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EDUCATION AND SOCIO-ECONOMIC CLASS: A STATISTICAL ANALYSIS OF 1971 IRISH CENSUS DATA*

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From unpublished tables supplementary to the Census of Population of Ireland, 1971, Volume XII, the educational status of the population aged 14 or over whose education had ended is analysed by social group. There are considerable differences between the levels of education reached in the different social groups. The low percentages for post-primary level are similar for agricultural and semi-skilled and unskilled manual workers. The rapidity of improvement in education by age is analysed by a method of gradients. Gradients of improvement are shown to have increased with the passage of time in the 80 or so years before 1971.

The association between socio-economic background and participation in full-time education in Ireland and elsewhere has been observed and commented on in the educational research literature. The major Irish work of the mid-1960s is the report *Investment in Education* (5), prepared by a survey team appointed by the Minister for Education in October 1962. Chapter 6 of the report considers participation rates of various socio-economic groups; paragraph 6.92 sums up the 1961 statistical evidence, as follows:

> These tables . . . show a very marked association between social group and participation in [non-compulsory] full-time education. In particular they show a marked contrast between Groups B (professional, senior employees, etc.) and C (clerks, etc.) on the one hand and Groups D, E, F, (skilled, semi-skilled and unskilled workers, etc.) on the other, a contrast which becomes the more marked the higher the age group and the higher the level. If the same circumstances were to prevail in future it would mean that today's children of those latter social groups would have a relatively small chance of being in full-time education in ten years' time (6, p. 150).

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Paragraph 6.134 of the same report considers the main areas in which improvement might be sought, two of which are the low participation rates in post-primary and higher education by children of social groups F (unskilled and semi-skilled workers) and G (unemployed, widows, etc.) and the low rate of participation in university by many social groups. The report considers Norway 'to be in many ways a most useful country for comparison purposes' (Appendix VIII D) and the Norwegian 1960 Census data are used to derive possible education targets for the projected Irish 1971 population and labour force, these targets appearing as Table D4 of Appendix VIII (5).

But improvement in participation rates by social groups F and G is difficult to achieve, according to the report. 'Experience in other countries has also shown that a significant improvement in participation by certain social groups can be a very slow and expensive process' (6, p. 176). The Crowther Report (2), published in 1959, discusses the same problem, as experienced in England.

In the present paper, we examine the relationship between educational level and socio-economic status within the Irish population, according to supplementary data provided by the 1971 Census of Population of Ireland (9). We consider that the analysis of 1971 data, as described below, is adequate in itself, without going into comparisons with the 1961 Irish data, or with the 1971 targets, or with recent Norwegian, English or other statistics. Such comparisons could provide a basis for further study and show how Ireland has fared since 1961 in comparison with other countries as well as what kinds of target now appear to be both feasible and relevant. However, an analysis by age of the 1971 statistics can in itself throw light on changes in educational participation in Ireland over the last eighty odd years.

Information obtained on educational level in the Census schedule is confined to the full-time education of persons aged fourteen years and over who were no longer receiving full-time education. Individuals were asked to state the age at which their full-time education had ended, which of three types of educational establishment they had attended (secondary; vocational, technical or commercial; university or higher technical), and the number of years of their attendance. Educational level was defined in terms of the highest level of educational institution a person had attended. Persons who did not indicate they had attended at any of the three categories specified in the Census schedule and persons making no entry at all were categorized as 'primary, including not stated' (9, p. vii).

Numbers in five educational categories were available for analysis:

1. Secondary, including the secondary top of a primary school;
2. Vocational, technical or commercial, including schools of commerce, secretarial colleges, schools of domestic science, and agricultural schools;
3. Secondary and Vocational;
4. University or higher technical, including institutions for teacher training, the military, agricultural and veterinary colleges, and major religious seminaries;
5. Primary or not stated.

In the Explanatory Notes to Volume IV of the 1971 Census (8) the principles underlying the socio-economic grouping used are described. For gainfully occupied persons, classification is based on occupation, or sometimes on a combination of occupation and employment status. Eleven socio-economic groups, together with an 'unknown' category, are used. They are:

1. Farmers, farmers' relatives, and farm managers;
2. Other agricultural occupations and fishermen;
3. Higher professional;
4. Lower professional;
5. Employers and managers;
6. Salaried employees;
7. Intermediate non-manual workers;
8. Other non-manual workers;
9. Skilled manual workers;
10. Semi-skilled manual workers;
11. Unskilled manual workers;
12. Unknown.

Occupations assigned to each of the eleven groups were those considered as 'generally similar as regards level of skill or educational attainment'. The actual assignment of occupations to each socio-economic group is given in Appendix B of Census Volume IV (8). The statistics in our tables also include those not gainfully occupied; these are assigned to the group on which they were deemed to be dependent.

The first two groups relating to agriculture and fishing can scarcely be regarded as 'socio-economic' in the sense of the remaining groups. The procedure may be seen as a recognition that agriculture is a separate and distinct 'way of life,' as the cliché has it, though such separateness from the rest of the population is receding rapidly with the improvement in the economic status of agriculture. Possibly the best principle of socio-economic

classification of the whole population would be one based on education and income but unfortunately we are still far from having the necessary information to meet this desideratum. As matters stand, Volume XII of the 1971 Census (9) classifies male farmers and relatives assisting in farm work according to farm size and according to both highest level of education attended full-time and age at which education ceased.

For the purposes of our analyses, the Central Statistics Office made available some computerized tables additional to those published in the educational Volume XII of the 1971 Census of Population (9). The data in these tables relate to the whole population whose full-time education had ended. The tables which we use show the population aged 14 or over (1,919,000 out of a total population of 2,978,000) classified by gender, quinquennial age group, and socio-economic group (including those of unknown socio-economic group).

The first part of our paper considers how educational attainment was distributed among twelve socio-economic groups in the spring of 1971. In these analyses, people aged 14 or over are separately classified as male and female. The second part of the paper compares the educational attainment of older people with that of younger people. Educational attainment and socio-economic status corrected for age form the subject of the third part of the paper, while age gradients in educational level are considered in the fourth part. The gradient expresses the *annual* rate at which a specified education percentage level is changing within an age group from older to younger people. In the final part of the paper educational levels of men and women are compared. This section is based on a correlational analysis of male and female gradients.

EDUCATIONAL ATTAINMENT AND SOCIO-ECONOMIC STATUS

Table 1 presents data on the educational levels of each socio-economic group. The numbers of males and females will be seen to be nearly equal. It will be noted also that the 'unknown' group is substantial, numbering 194,000. This is due in large part to assignment thereto of members of families with no gainfully occupied person and of retired persons who were not required to state their former occupation for the 1971 Census and who could not be assigned on the principles stated above.

The socio-economic groups are strongly differentiated by educational level in Table 1. Amongst males in the primary group, the largest group percentages are those numbered 1, 2, 11 and 12, suggesting that if the two agricultural groups had to be socio-economically assigned in toto, it would be at or near the lowest specific group 11, the unskilled manual. It is clear that the same assignment should be made of the 'unknown' group 12. The strength of secondary education in groups 5, 6 and 7 (the salaried) is very evident. That

TABLE 1

PERCENTAGE DISTRIBUTION OF POPULATION, AGED 14 OR OVER, CLASSIFIED BY GENDER AND BY SOCIAL GROUP, ACCORDING TO LEVEL AT WHICH EDUCATION ENDED, 1971.

SOCIO ECONOMIC GROUP	MALE						FEMALE					
	Secondary	Vocational	Secondary and Vocational	University	Primary and not stated	Number (000)	Secondary	Vocational	Secondary and Vocational	University	Primary and not stated	Number (000)
1. Farmers, farmers' relatives and farm managers	9.0	4.5	1.0	0.6	84.8	231.8	14.8	5.7	2.7	0.7	76.0	160.0
2. Other agricultural occupations and fishermen	4.3	4.5	1.2	1.1	89.0	59.1	8.0	5.7	1.9	0.6	83.9	26.7
3. Higher professional	14.0	1.1	3.2	75.5	6.1	28.7	36.5	3.7	11.5	30.4	17.8	28.7
4. Lower professional	26.0	6.9	6.5	45.6	15.1	24.9	41.8	6.0	7.9	28.5	15.7	52 7
5. Employers and managers	44.2	7.5	9.4	15.2	23.8	39.2	42 9	8.5	14.0	6.6	28.0	35.5
6. Salaried employees	47.6	8.7	10.3	10.5	22.9	18.6	41.9	9.2	15.1	4.0	29.8	13.2
7. Intermediate non-manual workers	40.8	11.2	6.7	3.2	38.2	99.4	35.2	15.1	16.1	1.6	32.0	159.7
8. Other non-manual workers	14.7	11.6	3.3	0.7	69.7	85.0	16.4	10.8	3.7	0.5	68.6	103.4
9. Skilled manual workers	13.0	25.3	6.4	0.9	54.5	170.0	15.7	11.4	4.4	0.4	68.2	113.7
10. Semi-skilled manual workers	9.3	12.2	2.2	0.3	76.0	46.1	8.2	9.6	1.5	0.2	80.6	74.8
11. Unskilled manual workers	4.1	6.0	0.6	0.1	89.3	97.9	5.0	5.0	0.8	0.1	89.1	56.3
12. Unknown	6.8	1.9	0.8	1.6	88.8	53.9	13.2	3.1	1.9	1.4	87.5	139.9
Total	15.4	10.1	3.5	5.2	65.8	954.6	20.5	8.5	6.0	3.5	61.6	964.6

Basic source: Census of Population of Ireland 1971, Volume XII.

the higher professional (group 3) should predominate in the university class is not surprising; neither is it surprising that the vocational percentage (25%) should be largest for skilled manual workers (group 9), though it is perhaps surprising that it is not much larger. The most striking contrasts are in the university column: four groups (groups 3 to 6) have some representation, the rest scarcely any.

Generally the female pattern is similar, if less emphatic, than the male. On the well-known and much discussed issue of 'women are better educated than men,' the total row shows indeed that the secondary percentage is larger for females and the primary lower. The latter is emphatically true for the large agricultural percentage groups 1 and 2 but not so for groups 3, 4, 5, 6, 9 and 10, which contain 319,000 or one-third of the total females. Groups 3 to 7 have highest percentages for secondary amongst females (near enough to groups 4 to 7 for males). The low proportion of 11% for vocational education amongst skilled manual women will be noted. It may be that women tend to acquire their skills on the job, at any rate to a greater degree than do men.

The reader is reminded that the table includes the non-gainfully occupied whose full-time education has ended, as well as the gainfully occupied, the socio-economic classification being based mainly on occupation. Men and women gainfully occupied should tend to have the same educational qualifications, if in the same socio-economic class. Dependents will be assigned to socio-economic groups mainly on the basis of the occupation of a man. One would like to know to what extent wives and dependent children have similar educational status to that of male heads of households. No such indications can be derived from the data analysed here. It may be stated that the correlational coefficient between the male and female percentages in the principal group (those whose education was to primary level or not stated) is 0.98; this is also the value of the correlation between the percentages whose education did *not* end at primary, i.e., the better educated. This very high relationship does not contradict the thesis that social groups are educationally homogeneous as regards men and women*.

Table 2 goes some way towards providing agriculture with a socio-economic grouping. It will be noted that it relates only to the gainfully occupied and to

* Hutchinson [4] showed from a random sample of 1,233 married men in Dublin in 1968 that there was a markedly significant relation between the social levels of brides and grooms; there was a strong tendency to marry into the same social group of origin (i.e., social group of father or father-*in*-law). There was also much aberration, most marked amongst the lower groups. Thus, amongst the seven social groups used (quite similar to our groups 3 to 11), the percentages for brides of similar social groups never exceeded 50 percent. What is termed the 'index of association', designed to measure tendency for brides to marry into similar social grades, was much more marked for the higher social groups than for the lower ones.

TABLE 2

NUMBER OF MALES WHO FINISHED THEIR EDUCATION AT PRIMARY LEVEL AS PERCENTAGE OF TOTAL GAINFULLY OCCUPIED IN THREE FAMILY AGRICULTURAL OCCUPATIONS, CLASSIFIED BY SIZE OF FARM, 1971.

Size of farm in acres	Farmers	Assisting on farm: Sons	Other relatives
0 - 10	96.3	87.7	97.8
10 - 15	96.1	85.0	96.7
15 - 30	94.7	79.4	95.1
30 - 50	91.6	73.5	93.0
50 - 100	84.7	62.0	88.0
100 - 200	70.2	49.3	80.2
200 -	51.9	37.6	72.8
All sizes	87.6	65.8	89.9

Basic source: Table 18A of Census of Population of Ireland 1971, Vol. XII.

males, while Table 1 includes dependents as well. By comparison, we may note that the percentage for all non-agricultural (i.e., not in agriculture, forestry or fishing) males gainfully occupied was 52.5, a figure attained only by farmers with 200 acres or more. From the educational viewpoint, the great majority of farmers should be assigned to the lowest socio-economic grade. The absolutely unbroken statistical regularity for all three groups will be noted. That the percentages for sons was much lower than for farmers is largely a phenomenon of age for, as will presently be seen, educational status is strongly influenced by age. That the next generation of farmers will be better educated than their fathers would be a source of satisfaction if it were not to be qualified by the fact that in 1971, sons assisting in farm work (31,500) numbered fewer than one-fifth of the number of male farmers (163,000). Other male relatives assisting (numbering 15,500) were even less well educated than farmers. Having regard to the age of so many farmers at any particular time, implying that they will not have many more sons, must it not be the case that a large proportion of the new generation of farmers must come from outside agriculture, unless, of course, amalgamation of farms occurs on a huge scale?* That the next generation of farmers may partly come from outside present-day agriculture must mean that they will be better educated, i.e., better able to cope with the problems of agriculture which, as in all other

* The question is not rhetorical. It is important but is not pursued by us, since it is not closely related to our main theme.

branches of economic activity, is becoming more complicated, hence requiring improved ability to read, write, figure and think. To the percentages in Table 2, we may add that for male agricultural labourers who finished their education at primary level – 92.2 percent. That this percentage is lower than that for small farmers may also be an age phenomenon, with which we now deal.

EDUCATIONAL ATTAINMENT AND AGE

The proximate object of Table 3 is to correct the crude percentages of Tables 1 and 2 for differences in age distributions of the socio-economic groups. The table itself, illustrated in Figure 1, has an importance which far transcends this purpose. It is, in fact, a short history of Irish education. For regularity and consistency as a statistical showing we have never before encountered its equal. Table 3 shows unbroken sequences for all five levels of education from ages 20-24 to 85 or over in 1971. Total post-primary percentages for males range from 7.4 for the oldest to 54.1 for the age group 20-24; the percentages range from 9.7 to 61.7 for women. The similarity of trends for men and women at different levels is most striking. The aberration between ages 14-19 and 20-24 in primary, secondary and university education is due, of course, to the large number aged 14-19 who had not completed their education.

The percentage trends for the Primary and Non-stated group, in point of numbers involved, are the most significant; here it may be noted that 100 *minus* the percentages shown on the table and chart represent the percentages of those who reached post-primary levels. Those who were aged 85 in 1971 were 15 in 1901 so that approximately the four last age groups relate to the pre-Independence situation. Figure 1 shows clearly the improvement after 1921 and the acceleration between the age cohorts 40-44 and 25-29, trends which are identical for men and women, thus enhancing the significance. To establish formally the similarity of percentage trends for men and women with primary or an unstated level of education, it may be stated that the correlation coefficient between the deltas (i.e., the consecutive difference from age group to age group), omitting the negative pair for age 20-24 *minus* 14-19 – 13 pairs in all – is .935.

The gap between the percentages of men and women reaching secondary level has widened for younger age groups. The vocational percentages, almost identical from age group 40-44 on, are much greater for men in the younger age groups. Between age groups 85 or over and 25-29, the percentage with university education increased from 2.1 to 9.0 for men and from 1.0 to 6.6 for women, so that the gradient of increase for women is steeper than for men.

TABLE 3

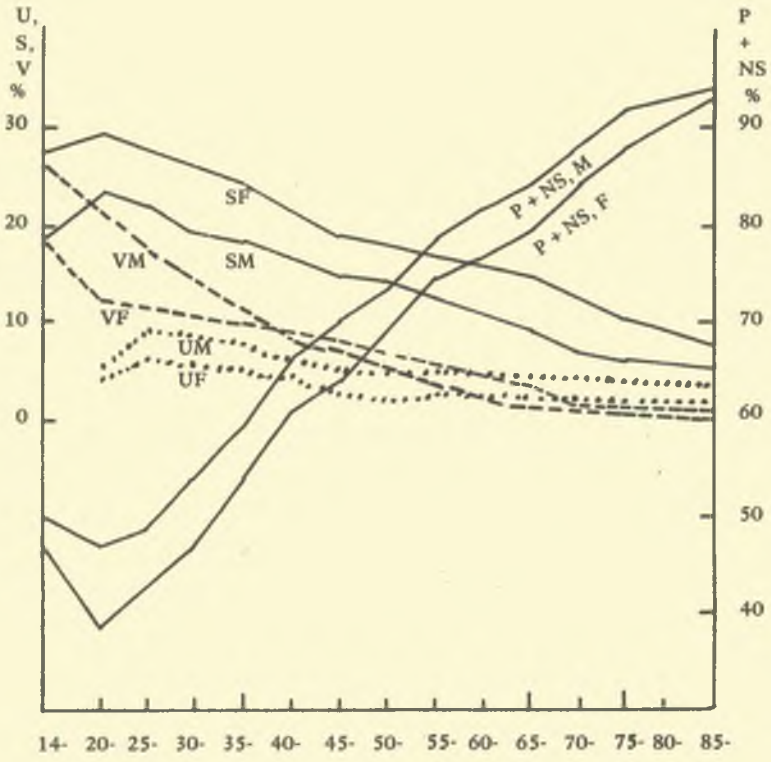
PERCENTAGE DISTRIBUTION ACCORDING TO LEVEL AT WHICH EDUCATION ENDED IN EACH AGE GROUP, MALE AND FEMALE, AMONGST THOSE WHOSE EDUCATION HAS ENDED, 1971

AGE	MALE					FEMALE				
	Secondary	Vocational	Secondary and Vocational	University	Primary and not stated	Secondary	Vocational	Secondary and Vocational	University	Primary and not stated
14–19	19.2	26.8	3.4	0.3	50.3	27.2	18.5	6.3	0.3	47.7
20–24	22.5	20.7	5.7	5.2	45.9	29.1	15.2	12.8	4.6	38.3
25–29	21.1	16.5	6.0	9.0	47.4	27.2	13.0	11.6	6.6	41.6
30–34	18.9	13.8	5.8	8.5	53.0	25.4	11.4	9.9	5.8	47.5
35–39	17.9	10.2	4.9	7.4	59.6	23.7	9.8	7.8	4.6	54.1
40–44	16.4	7.1	4.0	6.3	66.2	21.7	8.1	5.7	4.1	60.4
45–49	14.8	6.3	3.3	5.4	70.2	19.4	7.6	5.2	3.2	64.6
50–54	13.9	5.0	2.7	5.0	73.4	18.3	5.8	4.0	2.9	69.0
55–59	11.6	3.3	2.0	4.7	78.4	16.0	4.4	3.0	2.9	73.7
60–64	10.4	2.7	1.6	4.0	81.3	15.2	3.5	2.3	2.7	76.3
65–69	9.4	1.9	1.0	3.3	84.4	13.5	2.8	1.8	2.4	79.5
70–74	6.9	1.1	0.7	2.9	88.4	11.0	1.9	1.1	1.8	84.2
75–79	6.1	1.0	0.5	2.5	89.9	9.8	1.3	0.8	1.7	86.4
80–84	4.8	0.8	0.3	2.5	91.6	9.1	1.0	0.4	1.6	87.9
85–	4.2	0.7	0.4	2.1	92.6	7.7	0.6	0.4	1.0	90.3
Total	15.4	10.1	3.5	5.2	65.8	20.5	8.5	6.0	3.5	61.6

Basic source: Census of Population of Ireland 1971, Volume XII.

FIGURE 1

PERCENTAGE AT WHICH EDUCATION ENDED,
FOR EACH LEVEL OF EDUCATION, EACH AGE GROUP,
MALE AND FEMALE, POPULATION AGED 14 OR OVER
(DATA FROM TABLE 3).



Symbols

P + NS, M	:	Primary and not stated, male
P + NS, F	:	Primary and not stated, female
SM	:	Secondary, male
SF	:	Secondary, female
VM	:	Vocational, male
VS	:	Vocational, female
UM	:	University, male
UF	:	University, female

EDUCATIONAL ATTAINMENT AND SOCIO-ECONOMIC STATUS CORRECTED FOR AGE

Table 4 is designed to scale education levels so as to show differences between the socio-economic groups and also to correct for differences in age distributions. The Note to the table indicates how this was effected. A high ratio means that the education level was above that of the general average, a low ratio that it was below the general average. Table 4 may be regarded as Table 1 corrected for age distribution and scaled according to the general population levels; due to age correction the groups are more comparable than is the case with Table 1. As it happens, the showing of the two tables is relatively quite similar, highlighting for males secondary level in the case of socio-economic groups 5 to 7 and university level for socio-economic groups 3 and 4. Even the proportionalities in corresponding figures in Tables 1 and 4 are reasonably close. This means, of course, that the age distribution of the socio-economic populations (recalling that these include dependents as well as the gainfully occupied) are not so different as to affect substantially comparison of the original education level data between socio-economic groups.

AGE GRADIENTS IN EDUCATION LEVEL

Age-percentage distributions identical in form with those of Table 3 were produced for each socio-economic group. The data are too voluminous for reproduction here but the authors can arrange for their inspection. Instead, the so regular Figure 1 graphs were used as a guide to the analysis of each socio-economic group, using the remarkable property of these graphs, namely the strong tendency towards linearity in parts or over the whole of the graphs. The Secondary and Vocational group was omitted from this analysis as the numbers were small for some socio-economic groups. Instead of the Primary and Non-stated group percentages, 100 *minus* these were used throughout, i.e., the percentages at each age who ended their education at the post-primary level (deeming 'not stated' to be all primary); this group was dubbed Post-primary. The approximately straight-line sections determined from Figure 1 were deemed (by age) to be: Secondary: 20-24 to 85+ (one section); Vocational: (i) 14-19 to 35-39, (ii) 40-44 to 85+ (two sections); University, etc: (i) 25-29 to 70-74, (ii) 70-74 to 85+ (two sections); Post-primary: (i) 25-29 to 40-44, (ii) 40-44 to 70-74, (iii) 70-74 to 85+ (three sections).

Annual gradients were determined for each of these eight sections for each socio-economic group, ordinary least squares regression being used to estimate a and b of the formula

$$Y_c = a - bX$$

where Y_c is the calculated value of the percentage, X is the age (e.g., 27.5 for

the group 25-29) and b is the gradient required; the negative sign is designed to make the coefficient positive.

Age gradients, classified by level at which education ended, age group, gender and socio-economic group are set out in Table 5. In reading the table, we may take as an example the value 0.782 for vocational education in the farmers' age-group 14-39; this value indicates that, on average, the percentage of farmers aged 14-19 years (average 17 years) completing vocational education has been increasing by 0.782 per year during the 20 years before 1971 (farmers aged 37 years in 1971 would have been 17 years in 1951). A rate of increase of 0.782 per year gives 15.6 percentage points for 20 years. We must omit five years from the age groups quoted, to allow for mid-points within five-year sub-spans. The actual difference between mid-point averages in the basic figures was 16.0 (given by 21.8 minus 5.8) for a 20-year interval between such mid-points. A positive gradient means that younger people are getting proportionately more of a specified kind of education than older people; a negative gradient means the opposite.

Note from Figure 1 that for the whole population the slopes after age 20-24 are invariably downward for Secondary, Vocational and University groups and obviously so for the Post-primary group. The downward slopes indicate unbroken improvement in all types of education during the period 1900-1971, and the gradients, as defined, indicate the rapidity with which improvement was taking place in different periods.

Before the values of b were available, our hope was that the gradients would reveal differences between socio-economic groups, especially for the Post-primary group in recent years. In particular we were interested in how the lowest group 11 (unskilled manual) was progressing educationally by comparison with the other groups and with the general average. The gradients are shown in Table 5 which, together with Table 1, may be regarded as summarizing the Table 3 type data for each socio-economic group.

In a less formal way, the annual gradient can be understood as the *annual* rate at which a specified percentage is changing, within an age group, in the direction *from older to younger people.* Almost all changes observed in post-primary education show increasing participation among younger people (viz. Table 3) and the gradient formulae show such changes as positive values in Table 5. Negative values mean decreasing participation among younger people.

To estimate the aggregate change in percentage throughout the time span represented by the age group stated at the head of Table 5, it is necessary to subtract five years from the stated age-group value, before multiplying by the gradient. This is because the gradients are based on intervals between mid-

TABLE 4

RATIO OF NUMBER AT STATED EDUCATION LEVEL TO EXPECTED NUMBER, THE LATTER DERIVED FROM ALL GROUPS COMBINED AND CORRECTED FOR AGE DISTRIBUTION WITHIN THE SPECIFIED SOCIO-ECONOMIC GROUP.

SOCIO-ECONOMIC GROUP	MALE					FEMALE				
	Secondary	Vocational	Secondary and Vocational	University	Primary and not stated	Secondary	Vocational	Secondary and Vocational	University	Primary and not stated
1. Farmers, farmers' relatives and farm managers	0.660	0.613	0.355	0.125	1.191	0.818	0.887	0.580	0.219	1.126
2. Other agricultural occupations and fishermen	0.285	0.477	0.353	0.222	1.321	0.396	0.719	0.336	0.167	1.336
3. Higher professional	0.880	0.120	0.826	12.457	0.094	1.779	0.465	1.829	7.654	0.291
4. Lower professional	1.532	0.595	1.548	7.458	0.246	1.829	0.591	1.016	6.963	0.286
5. Employers and managers	2.846	0.865	2.523	2.556	0.359	2.047	1.029	2.192	1.632	0.464
6. Salaried employees	2.910	0.869	2.548	1.710	0.362	1.943	1.063	2.027	0.944	0.508
7. Intermediate non-manual workers	2.434	0.900	1.700	0.612	0.619	1.505	1.358	2.112	0.453	0.590
8. Other non-manual workers	0.904	1.084	0.845	0.124	1.097	0.739	1.098	0.543	0.130	1.194
9. Skilled manual workers	0.755	1.946	1.556	0.160	0.903	0.711	1.214	0.621	0.110	1.184
10. Semi-skilled manual workers	0.544	0.904	0.556	0.062	1.258	0.351	0.836	0.205	0.054	1.472
11. Unskilled manual workers	0.255	0.560	0.172	0.017	1.382	0.244	0.600	0.134	0.020	1.456
12. Unknown	0.668	0.422	0.449	0.445	1.113	0.901	0.763	0.696	0.534	1.059

Basic source: Census of Population of Ireland 1971, Volume XII.

Note: Ratios are those of actual numbers in each socio-economic group and each education class to the 'expected' number. The expected number is that which would be found if the *general* percentage education distribution at each age level applied to the total number in that age level in each socio-economic group, and these expected values were summed across age-levels within the group.

TABLE 5

GRADIENTS CLASSIFIED BY LEVEL AT WHICH EDUCATION ENDED, AGE GROUP, GENDER, AND SOCIO--ECONOMIC GROUP, FOR POPULATION AGED 14 OR OVER, 1971.

SOCIO-ECONOMIC GROUP	Post-primary			Secondary	Vocational		University, etc.	
	Age Groups							
	25–44	40–74	70+	20+	14–39	40+	25–74	70+
	Male							
1. Farmers, farmers' relatives and farm managers	1.206	0.354	0.110	0.256	0.782	0.073	0.020	0.006
2. Other agricultural occupations and fishermen	1.106	0.249	0.084	0.115	0.570	0.057	0.069	0.008
3. Higher professional	0.006	0.354	0.934	0.017	0.630	0.006	0.220	1.244
4. Lower professional	0.592	0.736	0.498	0.151	0.294	0.088	0.340	0.448
5. Employers and managers	0.560	1.152	1.072	0.434	-0.052	0.166	0.298	0.244
6. Salaried employees	0.602	1.122	2.272	0.615	-0.124	0.199	0.138	0.188
7. Intermediate non-manual workers	0.954	1.106	0.388	0.594	0.456	0.137	0.042	-0.078
8. Other non-manual workers	1.222	0.605	0.316	0.266	0.646	0.186	0.010	0.026
9. Skilled manual workers	1.246	0.947	0.416	0.194	1.118	0.368	0.024	0.016
10. Semi-skilled manual workers	1.222	0.454	0.232	0.174	0.582	0.143	-0.000	-0.038
11. Unskilled manual workers	0.660	0.171	0.010	0.076	0.648	0.056	0.001	0.002
12. Unknown	0.340	-0.210	0.248	-0.005	0.358	0.019	-0.026	0.024
All males aged 14 or over	1.264	0.734	0.284	0.290	0.802	0.150	0.138	0.048
	Female							
1. Farmers, farmers' relatives and farm managers	1.590	0.745	0.242	0.423	0.362	0.169	0.030	0.008
2. Other agricultural occupations and fishermen	1.538	0.443	0.078	0.244	0.296	0.120	0.033	0.010
3. Higher professional	0.248	0.733	0.766	-0.129	-0.016	0.049	0.457	0.484
4. Lower professional	0.592	0.819	0.826	0.290	0.024	0.128	0.228	0.448
5. Employers and managers	0.434	1.225	0.922	0.386	0.026	0.177	0.120	0.080
6. Salaried employees	0.638	1.351	1.036	0.488	0.234	0.196	0.056	0.100
7. Intermediate non-manual workers	1.066	1.154	1.064	0.442	0.524	0.250	0.028	0.028
8. Other non-manual workers	1.464	0.637	0.262	0.304	0.502	0.198	0.009	0.012
9. Skilled manual workers	0.918	0.834	0.212	0.299	0.192	0.236	0.006	0.024
10 Semi-skilled manual workers	0.782	0.419	0.018	0.143	0.364	0.131	-0.000	0.006
11. Unskilled manual workers	0.740	0.259	0.030	0.117	0.258	0.100	0.001	-0.000
12. Unknown	0.654	0.309	0.418	0.136	0.068	0.115	0.028	0.050
All females aged 14 or over	1.266	0.773	0.396	0.335	0.424	0.175	0.097	0.050

Basic source: Census of Population of Ireland 1971, Volume XII.

points of five-year time spans; e.g., 25-29 is used by the formula as 27.5, which is the median point of that interval. As an example, Table 5 shows a gradient of 1.246 for skilled manual workers in age group 25-44 of post-primary education. By taking mid-point intervals, we calculate that the percentage of such workers participating in post-primary education at age 27.5 years was 18.7 percentage points (1.246 x 15) higher than the corresponding percentage for those aged 42.5 years on average. The actual basic data show 56.7% for age group 25-29 and 38.2% for age group 40-44, which means an increase of 18.5 percentage points to the younger age group.

All our results are shown in Table 5. It should be emphasized that these gradients tell nothing about the *level* of education at any age; for this, reference must be made to Tables 1 and 4. Table 5 shows only rate of increase, the higher the gradient the more rapid the rate of increase. The very few minus signs (and these are attached to very low figures) show that the general picture for all socio-economic groups at all times was improvement. The most useful way to approach Table 5 is to compare each socio-economic gradient figure for each gender with the figure for *all* groups in the same column.* As we are dealing with trends in percentages (none of which can exceed 100) we expect lower gradients in sequence of high percentages than in lower. In the following paragraphs we deal separately with the different levels at which education ended. The two summary rows (all socio-economic groups) afford quantum support for the earlier remarks based on Figure 1.

Post-primary

The post-primary group synthesizes all non-primary 'enders'. In point of numbers this is by far the most important series. Of the three age gradients involved, that for the age group 25-44 is the most significant in indicating the most recent trends. One of the highest increases for men and quite the highest for women were in agricultural groups 1 and 2. We also note the substantial rate of increase compared with earlier periods. Among men in the 25-44 age range, the rate of improvement was large for socio-economic groups 8, 9 and 10; there was also substantial acceleration compared with earlier periods. Among women aged 25-44, the largest non-agricultural gradients were in socio-economic groups 7, 8 and 9, but in these cases, comparisons with previous periods are less regular than is the case with men. The nearly zero gradient for men in the 25-44 age group and the low gradient for women in the higher professional group 3 are due to the circumstance remarked about in the previous paragraph. The four percentages for men were 96.1, 96.4, 96.4 and 96.0.

* That for post-primary males aged 25-44 the gradient for the total is greater than all the constituent gradients strikes one as odd. We have carefully checked the computer results and found no error. The anomaly arises from the formula for calculating the simple regression coefficients, which contains grouping.

Though, as Table 1 shows, the post-primary level for group 11 (unskilled manual) is very low (in fact only 11% for both men and women), the gradients of improvement are also very low; at ages 25-44 gradients are 0.66 for men and 0.74 for women, little more than half the population values. It is true that both show substantial improvement compared with the other two age groups. Educationally it might appear that the poor are getting relatively poorer.

The very high gradient for salaried employee men (socio-economic group 6) aged 70 or over (i.e., educated more than a half century before 1971) and the subsequent marked decline in gradients will be noted.

Secondary

For men, gradients were marked and were highest for socio-economic groups 5, 6 and 7 (all non-manual) with agricultural (group 1) and other non-manual (group 8) groups making a fair showing. The best amongst women were groups 5 to 7 as with men but farmers, etc.(group 1) made a similar showing. The next gradients in size were those for socio-economic groups 2, 4, 8 and 9. Note that the gradient for women for all socio-economic groups is greater than that for men. Not only was the percentage of women who reached the secondary level greater than that for men (Table 1) but it was improving at a more rapid rate.

Vocational

Gradients for two age groups are provided. As for level (Table 1), the gradient of improvement is largest for skilled men (group 9) in the younger age group. The next best improvements amongst younger men are in socio-economic groups 1, 2, 3, 10 and 11, which satisfactorily include the agricultural and unskilled groups most in need of improvement. Amongst women aged 14-39, gradients are greatest for intermediate and other non-manual workers (socio-economic groups 7 and 8), no doubt reflecting the increasing demand for clerks and typists.

University, etc.

As with the Table 1 percentage levels, for men in both age groups, movement is practically confined to the higher non-manual socio-economic groups 3 to 6, in three of which the gradient declined from its value for ages 70 or over. The very large value 1.244 for men aged 70 or over in socio-economic group 3 will be noted; the value of the corresponding gradient for women is largest also. It may be stated that these high values are not small number phenomena. We cannot explain them.

EDUCATIONAL LEVEL AND GENDER

To investigate whether there was any evidence of discrimination as regards

TABLE 6

CORRELATION COEFFICIENTS BETWEEN CORRESPONDING MALE AND FEMALE GRADIENTS SHOWN IN TABLE 5 (*df*: 9)

Age	r	p
PP: 25-45	.79	<.01
PP: 40-70	.90	<.001
PP: 70+	.70	<.05
S: 20+	.81	<.01
V: 14-40	.49	NS
V: 40+	.77	<.01
U: 25-75	.70	<.05
U: 70+	.89	<.001

* Data available from Census of Population of Ireland 1966, Volume VII.

trend within socio-economic groups we calculated correlation coefficients between corresponding male and female gradients for each of the eight age classes in Table 5. These are presented in Table 6. In each case there were 11 pairs i.e., unknown (socio-economic group 12) was omitted. All coefficients are highly significant except that for Vocational at ages 14-40 where, as we have noted, from Figure 1, there was a marked difference in trends for male and female. This correlation analysis confirms lack of discrimination in education between men and women in each socio-economic group. It will be noted that this analysis of gradients is practically equivalent to a delta (Δ) analysis of the original 'level' data of Table 3. Corresponding correlation coefficients from the latter would have yielded much larger values, hence providing even stronger evidence of non-discrimination in socio-economic groups.

CONCLUSION

The main purpose of this paper was to examine the relationship in the Irish population between educational level, as reported in the 1971 Census, and socio-economic class. It was also possible from the data available to us to consider relationships between educational level and gender and age. Educational level was defined as the highest level of educational institution which an individual had attended full time. Socio-economic status was based on an eleven-group categorization of persons based on occupation, with an additional group for those of unknown occupation.

Our findings indicate that socio-economic groups differ sharply in the amount of education which they have received. Not unexpectedly, the greatest proportion of those who had received university education was found in the higher professional group. On the other hand, quite large proportions of

people who had received only primary education (or whose level of education was not stated) were found among manual workers (particularly unskilled ones) and farmers and other agricultural occupations.

When examined over time, there is clear evidence of an improvement in the level of education of the population over the past 80 years. The more recently a person was educated, the more likely he or she was to have received education beyond the primary level.

The general trend in improvement in educational level applied to all socio-economic groups. However, the rate of improvement was not similar for all groups. Neither did those most in need (i.e., with the lowest initial level of participation) always show the most rapid improvement. Thus, the number of unskilled manual workers who received post-primary education was initially low and their rate of improvement was also low. At the university level, improvement in participation was practically confined to the higher non-manual socio-economic groups.

Those engaged in agricultural employment however showed considerable improvement. These started from a fairly low base but showed high levels of increase in participation in secondary and vocational education.

We may ask is level of education reached a cause or an effect of lowly social status? Hutchinson (4; see also 1) showed in his study of a random sample of some 2,500 Dublin men that exactly half of those in the unskilled manual group were in the same lowly group as were their fathers. This means that half had descended from higher paternal social levels. The situation is therefore a mixture of social mobility and stability. Mobility, necessarily downward, may be due to inadequate level of education; stability at a low standard of education may be characteristic of lowly social status. We may safely surmise that social status may be both a cause and effect of the educational level an individual achieves though we are not in a position to estimate the extent to which it operates as a cause or as an effect.

In considering percentages for participation of males and females, we saw that for the whole population, at all times, there was no evidence of discrimination against women; the level and trend of the post-primary graphs (the complement of the primary and not-stated group) which synthesizes all post-primary experience, indicates rather the contrary. We recall, once more, that the data relate to the whole population, and not only to the working population. Decisions as to level of education of boys and girls are made in families; in general, there is no discrimination. It might appear that the university level, with 5.2% for men and only 3.5% in aggregate for women (Table 3), is an exception. This may be due to the fact of marriage; amongst women aged 24 in 1966 the percentage of single women who had attended university was 7.2; for married and widowed women it was 3.1 percent (7).

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