



Trends in the Ages of Gainful Workers, by Occupation, 1910-1930

Author(s): Mapheus Smith

Source: *Journal of the American Statistical Association*, Vol. 30, No. 192 (Dec., 1935), pp. 678-687

Published by: [American Statistical Association](#)

Stable URL: <http://www.jstor.org/stable/2277721>

Accessed: 15/06/2014 02:33

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



American Statistical Association is collaborating with JSTOR to digitize, preserve and extend access to *Journal of the American Statistical Association*.

<http://www.jstor.org>

TRENDS IN THE AGES OF GAINFUL WORKERS, BY OCCUPATION, 1910-1930

BY MAPHEUS SMITH, *University of Kansas*

During the last decade much has been said and written about the increase in the age of the nation's population. A number of changes in the age of the population are particularly significant:

I. Changes in the Age of the General Population

1. The Increasing Average Age of the General Population

This is accompanied by a decline in the percentage of children and of adults up to about 35 years of age and an increase in the percentage of those of each sex over 40 years of age.

2. Employment Status of the General Population

a. The percentage of the total population 45 years of age and over which is gainfully employed increased gradually from 44 per cent in 1870 to 53 per cent in 1910, and declined to 52 per cent in 1930.

b. The percentage of the total population in the most employable ages (16-64 years) which is gainfully employed reached a peak of approximately 62 per cent in 1910, declined to 59.6 per cent in 1920 and declined slightly to 59.1 per cent in 1930. In 1930 a greater percentage of the population between 20 and 44 years of age was employed than in 1920, but the percentage was smaller for the older and younger groups. In spite of a percentage decline from 1910, the actual number of gainful workers has steadily increased.

II. Changes in the Ages of the Gainfully Occupied Population

1. Changes in Percentage of Gainful Workers in Different Age Groups

a. There has been a steady decrease in the percentage of male gainful workers under 35 years of age since 1910, and an increase in all other age groups. The decreases and increases were fairly uniform throughout.

b. There has been a decrease in the percentage of female gainful workers under 35 years of age, and an increase in those who are older. Changes were not regular, the biggest increases and decreases occurring from 1920 to 1930. The

increases have been greatest from ages 40 to 50, and very slight at age 60.

2. Changes in the Median Age of Gainful Workers

- a. The median age of the gainfully occupied population (16-64) has increased from 32 years in 1890 to 35 years in 1930, compared with an increase from 30.7 to 35.7 years for the gainfully occupied population 10 years of age and over. Since 1910 the rate of change of the two groups has been almost exactly the same. The age of the gainfully occupied is not increasing quite so rapidly as that of the total population.
- b. The median age of male gainful workers 16 to 64 increased from 33.2 years in 1890 to 36.5 years in 1930; that of females increased from 25.0 to 30.0 years during the same period. The age of males increased much more slowly than that of females to 1910 and since then it has increased more rapidly.

Here, however, available data on age trends of gainful workers are about exhausted. A decrease in younger workers, and a corresponding increase of older workers has brought about an increase of 5.9 years in the median age of the gainfully employed male population and an increase of 1.2 years in the age of female workers from 1910 to 1930. But there is almost nothing available in a published form on age changes in socio-economic classes and specific occupations. Hitherto, it has not been possible to say which occupations are typical of the age trends of the total gainfully employed population, and which are aging more or less rapidly than the average. The decennial censuses have included data on occupations by age and sex but the occupational classifications were so different that it is difficult to compare the occupational data during this period. Now, however, reliable information on the median ages of workers in 53 selected occupations over a period of three decades is available for the first time, much of the basic data drawn directly from published census statistics properly classified and the remainder obtained from them by simple estimation procedures.

The sequence of steps traversed in obtaining comparable figures upon which the median ages presented in Table I are based, briefly stated, was as follows:

1. As a matter of convenience, occupations closely affiliated were grouped so as to obtain occupational classes embracing all of the

occupations included in the 1930 census classification. For example: actors and showmen were grouped together, as were

TABLE I
MEDIAN AGES OF WORKERS 16 TO 64 YEARS OF AGE IN SELECTED
OCCUPATIONAL GROUPS, 1910, 1920, AND 1930¹

Occupation	Male			Female		
	1910	1920	1930	1910	1920	1930
All gainful workers	33.9	35.4	36.5	27.8	28.5	30.0
Total of 53 occupations	31.3	33.6	34.6	28.5	28.7	29.8
<i>Professional persons</i>						
Musicians and teachers of music	32.6	34.8	33.0	29.2	31.8	35.4
Teachers (schools and colleges)	31.8	34.2	33.5	28.4	27.6	29.7
<i>Proprietors, managers and officials</i>						
Wholesale and retail dealers	40.3	41.2	41.6	40.9	41.6	42.6
<i>Clerical workers</i>						
Bookkeepers, cashiers and accountants	30.5	31.3	32.4	25.5	23.8	27.1
Clerical workers (proper)	24.0	29.1	30.1	24.0	23.9	26.3
Office boys, telegraph and other messengers	20.9	21.3	21.2	20.9	21.4	21.5
Stenographers and typists	23.6	23.6	24.3	23.0	22.8	23.7
Telephone operators	24.7	29.4	32.6	22.1	22.4	23.8
<i>Sales people</i>						
Commercial travelers	37.0	38.0	38.8	36.9	38.1	39.8
Newsboys	22.6	23.7	22.5	27.3	30.4	25.9
Real estate and insurance agents	41.9	42.4	41.7	40.4	42.3	44.1
Salesmen and saleswomen (proper)	30.2	31.6	32.7	24.7	26.3	29.5
<i>Skilled workers and foremen</i>						
Blacksmiths, forgemen and hammermen	38.4	39.5	43.6	—	—	—
Boilermakers	34.0	35.1	39.8	—	—	—
Brick and stone masons and tile layers	38.3	41.5	39.9	—	—	—
Cabinet makers	39.4	41.0	41.3	—	—	—
Carpenters	39.4	41.5	43.4	—	—	—
Electricians	29.3	30.0	33.1	—	—	—
Locomotive engineers and firemen	34.7	35.6	41.6	—	—	—
Machinists, millwrights and tool makers	32.4	33.1	37.0	—	—	—
Molders, founders, casters (metal)	35.2	37.1	39.9	—	—	—
Painters, enamellers and varnishers (building) and paperhangers	36.0	40.6	39.7	—	—	—
Plasterers and cement finishers	37.9	40.5	38.6	—	—	—
Plumbers, gas and steam fitters	32.0	34.8	37.2	—	—	—
Sawyers	34.7	37.7	38.1	—	—	—
Structural iron workers (building)	33.8	35.2	37.0	—	—	—
Tailors and tailoresses	35.2	39.0	43.1	27.7	32.5	37.1
Tin and coppersmiths	33.8	33.9	37.5	—	—	—
Skilled workers, printing, publishing and engraving	30.8	34.5	33.9	23.9	27.3	30.9
<i>Semi-skilled workers</i>						
Painters, glaziers, enamellers, and varnishers in factories	33.8	35.3	34.8	22.6	24.4	23.6
Bakers	32.3	35.0	34.3	36.4	37.0	38.9
Dressmakers, seamstresses and milliners	34.9	38.2	39.1	33.3	38.8	42.8
Grinders, filers, buffers and polishers (metal)	31.2	34.9	36.5	23.4	24.8	25.8
Operatives in cigar factories	33.0	38.1	40.0	23.9	26.1	27.2
Operatives in clothing factories	31.1	34.4	36.8	24.1	26.9	29.3
Barbers, hairdressers and manicurists	34.0	37.2	38.2	30.0	32.6	30.7
Boarding and lodging house keepers	44.7	47.3	49.1	43.2	46.1	46.8
Brakemen	30.9	32.7	37.3	—	—	—
Housekeepers, stewards and practical nurses	36.5	38.8	39.7	38.6	41.7	44.6
Watchmen, guards and doorkeepers	47.4	51.6	51.0	35.8	41.7	46.0
<i>Unskilled workers</i>						
Farm laborers	24.1	24.7	24.5	26.4	27.0	25.6
Charwomen, cleaners, and laundresses	36.8	38.6	37.6	36.4	38.8	40.6
Elevator tenders	28.0	36.5	33.2	—	—	—
Porters	31.9	35.6	34.8	—	—	—
Servants	32.9	35.4	34.7	27.5	31.4	31.7
Waiters, waitresses and bartenders	32.4	33.4	32.7	24.5	26.5	25.9
<i>Other laborers</i>						
Draymen, teamsters and expressmen	31.9	33.5	39.8	—	—	—
Firemen (except locomotive and fire department)	34.0	37.0	40.3	—	—	—
Fishermen and oystermen	35.5	38.1	38.1	34.9	33.4	38.3
Furnacemen, smelter men, heaters, and puddlers	33.7	34.6	37.9	—	—	—
Longshoremen and stevedores	35.3	36.5	39.6	—	—	—
Lumbermen, raftsmen and woodchoppers	32.8	33.9	35.8	—	—	—
Miners, oil, gas and salt well operatives	32.4	33.8	35.8	24.6	27.0	24.3

¹In calculating the median age, it has been assumed that the ages of workers form a discrete series the basic unit of which is one-tenth year. Where no median age is given there were too few cases for measures of central tendency to be reliable.

artists, sculptors and teachers of art; wholesale and retail dealers; bookkeepers, cashiers and accountants; and real estate and insurance agents. The purpose of these and the other groupings is to reduce the number of classes without increasing the heterogeneity of the combination so much that it is meaningless. The inclusiveness of the various occupations can be seen from their names in the table.

2. Certain of the occupations were selected for study on the basis of their homogeneity, and so as to include a preponderance of skilled, semi-skilled and unskilled groups but only one or two examples from the professions and proprietorial classes, which are probably the most homogeneous of the Edwards socio-economic classification.¹
3. Occupational statistics from the 1910, 1920 and 1930 censuses were classified into the occupations that are included in this report. The comparisons of the occupational classification of the 1910, 1920 and 1930 censuses with the classification employed here had to be made separately. The 1910 and 1920 data were classified with the aid of occupational indexes, and numerous items which appeared on the surface to be equivalent to items in the 1930 classification proved to be incomparable and could not be used. Data from some of the items were adjusted by estimation by the inclusion or exclusion of a relatively small proportion of persons.

It had been hoped that the data for 1900 might be used, giving a longer trend, but inspection of the difference between the classifications of the 1900 census and the other censuses showed this to be impossible. Changes in the census classification, and equally as important changes in the industrial and occupational organization of the country make the occupational data before 1910 almost entirely incomparable with that appearing subsequently.

4. The data were summarized in five age groups: 16-24; 25-34; 35-44; 45-54; and 55-64. Data from each of the three censuses had to be adjusted in one or more particulars in order to obtain age groups which were comparable. The most detailed age breakdown obtainable for 1910 gainful workers by sex and occupation, even by use of an unpublished census table, was 10 to 13, 14 and 15, 16 to 20, 21 to 44, and 45 and over. The 1920 age breakdown, more nearly comparable to the 1930 data, was 10

¹ Edwards, Alba M., "A Social-Economic Grouping of the Gainful Workers of the United States," *JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION*, December, 1933, pp. 377-387.

to 13, 14, 15, 16, 17, 18 and 19, 20 to 24, 25 to 44, and 45 to 64;² and that of the 1930 Census was 10 to 17, 18 and 19, 20 to 24, and five year intervals up through 64 years.³

The 1910 and 1920 data were distributed in accordance with the selected age breakdown by means of graphic interpolation on cumulative percentage curves, all drawn by freehand methods by the same person. The 1930 curve was first drawn for a given occupation through a very complete assortment of points from a zero percentage at age 10 to a percentage of 99.5 at age 80. Then the 1920 and 1910 curves were drawn on the same sheet through the same initial and final points and the points at the ages mentioned above. The curves thus constructed were made to conform to the same general character of the 1930 curve and were smoothed. From the 1920 and 1910 curves the percentages for each unknown limit of the selected age groups were read and applied to the total gainful workers obtained from the census volumes.⁴

The assumption that the 1910 and 1920 curves follow the general configuration of the 1930 curves for each occupation does not appear to be unreasonable; in fact, it is about as reasonable to suppose that the slope of one curve between the known points has the same character as that of another curve based upon similar data, as to say that the data for every occupation produce a smooth curve. The latter assumption is never seriously questioned, and, as a consequence, the first need not be.

The distributions thus provided from each of the three censuses were exactly comparable in occupational and age breakdown, and were ready to be used in the calculation of median ages.

Occupations Decreasing in Age. Practically all of the 53 occupational groups increased in median age between 1910 and 1930. The only exceptions among males were newsboys, and real estate and insurance agents; and among females were newsgirls, farm laborers, and operatives in mineral extractive industries. Each of these occupa-

² The 1920 data were from Vol. IV, Chapter IV, Table 6, pp. 378 ff. of the Fourteenth Census.

³ The 1930 data were from Vol. V, Chapter IV, Table 6, pp. 118 ff of the Fifteenth Census.

⁴ The 1920 data admittedly are somewhat incorrect, because of the effect of the war upon industrial organization and on the number of workers in various occupations between 20 and 31 years of age. Data on the occupations of drafted men, however, make it clear that the net effect of the war on the percentage distribution of workers in an occupation is not greater than one or two tenths of one per cent. Soldiers were drawn from the occupations with the largest number of workers and many of these had returned to employment before the 1920 Census was taken. Another error of the 1920 Census data grows out of the difference in the time of taking the Census: June 1st for 1910; April 1st for 1930; and January 1st for 1920. This had little or no effect on the ages of workers.

TABLE II
 PERCENTAGE DISTRIBUTION BY AGE GROUPS OF GAINFUL WORKERS 16 TO 64 YEARS OF AGE IN CERTAIN GROUPINGS
 OF SELECTED OCCUPATIONS,* 1910, 1920 AND 1930

Census year	Males						Females					
	Total	16-24	25-34	35-44	45-54	55-64	Total	16-24	25-34	35-44	45-54	55-64
Total for 53 occupations	100.0	32.5	27.4	20.9	12.7	6.5	100.0	40.2	27.3	17.6	10.0	4.9
	100.0	26.7	26.9	22.4	15.3	8.7	100.0	40.2	26.1	17.3	10.6	5.8
	100.0	25.3	25.6	22.8	16.7	9.6	100.0	36.9	26.6	18.3	12.1	6.1
Proprietors, managers and officials (wholesale & retail dealers, only)	100.0	7.2	25.7	32.0	22.4	12.7	100.0	8.6	23.0	31.1	23.3	14.0
	100.0	6.6	24.6	30.2	23.5	15.1	100.0	7.7	21.4	31.6	23.2	16.1
	100.0	6.4	22.9	30.6	25.0	15.1	100.0	5.9	19.8	32.1	27.3	14.9
Clerical workers	100.0	50.7	23.9	13.5	7.8	4.1	100.0	59.7	27.4	10.2	1.8	0.9
	100.0	38.8	28.3	17.7	10.0	5.2	100.0	60.5	26.4	9.4	2.8	0.9
	100.0	34.9	30.0	18.2	10.9	6.0	100.0	51.2	30.3	12.3	4.8	1.4
Sales people	100.0	27.2	30.1	21.8	13.9	7.0	100.0	50.9	27.4	14.7	5.2	1.8
	100.0	23.6	29.5	22.6	15.5	8.8	100.0	45.3	27.3	16.5	7.5	3.4
	100.0	21.0	30.0	24.4	15.9	8.7	100.0	36.7	24.8	20.9	12.8	4.8
Skilled workers and foremen	100.0	19.2	29.7	26.1	16.6	8.4	100.0	46.1	26.1	15.6	8.3	3.9
	100.0	15.8	29.3	26.7	18.5	9.7	100.0	32.4	28.6	20.0	12.2	6.8
	100.0	13.2	25.3	28.0	21.4	12.1	100.0	25.0	24.5	24.9	17.0	8.6
Semi-skilled workers	100.0	22.9	31.2	24.7	14.6	6.6	100.0	29.9	25.5	21.8	14.8	8.0
	100.0	15.9	28.6	26.4	17.9	11.2	100.0	23.3	22.4	22.4	18.5	12.7
	100.0	15.4	25.1	26.8	19.9	12.8	100.0	22.9	21.1	22.4	19.9	13.7
Farm laborers	100.0	55.7	21.6	11.6	6.7	4.4	100.0	46.6	25.3	15.2	8.6	4.3
	100.0	51.8	20.5	12.6	9.0	6.1	100.0	45.4	23.2	17.4	9.7	4.3
	100.0	52.9	20.1	11.4	9.2	6.4	100.0	48.8	20.9	15.6	10.4	4.3
Servant classes	100.0	25.7	32.4	24.5	12.1	5.3	100.0	36.6	27.3	18.6	11.7	5.8
	100.0	20.8	29.4	25.1	16.2	8.5	100.0	29.4	26.2	21.4	14.9	8.1
	100.0	23.6	28.6	24.4	15.7	7.7	100.0	31.1	24.9	21.1	15.2	7.7
Other laborers	100.0	25.2	32.5	24.0	13.3	5.0	100.0	44.4	22.5	17.1	10.6	5.4
	100.0	22.9	29.4	24.4	15.3	8.4	100.0	49.6	23.2	14.0	8.4	4.8
	100.0	19.0	26.1	26.1	19.5	9.3	100.0	46.1	21.2	17.9	10.4	4.4

* Each grouping contains only the selected occupations listed in Table I and is not intended to represent all occupations which might be included in it.

tions was marked either by an increase in the percentage of workers in the age group 16 to 24 or a decrease in the age group 55 to 64, or both.

Occupations Above Average in Rate of Increase in Age. Most of the other male occupational groups aside from newsboys, and real estate and insurance agents increased only slightly in median age, but eight increased more than six years: male clerical workers (proper) (6.1), telephone operators (7.9), locomotive engineers and firemen (6.9), tailors (7.9), operatives in cigar factories (7.0), brakemen (6.4), firemen (except locomotive and fire department firemen) (6.3), and draymen, teamsters and expressmen (7.9). These occupations were uniformly marked by a percentage decrease in workers 16 to 24 years of age and an increase in the percentage of workers above 35 years of age.

Many other male occupations surpassed the average of the 53 in amount of increase in age (3.3 years):

blacksmiths, forgemen and hammermen	dressmakers, seamstresses and milliners
boilermakers	grinders, filers, buffers and polishers (metal)
carpenters	operatives in clothing factories
electricians	barbers, hairdressers and manicurists
machinists, millwrights and toolmakers	boarding and lodging house keepers
molders, founders and casters (metal)	watchmen, guards and doorkeepers
painters, enamellers, varnishers (in buildings) and paperhangers	elevator tenders
plumbers and gas and steam fitters	furnacemen, smelter men, heaters and puddlers
sawyers	longshoremen and stevedores
structural iron workers in buildings	operatives in mineral extractive industries
tinsmiths and coopersmiths	

In most of these occupations the percentage of those above 35 years of age increased during the twenty-year period, while the percentage of those under 35 years of age decreased. The percentage of sawyers; structural iron workers in buildings; and boarding and lodging house keepers above 45 increased; while for watchmen, guards and doorkeepers only the proportion above 55 years of age increased.

Because the median age of female gainful workers increased less than that of males (1.3 years for the occupations under discussion

here) almost all female occupations exceeded the average amount of increase for the whole group, and many of them surpassed the median increase in age for all female gainful workers 16 to 64 years of age (2.2 years) :

musicians and teachers of music (6.2 years)	charwomen, cleaners, and laundresses (4.2 years)
teachers in school and college (1.3 years)	saleswomen (proper) (4.8 years)
wholesale and retail dealers (1.7 years)	tailoresses (9.4 years)
bookkeepers, cashiers and accountants (1.6 years)	skilled workers in printing, publishing and engraving (7.0 years)
clerical workers (proper) (2.3 years)	bakers (2.5 years)
telephone operators (1.7 years)	dressmakers, seamstresses and milliners (9.5 years)
commercial travelers (2.9 years)	filers, grinders, buffers, and metal polishers (2.4 years)
real estate and insurance agents (3.7 years)	operatives in cigar factories (3.3 years)
boarding and lodging house keepers (3.6 years)	operatives in clothing factories (5.2 years)
housekeepers, stewardesses, and practical nurses (6.0 years)	servants (4.2 years)
watchmen, guards and doorkeepers (10.2 years)	waitresses and barmaids (1.4 years)
	fishermen and oystermen (3.4 years)

We do not know the precise causes of the changes in average age reviewed above, but the general pattern of explanation appears to be a combination of average age at time of employment and average duration of employment of the workers concerned. Important evidence can be obtained by comparing the average age of persons placed in different occupations at comparable dates. Such a comparison shows that occupations differ in average age of persons placed, in average age of all workers engaged, and in difference between average age of persons placed and average of all workers engaged; and also that the occupational differences between average age of persons placed and the average age of persons gainfully employed are positively correlated to a medium degree.⁵ Such a correlation indicates that

⁵ A crude but indicative measure of this fact is a correlation coefficient of $+.54 \pm .10$ (Standard Error) for United States Employment Service placements in October 1934, compared with gainfully occupied workers of both sexes in 1930. The U.S.E.S. data were in an unpublished form. Although there are obvious factors, such as the depression, that affect this correlation, the coefficient is sufficiently large to insure at least some positive relationship between exactly comparable data.

the average age of persons placed is a factor in average age of all persons engaged, and because the correlation is not perfect, differences in average duration of employment also probably help to account for the average age of persons gainfully employed.

Either one or both of these two factors explains the median age of each occupational group, some occupations being influenced more by one than by the other. Skilled occupations, as a group, are marked by long duration of employment. In contrast, the average age of watchmen, guards, doorkeepers, teamsters, expressmen, charwomen, and cleaners at the time of obtaining employment is already far advanced, and duration of employment is shorter than that of the average skilled occupation.

There is no consistent relationship between increase in number of workers in an occupation 1910-1930 and increase in median age ($r = -.19 \pm .09$ for males, and $-.01 \pm .12$ for females), although there are some occupations in which males declined in total numbers and also increased rapidly in age. Outstanding examples include:

	Decline in Numbers 1910-1930	Increase in Median Age 1910-1930 (years)
Locomotive engineers and firemen . . .	8,065	6.9
Tailors	21,220	7.9
Operatives in cigar factories	41,399	7.0
Brakemen	5,128	6.4
Draymen, teamsters and expressmen . .	299,050	7.9

Another important fact related to median age is revealed by these occupational data. Invariably, occupations that are fundamental to other occupations, that constitute the first steps in the employment ladder, have smaller median ages than those higher in the scale. Thus, most office boys (median age in 1930, 21.2 years) later become clerks (median age, 24.0); salesmen (median age, 30.2); or bookkeepers, cashiers and accountants (median age, 30.5). Many salesmen in turn become real estate and insurance agents (median age, 41.9), or wholesale and retail dealers (median age, 40.3). Although they are not included among the selected occupations of Table I, the same sort of differences exist between the median ages of farm laborers and farmers, and of apprentices and skilled workers.

Because of the depression, it is not likely that we can forecast with any degree of accuracy the future age trends in the occupations under discussion. Projection of trends beyond 1930 is likely to be meaningless in view of industrial codes under the New Deal, and other governmental regulations, and in view of the weakness of the economic struc-

ture after 1930. However, unless the whole system of American industrial democracy is changed to a revolutionary extent, the aging of the working population will continue for some time yet, almost certainly for at least two decades, and probably longer. There has been an unquestioned decline in the number of young persons in the population. The population pyramid is actually smaller at the bottom than formerly and this condition of affairs will automatically spread to the older group as the years pass. By 1940 it will already be affecting the youngest working groups. The increased length of schooling, child labor agitation and the probable loss of interest in gainful employment following a history of emergency relief and a large amount of chronic unemployment will serve to reduce drastically the number of workers below 20 at that time. By 1950, the effects of the declining number of births may be expected to reach the 20 to 30 year group, and the result will be further aging of workers in all occupations in which workers are not already as old as they can be and retain their efficiency. But by 1960, or 1970 at the latest, the decline in the birth rate will probably have had its greatest effect on the age of the working population—at least its greatest effect during the present phase of our national development. By the latter date the age of gainful workers in each occupation will be somewhat closer to the upper age limit of productive efficiency than now unless an interruption of recent trends occurs.