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Poverty and Family Background in Greece: The role of father's occupation and education

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Needless to say, I claim full responsibility for all the contents of the paper.

Abstract

This paper examines the hypothesis that the family background in Greece, is a significant factor in determining the offspring's socio-economic status as well as the probability of falling below the poverty line. The occupation and education of the father of the head of household (respondent) were used as a proxy of parental status. Similarly respondent's education is also considered, since it is crucial in transferring the economic status from one generation to the other. The use of a measure of poverty instead of income (or consumption) was based on the assumption that poverty is not affected, to the same extent as income, by individual preferences between monetary and non-monetary rewards. Therefore it could be considered as a sharper indicator than income which might show higher mobility. The analysis is based on the micro-data of a survey carried out in 1988 by the Greek National Centre for Social Research. Although simple cross-tabulations show the influence of the particular parental characteristics on respondents' attributes, Loglinear Analysis was used in order to uncover the potentially complex relationship among all the variables employed in this study. The results suggest that people are facing unequal opportunities for education and unequal probabilities of falling bellow the poverty line because of family background. This raises the question of the efficacy of educational reforms alone to reduce inequality and poverty.

1. Introduction

The aim of this paper is to examine the relationship between family background and household economic status, using data from Greece. The main assumption is that the study of inequality and poverty needs to be approached in a fashion which is more dynamic that the one usually adopted. Results may delineate novel areas for policy interventions in fighting poverty and social exclusion in Greece. The hypothesis put forward is that the family background, and in particular the parents' socio-economic status, is a significant factor in determining the offspring's opportunities for training and accessing the labour market. The low socio-economic status of the parents is thus hypothesised to be linked with the possibility of their children falling below the poverty line. Within this hypothesis, education is considered as crucial vehicle transferring a specific economic status to the next generation.

In the last thirty years, and under the influence of conventional economics, researchers have tended to neglect the influence of the socio-economic status of the family of origin on that of the unit of analysis (household, individual etc). Instead, they have focused their studies mostly on the relation between poverty (or generally inequality) and the social and demographic characteristics of this unit. From the dominant perspective of conventional economics, each individual's current economic status depends on his/her personal choices and abilities through a utility maximisation process. The equality of opportunities and the individual's knowledge of all possible alternatives are considered as given facts. No obstacles are generally recognised in obtaining the necessary training and in gaining access to jobs, education and welfare provisions. It is taken for granted that potential talents, implicit in their genetic endowments, can be turned into capabilities through training (Taubman 1978). According to this conceptualisation, earnings are largely determined by the nature of personal

choices, the latter being influenced by the level of individual intelligence.

It appears from the above that two different approaches have emerged for understanding and accounting for inequality and poverty. The impact is evident in the planning of social policies. Although this difference in views touches on a number of vital issues, education and some inter-related topics seem to be of particular importance within this difference.

From the stance of Human Capital theory and the related "earning functions", poverty is associated with low productivity from the part of the poor, a result of their inadequate education and training (Mincer 1958, Becker 1964). Economic factors, such as the difference between the cost of an additional unit of education and the expected rewards from it, are proposed as explanations to evident variations in school attendance and quality. Due to the dominance of this standpoint, the fight against poverty in many European countries and the USA was more or less exhausted in efforts to bring educational reforms such as the introduction of compulsory and compensatory education and the removal of certain barriers which were taken to be responsible for the lack of equal opportunities in training and education.

The recent increase in inequality in developed countries re-opened the long-standing debate concerning intelligence and the use of IQ measurements. Proponents of the one approach consider the performance in IQ tests as the key factor in determining inequality and poverty. Intelligence is viewed as an independent genetic factor which is not affected by the socio-economic environment of the individual in any significant way. The parental level of education is not seen as related to the educational opportunities available to their offspring. Moreover, because of the reported intergenerational immobility and the relevant stability of IQ scores across the life span even after the application of specific educationary methods, advocates of this approach support that public spending on educational policies and particularly on

compulsory and compensatory education is totally unjustified (Jensen 1969, Herrnstein 1971, Herrnstein and Murray 1994). However, a number of other theorists have criticised this view, presenting arguments against the biological basis of intelligence and challenging the link between high IQ scores and intelligence (Atkinson 1983, Bowles 1972, 1973, Bowles and Gintis 1973, Bowles and Nelson 1974).[1] Empirical studies have also shown a strong influence of family background on child abilities (Bowles, 1972, Corcoran *et al.*, 1976).[2] Recently, as a response to the Herrnstein and Murray (1994), a number of studies have contributed to this debate by challenging the validity of the authors' arguments from different theoretical and methodological angles, as well as by bringing out the failures of their empirical analysis (Fraser 1995, Hauser and Carter 1995, Goldberger and Manski 1995, Fischer *et al.* 1996).

It worth, of course, mentioning that, during that period, a number of studies attempted to investigate the intergenerational transmission of inequality and bring the issue of intergenerational consequences of family background into the research agenda (Meade 1973, Coffield 1981, Bowles 1972, Bowles and Nelson 1973, Morgenstern 1973, Atkinson *et al.* 1983,. Goldthorpe 1980, Brittain 1977).[3]

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1 Prominent psychologists, such as Gardner (1983, 1991) have argued that tests of intelligence serve as traps for students, educators, as well as theorists, who, especially in the United States, overly emphasise the technocratic aspects of education.

2 Drawing again from psychological theory and research , Bereiter (1985) has shown that the educational disadvantaged are usually defined in terms of demographic and educational variables. The impact of interpersonal experiences tents to be ignored, probably because it cannot be readily abstracted and measured. Research has shown that effective schools are determined less by students and their aptitudes and more by parental and teacher support, involvement and the transmission of high expectations (see Ascher 1988, Brookover 1985, Comer 1988, Damon 1990).

3 The majority of these studies give emphasis to the indirect influence the family background has on earnings through the effect on one's education (Corcoran *et al.* 1976, Psacharopoulos 1977, Bowles 1972, Morgenstern 1973, Manski 1992). Due

Equality of opportunity has been called into question as far as race, ethnic and gender discrimination are concerned and in some countries this has led to the introduction of affirmative action policies. As a rule, however, the role of family background has not been a priority in the research agenda. Fortunately, the issue of equal opportunities has recently obtained a status of priority, especially within EU social policy interventions, due to the interest attracted by debates on social exclusion and marginalisation. The time is, therefore, right for shedding more light into the relationship of family background to equality of opportunities, especially in connection to inequality and poverty.

It has to be observed that people with socially and economically privileged parents usually earn more than people with less privileged parents. As Corcoran *et al.* wrote: *"There is no reason to suppose that men with privileged parents have a stronger preference for cash, as against psychic income, from their work. If anything, the contrary seems likely"* (Corcoran *et al.*, 1976: 430). Meade argues that even in a fully competitive, *laissez-faire* society with unrestricted mobility, personal income may continue to be unequal because citizens are not equally endowed. *"A citizen in a laissez-faire competitive society would receive certain endowments from his parents which could help to determine the amount of income which could earn and property he could accumulate during his own lifetime. This in turn would affect the endowments which he could hand on to his children"* (Meade,

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to lack of sufficient longitudinal data, many of these studies used certain parental characteristics and in particular father's education and occupational status as a proxy for the background and the income of the family of origin (Bowles 1972, Psacharopoulos 1977, Treiman and Hauser 1977, Papanicolaou and Psacharopoulos 1979). On the other hand some of the studies used more detailed information on family background based either on follow-up studies (Atkinson *et al.*, 1983) or on longitudinal data (de Wolff and van Slijpe, 1973, Gustafsson 1980, Solon *et al.*, 1991, Peters 1992). Similarly, sociological research on social, occupational and educational mobility, based on class analysis, puts emphasis on how the parental socio-professional status could explain their offspring's status (Goldthorpe 1980, Halsey *et al.*, 1980).

1973: 4). Among those endowments that a person inherits, Meade recognises property, the level of education and training (years of schooling, quality of schools etc.) as well as the "social contacts" he makes with other persons who are *"...affected by the social background into which he has born"* (Meade, 1973: 5).

It is not suggested here that the importance of personal characteristics is trivial in determining one's economic status. What is emphasised is the need for a more dynamic approach in tackling the issue of inequality and poverty. In practice, this means the broadening of our frame of reference to account for factors that may have a direct or indirect influence on what appears to be personal attributes.

2. Methodological Issues

This paper examines the relation between the educational and occupational status of the family of origin and the probability of falling above or below the poverty line. Having formed certain assumptions, the critical level of income in order to define the poverty line was taken to the half of average equivalent household income. The choice of poverty instead of income as the variable of interest is based on the hypothesis that family background does not strictly affect income, but rather one's opportunity to choose between activities with different monetary and non monetary awards. Bowles (1972) has pointed out that *"The income received by an individual is thus the result of a choice - a choice constrained by what could be called the occupational opportunity set... There is considerable evidence that rich, high-status parents place a larger value on the non monetary aspects of work and a lower value on monetary returns than poorer, lower status parents"* (Bowles 1972: S238). Thus poverty could be a sharper indicator of the influence that family background has on personal choices than income, which might show higher mobility. To illustrate this point further, one could easily imagine the offspring of a wealthy family choosing the academic field instead of the managerial (or industrial), even

though the former would normally offer less monetary awards. The same person, however, would not intentionally fall bellow a certain consumption level that would place him/her among the poor.

In beginning to think about methodology, the difficulties encountered were in regard to two questions; first, how to define parental background using empirical data and, second, how to select those parental characteristics that are most representative of parental status and may at the same time affect children's future economic status. The scarcity of available statistics partly simplified this task (see section on data). For the purpose of this study, analysis was confined to the use of father's education and occupation[4]. The critique may be that family background includes a variety of other factors which may play a significant role in children's future economic status. It is undoubtedly true that these parental characteristics are only a proxy of the economic status of the family. Unfortunately, even if information on the income of both parents were available, assessing their economic status would be impossible, since there are no reliable distribution statistics for Greece before the '70s.[5]

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4 Papatheodorou and Piachaud (forthcoming) also investigated the influence of the mother's educational level. Mother's education was found to have an influence, similar to father's education, on children's education and poverty. Furthermore mother's education appeared to be strongly associated with father's attributes and in particular, education. Therefore, when the mother of the respondent was better educated, it was highly probable that the father was better educated too. Given this, the result represents the cumulative effect on respondent's attributes of both parents being better educated. Similarly, when the father was little educated it was almost certain that the mother was little educated too and thus the result represents the cumulative effect of both parents being little educated. Therefore in order to simplify the analysis - since it does not affect the aims of this study in any significant way - we chose not to use the mother's education.

5 The lack of longitudinal data and panel surveys in Greece have put serious limitations in analysing the influence of parental characteristics on their children status and is common to all the studies in the area (Kasimati 1980, Karagiorgas *et al.* 1990, Psacharopoulos and Kazamias 1985, Tsakloglou 1990).

Similar difficulties were encountered in choosing the key characteristics of the head of household (where household is the unit of analysis) which may be affected by the parental background, and in accounting for the influence of other household members' features. Given the restrictions imposed by the lack of sufficient data, the choice of educational level of the head of household as a key personal characteristic in examining the influence of family background, is in line with the aim of this study. We should note that the study's aim is to examine the causal relationships between specific parental and respondent's attributes and to investigate their association and interaction. This present study does not hope to paint the complete picture of the influence of family background on individual status.

3. The Data

The study uses the micro-data of the 1988 sample survey, conducted as part of the second European Antipoverty Programme by the Greek National Centre for Social Research.[6] This survey was designed to provide a national sample from the population resident in private households. Excluded from the sample were individuals living in institutions, health care units, hotels etc. Households with foreign members were included, providing they were in possession of a residence permit. The unit of analysis was the household and the general sample fraction was 1/1000 based on 1981 Population Census. The sample classification criteria were the Regional Developmental Areas (YPA) and the degree of Urbanisation (urban, semi-urban and rural areas). The total sample comprised 3,112 households. In 2980 households interviews were successfully conducted (response rate 95.6%).[7] Refusal to

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6 This survey was conducted by Yfantopoulos, J., Balourdos, D., Fagadaki, E., Kappi, C., Kostaki, A., Papaliou, O. and Papatheodorou, C. (Yfantopoulos *et al.*, 1989, Deleeck *et al.* 1991). The data used in this study are the unpublished raw data.

7 This response rate is considerably higher than similar surveys in other

participate, absences or listing errors were the main reasons why interviews with the remaining households were not completed.

We defined the household as a group of people who live under the same roof, share food and a common budget. In the case of both married and cohabiting heterosexual couples, the head of household was assumed to be the man, except when he was seriously incapacitated. In all other cases, the head of household was named by the family members. Thus 493 household were monitored as headed by women. These women were often widowed, divorced, single or wives of emigrants and sailors. In this present study these latter households have been excluded. Excluded have also been 30 household which did not fill in the questionnaire section on income. Finally 30 more questionnaires were also excluded because of missing or insufficient information on occupation and education of the father of the head of household. Thus, the total number of cases used in this study is 2427.

The poverty line is defined by the use of household disposable equivalent income. This is the total (monetary) income from all sources from all members of the household, after taxes and social security contributions. The equivalence scale used in order to make comparable households with different sizes is the scale C proposed by O'Higgins and Jenkins (1990) and recommended by OECD in its work on Social Indicators. According to this scale the first adult in each household has a weight of 1.0 and each additional adult a weight of 0.7 and each child of 0.5.

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countries as well as with the sample surveys of the rest of the countries in the framework of the same programme (Atkinson and Micklewright, 1983, Deleeck *et al.*, 1991). Nevertheless these high response rates are not unusual in Greece. Thus in Greek Family Expenditure Surveys the non-response rates are below 10%. The European Community Household Panel Survey also gives similar figures of non-response rate for Greece (Eurostat 1996). In addition in this survey particular efforts were made in order to achieve a high response rate.

In trying to assess the family's of origin socio-economic status we sought information on the longest-practised job (occupation) and educational level of the father of household.[8]

4. Family Background, Education and Poverty

In order to investigate the relationship among the particular characteristics of the family of origin and the characteristics of the family of the respondent we first constructed some basic cross-tabulations. Table 1 shows the association between the education of the head of household and poverty. At a first glance the strong relationship between educational level of heads of household with the poverty rates is apparent. When the head of household had "no primary" education the poverty rates were considerably higher than for those with "primary" education; poverty rates fell dramatically for those with "secondary " and "higher" education. Another way to look at these differences is by calculating the relative odds-ratio. Thus the households with the head in the category "no primary" education are 22.4 times more likely to fall below poverty line than those whose head of household is in the category "college" and 8.4 times those in category "secondary" education.[9]

The above results are rather as expected, despite the sharp differences in poverty rates among educational categories.

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8 In case the respondent on the father's longest-practised job only, this response could have been misleading for the purpose of this study. The longest-practised occupation is not necessarily the occupation that the father had during particular period of respondent's life, i.e. when the respondent was young, which might consider a better indicator on the influence that father's status had.

9 It is clear that the more educational categories we use the more detailed information on the differences on poverty rates we could have. Thus, as reported in Papatheodorou (1991) there are substantial differences between lower and higher cycle of secondary education and the university and non university higher education categories, as far as the household income is concerned. Despite this drawback, the shortening of educational categories is considered necessary where the sample is not big enough and according to the type of tabulation, if we want to avoid a very small number of observations in particular subcategories.

They indicate the strong association between poverty rates and educational level of the head of household.

Table 1: Poverty by educational level of the head of household

	Educational Level of the Head of Household				
	No Primary Education	Primary Education	Secondary Education	Higher Education (College)	Total
Poor (%)	41.4	28.5	7.7	3.1	23.0
Not Poor (%)	58.6	71.5	92.3	96.9	77.0
TOTAL	100.0	100.0	100.0	100.0	100.0
(N)	(379)	(1242)	(479)	(327)	(2427)

$\chi^2 = 230.482$ DF 3 Significance 0.0000

When the relationship between poverty rates according to the educational level and occupational status of the father of the head of household is examined, a similar picture appeared. Poverty rates are clearly associated with the educational and occupational level of the father. In Table 2 the association between father's educational level and respondent's poverty rates is presented.

Father's educational level appears to affect poverty rates in the same way as the education of respondent, though not so sharply. The category "no primary" education had the higher poverty rates and contained the 61% of the total number of households below the poverty line. The poverty rates among the households with the father of the head in "no primary" education was 30.2 % while the relevant figure among those with a father in "higher" education was only 1.3%. Thus the household with the father of the respondent in category "no primary" education is 33.7 times more likely to be poor than the household with the father in category "higher" education

and 4 times more likely than those in category "secondary" education. Or, it is 0.03 times less likely for a household to become poor when the father of the head of household has a "higher" education than a "no primary education".

Table 2: Poverty by educational level of the father of the head of household

	Educational Level of the Father of the Head of Household				
	No Primary Education	Primary Education	Secondary Education	Higher Education (College)	Total
Poor (%)	30.2	18.6	9.7	1.3	23.0
Not Poor (%)	69.8	81.4	90.3	98.7	77.0
TOTAL	100.0	100.0	100.0	100.0	100.0
(N)	(1130)	(1094)	(124)	(79)	(2427)

$\chi^2 = 78.089$ DF: 3 Significance 0.0000

Similarly the occupation of the father has a clear influence on poverty rates of the household of the respondent. In Table 3 we classify father's occupation into three categories;[10]

10 At a first glance this classification of occupations, especially category I, may be seen as not particularly successful and further refinement of these categories could be suggested. Clearly, under the restrictions imposed by the available statistical data, the more occupational categories we use the more detailed information we could have. Papatheodorou and Piachaud (forthcoming), using the same micro-data, separated the "clerical, tradesmen and salesmen" from the "professionals and administrative executives" in order to refine the occupational categories. On the one hand it appeared that the performance of "clerical, tradesmen and salesmen" - as far as the influence of father's occupation to respondent's poverty and education is concerned - was more similar to that of the category of "professionals and administrative executives" than any other occupational category. One explanation for this is that the category of "professionals and administrative executives" is not very homogenised and incorporates occupations with very different monetary awards and skills, although they are classified in the same group.

Category I: Professionals, Administrative Executives, Clerical, Tradesmen and Salesmen,
Category II: Craftsmen, Labourers, Service Workers,
Category III: Farmers.

Table 3: Poverty by occupation of the father of the head of household

	Occupation of the Father of the Respondent			
	I	II	III	TOTAL
Poor (%)	9.0	18.0	29.3	23.0
Not Poor (%)	91.0	82.0	70.7	77.0
TOTAL	100.0	100.0	100.0	100.0
(N)	(389)	(651)	(1387)	(2427)

$\chi^2 = 83.187$ DF 2 Significance 0.0000
I : Professionals, Administrative Executives, Clerical, Tradesmen and Salesmen.
II : Craftsmen, Labourers, Service Workers
III : Farmers

There is an obvious association between poverty rates and father's occupation. The highest poverty rates appeared when the father was a farmer and the lowest in category I. Therefore 72.8% of the fathers of heads of all households below the poverty line were "farmers". Households with the father of the head in category III are 4.2 times more likely to be poor than

On the other hand these occupational categories contained the smallest number of cases which makes further sub-division rather problematic. Therefore, in order to avoid considerably small number of observations or empty sells, in particular sub-categories - since it does not violate the main aims of the study - it was decided this shortening of the occupational categories. The classification of the father's occupation in these categories is based on the methodology and definitions followed by Panagiotopoulou (forthcoming) who also used the same micro-data.

households with the father in category I and 1.9 times more those in category II. In other words a household is 0.24 times less likely to fall below the poverty line when the father of the head is in occupational category I than in occupational category III.

The above cross-tabulations suggest a clear association between parental characteristics and the probability of one household being below or above the poverty line. Why should that be the case? Undoubtedly, the educational level and occupational status of the father affect the educational level of his children. Indeed the educational level of the father, as presented in Table 4, is significantly related to the educational level of the head of household. The value of gamma is 0.649, which denotes a rather strong positive association between them. Thus the education of the father remains a strong determinant factor of the child's education.

Intergenerational mobility is apparent, however, in education. Two - non mutually exclusive - explanations may be suggested for this type of mobility. One is that, since the Second World War, the rapid changes that took place in the structure of Greek economy had a great impact on the division of labour and the nature of socio-economic activities (Karagiorgas *et al.*, 1990). This, in turn, created mobility in education, since changes in the occupational structure demanded educational adjustments to the new needs that emerged. Another explanation is also that educational reforms and compulsory education improved the population's educational level. (Kasimati, 1980)

Table 4: Households by educational level of the heads of household and the educational level of their fathers

Educational level of the respondent	Educational Level of the Father of the Respondent				
	No Primary Education	Primary Education	Secondary Education	Higher Education (College)	Total
No Primary Education (%)	27.3	6.5	0.0	0.0	15.6
Primary Education (%)	57.7	51.2	17.7	10.1	51.2
Secondary Education (%)	10.6	26.0	39.5	32.9	19.7
Higher Education (%)	4.4	16.4	42.7	57.0	13.5
TOTAL	100.0	100.0	100.0	100.0	100.0
(N)	(1130)	(1094)	(124)	(79)	(2427)

$\chi^2 = 616.359$ DF 9 Significance 0.0000
Gamma = 0.64902

It seems that under conditions related to modifications in Greek socio-economic activities, upward social mobility became an important issue for Greek families. Investing on the education of their children was, therefore, given high priority (Tsoukalas, 1986, Tsoukalas and Panagiotopoulou, 1992)[11]. Despite that, family background seems to put barriers in educational mobility. The majority (57%) of the respondents whose fathers had "no primary" education moved into the next

11 Petmesidou argues that the middle classes' families in Greece, despite the efforts put on their children's education, doubt meritocracy as far as the efficacy of education alone in social and economic success is concerned. On the contrary they tend to put more emphasis on access to the centres of power that someone could have. Therefore, although they recognise the value of education as a social status, they tend instead to consider the educational degrees as a poor substitute for the economic and social capital they do not have. (Petmesidou 1987).

educational category (primary). This might be seen as the result of introducing compulsory education up to this level. Only 4.4% managed to have a University degree while 27.3% were with "no primary" education. By contrast, none of the respondents whose fathers are found in the educational categories "secondary" and "university" appear with "no primary" education, while the majority appear to be in the "higher" education category themselves. In our view, this clearly illustrates that people face unequal opportunities in education because of their families' background.

In addition, as Table 5 shows, sons' educational level also has a strong relationship with their fathers' occupation. The majority of the households with the respondent's father in the category "farmer" had only "primary" education; overall 80.6% of them remained in the category "up to primary" and only 7.0% of them manage to be in the "higher" educational category. By contrast 32.6% of the respondents with the father in occupational category I (administrative executives, professionals, traders, clerical etc) appear to be in the "higher" educational category.[12]

12 In addition a number of studies also showed the unequal probabilities of access to the university education that people face in Greece, because of their family background (Psacharopoulos and Kazamias 1985, Fragoudaki 1985, Chrysakis 1991, 1996). Furthermore, as Chrysakis argued, during the period 1978 to 1988, these inequalities of access increased significantly, especially as far as the influence of the father's education is concerned (Chrysakis 1991, 1996).

Table 5: Households by respondent's father occupation and respondent's educational level

Educational Level of Respondent	Occupation of the Father of the Respondent			
	I	II	III	TOTAL
No Primary Education (%)	4.6	10.1	21.3	15.6
Primary Education (%)	31.1	45.9	59.3	51.2
Secondary Education (%)	31.6	28.1	12.5	19.7
Higher Education (%)	32.6	15.8	7.0	13.5
TOTAL	100.0	100.0	100.0	100.0
(N)	(389)	(651)	(1387)	(2427)

$\chi^2 = 362.905$ DF 6 Significance 0.0000
I : Professionals Adm. Executives, Clerical, Tradesmen and Salesmen.
II : Craftsmen, Labourers, Service Workers
III : Farmers

Clearly then, our evidence does not support pure versions of the "human capital" hypothesis of equality of opportunities. There are differences in patterns of continuing education among individuals which are clearly related to their parental status. As Piachaud argues *"Economists have, under the influence of the "human capital" school, tended to look at problems in terms of narrowly defined rates of return and paid too little attention to the actual circumstances of individuals and families and the choices, often all too limited, facing them. Yet, until the economic barriers to equal opportunity are understood and removed there can be little prospect of reducing educational inequality"* (Piachaud, 1975: 212).

Could the influence of father's education and occupation on respondent's educational level explain the association between those parental characteristics and poverty rates? Do

these parental attributes have any other direct effects on the household's risk of poverty?

In Figure 1 poverty rates according to the educational level of heads of household and their fathers are presented. To simplify we use only two educational categories "up to primary" education and "secondary and college" education. As can be seen, poverty rates among households, whose heads have the same educational level, vary according to the educational level of their fathers. Thus among households in which education of the respondent was "up to primary" those with fathers in "up to primary" educational level have higher poverty rates than those with fathers in "secondary and university" category. In other words the households with the respondent in "up to primary" category are 1.6 times more likely to be below the poverty line when their father is in "up to primary" level in comparison with those with a father in "secondary and university" level. Among those with the respondent in "secondary and university" level those with the father in category "up to primary" is twice as likely to fall below the poverty line than those with the father in "secondary and university" level.

Similarly, as it is illustrated in Figure 2, poverty rates among households with the same educational level of the head of household vary considerably according to the occupational status of their fathers. Indeed, the households with the respondent's education in the level "up to primary" are 2.1 times more likely to be poor when the occupation of their father is in category III (farmers) than in category I. The differences are sharper among households with respondents' educational level "secondary and college". Those with a father in category farmer are 2.8 times more likely to fall below the poverty line than those with a father in category I. In other words among the households in which the education of the respondent was in "secondary and college" category, those with a father in occupational category I were 0.36 times less likely to be poor than those with a father in category III.

Figure 1: Households in poverty according to respondent's and father's educational level

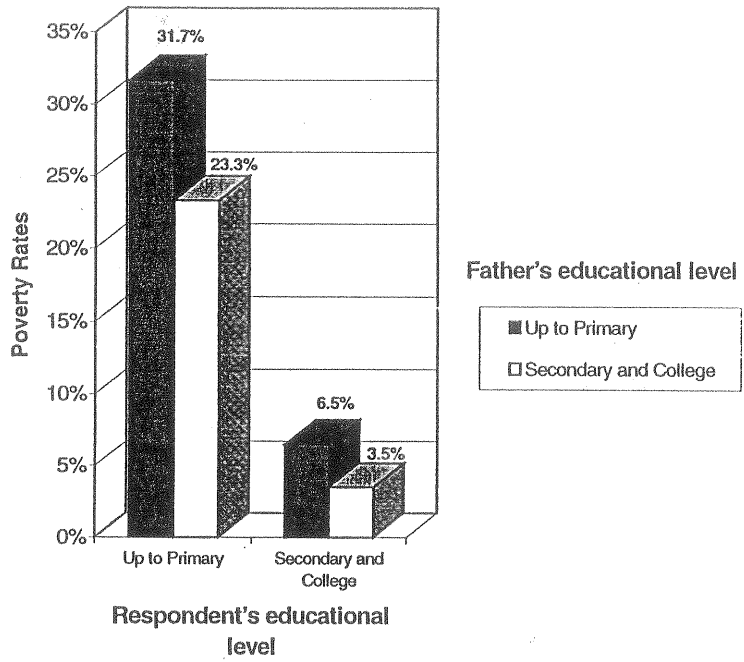
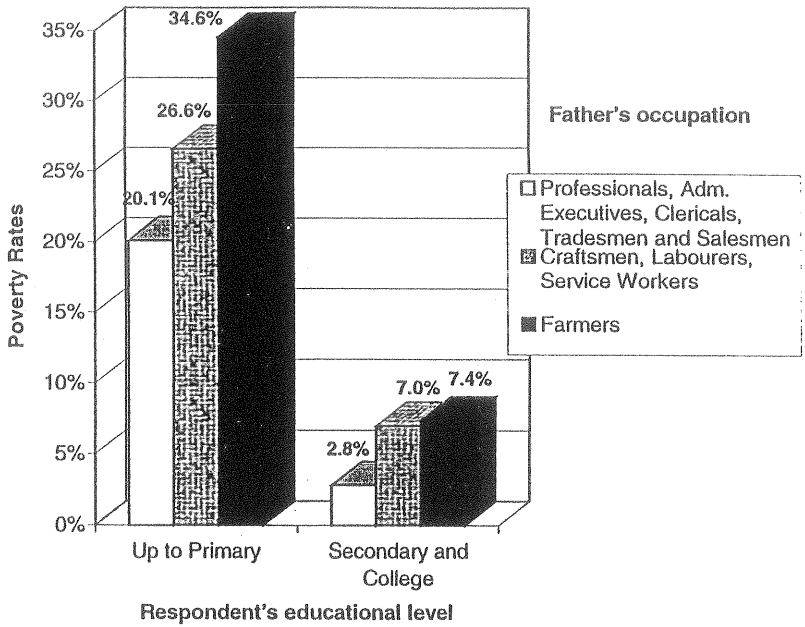


Figure 2: Households in poverty according to respondent's father's occupation and respondent's educational level



The above results suggest that father's occupation and educational level affect the probability of a household falling below the poverty line, not only indirectly, through the influence on respondent's educational level, but also directly.

5. A Model of the Effect of Family Background

So far we examined the relationships between poverty and particular characteristics of the family's of origin background and the head of household. It is obvious that, although we restricted our analysis to these attributes, we have investigated only a number of the possible associations and interactions among them. A lot of the potential complex relationships

among these variables have not been investigated. Thus we found that for a given level of the education of the respondent, the probability of being in poverty depends on his father's education. Does this indicate a causal connection? Could the father's educational level affect poverty rates through the effect on father's occupational status or the other way round? Do these attributes interact? In order to uncover the potentially complex relationships among those variables, given that all are categorical, we make use of log linear analysis.[13]

We consider a four way contingency table formed by the following variables:

- Poverty (P) - coded 1 if household is below the poverty line and 2 if household is above the poverty line (i=1,2).
- Respondent's education (E) - classified in two categories, 1 "up to primary" education and 2 "secondary education and university" (j=1,2)
- Fathers education (S) - the same categories as respondent education (k=1,2)
- Fathers occupation (O) - we distinguish 3 categories 1: professionals administrative executives, clerical, tradesmen and salesmen, 2: craftsmen, labourers, service workers and 3 Farmers (l=1,2,3)

The expected frequencies m_{ijkl} in each cell could be expressed with the following loglinear equation.

$$\log m_{ijkl} = \mu + \lambda_i^P + \lambda_j^E + \lambda_k^S + \lambda_l^O + \lambda_{ij}^{PE} + \lambda_{ik}^{PS} + \lambda_{il}^{PO} + \lambda_{jk}^{ES} + \lambda_{jl}^{EO} + \lambda_{kl}^{SO} + \lambda_{ijk}^{PES} + \lambda_{ijl}^{PEO} + \lambda_{jkl}^{ESO} + \lambda_{ikl}^{PSO} + \lambda_{ijkl}^{PESO}$$

where μ is the grand mean, λ_i^P the effect of attribute i of the characteristic P and λ_{ij}^{PE} the joint effect of i and j attributes of the characteristics P and E.

13 Agresti (1990), Kennedy (1992), Gilbert (1993).

We follow a notation used for hierarchical models, which contain all the lower-order relatives. Thus for the above saturated model the notation will be [PESO].

Our purpose is to find a suitable and parsimonious loglinear model, that provides a good fit of the data[14]. The test of the hypothesis that a particular model fits the observed data is based on the log likelihood ratio statistic (G^2) which has an asymptotic chi-square distribution (Argesti 1990).[15] The first step of our analysis is to test the hypothesis of the absence of the Kth and higher order interaction terms. Table 6 gives the estimated significance level that Kth and higher order effects are 0. The observed significance level for the test that third and higher order terms are 0 is large (0.4222) and thus the hypothesis that third and fourth order interactions are 0 should not be rejected.

Table 6: Test that all k-way and higher interactions are zero

K	DF	G^2	Prob.	Interaction
4	2	3.350	.1873	3
3	9	9.165	.4222	5
2	18	1070.231	.0000	2
1	23	4708.225	.0000	0

The results of Table 6 show that an adequate model to represent the data will include no higher than 2-order interaction terms. This, however, does not mean that all 2-order effects are present. Thus the next step is to test the individual terms. In order to do this the "partial chi-square" is used.[16]

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14 SPSS Model Selection Loglinear Analysis is used (Norusis, 1994).

15 $G^2 = 2\sum_i \sum_j \sum_k \sum_l f_{ijkl} \log(\frac{f_{ijkl}}{m_{ijkl}})$

were: f_{ijkl} the data cell frequencies, m_{ijkl} the estimated (model) cell frequencies and log is the natural logarithm.

16 The "partial chi-square" is the difference between the two likelihood ratio

Table 7 shows the importance of the various interaction terms, testing the partial association for the various orders less than or equal to 2.

Table 7: Partial chi-squares

Effect	DF	Partial Chisq	Prob.	Interaction
P*S	1	.362	.5475	5
P*E	1	159.046	.0000	5
S*E	1	103.020	.0000	5
P*O	2	20.295	.0000	5
S*O	2	219.239	.0000	5
E*O	2	134.472	.0000	4
P	1	747.396	.0000	2
S	1	1968.641	.0000	2
E	1	279.072	.0000	2
O	2	642.885	.0000	2

The examination of this table suggests that the only association than could be excluded is the [PS]. The best fitting model is the [PE] [PO] [SO] [ES] [EO] which includes all the two-pair associations and the lower order relatives except the association [SP]. Thus the selected model that fits the data is the following:

$$\log m_{ijkl} = \mu + \lambda_i^P + \lambda_j^E + \lambda_k^S + \lambda_l^O + \lambda_{ij}^{PE} + \lambda_{il}^{PO} + \lambda_{jk}^{ES} + \lambda_{jl}^{EO} + \lambda_{kl}^{SO}$$

The model fits very well with a G^2 = 9.52636 at 0.483 significance level.[17]

statistics for the model with and without the effect that is tested. The partial chi-square has also a chi-square distribution (Norusis, 1994).

17 Another way to select the best fitting model is by backward elimination or forward selection. In Annex I the model selection using backward elimination is

Table 8: Parameter estimates for loglinear model

Lamda				Asymptotic 95%	
Parameter	Estimate	SE	Z-Value	Lower	Upper
Constant (Grand mean)	2.5159	0.2327	10.81	2.06	2.97
E=1	-0.9149	0.2230	-4.10	-1.35	-0.48
S=1	2.9493	0.2360	12.50	2.49	3.41
O=1	2.2821	0.2423	9.42	1.81	2.76
O=2	0.9432	0.2745	3.44	0.41	1.48
P=1	-2.4570	0.1636	-15.02	-2.78	-2.14
(E=1)*(S=1)	2.0392	0.2159	9.45	1.62	2.46
(E=1)*(O=1)	-1.3055	0.1419	-9.20	-1.58	-1.03
(E=1)*(O=2)	-1.0335	0.1096	-9.43	-1.25	-0.82
(P=1)*(E=1)	1.8132	0.1638	11.07	1.49	2.13
(S=1)*(O=1)	-2.9622	0.2528	-11.72	-3.46	-2.47
(S=1)*(O=2)	-0.9380	0.2811	-3.34	-1.49	-0.39
(P=1)*(O=1)	-0.8270	0.1962	-4.21	-1.21	-.44
(P=1)*(O=2)	-0.3261	0.1236	-2.64	-0.57	-0.08

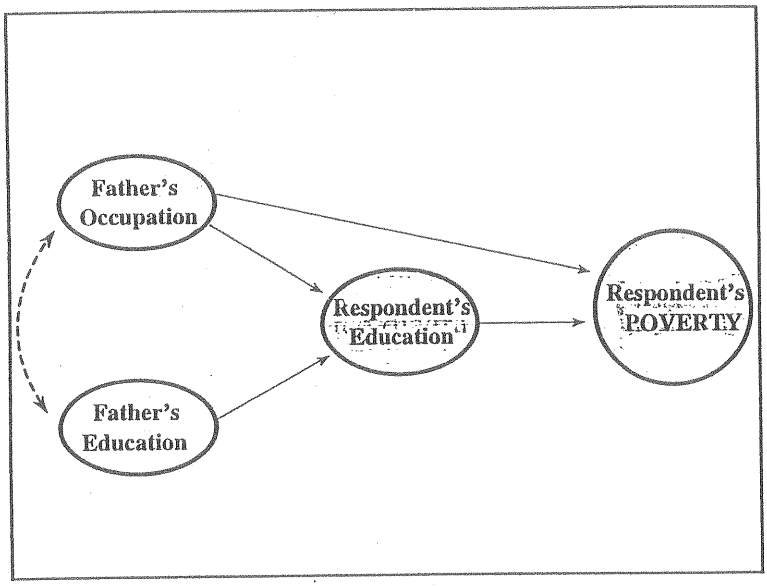
In Table 8 the estimates for the lambda parameters are presented. All the estimated coefficients have a value of $|z|$ which exceeds 1.96 and thus they can be considered significantly different from zero at the 0.05 level. The lambda parameters are simply the logarithms of the odds for the main effects and the odds ratios for the interactions for the estimated frequencies.[18]

presented.

18 The lamda parameters have been estimated using SPSS: General Loglinear Analysis. In order to give a frame of reference this procedure estimate the lamda parameters setting some of the lamda parameters to 0. In the above estimates all the effects involving the last category are set to 0. Therefore the parameters for P=2, S=2, E=2 and O=3 are set to 0. Thus the parameter estimate for P=1 uses the P=2 as a

According to this model, all the two way associations are significant except that of between Poverty and Father's Education [PS]. Each of the above associations is conditionally dependent, given the other two variables. The above associations are interpreted diagrammatically in Figure 3.

Figure 3: Diagram showing the relationship between father's occupation and educational level and their sons' education and probability of falling below the poverty line



As expected, the education of the respondent has a strong direct effect on the probability of the household being below the poverty line independently of his father's education and occupation.[19] The λ_{11}^{EP}= 1.8132 shows that a household is more

frame of reference etc. Since the lamda parameters are the log of the odds or the odds ratios (see note 20), we can easily estimate, from the figures provided in the table 8, all the other lamda parameters, with different points of references.

19 We do not discuss the main effects because they have already been presented in the cross-tabulation. Thus the λ_1^P= -2.457 shows that a household, with a respondent in "secondary and college" educational category and the respondent's

likely to be poor when the respondent's education is "up to primary" than when it is "secondary and college" education. This lambda parameter corresponds to an odds ratio of 6.13, which means that the odds of a household being below the poverty line with the respondent in "up to primary" is more than 6 times the odds for a household with the respondent in "secondary and college" educational category.[20]

Father's education is associated with father's occupation but it does not have any significant direct effect on poverty independently of the other variables. It thus influences poverty through its association with father's occupation and respondent's educational level. Indeed the father's educational level has a strong direct effect on his son's education. Thus, the λ_{11}^{SE} equal to 2.0392 shows that the heads of household are more likely to be little educated when they come from little educated fathers than from better educated. The corresponding odds ratio of shows that it is 7.68 times more likely a son to have an "up to primary" education when the father has an "up to primary" education too than "secondary or college". In addition father's occupation and educational level are associated. Fathers are less likely to have "up to primary" education when they are in occupation categories I and II than category III (farmers). Thus if the father has "up to primary" education the odds of being in occupational category I is only 0.051 times the odds of being in category III (farmer). Similarly, within the same educational level, the odds of being in category II is 0.391 times the odds of being farmer.

Father's occupation is directly associated with the probability of the household being below the poverty line, independently of the other variables. Thus, given a

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father farmer and in "secondary and college" educational category too, is more likely to be non poor than poor.

20 The lamda parameters are the logarithms of the odds and odds ratio. Therefore we can convert them to the relevant odds and odds ratio by taking the exponential of the lamda parameters. Thus ie the $\lambda_{11}^{EP} = 1.8124$ corresponds to odds ratio 6.12513 since exp(1.8124)=6.12513.

respondent's and his father educational level, father's occupation affects the probability of a household being poor or not. The $\lambda_{11}^{PO} = -0.8270$ and $\lambda_{12}^{PO} = -0.3261$ denote that households with the father in occupational category I or II are less likely to be poor than the households in category III. The corresponding odds ratio shows that the odds of a household falling below the poverty line with the father in category I is only 0.437 times the odds of a household with the father in category III. Similarly the relevant odds ratio for those in category II is 0.721. Thus the household with a farmer father is 2.3 times more likely to be poor than the household with father in category I and 1.4 times those with a father in category II, independently of the other variables. Additionally fathers' occupation influences their sons' educational level and thus have an indirect effect on the probability of the household being poor. It is 0.271 times less likely the respondent to have an "up to primary" education when the father's occupation is in category I than in category III. Similarly the respondent with "up to primary" education is 0.356 times less likely, than a respondent with "secondary and college" education, to have a father in occupation category II than in category III. In other words it is 3.69 times more likely for a respondent to have an "up to primary" education than "secondary and college" when his father is farmer than in category I.

6. Conclusions

In this paper the hypothesis that the family background plays a significant role in determining the probability of being below the poverty line is examined. The poverty line is considered a sharper indicator than income in investigating the influence of family background. The information used for defining the family of origin's socio-economic status is the education and occupation of the father of the head of household. Although simple cross-tabulations show the influence of the particular

parental characteristics on respondents' attributes, we made use of Loglinear Analysis in order to uncover the potentially complex relationships among those variables.

The analysis shows that the background of the family of origin is related with the probability of the household falling below the poverty line. More specifically, the education of the respondent seems to be a particularly strong predictor of poverty. Father's education is associated with father's occupation but it does not have any significant direct effect on respondent's poverty independently of the other variables. Father's education is, however, a strong predictor of respondent's education and is associated with the father's occupation. The probability of a respondent having little education is significantly higher if his father has had little education too. Father's education does not influence the respondent's probability of falling below the poverty line directly, but it does so indirectly, through the significant effect on respondent's education and the association with father's occupation. Father's occupation has a strong direct effect on respondent's poverty independently of the other variables. Households with respondents' fathers who were professionals, administrative executives, clerical, tradesmen or salesmen are less likely to fall below the poverty line in comparison with those whose fathers were craftsmen, labourers or service workers, and considerably less likely than those with fathers who were farmers. In addition, it has an indirect effect on poverty through the association with the respondent's education.

The above results show a clear causal relation between particular parental characteristics and respondent's attributes. Differences in family background result in people facing unequal opportunities for education and unequal probabilities of falling below the poverty line. These results suggest that there is a continuity in poverty and economic inequality across generations.

Annex 1

The backward elimination starts with a hierarchical model (or the saturated model) and then removes step by step all the effects that result in the least significant change in the likelihood-ratio chi-square (Norusis 1994, Gilbert 1993). In order to fit the best model variable selection algorithms are used, based on log likelihood ratio (G^2) statistics.[21]

Table: Selection of the model fitted to data with backward elimination

Model	G^2	DF	p
[PES][PEO][PSO][ESO]	3.35020	2	0.187
[PEO][PSO][ESO]	3.35011	3	0.341
[PEO][ESO][[PS]	3.45004	5	0.629
[PEO][ESO]	3.78627	6	0.706
[ESO][PE][PO]	5.41233	8	0.713
[PE][PO][SO][ES][EO]	9.52636	10	0.483

The best fitting model is the [PE] [PO] [SO] [ES] [EO] which includes all the two pair associations and the lower order relatives except the association between [SP]. The model fits very well with a G^2 = 9.52636 at 0.483 significance level. Thus the selected model that fits the data is the following:

$$\log m_{ijkl} = \mu + \lambda_i^P + \lambda_j^E + \lambda_k^S + \lambda_l^O + \lambda_{ij}^{PE} + \lambda_{il}^{PO} + \lambda_{jk}^{ES} + \lambda_{jl}^{EO} + \lambda_{kl}^{SO}$$

21 SPSS Model Selection Loglinear Analysis is used for the backward selection (Norusis, 1994).

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