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Canada

Canadian Fertility, Sex Roles, and Labor
Force Participation: A Sequential
Decision Making Framework

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A Thesis

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ABSTRACT

Canadian Fertility, Sex Roles and Labor Force Participation: A Sequential Decision Making Approach

Donald W. Kerr

This thesis is a parity specific analysis of the impact of changing sex roles and female labor force participation upon household fertility decisions. The notion of parity is defined in demography as the number of children a woman has borne. In proposing a parity specific analysis, the study specifically controls for parity. It is assumed that sex roles and female labor force participation have a differential impact upon fertility decisions for women of differing parities. The Canadian Fertility Survey (Balakrishnan et al, 1984), this country's first national fertility study, is used as the source of data. In testing for the parity specific impact of these factors on marital fertility, step-wise multiple regression analysis is utilized.

The findings indicate that both female employment and sex roles interact with parity, as do demographic and socio-economic factors acting as controls in the analysis. Female employment is found to encourage first births, have a null effect on second births, while strongly discouraging the birth of a third or fourth child. Egalitarianism in sex role attitudes and behavior is found to discourage births across parities, while its effect appears to hold greater importance to earlier order births. Sex roles and female employment are also found to interact in the explanation of fertility decisions. Overall, the findings demonstrate the value in separately examining fertility decisions by parity, in contrast to static models which focus upon completed family size.

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INTRODUCTION

The following study examines the impact of changing sex roles and female labor force participation upon household fertility decisions. The data utilized are drawn from the Canadian Fertility Survey (Balakrisnan et al,1984), this country's first national fertility study carried out in April-June of 1984. Relatively recent micro-level studies of marital fertility have emphasized the relevance of sex role attitudes and behavior (Bagozzi and Van Loo,1978; Scanzoni, 1975) along with wife's labor force participation (Balakrishnan et al,1979; Kyriazis and Henripin, 1982). This study attempts to build on past research, in following through on Namboodiri's (1972) call for a "sequential decision-making approach" in the analysis of fertility decisions. This approach is based on a seperate analysis of fertility by birth order.

The first section of this study introduces the research problem, along with a rationale for its relevance to social demographic inquiry in a changing societal context.

The second section is a review of the literature, outlining demographic analysis based upon neo-classical economics,

social exchange theory, and feminist studies.   In the same section, empirical research which specifically focuses upon the interrelationships between sex roles, labor force participation, and fertility is also introduced.

The third section specifies the empirical models to be tested.   Three alternative models are specified, based upon previous empirical research and the theoretical literature.

The fourth section outlines the methodology employed, involving a discussion of the data, operationalization of the conceptual framework, and the method of analysis.

The fifth section elaborates upon the findings, followed by a concluding section which summarizes the results.

I: THE RESEARCH PROBLEM

This. study is concerned with the impact of changing sex roles and female labor force participation upon the household fertility decisions of Canadian married women. In proposing a "sequential decision-making approach", a "parity-specific analysis" is involved.   The notion of parity is defined in demography as the number of children a woman has borne.   In proposing a parity-specific analysis, this study controls for parity. The fertility decisions of women at differing pari- ties are separately examined. It is assumed that sex roles and female employment will have a differential impact upon fertility depending upon _parity, as a distinction can be drawn between decisions relating to children of differing birth order.

The Canadian Fertility Survey is particularly useful in examining the sequence of decisions associated with family size in light of detailed information on a number of atti- tudinal, demographic, and socio-economic variables. Detailed information on sex role attitudes and behavior, on female work history and present labor force participation is obtained in a survey of 5315 women (including single women)

between the ages of 18 to 49. The results of the survey also provide detailed information on a whole set of socio-economic and demographic variables traditionally emphasized by demographers. These serve in the analysis as constraints on the impact of sex roles and labor force participation.

Rationale

As reported in a recent publication by Statistics Canada (Romaniuc,1984), the fertility rate in this country has fallen to an unprecedented low level. Since fertility is considerably more important than other demographic factors (mortality, migration) in determining changes in population growth and age structure, this holds innumerable implications for various areas of concern to the social sciences: labor market, health services, education, etc.,

This decline in fertility has coincided with changes in sex roles (both attitudes and behavior), which are closely interrelated with a steady climb in female participation in work outside the home. Despite a need for research into specifying the linkage between sex roles, labor force participation, and fertility, a lack of adequate Canadian data has left a scarcity of empirical research along these lines.

With respect to work outside the home, the participation rate of women in the labor force has climbed from 34.4% in 1966 through to 51.6% in 1982 (Statistics Canada,1983)... Among married women, approximately 34% were employed full-time, while an additional 12% were employed part-time. Clearly an analysis of marital fertility which emphasizes the relevance of wife's work experience remains an important area of research.

Research in the United States has indicated a shift toward more egalitarian sex role attitudes (Thorston and Freedman,1979). Although it remains uncertain to what extent this manifests itself in actual behavior, an increasing number of American men and women believe in a more equitable sharing of responsibilities in child care. Canadian demographic research has largely failed to examine such attitudinal considerations in the analysis of fertility decisions.

The availability of the Canadian Fertility Survey allows for a detailed micro-level analysis. This will serve in attempting to delineate the relative importance of sex role attitudes and female employment in explaining household fertility decisions.

In studying fertility, there has been a tendency for researchers to adhere to the static assumption that couples adopt a lifetime plan early in their marriage with respect to ultimate family size. Although this has facilitated the

analysis of fertility, it has also failed to capture the dynamic nature of household fertility decisions. In this study, the basic premise will be that the decision to have a first or second child take on a differing character from decisions with respect to higher parities, hence a dynamic analysis will be conducted.

II: LITERATURE REVIEW

Economic Models of Fertility

Beginning with a provocative paper written by Becker in
1960, economists and demographers increasingly began to apply
economic theory to the study of human fertility. The major
thrust of Becker's initial argument is that neo-classical
economic theory, with slight adjustments, provides a context
for the analysis of fertility. While features of Becker's
model of fertility have subsequently been revised, his funda-
mental framework remains important in an area not tradi-
tionally dealt with by economists.

Fundamental to neo-classical economics is a concern with
resource allocation decisions made under economic con-
straints. A basic premise is that households face a certain
set of consumption alternatives in light of available
resources. Both husband and wife arrive at joint decisions
in the allocation of resources by rationally attempting to
maximize utility or satisfaction through their choices. In
employing a strictly utilitarian concept of rationality, the
household chooses among a variety of consumption alternatives
given the relative prices of commodities and the resources

available.

Becker's rationale in applying this framework to fertility
is partially based upon the recognition of American couples
increasingly achieving control over both the number and
spacing of births. An expansion of knowledge about contra-
ception was associated with a widening scope for rational
decision-making. This allowed Becker to propose that econo-
mists treat fertility decisions as formally equivalent to
other decisions made under economic constraints.

In the context of this neo-classical framework, children
are treated as analogous to economic goods. The demand for
children is portrayed as part of the larger household
decision process where couples decide upon the number of
children that maximize utility relative to consumption
alternatives. Parents weigh the benefits and costs of having
children against the costs and the potential rewards in
alternative choices. Considering a child as analogous to a
consumer durable was justified in that "abstracting from the
kind of satisfaction provided by children makes it possible
to relate the demand for children to a well developed body of
economic theory" (Becker,1960:211). In other words, this
allows the microeconomic theory employed in the analysis of
the demand for consumer durables to serve as a useful
framework in the analysis of the demand for children.

Secondary to Becker's analysis are non-economic factors,

dealt with in a residual fashion through reference to the "tastes" or preferences for children vis a vis other goods. Throughout the literature "tastes" are understood as indicating the psychological needs and motivations behind fertility. These are correspondingly determined by various social and cultural factors such as religion or ethnicity although Becker's analysis did not elaborate upon the possible determinants.

While it might appear reasonable that tastes vary systematically across socio-economic and cultural groups, Becker's cost-benefit analysis does not permit for this possibility. Perhaps due to a concern with rigorously deducing testable hypotheses, Becker assumes that "tastes" vary randomly across households and are unrelated to income or cost factors. Following this assumption, tastes are held constant in his analysis, facilitating an examination of the impact of strictly economic variables.

The price of children is also held constant as couples, whether rich or poor, are assumed to face identical prices. The individual household decides upon the quantity of children relative to the quantity of other goods and services with the prices of both alternatives, by and large, set by the market place. Yet while faced with identical prices, the chosen expenditures upon children and various consumption alternatives vary across households. While couples face identical child costs, certain households obtain additional

utility through devoting a greater proportion of their resources to their children.

This decision in the allocation of resources led to an extension of the consumer durable analogy, in suggesting that parents decide on children of varying "quality". As he wrote "I will call more expensive children higher quality children, just as Cadillacs are called higher quality cars" (1960:211). In emphasizing that this does not imply "higher quality" as morally superior, the goal was to incorporate in the analysis the households' derivation of utility through its decision to spend varying amounts upon differing children. In viewing the child as an economic good, quality is measured in terms of the income spent, with higher quality representing a greater amount of market inputs allocated to the child.

In sum, three interrelated decisions in the allocation of household resources, are proposed; decisions as to the quantity of children, the quality of children, and the quantity of alternative goods and services. Depending upon the household's preferences, utility is maximized through a tradeoff involving the above choices.

In examining these decisions, a simplifying assumption is that both husband and wife come to a joint decision at a single point in time with regard to the quantity and quality of children. In developing a static framework, couples are viewed as adopting a utility maximizing lifetime plan early

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in their marriage.   Under this assumption, "tastes" are
understood as remaining constant over time, with spouses
arriving at joint decision due to overlapping preferences.

In employing his framework Becker proposed income as having
a positive effect upon fertility. With a climb in resources
measured in terms of husband's income, the couple devote a
greater amount toward raising children.   Although Becker
hypothesizes that most of this increase in resources will
produce an increase in the quality of children, he suggests
that an increase in quantity should also be expected.
Households were assumed to choose additional children as
their resources increase or the costs of children decline.
This positive income effect is a central hypothesis in the
testing of Becker's model, running counter to the prepond-
erance of evidence which indicated a negative correlation
(Jaffe,1940; Whelpton and Kiser,1951; Cambell and Patterson,
1966; Simon,1974).

It is important to note that Becker's initial model failed
to acknowledge the potential impact of female labor force
participation upon fertility decisions.   This might be
understood in that Becker develops a model which is specific
to the social and historical context of American society in
the early 1960's.   Implicit is the household's maximization
of utility through the traditional sexual division of labor.
Couples are assumed to adhere to "tastes" that support
traditional sex roles.   In developing a static model which

treats non-economic factors in a residual fashion, his presuppositions exclude the possibility of changing sex roles. Correspondingly, under the traditional division of labor, the potential impact of female labor force participation was understood as relatively minor.

An important revision to Becker's framework was introduced by Mincer (1962) through his concept of "opportunity costs", or the degree of foregone earnings experienced by the household in the decision to devote time to the raising of children. As hypothesized, the higher the opportunity costs, the lower the household's utility associated with children. The concept of opportunity costs is directly related to the impact of female labor force participation, in that Mincer assumes that women exclusively bear these costs. Again in implying a universality to the traditional sexual division of labor, women are understood as either never entering or readily leaving the labor force in raising children. An assumed relative efficiency for women in household production implied that the raising of children and labor force participation act as competing activities for a mother's time. Consistent with this argument, Mincer proposes that the higher the actual or potential income of a woman, the greater the potential opportunity costs in having children.

In elaborating upon the impact of opportunity costs, Mincer (1963) began with an analytical distinction between what has become known as a "substitution" effect in contrast to the

above mentioned income effect. The latter, conventionally operationalized in terms of husband's earnings, has consistently been hypothesized as having a positive effect. In contrast, the substitution effect which encompasses the opportunity costs, measures the effect of wife's actual or potential earnings. With a rise in opportunity costs and a corresponding rise in the cost of her time, the substitution effect was hypothesized as having a negative impact upon fertility. Mincer's revision improves on Becker's initial model in allowing for a strictly economic interpretation of the inverse relationship between actual or potential female earnings and fertility.

In further revisions of Becker's initial cost benefit analysis, researchers in applying the "new theory of consumer behavior" have explicitly drawn the time costs of children into the analysis (Becker,1965; Lancaster,1966; Willis,1973). While Mincer implies that child rearing and labor force participation act as competing activities for a woman's time, later revisions explicitly measure the wife's time available in home production relative to time in labor force. In moving beyond a focus upon child price and household resources, the "new theory of consumer behavior" examines the utility as derived indirectly from the market place, involving the expenditures and actual time devoted toward children within the home. Analytically, households were viewed as consuming basic commodities (ex. children, health, prestige) produced within the household, involving a combination of

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/time and market goods.

In examining time costs associated with fertility, the analysis excludes the husband's involvement in child rearing, assuming that his time is unproductive within the household. As with Becker and Mincer, the traditional sexual division of labor remains unquestioned, with women exclusively bearing the time costs in raising children. Further similarities with the earlier research, remains the assumption of homogeneous tastes and the employment of a static framework. Likewise, income is again hypothesized as having a positive effect upon fertility, with couples directing additional expenditures toward children as their resources increase.

Liebenstein (1974) attempts to rework the microeconomic framework in moving beyond certain of the restrictive assumptions in non-critically applying consumer theory to the analysis of fertility. In criticizing the tendency of economists to treat non-economic factors in a residual fashion, he emphasizes the likelihood of failure in applying narrowly construed economic models to the analysis of fertility decisions. As an alternative, he modifies the analysis through including social factors previously excluded by economists.

In criticizing the assumption of homogeneous tastes, Liebenstein's revision understands that preferences for children as depending upon the specific social and economic

environment of the household. Related to this premise, Liebenstein develops his alternate model through introducing the concept of social influence group (SIG). The overall population is understood as subdivided into a series of SIG's which in turn strongly influence target living standards and family size preferences. While highly correlated yet not equivalent to groups delineated in terms of socio-economic status, SIG's are rather ambiguously described as based upon various historical and socio-cultural factors. In turn, household decision making is understood as depending upon the household's relative position within a specific SIG.

In emphasizing the importance of social and economic environment in examining household decisions, Liebenstein revises the microeconomist's central hypothesis of a positive income effect. Without disputing the empirical evidence which has continuously demonstrated an inverse relationship between household resources and fertility, he hypothesizes that a positive income effect exists only within SIG's. In presenting a rationale for this hypothesis, his work resembles the relative deprivation literature in sociology.

As discussed in some detail by Merton (1968:279-329), it is often relative rather than absolute socio-economic status that holds greatest relevance in examining satisfaction with living standards and corresponding economic aspirations. Likewise, Liebenstein argues that household status relative to the consumption standards of significant others (i.e.

others within the same SIG) serve as central in the analysis of fertility decisions.

In households lacking the resources to obtain the common living standards associated with a specific SIG, a relative deprivation is hypothesized as leading to higher priority placed upon consumption alternatives to child rearing. Likewise, women in households attempting to obtain such representative consumption standards are more likely to seek household resources through labor force participation. In contrast, in households that have obtained such standards, resources more readily become available in the decision to have children. With the satisfaction of representative standards (with respect to expenditures upon status goods, housing, transportation, etc.), a climb in resources is understood to facilitate fertility decisions.

A fundamental pitfall of his theorizing is that the concept of SIG has never been fully explicated nor operationalized. Yet although this theoretical framework has never been put to empirical test, Liebenstein has been credited in his attempt to demonstrate how the historical and cultural context of the household influence its cost-benefit decisions. Factors beyond "opportunity costs" enter into elaborating upon the relationship between female employment and fertility. After criticizing the intrinsically "culture bound" character of strictly economic analysis, Liebenstein ambiguously refers to "cultural factors" influencing household decisions

(1974:467).   Although he has not successfully formalized an
alternative to microeconomic analysis,   his discussion serves
as an indication of the potential for economists in borrowing
from sociological research.

Easterlin (1969, 1975) also draws from sociological
research, in attempting to expand upon microeconomic
analysis. While commencing with a conceptualization of
rational decision-making involving a cost benefit analysis,
Easterlin does not accept the assumption of homogeneous
tastes across households and attempts to include non-
economic factors in his examination of fertility.   Given
that "the principal emphasis of sociology is on the tendency
of behavior to conform to social norms, the conceptual
embodiment of preferences", Easterlin suggests that econo-
mists draw from this discipline in its ability "to elevate
taste considerations bearing on choice to a position equal
to that of other factors" (1969:128).

According to Easterlin, the limited research on taste
formation could be drawn upon in developing a model of
fertility decision-making:

> In general, one's preference system at any given time
> may be viewed as molded by heredity and past and
> current environment. The process starts with birth
> and continues through the life cycle. Religion,
> color, nativity, place of residence, and education
> enter into the shaping of tastes. So, too, does one's
> childhood and adolescent experience in one's own home
> with material affluence and family size. One reaches
> family-building age with preferences already molded by
> this heritage, but these preferences are subsequently
> modified by ongoing occupational, income, and family

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building experiences, among others...(1969;135)

Easterlin formally deals with certain of the above factors in what has been considered a major contribution of his research, his "relative income concept". In certain respects, his discussion of relative income parallels Liebenstein's discussion of SIG's, in that both are related to the relative deprivation literature in sociology.

This concept is based upon the premise that one's preference system is shaped by the living standards experienced in the parent's household during adolescence. In drawing from the limited research on taste formations, a household's actual economic position relative to the living standards experienced in earlier socialization, was understood as strongly influencing household economic aspirations and preferences for children. As with Liebenstein, relative deprivation tends to curtail rates of fertility, while relative affluence would allow for an increase in the demand for children.

The concept of relative income was operationalized by measuring a household's current income relative to the income parents experienced in the household of their adolescence. More accurately, "relative income" was measured in terms of the income of younger males relative to older males (i.e. through exclusive focus upon the income of the husband).

Easterlin himself recognizes that demographic inquiry should attempt to obtain more accurate measures in an actual mapping of fertility preferences. His attempt to measure preferences for children through his estimation of relative economic aspirations in his own estimation remains incomplete. Yet his total exclusion of the experience of women in focusing solely upon the economic aspirations of the husband, leads to the obvious conclusion that his analysis is seriously flawed. Noteworthy, is a failure to address the impact of the wife's economic contribution, which implies an analysis of the wife's relative preferences for children and labor force participation.

Namboodiri (1972) introduces a further revision to the economics of fertility through emphasizing the importance of allowing for a time orientation in examining fertility decisions. This stems out of difficulties with the static framework of Becker's work and the modified versions thereof. Namboodiri criticizes the earlier research based upon the premise that couples adopt a utility maximizing lifetime plan early in their marriage. In arguing for a dynamic examination of fertility decision making, the alternative proposed is a parity specific analysis.

In presenting his observations, Namboodiri asks "whether family members fully take into account the commitments in respect of time, energy, and money, long term as well as short-term, when they think about having a child"

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(1972:189). He suggests that in all probability this is an untenable assumption. For certain couples, time horizons might be confined to relatively short periods, while others look far into the future.

Furthermore, Namboodiri recognizes that the decision to have a first or second child likely take on a differing character from decisions with respect to higher parities. As suggested, "the appropriate decision problem in the economic analysis of fertility is the sequential addition of each child and the timing thereof" (1972:191). He therefore allows for the possibility that factors influencing fertility decisions vary over time, with economic, normative, and societal considerations carrying differing weight by parity.

Also of fundamental importance to Namboodiri's approach is "a recognition of the interdependence of the utilities associated with children of different parities" (1972:191). Experiences in child birth and child rearing, complemented by the various changes tied in with the life cycle are understood as influencing the level of satisfaction associated with further children. In rejecting the assumption of constant preferences over time, Namboodiri's analysis more accurately accommodates an evolving perception of utility, depending upon the couple's life experience and phase in the life cycle.

Consistent with Namboodiri's argument is the likelihood

that the effect of wife's employment upon fertility vary by parity. As will be discussed in the concluding section of the literature review which focuses upon empirical research, the findings have remained inconclusive as to the effect of female employment by parity (Hout, 1978; Kyriazis, 1982). Alternate hypotheses as to its varying effect have been proposed.

One further critique which applies to most of the work involved in the economics of fertility concerns the assumption that the husband and wife have the same preferences. As Turchi (1975:26) writes "it is ironic that, in a discipline so concerned with the antecedents to and the outcomes of optimizing decisions, economists have spent so little effort in the analysis of the decision process itself". Again, although it might not be analytically convenient, Turchi argues that research should be directed toward recognition of at least two decision makers within the household.

In calling for an explicit treatment of husband and wife interaction, he suggests that "it would seem worthwhile both analytically and empirically to develop a fertility decision model which at least illustrates the manner in which husband wife conflict might affect fertility decisions" (1975b:116). Yet despite Turchi's recognition of the necessity in accommodating husband-wife interaction, economists have failed to model potential conflict of interest situations

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between spouses. While expressing a dissatisfaction with the problematic joint family function, economists have not developed alternative models which explicitly examine the separate utilities of husband and wife.

It is only in the socio-psychological literature which employs social exchange theory, that the interaction and potential conflict between spouses has been drawn directly into the analysis. As will be outlined in the following section, a major difference between the economics of fertility and a social exchange approach is its attempt to account for interaction and conflict resolution. This might be anticipated given the tendency of these theorists to begin with the non-economic factors peripheral to the research outlined above.

Social Exchange Theory

In developing models based upon social exchange theory, a focus upon household decision making has lead to an explicit treatment of husband-wife interaction. In contrast to the economics of fertility, most of this research begins with the attitudes and non-economic factors peripheral to the earlier research focusing on income and costs. In accommodating social interaction between spouses, their work is also credited in formally dealing with the impact of sex roles upon fertility decisions. In light of the evolving nature of sex role attitudes and behavior, this improves upon the premise of previous research that implies a joint maximization of utility based upon the traditional sexual division of labor.

An important addition to this literature is associated with the work of Bagozzi and Van Loo (1977). In developing their model, husband-wife interaction is conceptualized in terms of general socio-psychological processes occurring within the household. These have a corresponding direct impact upon fertility decisions. Bagozzi and Van Loo also directly draw from the economics of fertility in stressing the importance of socio-economic factors. As hypothesized, the decision to have a child "is a direct function of social psychological processes in the family and an indirect function of socioeconomic constraints on family size"(1977:302).

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With respect to the socio-psychological processes occurring within the household, two general processes act as endogenous components in their model. As argued, "the shared, socially constructed attitudes of household members influence family size" (i.e. what might be considered equivalent to the microeconomist's "tastes"), and secondly, "the social exchanges transpiring between husband and wife affect fertility" (1977:301). Attitudes of family members are further analyzed in terms of three conceptually distinct characteristics; an affective component, a behavioral component (representing actions and choices closely related to the decision to have children), and a cognitive component (comprised of beliefs related to the implications in having children). These in turn are interrelated with such "characteristics of the husband and wife, as personality traits, behavioral orientation, and expectations". Correspondingly, attitudes, expectations, personality, and behavioral orientations function as constraints on or facilitators of the social exchanges transpiring between husband and wife.

In elaborating upon the nature of this social exchange, Bagozzi and Van Loo argue that the marital relationship entails "a sharing and exchange of rewards and punishments where these might be physical, psychological, or social in nature" (1978:307). A fundamental assumption of this theoretical framework is that both spouses achieve joint satisfaction through this transfer of rewards and punishments,

through what is understood as a form of social currency (whether it is tangible or non-tangible). In other words, socio-psychological processes of give and take between spouses leave households negotiating a joint outcome in their fertility decisions relative to lifestyle alternatives. In examining fertility decisions, children themselves are viewed as a type of social currency, potentially providing both indirect and direct rewards, central to the couple's achievement of joint satisfaction.

According to Bagozzi and Van Loo, social exchange is shaped by the nature and degree of "social influence" associated with each spouse. This concept is defined as the form in which needs and expectations are communicated. In drawing from social exchange theory, the relative success in influencing the other in a close interpersonal relationship is understood to involve an interplay of "threats, promises, warnings, and mendations". By implication, husband and wife attempt to reach mutual satisfaction in an exchange of rewards and punishments, as shaped by their social influence.

Bagozzi and Van Loo operationalize this give and take relationship through the extent of role egalitarianism and the corresponding degree of conflict and power between husband and wife. Relatively bilateral social influence (as indicated by sex role egalitarianism) is understood to have a differing impact upon fertility in comparison to more traditional marital relationships.

In testing their overall approach, Bagozzi and Van Loo (1978:308) hypothesize:

> that the more balanced the power, the less the conflict, and the greater the egalitarianism, on the one hand, the greater the probability that the couple, desire a life style and mode of consumption at odds with producing a large family, engage in fertility planning and the use of contraceptives, and, in general, be susceptible to anti-natalist social, economic, and attitudinal constraints, on the other hand.

In other words, as attitudes and social exchanges within the household become more modern, relatively bilateral social influence leads couples to adopt a lifestyle non-conducive to large families.

Yet it should be re-emphasized that Bagozzi and Van Loo also model the impact of social and economic factors, in considering their indirect effect on fertility (rather than a direct influence hypothesized in economic research). Norms, social stratification, and economic constraints influence fertility through the above mentioned endogenous variables. Economic theory is employed in modeling the economic determinants (with reference to price, income and opportunity costs), which have direct influence on attitudes and social exchange and an indirect effect on fertility. As Bagozzi and Van Loo (1978:302) acknowledge, "although economists have not explicitly modeled such processes, these ideas are consistent with Easterlin's (1969) and Liebenstein's (1974) suggestions that income and the economic environment influence tastes".

Bagozzi and Van Loo have uncovered empirical support with respect to the impact of socio-psychological processes occurring within the household (1978:311-317). Families with bilateral social influence between spouses (as measured by sex role egalitarianism) along with more modern attitudes (as measured by media exposure and consumer orientation) are more likely to decide upon fewer children. Although they neglect operationalization of the affective and cognitive components of household attitudes, sufficient evidence is presented supporting their discussion of the tradeoffs and choices competing with large families.

Although Bagozzi and Van Loo appear as relatively successful in formalizing the impact of unique dynamics within the household, some criticism can still be levelled against their empirical treatment of socioeconomic factors. While they have drawn to a considerable extent from the economics of fertility in discussion of economic constraints, in their actual empirical research Bagozzi and Van Loo merely refer to the impact of husband's absolute earnings. While they acknowledged that opportunity costs act as an economic constraint upon the social exchange occurring within the household, they have not empirically measured its impact. Their analysis of fertility is undeniably lacking in failing to directly or indirectly examine the relevance of female employment status. Likewise, in examining the impact of sociological and normative constraints, merely one measure was employed in examining the impact of norms (wife's place

of birth), and another examines the relevance of social stratification (wife's education). Likely this failure partially lies in the methodological difficulties related to moving from the theoretical to the empirical level.

Scanzoni (1975,1978) has been credited in specifically attempting to delineate the interrelationships between fertility, sex role attitudes, and labor force participation. While he has also uncovered unequivocal evidence that egalitarian sex roles are strongly associated with smaller family size, he attempts to examine the consequences of female employment for this sex role - fertility linkage. As with Bagozzi and Van Loo, ultimate family size was understood as a result of processes of bargaining and exchange in which couples attempt to maximize mutual gain in the form of economic, social, and psychic rewards.

In empirical research, Scanzoni (1978:686-687) separately examines the impact of sex role egalitarianism upon fertility for a sub-sample of solely employed women. His theoretical rationale for this procedure is partially based upon the premise that an interplay between female employment and sex role attitudes is central in examining actual fertility behavior. His analysis uncovered evidence indicating that within a structural context of wife's employment, the existence of sex role egalitarianism has a significantly greater impact upon fertility curtailment then in the sample as a whole. As he suggests in interpreting these findings:

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> Once these wives are moved into a situation in which
> the demands of full-time employment are placed squarely
> upon them, norms pertaining to their greater rights and
> privileges apparently become exceedingly more salient
> than they would have been otherwise (1978:687).

Scanzoni's explanation is based upon his observation that while women have been increasingly entering the labor force, the traditional division of labor within the household has been relatively slow to change. While men and women are increasingly adhering to egalitarian attitudes, this has not been complemented by equal participation of men in household production. In the terminology of microeconomists, the "opportunity costs" of children continue to be largely born by women. As a result "an apparent structural adaptation to the decrease in time for extensive child care due to both parents' choosing to be achievers (or perhaps even merely workers) would be to produce fewer children for which the partners must care" (1975:2).

Feminist Analysis

Of central concern to feminist analysis is the necessity of "problematizing" issues that have previously been taken for granted. As emphasized in a recent collection of essays outlining Canadian Feminism, one such issue is "the sexual division of labor and the social relations between men and women that this division generates" (Luxton,1982:112-113). While many of the above outlined micro-level studies maintain mutual satisfaction under the traditional division of labor (Becker,1960; Easterlin,1975), feminists contradict this premise through emphasizing the inequities associated with traditional gender roles. Similar to the research of social exchange theorists, this calls for an explicit analysis of the social relations between men and women, in order to understand more fully understand decisions related to child care and reproduction.

In drawing from feminist theory, Folbre (1982) criticizes demographic analysis based upon neo-classical economics. As emphasized, the family can not be conceptualized as "a static, unchanging institution, a decision-making black box", but rather as an institution "prone to conflict and compromise". In rejecting consensual decisions, she emphasizes the necessity to consider changing power relations within the family as shaped by evolving historical and cultural circumstances.

Fundamental to her argument is an acknowledgement of structural inequalities in explaining fertility decisions. As she elaborates:

> At the very core of feminist theory, in virtually all its incarnations, lies a central insight about the nature of motherhood. However distinctive women's biological capacities may be, it is the social and historical context of child bearing and child rearing that largely determines their structure and meaning. To many feminists, this social and historical context inextricably links motherhood to the larger pattern of patriarchy. The social relations which govern reproduction often reinforce the domination of women and the exploitation of women's labor (1983:261).

While Folbre has not formalized a micro-level alternative to previous analyses of fertility decisions, the primary value of her discussion rests in "developing hypotheses that can serve as a useful guide for future research" (1983:261).

In addressing the nature of women's oppression in society, and more precisely, in the family, feminists have explicitly examined the division of labor in Canadian households. While "work" which falls outside of the official definition of "labor force" has been largely ignored by social scientists, feminists directly examine its character.

A mid-seventies study of Vancouver households (Meissner et al, 1975:431) concludes that despite the well-documented increase in the number of women in the labor force, "there can be little doubt that women continue to take primary responsibility for domestic work". Whether women work solely in the home, work part-time or full time in the work force,

this study indicates that child care, like housework continues to fall mainly to women. In measuring the actual time costs, in families with children the husband's contribution to regular housework increased only slightly when their wives obtained paid employment (1975:436). Likewise, little change was found in households where women pursue careers as opposed to work solely to subsidize family income. This supports the microeconomist's argument that the opportunity costs of children continue to be largely borne by women.

A more recent study has uncovered similar results, demonstrating little change in the actual division of labor (Luxton, 1983:27-44). While a minority of husbands have been taking on a larger share of this work, in the greatest majority of Canadian households, wives continue to take on the primary responsibility. In light of the well-documented increase in female labor force participation, the major thrust of Luxton's work implies an intensification in the exploitation of women's labor. Feminists have clearly documented that the time costs in having children continue to be largely born by women.

While this research has not explicitly dealt with fertility decisions, its findings are consistent with Scanzoni's discussion of an interplay between female employment and sex role attitudes. In a context of full-time employment, attitudinal and normative considerations pertaining to greater rights and privileges logically become more salient

than they would otherwise. Given the unwillingness of husbands to compensate their "partners" commitment to paid employment through a significant increase in time devoted to the household, wife's understandably exert interpersonal influence in attempts to obtain a more equitable situation. Due to the time constraints imposed upon her, she would be expected to negotiate with her husband for fewer children than if she were not employed.

Empirical Research

In advocating a dynamic specification of reproduction decisions, Hout (1978) examines marital fertility through a parity specific analysis. Consistent with Namboodiri's critique of the static framework of microeconomists, he rejects the presupposition that husband and wife adopt at the beginning of marriage a utility maximizing lifetime plan. His analysis presents evidence which portrays the one-period decision-making framework as empirically unattainable. Variation in effect of socio-economic determinants by parity is uncovered in applying an alternative sequential decision-making framework.

In analyzing data from the U.S. census of 1970, Hout is not capable of examining the impact of changing sex roles and

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other factors stressed by social exchange theorists. Yet in basing his analysis on micro-economic theory, he examines whether the effects of wife's employment and earnings potential varies with parity. The impact of opportunity costs associated with loss of employment income is anticipated to differ, depending on whether the decision is to have a first or second child relative to higher order births.

Hout suggests inherent ambiguities in analyzing fertility within a dynamic framework:

> The ambiguity is not as great when analyzing first and second births in contemporary United States. Effects on first and second births are predominantly effects on the timing of those births, because nearly all married women have had or expect to have at least one child, and nearly 90 percent expect at least two (Bureau of the Census,1976, Table 2). Interpreting effects on higher order births is more difficult because of the timing-numbers mix, e.g., does a positive income effect on third birth mean poor couples postpone third births or forego them altogether? (1978:141).

In considering wife's employment, two alternative hypotheses are discussed. After acknowledging normative pressures on American women to have at least two children, Hout proposes that "the ratio of opportunity costs of childbearing to the benefits of additional children", increase with the achievement of normative family size (1978:142). While women involved in the labor force are as likely as non-employed women to have at least two children, the potential opportunity costs associated with further children leaves them less likely to have higher order births. This would be supported

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in uncovering stronger effects of female labor force partici-
pation at higher parities. An alternative hypothesis
primarily concerned with the timing of births is that
employed women delay earlier births in satisfying economic
and career aspirations. The latter would be supported by
uncovering stronger effects at lower parities. His empirical
work failed to support either of the hypotheses, with little
variation in a weak negative effect at all births.

Hout's research also examines the impact of household
resources, in focusing upon the variation in effect of
husband's earnings. Empirical support is uncovered for a
hypothesized decline in income's impact with increases in
parity. A relatively strong positive income effect at the
first two parities, and non-significant effects at higher
parities supports Hout's expectation that the income effect
is less important at higher order births. In interpreting
his findings, he suggests that they "form impressive support
for the hypothesis that the timing of first and second births
is highly sensitive to economic opportunity, while the timing
of subsequent births is not subject to economic influence of
the same magnitude" (1978:149). Households at lower parities
are more likely to forestall having children if they lack the
economic means. This also suggests that at higher parities,
households of greater income are neither more or less likely
to decide upon an additional child. Rather than investing in
further children, with the obtainment of normative family
size, higher income households appear to devote resources

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toward consumption alternatives and child "quality".

In a similar study analyzing 1971 Canadian census data, Kyriazis (1982) also uncovers support for the sequential decision-making framework. While the potential impact of sex roles is not included in the analysis, the effect of other variables (husband's income, wife's education, age at marriage, place of residence and birth cohort) are shown to vary by parity. A separate analysis is carried out for Protestants and Catholics due to the likely interaction between religion and certain of the independent variables.

In measuring the impact of household resources, two differing indicators are involved. Both husband's "current income" and "projected income at 40" are used alternatively. In measuring the impact of household resources on decisions related to family formation, projected income is considered a more appropriate measure. As summarized, this is "because it holds age effects constant and also because it reflects husband's peak earnings potential" (1982:33).

In general, the findings suggest that projected income serves greater relevance in explaining fertility decisions. The effect of projected income is consistently stronger relative to current income. Rather than an immediate response to current economic position, this reinforces the presupposition that couples are purposeful decision makers, actively planning in expectation of changes in their circum-

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stances.

The effect of "projected income at 40" across parities is
generally consistent with Hout's analysis. For both Catho-
lics and Protestants the income effect is strongest and
positive at lower parities and negative at higher order
births:

> These income effects suggest that among Protestants
> there is decreasing marginal utility from an addi-
> tional child after a two-child family size has been
> attained so that a given increment in income produces
> substitution effects on fertility at higher birth
> orders. The substitution effects in the Catholic
> sample appear only at parity progressions 3-4 and 4-
> 5+. Assuming that an increase in income will be
> invested in an additional child only if that child
> does not exceed the normative family size range, these
> findings suggest that the upper family size limit is
> greater for Catholics than it is for Protestants
> (1982:389).

This interpretation is not readily supported in examining
the effect of husband's current income, e.g. within the
Catholic sub-sample, the effect of current income is positive
across all parities although it is stronger at the first
three.

In considering opportunity costs, the analysis includes
education of wife as an indicator of the forgone earnings
experienced in the decision to devote time toward children.
As with women who are involved in the labor force relative to
non-employed wives, higher educated women face greater
opportunity costs in the decision to have a child. The

higher the actual or potential income of a women as estimated by education, the higher the opportunity costs and the lower, the household's utility associated with children. This is supported in the findings with education having a negative effect across parities.

The effect of education is significantly stronger at the first birth, which indicates the importance of opportunity costs in leading many couples to forestall beginning a family. This is consistent with Hout's alternative hypothesis with respect to the possible impact of female employment status on the timing of lower order births. Although Hout failed to uncover empirical support for this negative effect, it is expected that employed women as with higher educated women delay birth of a first child in the pursual of economic and career aspirations. In light of the above, the effect of employment status will be re-examined using more recent Canadian data.

The effect of education is found to be stronger in the Catholic sub-sample. The proposed explanation is a greater conservatism among Catholics in considering household responsibilities. This leads to a greater incompatibility between female work within and outside the home. This finding implies that a direct measurement of the effect of changing sex roles serve in a more thorough delineation of household decisions.

A further noteworthy finding is the relatively strong negative effect of age at marriage, especially in influencing lower order births. While it remains almost a given among demographers that the older the age of marriage, the lower the probable completed family size, this effect appears to be largely due to its influence on the probability of earlier births. As summarized, "although the probability that a women who marries in her early twenties will end up having five children is considerably greater than that of a woman who marries in her thirties, the findings indicate that this overall effect might be due to the large difference in the probability of a first birth" (1982:39).

In employing microeconomic models, the above studies have not drawn directly into the analysis an explicit treatment of husband-wife interaction. While the above discussion implies a greater conservatism in Catholic familial relations, the analysis has not explicitly examined the impact of evolving sex role attitudes and behavior. The research continues to rely upon an assumed joint maximization of utility in fertility decisions.

The relevance of sex roles as emphasized by social exchange theorists have rarely been examined in the Canadian context. Furthermore, the available literature contains no reference to the direct measurement of sex roles in applying the sequential decision-making framework. While social exchange theorists focus upon sex role egalitarianism in operationa-

lizing bilateral social interaction, the empirical literature has not examined its relative importance in explaining births of differing parities.

A recent unpublished paper has utilized the Canadian Fertility Survey in examining the relative importance of sex roles in a static analysis of marital reproduction decisions (Chapman and Balakrishnan,1986). Support for the inverse relationship between egalitarian sex roles (both attitudes and behavior) and family size is reported in studying wanted and actual fertility\ The analysis supports the hypothesized impact of socio-psychological processes occurring within the household as proposed by Bagozzi and Van Loo. Families with bilateral social influence between spouses (as measured by sex role egalitarianism) along with more modern attitudes (as measured by various indexes representing attitudes toward the family, cohabitation and abortion) are more likely to decide upon fewer children.

This study also examines the effect of wife's education, employment status, present age, age of marriage, along with ascribed characteristics of the sample such as religion and ethnicity. The impact of normative considerations are included indirectly through examining the effect of whether the couple live in a rural or urban setting, the number of siblings in the wife's family of origin, and the value parents hold with respect to children. All of the above mentioned factors have been shown by Balakrishnan (1980) to

be related to marital fertility. In examining the relative importance of various determinants of fertility, these factors have been considered standard in the demographic literature.

Complementing the negative effect of sex role egalitarianism, wife's employment status is found to have a relatively strong negative impact upon family size. The analysis also tests for the possibility of an interplay between employment status and sex role attitudes in explaining fertility. This is done by including an interaction term in the analysis. Statistically significant results in explaining both wanted and actual fertility support Scanzoni's argument that modern sex role attitudes become considerably more salient in the structural context of female employment. This is equivalent to Scanzoni's findings after a separate examination of the impact of sex role egalitarianism upon the fertility in a sub-sample of employed women as opposed to women working solely in the home.

While the above study directly deals with the relative importance of sex roles in a national sample of married women; research involving less representative samples have also uncovered support for an inverse relationship between egalitarian attitudes and family size (Turner and Simmons, 1977; Veevers, 1977; McDaniel, 1984). McDaniel examines the expected family size of 1045 women interviewed in a 1974 fertility survey in Edmonton, Alberta. Family size expecta-

tions are shown to be inversely related to an egalitarian attitudes index, based on answers to questions on division of labor, authority, and decision making within the household. Furthermore, this static analysis of fertility expectations portrays the relative importance of labor force participation and other economic determinants, consistent with the micro-economic literature.

McDaniel's research supports the decision-making framework of social exchange theorists in emphasizing the importance of both sex roles and economic constraints. As she summarizes, ultimate family size appears to be largely a function "of a deliberate choice fostered by the unique circumstances in which the couple find themselves as well as their relative preferences for children" (1984:86). This implies that explanations of fertility differentials focusing upon inter-group differences are inappropriate in the contemporary Canadian context. As written in summarizing her empirical findings:

> Failure of the structural variables to explain much of
> the variance in expected fertility suggests that the
> traditional differentiating variables such as reli-
> gion, religiosity, ethnicity, and family size of
> origin are being replaced by a calculus of child
> bearing in which the decision to have children is made
> within the context of individual economic and social
> circumstances and preferences rather than in terms of
> old-fashioned normative pressures (1984:86).

The above justifies the empirical model to be tested in the present paper. As outlined in the following section, the major concern of the analysis are factors impinging upon

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fertility decision making and how they differ by parity.
This includes the effect of female employment and other
economic considerations. Furthermore, of major concern is
the relative importance of socio-psychological determinants
(i.e. sex role attitudes and behavior) by parity.

III: MODEL SPECIFICATION

In reviewing microeconomic and social exchange theory, a major innovation associated with the latter approach is a simultaneous analysis of economic and social choices. Social exchange theory builds upon microeconomic research by incorporating social considerations into the economic perspective. Of central importance is the influence of evolving sex roles, in directly drawing husband-wife interaction into the analysis. While it rejects the joint utility decision-making framework, it continues to rely upon economic theory in modeling the economic determinants of fertility (with reference to price, income and opportunity costs).

This study is based on a dynamic approach which specifically focuses upon the impact of economic constraints as hypothesized by economists, social interaction between spouses as emphasized by social exchange theorists, complemented by demographic and normative variables commonly utilized as controls in the literature. Of primary concern is the varying effect of female labor force participation and sex roles on fertility by parity.

Three alternative models are examined. The latter two are estimated separately by parity.

The first model examines "total number of children born" to Canadian women in intact first marriages. This is representative of research which employs the static framework, and is based on information on family size at time of survey. For comparative purposes, these findings are presented with results employing the sequential decision-making framework.

The second model adopts the dynamic perspective in examining fertility decisions over the reference period 1982-1984. This involves a separate analysis of the probability of a first birth during this period as opposed to the likelihood of a second birth, and the likelihood of a third or fourth birth. It is anticipated that there will be substantial differences in the estimates of parameters by parity. The reference period for actual fertility is limited so that there is a closer correspondence in temporal ordering between the determinants and fertility. While it is assumed that factors measured at the time of survey (1984) have not changed since the beginning of the reference period, it is considered inappropriate to draw inferences as to their impact on decisions relating to earlier births.

In the third model, the actual fertility behavior of a sub-sample of employed married women is compared to a sub-sample of married women not involved in the labor force.

This analysis is carried out in testing for a hypothesized interaction effect between female employment and sex roles. Again, this involves a parity specific analysis of births occurring throughout the reference period drawn from information available on fertility history.

As will be elaborated upon in the "Methods" section, the method of analysis in the testing of the three models specified shall be hierarchical step-wise regression.

Economic Constraints and Household Fertility

As stressed in reviewing microeconomic research, a focus upon resource allocation decisions made under economic constraints continue to remain important in explaining household fertility outcomes. Microeconomic research has supported the presupposition that parents weigh the benefits and costs of children against the costs and potential rewards of consumption alternatives.

As argued by Mincer, the utility of children declines with a climb in the costs of children and the "opportunity costs" of the mother. A relatively rapid expansion of women in the work force has extended the opportunities for women to gain income and other rewards outside of the family. Correspondingly, the opportunity costs associated with childbearing have risen. These costs are reflected in a negative effect

of female employment. This is further supported by feminist research which demonstrates that opportunity costs continue to be largely borne by Canadian women. A negative effect across all parities is anticipated.

As Hout discusses in reference to normative family size, with the achievement of two children, the ratio of opportunity costs of childbearing to the benefits of additional children are assumed to increase. While employed women are as likely as non-employed women to have at least two children, at higher parities female employment is expected to lead many couples to decide against further children. Hout's empirical work which surprisingly failed to support the above possibility leads to a re-examination of employment and fertility in the present study. The hypothesis put forward is that the negative effect of female employment is at its strongest with respect to decisions relating to the birth of a third or fourth child.

In focusing upon the timing of births, the effect of employment status is also hypothesized as being negative at earlier parities. Although weaker effects are expected, the opportunity costs associated with female employment are expected to lead many women to delay earlier order births. As most couples anticipate at least two children, the negative coefficients are understood to represent forestallment rather than curtailment of fertility in the pursual of economic and career aspirations.

Consistent with Mincer's discussion of opportunity costs, education of wife is also expected to have a negative effect upon fertility. Acting as an indicator of wife's potential earnings, a higher level of education is expected to lead to a curtailment of fertility. While critics argue that education also reflects differences in contraception use and relative preferences for children (Namboodiri,1972; Turchi, 1975), it continues to be considered a reliable estimate of opportunity costs (Willis,1973; Kyriazis,1982; McDaniel, 1984).

As with women who are employed, wives who can demand a higher income are expected to decide upon fewer children. Again, the ratio of opportunity costs of childbearing to the benefits of additional children are assumed to increase for higher order births. Furthermore, the effect of education is also hypothesized as having a negative effect at lower order births. As with employed women, wives who face higher potential earnings are more likely to delay the birth of a first child. Similarly, women who face higher opportunity costs after the birth of a first child are expected to delay a second birth. The negative effect of wife's education is expected to be weaker at earlier order births.

Due to the likely correlation between potential earnings and actual employment status, the two variables are used alternatively in the analysis. It is assumed that women who face higher potential income are more likely to be employed.

Due to problems of multicollinearity in regression analysis, an inclusion of both education and employment status is likely to lead to unreliable estimates.

The present study also directly deals with the relative importance of household resources. Since Becker's initial paper, microeconomists have consistently argued that a climb in household resources leads to higher fertility. Ceteris paribus, a climb in resources induces couples to devote a greater amount toward raising children.

Dynamic analyses examining the influence of household resources (operationalized as husband's income) indicate a variation of effect by parity. Consistently the strongest effects are found at lower parities, indicating that decisions relating to first and second births are more sensitive to economic influence. Furthermore, positive income effects at lower parities and non-significant or negative effects at higher parities are uncovered which contradict the assumptions of the static framework. Rather than a climb in husband's income leading to higher completed family size, more accurately economic advantage facilitates lower order births with couples who are financially secure having their first two children earlier. The economic circumstances of the household have a differing impact depending on whether normative family size has been achieved.

In the present study, husband's income is hypothesized as having a positive effect at the first two parities, reverting to a negative impact at higher parities. Furthermore, its influence is hypothesized as stronger at lower order births. The positive effect in the decision to have a first or second child is understood as reflecting timing differences. Households with higher income are more likely to begin a family, with lower income couples delaying children until their economic circumstances allow. The negative effect at higher parities is assumed to represent differences by income in completed family size. Consistent with previous research, higher income households are hypothesized to be more likely to devote resources toward consumption alternatives and child quality after the birth of the first two children.

Sex Roles and Fertility

As outlined in reviewing social exchange theory, household fertility decisions entail general socio-psychological processes of give and take between spouses. As discussed by Bagozzi and Van Loo (1978), both husband and wife communicate their "needs and expectations" in arriving at fertility decisions relative to lifestyle alternatives. Rather than assuming a joint maximization of utility under a traditional division of labor, the focus is upon evolving sex roles and the character of social interaction between spouses.

The social exchange influencing these decisions is shaped by the nature and degree of social influence associated with each spouse. As with feminist studies which call for an analysis of power relations between men and women, social exchange theorists explicitly examine the character of husband-wife interaction. Relatively bilateral social influence typifying this interaction (operationalized as sex role egalitarianism) is considered an important determinant of fertility.

Sex role egalitarianism is hypothesized as having a negative effect upon fertility at higher order births. Negative effects at higher parities are interpreted in terms of completed family size rather than the timing of births. As attitudes and social exchanges in the household become more modern, relatively bilateral social influence leads couples to adopt a life style non-conducive to large families. As Bagozzi and Van Loo (1978:308) argue, "the greater the probability that the couple desire a life style and mode of consumption at odds with producing a large family, engage in fertility planning and the use of contraceptives, and, in general, be susceptible to anti-natalist social, economic, and attitudinal constraints".

With respect to the first two parities, sex roles are hypothesized as being less important in explaining fertility decisions. Either non-significant or relatively weak negative effects are anticipated. A weak negative effect is

interpreted in terms of the timing of births, with households adhering to egalitarian sex roles slightly more likely to forestall their first or second child in the pursual of alternative priorities.

Sex role egalitarianism is also hypothesized as interacting with female labor force participation in explaining fertility decisions. On the basis of Scanzoni's research, it is expected that in the structural context of wife's employment, the existence of sex role egalitarianism has a significantly greater influence on fertility curtailment. With the traditional division of labor slow to change, the dual demands of work both within and outside the home lead modern sex role attitudes to become considerably more salient. This interplay between sex roles and female employment is support-ed by a stronger effect of sex roles in the sub-sample of solely employed women relative to non-employed women.

The present study includes indexes measuring both sex role attitudes and actual sex role behavior. While it remains uncertain to what extent attitudes and behavior correspond, it is anticipated that actual behavior will have a slightly stronger negative effect upon fertility decisions. An index measuring the actual division of labor with respect to child care and other household activities is assumed to be a more reliable measure of bilateral social influence. The research of feminists suggest that a majority of Canadian households continue to adhere to traditional sex roles in actual

behavior despite more modern attitudes of both Canadian men and women.

Demographic and Normative Factors

Further variables included in the analysis are age of marriage and age of wife, both of which are important demographic controls.

As demonstrated in previous research, the latter the age of marriage the lower the fertility in general (Balakrishnan, Ebanks, and Grindstaff,1979). As argued, this is largely due to shortened duration and such biological factors as lower fecundity at latter ages. A negative effect across parities is expected.

Present age of the wife is also understood as an important exogenous variable. While it has been shown to have among the highest associations with fertility (Krishnan and Krotki,1976; Henripin,1972) it primarily serves as a control variable in elaborating upon the influence of other factors. Again, a negative effect at all parity progressions is expected.

Two additional variables are included in the analysis as indirect estimates of normative constraints. The wife's religion and the number of siblings in her family of origin

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are included in the analysis in order to determine the relative importance of inter-group and normative factors in explaining contemporary fertility decisions. Recent research has shown that such variables are no longer relevant to fertility decision-making. This was reflected in preliminary analyses of the data, which demonstrated that such variables as "ethnicity", "region of Canada", and "immigrant status" are not significantly related to contemporary fertility deci-sions.

Specification I

While this first model is not the major focus of the proposed research, the findings will be presented for comparative purposes. All of the above mentioned determi-nants of fertility are included in this analysis with the exception of wife's education. This is due to the likely high correlation between female employment and potential earnings, which potentially leads to unreliable estimates.

It is re-emphasized that rather than examining period fertility, this static model examines "total number of children born". Most importantly, female employment is hypothesized as having a strong negative effect upon number of children, sex role egalitarianism is expected to be inversely related, while household resources are expected to have a relatively weaker positive effect.

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It is also hypothesized that these findings obscure the variation of effect by parity. Both the magnitude and possibly the sign of the relationships are expected to differ by birth order. This is demonstrated in the second model specified which employs the sequential decision making framework, the central focus of the analysis.

Specification II

The following results are hypothesized in the parity specific analysis involving Canadian married women in intact first marriages. All of the above discussed determinants of fertility are included in an analysis of period fertility 1982-1984.

1) Female employment is expected to have a negative effect across all parities. Its influence will be strongest in the decision to have a third or higher order child.

2) Sex role egalitarian attitudes will have a negative effect upon fertility at higher order births. Either non-significant or relatively weak negative effects are expected in decisions at the first two parities. While following a similar pattern, actual egalitarian sex role behavior is expected to have a slightly stronger influence across parities.

3) Husband's income will have a positive impact upon fertility at the first two parities, reverting to a negative effect at higher order births.   The influence of household resources will be stronger in decisions relating to the first two parities.

4) Age of marriage will be inversely related to fertility at all parities.   The older the age at marriage, the less likely children of any birth order be born during the reference period 1982-1984.   Wife's age is expected to have a negative effect across all parities.   With the passage of years, women are expected to be less likely to start a family or decide upon additional children.

5) Religion and number of siblings in the wife's family of origin are hypothesized as being relatively unimportant in explaining fertility decisions, with non-significant effects across parities.

6) In order of relative importance in explaining fertility decisions, economic constraints will surpass sex roles, while normative and intergroup differences remain relatively unimportant.

Specification III

In separately analyzing the fertility of employed women and women working solely within the home, education of wife replaces female employment in estimating the influence of opportunity costs. The focus of the third specification is whether support can be uncovered for earlier discussed interaction between female employment status and sex roles in explaining fertility decisions. Of secondary interest is the influence of wife's education, assumed to represent the wife's potential earnings.

1) In examining the fertility of the sub-sample of women involved in the labor force, the influence of sex role egalitarianism (both attitudes and behavior) is expected to be significantly stronger across all parities relative to women not in the labor force.

2) For both sub-samples, education of wife is expected to have a relatively strong negative effect at parity 2. This negative effect is expected to be weaker at lower order births.

IV: METHODS

Data

The data utilized in this study are drawn from the 1984
national Canadian Fertility Survey (Balakrishnan, Krotki and
Lapierre-Adamcyk,1984).   Detailed information on a number of
attitudinal, demographic, and socio-economic variables is
obtained in a survey of 5315 women (including single women)
between the ages of 18 and 49.   It is the only survey of its
kind on a national level in Canada.

The sample chosen was based upon a two stage probability
selection process involving a computerized generation of
random telephone numbers.   The survey was carried out using
in-depth telephone interviews.   This was decided upon after a
series of pre-tests examining the feasibility of administer-
ing a lengthy telephone questionnaire on the subject of
fertility in Canada.

Its relative success is reflected in a withdrawal rate
which is very low compared to other telephone surveys. Once
the interview had commenced, less than 2 percent refused to
continue.   Furthermore, the sample was weighted in dealing
with the traditional problems of non-responses and dif-

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ferences in selection probabilities of respondents. A detailed methodological report is available on such topics as sample plan, data collection, weighting, and sample validation (Tremblay and Trudel,1984).

In the present study, solely married women in intact first marriages are selected. This excludes from the analysis non-marital fertility along with the possibility of children born from previous marriages. Furthermore, with the focus upon fertility "decisions", fecundity is also considered an important criterion in sample selection. Women without children, who believe themselves or their spouses to be sterile are also excluded. In light of the above, 2889 married women are involved in the actual analysis.

The first model specification involves all of the women initially selected. The static analysis of "total number of children born" involves all married women who believe themselves capable of having children.

Further sub-samples are selected in applying the sequential decision making framework. In the second model specification, three separate sub-samples are selected by employing information available on the history of births.

The first sub-sample is selected in order to analyze fertility decisions for households at parity 0. The dependent variable in this case is whether or not a first child

was born during the interval 1982-1984. Therefore all respondents are selected with the exception of those with a first birth before 1982. The focus of concern is upon those factors related to whether or not a first child has been born during (and not proceeding) this interval.

The second sub-sample is selected in order to analyze fertility decisions at parity 1. The focus moves on to the next parity progression, as to factors relating to the possible birth of a second child during this interval. Correspondingly, all those women who had a second child before 1982 are excluded.

With the second sub-sample, further selection is required in maintaining the earlier discussed temporal ordering of the analysis. It is assumed that factors measured at time of survey (1984) have remained relatively constant from the beginning of the reference period (1982). This allows inferences to be drawn as to their effect on fertility decisions throughout this interval. In maintaining this temporal ordering, it is necessary to exclude women who had decided against further fertility well before the reference period began. The coefficients estimated should not involve women who might have decided to curtail fertility an unacceptable period prior to the survey.

In excluding these women not actively involved in the family formation process, only those who gave birth to a

first child during or after January 1980 are included in the
sample selection. This correspondingly includes women who
have potentially spaced their first and second births up to
an interval of 52 months (January 1980 to April 1984). This
selection is justified in maintaining the above discussed
temporal ordering although information is lost on a minority
of women with wide birth intervals. Furthermore, this is
justified in light of research measuring the average interval
between the first and second births of Canadian women.
Despite a scarcity of national research on childspacing,
Balakrishnan et al (1975:43) have demonstrated in limited
research on Ontario residents that the average interval is
approximately 35 months. This interval is accommodated for
in the above sample.

Due to the small number of women involved in decisions
corresponding to higher parities, the third sub-sample
selected involves both women at parities 2 and 3. The focus
moves on to factors relating to the birth of a third or
fourth child. In this case, the dependent variable is
whether a third or a fourth child was born during the
interval 1982-1984. Following the logic expressed above with
respect to temporal ordering, it is necessary to include
solely those women with a prior birth within two years
proceeding the interval. Correspondingly, the analysis
includes solely those women who gave birth to a second or
third child after January 1980. Again, this is justified in
light of the research of Balakrishnan on child spacing. The

average interval between the births of a second and a third
child was found to be 38 months, while declining only
slightly to 37 months in the interval between a third and
fourth child.

Due to the minimal number of women deciding on more than
four children, higher parities are excluded from the analy-
sis.

The third model specified tests for an interaction effect
involving employment and sex roles, with the above sub-
samples further subdivided. At each parity, two sub-samples
are selected, based upon knowledge of the respondents'
history of labor force participation. The first involves
exclusively women with a history of employment which indi-
cates that labor force participation influences the like-
lihood of an additional birth. A second sub-sample is
selected, based on women not involved in the labor force.
The operationalization of female labor force participation is
discussed in more detail in the following sub-section
"Variable Measurement".

Variable Measurement

Actual Fertility.

In the static analysis of "total number of children born" (TOTCHILD), fertility is measured on the basis of the following question:

"How many live births have you had up to now including those who died after birth or who do not live with you?" (Do not include current pregnancy if applicable).

    00 - none
    01 to XX children

In the dynamic analysis of period fertility (1982-1984), three separate variables are computed corresponding to decisions at each of the first three parities. At parity 0, the analysis examines the probability of a birth of a first child during this reference period. Correspondingly, fertility is measured with a dichotomous dependent variable (BIRTH0), computed with the following categories:

    0 - all women reporting that they had no children at
        the beginning of the reference period, i.e.
        January 1982, and did not give birth to a first
        child between January 1982 to April 1984.
    1 - all women who have given birth to a first child
        between January 1982 to April 1984.

No further information is available on fertility past April 1984, the time of survey.

At parity 1, the analysis examines the probability of a birth of a second child during the reference period. The dependent variable (BIRTH1) is categorized as follows:

    0 - all women reporting that they had solely one child
        at the beginning of the reference period, i.e.
        January 1982, and did not give birth to a second
        child between January 1982 and April 1984.
    1 - all women who have given birth to a second child
        between January 1982 and April 1984.

At parity 2, the analysis examines the probability of a birth of a third or fourth child. The dependent variable (BIRTH2) is categorized as follows:

    0 - all women reporting that they had two or three
        children at the beginning of the reference period,
        i.e. January 1982, and did not give birth to a
        third or fourth child between January 1982 and
        April 1984.
    1 - all women who have given birth to a third or
        fourth child between January 1982 and April 1984.

Labor Force Participation.

The influence of female labor force participation is measured through three separate variables corresponding to decisions at each of the first three parities. Due to the information available providing a historical overview of female employment, it is possible to estimate the influence

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of labor force participation while establishing time order at each subsequent birth.

Employment status is measured on the basis of information provided on the mother's age at each birth, along with her age at the beginning of her first three jobs and at the end of her first two (if applicable). This involved items relating to work "on a regular basis" including both full and part time employment and did not include work during full time studies or summer jobs. In establishing temporal ordering, the employment status variable specifies whether or not the wife was employed one year before the birth of each child. In examining the probability of an additional child, in the event of no further births, the wife's employment status at the midpoint of the reference period is reported (February 1983).

In estimating the influence of female employment at parity 0 on the probability of a first birth, a dichotomous variable (EMPLST0) was computed and categorized as follows:

    0 - one year before first birth, the respondent was
        not involved in the labor force (or) if no
        children are born, the respondent was not employed
        in February 1983.
    1 - one year before first birth, the respondent was
        regularly employed (or) if no children are born,
        the respondent was working in February 1983.

While the available information provides the exact period of employment for the first two job intervals, it does not

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provide information beyond the commencement of a third job (if applicable). If the birth of a child dates after the start of a third job, the respondent is considered employed one year before birth (although no information is provided on date of this employment ending). This is based upon the assumption that these women have an on going commitment to the labor force which would influence their fertility decisions.

In estimating the influence of female employment at parity 1 on the probability of a second birth, a dichotomous variable (EMPLST1) was computed and categorized as follows:

    0 - one year before second birth, the respondent was
        not involved in the labor force (or) if an
        additional child at parity 1 was not born, the
        respondent was not employed in February 1983.
    1 - one year before second birth, the respondent was
        regularly employed (or) if an additional child at
        parity 1 was not born, the respondent was
        employed in February 1983.

In estimating the influence of female employment at parity 2 on the probability of a third or fourth birth, a dichoto- mous variable (EMPLST2) was computed and categorized as follows:

    0 - one year before a third or fourth birth, the
        respondent was not involved in the labor force
        (or) if an additional child was not born, the
        respondent was not employed in February 1983.
    1 - one year before a third or fourth birth, the
        respondent was regularly employed (or) if an
        additional child was not born, the respondent was
        employed in February 1983:

In the static analysis of "total number of children born", an alternative measure of labor force participation is employed. Based upon detailed information on the date of marriage and employment history, the proportion of married life employed is calculated (PROPWORK).

Education of Wife.

The education of wife (EDUCWF) is measured with the following item:

"In total how many years of education did you complete?"

```
00 - none
00 to XX years
```

Sex Role Attitudes.

A Guttman scale was developed in order to measure the influence of sex role egalitarianism. The following two items were used in the computation of the scale:

"Do you think that looking after the children should be done only by the woman, mostly by the woman, equally shared by both partners or done mainly by the man?"

```
1 - only by the woman
2 - mostly by the woman
3 - don't know
4 - equally by both partners
5 - mainly by the man
```

"Do you think that household chores should be done only by the woman, mostly by the woman, equally shared by both partners, or done mainly by the man?"

(categorized as above)

In the computation of the scale, the first three response categories in the above items were classified as traditional, while the last two were considered egalitarian. Table 1 presents the item total correlations for the sex role attitudes scale (ROLEATT).

Table 1. Item Total Correlations of the Sex Role Attitudes Scale (ROLEATT).

Items	Correlation with Summated Scale *
Division of Child Care	.53
Division of Housework	.41

Coefficient of reproducibility = .97
Coefficient of scalability = .81

Note: N = 2889
* Correlation coefficients are Yule's Q

Two coefficients were estimated in evaluating the reliability of the scale. Firstly, the coefficient of reproducibility is a measure of the extent to which a respondent's scale score is a predictor of one's response pattern. Secondly, the coefficient of scalability indicates whether the scale is

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truly uni-dimensional and cumulative. A general guideline in estimating the reliability of a Guttman scale is that the coefficient of reproducibility be higher than .9, and the coefficient of scalability above .6. In this case, the coefficients of reproducibility (.97) and scalability (.81) demonstrate a reliable index.

ROLEATT is categorized as follows:

> 0 - traditional (did not endorse an egalitarian. response for either item).
> 1 - traditional-egalitarian (endorsed an egalitarian response for one item).
> 2 - egalitarian (endorsed an egalitarian response for both items).

Sex Role Behavior.

A Guttman scale was developed in order to measure the influence of sex role egalitarian behavior. The following two items were used in the computation of the scale:

"Would you say that it is always you, mostly you, equally you and your husband, or mainly your husband who does the housework?"

> 1 - always you
> 2 - mostly you
> 3 - equally
> 4 - mainly partner

"Would you say that it is always you, mostly you, equally you and your husband, or mainly your husband who does the cooking?"

(categorized as above)

In the computation of the scale, the first two response categories in the above items were classified as traditional, while the last two were considered egalitarian. Table 2 presents the item total correlations for the sex role behavior scale (ROLEBEH).

Table 2. Item Total Correlations of the Sex Role Behavior Scale (ROLEBEH)

Items	Correlation with Summated Scale *
Division of Cooking	.52
Division of Housework	.48

Coefficient of reproducibility = .93
Coefficient of scalability = .69

Note: N = 2889
* Correlation coefficients are Yule's Q

Again, the coefficients of reproducibility (.93) and scalability (.69) indicate a reliable scale.

ROLEBEH is categorized as follows:

    0 - traditional (did not endorse an egalitarian
       response for either item).
    1 - traditional-egalitarian (endorsed an egalitarian
       response for one item).
    2 - egalitarian (endorsed an egalitarian response for
       both items).

It is briefly mentioned that further measures of both
attitudes and behavior are required in obtaining greater
accuracy in estimating egalitarianism (despite the above
Guttman scales being successfully created). The possibility
remains that a respondent not endorse an egalitarian response
for either item, although egalitarianism actually exist in
either behavior or attitudes. In interpretation, it should
be noted that the above indexes measuring traditional
relative to egalitarian sex roles inevitably remain limited,
given the data constraints involved and the unavailability of
further measures.

Husband's Income.

Husband's income (INCHB) is measured on the basis of the
following item:

"What is your husband's gross annual income before taxes and
deductions?"

In obtaining information on household resources, 21 percent of all married women failed to report their husband's income. Due to the large proportion of respondents failing to report income, income was estimated for all missing cases on the basis of knowledge on husband's age, education and occupation.

This estimate was obtained by initially regressing husband's income (for all those cases where income was reported) on age, education and occupation of husband. Occupation was measured through a series of dummy variables representing different categories of occupation. Only two were retained in the estimation of income (managerial and professional occupations) while the remainder were not correlated with income at an acceptable level of statistical significance and serve as a reference category in the analysis. The variables involved in the estimation of income were categorized as follows:

Age of husband (AGEHB)

Drawn from information on the husband's birth date and calculated in years.

Education of Husband (EDUCHB)

"In total, how many years of education has your husband completed?"

00 - none
01 to XX

Managerial Occupations (MANG)

    0 - all other occupations
    1 - all occupations classified as "Managerial,
        Administrative and Related Occupations" according
        to the Canadian Classification and Dictionary of
        Occupations, (C.C.D.O.), Edition 1982, Employment
        and Immigration Canada, Canadian Government,
        Ottawa.

Professional Occupations (PROF)

    0 - all other occupations
    1 - all occupations classified in the C.C.D.O. as
        "Occupations in Natural Sciences, Engineering, and
        Mathematics", "Occupations in Social Sciences and
        Related Fields", "Occupations in Religion",
        "Teaching and Related Fields", "Occupations in
        Medicine and Health", and "Artistic, Literary,
        Performing Arts and Related Occupations".

Table 3 presents the results in using the Ordinary Least
Squares Regression technique (OLS), involving only respon-
dents who reported husband's income. Based upon this
initial regression, husband's income is estimated for the
remainder of the sample by utilizing the constant and
unstandardized coefficients. The explained variance
(R^2=.265) along with statistically significant coefficients
suggest that the estimates will be relatively accurate. The
structural form of the equation utilized in estimating INCHB
for missing cases is as follows:

INCHB = -14.729 + .347 (AGEHB) + 10.460 (EDUCHB) +

        86.409 (MANG) + 22.068 (PROF).

Table 3. Unstandardized Coefficients of OLS Regression Analysis of Husband's Income (INCHB) on Selected Variables, for Married Women Reporting Husband's Income.

Independent Variables	b/standard error
AGEHB	.347 **
	(.020)
EDUCHB	10.460 **
	(.682)
MANG	86.409 **
	(6.759)
PROF	22.068 *
	(6.574)
CONSTANT	-14.729
R^2	.265
N	2889

Note:
* significant at the .05 level
** significant at the .01 level

The mean income for the full sample after estimating income for those households failing to report husband's income was found to be $29,047 with a standard deviation of $152. This is acceptably close to those households actually reporting husband's income, with a mean of $29,131 and a standard deviation of $140.

As outlined in reviewing the literature review, there appears to be disagreement as to whether "current" or "potential" income better represent the effect of economic constraints on fertility decisions. The present study is restricted to current income, due to the difficulties involved in estimating a respondent's probable income at age

40.   In projecting husband's income at age 40, an estimating equation could not be produced.   The initial regression could not explain a sufficient level of variance in the income of husbands selected at this age, leaving for unreliable estimates of husband's income at age 40 for the remaining cases.

Religion.

Two dummy variables were computed in examining the influence of wife's present religion.   The first measured the influence of Catholicism (CATH), while the second measured the impact of Protestantism (PROT).   The two variables were categorized as follows:

Catholicism (Cath)

      0 - all other religions / no religion
      1 - Roman Catholic, Ukrainian Catholic, Apostolic
          Catholic, New Apostolic.

Protestantism (Prot)

      0 - all other religions / no religion
      1 - United Church, Anglican, Presbyterian, Lutheran,
          Baptist, Pentecostal, Jehovah's Witnesses, other
          Protestant.

Number of Siblings in Wife's Family of Origin.

The number of siblings in wife's family of origin (SIBLING) was obtained from the following item:
"Including yourself, how many children did your mother have?"

The actual number was obtained by subtracting one from the number reported.

Age of Wife.

The age of wife (AGEWIFE) was calculated on the basis of respondent's birth date.
Age at Marriage.

Age at marriage (AGEMAR) was calculated by subtracting the respondent's year of birth from the year of first marriage.

Hierarchical step-wise regression has been selected for the present analysis. Hierarchical regression has been chosen due to its usefulness in determining the importance of a particular variable (or group of variables) in terms of its contribution to the total explained variance of each model. In addition to determining the relative effect by parity of female employment and sex roles, the step-wise procedure determines whether they significantly add to the explained variance of each model.

The independent variables are therefore entered into the regression equation in a predetermined order. Firstly, the demographic variables are entered at step 1, in order to separately demonstrate their relative importance to the explained variance of each model. At the second step, normative factors are entered into the regression. At step 3, husband's income and female employment status are included in separately examining the impact of economic determinants. Due to the concern with the importance of sex roles to fertility, at the final step, which reflects the full model, the two indexes measuring egalitarianism are entered.

In the static analysis of "total number of children born", the structural form of the regression equation for the full model is as follows:

Specification 1:

TOTCHILD = a + b AGEWIFE + b AGEMAR + b CATH + b PROT +
           b SIBLING + b INCHB + b PROPWORK + b ROLEATT +
           b ROLEBEH
where

        a = constant
        b = unstandardized regression coefficients

        TOTCHILD = total number of children born

step 1)   AGEWIFE - age of wife
          AGEMAR - age of marriage
     2)   CATH   - Catholicism
          PROT   - Protestantism
          SIBLING - wife's siblings in family of origin
     3)   INCHB   - income of husband
          PROPWORK - proportion of married life employed
     4)   ROLEATT - sex role attitudes
          ROLEBEH - sex role behavior

In specification 2, three separate equations are estimated
corresponding to the probability of a birth based on the
three sub-samples discussed in the previous section. The
effect of female labor force participation is measured
through estimates of employment status prior to each consecu-
tive birth. The structural form of the regression equation
for the full model in the dynamic analysis of fertility is as
follows:

Specification 2;

BIRTH0   = a   + b AGEWIFE + b AGEMAR + b CATH +
(BIRTH1,BIRTH2)   b PROT + b SIBLING + b INCHB + b EMPLST0
                  (EMPLST1,EMPLST2) + b ROLEATT + b ROLEBEH
where

   (as above)
        BIRTH0 - probability of a birth at parity 0
        BIRTH1 - probability of a birth at parity 1
        BIRTH2 - probability of a third or fourth birth
        EMPLST0 - wife's employment status at parity 0
        EMPLST1 - wife's employment status at parity 1
        EMPLST2 - wife's employment status at parity 2

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The structural form of the regression equations with the third model specification closely parallel the above. The only difference is that employment status of wife is not included, while education of wife (EDUCWF) is added to the regression. At each parity, the fertility of employed and non-employed respondents is separately examined.

V: Findings

Specification 1

A) Sample Characteristics

Before presenting the results from the analysis of "total number of children born", the sample characteristics involved in applying the static model are briefly summarized. Table 4 presents the means and standard deviations for the explanatory variables involved.

Beginning with the dependent variable of total number of children born (TOTCHILD), the reported mean is found to be slightly less than two live births per respondent (1.9923). This reflects the low fertility of Canada, in focusing exclusively on marital fertility and involving both women who have completed their fertility along with those actively involved in decisions relating to family formation.

The mean age reported (AGEWIFE) is found to be 34.7 years, while the mean age at time of marriage (AGEOBMAR) is 21.9 years. In considering religion, 48.5 % of the sample is reported to be Catholic (CATH), while 41.5 % is reported to

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Table 4.   Sample   Means for Variables in the Static Model of
"Total Number of Children Born", for Married Once, Canadian
Women.

Variables	mean/standard deviations
TOTCHILD	1.9923
	(1.3465)
AGEWIFE	34.7190
	(7.7590)
AGEOFMAR	(21.9208)
	(3.3275)
CATH	.4864
	(.4999)
PROT	.4150
	(.4928)
SIBLINGS	4.1793
	(3.2130)
PROPWORK	53.5406
	(37.9026)
INCOME	291.3120
	(139.6314)
ROLEATT	1.6791
	(.5722)
ROLEBEH	.4522
	(.6840)
N	2782

be Protestant (PROT).   The mean number of siblings in the

respondent's family of origin (SIBLINGS) is found to be

slightly higher than four (4.1793). The mean income reported

for the husbands of the women selected is found to be 29,131.

In considering proportion of married life employed (PROPWORK), respondents on average have been working for 53.5 % of their married life. Again, this is reflective of the climbing participation rate of Canadian women in the labor force. Although not reported in Table 4, this can be compared to respondents with no children who were reported to have worked 80.4 % of their married life, and those respondents with children who have worked on average 48.7 % of their married life.

With the sex role indexes (ROLEATT,ROLEBEH), the reported means reflect a lack of correspondence between egalitarian attitudes and actual behavior. The mean response with attitudes (1.679) reflects an egalitarianism in sex roles, while the mean response with sex role behavior (.4522) reflects a continuation of traditionalism in the actual division of labor. This lack of correspondence between attitudes and behavior supports the earlier mentioned feminist research. This also holds implications for sociological research which analyses social attitudes while implicitly assuming a direct correspondence with actual behavior.

B) Findings

Table 5 presents the findings from the static analysis of "total number of children born". For comparative purposes,

these results are briefly outlined before moving to the parity specific analysis,

Support is uncovered for the inverse relationship between female labor force participation and fertility. Among

Table 5. OLS Regression Coefficients for the Static Model of "Total Number of Children Born", for Married Once, Canadian Women.

Independent Variables	b/standard error	beta
AGEWIFE	.0889 *** (.0026)	.5125
AGEOFMAR	-.0095 *** (.0005)	-.2827
CATH	.1706 ** (.0662)	.0633
PROT	.1688 * (.0667)	.0618
SIBLINGS	.0526 *** (.0061)	.1256
PROPWORK	-.0070 *** (.0005)	-.1958
INCOME	.0000 (.0001)	.0050
ROLEATT	-.0976 *** (.0346)	-.0415
ROLEBEH	-.1345 *** (.0290)	-.0683
Constant	1.6222 *** (.1634)	
R^2	.467	

Note: * significant at the .05 level
** significant at the .01 level
*** significant at the .001 level

Canadian married women, the greater the proportion of their married life employed, the more likely they have a smaller number of children.

Similarly, support is uncovered for the inverse relationship between sex role egalitarianism (both attitudes and behavior) and fertility. Egalitarianism in child care and household responsibilities, as manifested in either attitudes or actual behavior is associated with fewer children in Canadian households.

Household resources (operationalized through husband's income) is the only variable in the static analysis not to have a significant effect on fertility. In contrast to the research of microeconomists emphasizing the relative importance of household resources, the findings suggest that income differentials are of minimal value in explaining household decisions.

As hypothesized, the demographic variables act as important controls in the analysis of household fertility. The positive correlation between age of wife and number of children is anticipated due to additional births with the passage of years. The negative effect of age at marriage is expected due to such biological factors as lower fecundity at latter ages and the shortening of the period in which additional children are possible.

While normative and intergroup differences were hypo-
thesized as relatively unimportant in explaining fertility
decisions, the findings suggest that wife's religion and size
of wife's family of origin both have a statistically signifi-
cant effect on fertility. The greater the number of siblings
in the wife's family of origin, the more probable a larger
number of children be the outcome. Furthermore, Catholics
and Protestants are both found to have a greater number of
children than the reference group (i,e. other religions).
This is in contrast to a previous study which had found a
declining importance of normative and intergroup differences
(McDaniel, 1984).

The standardized slopes (Betas) also shown in Table 5
indicate the relative magnitude of effects. Not surprising-
ly, the demographic factors acting as controls are found to
have the strongest effect on "total number of children born".
Secondly, the effect of female labor force participation is
shown to have a relatively strong negative effect. In
contrast to expectations, normative factors appear to be
roughly equivalent or even slightly more important than the
sex role variables in explaining fertility. The effect of
husband's income is negligible, with the weakest relative
effect.

These results are based on the premise that couples adopt
a utility maximizing lifetime plan early in their marriage.
The static framework obscures however, the likelihood of

considerable variation in effect of explanatory variables by parity. It is only in accepting the static framework's premise of constant preferences over time that inferences can be made on ultimate fertility decisions. Due to the tenuous assumptions of the static framework, the above findings only serve as a point of reference in demonstrating the usefulness of the dynamic framework.

The purpose of the second specification is to demonstrate the usefulness of analyzing decisions relating to children in a dynamic framework in contrast to the static model which assumes that lifetime decisions are made at the time of marriage. The parity specific analysis is expected to permit a more accurate portrayal of actual fertility decisions.

The static analysis can also be criticized for failing to adequately deal with the problem of time order and causality. Variables measured at the time of the survey are merely related to the total number of children born. In drawing inferences about household decisions, no distinction is made between decisions relating to recent births as opposed to births occurring a considerable period prior to the survey. In the dynamic analysis of period fertility, greater attention is given to the problem of time order.

Specification 2

A) Sample Characteristics

The characteristics of the three separate samples involved
in the dynamic analysis of fertility are briefly summarized.
Table 6 presents the means and standard deviations of the
variables included in the dynamic model, corresponding to the
three separate samples involved in analyzing decisions of
differing birth order.

Beginning with the dependent variable, measuring the
probability of a birth between January 1982 and April 1984
(BIRTH), at parity 0, 20.7 % of respondents gave birth to a
first child, at parity 1, 60.3 % gave birth to a second
child, while at parity 2, 15.7 % gave birth to a third or
fourth child. The reported means reflect the propensity
toward an additional child only after the change in lifestyle
associated with a first birth. Once a household has made the
initial commitment toward beginning a family, the tendency is
to decide relatively soon upon a second child. While the
coefficients suggest that couples avoid the one-child
household, they also indicate that couples tend to curtail
fertility after normative family size (i.e. two children) has
been obtained.

With respect to age of wife, the reported means across
parities indicate a passage of years with parity progression.

Table 6.   Sample Means for the Dynamic Model of "Period Fertility 1982-1984", for Married Once, Canadian Women.

Variables	Parity 0	Parity 1	Parity 2
		mean/standard deviation	
BIRTH	.2067	.6031	.1570
	(.4053)	(.4903)	(.3647)
AGEWIFE	27.7574	28.3481	31.0781
	(5.5047)	(3.9389)	(3.9218)
AGEOFMAR	23.1395	22.3667	22.0279
	(3.5505)	(3.3383)	(3.0263)
CATH	.4722	.4340	.4828
	(.4996)	(.4966)	(.5009)
PROT	.3930	.4373	.4136
	(.4888)	(.4971)	(.4937)
SIBLINGS	3.4637	3.7037	4.1794
	(2.5802)	(2.6741)	(3.1070)
EMPLST	.7813	.5040	.4444
	(.4137)	(.5010)	(.4981)
INCOME	252.9404	268.0022	293.2264
	(123.5836)	(136.2711)	(136.0983)
ROLEATT	1.7866	1.6579	1.6250
	(.4685)	(.5809)	(.6287)
ROLEBEH	.6621	.3829	.3621
	(.7470)	(.6416)	(.6315)
N	652	243	203

In considering age at marriage, it would appear that women reaching higher parities begin their married life at a slightly younger age. Although the religion variables do not vary systematically, the coefficients imply that Catholics are slightly more likely to avoid the one-child household,

while Protestants are slightly less likely to remain child-less. With the number of siblings in the respondent's family of origin, on average it is found to climb slightly with parity progression.

In considering husband's income as an indicator of house-hold resources, the coefficients indicate a climb in income as households move through the family formation process. At parity 0, the mean husband's income is estimated at $25,294, climbing to $29,323 at parity 2. This climb in income most probably reflects the passage of years with parity progression.

With female employment status, the coefficients demonstrate the tendency for women to leave the labor force (whether temporarily or permanently), once the commitment has been made toward children. While at parity 0, fully 78.1 % of the women selected are involved in the labor market (whether full or part time), this drops to 44.4 % at parity 2.

With respect to the sex role variables, women reaching higher parities appear to be only slightly more likely to adhere to traditionalism in their sex role attitudes. In considering actual behavior, households reaching higher parities appear to be significantly less likely to adhere to egalitarian behavior, although across parities the coefficients imply a traditionalism.

B) Findings

Tables 7 through 9 present the results from the dynamic analysis. The discussion of the correspondence between actual results and the hypothesized variation in effect of determinants by parity begins with reference to unstandardized regression coefficients in Table 7.

In terms of a general overview, support for interaction effects due to parity are uncovered. In comparing unstandardized coefficients across parities, many of the relationships examined vary in character. The results suggest that the decision to have a first child at parity 0 differs from decisions relating to a second birth at parity 1, or a third or fourth birth at parity 2. Correspondingly, the inferences on household fertility decisions drawn from the results of the static model can be questioned.

This variation of effect by parity is most clearly demonstrated in examining female employment (EMPLST) and the probability of a birth during the interval 1982-1984. Female employment is hypothesized to have a negative effect across parities, with its strongest influence on the decision to have a third or fourth birth. The negative effect at earlier parities is hypothesized to reflect timing differences, while the relatively stronger negative effect on higher order births is expected to indicate a curtailment of fertility.

Table 7. OLS Unstandardized Coefficients for the Dynamic Model of "Period Fertility 1982-1984", for Married Once, Canadian Women.

Independent Variables	Parity 0	Parity 1 b/standard error	Parity 2
AGEWIFE	-.0119 **	-.0202	-.0159
	(.0038)	(.0236)	(.0095)
AGEOFMAR	-.0013	.0145	.0107
	(.0057)	(.0157)	(.0120)
CATH	.0294	.0170	.0032
	(.0489)	(.1003)	(.0882)
PROT	.0544	.0077	.0076
	(.0494)	(.1036)	(.0912)
SIBLINGS	.0055	-.0027	-.0020
	(.0061)	(.0126)	(.0087)
EMPLST	.0650	.0037	-.1062 *
	(.0382)	(.0687)	(.0533)
INCOME	.0000	.0005 *	.0000
	(.0001)	(.0002)	(.0002)
ROLEATT	-.0521	-.1080	-.0450
	(.0351)	(.0608)	(.0432)
ROLEBEH	-.0502 *	-.0339	-.0272
	(.0221)	(.0552)	(.0431)
CONSTANT	.5677 ***	.9027 **	.5207 *
	(.1241)	(.2788)	(.2446)
R^2	.047	.043	.059
N	652	243	203

Note: * significant at .05 level
** significant at .01 level
*** significant at .001 level

Although the effect of labor force participation strongly interacts with parity, only partial support is uncovered for the hypothesized relationships. A positive effect at parity 0 (which approaches statistical significance, P=.09), and a weak positive effect at parity 1 is counter to expectations.

A relatively strong negative effect at parity 2 supports the hypothesis relating to a curtailment of fertility given the attainment of normative family size (i.e two children). The static analysis masks a positive effect at the first birth, a null effect relating to the second birth, with the strong negative effect solely relating to higher order births.

The positive effect at parity 0 suggests that work opportunities do not discourage or delay Canadian women from beginning a family. Contrary to expectations, women involved in the labor force were as likely, or even more likely to begin childrearing during the interval 1982-1984.

The negligible effect at parity 1 implies that after a first child is born the benefits associated with a second child continue to override employment considerations. Both employed and non-employed women appear equally likely to avoid the one-child household.

The strong negative effect at parity 2 as anticipated indicates that decisions relating to the birth of a third or fourth child are strongly influenced by career and economic aspirations. The opportunity costs associated with having higher order births appears to be a major factor explaining the smaller completed family size in Canadian households.

In a similar study based upon American data, White and Kim (1986) have uncovered results approximating those discussed

above. In examining the complex effects of female employment, their research similarly uncovers a positive effect at the first parity progression. In interpretation, they argued that a career does not act as a competitive alternative to childbearing until at least after the first child is born. No evidence of a delaying effect of female employment at the first parity was disclosed, with employed women actually slightly more likely to have a first child during the interval examined.

A second study which indirectly supports this interaction between employment and parity is Bulatao's (1981) examination of the values and disvalues parents attach to children at successive childbearing decision points. In directly asking respondents about the disvalues or costs they associate with children, it was only after the birth of a first child that couples acknowledge the difficulties associated with both the parental and employment roles and the potential loss of income associated with the decision.

The positive effect disclosed at parity 0 implies that "opportunity costs" are of minimal relevance to the decision to have a first child. Yet the positive effect also implies that rather than delay a first birth, employed women are slightly more likely to have a first birth during the interval. Since age of wife and age of marriage are controlled for in the analysis, this positive effect is not likely to be the result of a "catch up" phenomenon among

women who have devoted many years to the labor market. In reviewing the available literature, it is uncertain as to why employed women are slightly more likely to perceive greater benefits in the decision to begin a family. Further inquiry along these lines is necessary.

Egalitarian sex – role attitudes (ROLEATT) and actual egalitarian behavior (ROLEBEH) are also expected to show a similar pattern of effects across parities. With the achievement of normative family size, sex role egalitarianism is hypothesized as having a strong negative effect on fertility decisions. At the first two parities, sex role egalitarianism is expected to be relatively less important. Since a majority of Canadian households continue to plan for at least two children, the anticipated weak negative effects are again understood largely in terms of timing differences.

Both egalitarian attitudes and behavior are found as expected to have a negative effect across parities. Yet the results portray a pattern of effects which are counter to expectations. In general, sex roles appear to be of greater relevance to the planning of earlier order births. In comparing coefficients across parities, the relative effect for both indexes remains weakest at decisions relating to parity 2. With respect to sex role attitudes (ROLEATT), egalitarianism has its strongest effect at parity 1, (approaching statistical significance at p=.07). Actual

behavior (ROLEBEH) has its strongest effect on decisions relating to births at parity 0.

An advantage of the dynamic model over the static analysis is that inferences can be drawn on the timing or spacing of births. In the static analysis, the relative importance of sex roles to the timing of earlier rather than higher order births is overlooked. According to this dynamic analysis, egalitarian couples are more likely to delay their first or second child, rather than delay or curtail their third or fourth birth. The static analysis is not capable of drawing this distinction. It limits inferences to a one time decision regarding total number of children born.

Due to a lack of concern in the available literature with examining the effect of sex roles on fertility while applying the sequential decision making framework, it is possible only to speculate upon the relative effects of the two indexes by parity. As emphasized earlier, the influence of sex role attitudes relative to behavior can be expected to differ, largely due to an apparent lack of correspondence between attitudes and actual behavior in Canadian households. It is interesting to note that while egalitarian behavior has its strongest effect on the decision to begin a family, egalitarian attitudes are considerably more important only after a first birth.

Egalitarian behavior is viewed as a more reliable indica-
tion of bilateral social influence in household decisions.
Correspondingly, the bilateral give and take between spouses
as stressed by social exchange theorists is likely to be most
relevant to decisions relating to a first birth.

In contrast, egalitarian attitudes held by Canadian women
do not necessarily imply bilateral social exchange. As
stressed by feminists, although attitudes have changed
rapidly in the Canadian setting, the actual division of labor
for married couples has been slow to change. While a growing
proportion of women indicate egalitarian attitudes with
respect to child care and housework, a majority also indicate
a lack of sharing in the actual allocation of tasks within
the home. With husbands continuing to avoid equal responsi-
bility in child care, egalitarian attitudes would under-
standably become more salient after experiencing the time
intensive costs of a first child. After a first birth, women
are more likely to realistically evaluate the benefits and
costs of a second birth, along with the probable contribution
of their husband to child care. Correspondingly, women
rejecting traditional roles yet experiencing an unequal
division of labor might be less likely to rush a second
child.

What remains unexpected is the weak effect uncovered for
both indexes at parity 2. This implies that non-traditional
couples are only slightly less likely to decide upon a third

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or fourth child. The results suggest that labor force participation, rather than sex roles are considerably more important in predicting higher order births. Again, further inquiry into the parity specific influence of sex roles is necessary.

In contrast to the above, household resources (operationalized as husband's income) is hypothesized to have a positive impact upon fertility at the first two parities. This effect is expected to revert to negative at decisions relating to parity 2. The influence of husband's income is expected to be strongest in decisions relating to the timing of the first and second births.

While the results again demonstrate the importance of parity in explaining fertility decisions, the pattern of effects is not consistent with these hypothesized relationships. Although husband's income is found to have a positive effect at the first two parities, its influence on the decision to begin a family appears negligible and non-significant. Furthermore, the influence of household resources on decisions relating to the potential birth of a third or fourth child is negligible.

The above pattern of effects represent the immediate response of couples to their current economic position. Due to the difficulties in estimating "projected income", the analysis does not allow for the possibility that couples base

their decisions on foreseen changes in their economic circumstances. While research has suggested that projected income is more appropriate in explaining fertility decisions (Mincer,1963; Turchi,1975; Kyriazis,1982), data constraints limit the discussion to the effect of current household resources. Correspondingly, the negligible income effects at parities 0 and 2 do not necessarily imply that economic considerations are irrelevant to these fertility decisions. While the findings are limited to the effect of current economic standing, it is fully appreciated that many couples are purposeful decision makers, actively considering potential changes in their economic position in arriving at fertility decisions.

The weak non-significant effect at Parity 0 indicates that the current level of household resources for a couple holds little importance in decisions relating to a first birth. Perhaps long term economic considerations or the non-economic costs and benefits associated with children override current economic considerations. Wealthier couples appear no more likely to rush a first birth, contradicting the hypothesized facilitation of births associated with economic means. It remains possible to speculate upon the non-economic benefits (the emotional gratification in beginning a family, the confirmation of a marriage through the birth of a first child) which appears to be equally appealing to Canadians of varying income.

In controlling for female labor force participation and egalitarianism in sex roles, this lack of income effect can not be explained in terms of the propensity of upper income women to involve themselves in careers or to adhere to egalitarianism in sex roles. After controlling for both factors, the reported coefficient indicates that current income remains relatively unimportant in explaining decisions relating to a first birth.

It is solely after the birth of a first child, that decisions relating to an additional child appear sensitive to current economic means. The positive and statistically significant effect at parity 1 emphasizes the relevance of current resources in terms of the timing of a second child. The positive coefficient suggests that couples with lesser economic means are more likely to delay a second child, while relative affluence facilitates a second birth. As in evaluating the time costs of children, it is possible that experiences with a first child lead to a more realistic evaluation of the economic costs of a second. Couples lacking the economic means might have a first child for the emotional satisfactions associated with the non-economic benefits of children. Yet after experiencing the economic strains associated with their first child, realistically evaluate their economic position and therefore delay a second birth.

The weak income effect at decisions relating to a third or fourth child is possibly explained in terms of "child quality". Although the relationship at parity 2 is not inverse as anticipated, the positive income effect is very weak and far from statistically significant. Although wealthier couples are more capable of affording additional children, they appear no more likely to do so after a normative family size has been achieved. The ability to readily afford additional children is possibly countered by higher child quality.

It is again acknowledged that the above results do not take into consideration potential income flow over time. It is possible that while the timing of a second child remains sensitive to immediate economic means, the decision to begin a family or decisions relating to higher order births are more sensitive to longer term economic considerations. While this remains beyond the scope of this analysis, it is important to note that the decision to use either projected or current income has been found to have little impact on the parameters of other explanatory variables in fertility models (Kyriazis,1979,1982). This is reassuring, given the central focus of this study, i.e. the relationship between sex roles, labor force participation and fertility.

The remaining variables involved in the analysis are of secondary interest, and are only briefly dealt with at this point. Beginning with the demographic variables, both wife's

age and age at marriage are expected to have a negative effect across parities. No hypotheses with respect to interaction effects with parity are presented.

As expected, wife's age is shown to have uniformly a negative effect across parities (significant at parity 0, approaching statistical significance at parities 1, p=.14, and parity 2, p=.09). With all other factors equal, older women appear to be less likely to have a first or additional child. Understandably, the probability of a birth during the interval 1982-1984 is greatest for women in their prime childbearing years, only to decline relatively rapidly as women move into their thirties. This is consistent with earlier discussed research which suggests that age has among the highest associations with Canadian fertility (Krishnan and Krotki,1976; Henripin,1972).

Unexpectantly, age at marriage is found to have a negative effect only at parity 0 (although non-significant across parities). The weak positive effects at parities 1 and 2 suggest that after holding all other factors in the analysis constant, women marrying at an older age are slightly more likely to have decided upon an additional child during the reference period studied. This possibly represents an attempt for these women to "catch up" with earlier marriers after devoting previous years to alternative pursuits.

The relatively weak effects also imply a declining importance of age at marriage in explaining the timing of births and cumulative family size. This conclusion is consistent with Balakrishnan's (1986) detailed study of changing nuptiality patterns and their fertility implications in Canada. Furthermore, while late marriers possibly rush births given the time constraints involved, Balakrishnan (1986:1) indicates that these women are not likely to entirely "catch up" with earlier marriers. Their failure to do so is supported in the static analysis, in uncovering an inverse relationship between age at marriage and total number of children born.

Two further factors are included in the analysis as indirect estimates of normative constraints i.e. the wife's religion (CATH,PROT) and the number of siblings in wife's family of origin (SIBLINGS). The only hypothesis put forward is that these variables are relatively unimportant in explaining fertility decisions due to the declining impor- tance of intergroup and normative factors in the contemporary Canadian context. This hypothesis appears supported, with non-significant and apparently weak effects across parities. Further support for this hypothesis is uncovered in comparing standardized slopes in Table 8, and in examining the contri- bution of normative factors to the total explained variance of the model in Table 9.

The OLS standardized coefficients (betas) for the dynamic model of period fertility are presented in Table 8. These coefficients indicate the relative magnitude of effects and are rank ordered by parity from those with the strongest to the least important impact.

Table 8. Rank-Ordered OLS Standardized Coefficients for the Dynamic Model of "Period Fertility 1982-1984", for Married Once, Canadian Women.

	Parity 0	Parity 1	Parity 2
	AGEWIFE (-.1617)	AGEWIFE (-.1623)	AGEWIFE (-.1709)
	ROLEBEH (-.0925)	INCOME (.1423)	EMPLST (-.1450)
	EMPLST (.0663)	ROLEATT (-.1279)	AGEOFMAR (.0890)
	PROT (.0656)	AGEOFMAR (.0980)	ROLEATT (-.0776)
	ROLEATT (-.0602)	ROLEBEH (-.0444)	ROLEBEH (-.0471)
	CATH (.0363)	CATH (.0172)	INCOME (.0354)
	SIBLINGS (.0349)	SIBLINGS (-.0148)	SIBLINGS (-.0175)
	INCOME (.0254)	PROT (.0079)	PROT (.0103)
	AGEOFMAR (-.0114)	EMPLST (.0038)	CATH (.0044)
R^2	.047	.043	.059
N	652	243	203

Beginning with the economic determinants (EMPLST,INCOME), it is acknowledged that the two variables have an opposite pattern of effects across parities. While female employment is relatively important at parity 0, negligible at parity 1, reverting to a very strong effect at parity 2, husband's income has relatively weak effects at both parities 0 and 2 while remaining important at parity 1. In considering the interrelationships between the two variables, it is possible to further speculate upon these findings.

The tendency in the literature reviewed is to consider household resources strictly in terms of husband's income, while limiting the discussion of female labor force partici- pation to the probable opportunity costs foregone by women in the decision to have children. The emphasis is upon the earlier discussed "substitution effect" of wife's income, rather than considering a possible direct "income effect" as women through employment contribute to the total resources of the household. This tendency in the literature might also be criticized in light of the earlier outlined research indicat- ing that "perceived" opportunity costs hold little importance in the decision to begin a family (Bulatao,1981). Further- more, the earlier reported means indicate that the greatest majority of childless women are employed and contributing an income towards the household's economic well being. Further questions that arise and deserve mention are as follows.

Is the negligible income effect at parity 0 the result of an inappropriate measure of current household resources? The analysis is limited to the current income of the husband while excluding the wife's contribution. Correspondingly, does the positive effect of female employment at parity 0 better represent the economic advantage associated with a dual income household and correspondingly facilitate a first birth? With the benefits that Canadians associate with children and the relative lack of importance of "perceived" opportunity costs on decisions at parity 0, dual income households would be expected to better afford the considerable outlay of resources associated with a first child. Furthermore, does the strong income effect at parity 1 suggest a climb in importance of husband's economic contribution relative to the wife's economic contribution after the first parity progression? With the time intensive costs of early childhood care and the corresponding loss of employment income which many women bear (whether temporary or permanent), it appears logical that the husband's income would hold more weight in facilitating a second birth.

In moving on to role egalitarianism, Table 8 again demonstrates the relative importance of egalitarian behavior to decisions at parity 0, and egalitarian attitudes to decisions at parity 1. Furthermore, both sex role variables rank slightly lower relative to other explanatory variables at parity 2. Again, egalitarian couples are slightly more likely to delay a first or second child rather than delay or

curtail their third or fourth child.

In contrast to expectations, egalitarian behavior is not
found to have a stronger effect relative to sex role at-
titudes in explaining fertility decisions. It was assumed
that egalitarian behavior serves as a more accurate measure
of bilateral social influence, correspondingly leaving for a
slightly stronger negative effect. In contrast, at both
parities 1 and 2 egalitarian attitudes are found to have a
considerably stronger effect. This implies that rather than
bilateral social influence, it is possibly the desire for
egalitarianism, often in a context of inequality, which has
the greatest discouraging effect on fertility.

In briefly considering the demographic variables, the
importance of age of wife is again highlighted, ranking first
across parities. While age at marriage is less important,
its relative effect holds greater relevance in predicting
higher order births. Its effect remains negligible at parity
0, with stronger effects at parities 1 and 2.

The hypothesis relating to normative factors is supported
in comparing standardized coefficients. At parity 2, the
three variables rank lowest among the explanatory variables.
At parity 1, only the effect of female employment ranks
lower. At parity 0, the variables climb slightly in terms of
their ability to predict fertility decisions. Overall, this
demonstrates a declining importance of normative and inter-

group differences in explaining contemporary fertility
decisions. The findings indicate that they are of least
importance in predicting ultimate family size, and higher
order births. This in turn, can be held in contrast to the
static analysis which suggest an importance to normative
factors.

The contribution of each set of variables (normative,
economic, and sex roles) to the total explained variance of
the model is presented in Table 9. The step-wise procedure
is capable of determining whether each set of determinants
adds significantly to the explained variance of the dynamic
model. As earlier hypothesized, economic constraints are
expected to surpass sex roles, while normative and intergroup
differences remain relatively unimportant.

At all parities, the normative variables do not produce a
significant change in R^2's, when controlling for demographic
variables. Of all variables in the dynamic analysis, the
normative variables are of least importance to the explained
variance of period fertility.

With respect to the R^2 change attributable to the economic
variables, a significant increment in explained variance is
uncovered at parities 1 and 2, failing to produce a signifi-
cant F ratio in decisions at parity 0. This is expected with
the importance of husband's income at parity 1 and female

Table 9. Analysis of R^2 Change Due to Normative Variables, Economic Variables, and Sex Role Variables, For The Dynamic Model of "Period Fertility 1982-1984".

	Parity 0	Parity 1	Parity 2
R^2 demographic	.0247	.0043	.0178
additional R^2 due to normative variables	+.0039 (.8734)	+.0030 (.2419)	+.0040 (.2011)
additional R^2 due to economic variables	+.0043 (1.4251)	+.0176 * (2.3117)	+.0283 * (2.9040)
additional R^2 due to sex role variables	+.0145 *** (4.8726)	+.0179 * (2.3823)	+.0086 (.8807)
total R^2	.0474	.0428	.0590

Notes:
* significant at .1 level
** significant at .05 level
*** significant at .01 level
figures in brackets are F ratios
the following formula is used in the calculation of the F ratio to test for the significance of change in R^2 due to the addition of variables to a restricted model.

$$F = \frac{(R^2 \text{ full} - R^2 \text{ restricted}) / (k \text{ full} - k \text{ restricted})}{(1 - R^2) / (N - k \text{ full} - 1)}$$

employment at parity 2. Both variables are of less impor-
tance at parity 0.

With the sex role variables, a significant increment in
explained variance is uncovered at parities 0 and 1, failing
to produce a significant F ratio in decisions relating to
higher order births. This is supportive of the earlier
conclusion that sex roles are of greater relevance to the

planning of earlier order births, with their relative effect remaining weakest at parity 2.

In comparing economic and sex role variables, their relative importance is found to depend on parity. At parity 2 economic variables appear to be of considerably greater importance in explaining the timing and curtailment of higher order births. At parity 1, sex role and economic factors appear to be roughly equivalent in terms of their contribution to the explained variance. At parity 0, sex roles appear to be considerably more important than economic factors.

The step-wise procedure at least partially supports the hypothesized contribution of each set of variables to the total explained variance of the model. Without dispute, normative and intergroup differences remain unimportant across parities in explaining fertility decisions. Furthermore, as hypothesized, economic constraints are found at higher parities to surpass sex roles in terms of their contribution to the explained variance. What remained unexpected was the importance of the sex role indexes relative to economic factors at parity 0. All importantly, the overall results support McDaniel's research, as "the traditional differentiating variables such as religion, religiosity, ethnicity, and family size of origin are being replaced by a calculus of child bearing in which the decision to have children is made within the context of individual

economic and social circumstances and preferences rather than
in terms of old-fashioned normative pressures (1984:86).

Specification 3

In testing for the hypothesized interaction effect between
female employment and sex roles, the effect of role egali-
tarianism for a sub-sample of employed women is compared to
the effect for a sub-sample of women not involved in the
labor force. On the basis of Scanzoni's research (1975), the
influence of sex role egalitarianism (both attitudes and
behavior) is expected to be stronger across parities for the
sub-sample of employed women. For women working solely in
the home, the effect of egalitarianism is expected to be
weaker. Table 10 presents the standardized regression
coefficients for the sex role indexes while controlling for
the other determinants listed. The coefficients drawn from a
separate analysis involving each sub-sample are presented.

Of secondary interest are the reported coefficients
relating to wife's education. Education of wife is assumed
to represent the effect of wife's potential earnings, again
involving a discussion of opportunity costs and fertility.
For both sub-samples, education of wife is expected to have a
strong negative effect at parity 2. This effect is expected
to be weaker at lower order births.

In general, the sex role coefficients are found to have a greater effect among the sub-sample of employed women. With the exception of egalitarian attitudes at parity 0, the relative effects of both indexes are stronger among women who face the dual demands of work both in the home and in the labor force. Although most of the coefficients are non-significant, many approach statistical significance, with the pattern of effects tending to support the hypothesized interaction effect.

Table 10. OLS Standardized Coefficients for the Dynamic Model of "Period Fertility 1982-1984", for Employed and Non-Employed Married Once, Canadian Women.

Independent Variables	Parity 0	Parity 1	Parity 2
	Betas - Non-Employed / Employed		
AGEWIFE			
AGEOFMAR			
CATH			
PROT			
SIBLINGS			
INCOME			
EDUCWIFE	.1069/ .0050	-.0273/-.0112	-.1200/-.1989
ROLEATT	-.1052/-.0504	-.1351/-.1391	-.0655/-.1098
ROLEBEH	-.0868/-.0944*	.0063/-.0401	-.0351/-.1285
N	143/510	120/122	113/90
R^2	.072/.145	.052/.071	.046/.162

In examining the period fertility of the sample as a whole, the relative effect of sex roles was found to be weakest at decisions relating to higher order births. This does not appear to be the case among the sub-sample of employed women. Among employed women, the reported coefficients indicate that sex roles are as important in discouraging higher order births as at earlier parities. While the relative effect of sex roles across parities is generally greater among the sub-sample of employed women, the interaction effect appears to be of greatest importance to decisions relating to higher order births. In specifying the effect of egalitarianism, whether or not a women is employed appears to hold greater importance to decisions relating to the potential birth of a third or fourth child.

These findings are generally consistent with Scanzoni's research. In the structural context of female employment, women adhering to egalitarianism are expected to be more likely to exert interpersonal influence in decreasing the time required for child care. These women are expected to be considerably less likely to perceive the benefits associated with additional children, relative to women who do not face the dual demands of labor force participation and work within the home. With women who work solely in the home, egalitarianism would not be expected to have as great a discouraging effect on higher order births or a delaying effect on earlier births. Without such dual demands, the character of the social exchange between spouses is expected to differ.

With fewer demands on their time, rather than exerting
interpersonal influence on delaying or curtailing fertility,
women would be more likely opt for the benefits of children.

In briefly moving on to wife's education, the hypothesized
relationships are only partially supported. As expected,
wife's education has a relatively strong negative effect at
parity 2 for both sub-samples. This is consistent with
Mincer's research, which argues that the ratio of opportunity
costs of child bearing to the benefits of additional children
increase at decisions relating to higher order births.
Acting as an indicator of wife's potential earning, a higher
level of education is found as expected to lead to a curtail-
ment of fertility.

Education of wife is also found to have a negative effect
at parity 1. This supports the hypothesis that women who
face higher opportunity costs are slightly more likely to
delay a second birth.

The positive effect at parity 0 supports the earlier
conclusion found in examining the effect of female labor
force participation. In accepting wife's education as
acting as a reliable estimate of opportunity costs, further
support is uncovered for the earlier findings that "opportu-
nity costs" are of minimal relevance to the decision to begin
a family. Women who face potentially a higher income appear

to be as likely, or even slightly more likely to have a first child during the period studied.

VI: Summary and Conclusions

This study has been a parity specific analysis of the impact of changing sex roles and female labor force participation upon household fertility decisions. The major focus of the analysis was upon the relative effects of explanatory variables while drawing a distinction between decisions relating to children of different birth orders.

For comparative purposes, the first model specified was representative of research which employs the static framework. The second model adopts the dynamic perspective, in examining fertility decisions over the reference period 1982-1984. This involved a separate analysis of the probability of a first birth, as opposed to the likelihood of a second birth, and the likelihood of a third or fourth birth. A third model was specified in testing for a hypothesized interaction effect between female employment and sex roles in explaining fertility decisions.

Although most of the variables involved in the first model specification were shown to be significantly correlated with total number of children born, the static framework was criticized for obscuring the considerable variation in effects by parity. In the dynamic analysis, both female

employment and the sex role indexes were shown to interact with parity, as were other variables acting as controls in the analysis. This supports Namboodiri's (1972) assertion that the decision to have a first or second child takes on a different character from decisions with respect to higher parities. Furthermore, instead of examining fertility while assuming a "utility maximizing lifetime plan", the results portrayed the value in Namboodiri's assertion that "the appropriate decision problem in the economic analysis of fertility is the sequential addition of each child and the timing thereof" (1972:191).

This variation of effects by parity was most clearly demonstrated in examining the influence of female labor force participation. While the results from the static model indicated a strong negative effect, the dynamic analysis demonstrated how this was only true at decisions relating to higher order births. The static analysis was found to mask a positive effect with respect to the probability of a first birth, a null effect relating to the second birth, with the strong negative effect solely at decisions corresponding to higher order births. These findings are counter to expecta-tions, as a negative effect of female employment was hypothe-sized across parities.

In considering this variation by parity, it is again emphasized that the major advantage of the dynamic over the static model is that inferences can be drawn on the timing

and spacing of births.   In contrast to expectations, the
positive effect at parity 0 implied that women in the labor
force were as likely, or even more likely to begin childrear-
ing during the interval 1982-1984. The weak effect at parity
1 implied that female employment held little relevance to the
delaying or propensity toward having a second child. It is
only at parity 2 that a strong negative effect as anticipated
indicated that decisions relating to a third or fourth birth
were strongly influenced by career and economic aspirations.
Overall, the "opportunity costs" associated with loss of
employment income appeared to be of minimal relevance to the
decision to begin a family, while the strong negative effect
at parity 2 indicated that such costs hold importance only
after normative family size (i.e. two children) had been
achieved.

It remains uncertain as to why female employment actually
tends to encourage beginning a family rather than having the
opposite effect. Since age of wife and age of marriage were
controlled for in the analysis, the positive effect at parity
0 is not likely to be the result of a "catch up" phenomenon
among women who have devoted many years to the labor market.
Yet the strong negative effect at parity 2 is consistent with
the literature reviewed, highlighting the importance of
"opportunity costs" to decisions relating to higher order
births. This discouraging effect of female employment at
higher parities is also consistent with the results from the

static analysis, with women devoted to the labor force on average having smaller completed family size.

In considering the positive effect at parity 0 and the negative effect at higher order births, this variation might be partially explained in terms of Bulatao's (1981) research. He had concluded that "perceived" opportunity costs hold little importance to couples at earlier parities, only growing in importance with the achievement of normative family size. It would appear that the non-economic benefits associated with having a child (the emotional gratification in beginning a family, the confirmation of a marriage through the birth of a first child) at earlier parities are equally appealing to both employed and non-employed women.

The two sex role indexes were also found to interact with parity in explaining fertility decisions. Yet, counter to expectations, sex role egalitarianism appeared to be of greater relevance to the planning and timing of earlier order births. While the initial hypothesis relating to the effect of sex roles was partially supported (with a negative effect uncovered across parities), it remains uncertain as to why the relative effect for both indexes remained weakest at decisions relating to the birth of a third or fourth child. The results implied that non-traditional couples were only slightly less likely to decide upon a third or fourth child, while labor force participation rather than sex roles act as crucial in predicting higher order births. Again, the static

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analysis was not capable of drawing this distinction, in limiting inferences to a one time decision on total number of children born.

Due to a previous lack of concern with examining the effect of sex roles while applying the sequential decision making framework, it was only possible to speculate upon the relative effects of the two indexes. With a lack of correspondence between attitudes and actual behavior in Canadian households (as reflected in the reported means), the effect of the two indexes was different as expected. While egalitarian behavior was found to have its strongest discouraging effect upon the decision to begin a family, egalitarian attitudes were found to be considerably more important only after a first birth.

Given that egalitarian behavior is viewed as a more reliable indicator of bilateral social influence in household decision making, the findings suggested that the bilateral give and take between spouses (as stressed by social exchange theorists) was most relevant to decisions relating to a first birth.

In contrast, egalitarian attitudes as held by the women surveyed, were understood as not necessarily implying bilateral social exchange. This lack of correspondence between attitudes and behavior enters into a possible explanation of the relative importance of egalitarian

attitudes at parity 1. After a first birth, women are more likely to realistically evaluate the benefits and costs of a second birth, along with the probable contribution of their husband to child care. With husbands continuing to avoid equal responsibility in child care, egalitarian attitudes understandably would become more salient after experiencing the time intensive costs of a first child. Correspondingly, women rejecting traditional roles yet experiencing an unequal division of labor might be less likely to rush a second child.

Egalitarian behavior was also hypothesized as having a stronger effect across parities. Since it was assumed that egalitarian behavior serves as a more accurate measure of bilateral social influence, it was expected to have a slightly stronger negative effect. In contrast, at both parities 1 and 2 egalitarian attitudes were found to have a considerably stronger effect. This implied that rather than bilateral social influence, it was possibly the desire for egalitarianism, often in a context of inequality, which had the greatest discouraging effect on fertility.

Other variables of secondary interest to the analysis were also found to vary in effect by parity. While husband's income was found to have a non-significant effect in applying the static model, the dynamic analysis demonstrated a statistically significant effect depending upon parity. The decision to have a second child appeared to be specifically

sensitive to current economic means. Furthermore, education of wife was found to have a positive effect at the first parity, while reverting to a negative effect at higher order births. Acting as an indicator of wife's potential income, this added further support for the finding that "opportunity costs" are of minimal relevance to the decision to begin a family. As hypothesized, the variables measuring normative and intergroup differences were found to be of minimal importance in the dynamic analysis. With the demographic variables, as expected they were strongly correlated with period fertility, again acting as important controls.

The step-wise procedure added further support for the above findings. In failing to significantly contribute to the total explained variance of the dynamic model, the normative and intergroup differences were again portrayed as relatively unimportant to contemporary fertility decisions. While these structural variables failed to explain much of the model's variance, the contribution of the economic and sex role indexes supported the assertion of social exchange theorists that the individual economic and social circumstances couples face hold greatest relevance to contemporary fertility decisions. In highlighting the importance of sex role variables to the timing and spacing of earlier order births, the two indexes were found to contribute significantly at parities 0 and 1. The economic variables added significantly to the explained variance at parities 1 and 2. The latter

highlighted the relative importance of female employment at parity 2 and "current income" at parity 1.

In further clarifying the nature of the relationship between sex roles, female employment, and fertility, the third model uncovered results supporting the hypothesized interaction effect. In general, the sex role variables were found to have a stronger negative effect among the sub-sample of employed women. This is consistent with the research of social exchange theorists, suggesting that a combination of female employment and egalitarian sex roles lead women to exert interpersonal influence in decreasing the time required for child care. Furthermore, this interaction effect appeared to hold greatest importance to decisions relating to higher order births.

The importance of this interaction effect to higher order births was most clearly demonstrated in examining the reported coefficients among the sub-sample of employed women. In this case, sex roles appeared to be as important in discouraging higher order births as at earlier parities. While sex roles had been found in the second model specification to hold least importance in predicting higher order births, within the structural context of female employment the effect was to climb considerably. This is consistent with the literature reviewed, as women continuing to bear the opportunity costs of fertility are expected to push for household decisions against higher order births, especially

in light of the dual demands both within and outside the home and egalitarian aspirations.

It is fully admitted that the above study is limited in its scope, and a series of questions arise deserving further inquiry. Questions which have arisen range from factors entirely excluded from the analysis through to fundamental assumptions upon which the initial hypotheses were based.

One factor which deserves emphasis (and has hopefully been apparent in the discussion of the findings) is that the results cannot be considered "conclusive" but more accurately "suggestive". This is in light of the relatively low level of significance involved in discussion of many of the explanatory variables (as many merely approached statistical significance).

A second factor which deserves mention (although excluded from the analysis due to data constraints) is the influence of day care facilities or alternative methods for early childhood care (the availability of grandparents, extended family). In specifying the influence of labor force parti-cipation upon fertility, it would be useful to examine the parity specific effect of these factors which would lessen the opportunity costs couples face.

While also remaining beyond the scope of the present analysis, it would be of interest to examine the factors

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which motivate women to seek employment. This in turn may have a corresponding indirect effect upon fertility decisions. The present study has merely examined the effect of whether or not a woman is employed. Questions which might arise relate to whether the effect of female employment differs among women who work to obtain a desireable standard of living relative to women committed to a career without the same sort of economic pressures. A similar question which arises in light of the feminist perspective is whether the effect of female employment differs among women who are forced to work by their husbands relative to those who do so by choice. Again, due to data constraints, these questions can only be left open for further research.

Furthermore, criticism might be directed towards the above analysis, in that the costs in having children have been made explicit, while by in large neglecting the benefits relating to fertility decisions. This focus was justified in that a simplifying assumption of the micro-economic model is that the tastes relating to children remain relatively constant across households. In other words, all couples are understood as viewing similar benefits associated with children, leaving the costs crucial in terms of fertility decisions.

This assumption is somewhat consistent with research which suggests that there has been a convergence in the level of "desired" fertility among a majority of Canadian couples, i.e. two children (Romaniuc, 1984:62). With most Canadian

couples apparently valuing the benefits of the two-child household, this shift in focus to the costs couples face might be at least partially justified.

One further question arises in relation to the conceptualization of "rationality" as employed throughout this study. In applying a strictly utilitarian concept of rationality, households were understood as arriving at decisions by rationally attempting to maximize utility or satisfaction through their choices. As earlier discussed, the application of this framework to the study of fertility decisions has been justified in light of the overwhelming majority of Canadian married women reporting use of highly effective techniques of birth control. In turn, an expansion of knowledge about contraception has been associated with a widening scope for rational decision making.

Despite this observation, the question remains for many observers regarding the extent to which fertility choices are conscious decisions or whether they merely happen and couples adjust after the fact. Future inquiry might consider the possibility that specific segments of the population follow different approaches to childbearing (eg. clear cut decisions being more of an upper class - middle class phenomenon). It would remain interesting to determine whether there are social or cultural variations in the applicability of the present model. This could be tested in separately applying the dynamic model on various sub-samples of the population

(ex. social classes,. ethnic groups). This had not been
feasible for the present study given the size of the initial
sample employed.

As earlier outlined, the fertility rate in this country has
fallen to an unprecedented low level. This decline in
fertility has coincided with changes in sex roles, which are
closely interrelated with a steady climb in female participa-
tion in work outside the home. Furthermore over the last few
decades, this decline in fertility has also been associated
with a drop in the variation of completed family size across
Canadian households (with a convergence toward the two-child
norm).

It is hoped that this thesis has demonstrated the value in
examining separately by parity the influence of economic and
sex role variables. In concluding, one further advantage of
the dynamic framework is highlighted. In light of lack of
variation in completed family size, the static framework's
focus upon total number of children born has certainly
declined in importance. Surely, the focus upon spacing and
timing differences which is only possible in applying the
dynamic framework holds far greater relevance to the contem-
porary Canadian context.

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