a function of her background (WB). The former is measured by the wife's responses to the JPS and EPS scales, while the latter is operationalized as the wife's education (WE) and her age at first marriage (WAM). The system of equations representing these relationships can be written as follows:

$$WRE = \gamma(WB) + \zeta \tag{8}$$

$$\begin{bmatrix} WE \\ WAM \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} (WB) + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix} \tag{9}$$

$$\begin{bmatrix} JPS \\ EPS \end{bmatrix} = \begin{bmatrix} \alpha_3 \\ \alpha_4 \end{bmatrix} (WRE) + \begin{bmatrix} \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \tag{10}$$

where similar assumptions are made as with equations (1)-(3), and the variance-covariance matrix of observations is parallel to equation (4).

To test hypothesis 4, the causal model of Figure 5 will be used. The propositions contained in this model are (1) gender role egalitarianism (RE) will be a direct function of the socioeconomic status (SES) of the household and (2) fertility (F) will be a direct function of RE and an indirect function of SES. Thus, it is hypothesized that $\gamma_1 = +$, $\beta = -$, and $\gamma_2 = 0$. The system of equations implied by Figure 5 can be expressed as follows:

$$\begin{bmatrix} 1 & 0 \\ -\beta & 1 \end{bmatrix} \begin{bmatrix} RE \\ F \end{bmatrix} = \begin{bmatrix} \gamma_1 \\ \gamma_2 \end{bmatrix} (SES) + \begin{bmatrix} \zeta_1 \\ \zeta_2 \end{bmatrix} \tag{11}$$

$$\begin{bmatrix} WE \\ HE \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} (SES) + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \end{bmatrix} \tag{12}$$

$$\begin{bmatrix} JPS \\ EPS \\ DFS \\ IFS \end{bmatrix} = \begin{bmatrix} \alpha_3 & 0 \\ \alpha_4 & 0 \\ 0 & \alpha_5 \\ 0 & \alpha_6 \end{bmatrix} \begin{bmatrix} RE \\ F \end{bmatrix} + \begin{bmatrix} \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \varepsilon_6 \end{bmatrix} \tag{13}$$

where, as before, it is assumed that all variables are expressed as deviations from their means and that all disturbances are mutually independent and are independent of their corresponding explanatory variables. Letting z = vector of observations, α_a = the parameter matrix relating RE and F to their respective measures, α_b = the parameter matrix

relating SES to its measures, ϕ = var(SES), ψ = variance-covariance matrix for the ζ's, $\theta^2_{\varepsilon_a}$ = diagonal matrix of error variances for JPS, EPS, DFS, and IFS, $\theta^2_{\varepsilon_b}$ = diagonal matrix of error variances for WE and HE, and $\Gamma = (\gamma_1\gamma_2)'$, one may write the variance-covariance matrix of observations as follows:

$$E(zz') = \begin{bmatrix} \alpha_a(\beta^{-1}\Gamma\phi\Gamma'\beta'^{-1} + \beta'\psi\beta'^{-1})\alpha_a + \theta^2_{\varepsilon_a} & \alpha_a\beta^{-1}\Gamma\phi\alpha_b \\ \alpha_b\phi\Gamma'\beta'^{-1}\alpha_a & \alpha_b\phi\alpha_b' + \theta^2_{\varepsilon_b} \end{bmatrix} \quad (14)$$

To test hypothesis 5, the causal model of Figure 6 can be used. In this model, fertility (F) is shown as a function of both role egalitarianism (RE) and expected contraceptive success (ECS*). The system of equations for the model of Figure 6 can be expressed as follows:

$$F = (\gamma_1\gamma_2)\begin{bmatrix} RE \\ ECS^* \end{bmatrix} + \zeta \quad (15)$$

$$\begin{bmatrix} JPS \\ EPS \\ ECS \end{bmatrix} = \begin{bmatrix} \alpha_1 & 0 \\ \alpha_2 & 0 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} RE \\ ECS^* \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ 0 \end{bmatrix} \quad (16)$$

$$\begin{bmatrix} DFS \\ IFS \end{bmatrix} = \begin{bmatrix} \alpha_3 \\ \alpha_4 \end{bmatrix} (F) + \begin{bmatrix} \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \quad (17)$$

where similar assumptions as to measurements and disturbances are made as before. In addition, the variance-covariance matrix of observations is parallel to that presented in equation (4) except that $\underset{\sim}{\phi}$ = variance-covariance matrix of RE and ECS*.

To estimate the parameters shown in Figures 2-6, one may use the computer program, LISREL, developed by Jöreskog (Jöreskog and van Thillo, 1972). Briefly, the program finds maximum likelihood parameter estimates by minimizing the following function:

$$F = 1/2[\ln|\Sigma| + tr(S\Sigma^{-1}) - \ln|S| - r+s)] \quad (18)$$

where $\Sigma = E(zz')$, S is the sample variance-covariance matrix, r is the number of measurements for exogenous variables (r = 2 for hypotheses 1, 2, 3, and 4; and r = 3 for hypothesis 5), s is the number of measurements for endogenous variables (s = 2 for hypotheses 1, 2, 3, and 5; and s = 4 for hypothesis 4), ln is the natural logarithm, and tr stands for the trace. Jöreskog's program uses the Fletcher-Powell iterative procedure to obtain a numerical solution for equation (18). A likelihood ratio goodness-of-fit χ^2 test is provided which can be used to test particular models defined by equation (4) or equation (14). The null hypothesis is tested against the most general alternative hypothesis that the variance-covariance matrix for the overall causal model is any positive definite matrix. The resulting p value gives the probability of obtaining a χ^2 value larger than that actually obtained, given that the hypothesized model holds. The greater the p value, the better the fit. Generally, p values of about .10 or higher give satisfactory fits. Since the χ^2 test is sensitive to sample size, one may often wish to test models which are subsets of each other differing, say, by one or a few parameters. In such cases, it is possible to test the introduction of new parameters by examining the differences in χ^2 values between models to see if there is an improvement in fit. This procedure is used below. Finally, the formula for calculating the degrees of freedom for the causal models is

$$d.f. = 1/2(r+s)(r+s+1) - t \qquad (19)$$

where t equals the number of parameters to be estimated and r and s are as defined above.

Before presentation of the results of the study, it will prove useful to compare briefly the causal modeling methodology used herein to path analysis. Causal modeling represents a generalization of path analysis. Path analysis (cf. Duncan, 1966, 1975; Heise, 1975) represents sets of linear causal relationships. Causal analysis does this, too, but rather than examining each equation individually in isolation, as done with path analysis, it investigates the entire system of equations simultaneously. In addition, causal analysis provides an overall χ^2 test of significance for one's entire theory, while path analysis only provides a test for each individual equation. Causal analysis further supplies a means to incorporate multiple measures, thereby yielding a methodology for separating errors in equations from errors in variables. Path analysis confounds errors in equations with errors in variables. Finally, causal analysis delivers similar advantages as other maximum likelihood procedures in that parameter estimates are scale-free, optimally efficient

over variable sample sizes, and robust over nonnormality.

Findings

Hypothesis 1

The results for the hypothesis maintaining that gender role egalitarianism will be a function of the socioeconomic status of the household are shown in Figure 7. Notice first that the data for both samples fit the causal model reasonably well, confirming the hypothesis. Further, as predicted, the relationship between gender role egalitarianism and status is stronger for the subsample of households with wives working full time ($\gamma = .62$) than for the entire sample ($\gamma = .57$); and the goodness-of-fit for this subsample ($\chi^2 = 2.74$, 1 d.f., $p \simeq .10$) is somewhat better than that for the entire sample ($\chi^2 = 3.54$, 1 d.f., $p \simeq .06$). Thus, socioeconomic status (as measured by the wife's and husband's level of education) tends to positively affect the degree of role egalitarianism in the family. The greater the education, the more balanced the interests, rights, and obligations of the husband and wife in their relationship.

Hypothesis 2

Figure 8 summarizes the findings for the model hypothesizing that fertility will be a function of gender role egalitarianism. The data for both samples fit the causal model very well, confirming the hypothesis. That is, as predicted, general role egalitarianism is negatively related to fertility, and the relationship is stronger for the subsample ($\gamma = -.47$, $\chi^2 = .96$, 1 d.f., $p \simeq .33$) than for the sample as a whole ($\gamma = -.37$, $\chi^2 = 2.77$, 1 d.f., $p \simeq .10$). Hence, more egalitarian households tend to desire and choose smaller family sizes.

Hypothesis 3

The findings for the model hypothesizing that the wife's attitudes toward gender role egalitarianism will be a function of her education and age at first marriage are illustrated in Figure 9. As predicted, the data fit the model very well ($\chi^2 = .06$, 1 d.f., $p \simeq .81$), confirming the hypothesis. The higher the level of education for the wife and the later her age at first marriage, the more favorable her attitudes toward gender role norms of equality ($\gamma = .41$).

Hypothesis 4

Hypothesis 4 combines hypotheses 1 and 2 into a single system of structural equations. The findings for the hypothesis (i.e., the model hypothesizing that fertility will be a direct function of gender role egalitarianism and an indirect function of the socioeconomic status of the family) are displayed in Figure 10. Although the results indicate borderline fits (i.e., $\chi^2 = 18.94$, 7 d.f., and $p \simeq .01$ for the entire sample; and $\chi^2 = 13.93$, 7 d.f., and $p \simeq .05$ for the subsample), all parameter estimates are twice their standard errors and in the predicted direction. Further, the estimates for the effect of socioeconomic status on role egalitarianism and the effect of role egalitarianism on fertility are stronger for the subsample (i.e., $\gamma_1 = .62$ and $\beta = -.31$) than for the entire sample (i.e., $\gamma_1 = .57$ and $\beta = -.30$) as predicted. The findings for a slightly different hypothesis (i.e., the model hypothesizing that fertility will be a direct function of gender role egalitarianism and both a direct and indirect function of the socioeconomic status of the family) show slightly poorer overall fits than hypothesis 4, although parameter estimates are again twice their standard errors, and the fit for the subsample is better than the fit for the entire sample, as predicted ($\chi^2 = 18.72$, 6 d.f., and $p \simeq .00$ for the entire sample; and $\chi^2 = 13.89$, 6 d.f., and $p \simeq .03$ for the subsample).

Of particular significance is the subhypothesis examining the direct effect of the socioeconomic status of the family on fertility. The relevant parameter representing this causal path is shown as γ_2 in Figure 5. The subhypothesis can be tested by taking the difference in χ^2 tests for hypothesis 4 and the hypothesis including γ_2 in the model. Performing this operation yields $\chi^2 = .22$, 1 d.f., $p \simeq .66$ for the entire sample and $\chi^2 = .04$, 1 d.f., $p \simeq .86$ for the subsample. Thus, in both samples, one may reject the subhypothesis positing a direct effect from socioeconomic status of the family to fertility. Moreover, strong evidence exists supporting the hypothses that fertility is a direct function of social exchange between the husband and wife and that socioeconomic variables influence fertility only through their impact on these exchange processes. This finding supports the general programme of interactionism in social psychology while leading one to question the paradigm of situational determinism inherent in some economic, demographic, and social theories.

Hypothesis 5

The results for the hypothesis suggesting that fertility will be a direct function of both gender role egalitarianism

and expected success of contraceptive usage are illustrated in Figure 11. Notice first that the data for both samples fit the causal model very well, confirming the hypothesis (i.e., $\chi^2 = 4.85$, 4 d.f., and $p \simeq .30$ for the entire sample; and $\chi^2 = 3.22$, 4 d.f., and $p \simeq .52$ for the subsample). Moreover, as predicted, the relationships between gender role egalitarianism and fertility and between expected success of contraceptive usage and fertility are stronger for the subsample ($\gamma_1 = -.41$ and $\gamma_2 = -.26$) than for the entire sample ($\gamma_1 = -.36$ and $\gamma_2 = -.18$). Thus the greater the gender role egalitarianism and the greater the expected success of contraceptive usage, the smaller the desired and intended family size. Notice further that the relative impact of gender role egalitarianism versus expected success of contraceptive usage on fertility is 2:1 for the entire sample and about 1.6:1 for the subsample, indicating that social exchange processes between husband and wife are relatively stronger influences on family size.[4]

Discussion and Conclusions

Fertility decisions are regarded as basically social psychological phenomena wherein the husband and wife achieve individual and joint satisfaction through the exchange of social, psychic, and monetary rewards and costs. The nature of the transaction, in general, and the family size outcome, in particular, are hypothesized to depend on three processes: (1) the transfer of social influence between husband and wife, (2) the individual characteristics (e.g., attitudes, motivational and interpersonal orientations, and personality traits) of the husband and wife, and (3) the socioeconomic constraints surrounding the marital relationship.

Social influence was operationalized through the degree of gender role egalitarianism between husband and wife. The hypothesis was that the greater the gender role egalitarianism, the smaller the desired and intended family size. The data provided strong support for this hypothesis. It appears that (1) the more the husband and wife desire the rewards associated with egalitarian marriages, the less they will desire the benefits that accompany additional children

[4] Because of relatively high multicollinearity between expected success of contraceptive usage and socioeconomic status of the family, it was not possible to test the model wherein gender role egalitarianism, socioeconomic status, and expected success were all modeled simultaneuously as independent variables.

and the smaller will be their desired and intended family size; and (2) the more willing the husband and wife are to accept the costs associated with egalitarian marriages, the less they will be able to assume the costs of additional children and the smaller will be their desired and intended family size. Similarly, the more egalitarian the marriage, the greater the opportunity that the spouses have to pursue interests and activities in conflict with large family sizes. Typically, more equalitarian marital relationships are characterized by: dual career orientations; greater relative consumption of travel, entertainment, educational, and other goods and services; and relatively more expenditures per child for food, clothing, health and related items. All of these activities imply trade-offs resulting in less demand for children.

A second major hypothesis concerns the role of socioeconomic constraints in fertility decision making. It was predicted that, if family decisions are primarily determined by social exchange processes between husband and wife, socioeconomic factors should influence fertility only through their impact on these exchanges. The data provided strong confirmation of this hypothesis. Wife's education and husband's education influenced desired and intended family size only through their effect upon gender role egalitarianism. It appears that greater education fosters: (1) more positive attitudes toward activities competing with child rearing; (2) less desire for the rewards associated with children; (3) less subordination of the wife's interests to those of her husband and children; and (4) generally more balanced expectations and orientations of the husband and wife as to sex role equality in the household. More modern gender role norms, in turn, affect decision making and result in a lower demand for children.

Finally, although the data did not allow for a full test of the effect of individual characteristics of the husband and wife on fertility, the use of expected success of contraceptive usage as a proxy provided indirect support for the hypothesis. That is, the greater the expected success, by husband and wife, the less the desired and intended family size. Future research is needed into the attitudes, personality, and cognitive information processing of family members and how these factors interact with fertility decisions.

A number of implications of the above findings deserve mention. First, the results suggest that it may not be sufficient, and may even be misleading, to examine only the impact of economic and social variables on fertility. Family size decisions depend on the interaction between husband and

wife and to look only at external constraints without taking into account how these affect the social exchanges between the spouses risks failing to fully explain fertility and making incorrect predictions. Different households may respond differently to the same economic and normative constraints depending on the needs and attitudes of the spouses, the flow of social influence between them, and other aspects of the family structure and marital relationship. Second, from a policy standpoint, the findings suggest that it is important to understand the social psychology of the family in order to better adjust social programs. Economic incentives or disincentives, for example, will not affect all households in the same way but will influence fertility complexly through their interaction with the style and dynamics of family life.

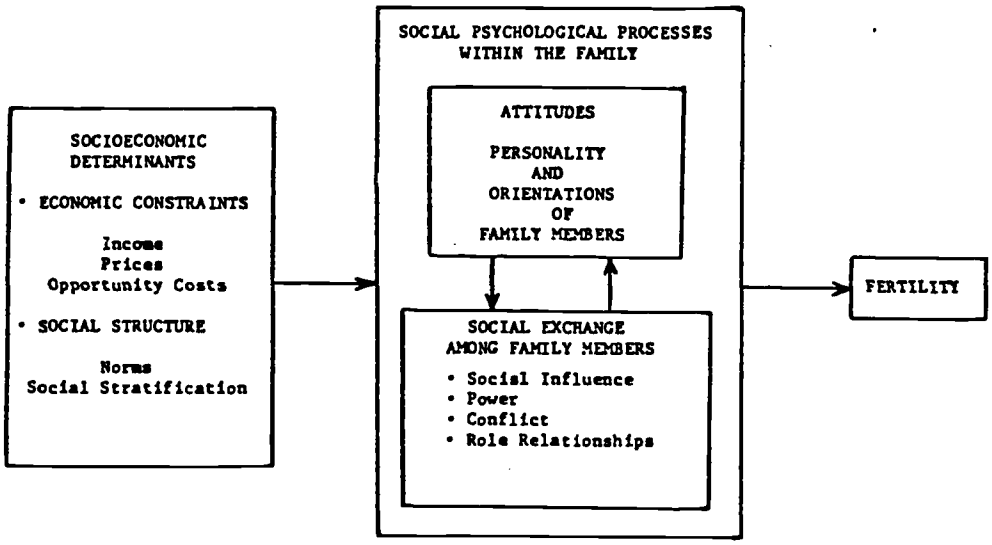


Figure 1

An Outline of the Theory

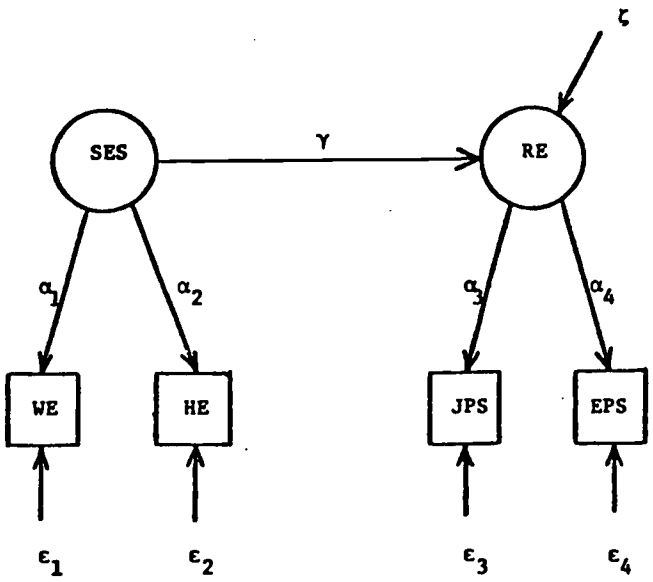


Figure 2

Recursive Causal Diagram for Hypothesis 1

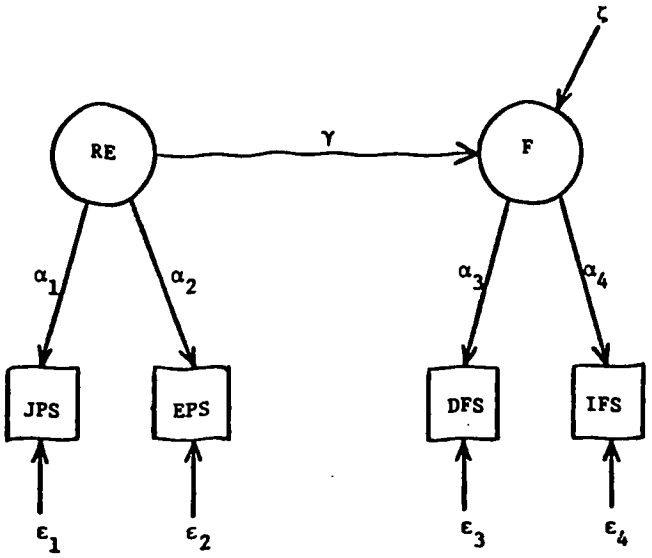


Figure 3

Recursive Causal Diagram for Hypothesis 2

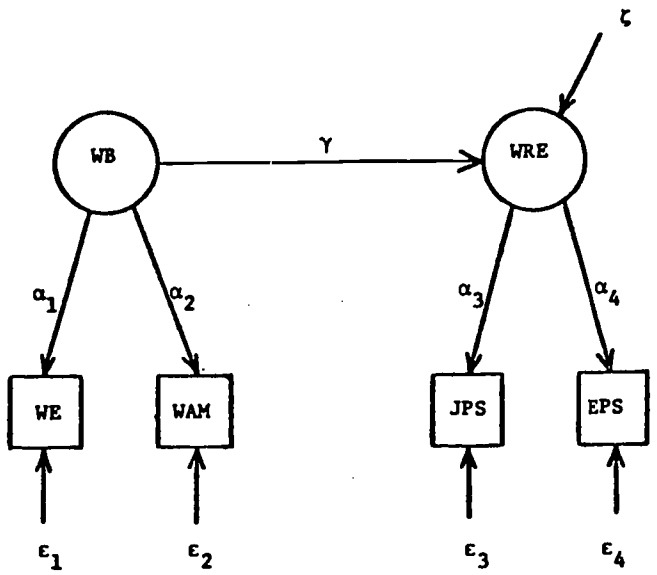


Figure 4

Recursive Causal Diagram for Hypothesis 3

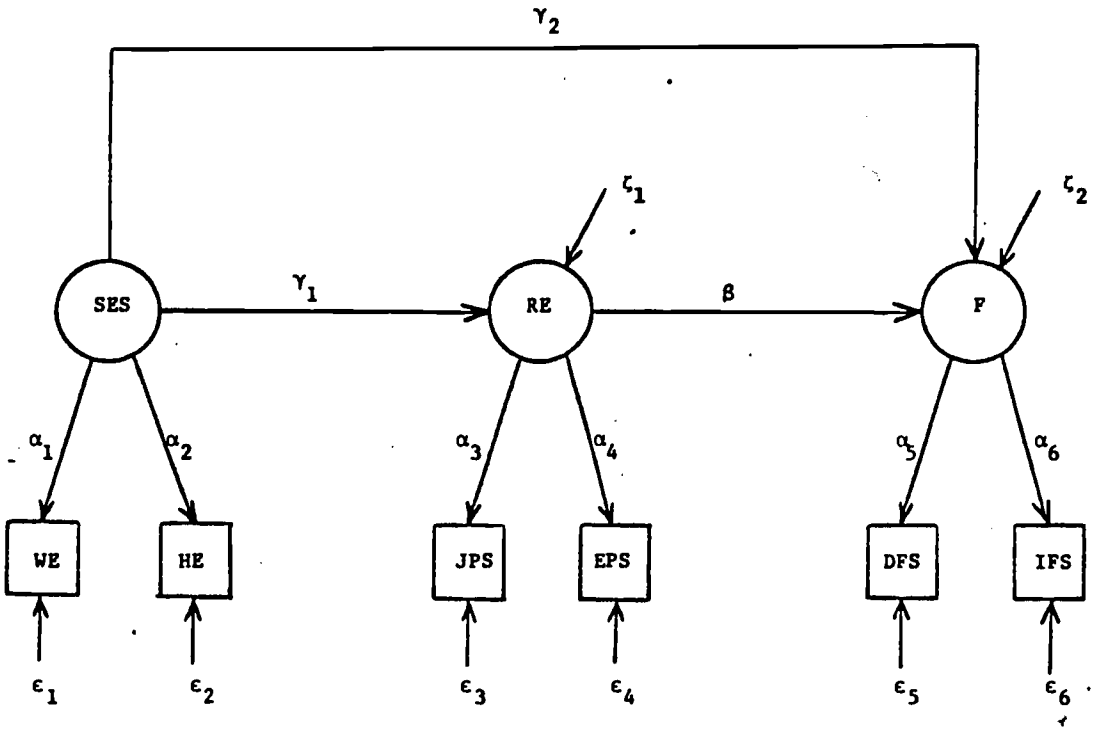


Figure 5

Recursive Causal Diagram for Hypothesis 4

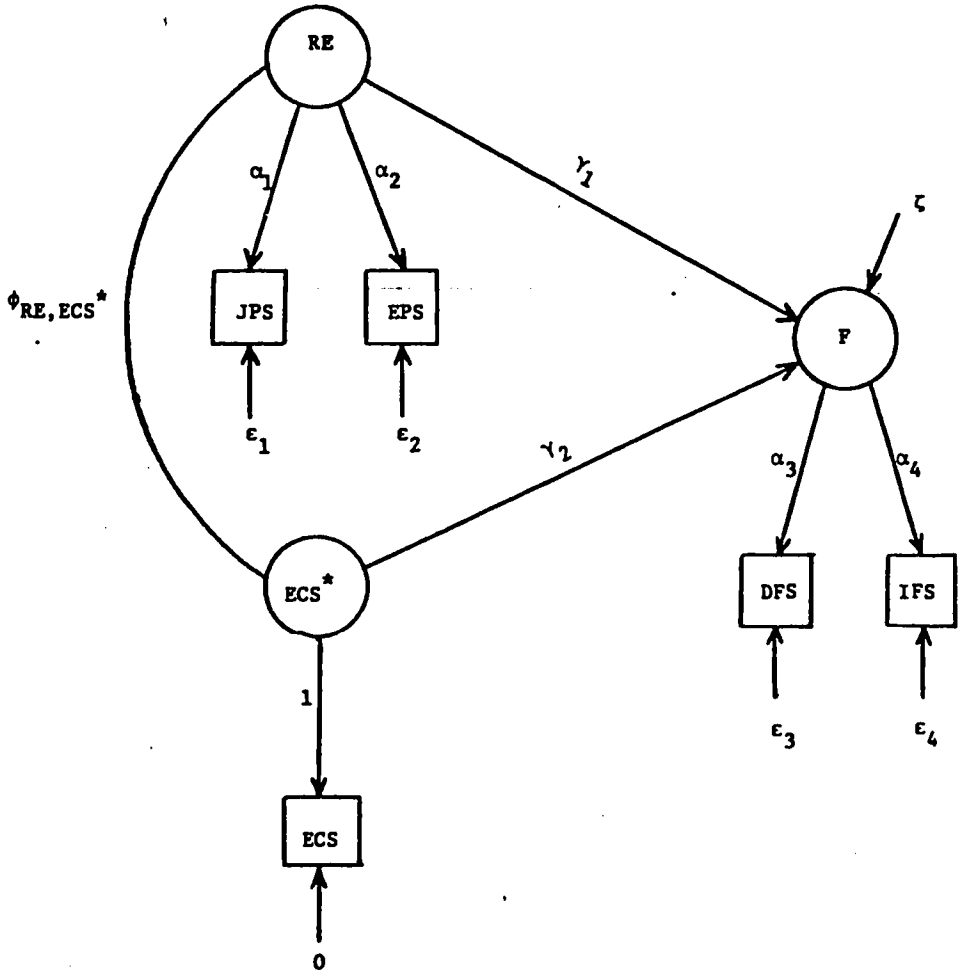
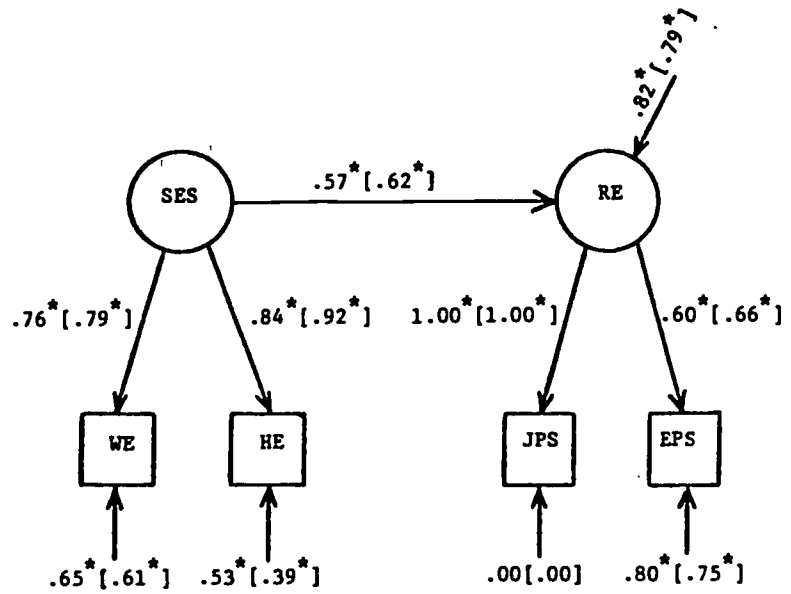


Figure 6

Recursive Causal Diagram for Hypothesis 5



Sample N_1

χ^2 = 3.54
d.f. = 1
p = .06

Sample N_2

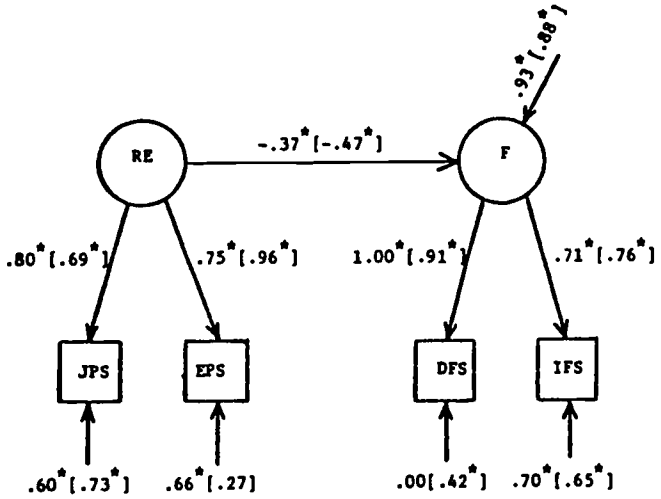
χ^2 = 2.74
d.f. = 1
p = .10

Figure 7

Findings for Hypothesis 1[a]

[a]Parameters for Sample N_1 are expressed as open numerals, while those for Sample N_2 are within brackets.

*Note: Parameters at least twice their standard errors.



Sample N_1

χ^2 = 2.77
d.f. = 1
p = .10

Sample N_2

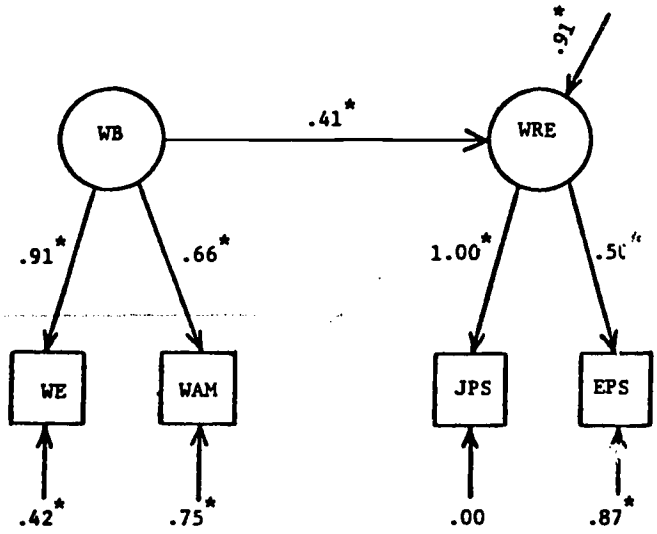
χ^2 = .96
d.f. = 1
p = .33

Figure 8

Findings for Hypothesis 2[a]

[a]Parameters for Sample N_1 are expressed as open numerals, while those for Sample N_2 are within brackets.

*Note: Parameters at least twice their standard errors.



Sample N_1

χ^2 .06
d.f. = 1
p = .81

Figure 9

Findings for Hypothesis 3

*Note: Parameters at least twice their standard errors.

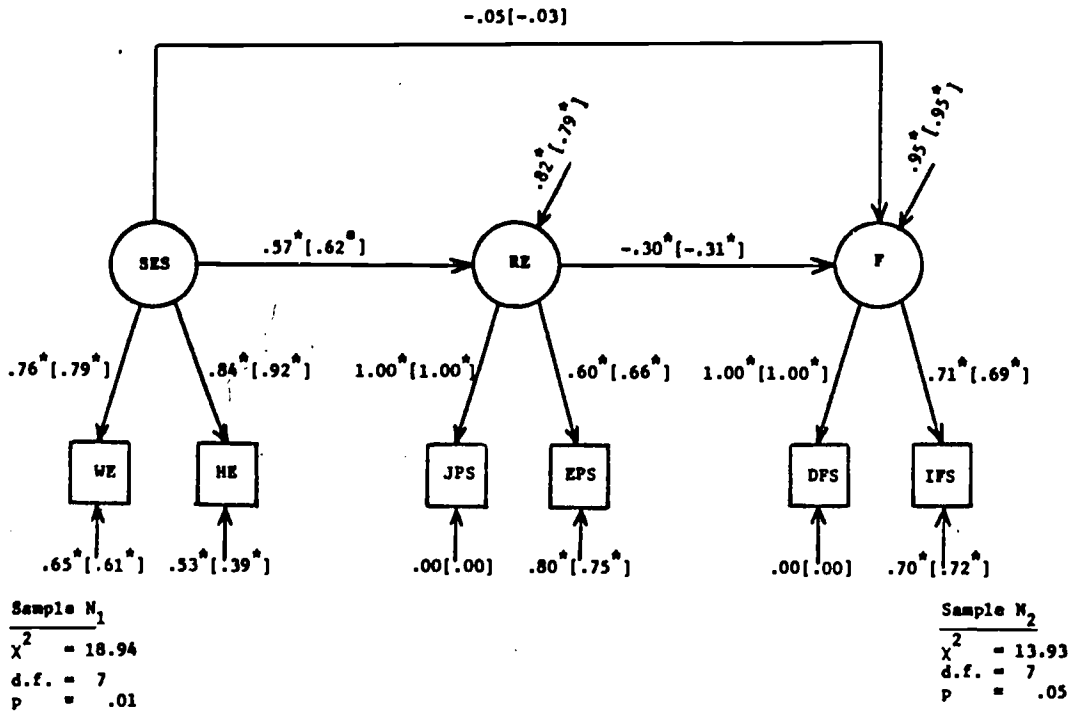
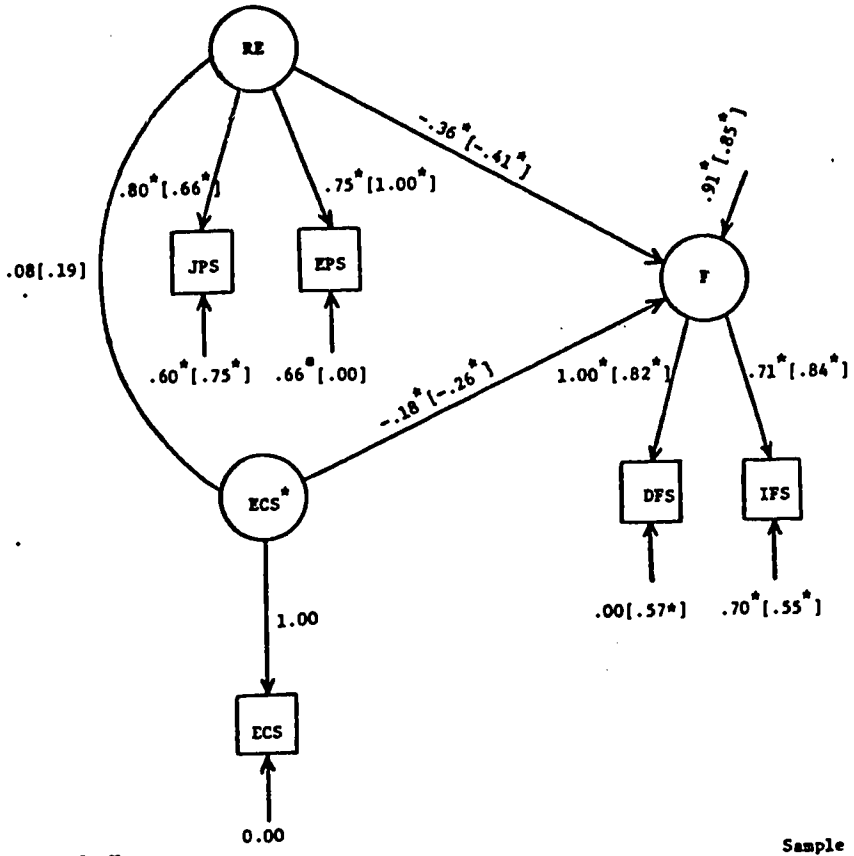


Figure 10

Findings for Hypothesis 4*

*Parameters for Sample N_1 are expressed as open numerals, while those for Sample N_2 are within brackets.

*Note: Parameters at least twice their standard errors.



Sample N_1

χ^2 = 4.85
d.f. = 4
p = .30

Sample N_2

χ^2 = 3.22
d.f. = 4
p = .52

Figure 11

Findings for Hypothesis 5[a]

[a]Parameters for Sample N_1 are expressed as open numerals, while those for Sample N_2 are within brackets.
*Note: Parameters at least twice their standard errors.