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POPULATION DETERMINANTS OF SOCIAL CHANGE:  
AN ANALYSIS OF THE AGE COMPOSITION OF THE UNITED STATES  
FROM 1920 to 1983

by  
GUY NORMAN BURKHARDT

A dissertation submitted in partial fulfillment of the  
requirements for the degree of

DOCTOR OF PHILOSOPHY  
in  
URBAN STUDIES

PORTLAND STATE UNIVERSITY

1988

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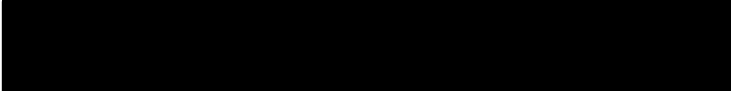
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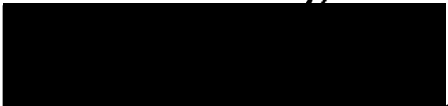

  
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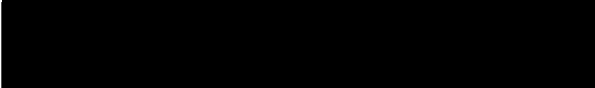
  
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AN ABSTRACT OF THE DISSERTATION OF Guy Norman Burkhardt for  
the Doctor of Philosophy in Urban Studies presented  
November 3, 1988.

Title: Population Determinants of Social Change: An  
Analysis of the Age Composition of the United States  
from 1920 to 1983.


APPROVED BY THE MEMBERS OF THE DISSERTATION COMMITTEE:

  
John O'Brien

  
Chuck Tracy

  
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Richard Brinkman

  
Hugh Lovell

The purpose of this study is to explain the  
consequences of a changing age structure on social change  
in the urban industrialized environment. This analysis  
determines the impact of the younger to the older labor  
force aged population on both negative and positive forms  
of social change behavior. The indices of social behavior

to be examined are the deviant behaviors of homicide, suicide and certain innovative behavior associated with patent activity. The specific age composition of the population to be examined is the ratio of young male adults aged 15-34 to those aged 35-64.

The analysis of main effects of the model is conducted, controlling for the effects of unemployment and urban growth. These control variables have traditionally been documented as being important factors associated with deviant forms of behavior. However, the more contemporary literature increasingly recognizes the relationship between age and the tendency to act out certain social change behaviors.

Most of social change emphasizes "negative" deviant behaviors. This study incorporated two innovative measures related to patents in an attempt to measure "positive" forms of deviant behavior. This strategy is used to determine if positive behavior can be explained by the same independent variables used to account for negative behavior.

A multiple linear regression model is used to analyze the hypothesis of the research model. The results show a significant relationship between the age composition of the population and the selected indices of social behavior. As expected, the traditional indices of negative deviant behavior are consistent with the findings of the model.

The less traditional indices used to measure innovation also result in positive findings. However, the significance of these latter findings are more modest in comparison to those of the traditional measures of deviant behavior.

The implications of this study are that when pressure for opportunity builds in the population due to a heavy proportion of young adults, the prevalence of both positive (innovative) and negative (destructive) behavior increases. These behaviors reflect the need within society to change and adapt to population requirements. These dynamics are heightened as our society becomes more urbanized under the circumstances. The task for social policy makers is how to encourage the positive innovative forms of social change.

## ACKNOWLEDGMENTS

It is a special occasion when the opportunity arises to express appreciation to those who have supported us in our quest to obtain sought after goals.

I would like to take this opportunity to thank my committee members for their patience and diligent support while working with me on this dissertation. The effort of the committee members should be acknowledged as a genuine effort to bring together a interdisciplinary perspective to enrich a project with contrasting academic views and life experience. This is a commendable effort in the spirit of engaging in healthy debate and reconciliation in the pursuit of achieving a measure of academic excellence.

A special thanks must also be given to the library staff at Portland State University for their undaunted support, resourcefulness, and expertise in tracking down needed materials for my research.

Behind the scenes but always in my corner is my family. It is difficult to thank them in a meaningful way more than our unspoken faith in each other has already done. But if our language could permit such expression, I would wish that they understand the strength, courage, and love they give me when I think of them as I dream of new endeavors to challenge.

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## CHAPTER I

### INTRODUCTION

The purpose of this study is to examine the extent to which certain aspects of social change are related to the changing age composition of the population of the United States during the period 1920-1983. Specifically, relative changes in the ratio of younger to older working age adults in the aggregate population will be analyzed to determine their association with selected measures of social change in the industrialized urban environment.

Moore (1968) defined social change in the following manner:

Social change is the significant alteration of social structures (that is, of patterns of social action and interaction), including consequences and manifestations of such structures embodied in norms (rules of conduct), values, and cultural products and symbols. (p.366)

However, since the process of social change is such an all-encompassing concept, it is only possible to operationalize a few of its components to serve as indicators at the macro level. These indicators will serve as proxy measures which reflect a portion of the whole process. The measures selected to index certain aspects of social change will be defined in this analysis by variables representing deviant and innovative behavior.

The impetus behind this analysis comes from the growing number of publications discussing the demographic characteristics of the post-World War II "baby boom" and its influence on the socio-economic system in the United States (Ahlberg and Schapiro, 1984; Brown, 1981; Easterlin, 1980, 1968, 1961; Wachter and Wachter, 1978). It has been consistently reported in this literature that the age composition and the size of the baby boom have made significant contributions toward affecting socio-economic changes. What has not been done is to reflect on these findings in a retrospective manner to examine the age composition of the population and its association with certain social changes in the pre-World War II period.

Instead, the demographic characteristics of the baby boom have been treated as a unique occurrence, with little or no attention given to the age structure of the pre-World War II population. It appears that the baby boom and its surrounding phenomena hold a certain fascination for social scientists which, in general, has inhibited further study of the population's age composition as a unique unit of analysis. As a consequence, historical data which might contribute valuable information to understanding the determinants of social change may have been overlooked.

When a comparative analysis is made between the pre- and post-World War II periods, there emerges a striking similarity in their demographic characteristics. In both

cases, the younger age groups are predominate in the population. For instance, Easterlin (1968, p.14) notes, "the population of persons aged 15-29 actually declined in absolute number from 1940 to the mid-fifties." Even with the exception of the trough that resulted from World War II when a large aggregate of young male adults were overseas, there still persist an aggregate shift in the population as observed by Easterlin. Illustrated in Figure 1 is the ratio of young male adults compared to older adults of the working age population in the period preceding 1940 to the mid-fifties.

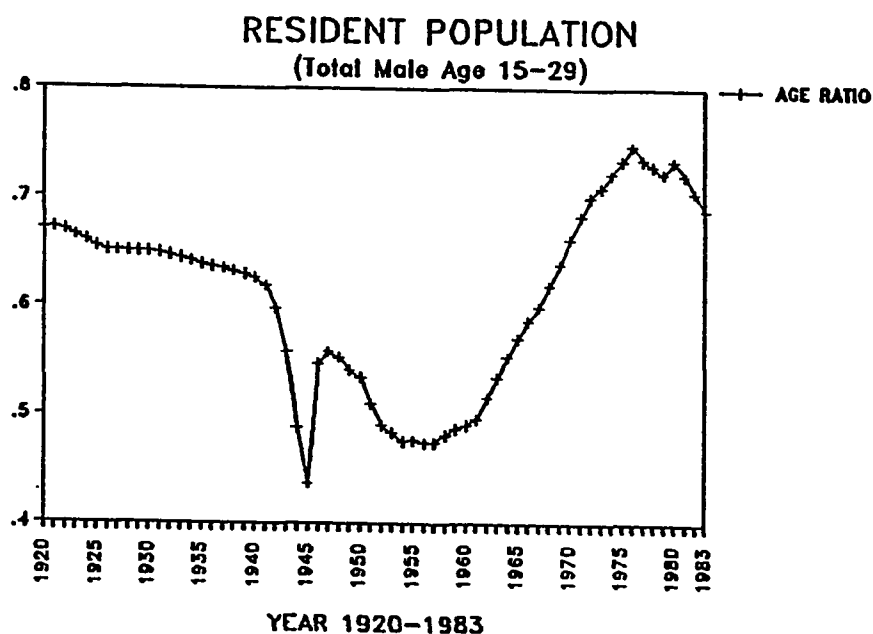


Figure 1. Ratio of total male adults aged 15 to 29 divided by those aged 30 to 64.

Easterlin's observation of the dominance of the younger age groups in the period preceding 1940 and the period



following the mid-fifties is noteworthy in relation to the subject of social change. The shift in the aggregate age composition of the population described by Easterlin offers a demographic perspective from which a hypothesis of social change may be formulated. Appropriate to this discussion is a brief explanation of the contributing forces that created the aggregate shift in the age composition of the population.

There are two primary reasons for the change in the aggregate age composition of the population. The first is related to demographic changes in the mass immigration-migration era, and the second is primarily the occurrence of the baby boom.

The pre-World War II period shows a persistent decline in the birth rate during the early part of this century which coincides with the mass immigration era (Easterlin, 1961). Immigration during the 1900-1930 period brought an infusion of young adults who entered the ranks of the working age population. It is well known now that these young adults migrated to the urban centers.

The second reason for the shift in the ratio of younger to older working age adults is the baby boom which occurred from approximately 1947-1963 in the post-World War II period. Like the immigration-migration era, the baby boom was primarily concentrated in the urban centers of the United States.

The fluctuating proportions of young male adults within the population will be the primary focus of this study. By examining the age composition of the population in this manner it should be possible to determine what relationship the variance of these demographic changes have with the selected indices of deviant and innovative social change. This is useful for studying social issues associated with changing demographic characteristics of young adults over time.

For instance, Easterlin (1968) projects that long-term demographic waves will emerge in socio-economic future of the United States (p.141). If Easterlin's hypothesis is confirmed, it should be associated with a trough in the future profile of the working age population as the baby boom generation matures and the baby bust generation enters the labor force. The trough projected by Easterlin has the potential of carrying with it several of the social change phenomena associated with the baby boom. To what extent the trough produced by the baby bust generation will be associated with similar social change indices is yet to be determined. Understanding whether the pre- and post-World War II periods feature significant associations between the age composition of the population and the variables indexing social behavior is a worthy topic for the scientist of social change.

By developing a research model which focuses on the aggregate age composition of the population, it will be possible to broaden the scope of traditional demographic analysis. This will, hopefully, offer the research scientist the ability to demonstrate whether changing demographic profiles at the national level are associated with certain aspects of social change in the urban setting of the United States from 1920-1983. A demographic analysis of this nature should prove useful for future researchers investigating social change.

## CHAPTER II

### THEORETICAL PERSPECTIVES OF SOCIAL CHANGE

#### Components of Social Change

For some time now social scientists have studied human behavior and the quality of life in urban industrialized society. One of the best known early work was written by Louis Wirth (1938) in his seminal piece "Urbanism as a Way of Life," where he described size, density, and heterogeneity as having a significant influence on human behavior in the urban setting. Referring to Wirth's piece, Fischer (1972, p.188) noted, "the power of the work is that it forms an essentially complete middle-level theory--a dynamic model" from which several propositions can be extracted. Fischer's appraisal of this work implies that Wirth created a model from which specific deductions can be made about the common characteristics of urban industrialized environments in general.

Relevant research in the social sciences since the publication of Wirth's work has continued to explore the basic tenets of his model (i.e. size, density, and heterogeneity), with varying conclusions. While size, density and heterogeneity may be prominent features of the urban environment, they must not be over-emphasized; they

offer partial explanations of human behavior in the urban setting. Hence, further investigation is merited, relative to Wirth's hypothesis, into how other urban phenomena might affect conditions related to certain aspects of social change.

Therefore, the purpose of this study is to examine the relationship between changes in certain aspects of urban phenomena to discover in what way demographic determinants contribute to certain aspects of social change. The variables chosen to represent social change in this analysis are divided into the categories of "legitimate" and "illegitimate" behavior. The variables measured will be innovative behavior (i.e. patent development) indexing social change considered to be legitimate, and anomic behavior (i.e. homicide and suicide) considered to be illegitimate by traditional social norms.

The term "social change" offers the social scientist somewhat of a generic label from which a variety of interpretations may arise. Social change in this study is primarily concerned with behaviors that are likely to affect the social fabric of society. The premise behind this logic rests with the explanation of social change given by Ogburn (1930) where he indicates that not all social change leads to changes in the organization of the social structure.

For instance, in certain stationary non-industrialized societies there may be substantial social change during periods of crisis, but there would be little, if any, change in the organization of social structure. Social change is more prone to affect cultural norms when it occurs in a structurally dynamic industrialized society --a society where changes in institutional norms are more prevalent and therefore more susceptible to the forces of social change.

From this perspective, Ogburn's (1930) discussion suggests that behaviors which produce social change have a significantly greater probability of influencing change in the organization of the social structure in an industrialized culture. Here heterogenous interaction is more dominant in terms of an increased number of secondary versus primary relationships than in a relatively stationary non-industrialized society. Sadalla (1978) refers to an increase in secondary relationships as comprising an increased amount of "structural differentiation". This may contribute, in part, to an increased amount of social disorganization in the urban setting generally (Cohen 1959, p.463).

With the increased structural differentiation inherent in the urban environment, a consistent flow of new inputs may emerge to contribute both positive and negative influences. From this standpoint, social change must be

examined to determine whether it has affected the social structure in a given society in a positive or negative manner. Hence, behaviors which deviate from the statistical norm do not necessarily mean they are uniform in their significance. In this sense, nonconforming behavior which defines certain aspects of social change should be divided to include both legitimate and illegitimate behaviors as separate dimensions of its definition.

From a theoretical perspective, behaviors considered to have illegitimate connotations when compared with societal norms are, in this analysis, defined in terms of whether they are "alienating" and generally held to have an adverse affect on society. Quite to the contrary are legitimate behaviors such as innovation which also deviate from the statistical norms of society but are not viewed as illegitimate.

Schumpeter links the issues surrounding the unconventional behavior of innovation with the entrepreneur. In this regard, Schumpeter says "the entrepreneur is, among other things a social deviant" (Higgins 1968, p.101). The emphasis here is not on negative behavior. Rather, the emphasis is on innovation resulting from the resourcefulness of the entrepreneur and should be viewed in a positive manner. This unconventional

behavior contains positive attributes and should be identified as a non-alienating form of social change.

Therefore, the variables selected to measure social change in this study were chosen for the fundamental reason of establishing indices depicting both the negative and positive sides of the social change equation. By focusing on both legitimate and illegitimate indices, the analysis will develop a more complete explanation of social change.

#### Social Change and Age Composition

Differentiating Age-Cohorts from Age Composition. In this study social change is examined from a demographic perspective. Specifically, the characteristics of the age composition of the population are central to the analysis. Age composition serves as the independent variable. Age composition should not be confused, however, with the concept of age-cohorts. Differentiating between the separate concepts of age composition and age-cohorts is important if the reader is to understand the intent of the research design in this study.

Clarifying the distinction between "age composition" and "age-cohorts" is not easy since both phrases are sometimes used in a similar manner. Consequently, there is a tendency to confuse the terminology used to describe the two topics. One strategy to distinguish them is to view the sum total of all age-cohorts as constituting a



composite of the age composition of the aggregate population at any given time. When the age composition of the total population is viewed as being the sum total of all age-cohorts, age composition can be more easily recognized as the "whole" rather than any one of its parts (i.e age-cohort).

When the difference in size between the concept of a single age-cohort and the larger age composition is understood, it can then be interjected that these concepts offer two separate scales from which social change can be measured. Differentiating between the two scales is important since the probability of a age-cohort effecting social change at the national level is less than that of the larger age composition of the population. Hence, the magnitude of the smaller age-cohort as opposed to the larger age composition of the aggregate population should be studied separately.

Ryder (1965) has been cited in the demographic literature for his piece on "The Cohort as a Concept in the Study of Social Change." Perhaps the most useful concept Ryder (1965) introduces is what he refers to as "demographic metabolism." Ryder states that "the lives and deaths of individuals are, from the societal standpoint, a massive replacement, which may be called "demographic metabolism" (p.843). Demographic metabolism is an important concept because it clarifies one dimension of how

the process of social change is ushered into the structure of society.

What is important about the notion of replacing forebearing cohorts with new cohorts is the influence that new cohorts may have in changing institutional norms. The degree to which traditional institutional norms are maintained will be the measure of whether the same social order is to be sustained. Hence, the ability of social institutions to metabolize new cohorts who are less inhibited by traditional values and who may have perceptions of the world which are quite different from their predecessors is an important issue confronting the social change scientist. The dialectic process of confrontation and resolve has been referred to as the "intersection of the innovative and conservative forces in history" (MacIver 1963, p.110). This is an important notion since it raises the issue of why the cohort is an important unit of analysis in the study of social change theory.

Yet the notion of social change based solely on the concept of replacement is rejected by Ryder (1965). Ryder comments that "to assert that the cause of social change is demographic replacement would be tantamount to explaining a variable by a constant, yet each fresh cohort is a possible intermediary in the transformation process, a vehicle for introducing new postures" (p.844).

Ryder's (1965) discussion further acknowledges that "rarely are changes so localized in either age or time that their burden falls exclusively on one cohort" (p.847). Implicit in this statement is the idea that the inter-relationship among the common characteristics of contemporary cohorts may be an important unit of analysis. That is to say, the age composition of the aggregate population may form a significant social change variable to be analyzed. The significance of this observation is that it describes more closely the purpose of the research design in this manuscript.

Combining the study of a single cohort's age at any given time with the study of social change has therefore been separated as a traditional method of cohort analysis. Cohort analysis can therefore be identified as a distinct form which is separate from the study of the age composition of the aggregate population. In this respect cohort analysis is important if the intention is to define differences "within a given cohort and/or between separate age-cohorts" in a period-by-period procedure.

But as Ryder notes, "the purpose of this essay is to direct sociologists toward the study of time series of parameters for successive cohorts of various types, in contradistinction to conventional period-by-period analysis" (Ryder 1965, p.861). By focusing on the magnitude of consecutive age-cohorts, it is possible to

perceive how a changing age structure emerges if circumstances prevail which cause a concentration of a dominant age group. When this has occurred as illustrated in Figure 1, there becomes sufficient justification for the social scientist to feature the age composition of the population as a worthy topic to be examined as a separate variable. This path of inquiry was encouraged by Ryder (1965) when he stated that "the study of the demographic metabolism of specific groups is a relatively uncharted area of great importance to the student of social change" (p.860).

In the contemporary literature it is now obvious that Ryder's observations have been utilized to a large extent. This includes the research findings on the baby boom and related literature. Hence, in the same spirit of social inquiry, this study will expand on Ryder's work as it focuses on the association between the age composition of the population and certain indices of social change from 1920-1983.

#### Long-wave Cycles: Empirical Evidence

The phrase "long-wave cycles" has been used in the literature to describe several social-economic phenomena. Among these phenomena are socio-economic patterns of legitimate and illegitimate behavior.

Long-wave Cycles and Legitimate Behavior. Kondratieff (1935) was perhaps the most notable of the early pioneers of the concept of long-wave cycles. While Kondratieff's work emphasized re-occurring trends of economic cycles, more recent authors have associated these fluctuations with technological changes which have occurred in approximately 40-year cycles (Tinbergen, 1984). The long-wave cycles described by Kondratieff are similar to Easterlin's hypothesis of boom and bust cycles of population growth which he describes as "demographic waves" in the social structure (Easterlin 1968, p.5). Both explanations describe long-wave cycles which last several decades.

The argument posed by Kondratieff differs substantially from Easterlin's hypothesis in that Kondratieff's work has been associated with econometric functions that serve as being the primary catalyst in the creation of the long-waves of technological development. Easterlin's hypothesis credits demographic waves as the primary push factor that precipitates like cycles in socio-economic change.

At first glance the views of Easterlin and Kondratieff would seem contradictory. However, the arguments of Simon Kuznets can be used to integrate these differing perspectives. Theoretically, Kuznets arguments are more encompassing than either Kondratieff's or Easterlin's. While Kuznets considers the overall cycles in population growth to be a driving force in the development of socio-

economic change, he also emphasizes the impact of technology on social change. From this perspective, Kuznets poses a more holistic and sophisticated argument.

Kuznets's emphasis was not on either the age structure of the population or the technological dimensions of social change as separate explanations. Rather, Kuznets attempted to integrate both sides of the equation of population growth and technological development when explaining trends of socio-economic phenomena.

The term innovation discussed above should be viewed in the entrepreneurial sense of the word. This is borrowed from the economic literature, specifically that of Joseph Schumpeter (1934) in his classic piece The Theory of Economic Development. Schumpeter identifies innovation as an entrepreneurial endeavor which is at the center of economic growth. Higgins (1968) reports that Schumpeter believed,

economic growth occurs when the social climate is conducive to the appearance of a sufficient flow of New Men, but the only real way to test whether the social climate is appropriate, is to see whether the New Men are in fact appearing; that is, whether there is economic growth. (p.104)

Although emphasizing the importance of the entrepreneur's contribution to innovation, Higgins readily concedes that this aspect of Schumpeter's theory on economic growth is also tautological: if there is a substantial degree of innovation, it must also follow that the appropriate climate necessary for this activity is

present. This leaves the social scientist no specific hypothesis to test since it does not define the conditions appropriate for innovation. The importance of Schumpeter's theory is too fundamental to ignore on these grounds that it is tautological, however, since new innovation can be viewed as being at the very core of economic development.

In this study socio-economic conditions which influence the development of innovative behavior are examined from a demographic perspective. The hypothesis to be tested measures the association between innovation activity and the age composition of the population. Later in this study the demographic waves of younger to older adults in the population is examined further to determine if it is a viable hypothesis linking the age composition to innovative activity.

Long-wave Cycles and Illegitimate Behavior. Homicide and suicide are commonly referred to as indicators of anomic behavior. The "strain theory" section of this discussion will elaborate further on the definition of illegitimate behavior.

More recently, Marchetti observed what he notes as "long-term pulsations in social behavior" (Marchetti 1986, p.376). These pulsations in human behavior are important to this analysis because they include activity that represents both legitimate and illegitimate behavior. Marchetti's findings illustrate long-wave trends in certain

technologies along with similar cycles in homicide and suicide rates that are approximately 50 years in length.

Marchetti's analysis is very similar to this study's in that he attempts to broaden the scope of observing long-wave cycles to include both positive and negative patterns of social change indicators. From this perspective this study's analysis and Marchetti's analysis are the same. Where they differ is in their approach to testing a viable hypothesis which explains these positive and negative measures of social phenomena from a theoretical perspective.

Marchetti's study offers a summary of observations that depict certain cycles of long-wave activity, but then only speculates on their association with other socio-economic change because of what he refers to as the exploratory nature of the analysis. Nevertheless, Marchetti's observations make a valuable contribution toward the logical development of alternative research designs which test specific hypotheses and which may better explain long-wave social phenomenon.

Thus far this discussion has identified the dependent variables of legitimate innovation and illegitimate anomic behavior as indexing certain aspects of social change. In addition, the independent variable of age composition has also been introduced into the analysis. There are two bodies of literature which discuss the social change



indices of legitimate and illegitimate behaviors and their relationship to the population change described above.

The first is the demographic literature in which the relationship between changes in the age structure of the population and subsequent illegitimate behavior has been examined (Ahlberg and Schapiro, 1984; Easterlin, 1980). The second body of literature consists of a number of studies which examine population change in relation to changes in legitimate behavior and the rate of innovative activity (Simon, 1981; Kuznets, 1958). Both areas have complementary explanations of social change related to the identified dependent and independent variables. The following discussion will elaborate on this literature for the purpose of establishing their linkages.

#### Population Growth, Age Composition and Deviant Behavior

The most recent discussions in the literature about the association between population change and the socio-economic system are concerned with the "baby boom" of the post- World War II period. Easterlin, 1980, 1968, Steinberg, 1982; Browne, 1981; Wachter and Wachter, 1978) have discussed several of these issues.

Easterlin's (1968) research findings discuss the issues surrounding the large number of young adults entering the labor force. The general conclusions of Easterlin are that the baby boom generation has had and

will continue to have a significant influence on the health of the socio-economic system in the United States. The overall findings in the baby boom literature suggest that these circumstances will continue to make it difficult and unlikely for this generation to sustain the level of prosperity enjoyed by the previous generation.

Unemployment. Reasons for this position focus on the issue of whether the economy can sustain an acceptable level of unemployment (i.e 4%) as defined by the "Full Employment and Balanced Growth Act of 1978". An unemployment rate that around the four-percent has been associated with full-employment and is generally considered to reflect a healthy economy (Gilpatrick, 1966). However, Wachter (1976, p.48) note that the impact of the baby boom pushed the "non-inflationary rate" or equilibrium rate of unemployment to approximately 5.5% by 1975; a 1.5% increase over this targeted level.

Wachter and Wachter (1978) state that "high rates of labor force growth, which cause increases in the equilibrium rate, thus become correlated with high rates of observed unemployment" (p.76). This increase in the non-inflationary rate of unemployment according to Wachter and Wachter is due to the extraordinary large number of younger workers entering the labor force as a result of the baby boom. The demographic influences on unemployment are independent of the forces which generate unemployment

during a downward trend in the business cycle. These findings are important in this discussion because they demonstrate an increased stress factor placed on the social structure as a result of a demographic change. This increased stress factor is particularly relevant to this study as it relates to producing an increased amount of anomic behavior.

For instance, Brenner (1973) found a significant correlation between unemployment and an increase in the rate of admissions to mental health institutions, suicide, and homicide. Brenner (1973) notes in this regard, "that it is a fact of fundamental importance that any societal change, be it cultural (involving norms, values, or beliefs) or social structure (involving social positions and institutions), results in a change in the economic system" (p.3). Brenner's observations focus on the linkage between internal fluctuations of structural changes that prohibit the economy from sustaining a healthy level of employment.

Therefore, Brenner would argue that social change occurs, in part, because of the transition period needed for new phenomenon to be integrated into the socio-economic system. The integration of such phenomenon may disrupt or delay the establishment of full-employment. This would create a condition of disequilibrium in the socio-economic structure. Ogburn (1922) addressed this type of issue in

earlier writings by introducing his hypothesis of cultural lag theory.

Cultural lag theory focuses on the time necessary for a culture's socio-economic system to integrate newly introduced phenomena into existing patterns of institutional and social norms of behavior. In like manner, social changes transform culture when they introduce significant alterations in pre-existing patterns of institutional norms for prolonged periods of time. For example, if unemployment rates persisted for a prolonged period, institutional norms would be re-directed to resolve this social issue because of the potentially destructive socio-economic consequences. Durkheim (1951), Brenner (1973), would view unemployment as the primary independent variable of social change in this example.

However, Ogburn argued that technological change served as the primary independent variable responsible for the process of social change which transformed pre-industrialized cultures into modern urban societies. This study will shift the emphasis away from technological change as the independent variable of social change to changes in the age composition of the working age population. By focusing on age composition as opposed to technological change, it will be possible to present an alternative explanation of factors associated social changes in the American culture.

This is not to say that technology is not an important contributor of social change. Such an argument is illogical since we know that technology continues to develop at an exponential rate. However, valid data sources are not available to measure technology as a independent measure in this analysis. Hence, acknowledging that this is a weakness of this study, the reader should bear in mind that the results of the analysis in this study reflect only demographic influences as they effect certain social changes. Therefore, this is an instance where the condition of "ceteris paribus" is implemented (Pearce 1986, p.61).

Given the precondition that technology is not measured in the proposed analysis, the age composition of the population is considered as the primary independent variable used to measure social change. For example, Ahlberg and Shapiro (1984) conducted a cohort analysis of young adults age 15-34 and found a significant relationship between the relative increase of these young adults and their rate of suicide.

The young adults of the post-World War II baby boom produced an unusually high number of young adults who entered the labor force during the same period. This created pressure to supply an increasingly high rate of entry level jobs. The impact of this demographic anomaly

is particularly important as it relates to the study of the rise in the rate of deviant behaviors generally.

A rise in illegitimate behavior has traditionally been associated with unemployment as noted in the early work of Durkheim (1938) where he developed the concept of "anomie" in his work Suicide. Durkheim's work lead to the development of strain theory. Strain theory attempts to establish the linkage between dysfunctions in the social structure and stress-related anomic behaviors. Durkheim original work has been supported by recent literature (Brenner, 1976; Henry and Short, 1954).

The emergence of the literature discussing the baby boom has now added a new chapter to the traditional explanations of anomic behaviors. Traditional explanations of anomic behavior connected with unemployment are now linked with a change in the age composition of the population. Easterlin (1980) discusses the age composition associated with the baby boom as being a contributing source of stress as it is linked with pressures brought about by increased unemployment and the deterioration of this groups economic position.

The definitions of unemployment with which this analysis is primarily concerned are those associated with "structural" and "involuntary" forms of unemployment. John Maynard Keynes (1936), introduced the concept of

involuntary unemployment into the mainstream of economics.

Keynes's formal definition of involuntary unemployment is:

Men are involuntarily unemployed if in the event of a small rise in the price of wage-goods, both the aggregate supply of labor willing to work for the current money-wage and the aggregate demand for it at that wage would be greater than the existing volume of employment. (p.15)

In more common terminology, involuntary unemployment is what is commonly associated with a dip in the business cycle which, in turn, creates a certain additional volume of unemployment not ordinarily incurred by the anticipated amount of frictional unemployment (i.e. 2-3%). Any level of unemployment above the frictional rate would be considered to have a detrimental effect on the socio-economic system.

Undesirable effects of unemployment can also be attributed to an increase in the level of what has been referred to as "structural unemployment". Structural unemployment may be defined as:

---that amount of unemployment (less minimal frictional and seasonal) which cannot be removed by monetary and fiscal policy without creating substantial continuing inflation (as opposed to one-shot, non-repeatable price rises) deriving directly from shortages of labor. (Bergman 1966, p.1).

More simply put, structural unemployment results when the perfect substitution of the labor force's skills (i.e. human capital) is out of balance with the current demand for labor. Such an instance could occur if a sudden influx of workers entered the labor pool with skill levels that

did not match the demand for labor. This may occur when there is a population increase, such as the baby boom, where the supply of labor supports an excess of varied or minimal skill levels which may exceed the market demand (Gordon, 1976).

For instance, a labor force with an excessively large number of young adults would have a concentration of skills in only certain areas of the market associated with the age specific characteristics of the dominant cohort. This would result in structural unemployment because of the excess supply of skills that fail to match up with the current demand for labor, even though there may be an ample number of available laborers who are willing and able to work. Hence, the consequences of structural unemployment would create displacement in the same manner as involuntary unemployment in the context of being unemployed for undesirable reasons.

Given these circumstances, it would be expected that both structural and involuntary unemployment would promote anomic behavior because the average person could only view his/her unemployment from the perspective of being a displaced worker for reasons beyond his/her own control. For this reason it would be expected that anomic behavior attributed to unemployment conditions would be a combined product of both types of unemployment that are damaging to the health of the social structure. Therefore, it would be



prudent from a theoretical perspective in the tradition of Durkheim for the propositions that correlate unemployment with anomic behavior to include the relative importance of both structural and involuntary unemployment in future analysis.

Strain Theory (anomie). Robert Merton's (1949) work modified Durkheim's notion of anomie by developing a typology that enabled the process of deviancy to be operationalized in two parts. Merton's explanation of anomie delineated several types of behavior which represent alternative adaptations an individual might make when adjusting to discrepancies between cultural goals and access to institutional means of achieving these goals. The typology in Table I signifies to what extent individuals demonstrate; "'acceptance' (+), 'rejection' (-), and 'rejection of prevailing values and substitution of new values ( $\pm$ )'" (Merton 1949, p.133).

TABLE I

## MERTON'S TYPOLOGY OF ANOMIE

Modes of Adaptation	Cultural Goals	Institutionalized Means
1. Conformity	+	+
2. Innovation	+	-
3. Ritualism	-	+
4. Retreatism	-	-
5. Rebellion	$\pm$	$\pm$

The Merton typology has repeatedly been used in the literature to describe behavior outside the norms of

society. However, it falters in that it fails to consider all alternative adaptations from which an individual may choose (Blalock, 1969; Dubin, 1959). When examining Merton's typology there emerge at least four more alternative cells which represent additional forms of adaptation that were omitted in his original work.

Blalock (1969, p.31) identifies the omitted cells in Merton's typology as separate permutations or a statistical oversight if all possible alternatives are recognized. To correct this oversight (if it was one), it is necessary to incorporate a minimum of at least four additional cells to form a complete typology explaining alternative human behaviors and/or adaptations. The alternative cells that Blalock noted are illustrated in TABLE II. Definitions and labels will be assigned to each cell later in this discussion.

TABLE II

ADDITIONAL FORMS OF ADAPTATION TO MERTON'S  
TYPOLOGY AS NOTED BY BLALOCK

Modes of Adaptation	Cultural Goals	Institutionalized Means
6. (not labeled)	+	±
7. (not labeled)	±	+
8. (not labeled)	-	±
9. (not labeled)	±	-

From a theoretical perspective there is an exception to the logic of entering additional cells into the original

typology posed by Merton. In essence, Blalock (1969) is merely expanding on Merton's original observations to include other adaptations which were omitted. "Was it simply not noted, or was the selection purposeful? There may be the implicit hypothesis that certain combinations are incompatible or highly unlikely. This is saying that variables underlying the basis for the classification are empirically related in a specific manner" (pp.31-32).

With the possibility that Merton omitted these alternative permutations on theoretical grounds, it is necessary to examine their various meanings. Accordingly, the omitted cells will be examined to define their meanings in terms of whether they fit the logical scheme of the strain theory's premise.

Durkheim introduced the term "anomie" to specify a state of normlessness which promoted acts of deviant behavior. Merton followed with his typology which attempted to explicate the alternative forms of deviant behavior consistent with the tenets of Durkheim's argument. By and large, Merton has succeeded in identifying many of the alternative behaviors that stretch beyond traditional social norms.

With further examination of the typology posed by Merton it is evident that this scheme is inadequate if its meaning is applied to behavior beyond the parameters defined as "deviant" or associated with alienation (Seeman

1959). Cloward (1959) addresses this aspect of Merton's typology by noting that there are legitimate and illegitimate opportunities for individuals to engage in nonconforming behavior in their quest to obtain personal success goals.

Hence, Merton's typology fails only if it is assumed his analysis should include both legitimate and illegitimate forms of behavior. But, as has been pointed out, developing a theory explaining both forms of behavior was perhaps not his intention, and therefore he should not be criticized on those grounds. Dubin (1959) had previously acknowledged the observation made by Blalock when he noted that "this is a context that Merton deliberately avoids, except obliquely in the last section of "Social Structure and Anomie" (p.150).

Merton (1949) emphasizes deviant patterns of behavior in his analysis; although his commentary notes that there are other alternative adaptations in the "realms of intellectual and artistic achievement" that may offer alternative careers but may not reap large economic rewards (p.147). Acknowledging this, Merton signifies that some deviants may have alternative sets of values but still stay within the realm of what is identified as normative behavior in the cell he labels "conformity."

Under the traditional usage of the typology set forth by Merton, behaviors linked to monetary success as the

major cultural goal have been accepted as anchors by which normative behaviors are measured. But as Merton (1949) points out, there are "alternative behaviors in the repository of common values" (p.146). In this respect, Merton fully acknowledges alternative forms of behavioral patterns that come under the auspices of what he defines in his cell "conformity". It must be noted that these behaviors also deviate from conventional social norms, even though they are positive adaptations that may contribute to the betterment of society.

However, as already stated, Merton does not elaborate on what the cells depicting positive and/or legitimate adaptations may look like and thus omits them from his typological scheme. Noting that Merton omitted these cells on theoretical grounds, as stated above, his discussion then became limited to illegitimate forms of adaptation. Because Merton apparently imposed these parameters on his typology of anomic behavior on theoretical grounds, further definitions which include legitimate behaviors are needed to delineate a more complete typology.

Thus, this analysis elaborates further on these potential meanings and assigns operational definitions to the missing cells in the following discussion on "alternative cell definitions" in Chapter III. Given these definitions, a more complete typology that depicts the alternative choices associated with innovative behaviors

can be considered in addition to Merton's original typology. It is then possible, from a theoretical point of view, to develop a model that includes behaviors which explain both the negative and positive dimensions of certain social changes.

#### Age Composition and Illegitimate Behavior

With reference to how Merton's typology exemplifies illegitimate behavior of the younger, more volatile population, it is necessary to review the current literature to identify some parameters that may be helpful in understanding which age groups are prone to act out deviant behavior. Establishing these parameters will prove useful in the analysis as the ratio of young adults compared to the older working age population is entered into the regression model. Regressing this ratio on the variables of illegitimate behavior should test whether the findings related to the observations made in this study from 1920-1983 are consistent with findings in the literature.

According to the literature, as might be suspected, the younger adults who have not yet traversed middle age are the most volatile age group. Greenberg, (1983) notes in his analysis that the data he examined "suggest that the arrest rate for aggravated assault does not decline in late adolescence and early childhood, but only in middle age, if

at all." Declines in illegitimate behavior among older adults have been generally supported in the literature. Greenberg's discussion goes on to indicate that criminologists have referred to this kind of occurrence as a "maturation effect" (p.32).

Jolen (1985) corroborates Greenberg's discussion by summarizing that a decrease in criminal behavior patterns associated with the maturation effect are generally prevalent when examining behavior profiles associated with mid-life changes. The dominating focus of these discussions is a disciplinary perspective which narrows the field of study to acts of criminal behavior. This is perhaps due to the specialized arena of these studies; and possibly to the era in which we live that has an absence of interdisciplinary approaches in social science inquiry.

Pitirim Sorokin's comments are less restricted and more encompassing as he discusses the volatility of behavior among certain age groups in a cross-cultural examination from an historical perspective. The findings in the research by Sorokin (1947) hold that:

In a revolutionary era the younger groups predominate and furnish the majority of the leaders as well as the followers of such movements. The fathers and grandfathers, in general, are on the other side of the barricades. During conservative or reactionary epochs the leaders and rulers are usually the older people. (p. 193)

In general, Sorokin (1947) notes "a statistical study of the various leaders shows the average age of leaders in

ten great reform movements to be lower than that of the leaders in quiet and conservative epochs" (p.193). The reform movements include the Protestant reformation, English revolution, American revolution, and anti-slavery movement in America among others. The average age of reform leaders in Sorokin's study were noted to be in their early thirties through approximately forty years of age.

The perspective gained by the observations of Sorokin are important from a theoretical standpoint in that they offer historical evidence which corroborates research findings of contemporary literature on deviance. However, it should be said that Sorokin's statistical method is suspect if the scrutiny of contemporary standards of scientific research are imposed on his sample of convenience. Nevertheless, his results are consistent with the findings in contemporary literature.

#### Population Growth, Age Composition and Innovative Behavior

Innovative behaviors related to changes in population growth were noted by Simon Kuznets (1960) when he stated the proposition that "population growth would produce an absolutely larger number of geniuses, talented men, and generally gifted contributors to new knowledge--whose ability would be permitted to mature to effective levels when they join the labor force." (p.328). This observation suggests, all other things being equal, that an increase in



the number of the working age population would create conditions that promote additional "inputs" to the rate of innovative activity (Kuznets 1962, p.19).

Kuznets's reasoning is especially pertinent to the argument being posited in this study concerning a change in the age composition of young adults as they enter the labor force. With a demographic wave of young adults entering the labor force there would be a similar wave of young adults introduced who tend to be economically active and hence productive in the industrialized American society.

Age Composition and Legitimate Behavior. Evidence produced by Mincer (1974) in his study on human capital provides significant findings note that the younger age groups are also the more productive age groups. This evidence suggests that the age group comprised of individuals aged 15 to 45 years demonstrates the most dramatic growth in personal income profiles. Anthony Downs offered an explanation which preceded the work of Mincer but nevertheless is complementary.

Downs (1967, p.20) elaborates on what he refers to as the "age lump" phenomena and its impact on the growth of bureaus. The scenario Downs describes coincides with Mincer's findings as they relate to behavior profiles of young adults. Just as in Mincer's study, Downs observes rapid organizational growth of bureaus until the younger age lump of personnel becomes more established or moves on,

seeking more prosperous ventures. Downs goes on to maintain that after the initial growth spurt, the organization experiences a plateau in growth as the age lump grows older along with the bureau. This eventually leads to a continuing leveling off and eventual decline in the rate of productivity and organizational growth.

Downs's and Mincer's observations are significant to this study where they demonstrate the propensity of young adults to engage in innovative behavior as illustrated by their productivity and accelerated income growth profiles. These observations establish a linkage between the younger more productive working age adults and the indices of innovation used in this study.

Given the deductions of Downs and Mincer, an increase in the rate of innovative activity should emerge due to the forces produced by a rise in the more productive working age population. This should occur during periods when a large wave of a young adults are present in the socio-economic system. From this perspective a more refined version of Kuznets's proposition regarding the tendency of newly introduced workers in the labor force to produce additional inputs of innovative activity may be developed.

Still, from a historical perspective, others have confirmed the propensity of younger age groups to be involved in producing inventive activity in several fields of study. Adams (1946) discusses the notion that

scientists reach their prime age at a relatively early age. He notes "that most scientists take at least the first steps towards their best work before the age of 30" (p.167). Further in the analysis, Adams discusses the median primes of scientists across several subjects as encompassing the ages from the mid-thirties to the mid-forties.

A technical point should be made which differentiates inventions from innovations. Schumpeter used the term innovation to distinguish the entrepreneur as the vital link to socio-economic activity. "The entrepreneur is the man who sees the opportunity for introducing a new technique or a new commodity, an improved organization, or for the development of newly discovered resources" (Higgins 1968, p.93). Inventions, by contrast, are linked with the activity of the inventor and are in many instances may never be introduced into the economy. Nonetheless, both inventions and innovation are integral parts in the transformation of culture.

Harvey Lehman (1945) explored the question of peak performance by examining samples of individuals from a variety of professions. In addition to the scientific disciplines, Lehman's study included other endeavors such as professional sports and artistic fields. His findings corroborate in large part the observations by others as discussed previously in this manuscript.

Overall, the findings suggest that stellar performances are usually at least initiated by the early thirties, if not before, and tend to peak and level off in the mid-forties. Although it should be noted that there is some variation in the age when peak performance is achieved among separate fields of endeavor, the consensus is that the younger age groups are linked to the process of unconventional behavior as it relates to innovative activity. Lehman (1945) notes:

On the whole it seems apparent that the nicest neuromuscular coordination and, the best creative thinking must occur (most frequently) at very nearly the same chronological age. This seemingly agreement in such widely different fields of endeavor, as regards the age level at which peak attainment is most likely to be achieved, seems to good an agreement to be the result of mere coincidence. (p.137)

If a shift in the aggregate age composition of those who demonstrate a propensity to engage in innovative activity can be predicted, then such behavior should be planned for by society. And if the behavior is unconventional, as is the case of innovation, society may better prepare policy issues to manage these behaviors in a beneficial manner. Thus, age related issues are important for society to consider as the aggregate age composition fluctuates over time. Hence, further examination of how age specific demographic characteristics contribute to social change warrants further research.

Consequences: Short-Term and Long-Term

Julian Simon (1977) supports the logic of Kuznets's reasoning when he states that "an increment of population initially has a negative effect upon economic welfare, after some decades the effect has become positive" (p.136.) The work by Simon therefore qualifies Kuznets's original proposition by reformulating the premise to include a short-term and a long-term consequence of how population change affects innovative activity in the socio-economic structure.

Simon's early work inspired his more recent efforts which place great stock in the potential of new forms of innovative activity to emerge as a result of increases in population growth. New innovation, argues Simon, will create new alternatives which can resolve any shortages in resources that might befall individual societies (Simon 1981, p.263). Simon's discussion is significant because of the basic tenets and ramifications of his argument.

If just the basic proposition of short-term and long-term consequences of population growth can be accepted when considering possible outcomes, policy decisions for societal issues may vary greatly. However, it should be noted that both Kuznets and Simon primarily restricted their commentary to issues involved with long-swings in overall population growth. Their discussions did not expand this general thesis to include more refined

arguments regarding the specific age composition of the population.

The substance of the discussions posed by Kuznets and Simon are nevertheless prominent issues for contemporary research analysis on the age composition of the population. Both the secular trend of the total aggregate of population growth and the smaller aggregate of a changing age composition within its parameters must address similar issues at the macro level. Each level of analysis at the macro level must to some degree address the concerns of the allocation of the resource base.

For instance, in the United States we have seen a significant amount of social change and economic consequences associated with the baby boom. As a consequence, the baby boom has brought a certain urgency to the forefront of political consciousness in the United States. One of the most prominent examples of the baby boom's impact is how it continues to plague the unemployment rate; and more importantly, the policy implications that will have to be addressed as the economy is nurtured back to health.

For example, the previous discussion on unemployment noted that there has been an increase in the non-inflationary rate of unemployment as a result of baby boomer's entering the labor force (Wachter and Wachter, 1978). This is an example of how the baby boom has

---

effected this aspect of social change in the short-term. The effect on unemployment and other aspects of social change cannot be limited to this short-term observation since the non-inflationary rate of unemployment is more specifically linked to the age characteristics of the baby boom.

Recently, it was reported that "by the year 2000 one out of every four Americans will be over 50 years old. By the year 2020, the entire baby boom will be over 55 years in age" (Downs 1988, p.13). The implications of this observation suggest that the aging of the baby boom has long-term effects, not only on the employment picture, but on the political and social attitudes of these individuals.

For instance, suppose that, as conventional wisdom would have it, cohorts entering adulthood tend to be liberal, that the individuals in them tend to become more conservative as they grow older, and that older cohorts experiencing heavy mortality are predominantly conservative. (Glenn 1977, p.22)

If the above statement is an accurate portrayal of what the attitudes may be as the baby boom ages, the question then arises: What will be the consequences for the socio-economic system in general? The effects of the age composition, as it influences social change, must be considered an important factor for the short-term and long-term socio-economic research and social policy.

That is to say, if solutions such as stimulating the economy through increased government spending are sought to reduce the unemployment rate for the short-term, the long-

term unemployment problem may still persist. Unless policy strategies are devised and implemented to address both the short-term and long-term unemployment rate, and other related issues associated with the aging baby boom, the expenditures may be wasted and the health of the socio-economic system may be jeopardized.

While the example of the impact on unemployment associated with the baby boom is a negative and unpleasant narrative, it only points to one dimension of the effects of how a change in the age composition may affect the socio-economic system. Alternatively, the most likely possibility, which is more central to the thesis of this manuscript, is the presence of a systematic change of both negative and positive influences associated with change in the age structure of the population. What these changes will be is still open to question.

For the present, however, only the association between age composition of the aggregate population and the stated indices of social change from 1920 to 1983 will be examined. Therefore, if it can be hypothesized for the purpose of this discussion that a change in the age composition leads to a change in legitimate and illegitimate behavior, then it must now be explained under what circumstances this may occur. Examining the conditions which contribute to the deterioration of cultural and social conventions is especially pertinent to



this discussion. Understanding how institutional conventions lose their ability to control behavior within the parameters of contemporary social norms is important to understanding certain social change.

In other words, does the industrialized "urban" environment foster the process of changing social norms by happenstance, or is there theoretical evidence that offers an explanation? The following discussion will set forth the proposition that it is an increased state of "anonymity" in the industrialized urban environment that makes the hypothesis of this research design a likely probability.

### CHAPTER III

#### ANONYMITY AND URBANIZATION

At this juncture in the discussion it is necessary to focus on the social phenomena which make the proposed analysis particularly relevant to the urban industrialized environment. The specific phenomenon to be examined in this regard is the concept of "anonymity". The following discusses how the dimensions of anonymity offer a social theater for the potential of a dynamic environment to emerge which enables and/or promotes alternative behaviors of social change.

The concept of anonymity has been associated with the industrialized urban environment as far back in the literature as the early works of Georg Simmel. Simmel (1950) in his piece "The Metropolis and Mental Life" spoke of the metropolis as offering a medium that substantially increased the opportunity of individuals to develop lifestyles that represented more closely their personal visions of their own potentials. The discussions surrounding this central theme of increased freedom in the urban setting permeated Simmel's work on "The Stranger" and gave his piece "Secrecy" several interesting dimensions (Simmel, 1950). The theme in these two classic works centers on the

private sphere the stranger and the state of secrecy enjoyed in the metropolis.

It is this privacy embodied in the anonymous condition of the urban setting that allows the individual freedom of movement within the context of already established social norms. There should, however, be a distinction made regarding the similarities and differences between anonymity and freedom. Emphasizing these characteristics will demonstrate the importance of Simmel's work.

Anonymity and freedom share the characteristic of producing a sanctuary for the individual to act out his/her preferences in behavior. But they differ as they approach the dilemma of bearing the consequences for those choices. In the case of making a decision under the condition where the individual has freedom of choice, and is also known, he/she must take on the responsibility of his/her actions as they are monitored by the cultural norms embedded in society. Consequently, legal and/or social sanctions may be imposed if an individuals behavior is identified as being inappropriate by his/her peers.

Hence, an individual may be branded an outcast even though their behavior is within the legal parameters of the law. An example of this has occurred in the case of those who have been labeled as eccentric scientists, or the promising artists whose imaginations have produced controversial pieces of work. Individuals who fit into

these type of categories, although often admired, have also been admonished when judged by those who use contemporary social norms and/or behavior paradigms as their standard.

On the other hand, the condition of anonymity poses quite a different scenario. An individual may make a choice in his/her best interest but may also violate cultural norms for which there would ordinarily be a consequence if he/she were to be identified. But since the individual is protected by the sovereign condition of anonymity, he/she risks little threat of having to suffer any sanctions.

The primary contribution of Simmel's work relevant to this analysis is his conception of one's ability to break away from social and cultural norms that constrain behavior in the industrialized urban setting. Central to this notion are the inherent advantages of maintaining secrecy and the increased opportunity for the stranger to be more mobile in the urban setting--at least in terms of having fewer responsibilities to the allegiances of group memberships. In this respect, it is the anonymous condition that provides a sovereign state for the individual who desires freedom of movement in a society. Otherwise, being identified would restrict his/her social mobility and/or behavior within proscribed social norms.

In subsequent literature there has evolved a dominating assumption that the anonymous condition is an undesirable

circumstance which must be tolerated with increased urbanization. Louis Wirth is perhaps the most recent prominent author since Durkheim whose sentiments carry this message.

Such sentiments generally have posited a certain fear and thus may have inadvertently produced a void in the literature, where arguments supporting the positive attributes of the anonymous condition have been lacking. If further exploration of the varied potential of anonymity were pursued, a more sophisticated body of theoretical tools used for the analysis of human behavior and urban phenomena in general may be developed.

A preoccupation with the increased potential of acting out negative behaviors under the anonymous condition has tended to undermine any constructive inquiry into its positive attributes. Diener (1977) noted, however, that both types of behavior are possible under the auspices of anonymity. In this sense, there is ample opportunity for the individual to perform innovative behavior which contributes to the well-being of society within the anonymous condition, just as there is the potential for the individual to act out negative behavior which is damaging to society. Thus, it is important to recognize that anonymity only facilitates an environment for legitimate and illegitimate behaviors to be acted out and is not cause of the such behaviors.

### Window of Opportunity

To better understand the intent and purpose of this analysis, the concept of the "Window of Opportunity" (W/O) will be introduced at this juncture. The W/O portrays alternative behaviors that can flourish and/or be experimented within the social structure of society under the condition of anonymity. The W/O serves a useful purpose by combining the theoretical typologies describing adaptations of human behavior into a single conceptual framework.

The concept of the W/O combines the typology of "anomie" put forth by Merton with the additional cells that Blalock recognized as missing adaptations of behavior in Merton's original work. Dubin (1959, p.148) followed this line of thought in his work by supplying the missing cells with appropriate titles by developing reciprocal variations on the original cells Merton identified as anomic behaviors. The W/O illustrates four additional cells representing legitimate behaviors as opposed to the illegitimate behaviors described in Robert Merton's original typology. This allows the notion of innovative activity to be developed within the conceptual framework of the W/O. Table III offers a useful pictorial representation depicting this conceptual model:

TABLE III  
WINDOW OF OPPORTUNITY

Modes of Adaptation	Cultural Goals	Institutionalized Means
1. Conformity	+	+
<hr/>		
2. Innovation	+	-
3. Ritualism	-	+
4. Retreatism	-	-
5. Rebellion	±	±
(Illegitimate Behavior)		
<hr/>		
6. Behavioral Innovation	+	±
7. Value Innovation	±	+
8. Behavioral Ritualism	-	±
9. Value Ritualism	±	-
(Legitimate Behavior)		
<hr/>		

Of particular interest to this discussion are the closing comments alluded to by Merton (1949) in his chapter "Social Structure and Anomie" when he notes:

it has not put the explanatory power of the analytical scheme to full empirical test by determining group variations in deviant and conforming behavior; it has only touched upon rebellious behavior which seeks to refashion the social framework. (p.149)

Merton's notation enhances the theoretical grounds from which this study is based as it attempts to delineate other possible ways his original typology may be used.

Contingent to developing a typological scheme inclusive of both positive and negative adaptations is the necessity to expand on the original configuration; and this is what makes the W/O appropriate for this purpose. Developing

valid definitions for the additional cells of the W/O also necessitates that some speculation be imposed on their relative meanings because of the exploratory nature of this part of the analysis. In order to minimize any elaborate speculative inquiries into tertiary issues related to the original analysis, it is proper to establish concurrent definitions that complement rather than stray from the original integrity of Merton's scheme.

It is useful to anchor the definitions of these new cells in the W/O within the meaningful confines of variables that are readily accessible for quantitative analysis. This is possible by attaching their meaning to the relationships of cells which restrict their definitions within reasonable parameters that may be identified as legitimate behavior. For this reason, only variables that have already been developed as proxy measures in socio-economic fields of study (i.e. patents) are included to represent legitimate forms of behavior. Therefore, patents will be used to index alternative adaptations which are legitimate.

As has already been noted earlier, studies have identified the younger age groups as being more volatile than their older counterparts in the sense that they are prone to be more involved in certain types of deviant behavior. The development of such studies echo the recommendations made by Merton when he commented on the



need for further study of the particulars of his analysis, especially as they relate to group variations responsible for certain trends of aggregate behavior.

Following Merton's lead, this investigation sets up the same analytical model to develop a more sophisticated hypothesis which examines the age composition as it relates to both the positive and negative adaptations within American culture. Therefore, the methodology for this analysis is designed to test whether a similar ratio in the age composition of the younger to older population is associated with these alternative adaptations of unconventional behaviors.

#### Alternative Cell Definitions

Developing alternative cell definitions requires that the dialectic between cell (1) "Conformity" and cell (5) "Rebellion" be elaborated on to describe the feasibility of alternative meanings that are useful to this analysis. By doing so, the reciprocal meanings surrounding the definitions of cells (2) "Innovation", (3) "Ritualism", and (4) "Retreatism" can be better understood as they pertain to the newly introduced cells six through nine (see Table III).

The first and perhaps most obvious cell to be expanded upon in Merton's original typology is cell (2) labeled "Innovation". In sharp contrast to how Merton defined this

cell, the concept of innovation in this discussion is used in direct opposition to the manner in which it has been previously portrayed. Merton's (1949) discussion focuses on the tendency of individuals to act out illegitimate behaviors such as cheating or committing behavior which might be considered criminal in an attempt to obtain their personal success goals (p.134). In this sense deviant innovation is described as a response to frustrated or failed efforts to accomplish the pseudo success goals of American culture.

The focus and use of the term innovation will be utilized in the newly formed cells 6 through 9 of the W/O (see Table III) to depict positive attributes of legitimate behavior. But first, if we are to shift away from the negative connotations associated with Merton's original use of the term, it is necessary to focus on the signs of each cell signifying the type of adaptation that corresponds to the various definitions. By doing so it becomes possible to differentiate the original typology from the additional four cells which constitute the completion of the Window of Opportunity.

Behavioral Innovation. This cell depicting "Behavioral Innovation" perhaps most closely represents the measure of innovation used (i.e. patents) in this analysis. As can be noted, the "acceptance" (+) of cultural goals and the "rebellion" (+) of institutional means has been identified

in cell (6) representing Behavioral Innovation. With this observation it can be suggested that new patent development is a form of accepting the cultural goals of American culture associated with entrepreneurial endeavors and monetary rewards. However, it can also be argued that this type of innovative activity engages in rebellious ( $\pm$ ) behavior which alters institutional means of conserving existing and well-established norms of behavior that attempt to preserve old paradigms in the Kuhnian tradition (Kuhn 1962).

It should be noted that there are clearly overlapping explanations from the theoretical perspective that all patent development could be viewed as a natural occurrence which is encouraged by institutional means in the socio-economic structure of American culture. This is a legitimate point of contention. But it must also be acknowledged that not all institutional means within the culture would either promote or agree with certain types of innovation related to new forms of patent development.

Innovative activity such as patent development may very well produce certain social change that has the potential to transform American culture beyond what any established social norms may predict or allow. On this basis it is here argued that patent indices are a valid proxy measure of legitimate behavior appropriate for representing certain social change for the expressed purpose of this analysis.

Value Innovation. When examining "Value Innovation" identified in cell (7), it is again important to articulate the qualities of its components that differentiate it from the other alternative adaptations of legitimate behavior. The most striking difference from the preceding cell is that this form of adaptation signifies a de-emphasizing component as identified by "rebellion" ( $\pm$ ) toward established cultural goals and an "acceptance" (+) of its institutional means.

The cultural goal associated with value innovation is somewhat different from Merton's interpretation in that it differs from the overriding cultural goal of American society which emphasizes the achievement of monetary success. This cell represents a certain rebellion against accepting this premise in total. And while there is nothing inherently wrong with these success goals, and the premise of such achievements should not be indicted on these grounds, it is still necessary to examine other preferences in life-style of those who subscribe to alternative variations of original cultural goals.

Value innovation suggests, then, that values of obtaining monetary success prescribed by cultural goals may not produce the sustenance necessary to fulfill all individual needs and thus may precipitate alternative adaptations. Respecting the option of choosing other legitimate behaviors, it is now possible to speculate on

alternative adaptations by the individual which may promote certain aspects of social change. Given that the value innovation cell's definition de-emphasizes the overriding goal of monetary success and suggests by its tenets that this preference may be averted in favor of other aspirations, we can reflect once again on a few of Merton's initial observations.

Merton's brief observation alluded to earlier in this discussion refers to alternative adaptations by the individual such as artistic and intellectual endeavors which may reap only moderate monetary rewards. These endeavors were included in Merton's original typology under the cell (1) "Conformity." It can readily be argued though that what has been referred to here as conforming behavior reaches beyond what has traditionally been considered to be mainstream social norms and in some instances is the very foundation from which certain other social change movements emerge.

Examples of this may be in areas where individuals engage in grass roots or non-profit innovation which may lead to the conservation of natural resources. Other examples may emerge from professional fields where the teaching of novel ideas is prevalent but still remains on the perimeter of mainstream social norms. Legitimate behaviors such as these, which are acted out through accepted institutional means, may inspire certain social

changes that are outside the dominant cultural goals of society and may induce new cultural transformations.

However, as may be expected, the social changes may not be accommodating to those who disagree with the direction these changes take when they appear to be on the fringe or completely beyond the mainstream of contemporary thought. Thus, these cultural transformations may meet with a great deal of resistance. Resistance may occur even though the behavior appears to be a positive and legitimate alternative adaptation that would not be considered deviant by traditional social norms as defined by institutional conventions.

Behavioral Ritualism. Cell (8) "Behavioral Ritualism" depicts behavior which is a more radical departure from traditional cultural goals and can be interpreted in perhaps more revolutionary terms. As noted in the W/O above (see Table III), the notations of this cell signify a "rejection" (-) of cultural goals and "rebellion" (+) toward the institutional means of obtaining these end results. In many respects, given these notations, it could be argued that a great deal of "retreatism" as detailed by cell (4) in Merton's original typology, is prevalent in this cell because of the contrary configuration of its scheme. While this is not as pertinent to this analysis in terms of creating and utilizing representative indices of

measurement, it is nonetheless important to examine some of its implications as they may affect social change.

Precedents for this type of behavior can be drawn in many instances from other cultures where contrasting cultural goals exist and where institutional means are similar to the American culture but are different in how they attempt to fulfill the individual's needs. Translating these ideologies into American culture can usually only be seen in segmented instances where fraternal organizations or secret societies may emerge.

So as not to stray from the intention of this discussion, it is only important to note that these behaviors are tolerated in American culture (and even accepted as quasi-legitimate manifestations of behavior which constitute alternative forms of adaptation) as long as they remain within the confines of generally held American values of expression. In all probability, they will continue to be small gatherings of individuals in such organizations as the Ku Klux Klan, and given historical evidence, they are unlikely to create any long-term social change.

However, behaviors of innovation more closely associated with the values of certain secret societies or fraternal social orders may emerge to create periodic short-term social change. This is most likely to occur during times of crisis when traditional cultural values may

be questioned when these social conventions have seemingly failed. This could happen during periods of susceptibility such as the Great Depression when alternative explanations of adaptation may be given more credence by certain parts of the citizenry.

Value Ritualism. The last cell, (9) "Value Ritualism" exemplifies some "Retreatist" behaviors of adaptation as did cell (8) "Behavioral Ritualism". Adaptations of value ritualism would appear to take on qualities that are less divergent than those involved with behavioral ritualism. Value ritualism signifies a "rebellion" ( $\pm$ ) toward cultural goals of society and "rejects" (-) the institutional means.

Examples where innovative behaviors which may fall in the cell of value ritualism can be discovered in sub-cultural communities who engage in belief systems that depart from the mainstream of conforming to behavioral social norms. Individuals belonging to certain religious orders who believe in the preservation of values associated with more puritan ethics from pre-industrialized society are among those who may fit the typological scheme associated with value ritualism.

The Amish people are one such group who have rebelled against the twentieth century values that have evolved from the cultural goals of American culture. Despite their differences and preference to redefine the institutional means by which they attempt to obtain their sub-cultural



goals, groups such as this co-exist in relative harmony within the overall culture of American society. Yet, while these types of people have in many ways divorced themselves from the mainstream of American culture, they still maintain a high standard of living, as they view life, and are more than able to develop alternative adaptations which must be viewed as legitimate behaviors of innovative activity.

It is doubtful that these kinds of communities will become so prevalent that they might invoke any large degree of social change which may revert to puritan values or otherwise. However, subcultures which maintain strict moral codes of ethical behavior offer a distinct contrast and constant reminder of alternative adaptations of legitimate behaviors within the American culture overall.

### Summary

The conceptualization of the Window of Opportunity mandates that some speculation be given when defining the cells which represent innovative and/or legitimate behavior. By combining these definitions with the definitions of illegitimate adaptations in Merton's original typology on anomie, it becomes possible to form a more complete typological scheme. This produces a broader theoretical perspective from which the dependent variables

can be logically operationalized by including both legitimate and illegitimate adaptations of behavior.

Hopefully, by broadening the theoretical model into what has here been referred to as the "Window of Opportunity," there will be an inducement to develop more sophisticated research designs that are able to more accurately portray certain social change on a large and small scale. But by no means does this typological scheme attempt to clarify and envelop all the adaptations associated with innovation. It is merely intended to offer a working model from which more sophisticated analysis may be undertaken.

## CHAPTER IV

### RESEARCH DESIGN

The following sections include the operational definition of each variable in the study, an overview of the data sources, and a brief description of the statistical technique used in the analysis. The technical components of the research design in each section should provide a valuable precursor to the statistical analysis in Chapter V.

#### Independent Variable

The independent variable (i.e. age composition) is measured by using census data from 1920-1983. Data representing the independent variable are compiled from the U.S. Bureau of the Census: Estimates of the Population of the United States, by Single Years of Age, Color, and Sex (1965), (1974), (1983), (1986). Illustrated in Figure 2 is the growth profile for the male population of the United States aged 15 to 64 years of age.

The variance of the age composition within the overall working age population over time is critical to this research design. The extent to which the variance in the age composition of this aggregate population accounts for

the variance in the dependent variables is the central focus of this study.

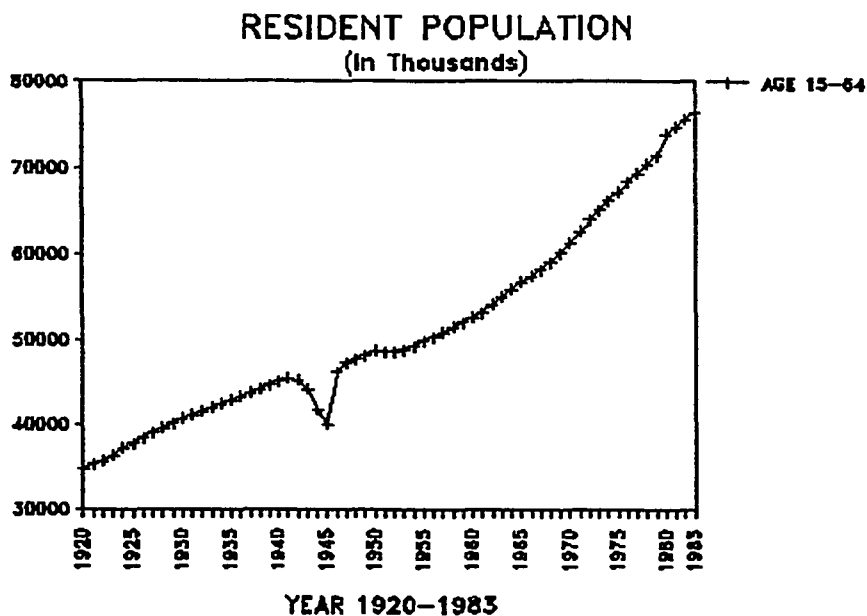


Figure 2. Total Male Population aged 15 to 64 years old for the United States from 1920-1983.

It should be noted, however, that the definitions of the labor force has changed over time. The contemporary method used by government reporting agencies to define the labor force has been in existence since 1947. This definition includes all individuals able and willing to work who are 16 years and over, with the retirement age being 64 years of age. Prior to 1947 the labor force data also included those who were 14 and 15 years old. The earlier definition reflected the fact that labor force participation started at slightly earlier ages.

For the purpose of this study the labor force age is defined by using persons between 15-64 years of age. By doing so, the difference is split between the two-year age disparity in the definitions used before and after 1947, when the formal definitions of the labor force changed. This change will not compromise the validity of this measure since the great majority of behavior depicted with the dependent variables is not attributed to those persons in the population who are at the lower end of the age spectrum.

Defining the age composition is somewhat straightforward. The age composition is defined by Easterlin's initial findings in Figure 1 of the introduction in Chapter I. Only one change will be made to the way Easterlin configured the age composition. The ratio to represent the relationship between the younger and older working age adults will be 15-34 divided by 35-64 year old adult males. This definition will substituted for Easterlin's original ratio of 15-29 divided by 30-64 years of age.

The change in the age ratio of younger versus older working age population was implemented for theoretical reasons. As discussed in Chapter II, the theoretical evidence suggests that both innovative and deviant (anomic) behaviors remain prevalent up through 34 years of age before showing signs of stabilizing. For this reason the

addition of the five-year age interval (i.e. 30-34) has been instituted to create a more consistent linkage between the independent and dependent variables.

By introducing the age ratio of 15-34 year old adults to 35-64 year old working age adults, it may be determined if this age composition has a significant relationship with the social change indices defined in this study. Each index which constitutes a variable of illegitimate or legitimate behavior portrayed in the Window of Opportunity will be measured separately with the same procedure. The procedure will be duplicated for each dependent variable. Figure 3 illustrates the trend of the age ratio of the male population aged 15-34 divided by those aged 35-64.

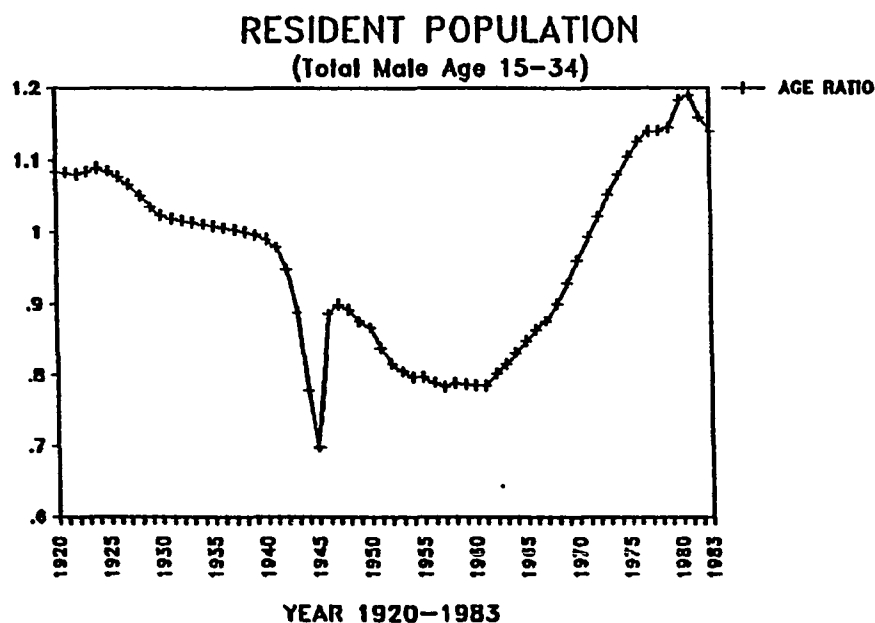


Figure 3. Age Ratio of the Resident Male Population aged 15-34 divided by 35-64.

Tables which contain a collapsed summary of the pertinent statistics for each dependent variable will be developed to display the significance of the relevant regression products for each separate measure. The composition of these tables will enable the reader to examine the significance of each regression model as they relate to the separate indices of social change.

Following the conventional method used by Simon Kuznets (1958) and Richard Easterlin (1968), only the male population will be used in this study. Males have been selected because they represents the most stable and consistent population in terms of its social role; it is the traditional bread winner, and this group has the highest and most stable labor force participation rates. By identifying the labor force in this manner, it should be possible to distinguish whether there has been a significant shift in the age composition of the this group from 1920-1983.

In addition, race will not be separated as a unique unit of analysis for the purpose of this study. This is not to suggest that race is not an important variable of social change. However, it is proposed that the importance of the race variable is more relevant to a regional analysis where racial composition varies considerably, as opposed to a study at the national level where the racial composition has been fairly stable over the period studied.

Aside from any theoretical argument for including or excluding race as a separate variable are the constraints imposed by the data sources. The variables in the research design are not broken down by race and therefore are unavailable. Race is therefore not used as a separate unit of analysis.

Therefore, the inclusion of all races within the total male population is used to determine if long-term demographic waves are associated with similar patterns of both legitimate and illegitimate social change. The purpose of analyzing age composition in a longitudinal study in this manner is to examine whether a demographic explanation may emerge that will either corroborate or reject the general findings in contemporary literature. These findings should prove useful when discussing the impact of various age structures in society as they affect certain social change indices.

#### Intervening Variable

The data representing the intervening variable of unemployment in this analysis are the "unemployment rates" for the total civilian labor force. Unemployment rates are taken from the Historical Statistical Abstracts of the United States (1984), (1976), (1971). Methodology for these data was developed by Stanley Lebergott (1964).



Lebergott (1964) refined the earlier measures for unemployment to make them more consistent with the current estimates used by the Bureau of Labor Statistics (BLS). This was done because the early surveys before 1940 are more subjective in how they measured the rate of unemployment and therefore posed a threat to internal validity. The correction of this problem created data sets which are comparable with data gathered by using more contemporary sampling procedures.

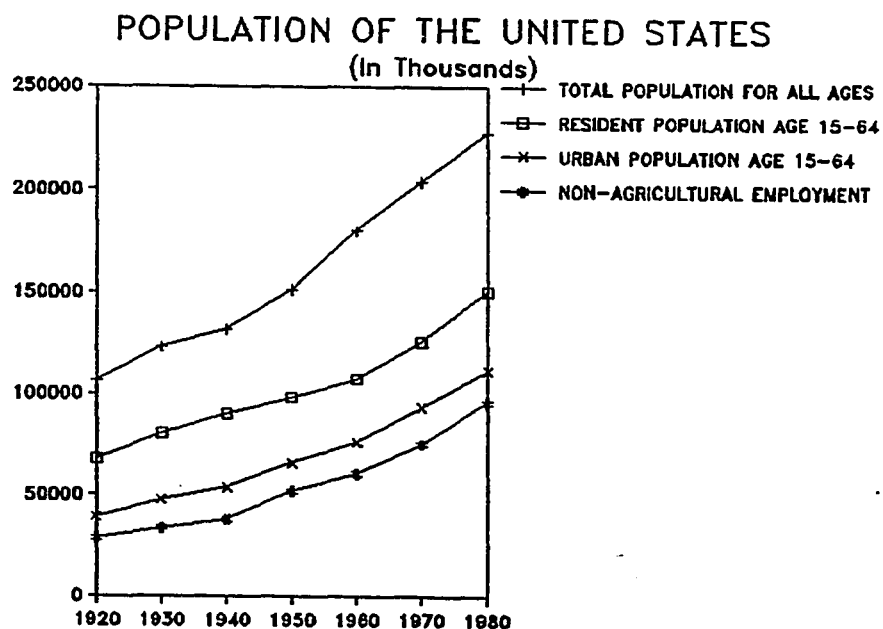
#### Control Variable

The control variable of "urbanism" has been defined as the number of persons in the non-agricultural employment sector divided by the total number of persons employed in the civilian labor force. Specifically, the measure of non-agricultural employment will be used to reflect an increased amount of anonymity since this phenomenon is largely centered in urban areas. As such, city centers may influence the degree to which the anonymous condition is a prevalent factor which, in turn, may influence behavior among urban dwellers generally (Ogburn and Duncan 1964, Keyes 1958). The analysis will therefore control for the anonymous condition by measuring urbanism as a control variable when examining the relationship between age composition and the variables indexing social change.

However, the only urban data used to identify the urban population by the U.S. Bureau of the Census are the statistics collected at ten-year intervals. This created a problem since annual data of the urban age composition are needed to conduct this analysis. For this reason it is necessary to substitute a proxy measure to represent the urban population which is comparable with the other variables in the research design.

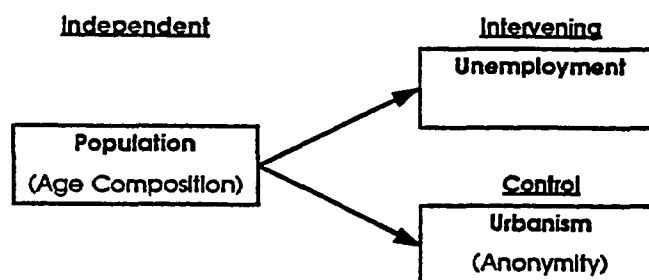
To accomplish this objective it was necessary to select a variable which represented urban data on an annual basis which can serve as a valid measure for the urban population as described by the U.S. Bureau of the Census. Generally, the most consistent definition of an urban population is a place with 2,500 people or more in incorporated areas. This definition has been used over the entire time span from 1920-1983, which is the period under investigation.

There have been subsequent definitions used to measure the urban population such as Standardized Metropolitan Statistical Areas (SMSA's). However, this definition is a relatively recent measure of urbanism employed after World War II and does not cover the historical time span necessary for the purpose of this study. As can be observed in Figure 4, the same general trends are present for both the urban population and the non-agricultural labor force. The illustration in Figure 4 portrays comparable population trends at ten-year intervals.



**Figure 4.** Comparable population trends at ten-year intervals.

Hence, non-agricultural employment should serve as a useful proxy for urbanism since the majority of manufacturing and government employment is concentrated in the urban centers. Thus, the elimination of certain agricultural influences from the labor force refines the measure used as the urban index. The similarity between the trends in Figure 4 suggests that there is empirical justification to use the non-agricultural labor force to act as a proxy measure for the urban population aged 15-64. Figure 5 illustrates the relationship between the components of the proposed research model discussed above.



**Figure 5.** Relationship between the Independent, Intervening, and Control variable in the research design.

### Dependent Variables

The final variables to be described are the dependent variables of nonconforming behavior. The dependent variables are divided into two categories of anomic and innovative behavior. Innovative behavior is measured by patents filed and patents issued. Anomic behavior will be measured by the homicide and suicide rates.

Anomic Behavior. Homicide and suicide have been deemed important anomic indices because they represent the most extreme forms of illegitimate behavior in society. The national homicide rate is selected to represent the level of crime because it offers the most reliable and valid data available among crime statistics. Data reflecting other types of crime (i.e. burglary, assault, rape etc.) are poor indicators of crime rates because they are not consistently reported across all parts of the country. The variance in reporting levels is recognized as producing a highly

unreliable index of crime because of the error factor in these statistics (Graham, 1969). Hence, homicide serves as the most reliable proxy measure for crime since it is the index that is most consistently reported.

Suicide is an illegitimate behavior which is under-reported; in many cases it is difficult to identify. Douglas (1967) cautions the reader to be aware of potential weaknesses in using this data because of potential threat to the validity of the measure (p.163). The degree to which the under-reported suicide is a problem is not known. However, this issue should be noted as a weakness in the data and should be kept in mind when examining the results of the research analysis. Nevertheless, suicide has been used as a valuable index of social change as described in chapter II. Both sets of data for suicide and homicide have been extracted from the Health and Vital Statistics in the Statistical Abstracts of the United States (1984), (1979), (1976) and the Historical Statistics of the United States (1975a).

Innovative Behavior. As previously discussed, the innovative indices used in this study are patents issued and patents filed in the United States from 1920-1983. The data on these indices are compiled from the Patent and Trademark statistics in the Statistical Abstracts of the United States (1984), (1979), (1976) and the Historical Statistics of the United States (1975b). The difference in

the indices used to represent innovative behavior from the anomic indices is that they are less traditional measures of nonconforming behavior from a sociological perspective.

Patents have traditionally been used in the economic literature to measure various innovative activity. When referring to the patent literature, Kuznets (1962) stated that:

according to the preliminary indications provided by studies already made, it can with further work yield some quantitative indexes of output of inventive activity--at least of rough trends and differences in the economic magnitude of new inventions in various fields at various times. The data are incomplete, since unpatented inventions escape attention; but they can yield far more information on trends and differences--to be linked with scientific discovery at one end and innovations at the other--than has been secured so far. (p.42)

It is the connection between these "indexes of output" (i.e. patents) mentioned above and their relationship with the inputs of the younger age composition of the population which is the focus of this study.

Schmookler (1962a) comments on the need to measure inputs in a uniform manner when he states that "what one would like would be estimates of the physical and human inputs used, each in some relevant, homogeneous unit" (p.49). The difficulty in measuring the inputs from one source of innovation is that other equally important sources of innovations may be ignored in the search to identify a valid index for measurement. For this reason the change in the human inputs (i.e. age composition) is

used to measure the output of innovation as defined by patent activity.

While using patent statistics to measure innovative activity is a common practice because the data is readily available, this practice is not without its weaknesses. For instance, Sanders (1962) remarks that there are inconsistencies in the data over time that should be controlled. While Jacob Schmookler also agrees in principle with the need to develop a more certain index for measuring innovative activity, he also recognizes the fact that historical data are just not available. Schmookler (1962b) comments in this regard, "as much as we might prefer caviar, we had better settle for plain bread when that is all we can get" (p.78).

While acknowledging that it would be more desirable to measure innovation by examining the characteristics of those engaged in innovative activity directly, the constraints imposed by the available data limit the degree to which this can be accomplished. Consequently, this study will use patent statistics to develop proxy measures for the purpose of establishing measure of innovative activity related to the demographic characteristics of the population. This will be done by breaking down the patent data into two separate indices.

The first index is all patents filed from 1920-1983. An examination of this index should determine if the

overall rate of patents filed is a useful index in this study. The second index involves using only the categories associated with patents issued to American individuals, U.S. corporations, and the United States government. This index will measure the rate of patents issued as opposed to patents filed to determine whether the rate of patents issued is a more reliable method for measuring the rate of innovation. In addition, by using patents issued as a separate index, foreign patents can be dropped from the data. By doing so, this should develop a mechanism which will control for some of the foreign influences which may effect the validity of the innovative measures for the United States.

Anomic and innovative behaviors have been chosen as the dependent variables because they represent phenomena which have been established as being primarily concentrated in the urban environment. These outcome variables are tested to determine if they are systematically related to the changing age composition of the population while controlling for intervening variable unemployment. With the addition of the dependent variables to the analysis the proposed research model is now complete. Figure 6 illustrates the relationships between all variables in the proposed research model, with the exception of the dummy variable representing the Great Depression of the pre-World War II period.



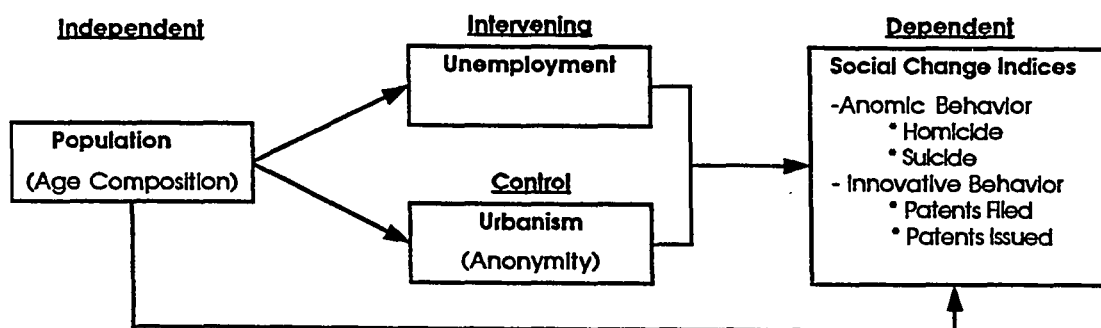


Figure 6. Complete Research Model.

### Dummy Variable

It is necessary to use a dummy variable to control for the influence of the Great Depression in the pre- World War II period because of its historical uniqueness and its socio-economic influence on society. The years used to control for the effects of the Great Depression are 1930-1940. The operational definition of the dummy variable is constructed by assigning a value of "1" for each year used to represent the Great Depression (i.e.1930-1940). The remaining cases in the time period being examined from 1920-1983 are assigned a value of "0" for each case (i.e.year).

The inclusion of this dummy variable should provide a useful procedure for incorporating any distinguishing effects that the Great Depression had on the indices of social change. Specifically, the Great Depression years will be analyzed separately to determine if the results for this pre-World War II period are significantly different

from the results in the overall Multiple Linear Regression (MLR) model. The overall MLR includes both the pre- and post-World War II periods from 1920-1983. Figure 7 illustrates the unusually high unemployment rates during the years of the Great Depression.

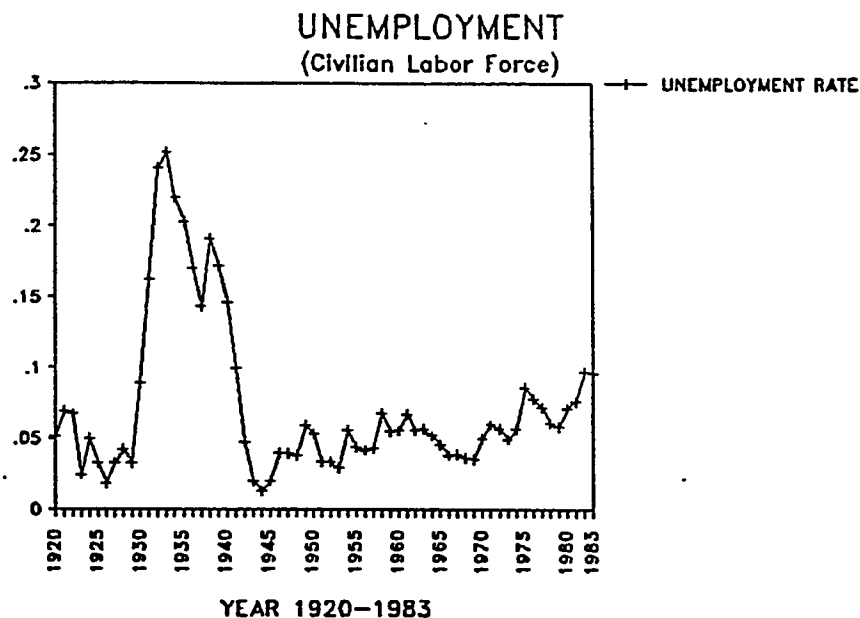


Figure 7. Unemployment Rates for the Years 1920-1983.

#### Defining the Units of Observation

A total of fifty-nine cases of observation are examined for the purpose of this analysis. This number has been derived by taking the total number of observations (i.e. 64 years) from 1920-1983 and subtracting the five cases representing 1941-1945 during the years of World War II. The World War II years have been dropped from the analysis because they represent a period where the demographic and

socio-economic circumstances are unique from the other years included in the research model.

One could argue, for instance, that the circumstances surrounding a period of world war may serve to unify the population and thus may breed conforming behavior. As a consequence, such solidarity could be expected to reduce deviant behavior in the form of suicide and homicide. Durkheim (1951) referred to this in his discussion on national crises due to revolution and/or political upheaval (p.203). Concomitant to this, it can also be argued that many of the younger, more volatile males were sent off to fight in the war and this reduced the potential risk group who may produce additional inputs to illegitimate forms of behavior.

In addition, the measures used in this study describe social change indices which are associated with the age composition of the resident population. This would exclude the influence of those young adults overseas. Therefore, it can be stated that the relationships of the indices of social change are only relevant in the research design as they relate to the age composition of the resident population. Any other explanations of social change are beyond the scope of the data and must be treated as tertiary considerations for the purpose of this study.

### Limitations of the Data Sources

Developing valid measures that approximate a true measure of reality, at least to the extent that we understand it, in the most accurate and efficient manner possible is paramount. Also, prefacing the limitations as well as the unique characteristics of an individual study is always important if an accurate portrayal of the findings is to be fully realized. One of the first issues to be addressed in this study is the internal validity of using secondary data sources. The following presents an overview of the threats to validity when using secondary data sources.

Secondary Data Sources. Data for this analysis are gathered and compiled from archive data from the historical statistics of the United States. Specifically, the most pertinent data come from the Bureau of Labor Statistics (BLS), U.S. Bureau of the Census, and the Health and Vital Statistics of the United States. Combined, this annual data base provides the necessary statistical information to develop an in-depth analysis of certain population determinants of social change in the United States from 1920-1983.

The time frame under investigation has been determined for two fundamental reasons. First, because current data are only available across all variables for certain years the analysis can only be updated through 1983. The second

consideration is more theoretical in nature. From a theoretical perspective, the year 1920 has been selected because it is first census where the majority of the population resided in urban centers in the modern industrialized era. Accordingly, identifying and extracting data that best represents the variables in the research design during this period presented a challenging proposition.

Collecting data from archive materials is generally a formidable task because of the many inconsistencies found among the definitions used to describe the categories of data over time. Inevitably, the methodology and/or procedures of official reporting agencies who are responsible for collecting and defining data, update and refine these statistics in an attempt to keep pace with contemporary demands of socio-economic inquiry. Concurrently, when the social scientist is examining these data, he/she discovers that one or more of the variables in a particular research design have been modified, omitted, or redefined over the course of the data collection period. The question then becomes whether there is a threat to internal validity of the available data in this sample of convenience that could jeopardize the study. It was determined for the purpose of examining the social change indices of this research design that the available data are suitable to conduct a meaningful analysis.

### Methodology

The covariance among the variables in the research design is measured by a least squares regression model. The use of a multiple regression model allows for a cross-sectional analysis to be implemented. In addition, a regression model is an appropriate statistical procedure to implement in this study because it facilitates the measurement of the interval-scale variables used in the analysis.

Blalock (1979) notes that "the use of a particular mathematical model presupposes that a certain level of measurement has been obtained" (p.20). The primary reason for selecting the multiple regression model is because it is a robust model and the statistics used in this study are interval level data. In this regard this statistical procedure has been selected as the method of choice because the interval level data meets the criteria for maintaining the underlying assumptions of the regression model (Blalock, 1979, p.451).

Implications of the Statistical Procedure. The statistical method used in this research design posed a dilemma of sorts because it represents a compromise between the ideal and a practical approach to measuring the social change indices under investigation. Specifically, the issue of how to institute a multivariate analysis that measures the variance among the indices of social change

historically presented certain difficulties. The primary difficulty is how to measure changes in the age composition related to the social change indices when each case in the research design represented an annual observation in the period from 1920-1983.

Because time is a factor in the analysis, it was thought that a time series analysis such as an Auto Regressive Integrated Moving Average (ARIMA) model might be an appropriate tool for the research analysis. But with further examination of this technique it was determined that time series analysis is inadequate for this study; the primary reason for this being that the ARIMA model's utility is in the area of forecast analysis and not in the arena of multivariate analysis of existing data (Ostrom 1980). For this reason it was determined that a MLR would be utilized for the purpose of this study.

Utilizing the MLR meant dealing with a limitation of a different nature than those encountered in the ARIMA model. The MLR offered sufficient capacity for analyzing the data in the research design so long as the factor of time was not considered as a variable. As a consequence, the statistical findings of the research design reflects a static examination of the indices of social change in the sense that the results reflect a snapshot of the data over time.

Therefore, in order to test how robust the findings of this research model are, additional studies in the area of social change research must be conducted to corroborate these results. That is not to say that the findings in this research design do not have merit. On the contrary, the findings of this research design should contribute a valuable addition to understanding the process of illegitimate and legitimate social change. For the purpose of this study, however, it must also be recognized that the technique selected for the statistical analysis is not without its weaknesses. The primary weakness is the limited number of cases in the study.

Because there are only 59 cases (i.e. years) in the research model, it was only possible to comment on the findings in a limited manner. For the purpose of this analysis the regression estimates are tested at the .05 level of significance. It should be noted that the .05 level of significance must be prefaced by stating that this measure is a conventional measure which estimates the regression model with the assumption that the data is from a random sample. However, since we know that the sample in this model is not a random sample, but rather a sample of convenience with a limited number of cases, the sample size may need a more sensitive test of significance.

Given the limited number of cases, the reader should pay attention to the changes in the Beta values as they may



indicate a significant change even though they are not at the .05 level of significance. The solution to this problem should be resolved in the future since the time period will be broadened and more observations will be added to the analysis. This will provide additional cases to be included in the research design and thus should develop a more robust model of analysis.

A lag effect in the research model was also considered since it would be expected that the influence of unemployment and/or a specific age composition in the population may not always have an immediate consequence. However, it was determined that a lag procedure is not necessary to institute and should not be considered a weakness in the research model because the age composition (i.e. 15-34) used as the independent variable covers a wide age span. This age group is composed of several ages, all of which are prone to act out social change behaviors. Thus, while behavior may not manifest itself until several years latter, it is entirely possible that the social change behavior would be accounted for in the MLR within the wide age span being examined.

The age composition compensates for any lag effect in the sense that the social change behaviors are prone to be acted out within the age group being examined. It is only for those ages that are beyond the scope of the younger age composition that a potential lag effect would not be

accounted for in this analysis. It should also be noted that this may not be an issue of particular importance since behavior usually stabilizes as the population reaches middle age as was noted in the previous discussions. For contemporary analysis, however, cross-validation studies which measure similar social change indices will be needed to determine the reliability of the findings in this research design.

## CHAPTER V

### RESEARCH FINDINGS

The research findings reveal several interesting results. In order for the presentation of the research findings to be consistent, the presentation of the results for each index of social change are discussed in the following manner. There is a descriptive analysis of graphs related to each dependent variable just prior to the discussion of the regression results. The discussion of the graphic display and regression procedure related to each dependent variable is presented with the use of the same format.

The regression results for each dependent variable are introduced in three tables. The first table includes the results of the regression for all variables in the research model without the dummy variable representing the Great Depression. The second table contains the regression coefficients for the pre- and post-World War II periods. The third table is the same as the first table for each dependent variable with the exception that it includes the dummy variable for the Great Depression.

By developing three separate tables for each dependent variable it becomes possible to compare the regression

results for the pre- and post-World War II periods to the results of the total period from 1920-1983. This is useful to determine if the hypothesis being tested has consistent results across time. Specifically, controlling for the effects of the Great Depression is important to determine if it is a significant factor in altering the regression results in the pre-World War II period.

#### Data Analysis of Illegitimate Behavior

The first two dependent variables to be analyzed are suicide and homicide; the indices of illegitimate behavior. These dependent variables of illegitimate behaviors will be introduced prior to legitimate behaviors as portrayed from top to bottom in the Window of Opportunity (see Table III).

Suicide. Suicide can be classified as an anomic behavior within the confines of the cell of "retreatism" in the W/O. Although deviant, suicide is obviously not an overt threat of aggression that poses an external harm to society as does homicide. Nevertheless, suicide is no less a loss to society and must be considered as a detrimental indicator of the internal workings of the social structure within American culture.

Probably the most noticeable fluctuation in suicide rates portrayed in Figure 8 are the changes during Great Depression years from approximately 1930-1940. As illustrated in Figure 8, suicide rates peaked during the

years of the Great Depression and then fell sharply during World War II. Following World War II there was a sudden surge upward from 1945-1950, after which the trend dropped and leveled off until approximately 1958.

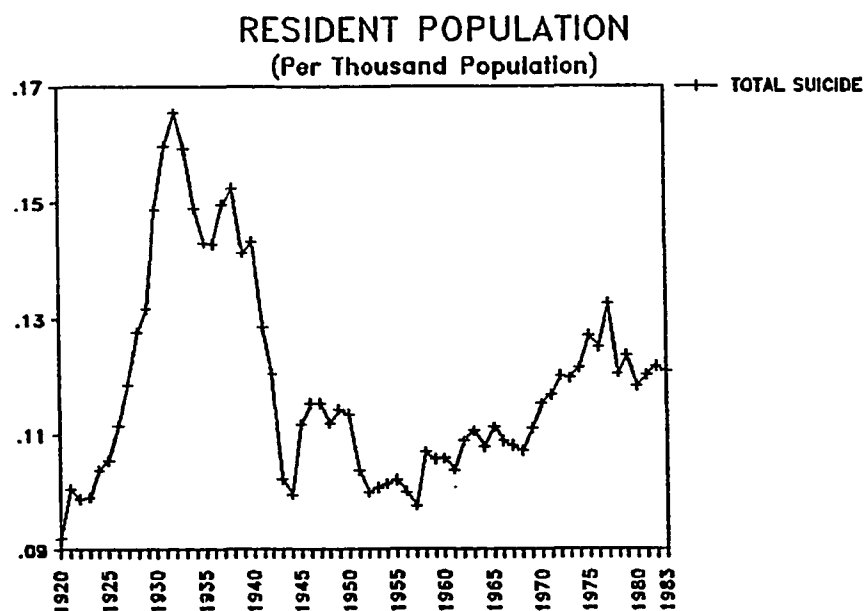


Figure 8. Suicide Rates among the Resident Population during the period 1920-1983.

The five year surge in the trend following World War II was most probably a result of the large number of armed forces returning from active duty overseas. It is reasonable to believe that it took this period of time for this group to be integrated back into society. As a consequence, a rise in suicide could be expected as this group adjusted to the demands of civilian life styles. However, this is only a speculation since this study is not designed to examine this specific issue.

From 1958-1983 there is a gradual increase in the suicide rate. The demographic explanation being put forth in this analysis examines this increase as it relates to the ratio of younger to older working age adults. The change in this age composition takes into consideration the upward trend resulting from the post-World War II baby boom and the re-emergence of immigration.

Table IV is the zero order correlation matrix for the dependent variables used in the research model. The correlations between the age ratio (i.e. age composition) and suicide shows a positive relationship at the .345 level. This positive correlation is supported by the discussions in the demographic literature by Richard Easterlin (1980) and Ahlberg and Schapiro (1984).

TABLE IV  
ZERO ORDER CORRELATION MATRIX FOR THE  
VARIABLES IN THE RESEARCH MODEL

	Age Ratio	Urbanism	Unemployment	Depression
Age Ratio	...	...	...	...
Urbanism	-.191	...	...	...
Unemployment	.244	-.457	...	...
Depression	.140	-.566	.884	...
Suicide	.345	-.350	.814	.846
Homicide	.844	.061	.339	.223
Patent Filed	.423	-.717	-.070	.031
Patent Issued	.227	-.745	.365	.471

However, the largest correlation coefficient is between the depression variable and the suicide rate with a correlation of .846. The correlation between unemployment

and suicide ranks second with a correlation of .814. The shared variance between these two independent variables was expected since both measures were designed to control for changes in the unemployment rate. Davis (1971) cautions about the potential for such collinear effects to alter the coefficients in the MLR. This collinear relationship should not pose a problem in the analysis since the results of the MLR will be monitored in the analysis to insure that the findings are not invalidated by multi-collinear influences. Table V contains the means, standard deviations, and coefficients of variation for all the variables in the regression equation as calculated in rates per thousand population.

TABLE V  
MEAN, STANDARD DEVIATIONS, AND THE COEFFICIENTS OF  
VARIATION FOR THE VARIABLES IN THE RESEARCH MODEL

	Mean	Std Dev.	Coefficient of Variation	No. of Cases
Age Ratio	.972	.126	7.714	59
Urbanism	.868	.088	9.864	59
Unemployment	.077	.057	1.351	59
Suicide	.118	.018	6.556	59
Homicide	.072	.019	3.789	59
Patents Filed	.559	.114	4.904	59
Patents Issued	.293	.070	4.186	59
Depression	.186	.393	.4733	59

The positive association between the high unemployment during the Great Depression and/or high unemployment generally and its relationship with suicide is supported by

the work of Durkhiem (1951), and more recently Henry and Short (1954). The magnitude of these relationships will be discussed further later in the discussion related to the three multiple linear regression models (see Table VI, VII, and VIII).

The most surprising relationship found in Table IV is the negative correlation of  $-.350$  between urbanism and suicide. Given the literature on urbanism by Louis Wirth (1938), Fischer (1972) and others, it was expected that there would be a positive relationship between urbanism and suicide. Thus, the negative relationship is inconsistent with previous research. However, with the exception of the negative zero order correlations between urbanism and suicide, the correlations of the variables related to suicide are as anticipated.

There are several possible explanations for the negative relationship between urbanism and suicide. One possibility is that the theoretical basis for positing a positive relationship between urbanism and suicide is incorrect. This is unlikely, however, since this relationship has been substantiated by several authors.

Another possibility is that the observed negative relationship is spurious. This suggests that there is another variable which is suppressing the true relationship between urbanism and suicide. If this is true, once the suppressor variable is controlled, the true relationship



between urbanism and suicide should emerge. The results in Table VI support this proposition. Table VI contains the regression results for suicide without the "depression" variable. Included as independent variables are "age composition" (i.e. age ratio), "unemployment", and "urbanism."

TABLE VI  
REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN SUICIDE IS THE DEPENDENT VARIABLE  
WITHOUT THE DEPRESSION VARIABLE

R Square .68729  
Adjusted R Square .67023

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.023009	.011324	.158673	2.032 *	.2643
Unemployment	.255497	.027680	.795341	9.230 *	.7796
Urbanism	.008972	.017710	.043124	.507	.0682
(Constant)	.068716	.020358		3.375 *	

F = 40.29403

Significant F = .0000

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\* = Alpha is significant at the .05 level.

In general, the results displayed in Table VI support the propositions set forth in the theoretical section of this dissertation. As reflected by the F statistic, the regression model in Table VI is highly significant, accounting for over 68% of the variance in suicide. However, by itself, this statistic does not indicate the relative importance of each variable in the research model. More importantly is the fact that the signs of the

estimated regression coefficients are all positive; these results are consistent with the hypothesis of the research model.

The importance of this observation is twofold. First, the magnitude of the unemployment variable supports earlier research which documents unemployment as being an important factor associated with anomic suicide Durkheim's (1951). As discussed in Chapter III, this is the theoretical reasoning for controlling for the effects of unemployment by including it as the intervening variable in this study.

Testing the unemployment theory is only important to the extent that it is controlled. More specifically, identifying whether "age composition" offers an additional explanation of social change within the urban setting is the focus of this study. To this end, the data in Table VI supports this hypothesis as indicated by the positive regression coefficients associated with age composition and urbanism.

However, in the case of suicide, the partial correlation coefficient for age composition is less important than is the variable of unemployment. Nevertheless, while the partial regression coefficient is smaller than that for unemployment, it is important to note its relative contribution to the results of the research model as a whole. This will be important as the results for each

of the dependent variables are compared and used to evaluate the overall effectiveness of the research model.

Secondly, what is also important to note is the positive regression coefficients associated with urbanism. These are noteworthy since they reflect a positive association, which is a reversal of the negative relationship between urbanism and suicide noted in the zero order correlation matrix in Table IV. However, it must also be emphasized that the value of the T statistic associated with urbanism is not at the .05 level of significance. Nevertheless, the importance of noting the reversal in the sign associated with urbanism signifies that there is a suppressor variable in the research design.

The suppressor variable in this case is most probably unemployment since it is the most influential variable in the MLR related to suicide. Davis (1971) would designate unemployment, in this case, as the suppressor variable.

That is, when T is controlled, the relationship between X and Y does not vanish; it either swells or changes its sign. In either event, one views T as masking the "true" relationship, which only appears when T is controlled. (p.95)

More will be said regarding the suppressor variable issue later in the discussion. At this point it is important to introduce the pre- and post-World War II regression results in Table VII. An analysis of these results will determine if the MLR produces consistent results from 1920-1983 when the period is divided in two

parts. Understanding whether the hypothesis of the research design can withstand this type of analysis is important if historical circumstances such as the Great Depression are to be ruled out as playing a significant role in the results of the analysis.

TABLE VII

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN SUICIDE IS THE DEPENDENT VARIABLE  
FOR THE PRE- AND POST- WORLD WAR II PERIODS

	<u>1920-1940</u>		<u>1946-1983</u>	
R Square	.84617	R Square	.66214	
Adjusted R Square	.81902	Adjusted R Square	.63232	
-----Variables in the Equation-----				
Variable	B	Beta	B	Beta
Age Ratio	-.841419	-1.250127	.047772	.783904
Unemployment	-.061499	-.197085	.087153	.171770
Urbanism	-.405670	-.335771	-.033535	-.136774
F = 31.17071			F = 22.21065	
Significant F = .0000			Significant F = .0000	

The most notable observations to make in Table VII are in reference to the direction of the signs of the B and Beta coefficients. Specifically, the direction of the signs of the regression coefficients for 1920-1940 are quite different from those in the period 1946-1983. Furthermore, the regression coefficients for 1920-1940 can only be regarded as having nonsensical results since they

make no logical connection with the theoretical basis of the hypothesis in this study. Only the regression coefficients in the period post-World War II of 1946-1983 reveal the positive values that are consistent with the findings in the literature.

A comparison of the regression coefficients in Table VI with those in Table VII reveals similar results if only the regression coefficients for 1946-1983 are examined. The results in Table VI, which represent the total period from 1920-1983, correspond to those found in the post World War II period. However, this by itself does not give any logical explanation for the unintelligible results in Table VII for the pre-World War II period from 1920-1940.

Although an examination of the regression for age composition (i.e. age ratio) and unemployment in the post-World War II period reveals a clue in that the importance of these variables have switched places from how they appeared in Table VI. The dominant variable in Table VI is unemployment. This is not the case in the post-World War II period in Table VII. Instead, the age composition has the largest Beta related to suicide. This suggest that there is something during the time period from 1946-1983 that de-emphasized the relative importance of unemployment and strengthened the contribution of age composition.

There are two possible historical events that could have created such a change. The first event that most

probably is the reason for the importance of the unemployment variable in Table VI is the occurrence of the Great Depression. The dramatic increase in the rate of unemployment during the Great Depression could have easily skewed the results of the regression coefficients related to the unemployment variable. Secondly, without such an anomaly in the post-World War II period, the effect of the baby boom could have just as easily affected the results of the regression coefficients related to the age composition of the population. For these reasons it is important to control for the Great Depression. The use of a dummy variable in the MLR in Table VIII served to control for the effects of Great Depression.

TABLE VIII

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN SUICIDE IS THE DEPENDENT VARIABLE  
WHILE CONTROLLING FOR DEPRESSION

R Square .80714  
Adjusted R Square .79286

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.034883	.009206	.240550	3.789 *	.4583
Unemployment	.040690	.043084	.126663	.944	.1275
Urbanism	.045848	.015412	.220365	2.975 *	.3752
Depression	.038347	.006620	.825280	5.793 *	.6191
(Constant)	.034525	.017181		2.010 *	

F = 56.49983

Significant F = .0000

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\* = Alpha is significant at the .05 level.

An examination of Table VIII reveals that the largest regression coefficients are related to the depression variable. In addition, the variable of unemployment is the least important independent variable. These results indicate that the relative contribution of the unemployment variable in Table VI is inflated by the depression period. This can be observed by comparing the regression coefficients for unemployment in Table VI with the coefficients for unemployment and depression in Table VIII. The depression appears to have masked the true relationships of the variables in Table VI when it was not separated as a unique measure. In this sense depression is acting as a suppressor variable.

Another notable observation can be made concerning urbanism when examining Table VI and Table VIII. In Table VI when depression is not controlled, urbanism is also not significant at the .05 level of significance. By contrast, in Table VIII the regression coefficients for urbanism are positive and maintain a .05 level of significance. Here again, as is the case for unemployment, the true relationships related to urbanism emerge after the depression variable is controlled.

Summary. The analysis concerning the first set of data on the illegitimate behavior of suicide supports the hypothesis that age composition, as defined in this study, has a positive association with suicide; the first index of

social change to be examined. However, an examination of the Beta values reveals that the relative contribution of the variable depression explains a much greater proportion of the total variance than the contribution of age composition. The variable urbanism also had a positive association with suicide at the .05 level of significance after the Great Depression is controlled. However, unemployment is not significant at the .05 level after the depression variable is controlled.

The question now arises as to whether the same procedure may result in producing similar findings for the second illegitimate index of social change (i.e. homicide). And further, will the same procedure produce consistent findings across all indices of social change? The following discussion examines this question as it relates to the remaining variables in the research model. These variables include both the illegitimate and legitimate adaptations in behavior as reflected in the Window of Opportunity.

Homicide. The second index of illegitimate behavior to be examined is homicide. Homicide can be classified in the cell Merton labeled as "innovation" in the W/O since homicide is acting as a proxy measure for crime. However, it should be emphasized that the term innovation is used in this context to describe illegitimate forms of behavior. This example is intended to be consistent with Merton's



example of certain criminal behavior and should not be confused with any positive behaviors.

Homicide can also be interpreted as an act of what Merton referred to in the cell of "rebellion" since this behavior rejects all culturally proscribed goals and institutional means of adaptive behavior. As one can see, there is some latitude in how the various cells in Merton's typology of anomie can be viewed if it were fully critiqued. The intention here is only to identify homicide as a anomic behavior which fits into the general scheme of Merton's typology. Thus, it will suffice to describe homicide as the most aggressive overt example of illegitimate behavior acted out in society which fits the cell of "innovation" and/or "rebellion".

The following procedure is the same process implemented for the analysis of suicide. The same set of variables used to measure suicide are used for the dependent variable homicide. This will enable comparisons to be made between the results for both indices of illegitimate behavior. These comparisons should be useful to determine if both indices of illegitimate behavior can be predicted and/or examined with similar methodology.

To prevent the discussion from becoming redundant, only the differences will be highlighted when comparing the remaining dependent variables in the study. By proceeding in this manner, any differences in the results can be

examined to determine how they may alter the complexion of the findings associated with the hypothesis put forth. Figure 9 illustrates the homicide rates for the resident population.

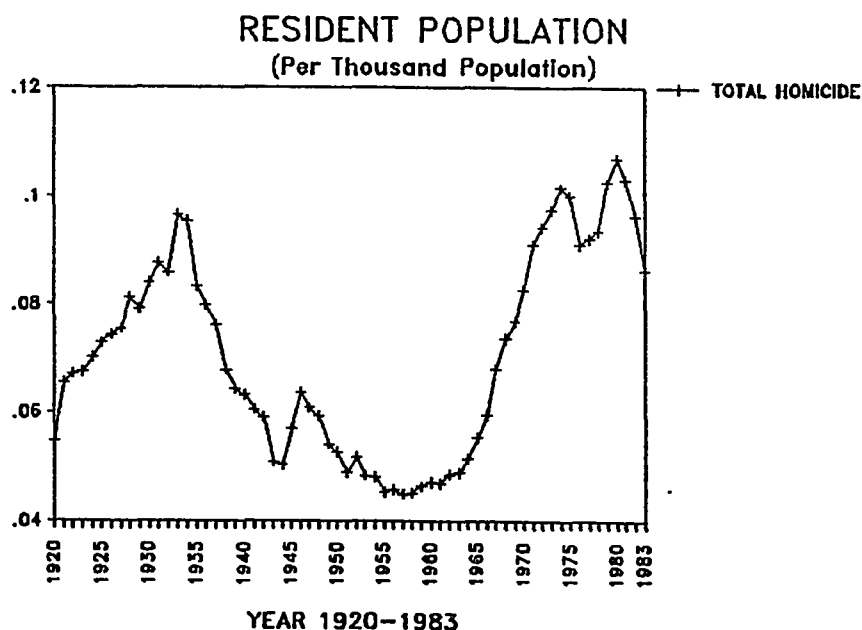


Figure 9. Homicide Rates for the Resident Population during the period 1920-1983.

The homicide rates from 1920-1983 follow the same general downward pattern as those of suicide after the Great Depression and then continue to climb upward in the post-World War II period after leveling off around 1958. However, the upward trend in the homicide rates is much more pronounced in the post-World War II period than are the suicide rates. Generally, the overall trend of homicide rates appear to coincide most closely with the

trend in the age composition of the male population in Figure 3 of Chapter IV.

Of course, testing whether the age composition of the male population is related with the homicide rates illustrated in Figure 9 is a fundamental part of this analysis. And as it turns out, the most notable observation in Table IV is the relationship between age composition and homicide. In contrast to the correlations for suicide, the dominant correlation related to homicide is with the age composition of the population; the largest correlation related to suicide is depression, with unemployment ranked second (see Table IV). The zero order correlation between age composition and homicide is .844 and the correlation between unemployment and homicide is .339. The correlation of depression and homicide is .223.

The next observation which is important to note is the positive correlation of .061 between urbanism and homicide. In contrast to the negative correlation between urbanism and suicide, the correlation between urbanism and homicide, although small, is in the positive range. The positive value of the correlation between urbanism and homicide is more noteworthy in the following discussion related to the MLR in Table IX.

It is important to note that there are no contradictions between the zero order correlations and the general findings in the literature on homicide. As

indicated by Easterlin (1980), the association between a change in age composition should maintain a positive relationship with illegitimate behavior. In addition, homicide has a positive association with unemployment as indicated by the findings of Henry and Short (1954). Finally, the discussions by Louis Wirth (1938) suggest that an increase in urbanism would be accompanied by social disorganization which perpetuates illegitimate behavior. Thus, Easterlin, Henry and Short, and Wirth hypothesized that the independent variables in Table IX should have a positive association with homicide.

TABLE IX  
REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN HOMICIDE IS THE DEPENDENT VARIABLE  
WITHOUT THE DEPRESSION VARIABLE

R Square .83149  
Adjusted R Square .82229

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.126945	.008663	.840024	14.654 *	.8922
Unemployment	.099287	.021175	.296579	4.689 *	.5344
Urbanism	.077294	.013548	.356494	5.705 *	.6097
(Constant)	-.126527	.015574		-8.124 *	

F = 90.46112

Significant F = .0000

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\* = Alpha is significant at the .05 level.

According to the findings in Table IX, the same basic relationships between age composition, unemployment, and urbanism hold true for homicide that were demonstrated in

the discussion on suicide. The partial regression coefficients for these variables are all positive. In addition, the overall MLR model is highly significant, as designated by the F statistic, for both homicide and suicide.

The largest Beta value is attributed to the age composition of the population. This signifies that the relative strength of the defined age composition of the population explains the greatest proportion of the variance in homicide. The relative strength of the Beta value attributed to urbanism ranks second in its contribution toward explaining the variance in homicide, followed by the variable unemployment. To gain further perspective on these results, the period from 1920-1983 is once again divided into two parts to control for the Great Depression as was done in the case of suicide. Table X divides the analysis into the pre- and post World War II periods.

As was observed in Table VII for suicide, the signs of the regression coefficients in the pre- World War II period for homicide also appear to be unintelligible. Only the regression coefficients in Table X for the post-World War II period from 1946-1983 reveal results that are consistent with the tenets of the research model. The results in Table X show a positive relationship for age composition and urbanism. These positive relationships are as expected.

TABLE X

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN HOMICIDE IS THE DEPENDENT VARIABLE  
FOR THE PRE- AND POST- WORLD WAR II PERIODS

<u>1920-1940</u>			<u>1946-1983</u>		
R Square	.35079		R Square	.94997	
Adjusted R Square	.23623		Adjusted R Square	.94555	
-----Variables in the Equation-----					
Variable	B	Beta	B	Beta	
Age Ratio	-.408477	-1.378822	.147855	.948038	
Unemployment	-.081681	-.594710	-.232489	-.179047	
Urbanism	-.475037	-.893296	.113590	.181030	
F = 3.06192			F = 215.18948		
Significant F = .0564			Significant F = .0000		

However, what was not expected in Table X are the negative regression coefficients related to unemployment. However, it is possible that this negative relationship is due to the magnitude of the age composition variable. The age composition associated with the baby boom in the post-Wold War II period could be suppressing the true relationships between unemployment and homicide. In addition, the anomaly of the depression variable could be responsible results in the pre- World War II period. Table XI controls for the Great Depression in a MLR that covers the period from 1920-1983.

TABLE XI  
REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN HOMICIDE IS THE DEPENDENT VARIABLE  
WHILE CONTROLLING FOR DEPRESSION

R Square .84327  
Adjusted R Square .83167

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.130825	.008648	.865702	15.127 *	.8995
Unemployment	.029082	.040475	.086870	.719	.0973
Urbanism	.089346	.014479	.412080	6.171 *	.6431
Depression	.012533	.006219	.258822	2.015 *	.2645
(Constant)	-.137702	.016140		-8.532 *	

F = 72.63794                      Significant F = .0000

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\* = Alpha is significant at the .05 level.

An examination of the MLR in Table XI reveals a similar pattern in the regression coefficients as those found in Table IX. One of the most notable observations in Table XI is the significant relationship of the depression variable. The importance of this relationship is that it reflects the need to separate the unemployment during the Great Depression from the unemployment experienced in all the other years from 1920-1983. As can be seen in Table XI the unemployment variable is not maintained at the .05 level of significance after the Great Depression is controlled. This is contrary to the results in Table IX where the regression coefficients related to unemployment maintain the .05 level of significance.

The depression variable is importance to this analysis because it effects the results in the pre-World War II period from 1920-1940. Thus, controlling for the Great Depression is important if the demographic influences contributing to social change are to be understood. After controlling for the depression variable in Table XI, the results indicate that age composition is highly significant. In addition, the regression coefficients related to age composition are the largest positive results in the regression. But it should be cautioned that these results are most probably more relevant in the post-World War II period when it is not necessary to control for an anomaly such as the Great Depression.

Summary. Thus far the data analysis of homicide has revealed a positive association with the independent variable of age composition at the .05 level of significance. In this sense, the results of the MLR's examined thus far, for both of the illegitimate measures of social change, support the general propositions presented in the research design.

There are, however, some differences in the degree to which the age composition accounts for the variance in the dependent variables of suicide and homicide. This is to say, that in the case of suicide the dummy variable of Depression accounts for the majority of its variation. But



in the case of homicide, the independent variable of age composition prevails as the dominant variable.

#### Data Analysis of Legitimate Behavior

The following examines the indices of legitimate social change in a brief discussion as they compare to the indices of illegitimate behavior. Determining if the regression results for these indices are similar to suicide and homicide should be useful in judging whether similar methodology can be used to analyze both positive and negative social phenomena.

Patents Filed. Patents filed in the United States are examined with the same procedure used for the indices of illegitimate behavior. The findings reflect results which are measured in rates per thousand population. This was also done for the indices representing suicide and homicide. Figure 10 illustrates the trend in patents filed from 1920-1983.

The trend of the patents filed index decline sharply in the pre-World War II period. This pattern is similar to the fluctuations of the illegitimate indices of social change. Patents filed then take a dramatic jump and sharp decline around 1945. The sharp fluctuation of patents filed in 1945 may have been due to the anticipated ending of World War II and the concomitant economic activity produced by the end of the war. These years have been

dropped from the analysis up through 1946. This activity soon leveled off and began a steady, although marginal rate of increase, in the post-World War II period from 1950-1983.

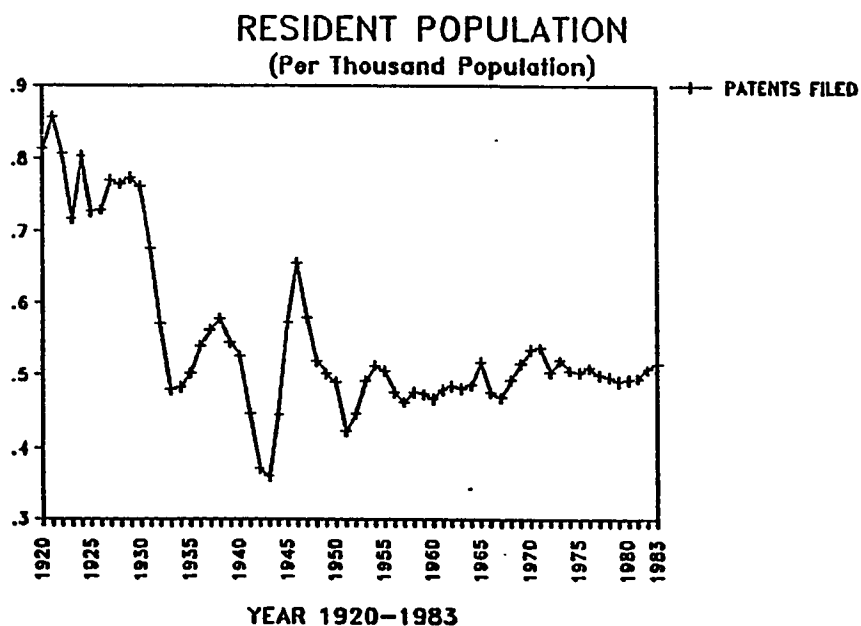


Figure 10. Patents Filed for the Years 1920-1983.

An examination of the zero order correlation matrix in Table IV reveals a positive correlation of .423 between the independent variable of age composition and the dependent variable of patents filed. The regression coefficients related to age composition and patents filed in Table XII are also positive. This is the first indication that the association between the age composition of the population and the indices of social change are consistent for both legitimate and illegitimate behaviors. It should be noted,

however, that there is some variation in the relative strength of this relationship for each dependent variable.

TABLE XII

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN PATENTS FILED IS THE DEPENDENT VARIABLE  
WITHOUT THE DEPRESSION VARIABLE

R Square .85573  
Adjusted R Square .84786

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.353869	.047903	.391820	7.387 *	.7057
Unemployment	-1.159001	.117095	-.579294	-9.989 *	-.8003
Urbanism	-1.174495	.074918	-.906410	-15.677 *	-.9040
(Constant)	1.323161	.086121		15.364 *	
F = 108.73952		Significant F = .0000			

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\* = Alpha is significant at the .05 level.

However, there are some unique findings in the MLR in Table XII related to patents filed that differentiate them from the results of the MLR's for the indices of illegitimate behavior. In contrast to the positive B and Beta values associated with unemployment and urbanism for suicide and homicide, the regression coefficients associated with patents filed are negative. Thus the negative B and Beta values for these independent variables for patents filed contradict the positive direction of the relationships between the variables in the research design

for the indices of social change diagrammed in Figure 6 of Chapter IV.

With further examination of Table VIII it can be observed that the negative values associated with unemployment and urbanism are dominant results in the equation. The results for unemployment and urbanism have a negative relationship with patents filed at the .05 level of significance, at least in terms of how these measures are operationalized in this research model. The explanation for these results are mixed.

It would appear from these results that there are some inconsistencies. For instance, it is hard to imagine that the relationship between urbanism and patents filed should be negative since the large majority of commerce occurs in urban areas. Therefore, the negative results contradict the positive relationship that is predicted by the theory behind the research design.

However, it has already been noted in Chapter IV that the proxy measure for urbanism represents a compromise in that it reflects the secular trend of the urban population. As noted, it was preferable that a direct measure of the urban age composition of the population be used as the urban index. But since this annual data is not available, it was hoped that the proxy measure of urbanism would produce an adequate measure that could account for the urban influence on the social change indices.

The use of the proxy index of urbanism to measure the illegitimate indices of social change produced positive results at the .05 level of significance after all the other variables in the research model were controlled. Thus, in the case of the illegitimate indices of behavior, there is a significant amount of variance among suicide and homicide that could be accounted for by the secular trend of urbanism after controlling for the remaining variables in the MLR's. This is not the case for patents filed.

It is difficult to determine exactly why the urbanism index has a negative relationship with patents filed. What can be said is that the proxy measure for urbanism does not account for any positive relationship in the variance for patents filed after all variable in the research design are controlled. As noted in Chapter IV, the patent statistics can only be relied on to measure general trends in innovation. From this perspective the indices of suicide and homicide may represent more robust measures of social change behavior.

Attempting to associate patents filed with the proxy measure urbanism may be prohibited to a significant degree because these indices may not be refined enough to measure these social phenomenon. This once again raises the need to develop more specific measures for these indices. It also points to the difficulty with using historical data. However, these issues will not be resolved in this study or

in the immediate future since refining and understanding these data is an ongoing process.

In the case of the negative relationship between unemployment and patents filed there are two explanations that need to be considered. First, the most plausible explanation of the findings related to the negative regression coefficients associated with patents filed, is the fact this data reflects a measure of those people who are unemployed and simply not engaged in innovative behavior. In other words, it would be expected that the higher the unemployment rate, the greater the negative association with patents filed. This would occur because unemployed persons are obviously taken out of the mainstream of society.

Secondly, it can be imagined that as the rate of unemployment goes up, people become more productive and thus more innovative in a manner that may solve their dilemma of being unemployed. This should, in turn, be reflected by an increased rate of patents filed. However, while it is difficult to imagine that this process does not occur, the results of the analysis do not indicate to what degree this scenario may be supported. Table XIII contains the results for patents filed for the pre- and post-World War II periods.

The results in Table XIII are indicative of the observations made regarding the illegitimate indices of

social change in the sense that the results in period 1920-1940 are also nonsensical. Only the results of the post-World War II period are consistent with the results of the total period from 1920-1983 contained in Table XII. For this reason the Great Depression was controlled for in Table XIV to determine if this procedure could account for the convoluted results in the pre-World War II period. This should be possible by comparing the results in Table XII where the depression variable is excluded from the analysis to those in Table XIV where depression is controlled.

TABLE XIII

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN PATENTS FILED IS THE DEPENDENT VARIABLE  
FOR THE PRE- AND POST- WORLD WAR II PERIODS

	<u>1920-1940</u>		<u>1946-1983</u>	
R Square	.86007	R Square	.27354	
Adjusted R Square	.83538	Adjusted R Square	.20944	
-----Variables in the Equation-----				
Variable	B	Beta	B	Beta
Age Ratio	-1.990800	-.573080	.193550	.735905
Unemployment	-2.066972	-1.283403	-.375075	-.171286
Urbanism	-4.478229	-.718160	-.672202	-.635256
F = 34.83068			F = 4.26742	
Significant F = .0000			Significant F = .0116	

For instance, it would be expected that a highly negative relationship would exist between the Great

Depression and patents filed because of the magnitude of the unemployment rates. However, this relationship does not exist in the results of the MLR in Table XIV. Instead, the regression coefficients related to the depression variable are negative and do not maintain a .05 level of significance.

TABLE XIV

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN PATENTS FILED IS THE DEPENDENT VARIABLE  
WHILE CONTROLLING FOR DEPRESSION

R Square .85918  
Adjusted R Square .84875

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.341317	.048992	.377922	6.967 *	.6880
Unemployment	-.931910	.229291	-.465789	-4.064 *	-.4840
Urbanism	-1.213480	.082021	-.936496	-14.795 *	-.8956
Depression	-.040540	.035229	-.140088	-1.151	-.1547
(Constant)	1.323161	.086121		15.364 *	

F = 82.36650

Significant F = .0000

---

\* = Alpha is significant at the .05 level.

There are a few possible reasons for not having a highly negative relationship during the Great Depression when unemployment rates were at an all-time high point in history. One possibility is that people did indeed become innovative during this era and this activity counteracted the possible high negative relationship that might be expected when there are high unemployment rates. Another



possibility is that the patent office became less restrictive in its procedures for filing patents. This would serve to encourage the public to engage in the patent process in an attempt to help resolve this economic crises. These alternative explanations are only offered as speculations since this study has cited no literature to corroborate these suggestions.

Furthermore, the data are not disaggregated sufficiently to separate out those persons who are unemployed and engaged in innovative behavior. To undertake this type of study, the research analysis would have to measure the age and unemployment status of those who apply for patents. This would separate those persons engaged in this type of innovation by age and employment status. The point to be emphasized here is that another measure is needed to develop a more detailed analysis.

Summary. The most notable finding related to patents filed reveals a positive association by the variable age composition. This finding corroborates the theoretical justification for using age composition as an independent measure. However, the results related to unemployment, the urbanism variable, and depression are more complicated to explain.

It was suggested that the proxy measure of urbanism is not the most desired operational measure for urban phenomena. The negative association between urbanism and

patents filed indicates that urbanism can be improved since theoretically it should have a positive relationship with this dependent variable. The most ideal measure use would have been to use the age composition of the urban population directly. However, as indicated throughout the analysis, the proxy measure of urbanism was developed because of insufficient annual data and the patent filed data can only offer general indicators of innovative activity.

It should also be noted that the dependent variable of patents filed is not a direct measure of those engaged in innovative activity. Instead, patents filed is only intended to be an experimental measure which is a proxy measure for innovative activity. For this reason there should be caution when the results of the regression analysis of this measure are interpreted.

The results for the variable of unemployment revealed a negative relationship with patents filed. This negative association suggest that unemployment jeopardizes the tendency for this type of innovation to take place. However, this is contradicted to a minor extent by the results related to the dummy variable representing the Great Depression. The discussion on these results is only offered as speculation since there is not significant empirical evidence to warrant any substantial conclusions in this matter.

Patents Issued. The creation of the patents issued index serves two purposes. The first, is that controlling for patents issued allows for a comparison to be made between patents filed and patents issued to determine which index is the more valid measure of innovation. The second reason for developing the patents issued index is to control for only patents issued to American interest in this index of innovation. This was done by dropping patents issued to foreign interest from the analysis. By removing foreign influences from the data, it was thought that a more useful index of innovation could be developed. Figure 11 illustrates the rate of patents issued from 1920-1983.

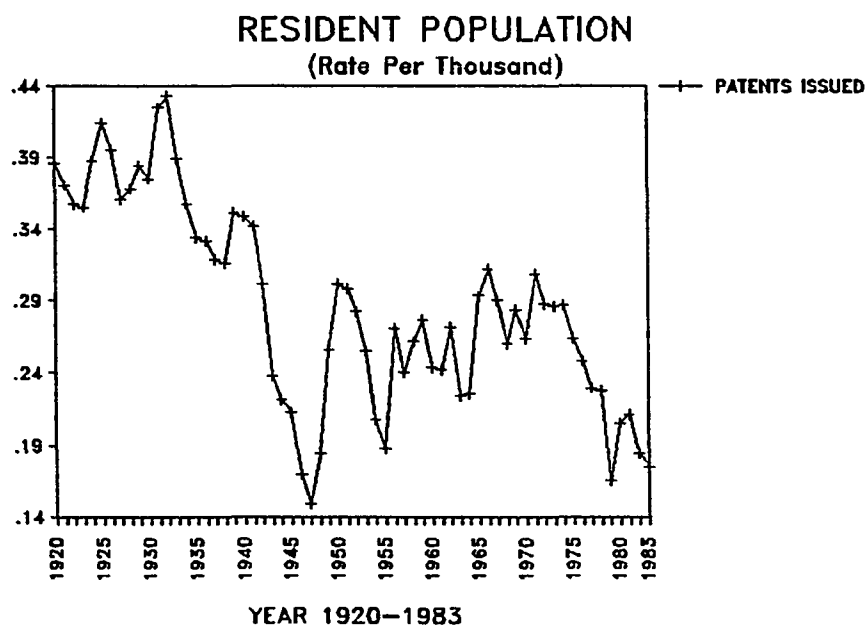


Figure 11. Patents Issued to American Interest from 1920-1983.

The trends in patents issued have a more fluctuating pattern than do the other indices of social change. However, within the more radical fluctuations appears a overall downward trend in the pre-World War II and an upward trend in the post-World War II period until it tails off in the late seventies and early eighties. The tailing off may only be another random fluctuation in the overall pattern for patents issued, although it is too early to tell due to the insufficient data. What is also apparent is that there is a much more pronounced upward trend in the post-war period for patents issued than there is for patents filed. Table XV illustrates the regression results for patents issued.

TABLE XV

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN PATENTS ISSUED IS THE DEPENDENT VARIABLE  
WITHOUT THE DEPRESSION VARIABLE

R Square .56317  
Adjusted R Square .53935

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.048154	.051596	.086136	.933	.1249
Unemployment	.016988	.126123	.013717	.135	.0182
Urbanism	-.579603	.080694	-.722621	-7.183 *	-.6957
(Constant)	.748310	.092761		8.067 *	

F = 23.63603

Significant F = .0000

---

\* = Alpha is significant at the .05 level.

The results of the analysis for patents issued reveal the most perplexing findings in this study since no real definitive results can be analyzed. An examination of the B and Beta coefficients in Table XV reflect results that support the basic tenets of the research model of this study; the age composition of the population has a positive relationship. However, the mere fact that the results are in a positive direction is negligible in the sense that they are not at the .05 level of significance.

Table XVI separates the data into the pre- and post-World War II periods. What is most apparent in this table is that the F statistic is not significant in the pre-World War II period. In addition, the regression coefficients for the pre-and post- World War II periods reveal that no consistent meaning can be derived from these results. The only regression coefficients that are consistent with the hypothesis of the research model are the positive B and Beta related to urbanism in the post-World War II period. However, it is not clear why these positive results have emerged.

It was thought initially that dividing the pre- and post World War II periods would be useful to demonstrate what effect the Great Depression may have had on patents issued. And to some extent it could be argued that the results from 1920-1940 are a result of the effects of the depression variable. But when examining Table XVIII it

becomes apparent that even after controlling for the Great Depression, only the independent variable of urbanism is significant at the .05 level of significance.

TABLE XVI

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN PATENTS ISSUED IS THE DEPENDENT VARIABLE  
FOR THE PRE- AND POST- WORLD WAR II PERIODS

<u>1920-1940</u>			<u>1946-1983</u>	
R Square	.27909		R Square	.37148
Adjusted R Square	.15188		Adjusted R Square	.31603
-----Variables in the Equation-----				
Variable	B	Beta	B	Beta
Age Ratio	-.529794	-.604471	-.190406	-.587036
Unemployment	-.250619	-.616770	-.791270	-.293011
Urbanism	-1.318494	-.838058	.987038	.756377
F = 2.19382			F = 6.69852	
Significant F = .1261			Significant F = .0011	

An interesting observation in Table XVII occurs in the depression variable related to patents issued if one considers the positive direction of the regression coefficients. While it is true that depression is not at the .05 level of significance, it is also true that one would have to imagine that the Great Depression had a significant impact on patent activity. However, the results of this analysis only suggest there is a possibility that a positive relationship is present in the findings.

TABLE XVII

REGRESSION ANALYSIS RESULTS FOR MODEL  
WHEN PATENTS ISSUED IS THE DEPENDENT VARIABLE  
WHILE CONTROLLING FOR THE DEPRESSION

R Square .57117  
Adjusted R Square .53940

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

Variable	B	SE B	Beta	T	Partial Correlation
Age Ratio	.059974	.052921	.107279	1.133	.1524
Unemployment	-.196856	.247680	-.158954	-.795	-.1075
Urbanism	-.542893	.088600	-.676852	-6.127 *	-.6404
Depression	.038175	.038054	.213110	1.133	.1353
(Constant)	.714272	.098767		7.232 *	

F = 17.98066

Significant F = .0000

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\* = Alpha is significant at the .05 level.

One possible explanation for modest results in the MLR in Table XVII would seem to lie with the institutional mechanisms that determine whether and when a patent will be issued. The lag time between when a patent is filed and when a patent is issued may result in prohibiting a pattern of the patents issued from being predicted. This unpredictability makes it difficult to judge the patents issued index.

Summary. The development of the patents issued index was founded on valid theoretical grounds in an attempt to compare patents filed from patents issued after dropping foreign influences that may effect the findings. Upon examining the results of the regression analysis, it

appears that the operational measures are only moderately successful in the sense that the direction of the relationships can be discussed with some logical consistency after the Great Depression is controlled. The modest findings more importantly reflect a need for more refined measures of innovation to be developed.

While the patent statistics show promising potential, they need to be disaggregated in more detail. This would enable the social scientists to make more definitive statements about the utility of patents statistics generally. It may be useful to shift the focus of analyzing innovation from the national level to a regional model. Shifting the focus of analyzing data at the regional level would provide more control over data of the research model. This could provide useful findings to be compared with national trends.



## CHAPTER VI

### CONCLUSION

To fully understand the concluding remarks of this study it is helpful to briefly review the literature and research design, followed by implications of the findings of the analysis. This should create a logical transition from the formulation of the hypothesis to a useful understanding of the findings in the research analysis.

#### Overview of Literature

The literature from which this study was founded has an interdisciplinary approach to understanding certain aspects of social change phenomena at the national level. More specifically, the focus of the study offers an alternative explanation of social change to that which has traditionally been espoused by economic interpretations of aggregate behavior.

It should be emphasized that the intent of this study is not to rebut the explanations offered by economic perspectives. Instead, it should be viewed as a complementary study which is intended to develop a perspective which offers a demographic explanation of the associations between indices of social phenomena. By doing

so it will assist in developing other avenues of social inquiry.

Of particular interest is the integration into the analysis of rather specific factors from the fields of demography and parts of the socio-economic literature. This is not as all-encompassing as it may appear. Only the specific theme of what is referred to in this analysis as "long-wave" social phenomena and its common association with issues of social change theory are examined.

Long-wave theory has been referred to and examined by several authors from the various social science disciplines. While each author defines long-wave social phenomena somewhat differently, there still emerges a common foundation from which this study has developed its hypothesis. Long-wave phenomena are defined in the various disciplines as observations of social behavior which last several decades in duration.

One of the earliest observers of long-wave activity was Kondratieff who developed what is appropriately referred to in contemporary terms as Kondratieff cycles (Tinbergen, 1984). Economic research has been the traditional arena to examine various explanations related to Kondratieff's original work. There has also been significant work done by Simon Kuznets (1958) which tendered explanations of long swings in population growth and related them to variables of economic development.

This crossover to a demographic explanation signaled an important fusion between the areas of demography and economics. Simon Kuznets's work developed a strong precedence for further analysis of demographic phenomena as it relate to socio-economic change.

Richard Easterlin (1968) followed the lead of Kuznets by investigating the determinants of what he referred to as "demographic waves" within the overall population and the labor force of the United States. The makeup of demographic waves on the national level has to take into consideration the main effects of birth rates, mortality, and the infusion of immigration. Net results of statistical data reflecting change in these factors constitute the primary sources for analysis of the age composition of the population.

Easterlin's (1980) examination of the demographic anomaly of the "baby boom" concluded that it would result in a boom and bust cycle in future birth rates, the result of which could have significant impact on the socio-economic system of the future. Ahlberg and Shapiro (1984) further refined the effects of demographic change when they found significant relationship between the younger age cohorts and the rate of suicide in the United States in the post World War II period. These observations, together with Easterlin's, suggest that the younger adults may be more volatile and thus more prone to commit acts of

violence. This observation expands on previous studies as it extends the parameters of demographic analysis to include age composition of the population as having a significant influence on behaviors of social change.

More recently Marchetti (1986) wrote an article entitled "Fifty-year Pulsations in Human Affairs". Marchetti's analysis examined long swings in human behavior from the pre-and post-World War II periods as far back as the late nineteenth century. The aspects of social change which he examined included homicide, suicide, and certain technological indices of human behavior.

Together, the behaviors Marchetti identifies demonstrate long-wave cycles of social change which create negative and positive influences on society. Marchetti reaches no viable conclusions on the possible factors which might create long-waves of social behavior because of what he refers to as the exploratory nature of his study. Hence, the combined documentation in the literature review leaves unanswered questions regarding the relationship of positive and negative social behaviors and their relationship with long-wave phenomena. This has set the stage for further research of these particular socio-economic phenomena.

To date, it appears that only moderate attempts have been made to explain long-waves of social change behaviors outside the economic arena. For this reason, this study's

purpose is to measure the relationship between long-waves cycles of social change behaviors and the demographic waves which are a product of the changing age composition of the United States from 1920-1983. This could offer an alternative explanation in terms of the demographic aspects of certain historical social change.

### Overview of the Research Design

The primary independent variable in this analysis is the age composition of the male adults in the working age population. Specifically, the observation made by Easterlin in the introduction of this manuscript is tested to determine whether the age composition has a significant association with certain indices of social change. The research model is designed to test this hypothesis by measuring whether the ratio of young male adults age 15-34 versus older male adults age 35-64 has a statistically significant relationship with the defined indices of social change. The method of analysis to be used to examine the variables in the research design is a multiple linear regression.

Establishing whether the ratio of younger to older workers has a significant relationship with the dependent variables is important for determining if this measurement of association is consistent across the behaviors of illegitimate and legitimate behaviors. If it can be

demonstrated that the relationship between the age composition of the population and the dependent variables are significant, then it is possible to argue more vigorously that negative and positive social change may be examined simultaneously. Of course this argument must be prefaced by the limitations of the data in this research design.

Attempting to explain aspects of social change with a single typological scheme is important for it displays whether the basic premise of explaining both negative and positive adaptations is feasible. If there is a logical connection between the age composition and social change indices of both illegitimate and legitimate behaviors, then it should be possible to broaden the analysis to examine similar research models that include other applications. Hopefully, this will lead to more refined research which has the potential to produce more sophisticated statements regarding the structure and process of social change systems.

As noted, the social change indices have been defined to include legitimate and illegitimate behaviors. Legitimate indices have been defined to measure the innovative activity of patent development. Illegitimate behaviors are indexed by the anomic behaviors of homicide and suicide. The legitimate and illegitimate indices serve as the dependent variables in this study.

The indices of social change are discussed in the context of what is referred to as the "Window of Opportunity". Developing the Window of Opportunity allows one to expand on Robert Merton's (1949) typological scheme depicting illegitimate behaviors associated with anomie. The reason for expanding on Merton's original scheme was to include legitimate adaptations of behavior with Merton's original definitions of anomic behavior to formulate a more complete typology. Theoretically, this was important to demonstrate that the research design falls within the mainstream of contemporary social thought.

In addition, the Window of Opportunity helped define the role of the anonymous condition since it provides an environment for positive and negative behaviors to flourish in the urban environment. This factor provided an important link showing how the associations between the indices of social change and the independent variables are likely to concentrate in the urban setting.

As a consequence of the urban focus, the attempt was made to develop an appropriate index which accurately controlled for the urban influence. Because the study is specifically interested in the working age population, the variable of non-agricultural employment was selected as the urban index since the large majority of industrial and government employment is centered in urban areas.

Therefore the urbanism index acts as a control variable in the model of the research design.

The intervening variable deemed important to integrate into the research model is unemployment rates.

Unemployment has traditionally been charged with being a primary force in promoting deviant acts of behavior. For this reason it was necessary to examine the influence of unemployment to determine whether its association with the outcome variables is significant in this study. With the addition of this final variable the research design is complete.

#### Implications of the Research Findings

The implications of this study center around the aging process to a large degree. Clearly, the intention of this study has been to focus on the ratio of younger versus older male adults in the population of the labor force. The historical pattern in the twentieth century has exhibited two demographic waves of young adults in the age structure of the United States from 1920-1983. It appears that the latter demographic wave in the post-World War II period is the most prominent as it relates to the indices of social change in this study.

A summary of the research findings reveals that using the Window of Opportunity as a single typology depicting negative and positive behaviors associated with the age



composition is a viable argument. From this perspective the demographic approach is a viable method for analyzing social change phenomena. The tests on the data concur with this proposition, as the measures reflect a positive association across the results for both illegitimate and legitimate indices of social change.

Indices of Illegitimate Behavior. The findings of this analysis must be qualified by emphasizing that there are some significant variations for each dependent variable as they relate to the age composition of the population. An examination of the relationship between the age composition of the population and the illegitimate behaviors of suicide and homicide indicate that homicide has a much higher association with age composition than does suicide.

In contrast to homicide the largest regression coefficients associated with suicide are found with unemployment. From this perspective the results of this study on suicide coincide with the work of Durkheim (1951), Henry and Short (1954), and Brenner (1976). However, when the years for the Great Depression are controlled, the largest regression coefficients associated with suicide are related to the depression variable. After controlling for the Great Depression, the importance of unemployment falls below the .05 level of significance for the period 1920-1983.

The importance of the change in the significance level of unemployment is it may indicate that there may be a threshold of tolerance that is being reflected by this result. The threshold of tolerance is used in the context of describing a level of unemployment that is associated with an increase in the rate of suicide. That is to say, that not all levels of unemployment are necessarily associated with an increase in suicide. It may only be that under extreme conditions such as the Great Depression when unemployment rates are extremely high that threshold of tolerance is reached. However, these results are not conclusive.

Unemployment has been identified by other authors cited above as having a positive association with suicide in the post-World War II period when there is no major crisis such as the Great Depression. And indeed, the results of this analysis also reflect a positive association between unemployment and suicide in the post-World War II period. These results indicate that there is a positive association between unemployment and suicide but do not specify at what level a threshold of tolerance is reached.

It has been assumed in this study that a healthy level of employment exist when the level of unemployment is at 4% or below as established by the Full Employment and Balanced Growth Act of 1978. The 4% level of unemployment as targeted by this legislation can be argued to sustain a

level of employment that may be considered as the presumed threshold of tolerance. But this argument is by no means conclusive.

In addition, the relative strength of the age composition variable has the largest regression coefficient associated with suicide and homicide in the post-World War II period from 1946-1983. From this standpoint, age composition is the most important independent variable which accounts for the greatest proportion of the variance associated with homicide and suicide in the post-World War II period. This finding indicates that the age composition associated with the baby boom appears as a significant factor associated with these indices of social change in the post World War II period.

The implications of these observations suggest that the combination of unemployment and a younger age composition of the population together create an extremely volatile condition for illegitimate behaviors to flourish. In conjunction with an increased amount of deviant behavior, public sentiment may become increasingly indifferent to the profound nature of how these behaviors effect the quality of life (Durkheim 1951, p.141). It may be surmised that this type of indifference may breed a lack of caring or public responsiveness to intervene and circumvent a continuation of this process. This response may be due to

a overwhelming feeling of hopelessness rather than any callous attitudes that may emerge.

Public sentiment is an important issue when considering the attitudes toward both illegitimate and legitimate behaviors of social change. The question of how public sentiment emerges as a dominant social condition is therefore a worthy area of study. One possible explanation is that certain social conditions that foster negative and/or positive influences on the public may persist for prolonged periods of time. These periods could theoretically be viewed from the long-wave perspective.

It can be said that the age composition as measured in this analysis has created long-wave phenomenon which in turn has been predominant in creating certain social conditions that will exist for prolonged periods. These social conditions are measured in this study to determine if they are associated with certain social changes in society. The social changes depict the emergence of long-waves of either illegitimate and/or legitimate behaviors. A few of the possible outcomes regarding illegitimate behavior are discussed in the above text. The next avenue to examine is the legitimate social sentiments that may emerge under these conditions that are said to cultivate new innovation.

Indices of Legitimate Behavior. The results of this study regarding the legitimate indices of social change

suggest that there is a significant positive association between the age composition and patents filed in the post-World War II period. This suggest that the younger age composition defined in this study effects legitimate social change in a manner similar to that of the illegitimate indices of social change.

The most conclusive results associated with the legitimate index of patents filed relate to the variables of age composition and unemployment. Unemployment has a negative relationship with the legitimate index of patent filed. Unemployment in this sense impacts society in a negative manner just as it did for the illegitimate indices of social change. However, in the case for patents filed the unemployment index has an negative relationship.

Alternatively, an examination of the age composition reveals that there is a positive relationship between the younger age composition and patents filed. Thus, changes in this age composition appears to be associated with innovation as measured by the proxy variable of patents filed. It should be noted, however, that while patents filed is a useful measure, it would be more desirable to measure innovation by examining the characteristics of those who engaged in innovative activity directly. Measuring innovation in this manner is not possible in this analysis because of insufficient data.

The measures for patents filed in the period from 1946-1983 appear to be the most useful innovative measure in this study. However, it should be noted that patents filed had only a marginal rate of increase in the post-World War II period. For this reason the reader should be cautioned when viewing the positive association between age composition and patents filed. The primary weakness of this measure of innovation (i.e. patents filed) is that it only reflects a single measure which may underestimate the actual amount of innovative activity in the United States during the post-World War II period.

For Example, there has been innovative activity in the service sector of our economy that cannot be patented. This fact may play a significant factor which effects the validity of measuring innovation with patent statistics. For instance, Naisbitt (1984) stated when discussing the direction in growth of the economy that:

the United States appeared to be a thriving industrial economy, yet a little-noticed symbolic milestone heralded the end of an era: In 1956, for the first time in American History, white-collar workers in technical, managerial, clerical positions outnumbered blue-collar positions. (p.2)

The observation made by Naisbitt is important because it gives an indication of when the service sector of the American economy began to flourish. Cetron, Rocha, and Luckins (1988) when discussing the service sector state:

The service sector has shown steady growth as a portion of the labor force. In 1984, it accounted for 72.2% of the labor force; the Bureau of Labor Statistics expects that number to rise to 73.5% by 1990 and 74.4% by 1995. We estimate that the service sector will account for 88% of the work force by the year 2000. (p.34)

Thus, the expansion of the service sector in the post-World War II period indicates that innovation is taking place in increasing proportions in non-manufacturing areas of the American economy.

An increased amount of innovation in the service sector does not mean that the patents filed index is without merit. It may be that patent activity and innovative activity in the service sector may parallel one another to a large degree. However, this is not explored in this study. The data in this study is only useful to measure patent activity from 1920-1983. And more specifically, the results of the regression analysis is most useful for the post-World War II period from 1946-1983. The cases observed in the pre-World War II period from 1920-1940 have spurious implications.

The inability to adequately measure the pre-World War II period is most probably because of the dramatic influence of the Great Depression. It is logical to believe that the anomaly of the Great Depression overshadowed any undercurrent of social change associated with the age composition of the population during the period. If it were not for the Great Depression the age

composition might have otherwise made significant contributions to the indices of social change.

Recognizing that both the illegitimate and legitimate indices in the post-World War II period have a positive association with age composition is important. This suggest that the social structure has a limited capacity to metabolize demographic change without realizing certain social changes as a result. The demographic influence on social change as measured in this study are mediated by the intervening conditions of factors associated with the rate of unemployment. But to the degree that we can predict change in the age composition, there are certain speculations that can be made regarding future social change.

#### Speculating on the Future

The next avenue to explore is to speculate on what may happen to the social change indices as the baby boom ages. Will productivity and deviant behavior begin to decline as the baby boom matures and becomes more settled into institutional norms? Will the baby bust generation, noted by Easterlin, develop a new demographic wave to be contended with as it picks up where the baby boom left off, or will it have the same magnitude?

Most probably, the baby bust generation will not have the same aggregate impact due, if nothing else, to its



smaller size as compared to the baby boom generation. Therefore it is somewhat unrealistic to expect the baby bust generation to compensate for or replace the baby boom's socio-economic impact. Nonetheless, the baby bust generation should contribute significant social change. This could be true especially in regions where younger age groups congregate due to migration in search of economic opportunity, climate conditions, or unusual circumstance.

But what of the affects of the demographic wave of an aging baby boom? Will the baby boom population be forced into earlier retirement in response to the need to supply corporate America with new blood, as we see in certain instances today, or will corporate America adjust to the aging baby boom? Will the socio-economic system respond to the unprecedented health care needs of this large, aging population via Social Security and private health insurance, or will the institutional framework of free enterprise succumb to the pressures and be forced into a socialized medicine compromise? And will there be further social change as result?

For instance, Longman (1988) reported recently that "an aging society brings exploding health-care costs, at the same time that the supply of qualified young workers is shrinking" (p.33). Johnston (1987) and his colleagues of the Hudson Institute in an earlier report also estimated that the rapidly expanding service sector will demand

higher numbers of skilled workers to meet the needs of the future. However, the projections of the Hudson Institute see the aging society as having a positive and a negative side.

On the one hand, the older workers of the future can supply many of the needed skills demanded by projected markets and also supply a more reliable workforce. On the other hand, an aging workforce will be less mobile and adaptable if past experience is indicative of the future trends. But if we focus on the positive contributions an aging workforce may deliver, several possibilities exist that might compensate for the anticipated decline of younger qualified workers.

Granted, only speculations can be made regarding the course of concerns that are emerging as a consequence of pressures brought about by a change in the age composition of the population. And to a large extent this discussion has only focused on some of the more troublesome and potentially devastating socio-economics issues. It is therefore appropriate to focus on a few of the potentially positive dimensions that are possible in the aging scenario of the baby boom.

For instance, if we see the older adults dominating the socio-economic system in the future, which is similar in character to the mid-forties and fifties, we may surmise that a more conservative period may emerge. A conservative

period may foster calmer times where the nation can regroup to evaluate social roles if less volatile activity results.

And if in fact older adults prevail in pure numbers as a dominant force in society, the question of whether their traditional tendency to become more conservative will be a benefit or a detriment? The optimistic scenario is that it will be a benefit. One example is that the older population may respond to the increased need for them to contribute to the socio-economic system, given the increased demand to resolve the potential crisis of having a shortage in skilled labor.

The incentives for older Americans to take on less traditional retirement roles to be more involved in society will persist if some of the projections hold true. Resolving potential socio-economic crises may indeed be a likely prospect for this group to focus on if issues such as forced retirement and increased health care costs are to be averted. With the realization by this aging demographic wave that these issues affect them in a very direct manner, the homogeneous attraction of similar age may serve to unify their aggregate population in seeking alternative solutions to social issues.

Among the possible scenarios that may emerge are those from an institutional perspective. Aging citizens may chose to only partially retire and hence demand that corporate America formulate work alternatives in the form

of something like job-share programs for senior employees. In this sense, retirement age may be extended or phased out of institutional norms entirely.

Prolonging the activity of older Americans in the labor force may become increasingly possible. Given current and future medical technology, the potential exists to create better lifestyles for those who incur physical impairments in the aging process. This may also justify and make possible, if not desirable, their continued involvement in the marketplace.

A more productive senior labor force can only serve to create additional inputs to the socio-economic system. These additional inputs have the potential to redefine the social roles and expectation of older Americans. As a consequence, this type of social change will hopefully create a different credo for society to follow. The influence of such attitudes can again only be speculated on as this aging process takes place. Nevertheless, a more productive senior population provides the potential for society to continue to take advantage of this human capital. In addition, an active senior population in the coming century may relieve an over-powering burden on the baby bust generation to supply all the demands which will be placed on them--as for example, Social Security benefits if social and/or institutional norms remain the same.

### Recommendations for Further Research

There are several aspects of this study which warrant further investigation. To this end, it should be re-emphasized that the analysis of this study focused on national data of the United States. The parameters of the data only enable limited inferences to be made regarding further research which may be examined on a regional level. However, if the data are adjusted an appropriate study can be modeled after this research design to focus on a regional level of analysis.

Using national level data proved useful in the development of a comprehensive model from which both legitimate and illegitimate behavior could be examined with a single typological scheme. Similarly, proper indices tailored to specific regional characteristics may be employed on a smaller scale to reflect more specific social change associated with demographic phenomena. This would prove useful for the public and private sectors alike.

For example, a cross-sectional research design on the regional level may produce a more robust model since the potential for collecting samples which are more focused may center on the age composition of specific populations. Extending the research in this manner may be more appropriate for studying specific regional effects of race, sex, and/or age since they are sometimes difficult to capture at the national level.

Undertaking further research on social change phenomena at a more local level, if executed properly, should benefit the public by providing information which may anticipate needed policy related to the demographic characteristics of the concentrated populations. In like regard the private sector may better understand important characteristics for predicting prospective markets such as housing, recreation, health care, child care etc. The implementation of the general framework of the demographic model used in this research design should be appropriate for both purposes.

Further study into long-wave demographic change is another area where considerable research may focus. This is especially important as we experience continued migration-immigration and possible boom and bust birth cycles which might concentrate in regional areas. The potential occurrence of change in the age composition of the younger population along with the aging baby boom promise to usher in a new wave of social changes in the future.

Hence, the development of demographic studies which more accurately define the specific age composition that contributes to these long-waves of social change will prove useful. The fusion of information from future research in this area on a regional and national level should contribute an integrated view of social phenomena from an interdisciplinary perspective.

## REFERENCES

- Adams, C.W. "The Age at Which Scientist Do Their Best Work" in ISIS, Vol. xxxvi, Nos. 105 & 106, 1946, pp.166-169.
- Ahlberg, Dennis A. and Morton O. Schapiro. "Socioeconomic Ramifications of Changing Cohort Size: An Analysis of the U.S. Postwar Suicide Rate by Age and Sex" in Demography. Published by the Population Association of America, Vol. 21, No. 1, February 1984.
- Bergman, Barbara and David E. Kuhn. Structural Unemployment in the United States. Economic Development Administration, 1966.
- Blalock, Herbert Jr. Social Statistics. New York: McGraw Hill Inc., 1979.
- \_\_\_\_\_. Theory Construction. Englewood Cliffs, New Jersey: Prentice Hall, Inc. 1969.
- Brenner, Harvey M. "Achieving Goals of the 1946 Employment Act" in U.S. Congress Joint Economic Committee: 30th Anniversary Review, Volume 1, No. 5, Estimating Social Cost of National Economic Policy; Implications for Mental and Physical Health and Criminal Aggression, Printed by U.S. Publishing Office 1976, pp.229.
- Browne, Lynn E. "Why Mini Skirts Won't Come Back" in New England Economic Review, November-December 1981.
- Cetron, Marvin J., Wanda Rocha, and Rebecca Luckins. "Into the 21st Century: Long-Term Trends Affecting the United States" in The Futurist, Vol. XXII, No. 4, July-August 1988, p.34.
- Cloward, Richard A. "Illegitimate Means, Anomie, and Deviant Behavior" in The American Sociological Review, Volume 24, No. 2, April 1959, pp.164-176.
- Cohen, Albert K. "The Study of Social Disorganization and Deviant Behavior" in Sociology Today, Robert Merton, Leonard Broom, and Leonard S. Cottrell (eds.), New York: Basic Books, Inc., 1959, p.463.

- Davis, James A. Elementary Survey Analysis, New Jersey, Prentice Hall, Inc., 1971.
- Diener, Edward N. "Deindividuation: Causes and Deviant Consequences" in Social Behavior and Personality. Society for Personality Research, Inc., 5 (1): 1977, pp.143-55.
- Douglas, Jack D. The Social Meaning of Suicide, Princeton, New Jersey: Princeton University Press, 1967, p.163.
- Downs, Anthony. Inside Bureaucracy, A Rand Corporation Research Study, Boston: Little, Browne, and Company, 1967, pp.20-22.
- Downs, Hugh. "An Endangered Species" in ABC NEWS, 20/20 Transcripts, New York: Journal Graphics Inc., 1988, P.13.
- Dubin, Robert. "Deviant Behavior and Social Structure: Continuities in Social Theory" in American Sociological Review. Volume 24, No. 2, April 1959, pp.147-164.
- Durand, John D. The Labor Force in the United States 1890-1960. Demographic Monographs, Volume 2, New York: Gordon and Beach Science Publishers, 1968.
- Durkheim, Emile. Suicide. New York: The Free Press, 1951.
- Easterlin, Richard A. Birth and Fortune. New York: Basic Books Inc., Publishers, 1980.
- \_\_\_\_\_. Population, Labor Force, and Long Swings in Economic Growth. National Bureau of Economic Research, New York: Columbia University Press, 1968.
- \_\_\_\_\_. "The American Baby Boom in Historical Perspective" in The American Economic Review, Vol. LI, No. 5, 1961.
- Fischer, Claude S. "Urbanism as a Way of Life" in Sociological Methods and Research, Vol. 1, No. 2, Sage Publications, Inc., 1972, pp.187-242.
- Full Employment and Balanced Growth Act of 1978. U.S. Code Congressional and Administrative News, 95th Congressional Session 1978, P.L. 95-523.



- Gilpatrick, Eleanor. Structural Unemployment and Aggregate Demand. Baltimore, Maryland: The Johns Hopkins Press, 1966.
- Glen, Norval D. Cohort Analysis, Beverly Hills, California: Sage Publications, Inc. 1977.
- Gordon, Robert A. Demographic Trends and Full Employment, A Special Report of the National Manpower Policy, Special Report No. 12, December 1976.
- Graham, Fred P. The Self-Inflicted Wound, New York: Macmillan Co., 1969.
- Greenberg, David F. "Age and Crime" in Encyclopedia of Crime and Justice. S. Kadish et al., (eds.) New York: McMillan, Vol. 1, 1983, p.32.
- Higgins, Benjamin. Economic Development, New York: W.W. Norton and Company Inc., 1968.
- Henry, Andrew F. and James F. Short Jr. Suicide and Homicide, London: Holt, Rinehart and Winston, Inc., 1954.
- Johnston, William B. Workforce 2000, Indianapolis, Indiana: Hudson Institute, Inc., 1987.
- Jolen, Annette. "Growing Old And Going Straight: Examining the Role of Age in Criminal Career Termination" in Unpublished Dissertation, Portland: Portland State University, 1985.
- Kondratieff, N.D. "The Long-waves in Economic Life" in The Review of Economic Statistics, Vol. XVII, No. 6, November 1935, pp.105-115.
- Keyes, Fenton. "The Correlation of Social Phenomena with Community Size" in Social Forces, Vol. 36, No. 4, May 1958.
- Keynes, John Maynard. The General Theory of Employment, Interest, and Money, New York: Harcourt Brace Javanovich, 1964.
- Kuhn, Thomas S. The Structure of Scientific Revolution, Chicago, Illinois: University of Chicago Press, 1962.
- Kuznets, Simon. "Long Swings in the Growth of the Population and in Related Economic Variables" in Proceedings of the American Philosophical Society, Vol. 102, No. 1, February 1958, pp.25-52.

- \_\_\_\_\_. "Population Change and Aggregate Output" in Demographic and Economic Change in Developed Countries, Princeton University Press for the National Bureau of Economic Research, 1960, p.339.
- \_\_\_\_\_. "Inventive Activity: Problems of Definition and Measurement" in The Rate and Direction of Inventive Activity: Economic and Social Factors, A Report of the National Bureau of Economic Research, New York: Princeton University Press, 1962.
- Lehman, Harvey C. "'Intellectual' Versus 'Physical' Peak Performance: The Age Factor" in The Scientific Monthly, Vol. LXI: July-December, 1945, pp.127-137.
- Lebergott, Stanley. Manpower and Economic Growth, New York: McGraw-Hill Book Company, 1964.
- Longman, Phillip. "The Challenge of an Aging Society" in The Futurist, Vol. XXII, No. 5, September-October 1988, p.33.
- MacIver, Robert M. The Challenge of the Passing Years, New York: Pocket Books, 1963, pp.110-111.
- Marchetti, Cesare. "Fifty-year Pulsations in Human Affairs" in Futures, Volume 18, No. 3, Butterworths Policy Journals, June 1986, p.376.
- Merton, Robert K. Social Theory and Social Structure, Glenco, Illinois: The Free Press, 1949.
- Mincer, Jacob. Schooling, Experience, and Earning, National Bureau of Economic Research and Columbia University, New York: Columbia University Press, 1974.
- Moore, Wilbert E. "Social Change" in International Encyclopedia of the Social Sciences, Vol. 14, pp.365-375, New York: Macmillan Co., 1968.
- Naisbitt, John. Megatrends, New York, New York: Warner Books Inc., 1984, p.2.
- Ogburn, William Fielding and Otis Dudley Duncan. "City Size as a Sociological Variable" in E.W Burgess and D.F. Bogue (eds.), Urban Sociology, Chicago: University of Chicago Press, 1964.
- Ostrom, Charles W. Time Series Analysis, Beverly Hills, California: Sage Publications, 1980.

- Pearce, David W. The MIT Dictionary of Modern Economics, Cambridge, Massachusetts: The MIT Press, 1986, p.61.
- Ryder, Norman B. "The Cohort as a Concept in the Study of Social Change" in American Sociological Review, Volume 30, No. 6, pp.843-861, Dec. 1965.
- Sadalla, Edward K. "Population Size, Structural Differentiation, and Human Behavior" Environment and Behavior, Volume 10, No. 2, Sage Publications, Inc., June 1978.
- Sanders, Barkev S. "Some Difficulties in Measuring Inventive Activity" in The Rate and Direction of Inventive Activity: Economic and Social Factors, A Report of the National Bureau of Economic Research, New York: Princeton University Press, 1962.
- Schumpeter, Joseph A. The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle, Oxford University Press, 1934.
- Schmookler, Jacob. "Inventive Activity: Problems of Definition and Measurement" in The Rate and Direction of Inventive Activity: Economic and Social Factors, A Report of the National Bureau of Economic Research, New York: Princeton University Press, 1962a, p.49.
- Schmookler, Jacob. "Some Difficulties in Measuring Inventive Activity" in The Rate and Direction of Inventive Activity: Economic and Social Factors, A Report of the National Bureau of Economic Research, New York: Princeton University Press, 1962b, p.78.
- Simmel, Georg. The Sociology of Georg Simmel, Edited by Kurt H. Wolff, Glencoe, Illinois: The Free Press, 1950.
- Simon, Julian L. The Economics of Population Growth, Princeton, New Jersey: Princeton University Press, 1977.
- \_\_\_\_\_. The Ultimate Resource, Princeton, New Jersey: Princeton University Press, 1981.
- Seeman, Melven. "On the Meaning of Alienation" in American Sociological Review, Vol. 24, August-December 1959, pp.783-791.
- Sorokin, Pitirim A. Society, Culture, and Personality, New York and London: Harper and Brothers Publishers, 1947.

- Stienberg, Ira. The New Lost Generation, New York: St. Martin's Press, 1982.
- Tinbergen, J. "Kondratiev Cycles and So-Called Long-waves" in Long-waves in The World Economy, Edited by Christopher Freeman, Dover, New Hampshire: Francis Pinter (publishers) LTD, 1984.
- U.S. Bureau of the Census. 1975a. Historical Statistics of the United States, Colonial Times to 1970, Part 1, Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. 1975b. Historical Statistics of the United States, Colonial Times to 1970, Part 2, Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. 1976. Statistical Abstracts of the United States, Washington, D.C.: U.S. Government Printing Office.
- \_\_\_\_\_. 1979. Statistical Abstracts of the United States, Washington, D.C.: U.S. Government Printing Office.
- \_\_\_\_\_. 1984. Statistical Abstracts of the United States, Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. 1965. Estimates of the Population of the United States, by Single Years of Age, Color, and Sex: 1900 to 1959. Current Population Reports, Series P-25, No. 311. Washington, D.C.: U.S. Government Printing Office.
- \_\_\_\_\_. 1974. Estimates of the Population of the United States, by Single Years of Age, Color, and Sex: April 1, 1960, to July 1, 1973. Current Population Reports, Series P-25, No. 519. Washington, D.C.: U.S. Government Printing Office.
- \_\_\_\_\_. 1983. Estimates of the Population of the United States, by Single Years of Age, Color, and Sex: 1970 to 1981. Current Population Reports, Series P-25, No. 917. Washington, D.C.: U.S. Government Printing Office.
- \_\_\_\_\_. 1986. Estimates of the Population of the United States, by Single Years of Age, Color, and Sex: 1980 to 1986. Current Population Reports, Series P-25, No. 985. Washington, D.C.: U.S. Government Printing Office.

Wachter, Michael L. "The Demographic Impact on Unemployment: Past Experience and the Outlook for the Future" in Demographic Trends and Full Employment, A Special Report of the National Commission for Manpower Policy, Special Report No. 12, December 1976.

Wachter, Micheal L. and Susan M. Wachter. "The Fiscal Policy Dilemmas: Cyclical Swings Dominated by Supply-Side Constraints" in The Economic Consequences of Slowing Population Growth, New York: Academic Press, 1978. p.71.

Wirth, Louis. "Urbanism as a Way of Life" in The American Journal of Sociology, Vol. XLIV, No.1, July 1938.