

‘Fertility, social class, gender and the professional model: statistical explanation and historical significance’¹

Abstract:

In 2012 Barnes and Guinnane published a revised statistical analysis of the critical evaluation of the official 1911 social class model of fertility decline that was presented in chapter 6 of Szreter’s *Fertility Class and Gender in Britain, 1860-1940 (FCG)*. They argue that the official model of five ranked social classes is, after all, a satisfactory statistical summary of the fertility variance found among the married couples of England and Wales at the famous 1911 fertility census and so they conclude that, *pace* Szreter, the official model provides a satisfactory account of the nation’s fertility decline as one of social class differentials. It is acknowledged here that B&G have deployed superior statistical techniques. But it is pointed-out that *FCG* identified far more fundamental problems with the design of the 1911 official model. It was a social evolutionary model privileging male professional occupations, not a modelling of recognised social class theory at the time or since. In *FCG* it was therefore termed ‘the professional model’. The central historiographical claim of *Fertility, Class and Gender* is re-affirmed: that in order to study fruitfully and to further elucidate the complex historical relationship between social class and the fertility decline among married couples in England and Wales, an alternative approach to that of the professional model of fertility variation is needed, one which explicitly integrates gender relations with social class.

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I am grateful to Geoffrey Barnes and Tim Guinnane (B&G) for the efforts they have made to revisit and revise the statistical analysis presented in chapter 6 of *Fertility, Class and Gender (FCG)*.² *FCG* was a historical study of the secular fertility decline among the married couples of England and Wales with radical historiographical implications. It commenced in chapters 2-5 with a critical examination of the previously untouched intellectual history of the Registrar-General's official model of social class. This was because, as chapter 1 demonstrated, this model exerted enormous, unchallenged historiographic influence, accepted as a starting point for all study of the subject since it was first devised by the original analyst of the occupational fertility data collected at the 1911 census, Dr T.H.C. Stevenson, the Superintendent of Statistics at the General Register Office of England and Wales (GRO), 1909-31. The excavation of the model's intellectual history in Part II (chapters 2-5) exposed major conceptual and methodological problems. B&G do not engage with the implications of these aspects of the critique of the model and instead focus exclusively on a statistical exercise conducted in Ch.6 of *FCG*.

In chapter 6 of *FCG* an attempt was made to evaluate statistically how well the five status-ranked classes of Stevenson's original version of the model summarised the variance in the published average fertility values available for 176 male occupational unit groups. The main purpose of this exercise was to evaluate whether one possible reason for the model's historiographical longevity could have been that, despite all its problematic design features, it nevertheless offered an apparently compelling summary of the demographic data. The

² Barnes and Guinnane, 'Social class' (page numbers in brackets in the text refer to citations from this article); Szreter, *Fertility, class and gender*.

Registrar-General in fact distinguished as many as 465 male occupations at the 1911 census- from among which the five socially ranked classes had been composed. These 176, analysed in chapter 6, were a selection for which Stevenson had also published their individual data- mostly those with the largest number of couples. My conclusions in chapter 6 were that since the model appeared to ‘explain’ only about half of the variance in the fertility of the married couples in these 176 occupations, this was hardly a compelling case to justify its decades of dominance; and that this only reinforced the conclusions drawn from chapters 1-5 that an alternative approach to all the variation evident in the occupational fertility patterns, abandoning the official model, would be a productive way forward (which then occupied chapters 7-10 of *FCG*).

B&G have now deployed a superior technique of statistical analysis to that used in ch.6, ANOVA, to re-analyse this variance. They find that Stevenson’s five-category model statistically explains 67% of the variance among the 176 component occupational units; and they provide a kernel density diagram (B&G, Figure 3), which graphically summarises the distribution of the averaged fertility values for these 176 occupations, sorted into the five graded classes. Further, it might be added that the mean value of each of these classes is statistically significantly different from each other and ranks in the order described by the official model, with the exception of Classes III and IV, which B&G acknowledge to be statistically indistinguishable. I do not dispute any of this. Chapter 6 acknowledged the rank order of the classes, while also pointing out that the central range of the picture was very blurred.³

³ Thus, *FCG* never questioned ‘that the *average* fertility values for the five graded classes could still exhibit the order predicted by the professional model’ but argued that this was ‘despite all the internal variance and

If *FCG* had only been a study of how much the five graded social classes of Stevenson's model summarised the variance in the 176 occupations, B&G's critical comment would be a justified corrective. However, ch.6 was only one part of a much wider study of the fertility decline in the population of England and Wales, presented in the 10 chapters of *FCG*. The statistical exercise offered in ch.6 was never published as a free-standing article but only in *FCG* in sequence following chapters 2-5. This is because those prior chapters are necessary for readers to comprehend that there are a number of crucial methodological problems with Stevenson's model. B&G's critical comment does not take into account the implications of all this research and is presented as a text-book exercise in ANOVA, with the statistical results treated unproblematically as having direct, substantive and historiographic implications for our understanding of the fertility decline. I do not think this is a tenable position, nor an intellectually fruitful one for the future study of the fertility decline.

I was pre-eminently concerned in Parts I and II of *FCG* with exposing the unwarranted historiographic dominance of the official classification scheme as a model of social class, given its conceptual and design weaknesses. I was interested in Parts III and IV to show how a radically alternative approach could be developed and used to explore dimensions of variation in male occupations' fertility and nuptiality that could not be accounted for by the official model. In short, I disagree with Barnes and Guinnane over R^2 : not so much its size or statistical significance, but its historical meaning in this case and, therefore, its substantive, historical significance. I defer to their point that social scientists do generally judge an R^2 of this magnitude (0.67) to be large and meaningful; but social scientists would also agree such a result is only reliably interpretable if we have confidence that the underlying model has

heterogeneity' (*FCG*, p.308). It is the dispersion around the means that reflects the conceptual messiness of the social classification discussed elsewhere in *FCG*.

theoretical validity and that the model's design is also satisfactory. We can perhaps move the debate forward therefore by asking: is the model robust? Is it optimal? Are its theoretical underpinnings intellectually rigorous? Is its design satisfactory? What can we actually learn from it? What is its intellectual opportunity cost? What does its singular emphasis on a linear gradient of supposed male occupational status fail to tell us; or even obscure from us? First, therefore, I will present a short summary of the critique that I presented in *FCG* of these aspects of the classification system used in the professional model to identify my chief concerns in this respect.

I

As the historiographical introductory chapter to *FCG* showed, the professional model of society was an official classification system for male occupations into five ranked social grades developed by Dr THC Stevenson between 1910 and 1927 from an original hybrid 8-class model. It subsequently provided, throughout the twentieth century, an unquestioned orthodoxy about the social morphology of the historic fertility decline in England and Wales. It had apparently found that 'the upper and middle class', Class I, had led the way towards lower fertility. They were followed by the skilled working class, Class III, while those with unskilled occupations, Class V, brought up the rear. In the 1920s Stevenson himself proposed a theory of 'diffusion' of novel behaviour down the nation's status hierarchy to account for the pattern he had found.⁴ The model had five, not three ordinal grades, because each of these three defined classes was separated by an 'intermediate' class containing occupations of a less determinate character judged to be of a social standing somewhere between those placed

⁴ *FCG*, p.13.

in the three core classes. These intermediate classes enabled the model apparently to apply to the whole population, rather than only the sections selected for the three named classes.

It is hard to exaggerate just how dominant this model was in demography, sociology, social policy, public health and epidemiology, both in Britain and internationally in the Anglophone world. It was still in 1996, when *FCG* was published, the official model of social structure in England and Wales, essentially unaltered.⁵ There was even a popular, derivative scheme in wide commercial use.⁶ In the interwar decades its popularity had spread internationally, with Stevenson's findings of a linear, graded pattern of 'class-differential' fertility promoted by leading figures in both Britain (W.H. Beveridge and A.M. Carr-Saunders) and USA (Warren Thompson, F.W. Notestein).⁷ Indeed, such was the cachet of the model that during the 1930s the US Census Bureau created an official model in direct emulation of the British one to measure change in US fertility differentials.⁸ The officials of many other countries also joined in the international comparative project of measuring 'differential fertility', creating similar, linear, socially-graded classification systems.⁹

⁵ The census authorities and leading British sociologists finally undertook the long-overdue work of revision of the professional model during the late 1990s in preparation for the 2001 census. This work cited the critical account of the professional model in Szreter 'The Genesis' as one of the motivating reasons for the revision: Rose and O'Reilly, *The ESRC Review*, p.25.

⁶ The commercial scheme was the so-called 'ABC' National Readership Survey scheme of social grading: Szreter, 'The Genesis', p.540, n.2.

⁷ *FCG*, pp.13-14, 269-71.

⁸ Szreter, 'The official representation of social classes', pp.291-305.

⁹ For early reports on such class-differential fertility studies for France, Germany, Italy, Netherlands and Sweden, for instance, see Sanger, *Proceedings of the World Population Conference*, pp.130-207.

The model was beguilingly powerful, apparently offering only a single, linear dimension of social differentiation to explain observed variation found in demographic and other phenomena. However, as the introductory chapter of *FCG* argued, this was also intellectually limiting, even stultifying. Over many decades of study, competing explanations of fertility decline tended to remain correspondingly uni-dimensional, such as diffusion (Stevenson's and Beveridge's proposed explanation) or democratisation (proposed by the American, Norman Himes, in 1936 in his encyclopaedic *Medical History of Contraception*) with little way of adjudicating empirically between them. This could lead, on the one hand, to a sterile standoff between mono-causal alternatives, each apparently consistent with the evidence of a linear social grading: economics versus culture; innovation versus diffusion; or simply to the abdication of judgement with indiscriminate lists concluding that almost everything was potentially important, such as that issuing from the influential Royal Commission on Population of 1944-49.¹⁰

The solution to this impasse offered by *FCG* was to commence by asking a typical historian's question: where has this official model come from? Or, in other words, why is the evidence classified and presented in this particular way? Part II of *FCG*, chapters 2-5, presented a fully-documented intellectual history of the genesis of the official 'social class' model. This demonstrated a number of important properties of the model, which should be of primary methodological concern to any historian or social scientist today studying the fertility decline and interested in the relationship between the fertility of the population's married couples, male occupations and social class.

¹⁰ *FCG*, pp.15-16; *Report of the Royal Commission on Population*, Ch.5, paragraphs 88-110.

First, it was shown that this ‘social class’ model was designed without reference to the recognised corpus of sociological theory of social class or stratification derived from the seminal works of Marx, Durkheim, Weber and their critics. Instead the classification principles used for aggregating groups of male occupations, which formed the five graded classes, were derived from a defunct social evolutionist consensus among the late Victorian and Edwardian British educated elite. This envisaged that male occupations could be linearly socially graded according, firstly, to the degree of presumed intelligence required for their performance; and, secondly, the degree of manual skill.¹¹ In view of this finding, and in order to avoid unhelpful confusion with the important body of theoretical, empirical and sociological work on social class relations in modern British history and historiography, *FCG* referred to Stevenson’s official classification scheme as ‘the professional model’ of society, signalling the fact that it was not a model derived from recognised social class theory and that most of the occupations collected in its highest status category, Social Class I, comprised the male liberal professions.

A second, related methodological concern exposed by *FCG* was the underlying occupational taxonomy of the professional model, which formed the fundamental social units from which the five classes were formed. This was not designed for the purpose of constructing a social classification scheme. It was a pre-existing, pragmatic compromise inherited by Stevenson, which reflected two other nineteenth-century historical influences. Firstly, a strong and long-standing historical interest on the part of the GRO, almost since its foundation in 1837, in the medical and disease implications of work of different kinds. This had resulted in a consequent need to harmonise occupational information collected at the census with lower

¹¹ *FCG*, pp.120-28; 165-73.

quality data collected at death registration under different statutory powers.¹² A second influence was the interest of economists and the Treasury in using occupational information for measuring economic functions and employment in different industries.¹³ This inherited, hybrid occupational taxonomy, though undoubtedly presenting much interesting information about a diversely-defined range of occupations, consequently had a number of deeply problematic design features if it was to be used as the foundation for a putative model of social classes in Britain. Probably the most unsatisfactory feature, on theoretical grounds in relation to social class, was the fact that employers, employees and the self-employed were all amalgamated together in many occupations (in as many as 110 of the 195 studied in *FCG*). Of equivalent concern for issues of basic statistical comparability was the fact that there were extremely large divergences in the demographic sizes of the 465 different male occupations distinguished in the official taxonomy at the 1911 census. Over 250 of the smaller occupational categories were consequently omitted from the official publication, which gave the tabulated fertility characteristics for each of the remaining 200 or so occupations, the source for the occupational analysis presented in *FCG* and by B&G.¹⁴ By contrast, for instance, just four of the approximately 200 occupations for which fertility information was officially published and which were analysed in *FCG*, jointly represented a larger proportion of the married male workforce than all these 250 omitted occupations, combined.¹⁵ Even among the remaining 200 or so tabulated occupations used in *FCG*, several individual occupations were sixty or seventy times larger than many of the other

¹² *FCG*, pp.77-8, 117; and see Higgs, 'Disease, febrile poisons'.

¹³ *FCG*, pp.114-20.

¹⁴ Registrar-General, *Census of England and Wales, 1911*, Table 35.

¹⁵ These four being: '84 coal- mineworkers at the face'; '79 agricultural labourers with undefined duties'; '61 carmen, carters (not working on farms)'; and '201 retired from business (not army or navy)'. The ID numbers are those used throughout *FCG*.

tabulated occupations in terms of the number of married couples they represented; and in one case 130 times greater.¹⁶

Thirdly, it was shown in Ch.5 of *FCG* that in fact the original version of the model, as applied to the 1911 census fertility data, was not a unitary scheme of five ranked classes summarising the whole population, but a hybrid of 8 classes. The model's architect, Dr Stevenson, knew that the fertility and infant mortality patterns of quantitatively large and highly socially significant sections among the working classes failed to conform to the linear social grading pattern he intended to depict with the new official class model. Textile workers were known to have unusually low fertility while coal-miners, the high-paid elite of the working-class, were known to have extremely high fertility. Stevenson's solution to these troublesome 'anomalies', was to remove workers in these two large sectors of the economy, along with those in agriculture, from the socially-graded classification scheme when reporting on the 1911 'fertility census'.¹⁷

So, although understood in the historiography for decades as a model apparently demonstrating class-differential fertility across the national population, not only were two large sections of the population placed in intermediate 'classes; but also three massive and iconic sections of the working-classes were removed entirely from the original version of the socially-graded professional model, placed on one side in three so-called industrial classes,

¹⁶ The largest single occupation among those analysed in *FCG*, (ID 84 'coal-mineworkers at the face' in Class VIII) represented fully 5.5% of the entire married male workforce, while the smallest (ID 24 'scientific pursuits') contained only 0.042%, a 130-fold difference in quantitative importance.

¹⁷ *FCG*, pp.259-60. As explained in *FCG*, Stevenson was equally keen to use the professional model to demonstrate a similar graded class differential in infant mortality, which primarily explains the removal of the low-status agricultural labourers into Class VIII, with their extremely low infant mortality: *FCG*, 246-54.

VI, VII and VIII. This was not a minor modification of the scheme- these three classes contained almost one quarter of the entire manual working-class labour force in 1911.¹⁸ Of the 465 original occupational unit groups - and of the 200 or so for which fertility information was published- this left the professional model of Classes I-V representing 176 of these occupations. As B&G (1278) acknowledge, ‘Szreter rightly stresses that many of these excluded couples (Classes VI to VIII) do not fit the professional model.’

II

I appreciate and agree with the aim of B&G to see the highest standards of analysis and testing of models applied to problems that we address in economic, social and demographic history. I accept that the kind of statistical evaluation performed in chapter 6 of *FCG* on a version of the Registrar-General’s model of the nation’s social classes can and should be

¹⁸ There were about 1.2 million factory operatives of both sexes above age 15 recorded at the in 1911 census in the textiles sector, 1 million labourers working in agriculture; and 900,000 coal and iron-miners (almost all coal-miners in fact and virtually all male). The 3.1 million workers in these three industries therefore represented 24.25% of all manual working-class workers of both sexes over age 15 and 19.65% of all workers (manual and non-manual) in the entire economy. Source for calculations: Census 1911, Vol. X Table 3, which shows 15,781,911 above age 15 engaged in occupations, both sexes combined. Approximately 23.5% (3,005,000) of this number were engaged in non-manual upper, middle and lower-middle class occupations as would be typically classed to Social Classes I and II (this is a rough estimate by taking all workers of both sexes in Orders I (294,000), II (officers only- 24,000), III (711,000), V (782,000) plus an estimate for the number of lower-middle class petty capitalists in XX (Food Tobacco Drink) of 389,000 (totalling columns 12 and 14 for employers and the self-employed, comprising about 281,000 male and 108,000 females) and 175,000 in XVII and XIX (Textiles and Dress. Columns 12 and 14); plus employers and the self-employed in the various other sectors of the economy, which totalled 242,000 in Order VII (Agriculture, columns 12 and 14); plus a further 388,000 throughout the rest of the economy (comprising: in order IX – 21,000; X - 75,000; XI - 23,000; XII – 111,000; XIII - 46,000; XIV - 7,000; XV - 16,000; XVII - 31,000; and XXII - 58,000 (not counting within XXII.4.4. self-employed street sellers).

improved upon. However, I also think that, to be consistent, the highest critical standards should be applied to the crucial question of the theoretical formulation and the operational design of the model at issue. It is not enough to suppose that application of the most rigorous statistical techniques of evaluation also confers validity on the model that is subjected to those statistical tests. I therefore regard it as a most unfortunate feature of their critical comment that, having – rightly – held chapter 6 of *FCG* to task for failing to apply the highest standards of statistical analysis, B&G do not observe similar high standards in respect of the implications of the findings of chapters 2-5 of *FCG*, which identified previously ignored - but critical - problems with both the theoretical specification and the design of the professional model. In my view these problems are of crucial importance and should not be artificially separated from the statistical ANOVA exercise, nor from the substantive interpretation of its results. Statistical explanation does not necessarily equate to historical explanation, nor to historiographical significance.

So, if I were to have the opportunity today of revisiting and improving the statistical analysis presented in chapter 6, in the light of B&G's reasonable critical comments on the limitations of the statistical methods deployed there, I would also want to respect and take into account the fundamental problems that I uncovered in chapters 2-5 of *FCG* in the design of the professional model. This would mean, firstly, that I would want to retain the attempt made in chapter 6 to allow statistically for the problem of the grossly unequal sizes of the male occupational groups. This is primarily because the object of *FCG* - and the object of the explanatory efforts in this statistical exercise - is, ultimately, to account for the changing family sizes of all individual married couples in the population of England and Wales, not the averaged fertility of occupational groupings of such couples. Male occupation is an attribute of these individual married couples and it is an attribute that we are constrained to use

because of the form in which the published data is available. If there are very large discrepancies in the numbers of married couples represented by the occupational attributes then we should try our best to take that into account in all forms of statistical analysis and representation. This is all the more important since we also know from the research presented in Part II of *FCG*, that the male occupational groupings have not been defined for comparability according to unified criteria but represent a diverse collection of social units, the product of various heterogeneous principles and expedients devised over several decades at the GRO. Probably a statistical purist, faced with this knowledge about the problematic character and sizes of the occupations, would simply conclude that no sound statistical exercise could be performed, since they are non-comparable units of analysis. My own approach in *FCG* was more pragmatic and so I offered a statistical evaluation, which concluded that the model's performance was far from compelling. It seems to me that the least we should do in any revised statistical evaluation, therefore, is to take into account the most salient and mathematically tractable feature of the known heterogeneity of the occupations, their discrepancies in size. This problem is not allowed for in any of B&G's graphic representations although they do at least acknowledge at one point that it is an 'important' factor.¹⁹

Secondly, I would now want to address explicitly the issue of what Stevenson did with the three anomalous industrial classes, rather than simply excluding them from the analysis, as I did in chapter 6 and as B&G have also done in their analysis. Indeed, I was aware in *FCG*

¹⁹ B&G (1273) commenting on *FCG*, Table 6.6, p.303, which attempted to make allowance for this factor, that: 'This important exercise reflects the different sizes of the occupational groups that form the observations. The smallest group (Class I's 'scientific pursuits') has about 2,400 couples in England overall, while the largest, Class V's 'carmen and carters- nonfarm' has some 181,000 couples. Thus, a misclassification in the latter has greater implications for our understanding of fertility patterns.'

that the exercise I conducted there was too lenient in this respect and I explicitly acknowledged the limitations of an analysis conducted only on the 176 occupations of Classes I-V when I concluded chapter 6, by pointing out that this gave:

...a false impression, which *exaggerates* the adequacy of the professional model's performance as a valid statistical summary of the whole nation's occupational fertility patterns. This is especially true if the anomalous fertility behaviour of the occupations in the three special industrial classes, created by Stevenson for the low-fertility textile workers and the high-fertility miners and agricultural workers, is brought back into the picture, *as it should be if there is to be assessment of the professional model's overall validity* to represent the fertility patterns of the whole nation.²⁰ [emphases added]

So, what I would now want to do, in deploying the superior statistical technique of ANOVA as proposed by B&G, would be to carry it out with a weighting factor for the differential sizes of the occupations, while also bringing back into the picture the occupations deliberately excluded by Stevenson in his efforts to enhance the performance of his original model. This can be done, while remaining faithful to Stevenson's own evaluations of where to distribute these 19 additional occupations across Classes III-V, because he subsequently in the mid-1920s reintegrated them into the five socially graded classes. As was carefully documented in *FCG*, Stevenson revised his original 8-class model in order to achieve 'the great merit of simplicity' and so get rid of the embarrassment of the three anomalous industrial classes.²¹ It was this simplification which was certainly significant in facilitating the scheme's translational appeal, international adoption and its long-term historiographical influence. In

²⁰ *FCG*, p.305.

²¹ *FCG*, pp.258-71, quote at p.262.

the course of his official work supervising presentation of the results of the 1921 census, Stevenson re-allocated the component occupations of Classes VI, VII and VIII to what he judged to be their correct places within the 5-class scheme, thereby reducing the whole male working population to the tidy professional model of 5 ordinal, graded social classes. All the mining occupations of Class VII and most of the textiles occupations of Class VI were allocated by Stevenson to Class III, while the agricultural labourers of Class VIII were allocated to Class IV.²²

Performing such a weighted ANOVA exercise on all 195 occupations sorted into the 5 graded classes of the full version of the professional model results in an R^2 value of 0.55, indicating that about half of the variance is statistically explained. What is the substantive significance and meaning of this result? To both ask and to answer such a question depends critically on the wider context of judgement and also on one's prior expectations. Many statisticians, knowing nothing of the content of chapters 1-5 of *FCG*, would of course consider such an R^2 result from a single-variable model as broadly falling into the same category as a result of 0.67, indicating prima facie evidence of the relatively impressive explanatory power of the 5 classes of the professional model to summarise the variance in the average fertility values of their constituent male occupations. But what is the *historical* meaning and significance that we should place on this R^2 value, especially given everything else that we know from chapters 2-5 of *FCG* about the professional model's motley inventory of underlying

²² The principles regarding Stevenson's re-allocation of the 19 occupations can be found in *FCG*, p.261, n.91. While most of the 12 textiles occupations were accordingly allocated to Class III, three were allocated to Class IV: '166 textile dyers'; '208 wool- carding, others, undefined'; '207 cotton- card room, others, undefined'. Importantly, there is explicit documentary evidence to confirm that Stevenson's allocation of mining occupations and most textile workers to Class III in the 1920s also represented the judgment of the allocation that he would have made originally in 1910-11, if he had not removed them to the separate industrial classes: *FCG*, p.260 at n.87.

occupational unit groups and its lack of theoretical articulation to the important concept of social class, which the model purports to represent?

There is no doubt that the professional model, for all its faults in construction and design, does reflect a broadly true generalisation about the British fertility decline: that the wealthier sections of society in 1911 tended to restrict their fertility more than most of the poor. As Figure 1 confirms, the model reflects this, in that most of that minority of families headed by males pursuing the range of better-paid, non-manual occupations sorted by Stevenson into Classes I or II exhibit a lower fertility than most of those among the large majority placed in Classes III-V, whose head pursued a manual occupation. Hence the R^2 value of 0.55.

However, is that enough of a finding, enough of an explanation to satisfy our historical curiosity? Or to enable us to understand the causation involved? There is clearly also a lot of dispersion and diversity accompanying this general relationship; and the extent of this statistically 'unexplained' heterogeneity is also illustrated graphically in Figure 1. It shows both the dispersion in averaged fertility values of the 195 occupations when allocated to the five ranked social classes in the influential and enduring, revised version of Stevenson's professional model, while also taking into account the relative sizes of each of these occupations as a proportion of all married males in the workforce in 1911.²³ Figure 1 is informative in showing how much quantitative overlap there was between Classes I and II;

²³ The occupational fertility data are weighted according to the size of each occupation (measured on the Y-axis in hundreds of thousands of married couples) among the married male workforce of England and Wales in 1911, as they were in *FCG*, Table 6.6. This would seem to be the fairest weighting factor to use, since to use all male workers, including the unmarried, would bias the weighting towards occupations with an unusually high proportion of younger men. To use only the number of married male workers employed in the specific cohort from which the completed marital fertility measures were drawn (ie men aged approximately 45-60 years old in 1911) would create a bias in the opposite direction, and being based on far smaller numbers, would introduce the possibility of more random dispersions into the weighting factor.

and similarly how much more overlap there was between all three of the non-manual classes, III, IV and V. Class III, the skilled working-class, encompasses the range of fertility values of both Classes IV and V. The poor performance of the professional model in relation to Classes III-V means that its single differentiating criterion of male occupational skill is a particularly poor guide to the dimensions of fertility variation among the vast majority of the nation's married couples whose head pursued a manual occupation, which of course is why Stevenson originally had to tamper so substantially with this part of the model.

{ NB NOTE to Printer: Fig. 1 to be inserted about here }

It is hard to know, beyond the general confirmation it offers of the single and singularly unexceptional generalisation about a broad poverty-wealth gradient, what further historical meaning or substantive significance should be placed on this ANOVA result for the professional model, given the model's theoretical incoherence and design flaws. I continue to think it is therefore high time for historians of the fertility decline to emancipate themselves historiographically and to engage in fresh thinking beyond and outside the received wisdom of the professional model so as to explore alternatives, including a more genuine engagement with the history of class relations. That is not to say that the professional model's support for the finding that there was a broad socio-economic gradient applying to fertility behaviour is invalid or untrue or unimportant. It is to repeat the primary historiographical message of *FCG* in pointing out that there is massive intellectual opportunity cost in continuing to dwell too exclusively on this single, general factor, alone, when Figure 1 indicates that there is so much more than this to learn about this fascinating historical problem.

III

It was therefore proposed in chapters 7-10 of *FCG* that research should take a new theoretical starting point, rather than premising research on acceptance of a national-scale, socially-graded model of a statistical event to be explained. Research should instead be informed by adoption of a flexible heuristic framework, which commenced with a theory of the perceptions and processes necessarily involved among the relevant agents – married couples, not occupational groups- who were restricting their marital fertility in sufficient numbers, en masse, to bring about the observable secular trend of sustained fall in national fertility rates.

It was argued that the core of such a theory should rest on the proposition that for marital fertility to fall in a sustained manner this would require a significant change in *perceived relative costs (and benefits) of childrearing*.²⁴ This led directly to the crucial insight that gender was constitutive.²⁵ Gendered roles were constitutive of such perceptions of relative costs and benefits because gendered identities and relations were central to those doing the perceiving- the two married persons. This in turn led to the appreciation that not only the

²⁴ For readers wishing to consult the text of *FCG* to see the development of the theoretical framework presented in the following paragraph, see: *FCG*, pp.443-65; 481-503; 513-32; 546-558. The theoretical approach has also been recently restated in summary form in Szreter, 'Theories and heuristics', where there is also reference to some of the most valuable recent historical and anthropological studies of changing reproductive behaviour, many of which have independently adopted approaches compatible with the heuristic framework advocated in *FCG*.

²⁵ *FCG* was of course entirely indebted here to all the transforming research published on gender history, exemplified, for instance, in relation to modern British history by Davidoff and Hall's, *Family Fortunes*; and Clark's *The Struggle for the Breeches*. The literature is now legion.

moral ideologies held by these reproducing agents in the past about their gendered roles but also the differing labour requirements - with respect to the employment of men, women and children - of the economy's diverse branches of industry mattered. They could directly influence differentiation of distinct norms of gendered working and parenting roles and related definitions of childhood and child-rearing in different communities, wherever specific industries were locally concentrated, as they often were in early twentieth-century Britain.²⁶ The understanding that labour markets could influence such familial norms and gendered roles of parenting meant that the history of the politics of industrial relations and of the civic communities in which industries were located could also be important influences accounting for the fertility differences observed among male occupations in 1911. All of this complexity would remain hidden and un-researched if the unitary socio-economic gradient of the professional model was believed to be a satisfactory summary of the nation's occupational fertility patterns.

The theoretical concept of communication communities was consequently proposed, defined as a social network of married men and women subject to a similar set of this important range of embedded and mutually-reinforcing institutions and influences. This could therefore produce a particular pattern of observable change in fertility and marriage behaviours among such a communication community that might be distinctive from other such communication communities with differently-formed gendered norms and roles. These were primarily communities sharing discourses, values and norms and so it followed that there could even be more than one such communication community living cheek by jowl in the same physical locality (e.g. Catholics and Protestants, though in the same locality dominated by the same

²⁶ For a superbly documented subsequent exploration of this- and its wider implications- in three diverse locations in England and Wales see, Pooley 'Parenthood and Child-rearing'.

industry); or that individuals could, at times experience allegiances to and participate in more than one such communication community. Furthermore, if they shared the same relevant means of significant social communication, such as the nationally-distributed newspapers, journals, novels and magazines read by the literate upper and middle classes in late Victorian Britain and sustained in their private correspondence, too, such communication communities might already exist before 1911 as virtual social networks spread across space, rather than necessarily as physically contiguous groups.

FCG concluded that the complex patterns of male occupational variation in reproduction, (embracing both fertility and nuptiality behaviour), that emerged from examining the published evidence available on the 195 male occupations from the 1911 census, were consistent with the theory of communication communities and their differing, gendered constructions of familial roles, often influenced by the labour market conditions of work in specific, locally-dominant industries. It was acknowledged that social class was important but that the intrinsically gendered concept of communication communities could be a more productive theoretical approach to describe the social units exhibiting distinctive reproductive patterns. It could both explain the overall, gross pattern of difference between most non-manual and most manual occupations – the broad ‘social class’ difference identified in a crude, summary fashion by the professional model of fertility decline - while also leading to productive explanations for the reproductive variability found *within* each of these two large categories: the ‘middle class’ bloc of the 71 non-manual occupations mostly classified to Classes I and II; and the much larger (comprising 69% of the married male national workforce), ‘working class’ bloc of 124 manual occupations allocated to Classes III, IV and V.

Examination in *FCG* of the combination of fertility *and* nuptiality patterns of the 71 occupations of Classes I and II showed that they were in fact composed of at least half a dozen identifiably distinct communication communities, invisible to the professional model. For instance, although exhibiting equally very low fertility and both placed in Class I, the meritocratic, reformed liberal professionals (such as doctors and solicitors), achieved their low fertility in combination with extremely delayed marriage, whereas the rentier and military officer class tended to marry their spouses at much younger ages.²⁷ Similarly, among the 124 occupational categories engaged in manual occupations allocated to Classes III, IV and V, the official model's proposed distinction in terms of skill appeared to have little discriminatory power. The reproductive patterns here indicated the importance, instead, of various labour-market induced gendered considerations, constitutive of different communication communities, illustrated in *FCG* by Figure 7.1 and Table 7.8.²⁸ Not only the extremely high fertility of colliery districts, where men were highly-paid while women had almost no employment outside the home, but also, for instance, the differing opportunities for self-employment or spouse partnership in diverse sectors of petty retail employment. Furthermore, the precise conditions of gendered work in different industries mattered. For instance, the time-inflexible female shift-workers in south Lancashire mill towns had very low fertility whereas just forty miles away women workers in the Staffordshire Potteries continued with higher fertility, facilitated by a much more time-flexible work regime.²⁹ These were among the industrial, labour market factors creating a diversity of several dozen communication communities with different reproductive regimes visualised in *FCG*, Figure 7.1, from the national occupational fertility patterns in this large, manual working-class

²⁷ *FCG*, pp.341-46.

²⁸ *FCG*, pp.312, 352.

²⁹ *FCG*, pp.322-60, 488-503.

section of the population, once one delves beneath the large, clumsy categories of the graded professional model.

IV

B&G are concerned that *FCG* has had what they see as the undesirable historiographical influence of encouraging the view that ‘social and economic forces played little or no role in the [fertility] transition’ (1279). This historiographic claim is somewhat difficult to evaluate, since B&G cite only their own work in support of this proposition plus one book that was in fact published 10 years before *FCG* (Coale and Watkins, *The Decline*). *FCG* certainly had an historiographical impact, attracting 25 published reviews that I am aware of. However, most of these correctly understood that the book’s new approach did not stipulate that social and economic forces were unimportant, but only that they were not more significant than the cultural, ideological and political. More importantly, these reviewers also understood that *FCG* showed that it is necessary to abandon the professional model as a representation of the social morphology of the fertility decline, in order to be able to engage with a more complex approach both to social class, to gender, to agency and to causation: one which embraces the formative, contingent, politically-mediated relationship between the economic and the cultural, rather than insisting on seeing economic and cultural forms of explanation as mutually exclusive alternatives to each other.

FCG has shown that the professional model of social classes devised by Dr Stevenson between 1910 and 1927 and subsequently widely adopted and historiographically far too

influential, was never a model of social class, which is partly at least why it was finally abandoned by the British census authorities at the 2001 census. B&G seem to be untroubled by this in continuing to describe the results of their analysis as demonstrating a strong relationship between fertility and social class. Indeed, their summary concludes that ‘Szreter argued that social class did not explain fertility differentials. We have shown to the contrary that it did.’ (1278).

There seem to be at least two fundamental misapprehensions compounded together in this concluding statement by B&G, both of which *FCG* was attempting to deal with. Firstly, to reiterate, the professional model was not designed to represent any known theory of social class. It is not really much more than a rather imprecise and indirect, pragmatic proxy for a crude wealth-poverty gradient in British society. Secondly, by tying the complex concept of social class to the word ‘explains’ in this concluding formulation, B&G appear to be inviting their readers to translate the statistical meaning of ‘explanation’ (explanation of variance between a model’s constructed categories), which they have used throughout their text up to that point, into a substantively and historically meaningful usage of the term, ie the proposition that fertility differences in British society are satisfactorily understood as products of the phenomenon of social class *because* of the results of the reported statistical analysis using the professional model. The whole point of Part II of *FCG* was to demonstrate how and why this is an invalid claim. It is not possible to support this previously widely-believed proposition from the occupational fertility evidence derived from the 1911 census in the form that it has been presented for generations, as the professional model. It is a difficulty that so much of the important twentieth-century published historical demographic and social evidence available to us has often been pre-sorted by officials into the classes of the professional model and sometimes it is necessary to work with the evidence in this form, *faut*

de mieux. However, this should be clearly understood as a necessary expedient, not as a satisfactory way to continue to study the influence of social class when more discriminating alternatives are available.

What has been shown in the research I have published both in *FCG* and subsequently in two further collaborative projects, deploying both quantitative and qualitative methodologies on superior, individual-level data, is that social class does, indeed, have an interesting and important relationship with couples' reproductive behaviour.³⁰ However, the professional model is a very limited tool for researching this. It is particularly opaque to the constitutive nature of gender relations, which at this time were much influenced by industrially-divergent labour markets. Gender is especially important for making sense of the diversity of fertility behaviours exhibited among married couples in their communication communities among both the upper, the middle and the working classes during this exciting period of dramatic change. The importance of integrating gender relations for understanding class and fertility was central to the historiographical impact and the intended historical contribution of the ten chapters of *FCG*. This could not have been more clearly signalled than by placing it in the title of *FCG* as the third term along with fertility and class, yet B&G's critical comment, in focusing so exclusively on chapter 6, alone, makes no reference at any point to gender.

³⁰ Garrett et al, *Changing family size*; Szreter and Fisher, *Sex Before the Sexual Revolution*.

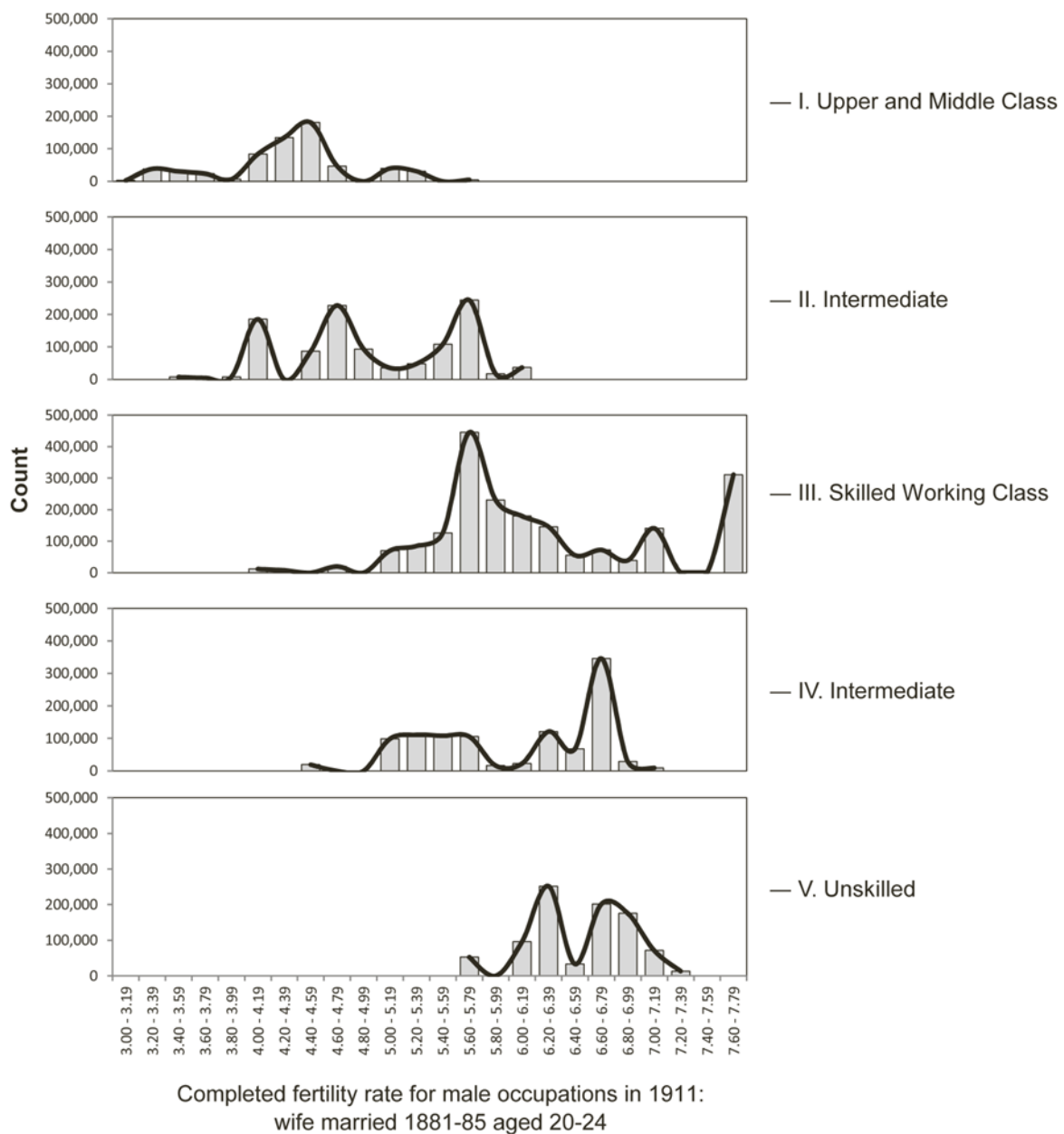
Appendix. A late errata note re. Appendix G of *Fertility, class and gender*.

This article offers an opportunity to warn readers of an oversight in the proofing or production of Appendix G, pp.632-33, in *FCG*. This error does not affect the data discussed above, nor any of the other figures and tables in *FCG*.

In Chapter 9 of *FCG*, pp.503-13, there is a section titled 'Fertility and Married Female Employment' which offers a self-contained discussion commenting on columns of data tabulated in Appendix G. Unfortunately, there is a serious and widespread set of errors in the tabulated data, though fortunately it is confined to Appendix G, only, and it does not affect the validity of anything written in the text on pp.503-13. All occupational fertility values cited and discussed in the text on pp.503-13 are correct. However, they do not match the figures listed in four of the columns of Appendix G because the latter are incorrect. These are Appendix G, columns 2,5,6, and 7, labelled 'AM2/01-05', 'Rank/AM3', 'AM3/01-5', and 'FM25PC20'. Fortunately, columns 9 and 10 are correct ('PC2/01-5' and 'PC3/01-5').

Nobody has ever contacted me about these incorrect columns of figures, which probably reflects the fact that I prefaced the discussion of fertility and female married employment among the 66 recorded female occupations with the necessary strong warnings that the data was likely to have been poorly recorded in the first place, that married women who worked for pay at this time were both a highly-selected set of working women and a selected set of married women, with both selective effects essentially varying and unknown- so that 'great caution is called for in interpreting this data.' (*FCG*, p.504) I do not propose to supply a corrected series of figures for these columns, since I do not believe the data justifies any further secondary analysis, given the attendant interpretative difficulties. Those interested in the relationship between female employment and fertility are better advised to consult the insightful work of my colleagues, Eilidh Garrett and Alice Reid: Garrett, 'Trials of labour'; Garrett and Reid, 'Satanic mills'; Garrett et al, *Changing Family Size*, pp.299-313, esp Fig. 5.8.4.

Figure 1 Occupational Fertility Averages weighted for occupational size in 1911 ('Count' = hundreds of thousands of married males in the occupations): 195 occupations allocated to the 5 socially-graded classes of the official, professional model.



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