# A STUDY OF THE RELATIONSHIP BETWEEN SUICIDE RATE AND AGE IN THE U.S. (1914 to 1964)

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#### Abstract

A study is presented comparing the functional relationships of suicide rate to age in the United States for four race-sex subgroups, white male, white female, nonwhite male, and nonwhite female. Regression coefficients or b values are used as a measure of the functional relationship for each year in each race-sex subgroup. Changes in these functional relationships during the period 1914-1964 are examined along with the hypothesis that these functional relationships are sensitive to the level of general business activity.

The functional relationship of suicide rate to age for white males is quite sensitive to the level of general business activity. The regression coefficients used to approximate the suicide rate-age relationship for white males in individual years vary inversely with the level of general business activity. This sensitivity of functional relationships to the level of general business activity was not observed however for the suicide rate-age relationships of the other three race-sex subgroups.

#### Introduction

Presented in this paper is (1) a comparison of the functional relationships of suicide rate to age for the four race-sex subgroups, white male, white female, nonwhite male, and nonwhite female; (2) an examination of the changes in these relationships during the period 1914-1964; and (3) an examination of the hypothesis that these functional relationships are sensitive to the level of general business activity.

Suicide rates had been observed to vary with age for all of the race-sex subgroups considered in this study. It was therefore decided to concentrate the analyses on the functional relationship of suicide rate to age rather than suicide rates themselves. Suicide rates are considered as a function of age or as the dependent variable in the regression analyses with age as the independent variable. Simple linear regressions and the b values or regression coefficients were used in the analyses as a measure of the functional relationship between suicide rate and age, since changes in the slopes of these straight lines can be more easily interpreted and related to the actual phenomena than could changes in constants calculated for a second degree curve  $(Y = a + bX + cX^2)$ 

This study differs from others in that it primarily focuses attention on these functional relationships and associates the changes in these relationships with the level of general business activity. Previous procedures have been to correlate suicide rates themselves with business activity rather than functional relationships.

### Summary of Conclusions

The typical suicide rate-age relationship for white males is linear. White male suicide rates increase steadily with age and are considerably higher in every age group than corresponding rates for the other three race-sex subgroups. White female suicide rates increase steadily as age increases up to about age 45 to 54, then decrease as age increases in the older age groups. Nonwhite male suicide rates increase steadily with age up to about age 35. After 35 the rates increase at a lower rate as age increases. Nonwhite female suicide rates are considerably lower than corresponding rates for the other three race-sex subgroups. Rates for nonwhite females increase slightly as age increases until about age 35, then decrease slowly as age increases after 35. The suicide rate-age relationship for each of the four race-sex subgroups is adequately described for this study by a linear approximation.

The functional relationship of suicide rate to age for white males was observed to be quite sensitive to the level of general business activity. The slopes of the linear regression lines used to approximate the suicide rate-age relationship for white males in individual years vary inversely with the level of general business activity. This sensitivity of functional relationships to the level of general business activity was not observed for the suicide rate-age relationships of the other three race-sex subgroups.

#### Nature of Data

Simple linear regression lines (Y = A + bX)fitted by method of least squares were used to approximate the functional relationship of suicide rate (Y) to age (X) for each year in each of the four race-sex subgroups. The slopes (regression coefficients or b values) of these linear approximations were arranged in a time series so that changes in slopes could be compared with the level of general business activity. The data cover suicide rates from ages 5 to 84 inclusive.<sup>1</sup> Ages 85 and over were not included because of the large sampling fluctuations due to small numbers in the population.<sup>2</sup>

The suicide rates were computed by the U.S. Department of Health, Education, and Welfare and represent the number of deaths by suicide per 100,000 population. A considerable number of these rates, especially in the nonwhite male and nonwhite female subgroups were based on fewer than 20 suicides and are subject to large sampling fluctuations.<sup>3</sup>

The category "White" includes those reported as Mexican and Puerto Rican, as well as those reported as "White." The category "Nonwhite" consists of persons reported as Negro, American Indian, Chinese, Japanese, and persons of mixed white-nonwhite races. Over 90% of this category is negro. Average suicide rates per year were computed within each age group for each of the four racesex subgroups. Unweighted averages were used because the typical suicide rate-age relationship was wanted, taking each year as equally important without regard to population size that year.

The indicated subgrouping by race and sex enabled an examination of the effect of each of these factors on the suicide rate-age relationship for each race-sex subgroup while holding the others constant.

#### Order of Analysis

The suicide rate-age relationship for white males is examined first; second, the suicide rateage relationship for white females; third, for nonwhite males and fourth, for nonwhite females.

#### White Male Suicide Rate-Age Relationship

Table I and Figure 1 show the mean suicide rates per year for white males classified by age. Table I and Figure 1 indicate that the mean white male suicide rates increase steadily with age.

Figure 1 indicates that the relationship of the average suicide rate to age for white males is closely approximated by linear regression. The slope (regression coefficient) of the fitted regression line for the average suicide rates to age relationship is plus 0.941.



A linear regression equation is also a good approximation for the individual years from 1914 to 1964 with the exception of a few years in which there is a slight leveling off in the two oldest age groups. The regression coefficients for individual years vary from a high in 1932 of 1.53 to a low in 1964 of 0.682

(Figure 2, Table 1). The nature of this changing slope is important. The changing slopes are brought about by changes in the suicide rates in the middle and older age groups, while the suicide rates in the younger age groups are less variable. The greatest variation of suicide rates appear from age 60 on with considerable variation between 30 and 60, but relatively little variation below 30 years. It is also apparent that when the regression coefficient increases the suicide rate increases in all age groups. The increase, however, is less in the younger age groups and greater in the middle and older groups respectively. The same is true when the regression coefficient decreases, there is a decline in the suicide rates in all age groups but the decline is greater in the middle and clder groups. Thus, the fitted regression lines that represent the relationship of suicide rate to age for white males from 1914 to 1964 rotate about a relatively fixed point, the left end of the regression line.

The external factors that cause this change in slope of the regression line affect the suicide rates in all groups in the same direction. These effects are less, however, in the younger age groups than in the middle and older age groups.

Suicide rates decline during periods of increasing business activity and rise during periods of falling business activity. In prosperity, ambitions can be satisfied and upward mobility maintained. In depression economic strain is greater and suicide may become the only exit from an intolerable position.

It was indicated earlier that changes in the regression coefficient were primarily brought about by changes in the suicide rates in middle and older age groups. These very age groups that show the greatest variation in suicide rate are the age groups that are most affected by changes in business. The younger age groups are not so deeply involved in business activity. Their financial losses are less severe in a depression as are their expectations less in prosperity.

In the years from 1914 to 1921 the turning points of general business cycles as computed by the N.B.E.R. and the turning points of cycles in the time series of regression coefficients' coincide reasonably well (Table 2, Figure 2).

# SUICIDE RATES OF WHITE MALES BY AGE FOR U.S. POPULATION, 1914-1964

Year	A	GE -	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	Regression Coefficient
101/				10 (				<i></i>	· · · ·		
1914			0.3	12.6	27.0	35.3	52.1	64.1	60.6	59.4	.941
1915			0.3	11./	26.2	35.8	50.6	68.2	66.8	63.1	1.030
1916			0.3	10.8	22.1	31.1	41.8	59.6	63.2	65.4	1.010
1917			_	~_	-	-	-	-	-	_	-
1918			0.2	9.5	24.1	29.0	33.3	45.2	49.8	53.9	.777
1919			0.3	7.7	19.9	27.1	31.7	43.3	49.4	59.7	.839
1920			0.2	7.5	15.7	22.7	30.2	38.3	46.6	52.2	.761
1921			0.4	8.5	19.4	29.9	42.5	52.2	56.6	60.7	.929
1922			0.3	1.4	1/.8	27.4	40.0	49.3	59.7	60.1	.947
1923			0.3	6.3	16.9	27.3	38.4	48.0	55.3	65.2	.967
1924			0.2	1.1	1/.1	28.8	40.5	52.3	59.0	58.9	.944
1925			0.3	7.4	17.0	27.3	40.3	51.1	63.0	61.5	.989
1926			0.3	1.1	16.8	29.6	42.0	53.0	64./	6/.7	1.060
1927			0.3	8.3	18.4	30.0	45.2	56.8	66.3	68.5	1.080
1928			0.2	8.1	19.3	30.1	48.2	58.6	/2.1	77.0	1.200
1929			0.3	8.9	19.2	31.8	46./	58.1	/2.6	76.8	1.180
1930			0.3	9.6	21.6	36.2	55./	70.6	/5.3	/6.1	1.230
1931			0.3	9.2	21.8	36.4	61.2	81.4	88.6	80.1	1.390
1932			0.3	9.4	23.0	36.5	62.1	85.9	92.2	88.5	1.530
1933			0.2	9.1	20.4	33.2	56.3	/4./	84.1	88.2	1.420
1934			0.3	9.6	21.3	31.0	48.1	63.6	/4.8	/8.1	1.220
1935			0.3	9.5	20.7	29.0	4/.0	58.5	63.6	/5.8	1.120
1936			0.4	9.1	21.0	30.7	44.9	57.3	61.6	73.0	1.070
1937			0.5	9.5	21.5	32.2	48.5	59.2	61.6	/3.8	1.090
1938			0.3	9.4	22.2	33.1	50.1	63.6	61.9	08.0	1.060
1939			0.5	8.5	19.8	29.3	44.8	58.2	60.2	70.4	1.060
1940			0.4	8.8	19.9	30.1	44.1	58.8	58.2	65.9	1.010
1941			0.3	7.8	18.3	26.4	35.8	49.2	55.2 40 0	65.7	.958
1942			0.4	1.2	17.4	25.3	33.0	40.0	49.9	60.2	.003
1943			0.4	6.5	13.5	19.9	20.2	3/.1	44.0	60.2 57.4	.022
1944			0.4	0.2	14.0	20.1	23.0	22.0	40.0	59 %	.702
1945			0.4	7.7	16.7	23.3	29.0	20.0	44.7	56 4	•/9/ 911
1940			0.5	1.1	14./	23.4	32.4	42.0	43.7	67.6	.011
1947			0.5	6.0	12.0	23.3	32.0	43.3	40.5	58 1	865
1940			0.4	6.0	12.2	21.0	33.5	44.7	40.0	59.6	.005
1949			0.4	6.9	13.3	24.0	34 1	40.0	53 2	61 9	919
1051			0.3	6.8	12.0	22.4	30 3	30 7	50 3	53.8	813
1052			0.3	6.9	12.0	10.5	20.5	38 /	47 2	56 7	815
1053			0.2	7.0	12.0	20 5	31 0	38 4	47.5	55 9	.013
1056			0.4	6.0	13.0	10 0	33 0	41 6	46.2	52.6	787
1055			0.2	6.2	12.7	10 Ω	31 7	41.0	45.6	54 7	810
1056			0.2	0.2	12.7	19.0	30.2	42.0	45.0	58 1	835
1950			0.5	6.5	12.9	20 1	30.3	38 1	40.4	55 3	781
1050			0.4	0.5	14.2	20.1	34.0	41 Q	45.8	58.3	823
1050			0.4	7.0	14.5	22.1	32.8	41.9	45.0	56.6	.800
1060			0.5	8.6	14.4	21.9	33.7	40.2	42.0	55.7	.763
1061			0.5	79	14.7	22.9	32.8	39.7	39.9	53.2	.733
1962			0.5	8.7	16.5	22.5	33.4	40.5	41.3	57.0	.763
1063			0.5	9.7	16.9	23.6	33.0	40.2	40.3	52.5	.713
1064			0.5	9.2	17.0	22.0	31.8	38.5	39.1	50.5	.682
1704			0.0	2.5	11.0	<i></i> .	51.0	50.5			
	Ŷ	=	.346	8.158	17.556	26.534	38.998	50.484	55.778	63.316	
	σ	=	.096	1.391	3.734	5.205	9.073	11.936	12.720	9.246	
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Suicide Rate (suicides per 100,000 population)

 $\overline{Y}_{c} = -9.212 + .941$  (x)

TURNING POINTS OF AMERICAN BUSINESS CYCLES AND OF TIME SERIES OF REGRESSION COEFFICIENTS FOR WHITE MALE SUICIDE RATE TO AGE RELATIONSHIP,

Business	Cycles <sup>(4)</sup>	Time Se Regression	ries of Coefficients
1914	Trough	1915	Peak
1918	Peak	1918	Trough
1919	Trough	1919	Peak
1920	Peak	1920	Trough
1921	Trough	1921	Peak

1914 to 1921

In the period from 1921 to 1929 the general level of business activity and the regression coefficients increased. In this period of heightened economic activity, the regression coefficients increased rapidly. Why did the regression coefficients rise during this prosperous period? A closer look at the nature of the boom shows that it was not a unified rise in prosperity for all



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segments of the economy. For example, there were many bank failures in this period. Nearly 1,000 banks failed in 1926 alone and over 600 in every year from 1923 to 1929. Business failures also increased considerably.<sup>5</sup> Agriculture did not share in the boom to the same degree as did the rest of the economy. There was a heavy increase in farm mortgage debt and foreclosures of farm property were high throughout the twenties. Farm prices and income collapsed in 1920-21 when European agriculture output returned to its prewar level. By 1925 it had made a satisfactory recovery but there was little expansion after 1925.<sup>6</sup>

The fact that prosperity was not shared by all segments of the economy during the twenties is perhaps the most important factor causing the regression coefficients to increase. While some individuals were enjoying the unprecedented boom, others were losing their savings, business, and farms. Again it was the middle and older age groups that were affected most severely. Suicide rates increased in these age groups causing the regression coefficients to increase. After the collapse of business in 1929 regression coefficients increased to a peak of 1.53 in 1932. Business activity reached its trough in 1932 and slowly started to improve again.

After 1932 regression coefficients declined and business activity slowly began to increase. Perhaps an important reason for the decline in regression coefficients was the result of programs undertaken by the federal and state governments. Such programs as social security, unemployment compensation, F.D.I.C., and public works projects greatly reduced the economic strains and especially the feeling of uncertainty present in the middle and older age groups.

The regression coefficients reached a low point, .762 in 1944, and began to rise in 1945 as the war ended and business was faced with the problem of reconversion back to peace time production. The variations in regression coefficients during the post war years and the turning points in general business activity do not coincide nearly as well as in the period from 1914 to 1921 (Table 3). There is evidence of a relationship between the two series, however, and the continued prosperity is reflected by a decline in regression coefficients especially since 1950.

In conclusion, it has been shown that the functional relationship of suicide rate to age for white males varies considerably between 1914 to 1964 and this variation is closely associated with the level of business activity. This is not to imply that changes in this relationship are completely explained by changes in the level of business activity. There are undoubtedly a multiplicity of factors which affect the relationship. Nevertheless, the association between the suicide rate-age relationship for white males and peaks and troughs of general business activity is quite remarkable. TABLE 3

TURNING POINTS OF AMERICAN BUSINESS CYCLES AND OF TIME SERIES OF REGRESSION COEFFICIENTS FOR WHITE MALE SUICIDE RATE TO AGE RELATIONSHIP, 1945 to 1964

Business	Cycles <sup>(7)</sup>	Time Series of Regression Coefficients				
1945	Peak	1944	Trough			
1945	Trough	1947	Peak			
1948	Peak	1948	Trough			
1949	Trough	1950	Peak			
1953	Peak	1954	Trough			
1954	Trough	1956	Peak			
1957	Peak	1957	Trough			
1958	Trough	1958	Peak			
1960	Peak	1961	Trough			
1961	Trough					

#### White Female Suicide Rate-Age Relationship

Table 4 and Figure 3 shows the average suicide rates per year for white females classified by age. White female suicide rates increase steadily as age increases up to about age 45 to 54 then decline in the last two age groups (Figure 3). A simple linear regression equation (Y = A + bX) was used to approximate the functional relationship of suicide rate (Y) to age (X). Although the actual relationship is curvilinear, the linear approximation used is accurate enough for comparing the changes in the relationship from 1914 to 1964. The slope of the fitted regression line approximating the average suicide rates to age relationship is .130.

White female suicide rates increase steadily as age increases in the younger age groups, level off in the middle age groups, and decline in the older age groups in every year from 1914 to 1964. The ages when the highest rates appear vary between 45-64. It is interesting to note that the period of menopause (usually between ages 45-50) occurs at the time when suicide rates are highest. This period of menopause, which is a time of nervous tension and frustration for women, may be the primary factor causing white female suicide rates to be highest during the period.

The decline of suicide rates in the last two age groups suggests that the white female is better able to adjust to old age than is her male counterpart. This is perhaps because old age for white females is not associated with the same loss of prestige or integration in society.

Retirement does not demand as severe an adjustment for white females as it does for white males because the pattern of life for the female is not so sharply changed as for the male after

#### SUICIDE RATES OF WHITE FEMALES BY AGE FOR U.S. POPULATION, 1914-1964

#### Regression Year Age - 5-14 15-24 25-34 35-44 45-54 55-64 65-74 75-84 Coefficient .2 10.3 1914 9.3 11.5 12.6 15.5 11.7 9.5 .112 1915 .3 8.1 10.4 11.6 13.3 14.0 14.0 10.8 .142 1916 .2 7.2 9.3 9.7 12.4 12.9 11.5 8.5 .111 1917 --1918 .3 5.8 10.1 11.5 13.4 11.2 10.9 .138 9.1 1919 .2 6.1 8.5 10.5 12.9 11.9 10.6 13.4 .142 .2 1920 5.5 8.2 10.0 11.7 11.1 9.9 8.6 .109 .2 1921 11.8 9.3 5.7 8.0 9.2 11.5 10.2 .119 1922 .1 6.0 7.6 9.6 11.4 11.9 10.7 10.7 .134 1923 .2 5.7 8.1 9.4 11.3 12.9 9.5 10.9 .132 1924 .2 5.4 7.6 9.5 11.1 11.9 10.1 8.0 .111 1925 10.7 .2 5.0 8.4 9.9 12.3 11.3 .103 6.9 1926 .2 8.6 10.2 12.6 12.3 10.7 10.3 .128 6.1 1927 .2 5.3 8.8 10.6 12.4 12.4 10.9 9.4 .125 10.3 1928 .1 8.8 12.5 11.9 8.2 6.1 11.8 .116 1929 .1 6.0 9.3 10.8 12.9 14.1 12.3 10.7 .146 1930 .1 6.4 9.8 11.4 13.2 14.5 12.7 10.0 .140 1931 5.9 9.9 14.2 15.2 .1 11.8 12.3 10.5 .148 1932 .1 5.9 9.9 11.1 13.9 15.0 14.7 9.0 .149 1933 .1 5.9 9.0 11.3 12.9 14.6 12.1 9.1 .134 1934 .1 9.2 5.7 11.1 13.8 13.3 10.9 9.9 .131 1935 .2 5.4 9.4 10.9 13.0 13.8 11.9 .122 7.9 1936 .2 5.0 9.8 10.9 13.3 13.4 11.6 9.0 .129 1937 .1 5.1 9.0 11.6 14.6 14.4 11.5 9.8 .143 1938 0 8.5 4.6 11.7 14.3 14.0 11.4 9.0 .139 1939 .1 3.9 7.6 11.0 14.3 13.7 12.4 7.5 .139 1940 .1 3.9 8.6 11.5 14.0 13.1 12.9 9.0 .147 1941 .2 4.1 8.1 10.3 12.8 12.5 10.7 8.3 .126 1942 .1 3.2 7.1 9.3 11.8 12.0 9.7 12.2 .161 1943 .2 3.2 6.1 8.4 10.8 12.4 11.2 9.1 .148 1944 .1 3.3 6.1 9.0 10.5 11.5 9.6 10.4 .146 1945 .1 3.0 6.8 9.5 12.0 11.4 10.9 9.9 .149 1946 .1 3.4 6.3 9.4 11.7 11.9 10.3 8.7 .137 1947 .1 2.7 6.0 8.9 11.8 10.9 11.5 8.8 .147 1948 .1 3.1 5.5 9.0 10.7 10.6 9.7 9.4 .139 1949 .1 2.6 5.1 8.2 10.4 11.5 10.0 7.6 .133 1950 .1 2.7 5.2 8.2 10.5 10.7 10.6 8.4 .139 1951 .1 2.3 5.0 7.7 9.8 9.2 9.1 8.3 .126 1952 .1 2.1 5.0 6.9 9.4 9.2 9.0 7.0 .117 1953 .1 2.3 4.8 6.5 9.0 9.3 8.3 7.5 .116 1954 4.4 .1 1.8 6.8 8.2 9.5 8.7 6.3 .113 1955 .1 2.0 4.9 6.6 10.3 10.4 9.4 8.3 .136 1956 .1 2.0 4.7 6.7 9.6 10.5 9.4 6.8 .124 1957 .1 5.0 1.8 7.1 8.8 10.1 8.3 6.2 .110 1958 .1 2.4 5.9 7.1 10.4 10.0 9.6 6.6 .116 1959 0 2.1 5.7 7.5 9.5 10.6 9.8 7.6 .129 1960 .1 2.3 5.8 10.9 8.1 10.9 8.8 9.2 .136 1961 .1 2.3 6.1 8.3 10.8 10.4 9.1 7.6 .121 1962 .1 2.9 7.3 9.5 12.4 11.1 8.8 7.6 .115 1963 .1 3.1 7.5 10.9 12.9 11.6 9.5 7.7 .119 1964 .1 2.9 7.3 10.9 12.5 10.9 10.4 6.7 .114 Ŷ .132 4.292 7.468 9.560 11.828 12.098 10.672 8.810 = σy = .061 1.809 1.748 1.564 1.556 1.649 1.411 1.387

#### Suicide Rate (suicides per 100,000 population)

 $\overline{Y}_{c} = 2.343 + .130 (x)$ 

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FIGURE 4

about age 65. The white female's role and functions in the family remain relatively unchanged as compared with the period before age 65.

White female suicide rates are influenced somewhat by the general level of business activity. They tend to rise during periods of depression and fall during periods of prosperity. The slopes of the regression lines representing the relationship of suicide rate to age for individual years vary only from .103 in 1925 to .161 in 1942 and there is no close association between the fluctuations in slopes and the fluctuations in the level of general business activity (Figure 4). This low degree of variability in regression coefficients is partly due to using a linear approximation when the actual relationship is curvilinear. The most important reason, however, for the low degree of variability in regression coefficients is because of the relative stability of suicide rates of white females.

In conclusion, the functional relationship of suicide rate to age for white females is not linear, but linear regression lines have been used as approximations to the true relationships. There is little change in the regression coefficients of these lines during the period studied.

#### Nonwhite Male Suicide Rate-Age Relationship

The average suicide rates per year for nonwhite males increase steadily as age increases in the first three age groups (5-14, 15-24, 25-34) Table 5 Figure 5). After 35 years of age the average rates increase at a lower rate as age increases and in the last three age groups (55-64, 65-74, 75-84) the rates are almost constant (14.2, 13.9, 14.0). A straight line regression equation was used as an approximation to the true relationship of average suicide rates to age. The slope of this fitted regression line is .174. The relationship of suicide rate to age varies for individual years. Suicide rates declined in the last age group (75-84) in 24 of the years studied and increased in 22 of the years studied. There is no apparent pattern to these occurrences nor do they coincide with periods of prosperity or depression. The differences observed are probably due to the fact that some of the suicide rates, especially in the last age group, were based on fewer than 20 suicides.

A tentative explanation for the reduced rate of increase of suicide rates in the middle age groups and lack of any definite directional movement of the rates for the last three age groups is that vertical socio-economic mobility for many nonwhite males exists only within the bounds of their race. This limit on upward mobility results in ambitions aimed at more modest positions and therefore suicide rates do not increase steadily as age increases because disappointments of not achieving desired goals are not as severe. Another explanation may be that frustrations associated with an unattained goal may be directed outward toward the

dominant class rather than inward resulting in suicide.



The regression coefficients of the fitted regression lines for individual years vary from . .036 in 1919 to .325 in 1932 (Table 5). It is difficult to associate changes in suicide rates for nonwhite males with changes in the level of general business activity. In periods of increasing or decreasing business activity no clear association can be made with the suicide rates in all age groups. Some of this lack of sensitivity to the level of general business activity can be attributed to suicide rates in many age groups being based on a small number of suicides. The conclusion, however, that nonwhite male suicide rates are only moderately sensitive to the level of general business activity seems reasonable. Perhaps the most important reason for this low degree of sensitivity of nonwhite male suicide rates to business activity is due to their minor role in the family. In many cases the nonwhite male is not the head of the family and often is only a transient visitor. He assumes no obligation to support the family in many cases, nor is he even an integrated member of the family. Therefore he is not severely affected by changes in the level of general business activity.

The time series of regression coefficients for nonwhite males show no close association with the level of general business activity (Figure 6) the fluctuations observed are perhaps the result of suicide rates being based on small numbers of suicides in the older age groups.



To summarize, suicide rates for nonwhite males do not increase steadily as age increases but level off after about 35 years of age. Suicide rates of nonwhite males are only moderately sensitive to changes in the level of general business activity and the fluctuations in the time series of regression coefficients show no close association with the level of general business activity.

#### Nonwhite Female Suicide Rate-Age Relationship

The average suicide rates per year for nonwhite females increase with age in the first three age groups (5-14, 15-24, 25-34) but then decrease as age increases in the next three age groups (35-44, 45-54, 55-64), and lack any definite directional movement in the last two age groups (Figure 7 and Table 6). The functional relationship of average suicide rates to age for nonwhite females is approximated by a linear regression line. The slope of the line which describes the average suicide rates-age relationship is almost 0,(.008). This is important for it suggests that age has no effect on the average suicide rate for nonwhite females.

There is considerable variation of suicide rates in individual years from the typical pattern. These variations are probably due to suicide rates in the last four age groups being based on less than 20 suicides, such rates being subject to

### SUICIDE RATES OF NON-WHITE MALES BY AGE FOR U.S. POPULATION, 1914-1964

### Suicide Rate (suicides per 100,000 population)

Vear	ACE	- 5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	Regression
Ital	AGE	- J-14	13-24	23-34		4J-J4	55-04		75-04	coerricient
1914		0.4	8.4	26.9	23.6	13.9	29.7	26.3	19.1	.262
1915		0.0	7.2	24.0	20.2	18.7	19.5	23.1	18.6	.235
1916		0.0	4.8	15.5	15.4	12.6	11.2	14.9	12.2	.144
1917		-	-	-	_	-	-	-	-	-
1918		0.2	6.7	14.8	15.7	8.6	16.1	23.8	17.6	.244
1919		0.0	5.2	11.8	10.9	8.8	9.8	8.0	3.6	.036
1920		0.2	3.7	8.5	8.3	10.7	10.0	12.6	10.7	.150
1921		0.1	6.3	10.8	12.8	10.3	10.3	19.0	10.4	.157
1922		0.1	4.6	9.2	14.1	10.7	9.9	13.2	20.5	.221
1923		0.0	3.5	7.5	11.9	13.2	10.4	12.0	5.7	.111
1924		0.2	4.1	9.6	13.6	10.2	13.8	11.8	11.1	.148
1925		0.2	4.8	9.7	12.0	8.2	9.1	16.6	19.3	.224
1926		0.2	3.8	9.7	10.3	12.1	14.0	14.5	10.8	.171
1927		0.2	4.3	12.8	12.8	12.4	12.6	16.5	7.6	.133
1928		0.0	5.2	10.8	14.0	14.2	15.8	9.9	15.6	.177
1929		0.2	5.7	11.6	11.9	16.6	13.8	17.5	22.3	.270
1930		0.1	4.4	11.9	13.4	14.3	16.5	23.0	15.6	.259
1931		0.1	4.6	12.7	14.2	14.6	20.0	14.9	11.0	.180
1932		0.2	5.9	11.9	16.1	16.8	24.9	16.3	25.8	.325
1933		0.1	5.9	11.2	16.3	17.5	13.8	17.4	13.7	.193
1934		0.1	6.3	11.9	11.3	13.8	16.7	10.8	25.0	.256
1935		0.2	5.1	10.7	13.0	14.8	17.8	10.8	9.4	.139
1936		0.4	5.5	9.2	13.2	10.6	17.8	11.2	7.3	.119
1937		0.4	4.4	10.7	13.7	13.2	15.9	13.0	12.5	.171
1938		0.3	5.5	9.8	12.7	14.0	17.2	9.0	24.4	.251
1939		0.0	3.9	10.1	11.8	13.1	12.0	9.3	16.9	.182
1940		0.4	5.1	11.5	10.6	14.8	12.6	13.5	6.5	.110
1941		0.1	5.1	10.3	10.5	12.5	11.7	11.3	12.1	.145
1942		0.2	5.0	9.3	9.7	8.0	14.5	9.2	10.1	.125
1943		0.4	4.9	7.8	6.2	6.9	10.3	6.5	8.2	.084
1944		0.1	3.9	7.6	7.2	8.0	11.1	6.7	7.7	.094
1945		0.0	5.1	9.1	8.8	9.1	9.1	12.2	14.6	.165
1946		0.2	5.0	9.4	8.8	9.9	12.8	10.7	12.6	.152
1947		0.3	5.0	8.9	11.1	9.1	13.8	14.3	16.5	.208
1948		0.0	5.0	9.1	12.2	14.1	10.9	14.5	12.6	.171
1949		0.1	4.6	9.9	11.3	12.0	16.4	15.8	15.3	.219
1950		0.1	5.3	10.1	11.3	11.7	16.8	15.0	7.9	.147
1951		0.3	5.2	10.7	10.8	11.4	12.0	10.1	15.1	.158
1952		0.3	4.5	10.7	8.9	9.9	14.3	11.0	10.9	.141
1953		0.1	4.2	10.1	10.3	12.6	12.0	12.2	21.9	.239
1954		0.1	5.5	12.8	10.6	11.4	12.2	13.6	13.4	.158
1955		0.1	6.5	9.6	9.6	10.5	12.7	10.8	12.8	.144
1956		0.1	5.8	10.8	10.5	9.8	12.2	10.0	11.5	.124
1957		0.0	5.6	13.0	10.6	11.8	11.9	17.4	15.6	.198
1958		0.2	5.4	12.6	12.3	12.8	15.3	14.2	11.5	.157
1959		0.2	6.6	14.4	11.0	13.9	14.8	14.9	22.9	.244
1960		0.1	5.3	12.9	13.5	12.8	16.9	12.6	11.3	.150
1961		0.1	7.6	16.3	11.5	14.0	15.0	13.2	16.6	.169
1962		0.1	7.5	12.8	12.8	12.4	14.6	16.8	13.6	.174
1963		0.3	7.5	15.9	14.9	13.6	12.7	18.2	19.0	.207
1964		0.1	8.0	16.2	12.8	11.8	12.3	13.4	12.5	.120
Ŧ	=	0.158	5.380	11.702	12.220	12.174	14.150	13.870	13.988	
σ	, =	0,119	1.133	3.539	2.935	2.537	3.808	4.180	5.159	
y	,			Ϋ́c	= 2.691	L <b>+ .</b> 174 (	(x)			

## large sampling fluctuations. $^{8}$

Suicide rates for nonwhite females tend to rise during periods of depression and fall during periods of prosperity, but due to the large fluctuations in rates it is difficult to observe this relationship.

One can only postulate reasons why nonwhite female suicide rates decrease as age increases after about 35. An important factor seems to be the important role of the nonwhite female in the family. The following pattern appears to be quite typical in nonwhite family life. Due to a high illegitimacy rate and large number of working mothers among nonwhites, a female becomes the head of the family. The mother must work to support her family, leaving the grandmother to take care of the children and the grandmother becomes the power-holder in the family. She raises the children and takes care of the home. It is the grandmother's probability of suicide that is reduced because of her important role in the family. Her interests and time are taken up by her many duties and she performs a necessary function in the family. This unique role of the nonwhite grandmother reduces her probability of suicide. She is supported by the other members of the family and her function of raising the children gives her a feeling of satisfaction and usefulness. It is important to note that this role of the grandmother is not reduced in cases where the male member of the family, or father, lives at home. In most cases the wife still works leaving the children with the grandmother. It is believed that this unique family relationship had its origin during the period of negro slavery in the south.

Figure 7 indicates that there is no tendency for nonwhite female suicide rates to increase during the period of menopause. The important role of the nonwhite female in the family during this period is perhaps often sufficient to counteract the feeling of nervous tension and frustration associated with menopause.

The slopes of the regression lines fitted to the annual data vary from -.037 in 1914 to .071 in 1936 (Table 6). There is no close association between the time series of regression coefficients and the level of general business activity (Figure 8). The fluctuations in regression coefficients are primarily the result of suicide rates in the last four age groups being based on small numbers of suicides.

In conclusion, it has been observed that nonwhite female suicide rates typically increase only in the first three age groups, and after 35 the rates decrease as age increases. No close association between the time series of regression coefficients and level of business activity was observed nor were suicide rates very sensitive to the level of general business activity.

#### Conclusions

Figure 9 indicates that the mean white male suicide rates are considerably higher in each

age group than the mean rates for the other three race-sex subgroups. This pattern is true for every year from 1914 to 1964, annual white male suicide rates are higher in each age group than the corresponding rates in the other three racesex subgroups for every year from 1914 to 1964.

The question arises: Why is suicide more prevalent among white males than among the other three race-sex subgroups in this study? Emile Durkheim attributes the high suicide rates of white males to their dominant place in our society.<sup>9</sup> Durkheim found that dominant classes are more prone to suicide than subordinate classes. The dominant class possesses a higher mobility aspiration than subordinate classes. The subordinate status reduces the probability of suicide because of the restraint enforced by the dominant class.

....the horizon (mobility aspiration) of the lower classes is limited by those above them, and for the same reason their desires are more modest. Those who have only empty space above them (unlimited mobility aspirations) are almost invariably lost in it, if no force restrains them.  $^{10}$ 

This freedom of upward mobility of white males due to their dominant position in our society places great strains on them. It allows them to desire positions far beyond their capabilities. If they fail to achieve these goals, they may be unable to accept defeat. This important theoretical view is best explained by the following quotation from *The Sickness Unto Death* by Soren Kierkegaard.

> FIGURE 7 AVERAGE SUICIDE RATES PER YEAR (1914-1964) OF NON-WHITE FEMALES FOR U.S. POPULATION



### SUICIDE RATES OF NON-WHITE FEMALES BY AGE FOR U.S. POPULATION, 1914-1964

AGE -	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	Regress Coeffic
	0.0	7.8	8.9	5.6	2.8	1.8	6.7	0.0	03
	0.0	5.4	10.4	8.2	5.5	5.3	0.0	8.8	.019
	0.0	3.8	3.6	2.2	3.1	1.2	2.2	0.0	017
	0.0	3.8	- 4.1	3.4	2.7	2.7	8.1	4.3	.056
	0.0	2.5	4.6	3.2	1.8	0.8	2.7	0.0	01
	0.1	3.7	2.9	2.3	3.3	1.5	1.4	3.6	.01
	0.0	3.7	4.9	2.9	1.8	2.1	1.3	0.0	02
	0.2	3.1	3.3	3.4	3.6	2.4	0.0	0.0	02
	0.0	2.5	3.6	3.6	1.5	1.1	0.0	2.9	00
	0.1	3.2	4.9	3.0	2.9	2.2	1.1	0.0	02
	0.0	2.3	3.9	3.2	3.4	1.6	2.2	0.0	00
	0.2	2.8	5.1	3.9	4.3	3.1	1.1	5.3	.02
	0.1	2.8	4.8	4.3	3.2	2.4	0.0	0.0	02
	0.2	2.9	5.3	3.2	2.3	3.4	5.4	2.2	.02
	0.0	3.3	4.2	3.6	2.6	3.4	1.7	2.2	.00
	0.1	3.6	3.8	3.7	2.9	2.9	3.4	2.1	.01
	0.0	3.5	5.2	3.0	2.1	4.5	2.4	4.2	.02
	0.2	3.7	4.5	4.7	2.6	4.0	1.5	0.0	02
	0.1	4.0	3.9	3.5	3.4	2.9	1.3	1.9	00
	0.1	4.3	5.1	4.2	3.2	2.8	2.5	3.6	.00
	0.1	3.6	6.3	4.0	1.2	2.0	1.2	5.3	.01
	0.3	3.0	4.9	2.7	2.8	2.3	2.2	10.4	.07
	0.1	3.4	4.7	3.0	3.8	2.9	1.6	1.7	.00
	0.1	2.9	5.3	3.1	2.9	4.1	3.0	0.0	00
	0.1	2.7	3.2	2.4	3.7	1.8	2.3	4.8	.03
	0.0	3.3	3.5	3.0	3.2	1.4	2.5	1.5	.00
	0.1	2.5	2.6	1.8	2.9	2.3	1.9	2.9	.02
	0.1	2.8	4.0	2.9	2.1	1.3	0.9	0.0	02
	0.1	1.6	1./	2.7	1.4	1.9	0.9	3.9	.02
	0.1	2.0	2.1	2.0	1.0	1.2	2.5	2.5	.01
	0.0	2.2	2.8	2.3	1.5	1.1	0.4	2.4	- 00
	0.0	2.3	2.0	2.0	3.4	2.2	1.0	0.0	00
	0.1	2.0	3.1	2.5	1.7	1.5	0.0	0.0	01
	0.1	1.0	3.1 2.5	2.4	2.2	0.0	1.9	2.0	01
	0.2	1.7	2.5	2.0	2.1	2.2	2.5	2.0	.01
	0.1	1.7	2.0	2.2	4.0	2 9	2.5	1.8	.02
	0 1	2.4	2.0	2.7	1.6	2.5	0.3	0.9	- 00
	0.1	2 0	2.1	1.6	1.8	1.9	2.2	0.8	.00
	_	1.5	2.8	2.0	2.8	2.9	2.6	0.8	.01
	_	1.8	2.8	1.7	2.8	2.6	2.5	1.5	.01
	0.1	1.2	2.6	3.0	3.0	3.3	2.7	1.4	.02
	_	1.4	2.5	2.3	1.3	4.0	1.9	2.1	.02
	0.0	1.7	3.6	2.8	3.1	2.9	2.4	3.3	.03
	0.1	2.2	3.7	2.7	2.9	4.3	3.0	1.9	.02
	0.0	1.5	3.5	3.7	3.2	3.4	3.8	4.2	.04
	0.2	2.0	3.5	3.9	2.7	3.2	1.9	1.6	.00
	0.0	3.0	4.6	3.9	3.3	3.9	2.0	3.2	.01
	0.2	2.6	5.0	4.0	2.7	2.3	5.0	1.5	.01
	0.0	2.0	4.7	4.1	3.4	4.0	3.2	2.8	.02
=	0.078	2.788	3.982	3.168	2.732	2.522	2.168	2.194	
=	0.011	, 160	.220	.152	.119	.147	.219	.310	

# Suicide Rate (suicides per 100,000 population)

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Thus when the ambitious man whose watchword was "Either Caesar or nothing" does not become Caesar, he is in despair thereat. But ' this signifies something else, namely, that precisely because he did not become Caesar he now cannot endure to be himself. So properly he is not in despair over the fact that he did not become Caesar, but he is in despair over himself for the fact that he did not become Caesar. <sup>11</sup>

The four race-sex subgroups show three similar relationships of suicide rate to age. The slope of the regression line representing the functional relationship of average suicide rates to age for white males is plus .941, indicating on the aver-age almost an increase of 1. suicide per 100,000 population for every 1 year increase in age. The slopes of the regression lines representing the functional relationship of average suicide rates to age for nonwhite males and white females are similar, .174 and .130, respectively. Thus suicide rates increase at a much lower rate as age increases for white females and nonwhite males than for white males. The slope of the regression line representing the functional relationship of average suicide rate to age for nonwhite females is .0087. This indicates that using this regression line we would predict almost no increase in rate as age increases.

It was also seen that the suicide rates of white males were extremely sensitive to the level of general business activity and that the time series of regression coefficients were closely associated with the level of general business activity. This extreme sensitivity and close association with the level of general business activity was not observed for the other three race-sex subgroups.

> FIGURE B TIME SERIES OF ANNUAL REGRESSION COEFFICIENTS OF SUICIDE RATES AND AGE, U.S. POPULATION 1914-1964 FOR NON-WHITE FEMALES AND TURNING POINTS OF AMERICAN BUSINESS CYCLES



\* NO DATA FOR 1917



<sup>1</sup>This age span is broken down into eight age groups, 5 to and including 14, 15 to and including 24, etc. Assuming ages were recorded as of nearest birthday the mid-points were taken to be 9.5, 19.5, 29.5, etc.

<sup>2</sup>Suicide, U. S. Department of Health, Education and Welfare, Vital Statistics - Special Reports, Vol. 43, No. 30, August 22, 1956 (Washington, 25, D. C.), p. 464.

# <sup>3</sup>Ibid

<sup>4</sup>R. A. Gordon, *Business Fluctuations*, New York: Harper and Brothers Publishers, 1952, p. 216.

<sup>b</sup>C. R. Whittlesey, *Principles and Practices of Money and Banking*, New York: The MacMillan Co., 1954, pp. 359-61.

<sup>6</sup>Gordon, op. cit., p. 379.

<sup>7</sup>Business cycle peaks and troughs from 1945-1948, R. A. Gordon, *op cit.*, p. 216. Peaks and troughs from 1948-1961,

The Postwar Cycles, William B. Franklin, National Industrial Conference Board, Inc. New York 22, N.Y.

<sup>8</sup>Suicide, U. S. Department of Health, Education and Welfare, Vital Statistics - Special Reports, op. cit., p. 476.

<sup>9</sup> Emile Durkheim, La Suicide, translated by J. A. Spaulding and G. Simpson, Glencoe, Ill: The Free Press, 1951, pp. 246-58. <sup>10</sup>Durkheim, *op. cit.*, p. 257.

<sup>11</sup>Soren Kierkegaard, The Sickness Unto Death, Garden City, N.Y.: Doubleday Anchor Books, 1954, p.152.

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