A New Measure of Social Position:

Social Mobility and Human Capital in Britain

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ABSTRACT

This paper develops and applies the "Essex Score" approach to classifying life chances. This is in essence a class measure, insofar as it identifies the extent of access (of individuals and households) to those resources which determine the distribution of economic power within the society. However it consists, not of distinct categories, but of a continuous indication of "human capital", constructed as a composite of education, recent work experience and occupational attainment. Its theoretical basis is straightforward; the mechanisms which connect these characteristics together, and which associate them with life-outcomes, can be simply and clearly specified. Its practical advantages include: its comprehensiveness of coverage across the population irrespective of past and present employment status; and its continuous measurement, which allows aggregation from individual to household levels of measurement, as well the sensitive investigation of the determinants and consequences of changes in social position during the life-course.

The Essex Score is designed as a tool to investigate patterns of differentiation in life-chances. However the illustrative application that follows focuses more specifically on the study of social mobility. It brings together inter-generational and life-course processes in the UK into a single analysis, covering the influences of parents' position, schooling, educational attainment, as well as the consequences of job performance and household or family formation processes.

The Essex Score is calibrated from the British Household Panel Study, and the analyses of mobility processes are based on this same source. The work described here is part of the Social Position and Life Chances (SPLC) research project (described in **Social Structure and Life Chances**, ISER Working Paper 2001—20).

NON-TECHNICAL SUMMARY

The Essex Score is a non-categorical indicator of personal resources salient to labour-market performance, which represents individuals' (and households') labour market skills, and measures much of what is more conventionally indicated by social class categories.

Class is directly and uniquely associated with the possession of economically salient resources—the embodied "mental" resources covered by the term "human capital"—which directly establish positions of relative economic advantage and disadvantage through the labour market. There are however two other sorts of embodied skills, referred to in the sociological literature—cultural and social capital—which can provide indirect economic advantages. Social capital is constituted by the individual's presence in networks of personal acquaintance and friendship, which can be used to gain information about and access to jobs and other economic opportunities. Cultural capital—which consists of the special knowledge which allows active and informed participation in institutions for consumption of final services (sports, entertainments, artistic events, as well as domestic consumption activities)—in turn may provide the material circumstances within which these personal connections may be made and confirmed. In this sense cultural and social capital can be translated or converted into human capital, albeit in an informal and hard-to-quantify manner. (However the chief relevance of cultural and social capital will emerge when, in another part of the SPLC programme, we turn to consider the consequences of social *positions* for living *conditions*. Cultural capital—ie consumption skills—are, in effect, combined with physical goods and material services, often in the company of others—drawing on social capital—to provide consumption experiences, and ultimately feelings, of well-being or ill, fulfilment, happiness or unhappiness.)

The main purpose of the paper is to apply the Essex Score estimation of human capital. It produces three substantive findings:

(1) The effect of parents' class on their children's *level* of human capital, as estimated by the Essex Score, is entirely swallowed up by that of the children's own educational attainment. Formal educational qualification is thus the initial means through which parents transmit their advantages to their children.

(2) Nevertheless, there is still some detectable independent (or "direct") effect of parents' human capital on *change* in their children's human capital during their adult lives. (Or to put in another

way: beyond the effect of parents' human capital on their children's formal educational outcomes, is a further effect on the dynamics of subsequent human capital accumulation.)

(3) Moving from individuals to households, we can see that choices and involuntarily changed circumstances in a strictly non-economic sphere can affect access to human capital, and hence longer-term life-chances. Both the "Allerednic" (reverse Cinderella, princess into scullery maid) effect, in which women's human capital is diminished as a result of choices of household work strategies, and the gendered partnership formation/dissolution effects (women gain disproportionately in human capital terms from marriage, and lose even more disproportionately from divorce)—which are not normally considered within conventional class analyses of social mobility—are nevertheless clearly class-like in their consequences, both for individuals and for their dependent children.

The Essex Score thus allows the integration of various sorts of social mobility analysis—inter-generational with intra-generational, individual with household-level—in a way that is not generally undertaken in categorical class -based analyses. It also provides a means of linkage with an adjoining field of social policy research, into poverty and wealth dynamics, which has been, over recent decades in the UK, undertaken separately from the sociological specialism of class mobility analysis.

A new measure of social position: social mobility and human capital in Britain

1 Power, position and mobility

1.1 Classes and classiness

Class is still an intense focus of curiosity and concern in Britain. (A BBC "tell your own class" website based on Rose and Pevallin 2000 recently received in excess of a hundred thousand "hits" within a single week). But it is subject to two quite strongly conflicting intuitive apprehensions, often held simultaneously by the same individuals: (1) that Britain is no longer the class-driven society that it once was, and (2) that "class" is still important as a determinant of life-chances, still an important generator of rewards and of injuries.

Such a widespread and deeply entrenched contradiction must have some underlying real and non-contradictory meaning. The answer can be found, I will propose, in the opening paragraphs of Dahrendorf 1959. He discusses the "classical" meaning of class as indicating "superiority", in the modern English colloquial sense of "a class act". Better-off, or "classy", parents, we know from our casual observation, tend disproportionately to have better-off children. But (this was Mike Savage's recent conclusion to a review of current argument on the subject) while class plainly continues to be implicated in the organisation of inequality in Britain, it does so in the absence of either effective class consciousness or any very clear or unambiguous class identification (Savage 2000 pp 40-41).

Class in the commonsense English-language usage, must reflect some understanding of an ordering of transmissable advantages—class***iness***, we might say—without a distinct set of class***es***. A non-categorical class indicator may sound like an oxymoron. Nevertheless, class without distinct class-categories is exactly what is intended. What follows is an attempt to articulate such a notion of class, less inconsistent with its casual usage, within a well-specified sociological context.

1.2 Class, status and authority

Power is the ability to achieve objectives despite resistance. It is a relational attribute. Each of the aspects of social power must be defined relatively, and indeed must depend for its efficacy on its relation to a social collectivity. Each aspect therefor has both a micro and a macro manifestation

There are three distinct faces of power: class, status, authority. This paper is mostly concerned with class, which is commonly accepted (eg Scott 1997) to reside in individual's possession of resources of various sorts:

- fixed and financial capital—financial instruments, material objects such as equipment and materials, land and buildings;
- embodied "human" capital—those personal skills and resources which determine the individual's position in the labour market.

Individuals' capacities to achieve their own life aims—their "life chances—are crucially dependent on the mixture of fixed, financial and embodied capital resources that are at their disposal.

A complication which we must confront immediately is that "human capital", the particular focus of this paper, is itself just one among a larger set of embodied "capitals" which are also to varying degrees relevant to the achievement of these goals. And indeed the word "capital" itself, when used in this context, is in some respects problematical. I shall discuss in a moment problems that arise both in relation to the use and depreciation of embodied resources, and in their conversion to fixed capital. For these reasons, and wishing to avoid for the moment the substitution of any other general term for this widely used metaphor, I shall for the moment use the neutral term "Essex Score" for the particular summary measure of resources which will be developed here.

But, before we turn to consider class and the various sorts of capital, we should briefly consider the other aspects of social power, "status" and "authority".

Status: from position to prestige to privilege.

At one extreme "status" implies no more than a location in some social state or position, as in "civic", "marital", or "employment" status. At the other extreme, it describes relational characteristics difficult to distinguish from what was previously referred to as "classiness". There are in fact three distinct but related concepts involved: position, prestige, and privilege. Talcott Parsons gnomic 1947 translation (pp 424-429) of Weber's sole, brief and enigmatic chapter on the subject of class and status, suggests that economic advantages may derive from the prestige attached to the particular status characteristics. (The—simplified—Parsons-speak version of Weber's text is as follows: "The term of 'social status' will be applied to a typically effective claim to positive or negative privilege with respect to social prestige so far as it rests on….mode of living…education … or … occupation" (p 428)). My translation of this translation is that the position gives rise to a prestige which in turn justifies (for our purposes specifically economic) privileges. When (and where) Weber originally wrote his words, the "charisma" attached to particular occupations would certainly have been considered as a reasonable justification of the economic advantages they bestowed. But this concept of privilege sits rather inappropriately in the context of a developed market economy. We would now be rather more comfortable saying that the economic power attached to tenure in particular occupations, can be more appropriately attributed to its implications of job-specific and more general skills and knowledge—to its contribution to human capital.

Weber's own discussion is clearly incomplete and unfinished. And we are in any case free to adopt whatever terminology is appropriate to our needs. For reasons which will become clearer in the course of the paper, I will include under "status" only those characteristics which are not included among the "economically salient resources" that constitute class. (That aspect of status that relates to standing or prestige will be treated separately, within the SPLC research programme, as a conditional characteristic, consequential to both class and other positional characteristics).

Status, in this conceptualization, is important insofar as it *interacts with* the various resources which fall under the class heading. "Interacts with" is used in the sense of "changing the nature of the effect of" those resources. For example: a given level of education, work experience, job commitment, has a certain value in the labour market determined (or at least justified) in part by its (apparent) productive efficacy. But the "rent" that can be extracted by deploying such resources in practice varies systematically between men and women. Women can expect, in present-day Britain—for reasons that

are only indirectly related to the real productive potential of their capabilities—to earn somewhat less than men from a given allocation of these resources. This is an interactive effect, insofar as gender modifies the influence of genuinely salient resources (eg Crompton 1997). Such status effects in general come from relatively long-lasting characteristics, including most notably in modern Europe and N America, gender and ethnicity. Other characteristics that (perhaps) also fall within this definition of status include some time-varying but shorter-term characteristics such as family-type responsibilities for children or older dependents. Notably absent, from this list, is any mention of occupation. Since occupational tenure contributes in a major way to the class-type resources, it would be unwise to attempt to attribute a separate status-type effect to occupations.

The notion of status is, in short, considerably changed and reduced, in this account, from the more comprehensive Weberian conceptualisation. And the Essex Score will be estimated so as to exclude the remaining status-effects, precisely *because* this will allow us subsequently to use the score as a means of estimating these status effects, and in particular to focus on the effects of gender. (The relatively small numbers of members of ethnic minorities in Britain, and the relatively small size of the BHPS sample, mean that ethnicity issues cannot be investigated in the SPLC programme.)

Authority is also a problematical concept in the context of a relatively well developed and efficiently working democracy. "Authority" implies rights of peremptory command, vested in individuals with a distinct category of citizenship, and exercised relatively independent of impartial review (Parsons translates Weber's "Herrshaft as "imperative control"). Some aspects of this sort of authority remain with the military in the UK (eg their independence from data protection regulations, and some aspects of employment safety law). The police have some remaining rights of arbitrary arrest though these have been, until recently at least, increasingly circumscribed. The medical profession maintains some peremptory rights to order or prohibit treatments, judges retain some limited imperative rights to imprison and order specific performance. But main trend of development in Britain, as in "Western" societies in general, have been in the direction of inhibiting this sort of authority, and monitoring and subjecting to open external review such peremptory practices that still remain. Authority is not discussed further in what follows.

1.3 Embodied "capitals"

The focus of this paper is on the concept of class. Of the two sorts of resources that together constitute class-type positions, the influence of fixed capital and financial resources will be considered in a separate paper for the SPLC programme; the following discussion relates to embodied capital.

In fact, in modern sociological discussions we can find three distinct forms of embodied capital, each of which has both micro- and macro-sociological manifestations:

- "Human capital" refers to economically salient personal resources (skills, specific knowledge associated with particular jobs, general education) of the sort that might for example be considered by prospective employers as justifying offers of employment (Becker 1964, Coleman 1988). We should be clear that these characteristics only have value in relation to given structures of production and distribution. Individuals and corporate groups representing their interests may both gain advantages (ie increase the value of those resources) and participate in the transformation of those structures by bargaining over how their resources may be deployed in production.

- "Social capital" refers to the range and nature of personal connections between an individual and others in the society, which may be deployed for some further purposes beyond the immediate enjoyment of their company. An individual may know many or few people, and the "usefulness" of these connections varies in relation to their source and their density (as in the Grannovetter 1983 example where weak ties, in the form of casual acquaintance with people in related occupations may lead to new employment opportunities that could not be provided by stronger ties). The individual-level quantitative allocation of these connections is not sufficient to understand their societal effects. A large number of connections with a group of others with strong mutual links might provide less "usefulness" than a smaller number of connection with more widely diffused networks (as in Puttnam's examples of recreational associations). In this context, the crucial macro- issue is the density and dispersion of networks of acquaintance across the society.

- "Cultural capital" refers to specific knowledge related to the participation in, and enjoyment of, the various forms of consumption in the society. "Culture" in this context refers, not just to the "high culture" of art galleries and opera-going, but equally to sports participation and spectatorship, to participation in recreational clubs—and indeed to the use of equipment and materials in the

"production" of consumption in the home. Specific knowledge *about* consumption contributes to individual's satisfaction *with* their consumption. And at a macro level, knowledge necessary to participate effectively in these various forms of consumption, is closely related to the desire to participate in them—and hence ultimately to requirements for production activities. So the society's overall level and distribution of cultural capital is a crucial determinant of the nature of its aggregate demand for different types of employment (as well as for imports from other societies).

The term "human capital" is sometimes used to cover all three of these. This is confusing, at least in the context of the economists' well established use of these words in the more limited sense set out above, so I propose to use "embodied capital" to describe the more general notion. Of these three categories, only "human capital" has *direct* economic salience in the labour market…though as we shall see in a moment, cultural and social capital do have indirect effects for individual-level economic outcomes.

The common element in the various modern sociological uses of this "capital" metaphor is that embodied capital is a resource which opens access to various categories of experience which are mediated by social institutions. Embodied capital is what enables social participation. Human capital, in this sense, gives access to employment. Cultural capital gives access to specific categories of consumption. Social capital provides information about the availability of production and consumption activities. And, insofar as connections with networks provide a degree of familiarity to others so connected, and perhaps serves to communicate impressions of personal characteristics such as trustworthiness or diligence, social capital may also provide individuals with some form of "license" or implied right to participate in those activities.

The metaphor itself is in some ways quite appropriate. Capital breeds capital. And in just the same way, the more one participates in these activities, the better one can participate in them. Our employment record convinces someone to employ us; and as we gain experience in the job, we become as a result more employable. The more we play golf, the better golfer we become, and the more enjoyment we get from our golf games. The wider our acquaintance, the more useful being acquainted with us becomes, and our acquaintance widens further as a result. What we do, becomes embodied in who we are, which in turn enables what we do next: an endless recursion of accumulation, like that of financial capital.

In some ways however the metaphor may be less well chosen. Physical capital depreciates with use; financial capital can as well be consumed as appreciate. Yet the use of embodied capital as set out here, cannot lead to depreciation. Far from it: we have an Alice-in-Wonderland paradox in which use of embodied "capital" is simultaneously investment in it. A further problem is that different sorts of fixed and financial capital have easy convertibility. Financial instruments can be quite quickly converted, for example, into productive equipment, and then back into financial instruments. But—it might be objected—some at least of these of these sorts of embodied capital have limited convertibility, and where there are possibilities for conversion, these are partial and relatively slow.

Some examples indicating the usefulness of the "capital" metaphor may be helpful at this point. First: concerning human capital.

Human capital in production.

Consider an experienced software engineer, a member of a team developing a new product which her employer plans soon to bring to market. Some very specific knowledge is embodied in her person, maybe years of development time that has been paid for by a large software house. Close to the time of product launch she becomes dissatisfied with her terms and conditions of employment. There are various possibilities. She may ask for a pay rise; but this might cause pay-relativities problems within the firm. She might ask to be re-employed as an independent contractor outside the firm; but this means that the software house loses some control over the product. She might threaten to resign and to set up as a competitor; her firm has some limited legal redress, but none which will be especially effective in a global market

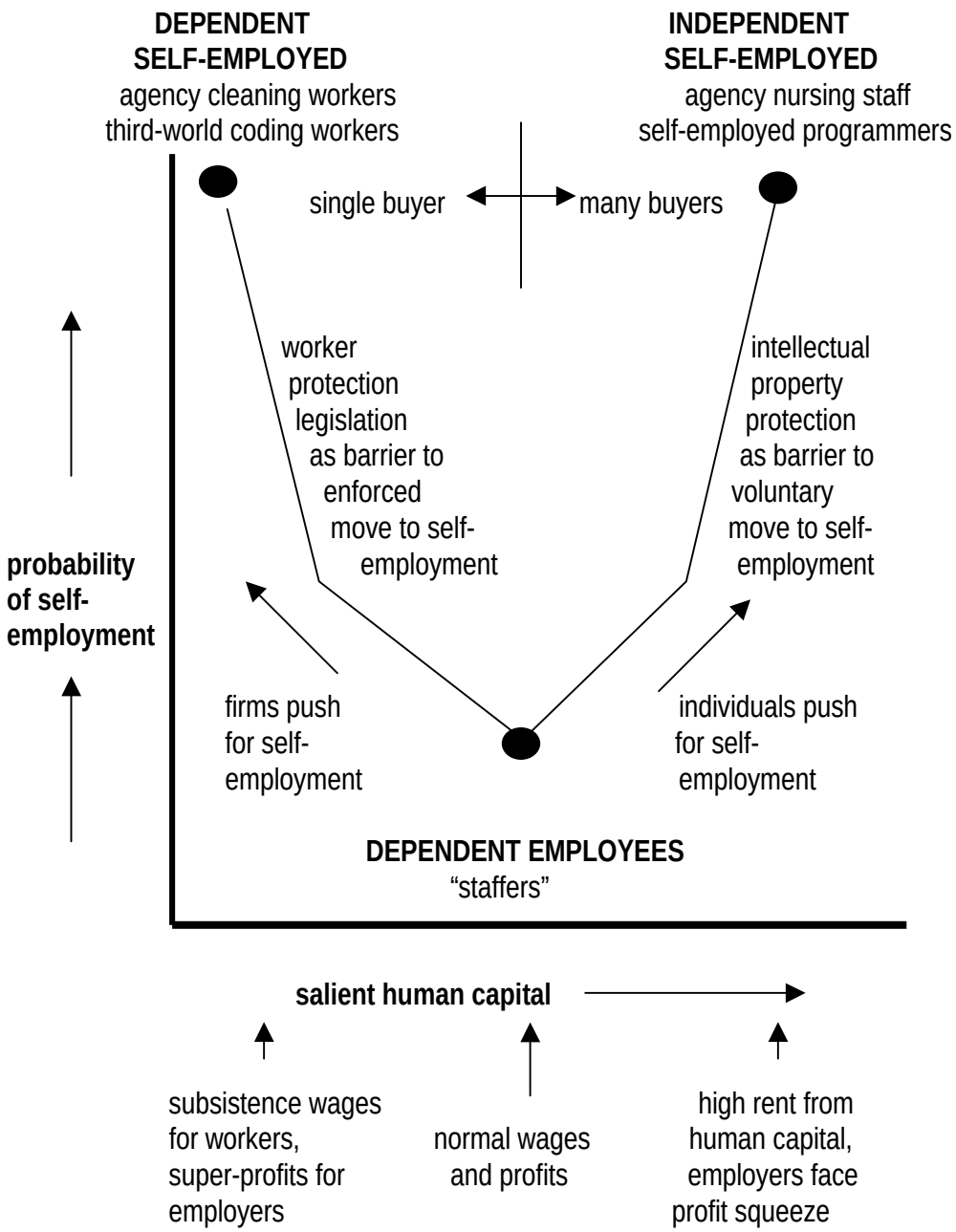
There is a range of possible outcomes, which fall into various categories. (1) she may simply get her pay rise, and better conditions of service. In this case she has used her bargaining power to increase the return on her embodied capital within the existing institutional framework. (2) she may be re-appointed as a better-paid independent sub-contractor, in which case she has, in effect, converted her embodied capital into something more analogous to the ownership of a piece of productive equipment. Or (3) she either sets up her own firm in competition with her old employer, or (if her employer is more sensible) she is bound more firmly into the current institution with golden handcuffs in the form of equity and stock options. In either of the last two cases she has unambiguously converted part of her

embodied capital into financial instruments. For all these outcomes, the "capital" metaphor fits the case quite well.

It might be objected that this is a very special case. But in fact analogies abound throughout the economy. Nurses resign from the hospital, only to be re-employed on a casual basis at considerably higher wages. Teachers, lawyers, media workers, indeed any members of any occupation with scarce specific skills do similarly. And analogously we find human-capital intensive firms which behave in similar ways; apparent consumer durable producers for example which are in fact just design specialists subcontracting the less profitable manufacturing and marketing functions. Certainly only a small proportion of all such workers do in fact become independents. But the possibility of their doing so informs the outcomes of all negotiations within the labour market.

And while all of these examples relate to the top end of the human capital continuum, similar but much less positive processes affect those at the lower end. The same hospital that employs the agency nurse also no doubt employs an agency to do the dirtiest of its cleaning jobs. Once perhaps it employed its own cleaners, but these had fine conditions of service, sickness and maternity benefits well above the legal minimum, a degree of job security, and the ability to protect these through industrial action. But since the human capital involved in these particular jobs is low, and in plentiful supply, the employer can improve the return on its fixed capital by outsourcing. Or similarly for the insurance company's sales force which might once have been secure and privileged "core" employees, but are now replaced by less well-treated employees in a telephone call-centre (in a process similar to those previously described in relation to manufacturing jobs by Piore and Sabel 1984).

Figure 1: Human capital and terms of employment: hospital and computing examples



There are of course other ways of conceptualising these processes of adjustment in employment structure and employment relations. But the general account of economic micro-dynamics that associates degrees of personal economic power with levels of access to human capital is not implausible. The degrees of conversion are limited, in these examples, but some conversion does take place. And more generally, the processes of exploitation involving embodied capital, both for those

with high levels of human capital and those with low, are quite closely parallel to those that relate to the possession or non-possession of fixed or financial capital.

In these examples, individuals are using their human capital to bargain with potential purchasers of their labour. The outcome of this bargaining process is a particular relation to owners of other sorts of capital in the production process. They may lead to varying conditions within employment (different degrees of discretion, span-of-control, supervision status, payment mechanism, job security), or various different sorts of relationship with a purchaser of labour outside a direct employment relation (including sub-contracting, "agency" work, "putting out", all of which I will consider as forms of self-employment). Figure 1 sets out schematically a model of a U-shaped probability of self-employment, with, on the left arm of the curve, those with low levels of human capital and facing monopsonistic potential employers being forced into self-employment so as to reducers employers' costs and wage rates, while those on the right arm with plentiful capital and many potential employers, themselves competing to move into a form of self-employment that allows them to extract a maximal part of the surplus earned by their capital. Similarly, within the context of a direct employment relationship, those with more, and scarcer, human capital, will be able to negotiate more advantageous employment relations. (An alternative, rather more extended, version of a somewhat similar argument may be found in Sorensen 2000.)

But the essential point for the purposes of the present discussion is that employment relations in general are an outcome of the bargaining process. The human capital is what gives the supplier of labour the power in the bargaining process (either individually or though an agent, or some collectivity such as a trade union or service agency). And hence, it is human capital, and not the nature of the employment relationship, that is the effective determinant of life-chances, and the appropriate indicator of social position.

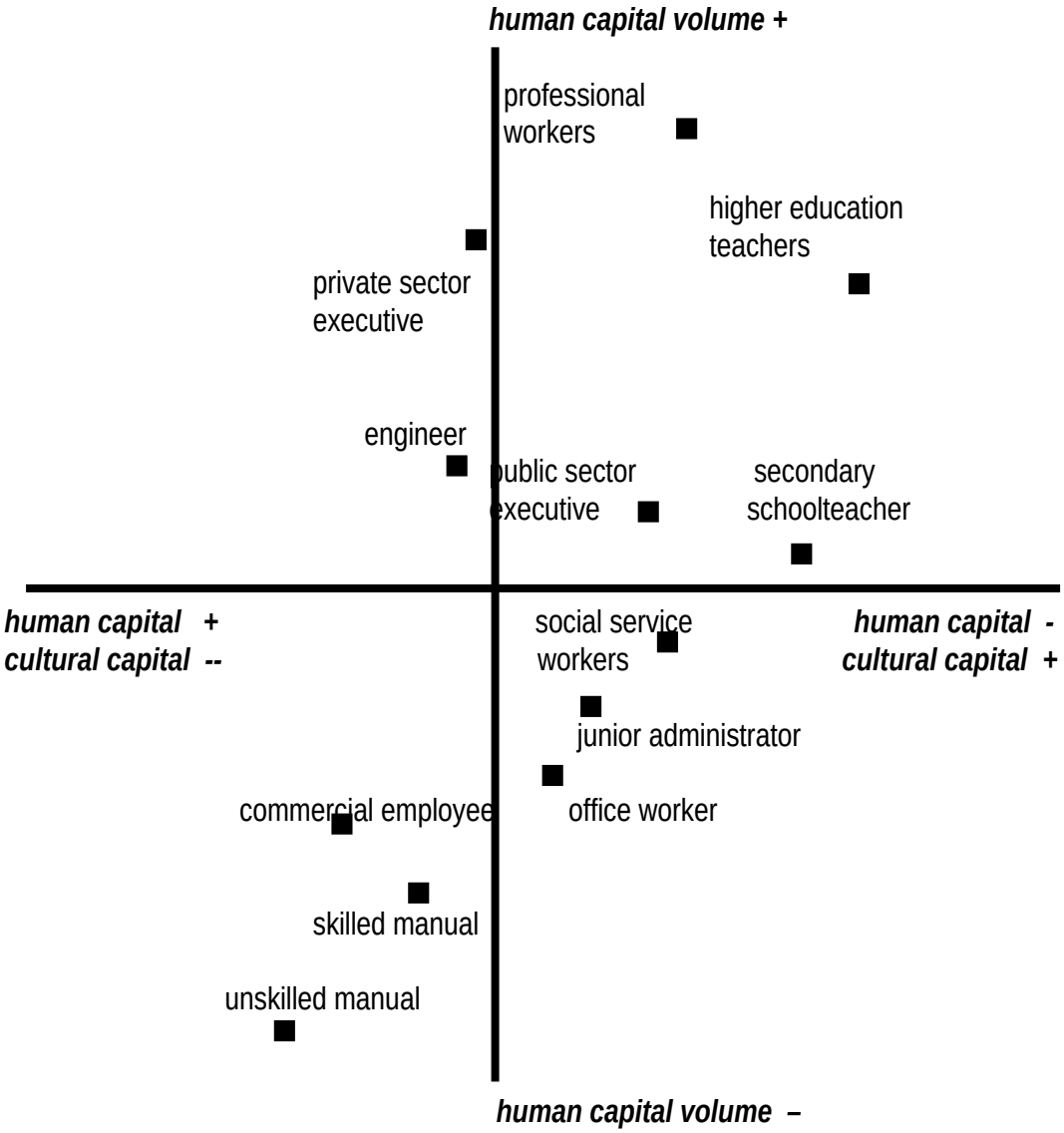
Cultural Capital in Consumption.

Bourdieu's core notion in Distinction might be summarised as "the production of consumption". The conventional factors of production—capital, equipment, labour—are put together by rational producers into some optimal combination in the production process. In much the same way, we might think of an analogous process of optimising consumption, in which cultural capital, financial means and consumption time take the place of the factors of production. Consider a choice-space defined by two

dimensions, economically salient “human capital” resources, ordered from lowest to highest, and “cultural capital”, similarly ordered. Sensible (ie not-irrational) individuals located in different regions in this space will choose different patterns of consumption. This is a calculus which generates “rational” lifestyle choices. Individuals will wish, Bourdieu tells us, to use their personal resources in a manner which optimally indicates their personal distinction or distinctiveness, achieving at once, in what is not a paradox, both individuation, and membership of a social group defined by lifestyle

It is distressingly easy to fall into caricature when describing briefly the predictions from this model. As we spell it out, we may discover, in one quadrant of the choice-space, the uncultured new rich, indulging in conspicuous consumption in a very expensive restaurant, In a second quadrant we find that a young, moderately paid lycee teacher, is at an art gallery (low entrance costs, high returns to specific knowledge). In a third, a rather poorer factory worker is enjoying sentimental pop music on the radio, while in the fourth the cultured inheritor of a family fortune (from a Left Bank bookshop, perhaps) finds himself in the expensive stalls of the opera house. But cliché (of a cinematic nature: Rohmer, “Moral Tales”!) notwithstanding, this calculus does indeed provide a not unconvincing model of how resources might optimally be deployed to generate both final satisfactions, and a sense of distinction in lifestyle.

Figure 2. Hypothetical embodied capital endowments: Sorokin-Bourdieu mobility space



(adapted from Bourdieu 1985 pp128-9)

Apart from direct consumption satisfactions, and the sense of distinction that derives from the appropriate deployment of personal resources in consumption, one may also indirectly derive economic benefits from them. The years spent on the golf links and in the opera stalls, at the football match or in the bar, also serve to form a range of acquaintances, accumulated perhaps just as a by-product of the consumption, or perhaps as a deliberate act (as in corporate entertainment). In either case, we may see, insofar as connections may be exploited for reasons other than those implicated in their formation, cultural capital in effect being converted into social capital, which may in the future be further transformed into economic advantage.

A human capital index produces a straightforward ordering of the members of the society in a single dimension from the worst-provided to the best. This is entirely appropriate in that people are differentially placed, in terms of their prospective earnings, along exactly such a single-dimensional continuum, and their prospective labour market earnings are a uniquely important determinant of life-chances. It would nevertheless be entirely inappropriate to represent social stratification, in a modern economy, in terms of a series of superimposed and non-overlapping layers with increasing levels of advantage.

Human capital alone provides in itself only a very limited view of the structuring of advantage and disadvantage. Instead, we plainly need something considerably more complex and multidimensional, to reflect, inter alia, the multiple different forms of distinction that might be sought at any particular level of economically salient resource allocation. The Bourdieu "production of consumption" model provides exactly that—a conceptual structure, with a specifically sociological pedigree, to place alongside the economists' somewhat analogous models of household production of final satisfactions (as in Becker's (1965) "Z goods")—which may be used to move forward from the analysis of strictly economic position, to the more complex and interesting issues that emerge when we consider of stratification in terms of living conditions and life-satisfactions.

The Bourdieu view of social positional space is set out in Figure 2. Here the two dimensions of the previously-discussed choice-space are compressed into a single continuum representing the composition of the embodied capital (ie the proportional split between directly economically salient human capital and cultural capital). And this dimension is set against the volume of human capital (in Bourdieu's original this is generalised to include all economic capital including fixed and financial capitals). People with different combinations of earning power and consumption skills will adopt different patterns of daily life (eg those with medium levels of human capital but high levels of cultural capital may choose to work shorter hours than those equivalently placed in economic terms but with less cultural capital). They may adopt distinct household work strategies (eg if partners are placed at widely differing points in this space, it may be rational to specialise, with one partner in paid work and the other not). And they may adopt distinct strategies for transmitting and converting their embodied capital (as where a moderately rich but well-connected household supports a child, financially and by personal introductions, in the early stages of an advantageous but initially badly-paid career). For expositional purposes Figure 2 follows Bourdieu in identifying distinct occupational groups

(hypothetically) with particular points in this space. But in fact we should be thinking of individuals as having, at a given points in the life-course, their own specific location in this social space. These positions ("by the generative logic of the habitus" to use Bourdieu's terms) in turn give rise to life-style choices and living conditions.

This model connects directly with an insight from Sorokin who, in what is probably the first systematic and comprehensive sociological discussion of mobility (most accessible in the 1959 edition though originally published in the early 1930s), introduced the distinction between vertical and horizontal mobility:

- "vertical" mobility takes place within an ordered hierarchy of social and economic advantage, while
- "horizontal" promotes individuation, differentiation, feelings of self worth, or distinction, within any given allocation of economically salient resources.

The various sorts of resources discussed in this section contribute in different ways to social positioning. The economically salient human capital resources contribute largely to establishing vertical position. The other sorts of embodied capitals allow us to establish, in Sorokin's term, horizontal position. Thus, one most helpful way of interpreting Bourdieu is to see the habitus as establishing various different social positions at any given levels of human capital. Where embodied resources are not directly economically salient, they may nevertheless contribute to improvement of well-being in the second, horizontal sense.

The only-indirectly-economically-salient embodied resources will thus be of some importance when, in the next stage of work on the SPLC programme, I proceed to consider the relation of social position to living conditions. This paper will however concentrate just on those resources related to mobility in the vertical dimension.

1.3 Other continuous or composite measures of position

The final issue from the sociological literature that must be confronted before we turn to the Essex Score itself, concerns the many previous attempts to construct continuous or non-categorical measures of social position.

Consider the first of these, best known from Blau and Duncan's The American Occupational Structure; an index of occupational attainment calibrated by regressing education and earnings on a measure of the esteem or social standing of various occupational categories. The theoretical reasoning behind this procedure was not spelt out in any very specific detail. Nevertheless, it is not at all difficult to construct *ex post facto* a theoretical argument on their behalf.

We need simply to reflect on Weber's conceptualisation of status referred to previously. If prestige or standing *is* what lies behind the economic power (as reflected in "privilege") related to status, then a composite such as the Blau and Duncan occupational attainment index, constructed from education and earnings, and calibrated from a study that contained measures occupational prestige, will indeed be a sensible measure of status. This same argument presumably holds for subsequent measures of the same sort, such as Kelly's Australian and worldwide socio-economic status scales (Treiman et al 1981). And it may also be the case that those who undertake studies that seek to measure prestige or standing *itself*, such as Hope and Goldthorpe (1974), chose to develop these as measure of social position on the basis of some-such similar Weberian argument. And indeed even the claims of the Cambridge Scale to act as an indicator of social position, which constructs an occupational ordering from accounts of the occupational affiliations of friends, on the assumption of affinities in the prestige levels in friendships, might also be justified by this same argument.

These arguments all rely heavily on the assertion of an association between prestige and economic power. And it is certainly the case that a clear positive association between measures of occupational prestige and indicators of economic success is found in each of the above studies, and all similar ones. All that is in doubt is the nature of the causal process. Does the power *really* derive from the prestige? When Weber wrote it was certainly plausible that economic advantages could be explained as normatively sanctioned "privileges" attached to a particular educational experience or tenure in an occupation. This is patently not the case now, in either Britain or America, and probably was not the case in the US in the 1960s when The American Occupational Structure was written. The association between prestige and economic success is to be explained, in the main, by quite the reverse causal narrative—by the fact that those who are successful are as a result often also prestigious. The fact of the association is enough to justify the use of prestige scores and the like, or occupational attainment scores derived from them, as indicators of economic success or failure. But any claim that these might represent genuinely causal factors for future success or failure would be extremely tenuous.

The Standard International Socio-economic Index of Occupational Status scale ("SEI": Ganzeboom, de Graaf and Treiman 1992) occupies an intermediate position. Its calibration does not involve any prestige measure. And it does look directly and unambiguously at the economic advantages deriving from current location in specific occupational categories. Income is the dependent variable in the calibration, rather than being used, as in the construction of the previously mentioned indicators, as a predictor of prestige. The authors themselves worry that the intuitive interpretation of the index is not entirely clear (p8)—though they then immediately provide the perfectly clear statement that "it measures the attributes of occupations that convert a person's main resource (education) into a person's main reward (income)". As such, it covers just one specific aspect of the index of social position required for the SPLC programme. Furthermore, it is, of necessity, calibrated only for the employed part of any population, and (less justifiably, as the authors admit) only for male workers. The SEI is an undeniably powerful instrument for the cross-national comparative investigation of the contributions of the various elements that determine current income. But is less appropriate for a programme of research into the determination of life-chances in a more general sense.

The arguments underlying the claims for an index such as the Essex Score, are by contrast, robust and straightforward. They address the real underlying issues of the core notion of social class, of long term advantages and disadvantages maintained through life-course and transmitted across generations, which result from differentials in possession of economically salient resources. The Essex Score approach, using the coefficients from a wage equation as the basis for an index of human capital, is a reasonably obvious idea in itself (and not in itself particularly original—a simple version of this was, for example, implemented by Blossfeld and Huinink in 1991). What is original to the Essex approach, resides in the recognition, based on the arguments in the previous pages, that such a human capital index, an index of embodied economically salient resources, is an appropriate way of representing those long term patterns of advantage and disadvantage that constitute social class.

In adopting this view, we are contributing to a long tradition of English social research into advantage and disadvantage, culminating in Townsend's (1979) magisterial study of poverty in the UK. To Townsend, the key to understanding poverty was the distribution of resources. But a major problem, in moving forward from Townsend's study, is that he identified the main resource as income, 70% of which was earned income (for those of working age the proportion would have been much higher).

From the perspective of the current study, income itself is not the resource, but merely the current return on the real resource, which is *the capacity to earn income*. It is this capacity which persists (though to varying degrees) through the life-course, it is this capacity which, through the normal and unremarked operation of private households, is transmitted across generations. It is this capacity (or capability to use the term employed by Sen, 1985), and not the use currently being made of it, that should be the basis of the social classification.

2 Estimating the Essex Score

2.1 The estimation procedure in general terms

The elements of the class index that we intend to construct, are those characteristics that give direct advantages in the labour market. Our task, in establishing a measure of social position, is to select a set of relevant personal characteristics which can be appropriately weighted and then combined to make up a single score. We will need to be able to say, in effect, that just so much of this personal characteristic and so much of that, combine to produce just so much economic advantage.

Which characteristics should be included? We can put forward clear hypotheses about elements which constitute economically salient embodied human resources. The value of human capital is determined as the outcome of the bargaining situation in the labour market. Employers, as one of the bargaining parties, will seek:

- Appropriate educational and other personal attainment
- Evidence of labour market attachment, diligence, and reliability
- Specific skills and experience, gained as a result of participating in particular production activities.

…while potential employees, as the other party to the bargaining process, will seek appropriate combinations of:

- High rates of pay
- Desirable and appropriate employment conditions and circumstances
- Job security

Those potential workers with "better" mixes of the first set of characteristics will get "better" combination of the second. But how to establish what constitute "better" mixes?

The straightforward empirical procedure used to derive the Essex Score involves one crucial strategic simplification: reduce the second list to a single category. If we assume that workers are willing to concentrate entirely on rates of pay rather than conditions of service (which is reasonable insofar as these are in general quite strongly and positively associated)—then it become straightforward to estimate the weights for the various characteristics in the score, by estimating a regression equation with wage rates on the left-hand side, and the worker's characteristics sought by employers on the right.

We estimate, in short, what economists think of as a "wage equation", which calculates the value of the various personal characteristics from their effect on the wage earning capacity. Of course some people are not in employment. Their lack of a wage does not at all imply that they have no wage-earning capacity, but only that they choose (as economists would say) or are constrained (as sociologists must add) to be outside employment. Their absence from the labour market may indeed be systematically related to their embodied resources. It might be, for example, that those with relatively little human capital but plentiful cultural capital, might choose to engage in activities outside the labour market. Or it could alternatively be that irrespective of their plentiful human capital they are constrained by some personal circumstances—a status-type characteristic, such as a duty-of-care for a child or aged relative—to remain outside paid work. In either case, it is important that we include these people in our procedures for calculating the potential economic value of the various characteristics.

There are in principle two alternative ways of including those currently non employed. We could seek evidence of their past (or future) earnings rates. Or we could follow the more conventional economists' procedure (Heckman 1976) of combining an estimation of the probability of an individual's selection into employment, with an appropriately adjusted regression estimate of the economic value of the various characteristics for those actually in employment. The Heckman approach is adopted for this paper; the alternative however produces reassuringly similar results (Gershuny 2000).

One constraint on the use of this sort of procedure for sociological analyses, which is not normally faced by economists, is that we will want to distinguish the class-type effects from those of status as defined above. We must avoid the circularity of argument that might otherwise involve us in

"predicting" gender and family status effects, in an index that has been calculated using these same variables. So while these sorts of characteristics are plainly strongly implicated in the determination of peoples' eventual incomes, we must nevertheless exclude them from the composite index of economically salient resources.

2.2 BHPS data

The evidence used throughout this paper comes from the British Household Panel Survey (BHPS). This is a longitudinal survey, in which all members of a random selection of British households in 1991, together with their natural descendents, and all their current household co-residents, are re-interviewed on an annual basis. The BHPS provides a detailed and careful collection of wage data, and allows us to connect various historical and other accumulated personal characteristics with their current consequences in terms of respondents wage rates. We have currently nine years of data from the panel itself, together with a considerable collection of retrospective information on employment and other circumstances prior to the start of the panel.

2.3 A measure of "job quality"

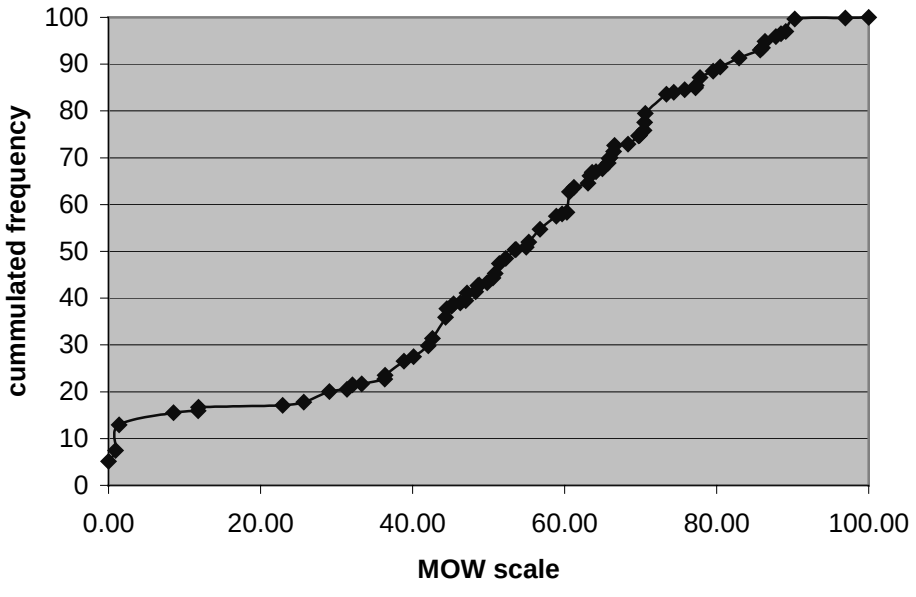
Central to the estimation, is the individual's experience in particular sorts of job. Different jobs have different "qualities", have a requirement for different levels of skill, knowledge and commitment. People's past experience in particular jobs at these different levels of "job quality" provides crucial evidence of their potential contribution in the labour market. It would be straightforward simply to include a long list of "dummy" variables in the regression equation, representing each of the distinct occupational categories, whose value would then be directly estimated. A neater approach to the estimation, however, is to substitute for the long list of individual occupational dummies, a single index of the "quality" of the job held by each respondent to the survey (Blossfeld and Huinink 1991 use Wegner's 1988 prestige score in a similar context). An interim attempt to construct an Essex Score (Gershuny 2000) used the Hope-Goldthorpe Scale as a rough approximation to a measure of job quality. But the HGS was calculated explicitly an indicator of occupation standing or prestige. As such we might expect it to be quite strongly correlated with some aspects of the sort of job quality that we are interested in, but also to confound them with other historical reflections on the "honorific"

characteristics of the job of the sort discussed in section 1.2. (The H-G scale was, furthermore, established on the basis of empirical research conducted nearly thirty years ago.)

I have instead adopted the approach of estimating the quality of jobs by their market valuation (ie the expected income levels of those doing them). A central component of the Essex Score is the Mean Occupational Wage (MOW) scale of job quality. This is constructed by pooling all the nine waves of BHPS responses (yielding 57,000 observations), adjusting monthly incomes by the RPI, and calculating the mean for each 2-digit group in the standard occupational classification. Incomes, as we would expect are widely spread, with a cluster of relatively poorly paid occupations, and progressively sparser numbers of people in increasingly well-paid jobs. A straightforward representation of mean income would therefore provide a relatively inefficient indicator of job quality. So, we take the natural log of income for each occupational category, and then normalise the result so that the lowest-income job is scored 0, and the highest is scored 100.

Figure 3 shows the cumulated distribution of BHPS respondents by the MOW Scale.

FIGURE 3: distribution of employed BHPS respondents by MOW scale



There is a cluster of very large occupations with low MOW scores. For example "other occupations in sales and service" which receives the lowest score of 0.00, and "childcare and associated occupations"

with score 0.92 between them account for 12.5% of all employees. So the procedure of looking just at 2-digit SOC classifications will be modified in the next versions of this work, breaking down selected large 2 digit SOC groups by their third SOC digit. But with this exception, the scale seems to provide a reasonably even distribution of respondents across the full range of the scale, with around 50% of all respondents located below a MOW score of 50. Indeed, just by inspection we can see that, when the 5 very large occupational groupings at the bottom of the scale are split into smaller groups—ie removing the cliff-edge at the extreme left-hand side of the distribution—we see just the log-normal form to be expected of an income distribution.

2.4 A Heckman wage estimation

The regression stage of the Heckman procedure provides estimates for the equation:

lwage = f(age agesq mow mowsq higra agegr agrsq medgra agemd agmsq
educ1 to educ6, jobtot1 to jobtot4,
famtot1 to famtot4, unmtot1 to unmtot4)

where:

- lwage is the log of the hourly wage rate;
- higra is a dummy variable indicating membership of the top 10% of the MOW scale (82-100) and medgra indicates membership of the next 30% (60-82);
- agegr agrsq agemd agmsq are the products and squared products of age and the high and medium grade dummies, introduced to allow for differing age/earnings curves;
- educ1 to educ6 provide dummy variables for, respectively, Higher Degree, 1st Degree, other tertiary qualification, A Level, O Level/higher grade GCSE and other GCSE/CSE;
- jobtot_ famtot_ unmtot_ represent respectively months in employment, family care and unemployment in each of the four years immediately preceding the date of interview .

This choice of variables is driven by the theoretical considerations set out in section 1 above, and is also influenced by (1) the availability of data in various parts of the BHPS and (2) specific aspects of the analytic task.

The selection stage of the Heckman procedure includes same variables plus sex to help identify the selection equation. Readers should note that despite its inclusion in the selection equation, which means in turn that its effects are used indirectly to adjust the size of the coefficients in the regression stage of the equations, there is no sex coefficient used in the imputation of the Essex Score. The

decision to exclude sex in this way follows from the discussion of" status" in Section 1 above. It means that any statistical association between sex and the Essex Score is a result of associations with the incidence of values of its component variables.

We can again use a pooled file of the full set of 9 waves of BHPS data (since the four previous years' employment history data can where appropriate be taken from the retrospective materials collected at waves 2 and 3); the equation is estimated for the whole pooled sample aged 20-59 (n=66702) . The output from the stata programme is provided in Appendix 1.

2.5 The Essex Score.

The final step is simply to take the coefficients from the Heckman regression stage, and estimate a predicted value for the log (shadow) wage rate for each age 20-59 respondent of each wave of the BHPS. I will refer to the exponential of this as an Essex Score. It is clear that this is not the only possible version of the score (hence it may be more appropriate to consider this as an Essex Score). However, while experiments with the inclusion of other variables and other approaches to its estimation do of course produce somewhat different results, there is sufficient stability to suggest that underlying the particular estimates, is a real characteristic, which is the respondent's human capital.

Table 1 Essex Score by sex and employment status
(unweighted: respondents aged 20-59)

	Essex Score Wave 1		Unweighted N Wave 1	
	7.52		7107	
	men	women	men	women
	8.69	6.45	3403	3704
Full time emp	9.57	8.07	2614	1576
Part time emp	8.55	6.23	92	916
Unemployed	5.15	4.31	294	130
Non-employed	5.59	4.52	403	1082

Table 1 gives a basic breakdown of this Essex Score estimation by sex and employment. Note that while the scores can be interpreted as a sort of "shadow" hourly wage rate, these are adjusted (in general downwards) to allow for the (presumably lower) average value of the economically salient characteristics of those outside employment. So, for example, the premium on the Essex Score earned by the possession of a University degree will be smaller than that actually observed in the real earnings data estimated from a sample with non-zero earnings.

Given that this is intended as a class index, it is not uninteresting to compare the Essex Scores with that subset of the respondents that can be allocated a Goldthorpe class (Table 2).

Table 2 Essex Score by sex and Goldthorpe class
(unweighted: respondents aged 20-59)

	Essex score		Unweighted N Wave 1	
	8.40		5469	
Goldthorpe categories	men	women	men	women
all	9.34	7.34	2896	2573
Service class,higher	13.96	12.69	589	223
Service class,lower	10.42	9.35	523	619
Routine non-manual	7.47	6.72	161	624
Personal service work	4.68	5.04	28	314
Sml props w employee	8.03	8.17	96	45
Sml props w/o employ	7.68	6.22	258	87
Farmers,Smallholders	7.76	7.83	41	6
Foremen,Technicians	8.09	5.73	323	116
Skilled manual work	7.95	6.09	374	74
Semi,unskilled manual	6.76	5.18	476	449
Agricultural workers	5.89	5.37	27	16

In general we find the expected sorts of ordering effects, with, for example, the higher service class with much the highest levels of human capital, and personal service workers with the lowest scores. Perhaps less expected are the variations in the gender differentials, with women proprietors with employees, and woman farmers/smallholders having a slight margin over similarly placed men. This presumably reflects gender differences of process of selection into and out of these occupational groups. The statistical association between Goldthorpe Class and the Essex Score is really quite high; the Eta of .761, implies that around 58% of the variation in the Essex Score could be explained by membership of Goldthorpe classes, while sex and Goldthorpe class together account for 61% of this variation.

One of the particular advantages of the Essex Score approach, however, is that it is comprehensive, providing an index for each member of the population, irrespective of their present or previous employment status. So for example, the 7107 respondents in Table 1, have been reduced to 5469 in table 2. The missing 1,638 are people aged 20-59 who do not have a current classifiable employment: these people are not in fact entirely without potentially economically salient personal resources… and we may also be concerned that they are to be found disproportionately among the worse-off. Nearly a

quarter of the sample has no individual level Goldthorpe classification—and in fact the majority of these are to be found among the worst-provided-for 20% of the population according to their Essex Scores.

Table 3 Explaining future income levels:
1991 Essex Score vs Goldthorpe Class Measure
Adjusted R-Sq. (respondents aged 20-59, G'thorpe cases only)

Individual income in…	1991	1993	1995	1997	1999
1 Essex Score+other vars	0.549	0.540	0.509	0.508	0.526
2 Essex Score alone	0.439	0.423	0.398	0.389	0.391
3 Goldthorpe+other vars	0.506	0.490	0.459	0.463	0.479
4 Goldthorpe alone	0.347	0.320	0.297	0.302	0.301
5 G'thorpe+Essex+other	0.566	0.551	0.518	0.518	0.535
6 sex,age,agesq alone	0.295	0.291	0.268	0.266	0.280
7 Essex contribution (6-1)	0.254	0.249	0.241	0.242	0.246
8 G'thorpe contribution (3-6)	0.211	0.199	0.191	0.197	0.199
9 Essex unique (5-3)	0.060	0.061	0.059	0.055	0.056
10 G'thorpe unique (5-1)	0.017	0.011	0.009	0.010	0.009
11 % of Essex by G'thorpe	0.76	0.76	0.76	0.77	0.77
12 % of G'thorpe by Essex	0.92	0.94	0.95	0.95	0.95

The Essex Score has been developed as an indicator of material advantage or "life-chances", so we would expect it to perform better than Goldthorpe class as predictor of current and future income—and indeed it does so. Table 3 sets out an explanation "tournament" between Goldthorpe Class and the Essex Score. The first six rows of the table set out the levels of variance in individual employment income, at various points in time, that can be explained by variously specified models, involving, the Essex Score, Goldthorpe class, and combinations of these with each other and with other variables (sex and age). We have exactly the same cases involved in each model; those cases with an Essex Score but no Goldthorpe Class in 1991, have been dropped (of the 2938 cases in which there is an earned income in 1999, 386 had an Essex Score but no Goldthorpe Class in 1991). So, by carefully comparing the explanatory power of these models we can derive straightforward estimates of the causal impact of the variables, using an extension of the simple but effective causal modeling technique suggested by Simon (1954).

Rows 1 and 3 give the proportions of variance in earned income at various points during the 1990s, as explained by the values of the two alternative class indicators in 1991. The "other variables" in these two models are sex, age, and age squared (whose effects are summarised in row 6). There is a small margin of predictive power of the row 1 Essex Score models over the row 3 Goldthorpe Class models.

But we cannot really see the scale of the advantage from these two rows, since in each case clearly part of the variance in income explained by the class variable is also associated with the row 6 sex and age variables. However, if we subtract the whole of the variance explained by the row 6 variables from rows 1 and 3, we get an irreducible minimum estimate of the respective explanatory contributions of the Essex and Goldthorpe indicators; these are set out in rows 7 and 8. 1991 Essex Score explains 25% of the variation in income in 1999, Goldthorpe class explains 20%.

Perhaps the most important question, though, concerns not so much the comparison of the levels of explanation, as exactly what variation is being explained. These are both claiming to be in some sense indicators of social class—are they predicting broadly the same variation? Line 5 shows this to be the case, by using both class indicators simultaneously in the same models. There is not a great margin of difference either between row 5 and the Goldthorpe models in row 3, or the Essex Score models in row 1. But, as we see by comparing rows 9 and 10 with rows 7 and 8, the Essex Score explains something like 95% of all the variance explained also by Goldthorpe Class, while Goldthorpe Class explains only 76-77% of the same variance explained by the Essex Score.

It is worth reiterating that this is not at all surprising, since the Essex Score is designed specifically to be a predictor of economic advantage, and Goldthorpe Class is not (or at least, not directly so). But it is claimed that a major, perhaps the major application of Goldthorpe Class is as a predictor of life chances more generally (Goldthorpe and Marshall 1991). And income is both an important element in life chances and (insofar as it is the main means of purchase of goods and services for consumption) it is also a substantial indirect contributor to most if not all other aspects of well being.

Further comparisons with Goldthorpe Class as an indicator of life-chances will be discussed in a separate paper for the SPLC project. However, since it will be integral to part of what follows here, I should mention at this point one further advantage of the Essex Score: its aggregability from an individual to a household level. "Human capital" is represented by, in effect, the hourly value of an individual's labour, and households consist of individuals who are to some degree willing to merge their resources, including their labour time, for a common good. So it may be appropriate for some purposes to think of a household level human capital indicator. This might perhaps be calculated as a simple sum of the individual members' Essex Scores. But since most analyses are carried out at the individual level, it may be more appropriate to calculate the value of the individual's share of the joint capital, with the total adjusted to take account of the "economies of scale" that arise from household membership.

There are various standard procedures for this ("equivalence scales"); I use the simplest version, Atkinson's suggested scaling by the square root of the number in the household. So two people with same Essex Score joining together will each have an effective household income which is proportionately 1.414 (ie $2/\sqrt{2}$) higher than their individual incomes.

Any categorical class indicator is of course at a disadvantage in this context, since individuals' classes cannot in this case be simply summed. Household level class is conventionally constructed from the categorical indicator using the "dominance method"—which means that there is no representation of either the variance of resources within the household (relevant since two lawyers provide more resources than, say, one brain surgeon and one non-employed nurse), or of the economies of scale available to the household.

3 Intergenerational mobility from retrospective data

3.1 The Essex Score through the 20th century

The main focus of the SPLC programme is on the life-chances of a representative sample of British residents during the 1990s. Change in intergenerational mobility is really a side issue. But of course one important question about the 1990s sample members, involves comparing how they move, to where they come from. Does the social position of parents continue to matter?

A preliminary and very general way to investigate this, is to use the retrospective data from the BHPS, collected in 1992 and 1993. The study has, for all of its original respondents, a complete employment history (collected in wave 2) and details about each job (wave 3; see Halpin 1997 for an account of the use of these sources). There are problems with recall errors in these data particularly leading to the progressive attenuation over time of recall of unemployment (Dex and McCulloch 1997, Jacobs 2002). Like any survey evidence relying on recall of historically distant events, it is subject to "sample selection bias"; while it provides a properly representative picture of the working lives of the 1992 and 1993 population, it does not provide a representative picture of the lives of, say, people born in Britain

between 1900 and 1909—because many of them will not have survived long enough to be interviewed by us, and because of the likelihood that matters of interest to us (ie class effects) may have been implicated in the selection of those who did not survive. The current view, among users of the data, is that (1) the general picture of occupational employment, and of presence in/absence from employment (but not of unemployment) in the retrospective data is adequate for cautious use, and (2) the material is adequately representative at least of those born from 1920 onwards.

One consideration, in implementing the current version of the Essex Score, was using evidence that would allow us to estimate human capital for the period covered by the retrospective data as well as for the panel itself. In fact there is one specific difference between the retrospective implementation and the panel implementation; for the panel analyses I used, for each year, the respondent's current "highest educational attainment", whereas in the implementation for the retrospective data discussed in this section, I used the highest attainment as reported in 1991. (There is, in fact, evidence available on the year that respondents' formal education was completed, but this was not used in this estimation.) Table 4 sets out the mean Essex Scores for the historical data, together with some indications of its spread between those with higher and lower levels of human capital.

It is important to remind ourselves that this table views human capital through 1990s eyes. The coefficients for the Essex Score are based on values of education and various aspects of work experience which have been calibrated on the basis of wage rates between 1991 and 1999. A University degree for example may have been worth more (or, less likely, less) in, say, 1950, when people born in 1925 were aged 25. But, for the purposes of the present discussion, all that will concern us is how the various economically salient characteristics that constitute human capital in the 1990s were accumulated in the successive birth cohorts that make up our 1990s representative sample of British residents.

The triangular shape of the panels reflects the differential coverage for successive birth cohorts. We have a full range of observations for the earliest cohorts, but the members of the most recent cohorts have (mostly) not yet reached the age of thirty. This, as we shall see, makes for some small complications in the later stages of the analysis. But we may immediately note two distinct phenomena in this table.

Most evident, and least surprising, is that we see through the period, for each cohort without exception, and for each age up to 45, a regular increase in the mean value of the Essex Score. This results straightforwardly from three processes: the general increase in the level of educational participation throughout the century; the increase in "high value-added" occupations; and the increasing level of participation of women in both the educational system and the labour force.

Table 4 Distribution of Essex Scores through the 20th century.
(Measures calculated separately for each age group and birth cohort)

	Age 20	Age 25	Age 30	Age 35	Age 40	Age 45	Age 50	Age 55
	mean Essex Score							
born 1920-29	4.96	5.60	6.12	6.53	6.86	7.01	6.93	6.62
born 1930-39	5.37	6.12	6.59	7.15	7.63	7.78	7.60	7.15
born 1940-49	5.64	6.50	7.10	7.72	8.34	8.58		
born 1950-59	5.72	6.80	7.56	8.31				
born 1960-69	5.49	6.87						
	median Essex Score							
born 1920-29	4.97	5.50	5.85	6.24	6.39	6.59	6.47	6.06
born 1930-39	5.23	5.92	6.28	6.76	6.92	6.93	6.81	6.28
born 1940-49	5.49	6.16	6.59	7.07	7.46	7.47		
born 1950-59	5.66	6.56	6.96	7.48				
born 1960-69	5.43	6.70						
	ratio of median to mean							
born 1920-29	1.00	0.98	0.96	0.96	0.93	0.94	0.93	0.91
born 1930-39	0.97	0.97	0.95	0.94	0.91	0.89	0.90	0.88
born 1940-49	0.97	0.95	0.93	0.92	0.89	0.87		
born 1950-59	0.99	0.96	0.92	0.90				
born 1960-69	0.99	0.98						
	% below .75 * median Essex Score for age and cohort							
born 1920-29	11.80	15.50	23.50	27.60	20.50	26.70	26.30	17.10
born 1930-39	12.10	23.60	27.20	23.30	24.70	23.60	23.90	25.00
born 1940-49	12.20	21.70	24.50	27.50	23.20	22.00		
born 1950-59	13.10	22.40	24.70	25.40				
born 1960-69	14.20	22.40						
	% above 1.50 * median Essex Score for age and cohort							
born 1920-29	2.50	7.00	10.40	13.50	12.50	12.60	12.20	12.30
born 1930-39	4.00	9.20	12.30	11.50	15.90	17.00	16.70	16.60
born 1940-49	3.30	11.90	15.30	12.70	20.00	21.80		
born 1950-59	2.70	11.80	16.30	16.90				
born 1960-69	3.10	11.50						

The second phenomenon is an apparent increase in the dispersion of the human capital scores. This is again, perhaps, not really a surprise, insofar as we know from other sources (Jenkins 1999) that, for some decades in the UK, incomes have been becoming less equally distributed. Nevertheless, the underlying human capital distributions do show this phenomenon with some clarity. And indeed, it might perhaps have been expected that all three of the factors adduced to explain the overall growth in human capital, might at the same time have led to a reduction in this dispersion.

A comparison of the first panel of Table 4 (mean income) with the second panel (median income) tells the essential story. There is relatively little change in the dispersion of human capital observable for people entering the workforce. But for those aged 30 and above we see a regular decline, both by cohort and by age in the ratio of the median to the mean. This implies in particular a relative growth in the weight (either size, or resource-level, or more likely both) of the of the more richly resourced "tail" of the distribution. We can illustrate this clearly by considering the proportions of the sample to be found at various distances from the relevant median Essex Scores.

In the context of income studies we are accustomed to think of relatively large distances for this purpose; we regularly think of people below half median income as "the poor", those of three or five-times the median income as "the rich". But we must expect the underlying human capital allocations to be much less widely dispersed, since income is the product of wage-rates and working time, and economists at least (though not necessarily sociologists) will expect that those with lower shadow wages will work at paid jobs for shorter hours if at all. More appropriate for the analysis of the dispersion of the Essex Score, therefore, are the 75%/150% limits used in the final two panels. We see little change in dispersion of the very youngest adults, but thereafter there is a not entirely regular, but still reasonably general, increase in the proportion of the "poorly resourced", and a more determined increase in the proportion of the "richly resourced" through the successive cohorts.

3.2 BHPS respondents and their parents

In order to consider changes in patterns of intergenerational mobility over the century we need to know something about the human capital of the parents of these BHPS respondents. Now, a small subset of (mostly) the younger members of the sample, have parents who are also members of the panel; it is

entirely possible, and not over-complex, to match this group with their parents and compare their Essex Scores. Indeed, Ermisch and Francesconi (2000) have been pursuing just this strategy to investigate other aspects of inheritance in the BHPS sample. This sort of prospective intergenerational data is inherently much superior to the conventional retrospective evidence commonly used in mobility studies, and, as has been the case for the Panel Study of Income Dynamics in the US, the BHPS will become an increasing important vehicle for intergenerational mobility studies as waves of data-gathering accumulate. However this is clearly not a viable strategy in relation to the whole of the retrospective sample.

We have neither the work history, nor the detailed educational attainment data necessary to calculate an Essex Score for BHPS respondents' parents who are not themselves members of the BHPS sample. We do, however, have the conventional "what was your mother's /father's employment status and occupation when you were about fourteen" questions, that are the standard basis for intergenerational mobility studies. Of course, among the reasons for moving to the Essex Score approach are the sample coverage limitations of current-employment-based measures of social position. But the broad coverage (ie " aged around 14") of this sort of retrospective question is (and is intended to be) rather less restrictive than a current "snap-shot" cross-section of occupational status. We might expect that most 1991 respondents will have had at least one parent with some job within a year or so around their 14th birthday. Responses to these questions cover 87% of respondents' fathers and 40% of mothers. Fully 94% of all respondents provided employment information for at least one parent. Using these data we can produce indicators that act as reasonably effective proxy for parents' human capital, available for the great majority of the retrospective respondents.

One way of going about this, is to use Goldthorpe Class, which we have already demonstrated to cover much, though not all, of the same variation as does the Essex Scale. The BHPS retrospective questions about parental employment were indeed designed to allow us to assign parents to Goldthorpe Class positions as well as other related classificatory schemes (including, occupation, employment status, size of employing firm and supervisory responsibilities).

A second approach is to use the MOW scale. This is also highly correlated with the Essex Score, with a correlation coefficient of .79. If we regress MOW and MOW squared (to allow for a U-shaped relationship that might be expected) on the Essex Score, we can explain 74% of all the variation. Of course the MOW score was constructed on the basis of 1990s wage rates. But we do have evidence

(Routh 1980) of very long-term stability—in some cases extending over multiple centuries—in wage rate relativities between different occupations. While there will have been some changes in these relativities over the mid-part of the century which is our concern in what follows, changes will seldom be large enough to move occupational rankings more than a few percentage points up or down the scale. The MOW scale will provide us with a reasonable general indication of the big picture.

A third alternative—whose results are reported in Table 5 and subsequently—is to simulate parents' Essex Scores from other data. Take that subset of BHPS respondents from 1991 to 1999 who have their own co-resident children aged 12 to 15, and simply regress the 2-digit SOC on the Essex Scores for this group. Then apply the resulting regression coefficients to respondents' reports of their mothers' and fathers' two digit SOC scores—to produce what we might think of as Pseudo-Essex Scores. As we see from the first two models reported in Table 5, Goldthorpe Classes perform a little better than this estimate, as a predictor of respondents' Essex Score at age 35 for people born in 1940-49. Dummies for the detailed Goldthorpe Class categories, together with a child's sex indicator, together explain 27% of the variation in their children's human capital. The simulations of mothers' and fathers' Pseudo-Essex Score, together with a joint parental indicator and a sex indicator, explain 25% of the variation.

Table 5 Determinants of Essex Score. at age 35, 1940s birth cohort
(** P<.005 * P<.05)

	1	2	3	4	5	6	7	8
MultR	0.53	0.50	0.58	0.57	0.76	0.75	0.76	0.75
AdjuR Square	0.27	0.25	0.33	0.32	0.57	0.57	0.57	0.56
Mother's Ps-ES/10		-0.17 **		-0.12 **		-0.04	-0.02	
Father's Ps-ES/10		-0.22 **		-0.16 **		-0.06	-0.04	
Parents' Ps-ES/10		0.62 **		0.44 **		0.17 *	0.10	
Service class,higher	3.66 **		3.07 **		1.14 *		0.86	
Service class,lower	2.76 **		2.36 **		0.97		0.80	
Routine non-manual e	2.34 **		1.79 *		0.53		0.41	
Personal service wor	1.71 *		1.65 *		0.61		0.56	
Sml props w employee	1.94 *		1.78 *		1.10		1.02	
Sml props w/o employ	1.05		1.16		0.45		0.37	
Farmers,Smallholders	1.90 *		1.54		0.66		0.60	
Foremen,Technicians	1.48 *		1.46 *		0.56		0.50	
Skilled manual worke	1.25		1.38 *		0.54		0.49	
Semi,unskilled manua	0.58		0.75		0.31		0.28	
WOMAN	-2.95 **	-2.96 **	-3.02 **	-3.05 **	-2.57 *	-2.60 *	-2.58 **	-2.54 **
FEEPAY			0.94 *	1.21 **	-0.31	-0.21	-0.30	
GRAMMAR			1.94 **	1.98 **	0.41	0.37	0.39	
SECMOD			-0.20	-0.27	0.00	-0.04	-0.01	
HIGHER					4.31 **	4.31 **	4.29 **	4.53 **
NOQUAL					-2.22 **	-2.27 **	-2.22 **	-2.44 **
(Constant)	7.61 **	5.79 **	7.37 **	6.53 **	9.03 **	8.77 **	8.67 **	9.79 **

Columns 3 and 4 add in the types of school attended. The models now explain 33% and 32% respectively of all variation of the BHPS respondents' age 35 Essex Score. Schooling-type in the UK is subject to various sorts of parental selection, either by paying for schooling, or by moving to areas with "good"—and preferably selective—state schools. Together, parents' class and educational choices on behalf of their children, explains around one third of all the variation in the human capital at age 35 of people born in the 1940s .

It is worth, at this point, unpacking the way "class" may work to allow the transmission of advantage. There are three elements.

1. Reflections of the resources present in the household of origin. These are of two sorts. Material resources, housing, furnishing, equipment are in themselves of some importance—are there books and other cultural artifacts in the home, does the child have her own space to work in? And, probably even more important are non-material circumstances: positive models of appropriate work culture and values communicated through casual conversation, and practical "good examples" of parental

assiduity and commitment, as well as the indirect effects of older household members social and cultural capital endowments. These may be presumed to have their effect, through the environmental mechanisms discussed by Bourdieu in Chapter 1 of **Distinction**, even independently of the next element.

2. Parents may make specific decisions (along the lines of Becker and subsequent human capital theorists) to allocate their own time with an explicit intent to transfer various sorts of economically salient knowledge and values to their children. And…

3. …we also have to concede the possibility of class differentials in the characteristics of the children themselves, whether directly health related, or related to some inherent academic or other abilities (as proposed by Saunders 1997). Once the possibility of these last are admitted, however, it is in practice very difficult to separate their effects from those of the previous two effects—and we do not need so to distinguish them for our present purpose. These three together, plus the parental choices that influence the type of schooling, constitute the parental endowment of their children's human capital.

So far the independent variables in the regression equations are genuinely independent. We have one set of variables that tell us about the respondents' parents and the sorts of schools they chose for their children. And we have an entirely distinct set of variables describing their children's (our respondents') Essex Scores. There are strong positive coefficients; the higher the parents human capital, the higher the children's. BHPS respondents born in the 1940s to parents in Goldthorpe's higher service classes receive an average Essex Score premium of 3.07 over the default group—placing them at nearly 50% above the (Table 4 estimate of the) median for this group. Two parents both with Pseudo-Essex Scores of 8, give their child a premium of 4.80 (ie (0.44*16)-(0.12*8)-(.16*8); note, incidentally, the approximately constant returns on both parents' employment implied by these coefficients—this observation may in the future contribute to arguments about the consequences of mothers' employment. There is no circularity whatsoever in the model: plainly the parents manage, presumably by some combination of the various means proposed in the previous paragraph, to pass on a substantial part of their own human capital to their children.

And indeed we get an unmistakable empirical signal about what these means are, from the change in the coefficient when we add-in the schooling variable. Comparing model 3 with model 1, we find, for example, that the children's human capital premium for higher service class parents falls from 3.66 to

3.07. Comparing model 4 with model 2, the premium associated with the sum of the parents' Pseudo-Essex Scores falls substantially. The reason is clearly the large positive coefficients on the fee-paying and selective schools coefficients newly introduced in the two later models. Clearly, some of the children's advantage associated with the parents' class-resources, is also associated with the schooling that is in effect selected for them (either by paying school fees, or by the advantage derived from the household of origin in gaining entrance to non-fee-paying selective schools). That part of the Table 5 evidence discussed so far tells us unambiguously that part at least of the class-resource transmission is achieved through the educational system.

Models 5 and 6, which add educational attainment (ie highest achieved academic qualifications) take us into new territory. There is very definitely a circularity in the estimation procedure, since the Essex score is itself calculated in part on the basis of the economic value of educational attainment. So the margin of explanation that takes the proportion of variance explained from 33% to 57%, is, in this sense purely tautological: we are using the same variable both to generate variability and to explain it. (Model 7 which uses both human capital indicators, is included simply to demonstrate that the parents' Goldthorpe class and parents' Pseudo-Essex Score are explaining the same variance in these models.)

However the real crux is equation 8, which drops all of the class-related variables in the model, leaving just gender and educational attainment with virtually no loss of explanatory power. That part of the variance in the children's human capital explained by parents' class-resources and educational choices, is also explained by the educational outcomes.

The straightforward reason for this is the one proposed by researchers in this field from the time of Halsey, Heath and Ridge (1981) onwards (though the phenomenon as registered through human capital is rather more complete than appears in the original categorical-class models). Parents' class strongly conditions children's outcomes. Well-resourced parents achieve this effect through those activities which serve to ensure high levels of educational attainment for their children. We infer that class position is reproduced across generations through the educational system.

Table 6:
Parental resources and school choice determining educational attainment

(** P<.005 * P<.05)	Higher educ. quals		No quals given no higher ed	
pseudo R**2	0.20		0.20	
1920s birth cohort	-1.93	**	1.99	**
1930s birth cohort	-1.48	**	1.11	**
1940s birth cohort	-0.24		0.39	
1950s birth cohort	0.09		0.17	
1960s cohort (default)				
Parental PsES dec 1 (def)				
Parental PsES decile 2	-0.19		0.05	
Parental PsES decile 3	0.86	**	-0.28	*
Parental PsES decile 4	0.81	**	-0.36	*
Parental PsES decile 5	0.48		-0.34	*
Parental PsES decile 6	0.93	**	-0.52	**
Parental PsES decile 7	0.77	*	-0.72	**
Parental PsES decile 8	1.31	**	-0.68	**
Parental PsES decile 9	1.18	**	-1.04	**
Parental PsES decile 10	1.95	**	-1.44	**
WOMAN(1)	-0.53	**	0.40	**
FEEPAY(1)	1.36	**	-1.45	**
GRAMMAR(1)	1.18	**	-2.10	**
Comprehensive (default)				
SECMOD(1)	-1.19	**	0.42	**
Parents' PsES *20s cohort	0.00		0.04	
Parents' PsES *30s cohort	0.01		0.08	**
Parents' PsES *40s cohort	-0.03		0.06	*
Parents' PsES *50s cohort	-0.01		0.03	
1960s cohort (default)				
Constant	-2.60	**	-0.60	**

But one side of the triangle of influence is missing. We have established the relationship from parents' class-resources to children's economic position at age 35, and from educational outcomes to economic position also. Table 6 models the remaining link, from parents' resources to educational outcomes. We are now in a position to look more generally to the whole of the retrospective sample rather than just at the 1940s birth cohort. We estimate the model using parents' Pseudo-Essex Score (the model works similarly for the MOW scale). We could adopt an ordered logit modeling approach, but in fact, since we are really only concerned with three educational outcomes (higher education/lower

qualifications/no qualifications) we can model by a nested pair of logistic equations. The first estimates the probabilities of higher educational qualifications for the whole sample, and the second estimates the probability of no qualifications for that part of the population without higher education.

We can see directly from the cohort coefficients, that throughout the mid-century period there was an increasing probability of higher education and declining probability of no qualifications across the population as a whole. The next panel of coefficients show the effects of parental PsES deciles from lowest to highest: the effects are, reasonably though not entirely regularly, such that the better resourced are the parents', the higher the relative odds of children achieving higher educational qualifications, and the lower the odds of their having no qualifications. Women have lower odds-ratios of higher education, higher odds-ratios of none. The final panel shows the (modest level of) interaction of the parental PsES score with birth cohort.

Table 7:
Effects of parents PsES, educational choices and attainment, on children's Essex Score
(** P<.005 * P<.05)

aged	20		25		30		35		40		45		50		55	
MultR	0.52		0.72		0.77		0.77		0.77		0.77		0.76		0.75	
AdjuR Square	0.27		0.52		0.59		0.60		0.58		0.59		0.57		0.56	
PARESSX	-0.02		0.02		0.04	**	0.08	**	0.04	*	0.06	*	0.04	*	0.02	
WOMAN	-0.50	**	-1.46	**	-2.34	**	-2.65	**	-2.55	**	-2.42	**	-2.18	**	-1.93	**
COH20	-0.08		0.82	**	0.58	*	0.66		-0.30		0.16		0.11		0.28	
COH30	0.34		0.88	**	0.73	**	1.08	**	0.13		0.39		0.04		-0.15	
COH40	0.26		0.73	**	0.63	**	0.84	*	0.16		0.55					
COH50	0.25		0.70	**	0.69	**	1.00	**								
COH60	0.01		0.36													
PARESSX*COH20	0.03		-0.02		-0.01		-0.03		0.01		-0.01		0.00		0.00	
PARESSX*COH30	0.01		-0.01		-0.03		-0.07	**	-0.02		-0.02		0.01		0.03	
PARESSX*COH40	0.02		0.01		-0.02		-0.05	*	-0.01		-0.03					
PARESSX*COH50	0.02		0.01		-0.02		-0.05	*								
PARESSX*COH60	0.01		0.01													
Woman born post 1950s	-0.05		0.37	**	0.74	**	0.31									
Fee-paying	-0.34	**	0.16		0.23	*	0.21		0.42	*	0.35	*	0.21		0.37	*
Non-fee, selective	-0.04		0.29	**	0.27	**	0.48	**	0.60	**	0.68	**	0.65	**	0.91	**
Lower status secondary	0.00		-0.08		-0.11		-0.02		0.03		-0.03		-0.06		0.04	
HIGHER	-0.14	*	2.61	**	4.06	**	4.47	**	4.74	**	5.14	**	4.80	**	4.15	**
NOQUAL	-1.30	**	-1.72	**	-1.99	**	-2.30	**	-2.71	**	-2.88	**	-2.82	**	-2.51	**
(Constant)	6.27	**	6.80	**	7.98	**	8.49	**	9.92	**	9.73	**	9.70	**	8.76	**

Table 7 provides the more comprehensive, whole-sample, view with children's economic position as the dependent variable. It models the children's Essex Score at each age with a separate regression

equation, including all post-1920s birth cohorts, with dummy variables for each birth cohort (default categories for which are the latest available—ie the 1970s for the 25 year-olds) and separate interaction terms for each cohort with parents' resource levels. The interaction vectors (PARESSX*COH20) and so on are included but are not significant except in the case of BHPS respondents aged 35.

We might also note some substantively interesting features in this table. (1) being a woman has, irrespective of any other characteristics, a negative effect on human capital. In constructing the model, an interaction between parents' human capital and gender produced no very consistent or significant results. However there is an evident interaction between birth cohort and gender, as indicated by the positive coefficients on the woman*/post-1960-birth row. (2) Though (as we saw in Table 5 for the 1940s birth cohort) the educational attainment characteristics can be used to explain almost the whole of the explainable variation, nevertheless we still get significant coefficients for some of the major elements in the model—parents' resources, their educational choices, and the children's eventual attainments—implying that the variance explanation is genuinely shared amongst them. (3) The slight excess coefficient on the selective-non-fee-paying school suggests that it may compensate for slightly lower average points on the PsES scale of parents of children attending this sort of school.

Table 8 consists of a similar set of models, but excluding the parental "class" resources and the educational choice variables. Levels of explanation are reduced by a only a fraction of one percent. The inescapable conclusion is, just as we found for the 35 year olds born in the 1940s, so for the full age range, and across the birth cohorts: while parents resources and their educational choices on behalf of their children continue to show significant effects even when combined within the same model with educational outcomes, still, very nearly the same levels of explanation can be reached using educational outcomes alone.

Table 8 Effects of educational attainment on children's Essex Score
(** P<.005 * P<.05)

age	20		25		30		35		40		45		50		55	
MulR	0.53		0.72		0.77		0.77		0.76		0.76		0.76		0.75	
AdjR Square	0.27		0.52		0.59		0.59		0.58		0.58		0.57		0.56	
WOMAN	-0.52	**	-1.43	**	-2.28	**	-2.59	**	-2.49	**	-2.35	**	-2.13	**	-1.89	**
COH20	0.24	**	0.62	**	0.36	**	0.19		-0.17		0.06		0.03		0.31	*
COH30	0.47	**	0.77	**	0.35	**	0.27		0.00		0.20		0.09		0.22	
COH40	0.54	**	0.75	**	0.36	**	0.26		0.03		0.28	*				
COH50	0.49	**	0.73	**	0.40	**	0.37	*								
COH60	0.18	**	0.46	**												
Woman born post 1950s	-0.05		0.32	**	0.68	**	0.28									
HIGHER	-0.19	**	2.77	**	4.23	**	4.69	**	4.96	**	5.35	**	5.14	**	4.54	**
NOQUAL	-1.28	**	-1.86	**	-2.17	**	-2.52	**	-2.96	**	-3.18	**	-3.10	**	-2.88	**
(Constant)	5.98	**	7.12	**	8.57	**	9.57	**	10.54	**	10.52	**	10.31	**	9.34	**

Plainly, part of the reason for the explanatory power of educational attainment is the circularity arising from the inclusion of educational attainment in the derivation of the Essex Score—though this cannot of course be responsible for much of its growth from age 25 onwards. And even that part of the variation in the Essex Score that can be explained by entirely independent measures of parents resources and educational choices, can also be explained by educational attainment. So the intergenerational transmission of embodied resources is achieved through the promotion of children's educational attainment. The effect of class is, it appears from this table, entirely indirect, operating via the educational system

Was this the case throughout the period covered by the retrospective data? We need a separate model for each age and birth cohort. Thus Table 9 summarises the correlations from a large number of regression models, each estimated separately for each age and birth cohort.

Table 9: Summary of separate models for each age and birth cohort

cohort	1920s	1930s	1940s	1950s	1960s
age 25					
parents PsES, school, sex, attainment	0.42	0.57	0.56	0.56	0.43
sex and educational attainment only	0.43	0.57	0.55	0.56	0.43
parents PsES, school and sex only	0.24	0.36	0.31	0.30	0.16
age 35					
parents PsES, school, sex, attainment	0.61	0.61	0.56	0.58	0.52
sex and educational attainment only	0.62	0.60	0.56	0.58	0.50
parents PsES, school and sex only	0.43	0.40	0.31	0.32	0.24
age 45					
parents PsES, school, sex, attainment	0.55	0.58	0.57	0.59	
sex and educational attainment only	0.54	0.57	0.57	0.57	
parents PsES, school and sex only	0.35	0.35	0.30	0.32	
age 55					
parents PsES, school, sex, attainment	0.53	0.58	0.58		
sex and educational attainment only	0.54	0.57	0.55		
parents PsES, school and sex only	0.34	0.36	0.28		

Three points emerge. The first is that, at least for the older three age-groups, the strength of the class effects (parental resources and educational choices) seem to have diminished through the century. This may bear some relation to the "…significantly weakening—direct effect of class…" finding in Marshall, Swift and Roberts (1997 p. 129). However the main conclusion of the Oxford study is that the direct effect of class is still substantial. The second of the conclusions that might be drawn from Table 9 is that, on the contrary, the direct or unmediated effect of parents' resources on their children's human capital—as indicated by the difference between the first two rows of each panel—is negligible. And the third observation follows from the first two, together with the fact that the overall explanatory power of the full model has in general fallen rather less than that of the parents' class models. The margins between the second and the third rows of each panel have been getting larger for each successive birth cohort. Again, rather contrary to the tenor of the Oxford argument, while the strength of the class effect has apparently been reducing, the relative influence of educational attainment appears to have been increasing.

One potential explanation for the apparent difference with the Oxford group was that it might be a result of modeling absolute levels of human capital, as opposed to the relative mobility chances that are the main concern of the Oxford group. The closest analogies within the human capital approach will be either the modeling of mobility in terms of rank orderings of resource levels, or of resources

relative to the median. I have constructed similar models to the above for both sorts of dependent variables, and I arrive at very similar results to those reported here.

But the major "educational attainment swallows-up parents' class effects" conclusion from the analyses so far is, as we shall see in a moment, not quite as conclusive as it may appear. We shall see in a moment that there are some further effects of parents class-type resources on change in their children's position during the life course, that have not yet been captured by the analysis.

4 Mobility through the life-course.

The analyses of long-term intergenerational effects as estimated from the BHPS retrospective data, really have the potential to do little more than parallel and perhaps amplify the results from studies using the traditional categorical-class indicators. We can now turn to what is the real value added from the Essex Score approach: the ability to integrate cross-generational and life-course mobility analysis using the 1990s panel evidence from the BHPS.

4.1 "Pools" and "balanced panels"

The previous sequence of analyses involved some statistical complications (some still unresolved), to cope with the "triangular" nature of retrospective or "survivor" data sets. Prospective data sets are in many ways simpler to deal with, but there are some balancing complications. We want to look at the evolution of circumstances of the same individuals over time—but respondents get older over time, and some do unfortunately die. Longitudinal panel analysis is often conducted using a "balanced panel" containing just those individuals who survive throughout the whole period of the panel. An alternative is to use "pooled" data in which shorter runs of evidence, perhaps just covering pairs of years, are piled up on top of each other so as to transform the panel from a "long form" with each respondent represented just once, to a "wide form", including all transitions of state and circumstance over the entire period of the panel, with respondents represented once for each pair of years in which they contribute data. In what follows we shall use both forms of dataset.

One problem with a conventional balanced panel is that it is unrepresentative in the sense that respondents who die during the panel period, are excluded from the balanced panel as a whole. This may lead to serious problems. What if the variables included in the models being estimated within the balanced panel are also implicated in those processes that lead to permanent exit during the period of the panel? We know, to choose the obvious example that concerns the subject of this paper, life-expectancies are significantly influenced by class in the UK. Can we therefor use balanced panels to investigate class-type issues?

In fact the problem can be quite simply resolved. The crux is that death is a relevant outcome of class-processes. A sensible way to sidestep the problem is by including the dead as members of the balanced panel, which would presents the complication that we must provide appropriate codings of dependent variables, to allow for this particular extreme form of non-participation in the study. And in fact for the analyses that follow this is mostly not a problem. The Essex Score in this paper is estimated only for age groups 20-59, and we have 9 consecutive years of panel data. So the sample chosen for analysis was aged 20-50 in 1991, and British death rates for this age-group are relatively low. The small numbers of deaths are treated simply as missing data in the following tables.

4.2 The distribution of the individual-level Essex Score in the 1990s

Table 10 sets out a first summary of the position of this representative sample of British residents after nine years of participation in the BHPS, broken down by sex, age-group and starting position in the human capital orderings. Table 11 sets out a summary of their mobility, in terms of change in Essex Score, over this period.

Table 10: Essex Score in 1999, by sex, age-group and 1991 Essex Score quintiles

	mean Essex Scores in 1999			Ns		
age in 1991	20s	30s	40s	20s	30s	40s
men						
1991 Essex Score quintile 1	8.29	5.89	4.68	97	24	21
quintile 2	8.18	6.90	6.18	116	57	43
quintile 3	9.15	7.74	7.09	153	90	92
quintile 4	11.18	9.88	8.43	113	168	145
1991 Essex Score quintile 5	14.90	14.39	12.90	46	191	209
women						
1991 Essex Score quintile 1	5.50	5.39	4.60	190	139	165
quintile 2	6.60	6.81	5.79	157	119	146
quintile 3	8.03	7.92	7.40	119	87	97
quintile 4	10.49	9.25	8.31	62	80	70
1991 Essex Score quintile 5	13.39	13.72	12.05	33	76	80

The 1991 Essex Score quintiles have been constructed taking the whole of the balanced panel together. Consider first the distribution of the sample across these human capital quintiles. The men in their 20s show an inverted-U distribution, with the mode in the middle, quintile 3. The women show a quite different distribution, strongly downward sloping, with the modal group at the bottom of the human capital distribution, and progressively fewer women in each successive category. Older people of both sexes tend to be more highly placed. But this cross-sectional age-gradient is much steeper for men than for women.. So for that third of the sample aged in their 40s in 1991, the men show a regularly upward-sloping gradiant, with 10 times as many in the top as in the bottom human capital quintile, while the equivalent group of women show just a rather less steep negative gradient as compared to the younger women.

Table 11:
Change in Essex Score in 1991-9, by sex, age-group and 1991 Essex Score quintile

	men			women		
age in 1991	20s	30s	40s	20s	30s	40s
1991 Essex Score quintile 1	4.38	2.10	0.71	1.69	1.30	0.45
quintile 2	2.48	1.09	0.50	0.93	1.19	0.04
quintile 3	2.03	0.59	0.04	0.99	0.83	0.21
quintile 4	2.27	0.99	-0.55	1.67	0.38	-0.53
1991 Essex Score quintile 5	2.56	0.80	-1.59	1.14	0.12	-1.79

Young men, and particularly those in the lower 1991 human capital quintiles, fare much better than equivalently placed young women. Table 11, sets out change in mean Essex Scores in the period 1991-9 broken down by sex, age-group and 1991 human capital quintile. Men in their 20s in the

bottom quintile show well in excess of twice the growth in resources over the period as do equivalently placed women. Indeed men of this age-group show substantial advantages right the way across the human capital spectrum, though the proportional advantage of the better-placed men is not so large. Thus, putting Tables 10 and 11 together, men in their twenties in the bottom quintile show a 112% (4.38/(8.29-4.38)) increase in their human capital, where similar women show a 44% (1.69/(5.50-1.69) increase. In the top quintile men show a 21% 2.56/(14.90-2.56)) increase, where women show just 9% (1.14/(13.39-1.14))change. The gender differences for the middle age group are similar in pattern but smaller, and they become negligible for people in their 40s in 1991. Note that in the middle quintile, women in the two older age-groups have a small advantage over men; with these two marginal exceptions, the gender differential is always quite substantially in favour of men.

4.3 Static models, life-course human capital change at the individual level

Modeling life-course mobility processes involves two distinct sorts of change. The first corresponds quite closely to what we conventionally associate with intergenerational mobility: the investigation of essentially fixed characteristics, such as parents' occupational status at some historical juncture. Parents' occupations, or the educational choices made by parents for their children during their childhood, remain as constants through the children's life-course, but still may have some effect on the patterns of their children's careers throughout their adult lives. We might think of these as being "static" determinants of life-course mobility. By contrast there are things that happen during adult life—decisions about employment or family status changes, accidents, windfalls, misfortunes, or lucky breaks—which also have consequences for change in human capital. We might think of these "time-varying" characteristics as the "dynamic" determinants of life course mobility.

Table 12 sets out for comparison the contribution of various static characteristics to the determination of life-course dynamics in our sample. This table, and all those following, has as the dependent variable, change in human capital (which means, inter alia, that there is no circularity when we use characteristics that contribute to our estimation of levels of human capital, as right-hand-side predictor variables in regression equations). Table 12 looks at ways of explaining, not the level of human capital, but the difference between levels of human capital in 1991 and 1999. Table 12 shows that fixed characteristics do have clear dynamic effects, and that in particular, parents characteristics continue to have effect during children's working lives. Model 1 shows that much of the association

between parents' PsES and change in human capital is concentrated within the first adult decade—as compared with the default age-group (aged 40-50 in 1991) those in their twenties could expect an extra .08 for each unit of parents' summed human capital, as well as an extra .49 as a result of attending a fee-paying school. Of course the cumulative effect of human capital, which we have seen from the previous two tables, must account for some of the effect on change during the panel period, So some of this effect is not genuinely life-course mobility, but comes via the effect of parental resources on the starting level of human capital in 1991. Model 2 shows the scale of these effects through the "1991 Essex Score" and "1991 Essex Score Quintile" rows.

Table 12: Explaining variation in change in Essex Score

(P<.005 * P<.05)

models	1	2	3	4	5	6
change in Essex Score 1991-99						
MultR	0.38	0.42	0.46	0.40	0.56	0.56
AdjuR Square	0.14	0.17	0.21	0.16	0.31	0.32
parents' Pseudo Essex Sc.	-0.01		0.04 *			0.02
1991 Essex Score		-0.22 **	-0.23 **		-0.48 **	-0.42 **
WOMAN	-0.27 **	-0.70 **	-0.82 **	-0.23 *	-1.04 **	-1.08 **
in 20s in 1991	1.21 **	2.02 **	0.79 **	2.27 **	1.09 **	0.42
in 30s in 1991	0.99 **	1.25 **	0.85 **	1.23 **	0.92 **	0.73 *
in 20s*parents PsES	0.08 **		0.08 **			0.05 *
in 30s*parents PsES	0.02		0.03			0.02
feepaying school	0.49 *		0.85 **			0.33
selective non-fee school	-0.13		0.28 *			-0.05
low level secondary school	-0.11		-0.26 *			-0.06
1991 ES quintile 2		-0.32 *			-0.09	
1991 ES quintile 3		-0.28			0.13	
1991 ES quintile 4		-0.04			0.32	
1991 ES quintile 5		0.31			0.63	
ES quin 2 * parents' PsES			-0.04 **			-0.02 *
ES quin 3 * parents' PsES			-0.04 **			-0.02
ES quin 4 * parents' PsES			-0.03 *			-0.02
ES quin 5 * parents' PsES			-0.01			-0.01
higher education				1.58 **	4.31 **	4.04 **
lower level qualifications				0.24 *	1.38 **	1.34 **
(Constant)	-0.15	1.85 **	1.81 **	-0.57 **	3.00 **	2.73 **

Model 3 demonstrated that there are in addition some career mobility effects, which are visible in the interactions between the parents' PsES and the children's ES quintile in 1991. There is an apparent "U-shaped" pattern of effects, in which those in the bottom and the top ES quintiles in 1991 both get substantially more positive effects from their parents human capital in the subsequent decade than do those in between. And as we shall see in a moment, there are also further substantial interactions

between these "parents' PsES*childrens starting ES" dummies, and age and sex, which mean that the lifecourse effects of these static characteristics, are not just significant, but also substantial. Models 4 and 5 add-in the educational attainment variables: readers might note that the significant effects of these are in this context definitely not circular or tautological, since the dependent variable is change in the Essex Score, and the educational attainment variable hardly changes during the 20-59 life-span of this balanced panel. Model 6 shows that even without the further interactions with age-group and sex, one of the "parents PsES*children's starting ES" categories remains significant even once the educational attainment dummies are included.

Table 13: Explaining variation in change in Individual Essex Score
time-invariant characteristics (** P<.005 * P<.05)
change in Essex Score 1991-99

	men			women		
1991 age group	20s	30s	40s	20s	30s	40s
MultR	0.65	0.33	0.49	0.47	0.38	0.46
AdjuR Square	0.41	0.09	0.23	0.20	0.13	0.19
parents' Pseudo Essex Sc.	0.10 **	0.06	-0.03	0.06 **	0.02	0.01
1991 Essex Score	-0.27 **	-0.26 **	-0.45 **	-0.14	-0.46 **	-0.46 **
feepaying school	0.43	0.12	0.65	0.36	-0.07	0.04
selective non-fp school	-0.03	-0.28	0.15	-0.06	-0.21	-0.02
low level secondary school	0.22	0.17	-0.09	-0.13	-0.16	-0.38
ES quin 2 * parents' PsES	-0.06 *	-0.07	0.02	-0.04	0.01	0.01
ES quin 3 * parents' PsES	-0.07 *	-0.09	0.05	-0.04	0.02	0.03
ES quin 4 * parents' PsES	-0.07 *	-0.06	0.02	-0.06 *	0.01	0.02
ES quin 5 * parents' PsES	-0.12 *	-0.05	0.04	-0.14 **	0.06	0.06
higher education	3.75 **	1.94 **	1.99 **	3.50 **	2.62 **	0.63
lower level qualifications	-1.78 **	-1.44 **	-1.47 **	-0.71 **	-0.88 **	-1.20 **
(Constant)	3.82 **	3.56 **	4.28 **	1.57 **	3.80 **	3.52 **

Table 13 adds in the additional interactions, through the device of separate model estimations for each separate sex and age-group. Here we see clearly:

- a negative gradient on the effects of the "parents' PsES*childrens starting ES" parameters for both men and women in their twenties in 1991—those children with well-resourced parents who started their careers with relatively low levels of human capital, subsequently received more benefits from their parents human capital, than did those who started their careers higher up in the human capital orderings. This effect is quite independent of the separate, substantial and significant effects of their educational attainments.
- Conversely (though these coefficients are not statistically significant) there appears to be a positive gradient for the "parents PsES*childrens starting ES" dummies for men and women in their 40s. Those older, among the panel members, who started the panel observation period with relatively

higher levels of human capital, also have higher rates of human capital growth associated with their parents' human capital. So the small but significant "inverted-U" relationship associated with these variables in Table 12, is revealed in Table 13 as the sum of two effects for the younger and older age-groups respectively, with opposite gradients.

There are relatively low levels of explanation for the models for the intermediate (age 30-40) group, might be associated with the switch between these two age-related effects—and also with the relatively low rates of change in individual-level human capital changes for this age group seen in Table 11.

But there is a more general point to be drawn from these analyses overall. We can see, from these examples, quite clear evidence of effects of parental human capital levels, which operate well into the life-course, and after the establishment of the panel respondents' final educational outcomes. Parents' human capital—their class, by the arguments set out in the first sections of this paper—continues to have independent, detectable and systematic effects, throughout at least the first three decades of their childrens' adult lives.

4.4 From Individual to household-level change

These are "static" effects (as defined above) on the life-course dynamics of human capital accumulation. We can also see "dynamic" effects, both on individuals' human capital accumulation of these resources, and on their household-level resources. To illustrate these, we consider the effects of job changes, and of changes in partnership status and in responsibility for children.

Table 14: Effects of changed circumstances on human capital

year-on-year change in scores	individ. Essex Score		household Essex Score	
	men	women	men	women
All	0.12	0.08	0.08	0.03
change in employment				
remain non-active	-0.18	-0.11	-0.13	-0.13
non-active-->job	0.13	0.18	0.12	0.12
job-->non-active	-0.57	-0.40	-0.49	-0.71
worse job	-1.80	-1.76	-1.11	-1.06
same job	0.14	0.15	0.10	0.12
better job	2.17	2.17	1.38	1.43
change partnership state				
remain unpartnered	0.18	0.11	-0.01	0.04
acquire partner	0.37	0.29	0.14	1.46
lose partner	0.17	0.06	-0.40	-2.66
keep partner	0.09	0.07	0.12	0.06
change child state				
remain no dep. child	0.12	0.08	0.13	0.08
acquire dep. child	0.19	-0.20	-1.99	-1.83
lose dep. child	0.04	0.05	0.71	0.35
keep dep child	0.12	0.10	0.11	0.05

We must now shift our focus from the balanced panel whose results were reported in the previous section, to a pooled file in which each pair of years for the members of the balanced panel are stacked on top of each other, showing the effects of changes in circumstances on annual change in human capital allocations.

Table 14 shows the relationship of various sorts of change (and, so as to make the classification comprehensive, continuities) in circumstances, over pairs of years, with the associated mean annual changes in Essex Scores. The first panel of the table deals with changes in employment circumstances. The effects shown in the first two columns of the first panel are purely tautologous, insofar as they follow straightforwardly from the definitions and coefficients that went into the calculation of the Essex Scores. Those men and women who, being inactive (un- or non-employed) in the labour market, remain so, see a small continuing erosion in their levels of human capital. Those who gain employment having been inactive, make small immediate gains, while those who, having been in employment, cease to be, suffer larger immediate losses. Those who move to "worse" jobs (as defined by the MOW scale) lose substantially, those who stay in their current jobs gain small amounts to reflect the accumulation of credit in the labour market for job tenure, while those who get "better" jobs, gain substantially. So far, so circular.

The corresponding changes in household-level capital, shown in the final two columns of this panel, follow quite straightforwardly. The household level Essex Score is simply the weighted sum of the scores of all the household members. While household members do quite often change their employment circumstances simultaneously, there is still a substantial independence. So the effects of employment changes appears in the household-level scores, as a "damped" version of the individual level effects.

Something rather more dramatic emerges however when we turn to the second panel, which deals with effects of changes in circumstances which are not definitionally linked to the construction of the Essex Score. The changes in the individual level scores are just what we would expect: the sample overall shows a modest year-on-year net increase in human capital, with those aged below 50 or so increasing their score somewhat each year. Plainly those of an age (or of a mind) to form partnerships, are, overall, at a life-stage where growth in Essex Score is relatively fast (indeed, there is some evidence that men may sometimes form partnerships because they get better jobs). There is, in the individual-level change in Essex Score, not much difference—other than the small male premium—between the men's and the women's effects of the various types of change in partnership status. There is however a really marked difference in the gender effects of partnership change at the household level.

We see that men who gain a partner, also make a modest gain in their household-level Essex score—but that women, under those same circumstances, make a gain that is some ten times as large. Similarly, men who lose partners make a small loss, but women, in these circumstances suffer a loss in their household-level Essex score that is between six and seven times larger than the men's.

The reason for this differential is quite straightforward (and will be entirely familiar to, those working in the area of family poverty dynamics: see eg Burkhauser et al 1990). There are in fact two processes which operate in parallel: (1) forming any partnership gives economies of scale, of the "two can live cheaper than one" kind (this is implemented within the household-level Essex Score through the Atkinson "$\sqrt{N}$" equivalencing mechanism); and (2) forming a partnership with someone better resourced, in human capital terms, gives a gain insofar as it gives access to part (here $\sqrt{N}/2$) of her or his resources. Both partners gain equally from the economies of scale effects. But when two partners with unequal levels of human capital form a partnership, one gains from this second effect, and one

loses. Men tend, on average, to marry "down", in human capital terms, women, to marry "up" (Chan and Halpin 2000). Partnership formation, on this basis, has on average one positive and one (just slightly smaller) negative effect on men's human capital; women on average get two positive effects. And in partnership dissolution the effects are reversed, to men's advantage.

Indeed, the fact that the disproportions in the sizes of the effects for men and women are larger on partnership dissolution than on formation may reflect in turn another phenomenon, the "Allerednic" (ie reversed Cinderella, princess into scullery-maid) effect, which can also be effectively explored using the Essex Score. A "rational choice" model of household division of labour within a partnership might predict that the woman, with lower levels of human capital, will withdraw partially or fully from the labour market to specialise in domestic production. Her own Essex Score diminished during the partnership while her partner's increases, and she therefor makes a larger loss through the second of the above mechanisms at the ending of the partnership, than the gain she made at the time of its formation (Gershuny 2000).

Finally in Table 14 we see the effects of acquiring or losing a co-resident dependent child. At the individual level we see the expected gender difference at the time that the child enters the household; the woman's attachment to the labour force weakens, and (perhaps as a consequence) the male partner's attachment strengthens. At the household level, the consequences of the new child are negative for adults of either sex, since there is an extra household member with, by definition, no extra human capital resource to add to the household's potential contribution to the labour market.

The various effects estimated separately in Table 14, tend to some degree to coincide (eg partnership dissolution may be associated with loss of a dependent child—or, more perniciously, the loss of a partner associated with continuing responsibility for a co-resident dependent child may also be associated with a weakening of labour market attachment). So, our final example of analysis of life-course mobility models these effects simultaneously.

Table 15 adopts the previous strategy of coping with age and gender interactions through the construction of separate models for each of the 6 salient combinations. We might note in particular that the gender differences in the consequences of gaining and losing partners increase through the age-groups: this may be partly an age effect—insofar as the various process such as the Allerednic phenomenon take their effect progressively over a number of years; it may also reflect some degree of

historical change, with younger women having, age-for-age, higher Essex Scores than did members of the older age cohorts at similar ages. Combination of the prospective analyses discussed in this section, with the retrospective materials discussed in the previous section, may allow us to disentangle these to some degree.

Table 15: Explaining variation in change in Household Essex Score: time-varying characteristics (P<.005 * P<.05)

Year-on-year change HH Essex Score

	men			women		
1991 agegroup	20s	30s	40s	20s	30s	40s
MultR	0.38	0.52	0.40	0.40	0.51	0.34
AdjuR Square	0.14	0.27	0.15	0.16	0.26	0.12
Remain non-active (def)						
Non-active-->job	0.35 *	0.00	0.11	0.39 **	0.09	0.11
Job-->non-active	0.03	-0.63 **	-0.49 **	-0.28 *	-0.28 *	-0.27
Worse job	-0.75 **	-1.14 **	-1.18 **	-0.64 **	-1.22 **	-1.06 **
Same job	0.10	0.22 *	0.23 *	0.15	0.20 **	0.23 **
Better job	1.23 **	1.65 **	1.61 **	1.47 **	1.58 **	1.41 **
Remain unpartnered (def)						
Get partner	0.63 **	1.07 **	0.28	0.88 **	2.55 **	2.95 **
Lose partner	-0.89 **	-0.46 *	-1.03 **	-2.12 **	-2.99 **	-3.40 **
Keep partner	0.42 **	0.16 *	0.08	0.18 *	-0.02	-0.09
Remain no dep. child (def)						
Acquire dep. child	-2.69 **	-2.67 **	-0.65 **	-2.23 **	-2.04 **	-0.17
Lose dep. child	1.40 **	0.92 **	0.39 **	-0.30	0.27	0.37 **
Keep dep child	-0.31 *	-0.12 *	0.05	-0.12	-0.12 *	0.19 **
Wave (2-9)	0.03 *	0.02	-0.01	0.03 *	0.02	-0.03 *
(Constant)	-0.33 *	-0.20	-0.10	-0.25 *	0.00	0.06 *
(N=26,648 pooled pairs)						

But for the present purposes the point of this analysis is again rather more general: it serves to demonstrate that the Essex Score approach, allied to the data in the BHPS, allows us to model, quite straightforwardly, the effects of changed circumstances during the life-course, on access to those class-type economic resources which determine life-chances in the longer term.

5 Conclusions

We started with an attempt to align the traditional sociological language of class and status, with the more recent innovations of various sorts of personal resources considered as types of "embodied capital". On this basis we constructed the Essex Score, as a non-categorical indicator of personal

resources salient to labour-market performance, which is intended as a measure of what is more conventionally indicated by categories of social class. Using the Essex Score we are able to:

(1) cover much of the same ground as that covered by the categorical measures in the field of inter-generational class mobility analysis, in a simple way, and perhaps with some contrasting conclusions;
(2) Treat life-course mobility in a way that accurately reflects the effect of life-events both inside and outside the labour market on the accumulation of economically salient resources, and hence on longer-term life-chances; and
(3) Integrate the inter-generational and the life-course mobility analyses, so as to allow the investigation of the interplay of early life and current circumstances in an appropriate way.

The Essex Score achieves these, furthermore, with comprehensive coverage of the relevant (pre-retirement) age-group irrespective of their current or past employment status (the older part of the population being more dependent on non-labour-market salient resources which will be dealt with separately within the SPLC programme). And it does so in a manner that can be appropriately scaled-up from an individual-level to a household-level coverage.

It adopts a strategic simplification of the Weberian concepts of class and status in a way that appropriately reflects the diminished importance of privilege for determining economic outcomes in developed market economies. In this reduced conceptualisation, class is directly and uniquely associated with the possession of economically salient resources—and in the context of this paper, more specifically with those embodied "mental" resources covered by the term "human capital". These characteristics serve to establish positions of relative economic advantage and disadvantage in what Sorokin called the "vertical" dimension of social space. Different employment relationships (eg labour contracts vs long-term service relationships, which may alternatively be seen as the determinants of class position) are in this view the consequences or outcomes, of bargaining processes determined by the balance of power between, on one hand individuals with particular human capital resources and their collective representatives, and on the other, organisations controlling other forms of capital and representing systems of production.

"Status" then denotes just those indirectly economically salient characteristics such as sex and family status which, while not directly contributing to individuals' productivity, nevertheless indirectly interact with human capital to determine position (for individuals or for households) in this vertical dimension.

It is clear that the social and cultural categories of embodied capital may also have indirect effects on positions in the "vertical" dimension, insofar as they are used as means for the storage, interpersonal transmission, and reconversion of human capital, as in the examples in Section 1. But their chief relevance will emerge when we turn to consider Sorokin's horizontal dimension. In this dimension different sorts of resources, mental and material, are combined to produce final satisfactions of various kinds. Cultural capital (ie consumption skills) are combined with physical goods and material services, in the company of others (drawing on social capital) to provide consumption experiences, and ultimately feelings, of well-being or ill, fulfillment, happiness or unhappiness. Social prestige or "standing", though seldom now used to justify economic privilege, is nevertheless undoubtedly still to be considered as another such important outcome. Bourdieu represents the two dimensions of this social space (as in Figure 2) as the basis out of which alternative lifestyles—which constitute individuals' personal "distinction", perhaps to be considered as equivalent to Weber's use of "prestige"—are constructed. (These consequential "conditions", will be discussed in another part of the SPLC programme, in a parallel to the discussion of "positions" in this paper.)

The second part of the paper, in operationalising and applying the Essex Score estimation of human capital, produces three substantive findings:

(1) The effect of parents' class on their children's level of human capital, as estimated by the Essex Score, is entirely swallowed up by that of the children's own educational attainment. Formal educational qualification is thus the means through which parents transmit their advantages to their children. The approach to modeling these effects employed here, needs some further thought, particularly applying other techniques (eg those outlined by Hendrickx and Ganzeboom 1998).

(2) Nevertheless, there is still some detectable independent (or "direct") effect of parents human capital on change in children's position during their adult lives. At first sight there may be some apparent conflict between the "level" and the "change" results. If there are indeed some direct "change" effects, why are these not also not seen in levels of attainment? The answer may be found in the U-shaped nature of the parental resource effects of parents' resources related to differences in the children's

"starting" positions. We see positive affects of parents' human capital for children starting in both the bottom and the top positions, none or negative effects in the middle—which in effect cancel each other out in the "level" analysis. The ability to estimate these life-course change effects is one of the chief advantages of the Essex Score approach.

(3) Moving from individuals to households, we can see how choices and involuntarily changed circumstances in a strictly non-economic sphere can affect access to human capital, and hence longer-term life-chances. Both the "Allerednic" effect in which women's human capital may be diminished as a result of choices of household work strategies, and the gender-differentiated partnership formation/dissolution effects—which are not normally considered within conventional class analyses of social mobility—are nevertheless clearly class-like in their consequences, both for individuals and for their dependent children. Again, the Essex Score approach provides a notably convenient mechanism for broadening the scope of class analysis, as well as for integrating this with the well-established, closely related (and mostly economists') research programme investigating the dynamics and consequences of poverty and wealth.

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Appendix 1: The MOW scale

(calibrated 2001, waves 1 to 9 of the BHPS)	SOC 2-dig	N	CUM FREQ	LOG INCOME	MOW
Other occupations in sales & service	95	2930	5.10	5.471	0.00
Childcare & related occupations	65	1359	7.47	5.492	0.94
Sales assistants & check-out operators	72	3116	12.90	5.502	1.37
Catering occupations	62	1502	15.51	5.661	8.56
Mobile market & door-to-door salespersons & agents	73	261	15.97	5.733	11.81
Hairdressers, beauticians & related occupations	66	398	16.66	5.734	11.84
Personal & protective service occupations nec	69	237	17.08	5.979	22.92
Domestic staff &related occupations	67	401	17.77	6.040	25.67
Health & related occupations	64	1320	20.07	6.115	29.05
Sales occupations nec	79	252	20.51	6.167	31.37
Receptionists, telephonists & related occupations	46	575	21.51	6.182	32.07
Travel attendants & related occupations	63	98	21.68	6.210	33.32
Other occupations in communication	94	570	22.68	6.277	36.32
Other occupations in agriculture, forestry & fishing	90	493	23.54	6.278	36.37
Clerks (not otherwise specified)	43	1738	26.56	6.333	38.86
Textiles, garments & related trades	55	538	27.50	6.361	40.14
Secretaries, personal ass., typists, word processor operators	45	1338	29.83	6.404	42.08
Other routine process operatives	86	900	31.40	6.416	42.59
Numerical clerks & cashiers	41	2609	35.94	6.455	44.35
Filing & records clerks	42	1034	37.74	6.458	44.50
Food, drink & tobacco process operatives	80	300	38.27	6.472	45.12
Clerical & secretarial occupations nec	49	283	38.76	6.478	45.41
Other occupations in mining & manufacture	91	114	38.96	6.497	46.28
Food preparation trades	58	294	39.47	6.513	46.99
Stores & despatch clerks, storekeepers	44	959	41.14	6.517	47.15
Other occupations in transport	93	140	41.38	6.542	48.31
Other craft &related occupations nec	59	733	42.66	6.549	48.59
Textiles & tannery process operatives	81	76	42.79	6.553	48.77
Other occupations nec	99	281	43.28	6.576	49.82
Social welfare associate professionals	37	592	44.31	6.592	50.55
Assemblers/lineworkers	85	536	45.25	6.599	50.86
Construction trades	50	1236	47.40	6.611	51.39
Vehicle trades	54	630	48.50	6.630	52.27
Admini/clerical officers etc in civil service & local govt	40	1053	50.33	6.657	53.48
Librarians & related professionals	27	52	50.42	6.660	53.59
Other occupations in construction	92	287	50.92	6.690	54.94
Woodworking trades	57	617	52.00	6.697	55.27

Appendix 1: continued

	SOC 2-dig	N	CUM FREQ	LOG INCOME	MOW
Road transport operatives	87	1558	54.71	6.730	56.76
Health associate professionals	34	1596	57.49	6.777	58.89
Printing & related trades	56	311	58.03	6.794	59.67
Metal working process operatives	84	186	58.36	6.808	60.30
Managers & proprietors in service industries	17	2510	62.73	6.816	60.65
Professional occupations nec	29	554	63.69	6.829	61.23
Chemicals, paper, plastics, related process operatives	82	512	64.59	6.870	63.09
Artists, musicians, athletes	38	911	66.17	6.875	63.32
Managers in farming, horticulture, forestry & fishing	16	405	66.88	6.882	63.60
NCOs & other ranks, armed forces	60	73	67.01	6.893	64.12
Other transport & machinery operatives	88	374	67.66	6.912	64.96
Metal forming, welding & related trades	53	697	68.87	6.929	65.74
Scientific technicians	30	574	69.87	6.931	65.85
Metal making &treating process operatives	83	97	70.04	6.934	65.99
Sales representatives	71	745	71.34	6.944	66.44
Plant & machine operatives nec	89	759	72.66	6.947	66.56
Buyers, brokers & related agents	70	142	72.91	6.986	68.33
Security & protective service occupations	61	1009	74.66	7.017	69.73
Legal associate professionals	35	42	74.74	7.020	69.84
Associate professional & technical occupations nec	39	648	75.87	7.034	70.46
Electrical/electronic trades	52	988	77.59	7.035	70.52
Metal machining, fitting &instrument making trades	51	1083	79.47	7.036	70.59
Teaching professionals	23	2341	83.55	7.099	73.41
Draftspersons, quantity & other surveyors	31	257	84.00	7.120	74.34
Managers in transport & storing	14	308	84.54	7.151	75.77
Architects, town planners &surveyors	26	250	84.97	7.184	77.24
Natural scientists	20	258	85.42	7.185	77.29
Financial inst office managers, civil service exec officers	13	996	87.16	7.196	77.81
Business & financial associate professionals	36	759	88.48	7.235	79.55
Computer analyst/programmers	32	530	89.40	7.255	80.47
Managers & administrators nec	19	1094	91.31	7.310	82.94
Engineers & technologists	21	998	93.04	7.372	85.74
General man & admin in Government, big companies	10	269	93.51	7.379	86.04
Production managers, manfact. construct. mining etc	11	789	94.89	7.386	86.34
Business & financial professionals	25	572	95.88	7.417	87.77
Health professionals	22	377	96.54	7.433	88.47
Legal professionals	24	255	96.98	7.447	89.11
Specialist managers	12	1532	99.65	7.473	90.26
Ship, aircraft officers, air traffic planners & controllers	33	100	99.83	7.620	96.93
Protective service officers	15	99	100.00	7.688	100.00
TOTAL		57410			

APPENDIX 2 The Heckman Estimation of the Essex Score

```
/*********************************
*** estimating M & F wage eq.  ***
*********************************/
version 7
*log close
clear
set matsize 150
set memory 48m
set more off
*log using "d:\tryit.log",replace

use  "d:\poolfile.dta"

replace age= . if age < 0
keep if (age > 19 & age < 61)
generate woman=sex-1
#delimit ;
heckman       lwage
              age agesq mow mowsq
              higra agegr agrsq medgra  agemd  agmsq
              educ* jobtot* famtot* unmtot*,
              select (woman age agesq mow mowsq
              higra agegr agrsq medgra  agemd  agmsq
              educ* jobtot* famtot* unmtot*);
predict heckman,xb;
/*
Heckman selection model                         Number of obs      =     67743
(regression model with sample selection)        Censored obs       =     25285
                                                Uncensored obs     =     42458

                                                Wald chi2(28)      =  39731.70
Log likelihood = -49552.32                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
lwage        |
         age |   .0351607   .0017705    19.86   0.000     .0316906    .0386308
       agesq |  -.0004006   .0000227   -17.65   0.000    -.0004451   -.0003561
         mow |   .0017666   .0003259     5.42   0.000     .0011277    .0024054
       mowsq |   .0001029   5.18e-06    19.88   0.000     .0000928    .0001131
       higra |  -1.395285   .1038818   -13.43   0.000     -1.59889   -1.191681
       agegr |   .0588611   .0053146    11.08   0.000     .0484447    .0692775
       agrsq |  -.0006201   .0000663    -9.35   0.000      -.00075   -.0004902
      medgra |  -.6790668   .0578339   -11.74   0.000    -.7924191   -.5657145
       agemd |   .0303696   .0030943     9.81   0.000      .024305    .0364343
       agmsq |  -.0003348   .0000395    -8.48   0.000    -.0004122   -.0002575
       educ1 |     .53995   .0135764    39.77   0.000     .5133408    .5665591
       educ2 |   .4754104    .008232    57.75   0.000     .4592759    .4915449
       educ3 |    .359283   .0087903    40.87   0.000     .3420542    .3765117
       educ4 |   .2548941   .0066423    38.37   0.000     .2418754    .2679127
       educ5 |   .1806694   .0059755    30.24   0.000     .1689576    .1923811
       educ6 |   .1257343   .0092617    13.58   0.000     .1075818    .1438869
     jobtots |   .0124648   .0013307     9.37   0.000     .0098566    .0150729
     jobtotr |   .0042406   .0012292     3.45   0.001     .0018315    .0066497
     jobtotq |   .0030369   .0011512     2.64   0.008     .0007805    .0052932
     jobtotp |   .0038579   .0008449     4.57   0.000     .0022019    .0055139
     famtots |   .0008699   .0020203     0.43   0.667    -.0030898    .0048296
     famtotr |  -.0003797   .0019256    -0.20   0.844     -.004154    .0033945
     famtotq |  -.0009906   .0019252    -0.51   0.607    -.0047639    .0027827
     famtotp |  -.0090433   .0014911    -6.06   0.000    -.0119657   -.0061209
     unmtots |  -.0147521   .0023779    -6.20   0.000    -.0194127   -.0100914
     unmtotr |  -.0082785    .002096    -3.95   0.000    -.0123865   -.0041704
     unmtotq |  -.0040058    .001985    -2.02   0.044    -.0078962   -.0001153
     unmtotp |  -.0083916   .0016774    -5.00   0.000    -.0116794   -.0051039
       _cons |   .5207986   .0349551    14.90   0.000     .4522877    .5893094
-------------+----------------------------------------------------------------
select       |
       woman |   .4672673   .0136447    34.25   0.000     .4405243    .4940104
         age |   .0014605   .0049462     0.30   0.768    -.0082339     .011155
       agesq |  -.0001892   .0000624    -3.03   0.002    -.0003115   -.0000669
         mow |    .012292   .0008947    13.74   0.000     .0105384    .0140457
       mowsq |  -.0001892   .0000136   -13.86   0.000     -.000216   -.0001625
       higra |   3.477386   .3911148     8.89   0.000     2.710815    4.243956
       agegr |  -.1307123   .0194229    -6.73   0.000    -.1687805   -.0926442
       agrsq |   .0014239   .0002349     6.06   0.000     .0009636    .0018843
      medgra |    2.30594   .1873219    12.31   0.000     1.938796    2.673084
       agemd |  -.0960162   .0097623    -9.84   0.000    -.1151499   -.0768825
```

```
       agmsq |   .0010277   .0001216     8.45   0.000     .0007894    .0012661
       educ1 |   .3818843    .042596     8.97   0.000     .2983978    .4653709
       educ2 |   .4805553   .0239076    20.10   0.000     .4336972    .5274134
       educ3 |   .4659194   .0269519    17.29   0.000     .4130947    .5187442
       educ4 |   .3432797    .018297    18.76   0.000     .3074182    .3791413
       educ5 |    .349069   .0163275    21.38   0.000     .3170677    .3810702
       educ6 |   .3171683   .0275303    11.52   0.000     .2632098    .3711267
     jobtots |   .1394602   .0026015    53.61   0.000     .1343613    .1445591
     jobtotr |   .0076305    .003345     2.28   0.023     .0010745    .0141866
     jobtotq |   .0051023   .0034286     1.49   0.137    -.0016175    .0118221
     jobtotp |    .003506   .0026062     1.35   0.179    -.0016021     .008614
     famtots |  -.0644475     .00395   -16.32   0.000    -.0721893   -.0567058
     famtotr |    .016466   .0050687     3.25   0.001     .0065315    .0264005
     famtotq |   -.012311   .0053811    -2.29   0.022    -.0228577   -.0017643
     famtotp |  -.0071732   .0041859    -1.71   0.087    -.0153773     .001031
     unmtots |  -.0268335   .0042277    -6.35   0.000    -.0351196   -.0185474
     unmtotr |   .0156583   .0048363     3.24   0.001     .0061792    .0251373
     unmtotq |  -.0109768   .0049972    -2.20   0.028     -.020771   -.0011825
     unmtotp |  -.0052384   .0043301    -1.21   0.226    -.0137252    .0032485
       _cons |  -1.232375   .0894219   -13.78   0.000    -1.407638   -1.057111
-------------+----------------------------------------------------------------
     /athrho |   .2444957   .0239476    10.21   0.000     .1975593     .291432
    /lnsigma |  -.9230696   .0041096  -224.61   0.000    -.9311243    -.915015
-------------+----------------------------------------------------------------
         rho |   .2397376   .0225712                      .1950286    .2834523
       sigma |   .3972976   .0016327                      .3941104    .4005106
      lambda |   .0952472   .0091889                      .0772373     .113257
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =    88.88   Prob > chi2 = 0.0000
------------------------------------------------------------------------------
*/
correlate lwage  heckman;
/*
             |    lwage  heckman
-------------+------------------
       lwage |   1.0000
     heckman |   0.7017   1.0000
*/
```