

FEMALE PARTICIPATION IN THE
WORK FORCE AND FAMILY SIZE
HAMILTON: A CASE STUDY

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CHAPTER ONE

INTRODUCTION

The Hamilton-Wentworth region has grown in population size and in density in the past few decades. In turn, it has also experienced growth in the area of female participation in the work force. This thesis will analyze the relationship between the participation rates and family size in the area from 1961 to 1981.

HISTORICAL OVERVIEW

To analyze how and why women actually entered the labour force, we must realize that until the early twentieth century, when forty per cent of the population was employed in agriculture, women primarily made all the clothes for their families, soap, food and other goods (Pollard, 1986, 38). But once the growing industrial sector's employment percentage overtook that of the agricultural sector, the lives of the people changed also (Pollard, 1986, 39). Goods which used to be made by the women in a family were now manufactured and readily available and affordable by all people (Pollard, 1986, 39). Consequently, more time was available to the female population, and employment in other sectors associated with manufacturing also increased. As noted in Pollard's thesis, "between 1961 and 1971, the

community, business and personal services became the largest employers in Canada" (Pollard, 1986, 41).

Hence, the opportunity to find employment and add to the family income was introduced. Even so, different women had varying reasons for entering the work force. The main reasons for doing so have been narrowed down to "economic need, personal satisfaction, and increased self-esteem" (Gelber, 1972, 10). In fact, women's roles in providing additional family income have become so vital that it has been said that "a second family income has been the main factor stabilizing the standard of living of middle- to low-income families" (Pollard, 1986, 43).

This second source of income became the only source for many families during the Second World War, when the female labour force grew to thirty-eight per cent of the total in the United States (Brownlee and Brownlee, 1976, 3). Though this rate dropped immediately after the war, the participation rate rose again to "an all-time high of 51.2 per cent in 1980" (Gerson, 1985, 5). The period of domestication had run its course in the 1950's and women were once again playing an important role in the sectors which were their greatest employers: community; business; and personal services (Gerson, 1985, 7).

INFORMATION RELATED TO STUDY AREA

The birthrate in the U.S. has experienced a great decline in

the last ninety years. In 1890, there were 65 births per 1,000 population. This number steadily decreased, experienced a sharp rise during the baby boom years around 1950, then decreased quickly to only approximately 16 births per 1,000 population in 1980 (Gerson, 1985, 6). This indicated a decrease in family size, which may have been accompanied by an increase in childless families (which would influence average family size statistics).

The preferred family size has also changed over the past few decades. Data collected in 1974 analyzed responses from males and females from 1936 to 1972. There was a noticeable concentration of responses in "the two-child category" (Blake, 1974, 31). Prior to women entering the work force en masse, in 1936, thirty-three per cent preferred two children. By 1972, this size had become the ideal, controlling almost fifty per cent of preferences. The male ratings were somewhat stronger, but substantiated those of the women (Blake, 1974, 31). This indicates family size preferences are heading for the lower end of the scale. It contrasts sharply with statistics from the U.S. for 1800 which stated that the birthrate for each married woman was 7.04 children.

In addition, another study was done concerning the growing issue of childlessness. It was stated that analysts were expecting "as much as thirty per cent" of American women to remain "permanently childless" (Bloom and Pebley, 1982, 203).

These expectations were found to be similar to those of the European nations (Bloom and Pebley, 1982, 203). Further proof was that among women who were or still are married, aged twenty-five to twenty-nine, childlessness had increased from twelve per cent in 1965 to twenty-five per cent in 1979 (U.S. Bureau of the Census, 1977 and 1980). This may be due to the growing number of women who are continuing their education to post-secondary school levels, starting careers, and therefore waiting until they are well-established before starting families.

Westhoff and Ryder stated that the decreases in family size were due to "changes in norms about the family, childbearing, marriage, and especially in the status of women in American society" (Bloom and Pebley, 1982, 205). This statement is especially important since it relates changes in women, which include employment, to family size. The strongest finding by Bloom and Pebley, in addition to Westhoff and Ryder, was that labour force participation was positively related with the incidence of childlessness: "above average proportions of childless women were found in professional, managerial, clerical and skilled employment" (Bloom and Pebley, 1982, 206). These statements suggest the thesis will find the increase of women in the work place decreases family size.

Some trends concerning the issue of women, careers and family were found by Hall and Hall in 1979. The first conclusion

was that more couples were consciously choosing not to have children. The second discovery was that "those who did choose to have children, chose to have fewer of them" (Hall and Hall, 1979, 127). They also observed that the timing of when to start a family had changed with people waiting until their relationship, and sometimes their career, was "well-established" (Hall and Hall, 1979, 127).

These findings indicate the trend was towards planned smaller families, and a concentration on personal satisfaction, such as better relationships with the spouse. It also strengthens the conclusions of the previous investigations, which relate increased participation negatively with family size. Though the conclusions seemed realistic and well-founded, the rest of the text by Hall and Hall was sometimes presumptuous, assuming too many factors in the lives of two-career couples, and using many cliches (ie. "she comes home at the end of the day full of tales of conquest and fulfillment, he comes...tired and edgy and wants to get away from it all").

PRELIMINARY OBSERVATIONS FOR HAMILTON

The American studies can be related somewhat to the city of Hamilton, which has experienced some of the changes noted previously. Data for Wentworth county shows an increase in female participation rates from 29.5% in 1951, to 31.2% in 1961,

to 41.3% in 1971, and 48.6% in 1984 (Social Trends in Hamilton-Wentworth, 1977). The projected participation rate for 1995 is 56.6% (Social Trends in Hamilton-Wentworth, 1982). In addition, while marriage rates from 1963 to 1974 were increasing in Wentworth county and in Ontario, the birth rates were steadily decreasing for the same areas in the same time periods (Social Trends in Hamilton-Wentworth, 1977).

In this thesis, the values for labour force participation and number of children per family for each census tract of Hamilton will be used in the data analysis portion. When analyzing the data, the fact that families with no children can decrease the average family size, in an area which would otherwise have a large value, will be taken into account.

POSSIBLE CONTRIBUTING FACTORS TO DATA VALUES

Factors which may contribute to low values may include education, income, location, and family background. The person who has concentrated on their education and intends to have a career is more likely to focus their energies on this before starting a family. Therefore, areas where there is a high degree of educated people may have a lower average family size. The location of the area being studied also can affect the dimensions. For example, undesirable locations such as the north end, near Beach Road, may have lower values than the southern and

middle class area of Upper Kenilworth-Limeridge-Upper Ottawa, which is located near two elementary and secondary schools.

Family background may influence the family size by providing a tradition for large numbers of children. Likewise, the income level of the census tract could play a role in increasing and in decreasing family size. For instance, people with higher incomes may wish to take advantage and enjoy it as much as possible and therefore dislike the responsibilities of having a larger family. On the other hand, they are more capable of providing for a larger family and may choose to have more children because of this.

All of the above factors may play a role in the family size of the census tracts which will be studied, and may influence the rates more than the participation values. The advantage of knowing the city of Hamilton and the tract divisions will assist in being able to identify which factors may have a part in determining the variable of family size, and which may have no effect.

CHAPTER TWO

DATA ANALYSIS

The independent variable in this analysis will be the female labour force participation rate, and the dependent variable will be the average family size. The former was determined by dividing the total population of females greater than fifteen years of age by the number of females in the labour force. The latter was calculated by dividing each family size (ie. the # of families with zero children, the # of families with one child, etc.) by the total number of families in each census tract.

Example:

1971: C.T. 10	
females > 15	1740
female labour	780
no. of families	1270
families with 0 children	355
families with 1-2 children	605
families with 3-4 children	260
families with 5+ children	45

Percentage of female labour = $(780/1740) \times 100 = 44.83 \%$

Percentage of 0-child families = $(355/1270) \times 100 = 27.95 \%$

Percentage of 1-2 child families = $(605/1270) \times 100 = 47.64 \%$

Percentage of 3-4 child families = $(260/1270) \times 100 = 20.47 \%$

Percentage of 5+ child families = $(45/1270) \times 100 = 3.54 \%$

The values for females older than fifteen years of age were used because it was the generally accepted age at which they could begin to work full-time in all the census books which were used. The values for average number of children for each census tract were taken directly from the census data provided, while the break-down of family sizes (calculated as shown above) demonstrated which group may have influenced the average value the most.

The values found for x(participation) and y(family size) were then plotted on a graph in order to have a visual perspective of the relationship. These can be found following the second chapter.

Once the calculations were made and graphs drawn for all the years being studied, a correlation and regression analysis was done. Linear regression required the use of the equation $y=a+bx$ to determine whether there was a relationship between our two variables. The next equations were used to find a and b:

$$a = (\text{Sum } y) * (\text{Sum } x^2) - (\text{Sum } x) * (\text{Sum } xy) / (n(\text{Sum } x^2) - (\text{Sum } x)^2)$$

$$b = (n(\text{Sum } xy) - (\text{Sum } x) * (\text{Sum } y)) / (n(\text{Sum } x^2) - (\text{Sum } x)^2)$$

Using these numbers, the new y was calculated and used to form a regression line for each census year.

The next step involved the computation of the coefficient of correlation, which reinforces the relationship found to exist by the regression line. For example, the ideal coefficient for this data would have a high negative value close to -1 . This would indicate that as participation in the work force increases, the average family size decreases. The equation used to find the coefficient of correlation was as follows:

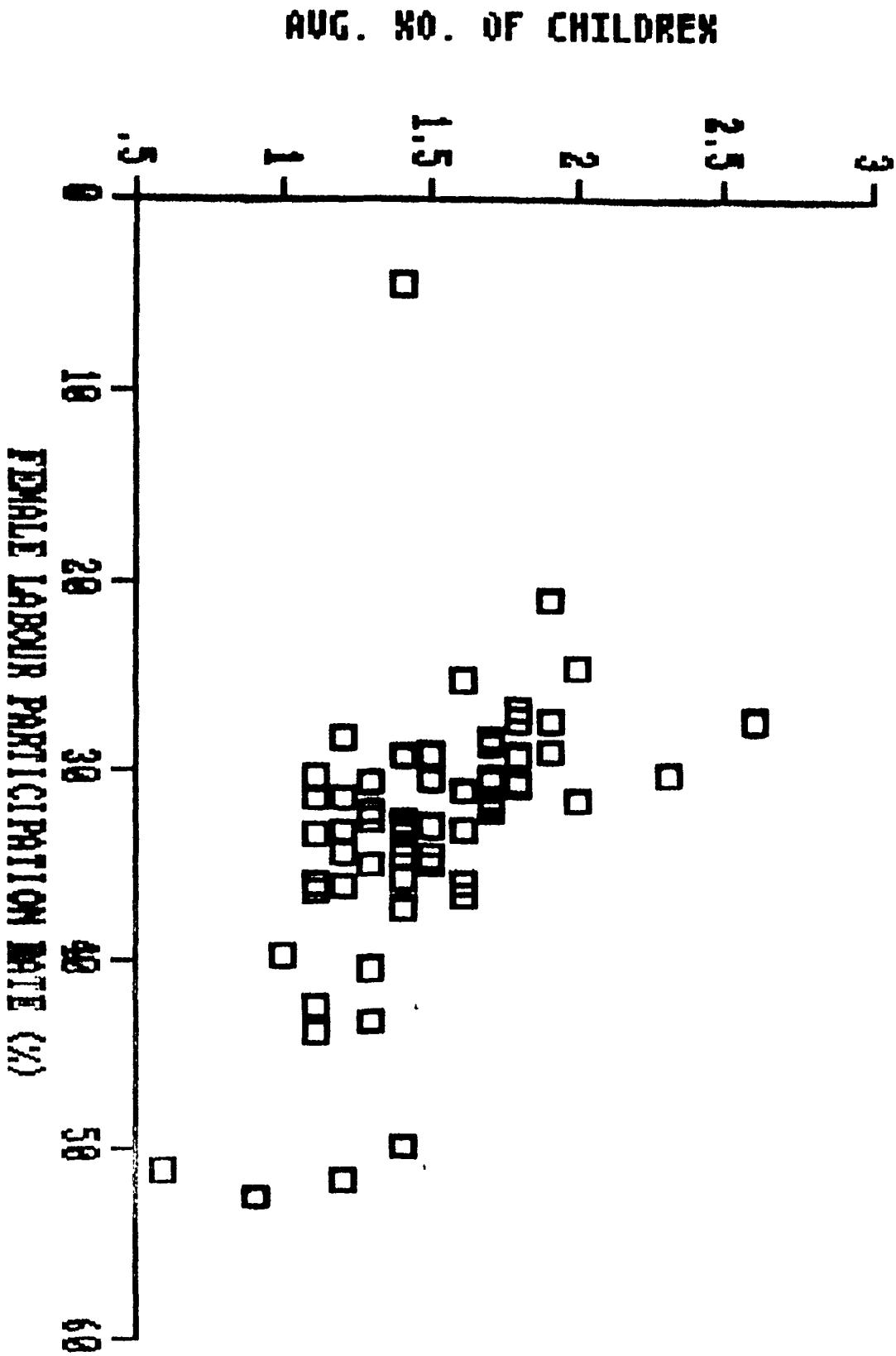
$$r = \frac{((n(\text{Sum } xy) - (\text{Sum } x) * (\text{Sum } y)))}{((n(\text{Sum } x^2) - (\text{Sum } x)^2)^{.5}) * ((n(\text{Sum } y^2) - (\text{Sum } y)^2)^{.5})}$$

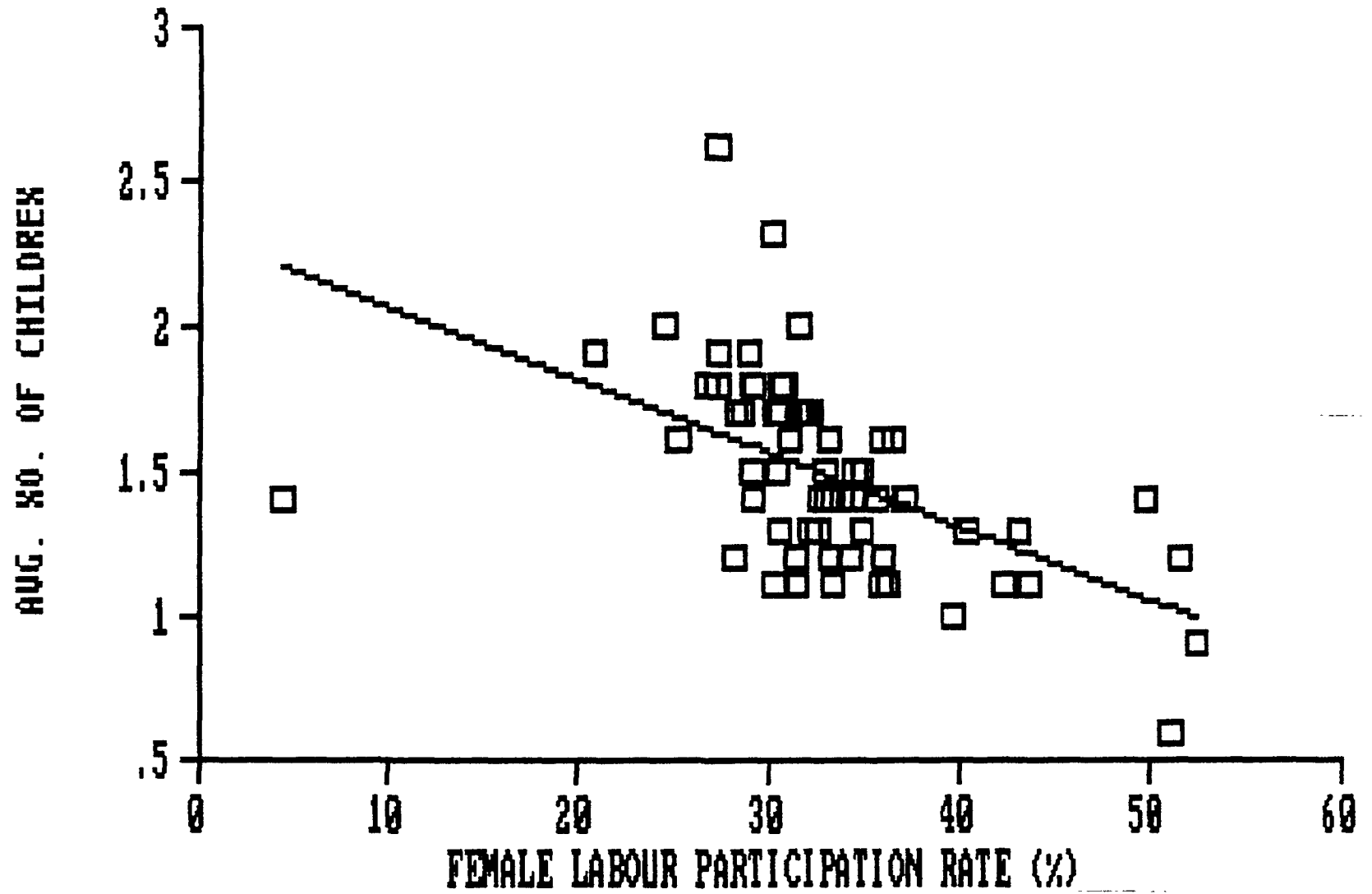
Though the equation may seem complicated, it was extremely useful in comparisons with the graphs. Unfortunately, the coefficients were not as close to the ideal -1 relationship as preliminary observations had indicated they may be.

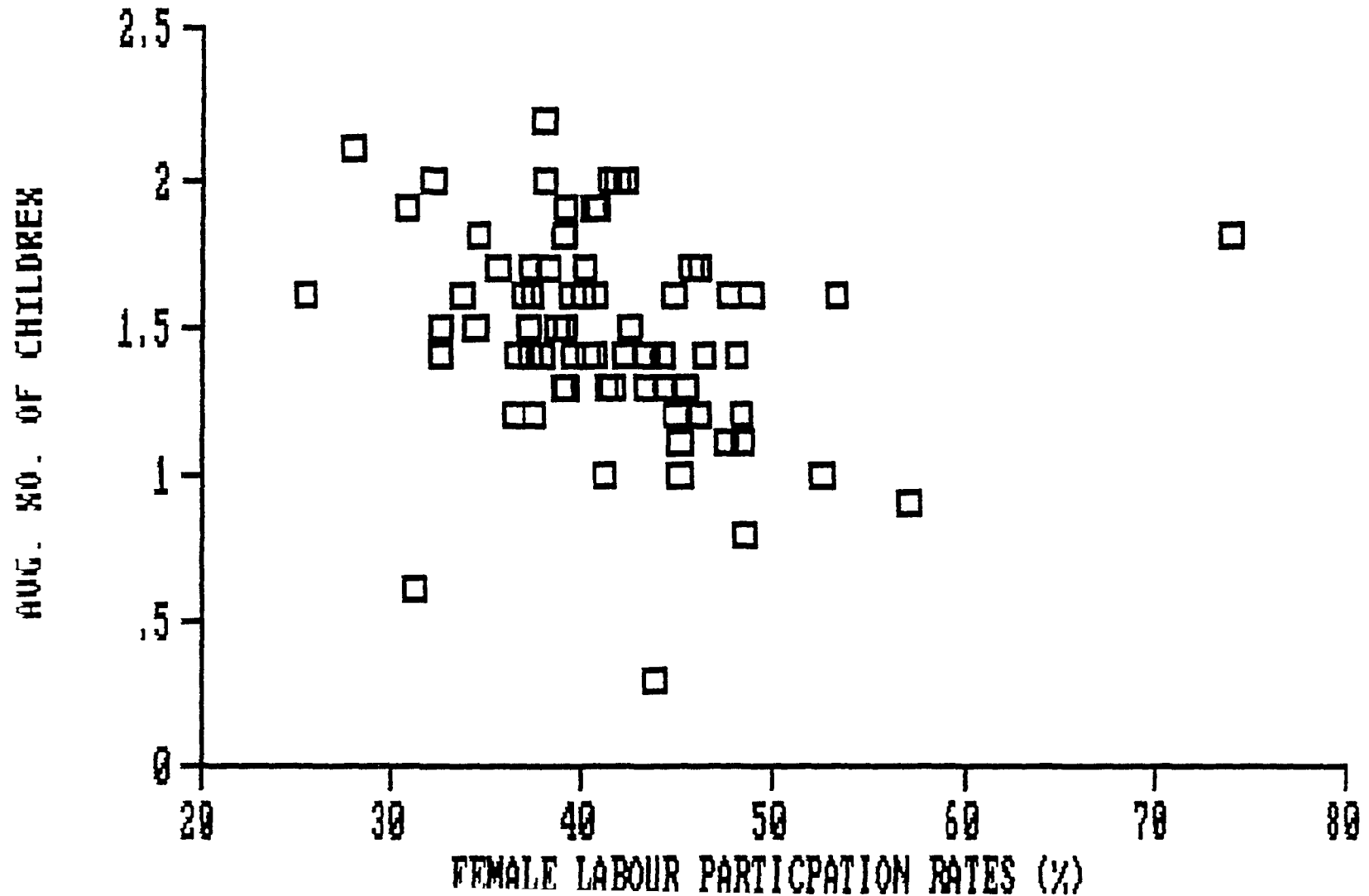
1961	$r = -.535091$
1971	$r = -.24259$
1976	$r = -.222418$
1981	$r = .0562394$

Yet, one has to keep in mind that the r values are influenced by outliers in graph plots. These stray points affected the coefficients somewhat in all four cases. It was even more clear when looking at the progression of the graphs over the twenty-year period.

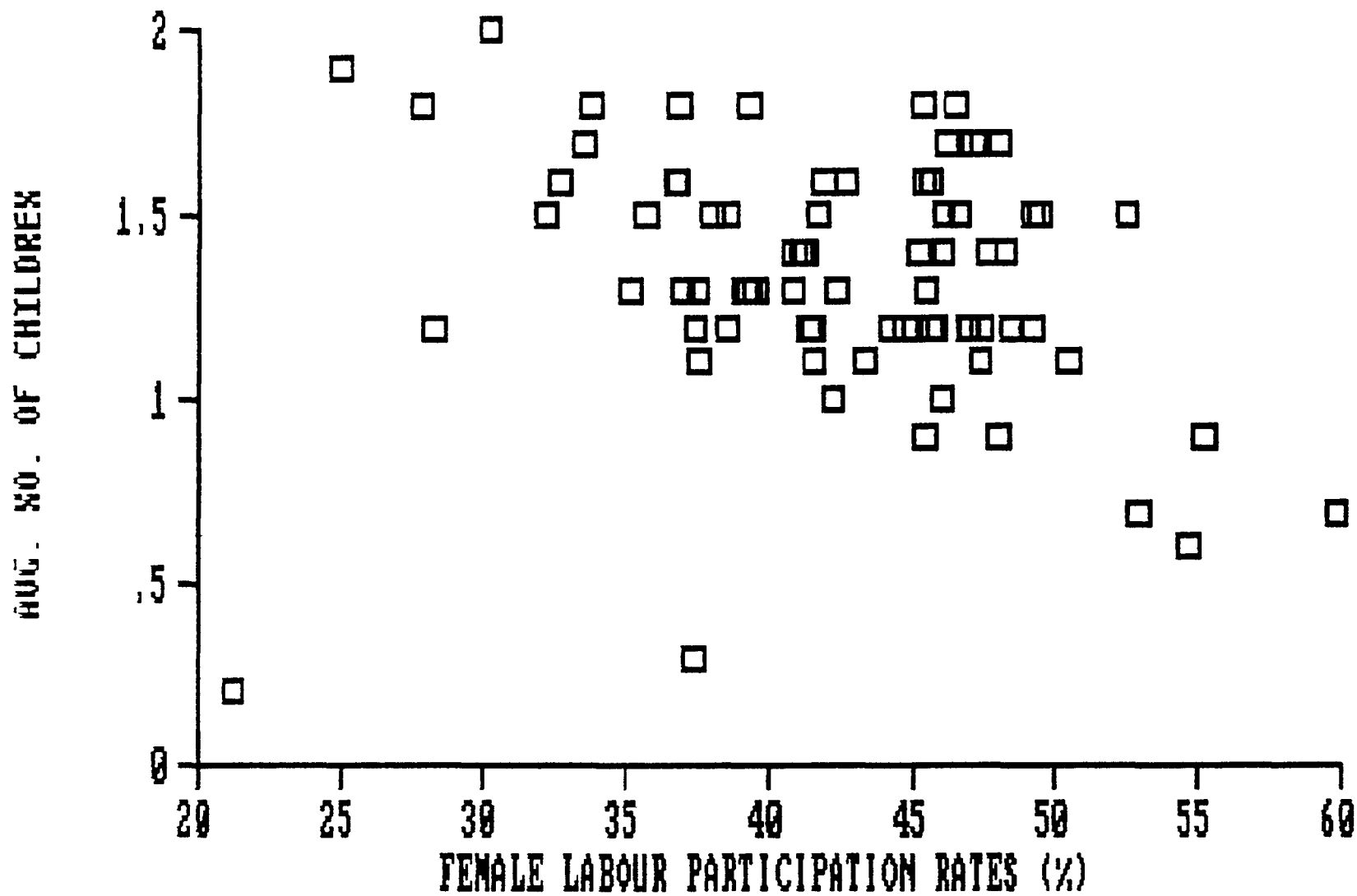
FEMALE PARTICIPATION RATES AND
AUG. NUMBER OF CHILDREN (1961)

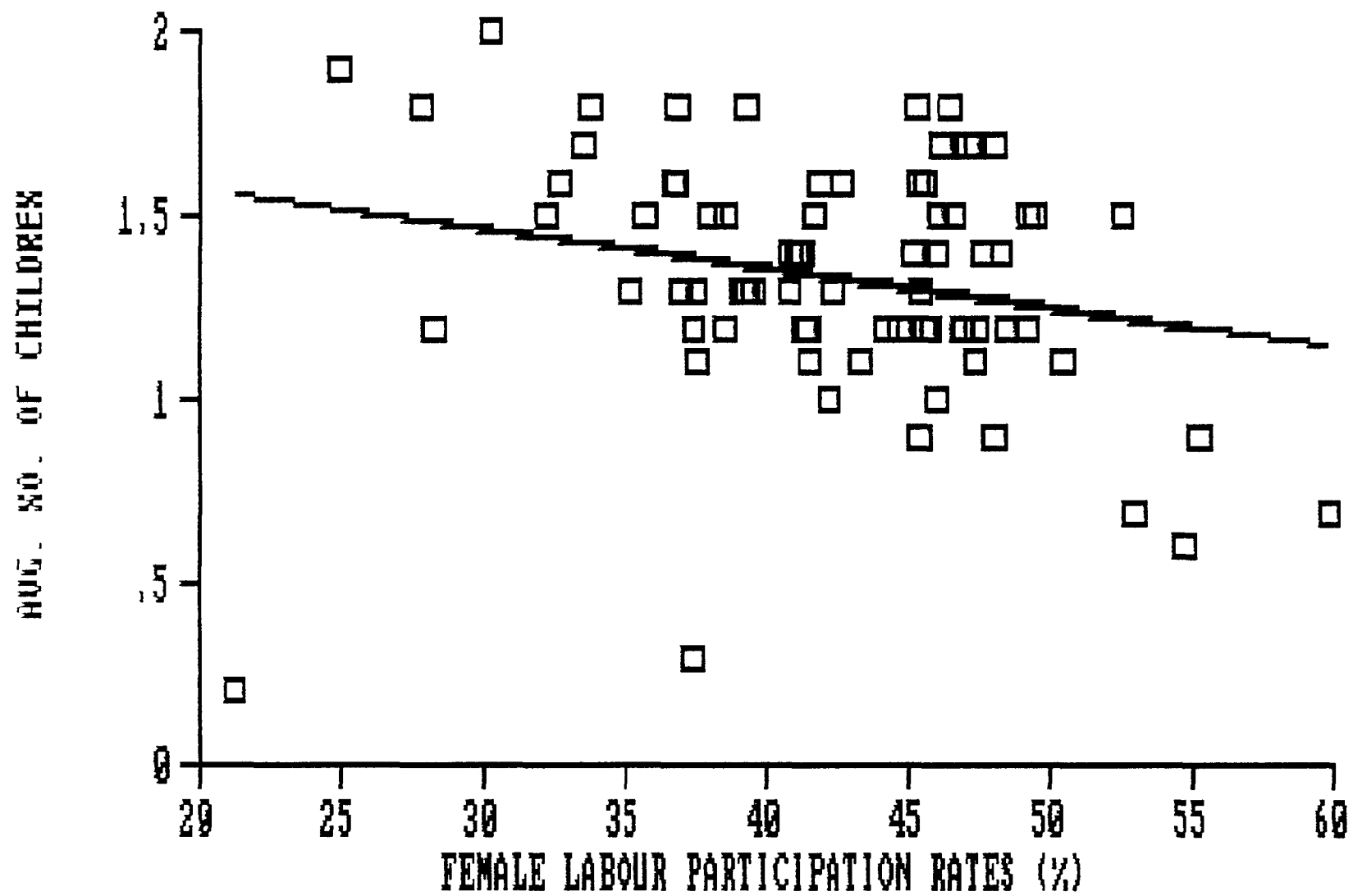


REGRESSION ANALYSIS OF PARTICIPATION
RATES AND NO. OF CHILDREN (1961)

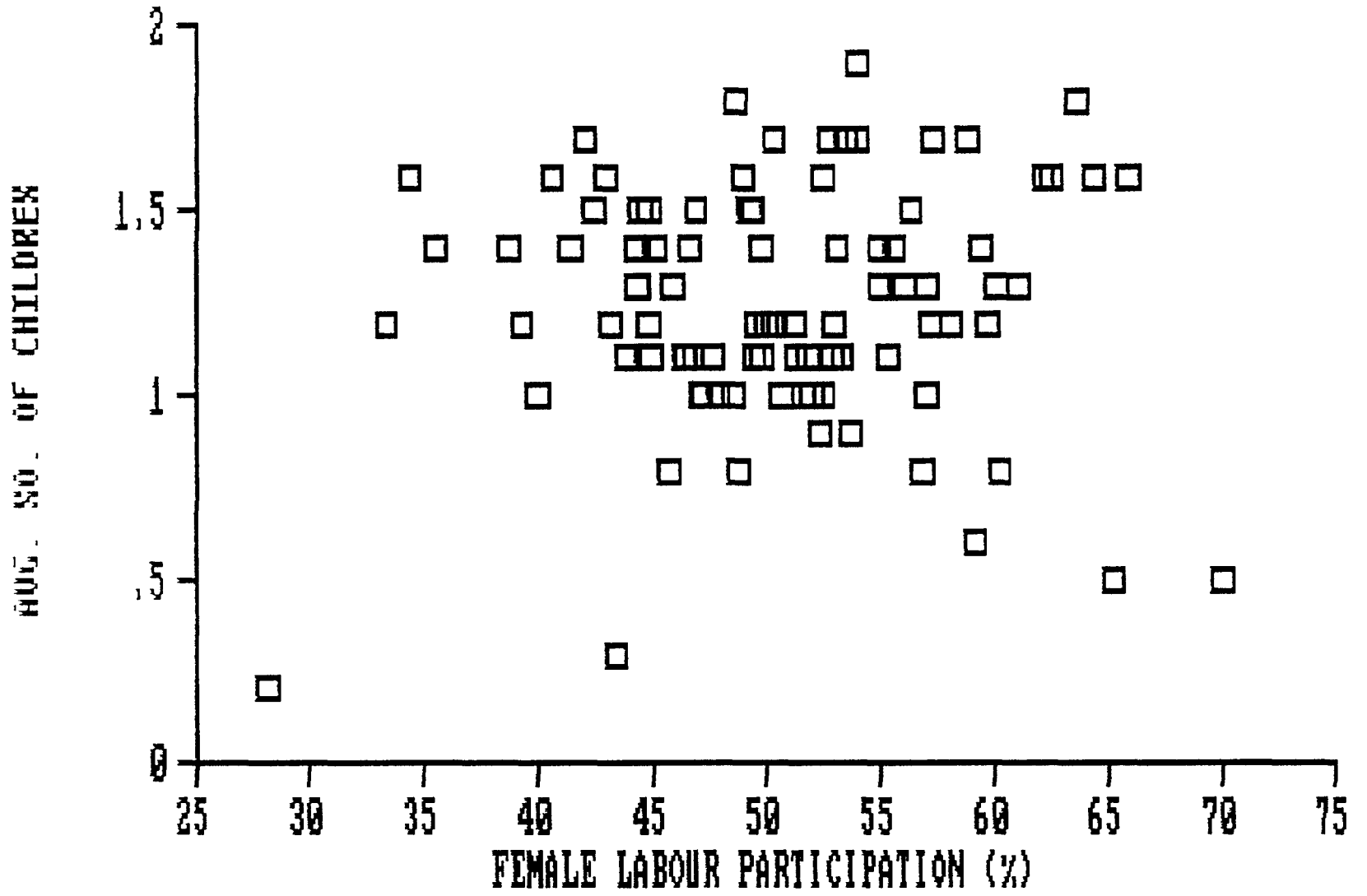
FEMALE PARTICIPATION AND
AUG. NUMBER OF CHILDREN (1971)

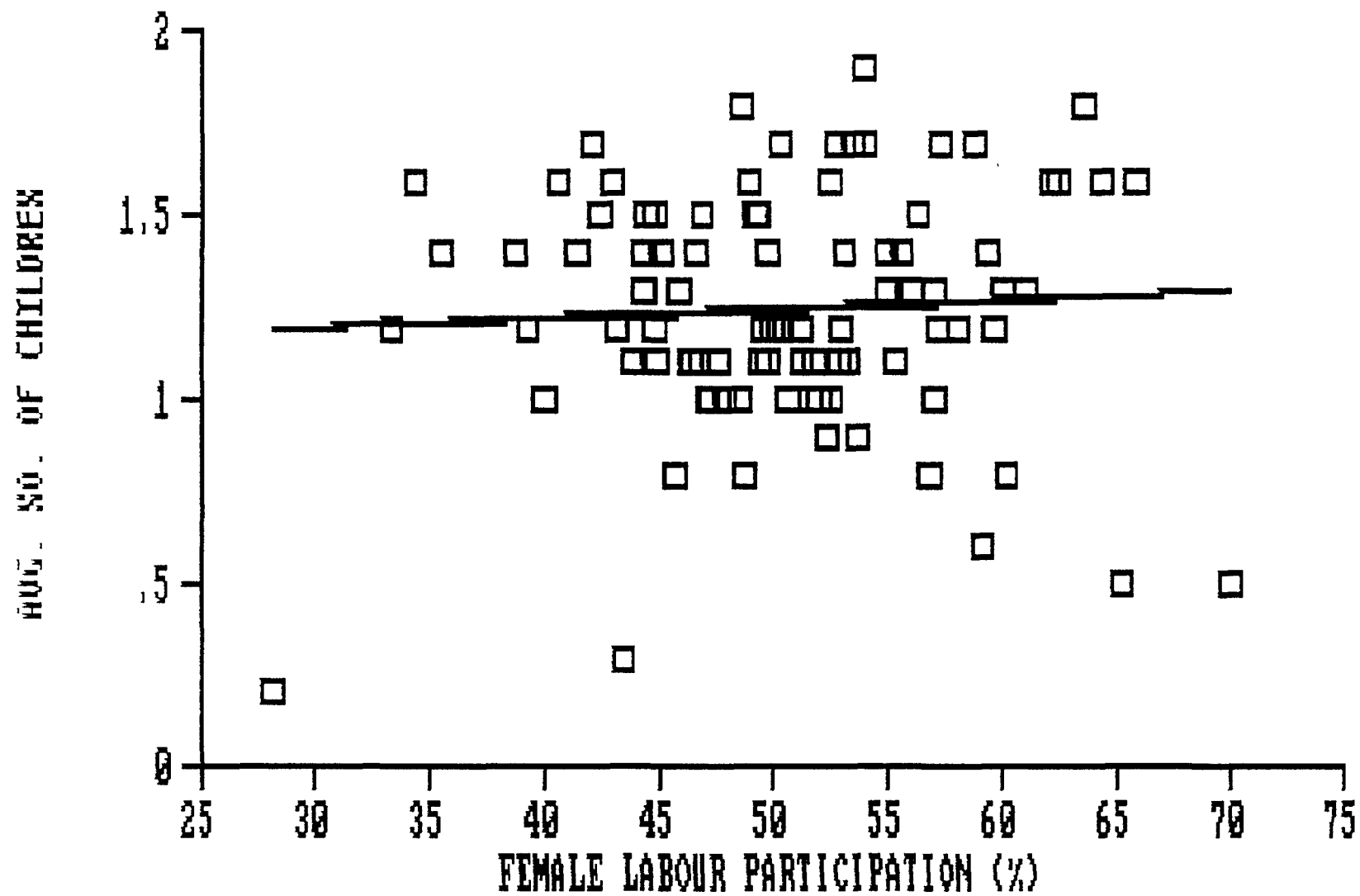
REGRESSION ANALYSIS OF PARTICIPATION
RATES AND NO. OF CHILDREN (1971)

FEMALE PARTICIPATION AND
AUG. NUMBER OF CHILDREN (1976)

REGRESSION ANALYSIS OF PARTICIPATION
RATES AND NO. OF CHILDREN (1976)

FEMALE PARTICIPATION RATES AND AVG. NUMBER OF CHILDREN (1981)



REGRESSION ANALYSIS OF PARTICIPATION
RATES AND NO. OF CHILDREN (1981)

CHAPTER THREE

ANALYSIS OF HAMILTON, 1961

Graph #1 shows the relationship which existed between female labour force participation rates and average number of children. Though the coefficient of correlation was only $-.535091$, there was a clearly defined steep and negative slope. The low value for r was due to the few values which strayed from the general clustering.

One census tract which showed an extremely low participation rate of only 4.41 and a normal family size was located in the same block as today's Hamilton Psychiatric Hospital. Upon further investigation, it was found that construction on the facility started in 1958 and therefore most of the population could be accounted for by the hospital. In fact, there were only nine families in the whole census tract, compared to hundreds in the rest of the city. These nine families determined the average family size for their area.

Some sectors of the city showed much higher participation levels than the norm of the day, 33.12%. Three census tracts had values over 51%, with corresponding low values for number of children. These were located in the central business district, where there was a multitude of apartment buildings suited to single people and couples without children. It also included the

St. Joseph's Hospital block. The area was suited to professionals who could afford the high rents, which would otherwise discourage the family-minded individuals. The downtown area is not viewed as conducive to family living and therefore did not attract this socioeconomic group.

Another interesting finding was a census tract in the western section of the Hamilton mountain, where Chedoke Hospital is located, with a participation rate of almost 50%. The number of children was near the average for 1961. It could be presumed that many of the employees were from the immediate area and therefore accounted for the high level of female employment. The hospital would have provided full- and part-time employment within a small distance from home for the mothers who wished to work yet didn't want to travel far from home.

Other than the few cases stated above, the rest of the census tracts clearly fell in a negative slope. That is, as labour participation increased, the average number of children decreased per family. This relationship would be substantiated ten years later when there would be an even greater percentage of women in the workforce.

One may wonder whether the evidence presented thus far would be enough to prove that the increasing level of employment amongst women may affect the number of children they have. But if the relationship exists over a twenty-year period, then it cannot be ignored.

ANALYSIS OF HAMILTON, 1971

The results obtained from the census in 1971 were plotted on graphs #3 and #4. The coefficient of correlation was determined to be $-.24259$. Though this value may seem to be lower than the one expected, the relationship which could be deemed from the graphs was that there had been a positive shift in the participation rates. Ten years previously, the majority of the scores were below 40%, whereas now they were above this number. This increase in employment among women was occurring in many places, as was noted by Alonso, "cross-national studies attest to the nearly universal movement of women out of the home under conditions of advanced industrialism" (Alonso, 1980, 37).

In 1971, the majority of the census tracts showed a negative association between the two main variables, but there were a few which were out of the norm and therefore affected the r value. The most obvious had a female employment level of over 78%, with 1.8 children per family. This tract was located near Hamilton's border with Ancaster, an established predominantly wealthy area. There were only twenty families in the area, most of which had one to two children each. But since there were 305 people in the tract, the great majority were not in a family. Therefore, the participation rate was due in large part to the females in this latter grouping.

There were two other sections in the city which weren't in

the main set. The first, with a participation level of 31.27% and .6 average number of children was located in the downtown core, between James and Bay Streets, and King and Main Streets. Today this area contains a condominium development, major banking centre, convention centre, art gallery, church, Hamilton Place, and the Ellen Fairclough Building. Some of these buildings existed in 1971, but there may have been a few small apartments amongst them since the population was over 2,500 people.

The other area in Hamilton which was out of the norm had an employment level for females over 40%, but it also had the lowest average number of children (.3). It was bounded by John and James Streets, and Aberdeen and Main Streets. Since 640 of the 840 families had no children, and the population was in the higher age bracket, it can be stated that the majority were probably empty nesters (ie. the children had grown and moved away), but still working.

ANALYSIS OF HAMILTON, 1976

In 1976, the data showed a clear relationship between the independent and dependent variables, but the slope was a gradual one with the correlation coefficient only being $-.222418$. This meant that as participation in the work force for women increased, the number of children decreased, but slowly.

There were a few unusual census tracts. The most

interesting one had the lowest values for both variables with 21.27% for participation and .2 children. This area was bounded by James and Queen Streets. It was, and still is, known as a popular place for students from outside Hamilton to find living quarters. Out of a population of 2,300, there were only 435 families. Of these families, 375 had no children. From the demographics of the area, it can be said that most of these families were empty-nesters, and that the rest of the population consisted mostly of students. This would also account for the low employment rate.

Another census tract in the city had only a slightly higher average number of children of .3, with a participation rate of 37.39%. Since it was directly south of the previous tract, most of the same reasons for the variation from the norm applied. The only difference was that there were many more residences in the area, allowing for more diversity in ages. Thus, more women of working age (15-65 yrs.) were living in the area, leading to the rate of 37%.

ANALYSIS OF HAMILTON, 1981

In 1981, the range of values for participation and number of children showed the greatest variability of all four census years. This was substantiated by the coefficient of correlation, which was $+.0562394$. Though there was some sort of relationship

in evidence from the graph, the large number of outliers, and general dispersion of values led to the only positive r value in the study.

As in the previous census, the same two tracts in the downtown area retained their extremely low values for average number of children. The demographics were similar, so the reasons for the unusual numbers could be explained by the presence of empty-nesters.

DATA ANALYSIS

Thus far, the individual situations for each census year in Hamilton have been discussed. But it is only when all the data is studied in its entirety that a clear picture of the relationship between the two variables evolves. The following tables provide a summary of the data which was studied.

TABLE 1:

<u>YEAR</u>	<u>PARTICIPATION RATE</u>	<u>AVER. # OF CHILDREN</u>
1961	31.12%	1.48
1971	41.35%	1.48
1976	42.35%	1.35
1981	50.53%	1.25

TABLE 2:

<u>YEAR</u>	<u>AVERAGE NO. OF CHILDREN</u>			
	<u>0</u>	<u>1-2</u>	<u>3-4</u>	<u>5+</u>
1961	33.46	44.68	17.74	4.12
1971	34.32	43.30	17.81	4.17
1976	35.29	46.69	15.74	2.3
1981	35.15	50.26	13.68	1.22

From these tables, it can be said that the number of children families are having has decreased since 1960. This may not be obvious from the first table, but when the data is subdivided to see where the changes have occurred, it is clear that there has been a major reduction in the percentage of families with five or more children. From this data and historical information, it can also be said that the "aversion to childlessness and only children is declining" (Bane, 1976, 43).

In addition to these changes, the participation of women in the work force has increased from 33% in 1961 to more than 50% in 1981. Some census tracts have recorded even higher employment rates of close to 70%. These values represent the percentages of all women over the age of 15 years, who are working or looking for work. The number was close to the amount of married women working in 1976 and 1981. The data for previous years was not

available.

With a few exceptions, most of the census tracts over the twenty years showed an increase in females working and a decrease in the family size. Some deductions could be made from this information. The first was that today's family needs the added income which a female could bring into a household, and therefore many women work outside the home. Secondly, having a career would not leave much time for the rearing of children, so their number would be decreased. Thirdly, if a career was foremost in a woman's mind, then the time and energy required by a family would be too great to accomodate immediately. This would lead to delayed motherhood, and a fewer amount of years (therefore, chances) of having more children.

Thus far, information indicating that there is an association between labour force participation and number of children has been presented. Data connecting these two variables have been collected since at least 1966, when Eli Ginzberg recorded the work history of females and compared it to their marital status and the amount children they had. He found that single and married females (with no children) had a continuous work history, while those who were married and with three or more children had either temporary work or no work at all (Ginzberg, 1966, 82). This was an indication that not only may participation affect the number of children a woman has or

decides to have, but the number of children may also determine the woman's participation. But more evidence has been provided for the argument concerning participation being the independent variable. If this were not the case, then women with a small number of children would have been employed in large numbers one hundred years ago instead of entering the work force only in this century (en masse).

Robert Kennedy also noticed this relationship and found through a national survey that "twice the proportion of employed women, as opposed to women not in the labour force, intended to remain childfree (one-seventh compared one-fifteenth)" (Kennedy, Jr., 1986, 92). This substantiated the finding by Gerson earlier in this thesis that since 1890, the number of births per 1,000 population decreased from 65 to 16 in 1950, while work force participation increased during the same period to over 40% (Blau, 1979; Sullerot, 1971; Wilensky, 1960).

Therefore, the city of Hamilton has only been following the trend of the rest of western society of smaller families and larger incomes (due to women working). From the studies discussed in this thesis and the data taken from the four census periods, an association between the two variables seems to exist. Participation is the independent variable, and the number of children in a family (whether it is one- or two-parent) is determined by this value.

CHAPTER FOUR

CONCLUSION

The purpose of this paper was to study the relationship between the participation of women in the work force and the average number of children in families. The study area concentrated on the census tracts in Hamilton from 1961 to 1981, using census data. The values for the two variables were compared for each tract over the twenty-year period.

The results obtained indicated that there was an association between participation and the average number of children per family. A correlation and regression analysis was done also. The calculations showed the relationship was diminishing because the r values became more positive over the twenty years instead of more negative. It was determined that the values were influenced by the census tracts with numbers out of the norm, thereby influencing the correlation and regression analyses. Otherwise, the majority of the areas showed a clear negative relationship (ie. participation increases and number of children decreases).

In the cases where the data seemed to be irregular, other attributes of the area which may have contributed to the irregularity were discussed.

In trying to find how the independent variable affects the

dependent variable, one cannot overlook disproving evidence. For instance, participation alone may not determine family size. Family size may also be affected by the education the woman receives. As stated earlier, the person that wishes to establish a career will usually have a good education background. They will more likely concentrate their energies in this direction for a while before considering getting married and starting a family. In this case, participation plays a role, but collectively with education.

The income base of the individual is another factor which can influence family size. The income provided by working may facilitate rearing more children, but it may also allow the people involved to spend the money instead on luxury items.

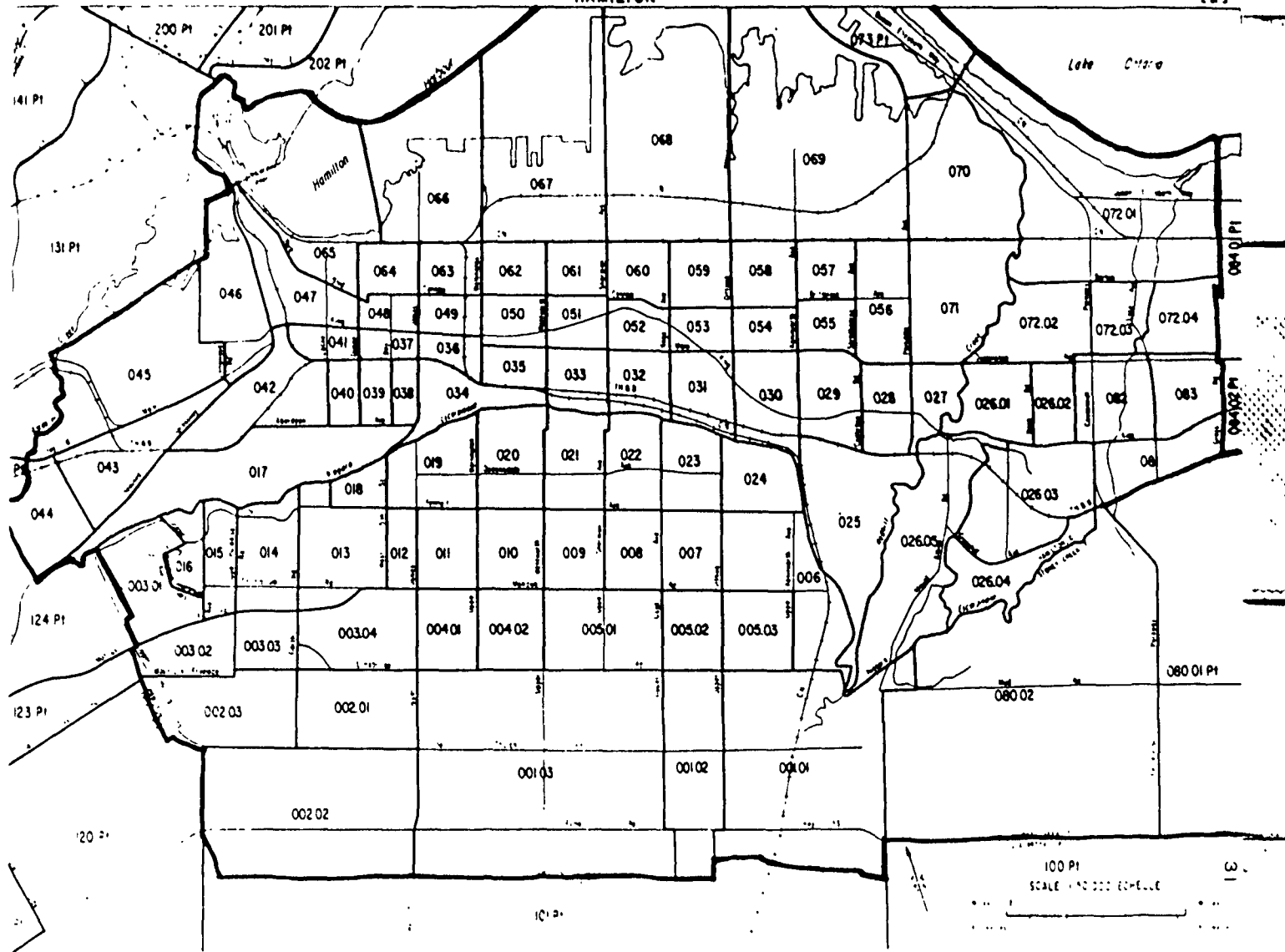
The location of a family and its cultural background may affect family size. The locational factor was mentioned in the explanation of several census tracts with low averages for number of children (ie. the area was not conducive to family-living). The other agent, family background, could provide a "tradition" for large or small numbers of children.

An important factor which cannot be quantified, and therefore was not used in this thesis, was human behaviour. No matter what the data may indicate, it cannot predict how people will react, and what they will decide to do. For example, a woman may have a career and still manage somehow to raise a large

family. Human behaviour is the one variable which contributes to the number of children a woman has, yet cannot be calculated mathematically.

This thesis has indicated that there is a relationship between participation and number of children, and that the average number of children decreases as the percentage of women in the work force increases, but the evidence is not conclusive. More work would have to be done to substantiate the evidence and to prove the relationship exists even with the presence of other factors which have been discussed.

HAMILTON



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