The impact of income inequality on the family: a test of a thesis

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Abstract

This paper seeks to test whether claims by Wilkinson and Pickett (2010) (W&P) on the negative effects of income inequality on social conditions in rich countries are borne out in the case of the family. The paper examines correlations between 13 family indicators and income inequality across developed countries. It finds that two indicators measuring early family formation correlate with income inequality, but most indicators do not and some do so in a negative direction. The paper then explores a structural precondition which W&P identify as necessary for the income inequality effect to operate, namely, the presence of negative social gradients in outcome variables. It finds that a negative social gradient is present for the family variables already shown to be linked to income inequality, but the small number of variables for which this is so highlights the limited scope of the W&P thesis. The paper also suggests that the growing literature on trends in family patterns over time gives little support to the idea that income inequality is a major influence. The overall conclusion reached is that while the W&P thesis has some validity in the family domain, income inequality on its own does not have a consistent relationship with family behaviour and is not a major contributor to differences between countries or change over time in family patterns.

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Introduction

In their influential book, *The Spirit Level* (2010), Wilkinson and Pickett (henceforth W&P) argue that more equal societies in the rich world consistently 'do better' than less equal ones. The variety of social outcomes to which they apply this thesis is wide, including, *inter alia*, physical and mental health, education, drug abuse, imprisonment and child well-being. Their argument is not merely that the poor fare less well than the rich on these outcomes but rather that society as a whole is worse off if income inequality is wide: life is expectancy in general (and not just for the poor) is shorter, educational attainment is lower, drug abuse and crime are more common, community bonds are weaker, and so on. They assert that these differences are so great that they can only be explained by reference to what is happening across the whole social spectrum rather than simply among the poor. They do not claim that *all* social outcomes are affected by income inequality and in particular, as we outline later, they use a 'social gradients criterion' to limit the areas to which their thesis applies. Nevertheless, they argue that the effects occur in so many aspects of life as to make income inequality a powerful and general (though not universal) negative influence on personal wellbeing and quality of life in the developed world.

This paper seeks to test the W&P thesis as it applies to the family. It explores how far family patterns across countries are linked to income inequality, in regard either to what might be called family vulnerability, as measured for example by teenage pregnancies or lone parenthood, or broader indicators of family functioning as measured by fertility or family formation. The objective is not to develop explanations for patterns that occur or explore their theoretical significance but simply to test empirically whether income inequality is as significant an influence on family life as the W&P thesis would suggest. The focus on family is justified on the basis that the impact of income inequality can be assessed through detailed analysis of particular domains as well as by extensive examination of many domains. While the analysis is limited to the family, its scope is reasonably wide within that domain. We examine 13 family indicators in our initial analysis below, which is based on aggregate data, and these reduce to 10 in the more detailed analysis later in the paper where micro-data are required. We adopt two definitions of what is meant by 'rich' countries: a limited set of long established market democracies (N=22) that are selected to approximately match the countries analysed by W&P and a wider set of OECD countries that adds ex-communist and less prosperous states to the smaller 'rich' group

(N=39). The reference year lies between 2003 and 2008 for most indicators, depending on data availability.[1]

Echoing the methodology used by W&P, the paper first asks whether family indicators vary across countries according to the level of income inequality, measured here by the Gini coefficient for the corresponding year.[2] Following that, it explores the 'social gradients' qualification – W&P's proviso that the negative impact they are concerned with is likely to come about only for social conditions that are 'responsive' to inequality in the sense that negative outcomes are more common among lower status groups. Thus the second question the paper explores is the extent of negative social gradients in family indicators and their potential role in limiting the scope of the W&P thesis. This part of the analysis is confined to European countries for which relevant micro-data are available. Finally, the paper briefly considers how the growing literature on the relationship between trends in income inequality and family outcomes over time relates to the W&P thesis.

The W&P thesis

The W&P thesis originated from research in epidemiology (Kondo et al. 2009) and was expanded to include a wide variety of harmful social outcomes in rich countries, all of which, W&P argue, are more prevalent where income inequality is wider (W&P 2008, 2009, 2010). W&P refer to negative psychosocial effects of social status differences to explain this effect, pointing especially to links between social hierarchy and emotive responses such stress, shame and anxiety. Layte (2011) distinguishes between psychosocial explanations which rely on social capital as an intermediary variable and those which emphasize psychological effects such as stress and status anxiety. Lancee and Van de Werfhorst (2012) suggest that neo-material or resources theories may also be relevant. These refer to the negative effect of income inequality on social infrastructure and services that are relvant to all members of society (see also Elgar and Aitken 2010, Lynch et al. 2000). Possible causal mechanisms, however, are not the focus of the present paper since its concern is to investigate whether a relationship between income inequality and a range of family-related outcomes really exists.

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[1] Some indicators are drawn from a range of years and the corresponding year for the Gini has been approximated. Details provided in Table 1. If the Gini is missing for a particular year, it is replaced by previous years/another source if necessary.

[2] This slightly diverges from the W&P approach which takes the 80/20 income ratio as the measure of income inequality.

The role of social gradients

A key feature of the W&P approach is the role they attribute to social gradients in the overall picture linking income inequality with poor social outcomes. Their thesis is that the inequality effect is confined to social conditions that are 'responsive' to inequality in that they are more common among lower social status categories. Thus, for example, deaths from homicide and heart disease are socially stratified in this way and are included within the ambit of their thesis but deaths from breast cancer typically show no social gradient and are omitted (W&P 2010).

Though social gradients in outcome variables form an important part of W&P's argument, they elaborate on this topic only to a limited degree. The problem is that standardised cross-national or cross-regional micro-data needed to measure social gradients are difficult to obtain and so a comprehensive evidence base is lacking. W&P's direct evidence for the interconnection they hypothesise rests on a study they conducted of social gradients in ten causes of death and their association with income inequality across US states in 1999-2002 (W&P 2008). However, the test is only indirect since they measure social gradients across counties (of which there are 3139 in the US), not socio-economic categories. For each cause of death, they judge that a negative social gradient is present if mortality is higher in poorer than in richer counties (that is, where the mortality rate is negatively correlated with median county household income). Using this test, nine of the ten causes of death they examine emerge as having a negative social gradient, with mortality from breast cancer as the exception. They then find that six of these nine causes are also influenced by state-level income inequality: counties at the same income level have higher mortality if they are in more unequal states. Of three causes of mortality which do not show this link, two (prostate and pancreatic cancer) are less socially stratified than the others, which W&P interpret as consistent with the contention that pronounced negative social gradients are part of the mechanism linking income inequality with poor social outcomes.

They recognise from their own and other studies that these patterns show many exceptions. Smoking, for example, is found in many studies to have a negative social gradient but it does not correlate with income inequality across countries, while in their own work they find that deaths from diabetes are socially stratified but also fail to vary with spatial variations in income inequality (W&P 2009: 495-6). Nevertheless, they conclude that evidence from mortality data shows a sufficiently widespread intermediating role for social gradients that it can be seen as part of an overall pattern of inter-connection between income inequality and poor social outcomes.

As W&P expanded their thesis to include social outcomes outside the field of health, the link with social gradients was likewise extended as a guiding assumption. Outcomes which correlated with income inequality were assumed to have a negative gradient. For those where no such link was found, the absence of a social gradient was pointed to as a possible explanation (Rowlingson 2011). For example, suicide is often used as an indicator of social dysfunction but, as W&P acknowledge, cross-country variations in suicide are not linked to income inequality. To account for this, W&P speculate that suicide rates may not be consistently stratified by social status and so may not be open to an influence from income inequality (W&P 2009: 496). Their concern was not to explore this question further but to apply it as a selection criterion to enable them to focus on particular outcomes – those which supported their case on the presumed basis that they were characterised by negative social gradients. This contrasts with our approach here, where we aim for a wide analysis of a particular domain, allow for contrary as well as supporting evidence, and test directly for the presence of social gradients.

Income inequality and the family

W&P limit their analysis of what might be called family-related indicators to two – teenage birth rates and abortion rates. For teenage births, they explore variance across 22 OECD countries and across US states while abortion rates are examined across US states only. Their findings on these indicators support their overall thesis – teenage births and abortion rates are greater in countries or states where income inequality is higher (W&P 2010). Here we include both these indicators but add eleven others to bring the total to 13. W&P interpret their selected indicators as measures of social dysfunction and there has been some questioning of the normative judgement implied by this view. Rowlingson (2011: 16), for example, asks whether teenage births should always be regarded as a social problem since early childbearing may have some health advantages for mothers. On the other hand, there is wide evidence that teenage motherhood is linked to many unfavourable outcomes such as a greater poverty risk for mothers and children (UNICEF 2001).

Here we accept that some social problems are easy to recognise and agree on (e.g. premature death), others assume norms not shared by everyone (e.g. in regard to abortion), or confuse symptoms with underlying causes (high imprisonment rates may be a problem in themselves or the conditions that cause them may be the real issue), or fail to recognise that what may be negative in one context may be positive in another (very low fertility can be a positive expression of choice for individuals, a critical demographic weakness for societies or a good and necessary

adjustment to environmental overload for the planet). In our approach to variable selection, we focus on family-related issues that are recognised as important dimensions of family functioning without suggesting that it is always either possible or necessary to decide whether they constitute 'problems' or not. These variables enable us to test for a link between income inequality and family outcomes, some of which may reflect family vulnerability and but all of which capture important aspects of family-related behaviour. A major consideration in our variable selection is data availability: the aim is to pick items that are meaningful in substantive terms while also having available relevant data for a sufficient number of countries.

The 13 variables that emerge from this selection process can be classed under the two broad headings of partnership and fertility (Table 1). Under the *partnership* heading, some variables relate to what might be called partnership fragility – (i) the divorce rate, (ii) the average duration between marriage and divorce, (iii) the proportion of sole parent households, and (iv) the proportion of births taking place outside marriage. Others have to do with partnership formation – (v) the marriage rate, (vi) the average age of first marriage, (vii) the prevalence of cohabitation, and (viii) single person households. Under the *fertility* heading, the selected variables are (ix) the teenage birth rate, (x) the abortion rate, (xi) the incidence of large families, (xii) the total fertility rate and (xiii) childlessness. The data are mainly drawn from the OECD Family Database. We use Gini coefficients from the SWIID database as the measure of income inequality (Solt 2009).

Following W&P's methodology, we test for an association between these indicators and income inequality by means of zero order correlations. In view of debate which has taken place over the correct universe of countries to which the analysis should be applied (Rowlingson 2011, Saunders 2010), we first examine an inclusive set of OECD countries which at a maximum number 39 and include some cases that are not 'rich' in the sense defined by W&P (they have a GDP per capita of less than $25,000 per year). Some of these countries have outlier values on certain variables and since part of the debate on the correct universe of countries has to do with whether outlier cases should be dropped or not, we include results with outliers included and excluded where relevant. To maintain comparability with W&P's approach, we also apply the same analysis to 22 countries which more or less match those that W&P examined (this selection excludes the ex-communist states of eastern Europe and a number of Latin American and Asian states but includes Japan). For a list of countries and indicators, see Appendix Table.

Table 1 presents results for the 13 indicators and Figures 1-4 set out illustrative scatterplots for selected indicators. A key indicator used by W&P – the teenage birth rate – shows a robust

connection with Gini across all variants of the analysis as does a closely related indicator, average age of marriage. The correlation for teenage births is quite strong for 33 OECD countries (Figure 1). It drops somewhat if two outlier cases (Mexico and Chile) are excluded but remains at a similar level if the focus is narrowed to the 22 rich OECD countries. A simple model which checks if this association is a spurious product either of overall level of development (as measured by GDP per head) or the overall level of fertility (as measured by the total fertility rate) finds that it is not (Table 2). In fact, when these two control variables are applied, the link between income inequality and the teenage birth rate among the rich OECD countries becomes more pronounced (Models 3 and 4 in Table 2).

Tables 1 & 2 and Figure 1 here.

All the other family indicators show relationships with income inequality that either fail to support W&P's thesis or tend to contradict it: they are weak, or are significant because of marginal cases, or in some instances have the wrong sign. The abortion rate is of particular interest here since it is one of the family-related indicators (measured across US states) which W&P use as evidence in support of their thesis. Among OECD countries for which abortion data are available, the link with income inequality shown in Table 1 is positive as W&P would predict, but if a single case that is extreme on both abortion and income inequality (Russia) is removed the correlation ceases to be significant. The divorce rate (Figure 2), on the other hand, is negatively related to income inequality across all OECD states, the opposite of what W&P would predict. Here too, however, outlier cases are responsible – Mexico and Chile both have little divorce and high inequality – and without them the correlation with divorce falls almost to zero. It is also notable from Table 1 that what is often taken as a key indicator of family vulnerability – lone parenthood – shows no significant association with income inequality.

Figure 2 here

There are two inter-related variables that tap into partnership fragility – the share of births taking place outside of marriage (Figure 3) and the prevalence of cohabitation (Figure 4). They are notable because they are *negatively* associated with income inequality in the rich OECD states and thus challenge the W&P hypothesis directly. Most non-marital births in the rich world now take place to cohabiting parents but assertions that cohabitation is a functional equivalent of

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marriage has been disputed based on evidence that it is a less stable form of union than marriage that is linked to lower social status (Perelli-Harris et al. 2010, Liefbroer and Dourleijn 2006, McLanahan 2004). This is true even in more equal states like Norway and Sweden as well as in the less equal US and UK (Perelli-Harris et al. 2010, Kennedy and Thomson 2010, Kiernan et al. 2010). Low levels of income inequality in the Nordic states coupled with their high levels of both cohabitation and non-marital births thus contribute to the negative association with the Gini coefficient reported in Table 1 and in Figures 3 and 4.

Figures 3 & 4

Social gradients: data and measures

We now turn to the second issue addressed in this paper, namely, the prevalence of negative social gradients in family behaviour and their role in mediating the link between family outcomes and income inequality. To investigate this topic we require internationally comparable micro-data and for this purpose we draw from Round 3 (2006) of the European Social Survey (ESS) and the 2006 EU Survey of Income and Living Conditions (EU-SILC). Round 3 of the ESS is of particular value because it contains a range of family-related indicators collected in the *Timing of Life* rotating module (see http://ess.nsd.uib.no/ess/round3/). The EU-SILC has the advantage of larger national sample sizes than the ESS and where selected indicators are available from that source we use it in preference to the ESS.

Ten relevant indicators are available from these sources. These echo in an approximate way a sub-set of the 13 indicators examined earlier but because they are operationalized from different data sources and in different ways they do not exactly match. Under the *partnership* heading, the variables are (i) currently divorced/separated, (ii) lone parenthood, (iii) currently married or civil partnership, (iv) married by 21 years old, (v) lived with a partner by 21 years old, (vi) currently cohabiting (those in partnerships only), (vii) long-term solo living (aged 40+).[3] Under the *fertility* headings, the variables include (viii) first child by 21 years old (females only) (ix) childless (females, aged 40+) and (x) large family (given birth/fathered 3 plus children, aged 40+). Owing to age effects in terms of family and couple formation, variables (vii), (ix) and (x) have been restricted to those aged 40 years plus.

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[3] The indicators "long-term solo-living" and "lived with a partner by 21 years old" are derived from a question on whether the respondent has ever lived with a partner for longer than 3 months.

These indicators are subject to a number of limitations. First is the small sample sizes on which they are based, resulting in wide confidence intervals around many of the estimates. The second is that the time-reference of some of the variables can be wide, in contrast the narrower time-reference of counterpart variables used earlier. For example, the percentage of respondents who had a birth before age 21, which is intended as a counterpart to the teenage birth rate referred to earlier, relates to respondents across the full adult age-range and therefore reflects behaviour across a wide span of years (respondents who were aged in their 60s at survey date in 2006 would have been aged under 21 from the mid-1960s to the mid-1970s, whereas respondents aged in their 20s would have been aged under 21 after the mid-1990s). This wide time reference reduces the meaningfulness of correlations with Gini coefficients for a fixed recent year. However, as Pearce and Davey Smith (2003) highlight, the problem of wide time referencing applies to many indicators used in research of this type, not least with health conditions which are cumulative outcomes arrived at over a lifetime rather than specific behaviours occurring at a particular point in time.

The proxy measure of socio-economic status (SES) we use is a three-category measure of educational attainment – incomplete secondary education or less, completed secondary education and third-level education, drawn from the ISCED classification in the ESS. This measure is used partly for the pragmatic reason that it has fewer missing cases and may be subject to less measurement error than other possible SES proxies such as income or occupational level. It also has the substantive appeal that it is more likely to be exogenous to family behaviour (it is usually completed before partnership or fertility begins) than income or occupation (both of which could be influenced by partnership or fertility processes). To measure social gradients, we calculate the odds of the behaviour in question in each of the three educational levels for each country and *define a country as having a significant social gradient on a particular indicator if there is a statistically significant difference in the odds of a positive score on the indicator between the lowest and highest educational categories*. The odds ratio between the lowest and highest educational categories quantifies the gradient: scores greater than 1 indicate a *negative* social gradient (the measured behaviour or status is more common among the less educated), while scores between 0 and 1 indicate the reverse. It should be recalled here that the direction as well as the presence of social gradients is of interest since for some indicators the direction of the gradient may be the reverse of what the general tenor of the W&P thesis lead one to expect.

Social gradients: results

The results of the analysis of social gradients are set out in summary form in Table 3, which shows the odds ratios between the lowest and highest educational categories for those indicators and countries where the differences are significant at the 95% confidence level. These results show that only those variables which relate to early family formation – age of marriage, age of cohabitation and births before age 21 – show negative social gradients for most countries. We have seen in the previous section that early family formation was the only aspect of family life which showed robust links with income inequality along the lines of the W&P thesis. Here we now find that this aspect is also characterised by the negative social gradients that W&P identify as necessary mediating links between income inequality and poor social outcomes. As far as early family formation is concerned, therefore, the present analysis lends support to the W&P thesis both on the effects of income inequality and the mediating role of negative social gradients.

We also saw earlier that indicators of partnership instability (cohabitation and divorce) showed the reverse of the association with income inequality than W&P would point to – both divorce and cohabitation were slightly *less* likely to occur in more unequal societies. Here we find that more countries have positive social gradients for these variables (n=10) than negative (n=4). This is consistent with W&P's claim that where income inequality does not link to social outcomes in the expected way, the absence or weakness of negative social gradients in those outcomes may explain why (on the absence of a consistent social gradients in divorce, see Härkönen and Dronkers 2006). The same applies to two other indicators which might have been expected to be affected by income inequality – the incidence of large families (3+ children) and of lone parenthood. For both these variables, negative social gradients are present for less than half the countries in the sample (n=10) and this could be considered too weak a pattern of social stratification of these behaviours to make them 'responsive' to income inequality in the manner proposed by W&P.

In one sense, therefore, the present results could be counted as broadly consistent with the W&P thesis: family indicators that have strong negative social gradients are robustly linked with income inequality, those which lack negative social gradients show no association and, for indicators with positive social gradients, the direction of association is reversed. In another sense, however, this conclusion serves to highlight the narrow scope of the W&P thesis since the range of variables for which the combination of negative social gradients and robust association with

income inequality holds – the tendency towards early family formation, as measured either by early child-bearing, marriage or cohabitation – is limited. The other aspects of family behaviour examined here, such as family stability, family size and whether family formation occurs at all, are not stratified in the relevant manner and thus, to use W&P's language, are not responsive to income inequality. The upshot is that, in the family arena, the W&P thesis is largely valid in so far as it goes but application of the social gradients criterion means that it does not go very far.

Trends over time: income inequality and the family

The issues considered so far are a-historical in that they relate only to the present. We can also ask how a more historical view of trends in income inequality and family behaviour relates to the W&P thesis. It should said from the outset that income inequality has not featured as a major explanatory factor in general academic accounts of family change in the second half of the twentieth century and thus that an attempt at reverse projection of the W&P thesis across recent decades would run against the grain of most scholarly work in the field. The concept of a 'second demographic transition' has been used to refer to the sharp changes in family life which occurred in western countries from the mid-1960s onwards – the fall in fertility to very low levels, the growing instability of partnership as reflected in a sharp increase in divorce and relatively transient cohabitation, the transformation of women's roles in the home, and the de-coupling of sex from marriage (van de Kaa 2002, Lesthaeghe and Surkyn 2006). The 1960s and 1970s are often identified as a major turning point in this broad transformation (see, e.g., Therborn 2003, Fukayama 2009, Popenoe 2012). From our present point of view, an important feature of these developments is the inequality context in which they occurred: the 1960s and early 1970s were a time when income differences were either falling or already at a long-time low and the more recent return to widening income disparities was still a long way off (Brandolini and Smeeding 2009). This would suggest that in so far as income distribution had any association with the onset of rapid family change, it was high levels of equality rather than inequality that were the significant factor. Such an association would be loosely consistent with the theory of the second demographic transition which holds that the economic prosperity and security of the 1960s helped pave the way for the new regime of 'post-materialist values' which it sees as the driving force behind changing family behaviour (van de Kaa 2002, Lesthaeghe and Surkyn 2006).

It is also notable that the two family-related variables which W&P focus as manifestations of social problems – teenage births and abortion – have declined over recent decades when the

trend in income inequality was generally upward. In 29 OECD countries, the teenage birth rate fell on average by a half between 1980 and 2008 and only one country – Malta – showed an increase (OECD Family Database, 2012, Chart SF2.4.D). Trends in abortion were more mixed but overall have been downwards since the mid-1990s and eastern Europe in particular has experienced a sharp fall in abortion during a period of high and generally rising income inequality (Sedgh et al. 2012: 627). In the United States between 1990 and 2008, the teenage pregnancy rate fell by 40 per cent, the teenage abortion rate by 56 per cent and the overall abortion rate by 29 per cent (Ventura et al. 2012: 10), though this was a period of rising income inequality (OECD 2008: 27). These data suggest then, that even for those variables which seem to be linked with income equality on a point-in-time cross-sectional basis there is no similar link when we look at trends across time.

While few scholars have looked to trends in income inequality as influences on family change, there has been interest in the reverse causal connection – family change as a contributor to widening income inequality. Some of the family trends looked at in this context lie outside the scope of we have considered in this paper, for example, the rise of educational homogamy and its possible links with widening inequalities in household incomes and success in the job market (Esping-Andersen 2009: 59-61; McCall and Percheski 2010: 336-7, Schwartz and Mare 2005, Reed and Cancian 2009). Others dispute that educational homogamy has in fact universally increased (Blossfeld 2009: 516, Smits 2003, Smits and Park 2009) or question whether, even when it occurs, it has a significant impact on income distribution (Breen and Salazar, 2009, 2010, Western et al. 2008). Nevertheless, the key point for the present paper is that the causal mechanisms at issue here run from family change to income inequality rather than vice versa and thus do little to reinforce the W&P thesis.

A similar point arises from a second major area of investigation is this field – that focusing on the rise in family instability and its contribution to income inequality. The issues here are the sharp growth of lone parenthood and unstable cohabitation among families, the concentration of this growth in lower SES groups, and the impact of 'absent fathers' on household resources. In the US, a number of studies have attempted to calculate the share of rising income inequality which can be attributed to the growth of female-headed families, with estimates ranging from 11% to 41% (McLanahan and Percheski 2008: 259). Some studies have come closer to the thrust of the W&P thesis by exploring whether causality might also flow in the other direction: worsening income prospects for poorly educated fathers may weaken their ability to contribute to

the family household and thus feed into higher rates of family breakup and lone parenthood. Even here, however, the concern is with the impact of income inequality on the 'diverging destinies' of better-off and poorer families rather than to any hypothesised overall decline in family well-being as might be posited by the W&P thesis (Waldfogel et al. 2010, McLanahan 2004, McLanahan and Percheski 2008). There has been some research in a similar vein outside the US (Holmes and Kiernan 2010, Kennedy and Thompson, 2010) and this has included some elements of cross-country comparison (Kiernan and McLanahan 2011; Cherlin 2011, Perelli-Harris et al. 2010).

Conclusion

This paper has argued that the W&P thesis concerning the negative effects of income inequality on social outcomes has some validity when applied to the family but the scope of that validity is narrow. Indicators of early family formation (teenage birth rates and early age of entry into partnership) are linked to income inequality in a robust way and are characterised by the negative social gradients which W&P point to as necessary mediating links between income inequality and social outcomes. However, the paper has also found that no aspect of family behaviour other than early family formation is robustly linked to income inequality across countries. The latter finding can be accounted for within the W&P framework on the basis that most family behaviours do not display the negative social gradients which W&P say are required to make them 'responsive' to income inequality. The few variables for which this criterion is fulfilled, however, confirms the limited scope of the W&P thesis.

If we go beyond W&P's point-in-time focus and look at trends over time, a similar conclusion holds. Rapid change in family behaviour often labelled the 'second demographic transition', which includes many of the developments that W&P interpret as negative, commenced when income inequality was generally low and stable in the 1960s and 1970s and so were not driven by rising income inequality. Key indicators of family dysfunction highlighted by W&P such as teenage births and abortion rates have tended to decline during recent periods of rising income inequality. These indications suggest that trends in income inequality have not been a major driver of family change, though in some countries a reverse causal relationship may sometimes be important (for example, in that rising educational homogamy or increasing lone parenthood may contribute to widening inequalities in household incomes). Thus the overall conclusion reached is that, apart from its present-day cross-country associations with early family formation,

income inequality on its own does not exert a consistent effect on family behaviour and is not a major contributor to differences between countries or change over time in family patterns.

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Table 1: Correlations between family indicators and Gini coefficient in OECD/EU countries

	All OECD countries		Spirit Level countries		Source & year
	Correlation (excl. outliers)	N (excl. outliers)	Correlation	N	
Partnership variables					
Divorce rate (divorces per 1000 population)	**-0.40*** (-0.07)	38 (36)	-0.13	22	OECD 2008
Dissolution time (average time from marriage to divorce)	-0.06	29	0.46	15	OECD 2008
Sole parent households (as proportion of all households)	0.29	35	0.33	20	OECD 2003[Ψ]
Births outside marriage (% live births outside marriage)	-0.07	36	**-0.53***	21	OECD 2008
Marriage rate (marriages per 1000 population)	**0.56***** (0.29)	33 (30)	0.20	21	OECD 2005
Average age of first marriage	**-0.46**** (**-0.39****)	32 (31)	**-0.48***	17	OECD 2008
Cohabiting (as proportion of population aged 20 plus)[1]	-0.30	34	**-0.57****	20	OECD 2003[Ψ]
Living alone (as proportion of population aged 20 plus)[2]	**-0.54***** (**-0.35***)	34 (33)	0.03	14	OECD 2003[Ψ]
Fertility variables					
Teenage births (births per 1000 women aged 15-19 yrs)	**0.76***** (**0.53*****)	39 (37)	**0.54****	22	OECD 2008
Abortion rate (per 1000 females aged 15-44 yrs)[3]	**0.55**** (0.33)	26 (25)	0.27	17	2003 Sedgh et al. 2007
Large family size (three plus children in household, as proportion of households)[4]	**0.47**** (-0.23)	32 (30)	-0.22	17	OECD 2007
Total fertility rate	**0.36*** (0.29)	34 (33)	0.16	22	OECD 2008
Childlessness (women aged 40-44 years with no children in household)[5]	0.07	27	-0.47	11	OECD 2007

*** p≤0.001, ** p≤0.01, * p≤0.05

[Ψ] The OECD data for these variables is drawn from a variety of years; 2003 is the best approximate.

1. Cohabiting prevalence as proportion of couples (ESS 2006) also tested with similar results.

2. Solo-living, never lived with a partner for more than three months, aged 40+ only (ESS 2006) also tested: no significant correlation.

3. Abortion ratio per 100 live births (Sedgh et al. 2007) also tested with similar results.

4. Proportion of children in large families as proportion of family households (OECD, 2008) also tested: no significant correlation.

5. Childlessness at aged 30-34 and 35-39 (OECD, 2007) also tested: no significant correlation.

Table 2: Regression of teenage births and income inequality with controls

	OECD countries (n=34)		Rich OECD countries (n=22)	
	Model 1	Model 2	Model 3	Model 4
	Standardized coefficients	*Standardized coefficients*	*Standardized coefficients*	*Standardized coefficients*
Gini	0.78***	0.67***	0.54**	0.62**
GDP per capita		-0.19		0.25
Total fertility rate		0.11		0.29
Adj. R-squared	0.60	0.61	0.26	0.34

*** p≤0.001, ** p≤0.01, * p≤0.05

Table 3: Odds ratios (lower secondary or less *v* tertiary education)

	ESS 2006							EU SILC 2006		
	Married <21	Lived with partner <21	Currently cohabiting	Solo living, 40+	First child <21 ,females	Childless, , females, 40+	Large family, 40+	Married	Divorced	Sole parent hhold
Austria	3.9	2.4		n.s	12.9	n.s	n.s	0.7	0.7	n.s
Belgium	5.9	4.0	n.s	n.s	16.3	n.s	n.s	n.s.	n.s.	1.6
Bulgaria	6.8	6.7	n.s	n.s	6.5	n.s	9.8			
Cyprus								n.s.	n.s.	n.s
Czech Rep.								0.3	n.s.	2.6
Denmark	7.3	1.7	n.s	n.s	9.9	n.s	2.6	0.6	n.s.	2.2
Estonia	2.1	1.8	n.s	n.s	4.1	n.s	n.s	0.3	0.5	n.s
Finland	3.5	1.3	n.s	n.s	5.6	n.s	n.s	0.5	n.s.	2.0
France	4.1	1.7	0.7	2.7	11.5	n.s	n.s	n.s.	1.5	n.s
Germany	2.9	2.5	n.s	n.s	3.4	n.s	2.0	0.5	0.8	1.7
Greece								1.2	n.s.	n.s
Hungary	4.8	4.4	n.s	n.s	7.5	n.s	n.s	0.5	0.7	n.s
Iceland								0.4	n.s.	1.8
Ireland	4.9	2.3	n.s	n.s	6.6	n.s	n.s	0.8	1.9	2.4
Italy								1.3	0.6	0.5
Latvia								0.3	0.6	0.5
Lithuania								0.3	0.5	n.s
Luxembourg								n.s.	n.s.	n.s
Netherlands	4.1	2.3	0.5	2.5	3.6	0.4	1.7	n.s.	n.s.	2.1
Norway	3.7	1.9	0.5	n.s	4.5	n.s	n.s	0.5	2.5	1.6
Poland	3.6	2.9	n.s	n.s	8.8	n.s	4.1	0.4	0.6	n.s
Portugal	2.7	2.7	1.0	n.s	3.2	n.s	n.s	1.6	n.s.	0.4
Russian Fed.	1.6	1.6	n.s	n.s	n.s	n.s	3.8			
Slovak Rep.	10.7	9.4	n.s	n.s	8.6	n.s	7.7	0.2	0.4	n.s
Slovenia	5.0	3.9	n.s	n.s	8.3	n.s	2.4	0.5	0.7	n.s
Spain	3.6	3.2	n.s	n.s	6.3	0.3	2.5	1.4	n.s.	n.s
Sweden	3.7	1.8	3.0	n.s	7.4	n.s	n.s	0.6	n.s.	n.s
Switzerland	4.6	2.4	1.1	3.3	8.3	n.s	n.s			
Ukraine	n.s	n.s	n.s	0.5	2.1	n.s	2.6			
UK	3.3	2.4	n.s	n.s	5.2	n.s	n.s	n.s.	4.9	1.8
Overall -	**21/22**	**21/22**	**3/22**	**3/22**	**0/22**	**2/22**	**10/22**	**4/26**	**4/26**	**10/26**
Overall +	**0/22**	**0/22**	**3/22**	**1/22**	**21/22**	**0/22**	**0/22**	**16/26**	**10/26**	**3/26**

Notes: Austria is missing on current cohabiting status; n.s=non-significant; Blank cells indicate missing data; overall -/+: no. of countries with negative/positive social gradient

Appendix Table: Country and indicator data

Country	Spirit Level	Divorce rate	Dissolution time	Sole parents	Births outside marriage	Marriage rate	Av. age marriage	Cohab	Living alone	Teenage preg.	Abortion	Large family	TFR	Childless
Australia	Yes	2.3		5.8	33.4	5.4		8.9	26.5	14.6	20.0		2.0	13.0
Austria	Yes	2.4	12.1	9.7	38.8	4.8	30.8	6.5	33.5	11.2		5.0	1.4	33.9
Belgium	Yes	3.3	14.8	12.1	43.2	4.1	29.6	6.4	31.6	7.6	8.0	8.0	1.8	19.6
Bulgaria	No	1.9	14.9	6.5	51.1		27.1	4.2	22.7	43.4	22.0	2.0		31.0
Canada	Yes	2.2		15.7	24.5	4.6	28.6	8.9	26.8	12.5	15.0	10.0	1.7	
Chile	No	0.2								59.4			2.0	
Cyprus	No	2.1	10.9	5.7	8.9		27.9	0.9	16.0	6.8		11.0		14.6
Czech	No	3.0	14.0	12.9	36.3	5.1	28.4	2.9	30.3	11.5	13.0	4.0	1.5	19.3
Denmark	Yes	2.7	11.5	5.1	46.2	6.7	32.7	11.5	36.8	6.0	15.0		1.9	
Estonia	No	2.6	13.2	14.7	59.0	4.6	27.9	11.8	33.5	22.9	36.0	5.0	1.7	21.9
Finland	Yes	2.5	13.0	7.6	40.7	5.6	30.8	11.8	37.3	8.6	11.0	6.0	1.9	28.8
France	Yes	2.1	13.3	8.0	52.6	4.5	31.0	14.4	31.0	11.5	17.0	7.0	2.0	20.6
Germany	Yes	2.3	14.0	5.9	32.1	4.7	30.9	5.3	35.8	9.8	8.0	4.0	1.4	33.6
Greece	Yes	1.2	12.5	8.7	5.9	5.5	30.3	1.7	19.7	12.0		5.0	1.5	24.8
Hungary	No	2.5	14.1	10.7	39.5	4.4	28.7	6.3	26.2	20.1	26.0	7.0	1.4	16.5
Iceland	No	1.7	11.9	7.2	64.1	5.4	32.7		30.7	14.5			2.1	
Ireland	Yes	0.8		11.7	32.8	5.1	30.7	5.9	21.6	17.5	7.0	8.0	2.1	
Israel	Yes	1.9								14.1	14.0		3.0	
Italy	Yes	0.9	16.8	8.9	17.7	4.2	31.2	2.0	24.9	4.8	11.0	4.0	1.4	22.0
Japan	Yes	2.0		8.4	2.0	5.7		2.1	29.5	4.8		3.5	1.4	
Korea	No	2.6		9.4	1.5	6.5				5.5			1.2	
Latvia	No	2.7	13.6	20.3	43.1		26.8	5.5	25.0	24.5	29.0	5.0		30.5
Lithuania	No	3.1	13.5	7.2	28.5		26.2	4.1	28.7	19.0	15.0	6.0		19.3
Lux.	No	2.0	13.6	8.4	30.2	4.4	30.9	14.0	29.3	8.7		8.0	1.6	26.8
Malta	No				25.4		29.1	2.1		18.7		8.0		12.5
Mexico	No	0.7		10.3	55.1	5.6	26.4		7.6	64.3		17.0	2.1	27.4
Nether.	Yes	2.0	14.1	5.8	41.2	4.5	31.1	9.3	33.6	5.2	9.0	7.0	1.8	24.3
New Zealand	Yes	2.3		9.3	46.5	5.0		9.4	22.6	22.1	21.0	8.0	2.2	
Norway	Yes	2.1	13.6	8.6	55.0	4.8	32.3	10.7	37.7	9.3	15.0	6.0	2.0	
Poland	No	1.7	14.3	12.6	19.9	5.4	26.3	1.3	24.8	16.2		9.0	1.4	13.2
Portugal	Yes	2.4	14.5	8.6	36.2	4.6	28.4	4.1	17.3	15.9		4.0	1.4	17.9
Romania	No		12.2	9.3			27.0	4.3	18.9			6.0		21.6
Russia	No					7.5					45.0			
Slovak	No	2.3	14.6	9.2	30.1	4.9	27.5	1.4	19.4	21.5	13.0	8.0	1.3	18.5
Slovenia	No	1.1	16.0	12.5	52.8	2.9	29.6	5.4	21.9	5.1	16.0	5.0	1.5	15.2
Spain	Yes	2.4	15.2	9.9	31.7	4.8	28.8	3.3	20.3	13.7		4.0	1.5	18.1
Sweden	Yes	2.3	11.5		54.7	4.9	33.4			5.9	20.0		1.9	
Switz.	Yes	2.6	14.4	5.2	17.1	5.4	33.7	5.9	36.0	4.3	7.0		1.5	
Turkey	No	1.4	10.4			9.1		0.2		35.9		20.0	2.1	16.1
Ukraine	No													25.1
UK	Yes	2.4	13.0	9.8	45.4	5.2	30.7	8.7	30.2	23.6	17.0	7.0	2.0	
USA	Yes	3.7		9.2	38.5	7.6		5.5	27.3	35.0	21.0	7.0	2.1	
N of cases		38	29	35	36	33	32	34	34	39	26	32	34	27

Figure 1: Teenage pregnancy rate and income inequality (39 OECD countries)
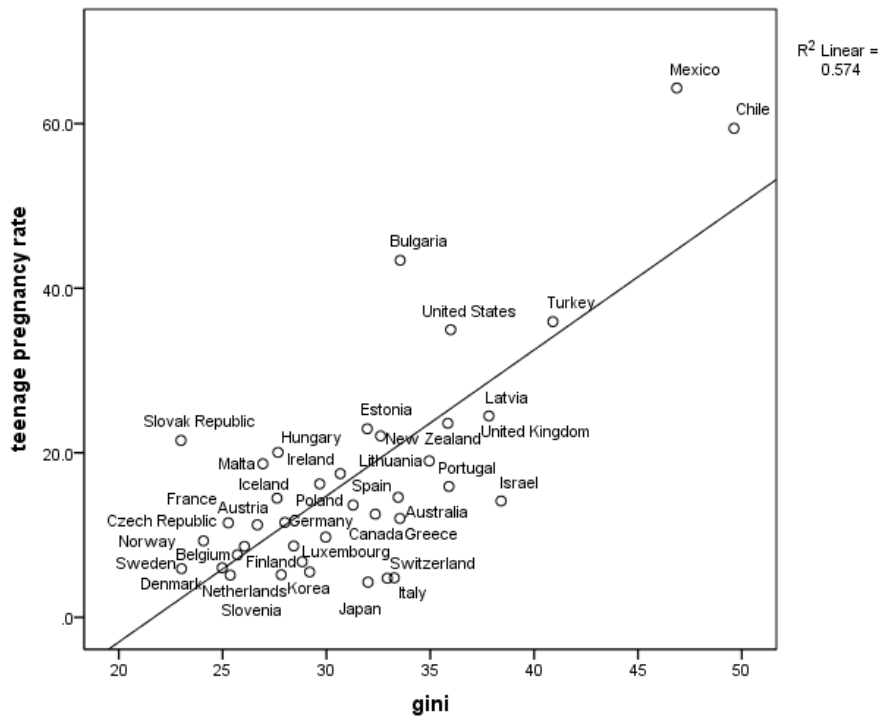

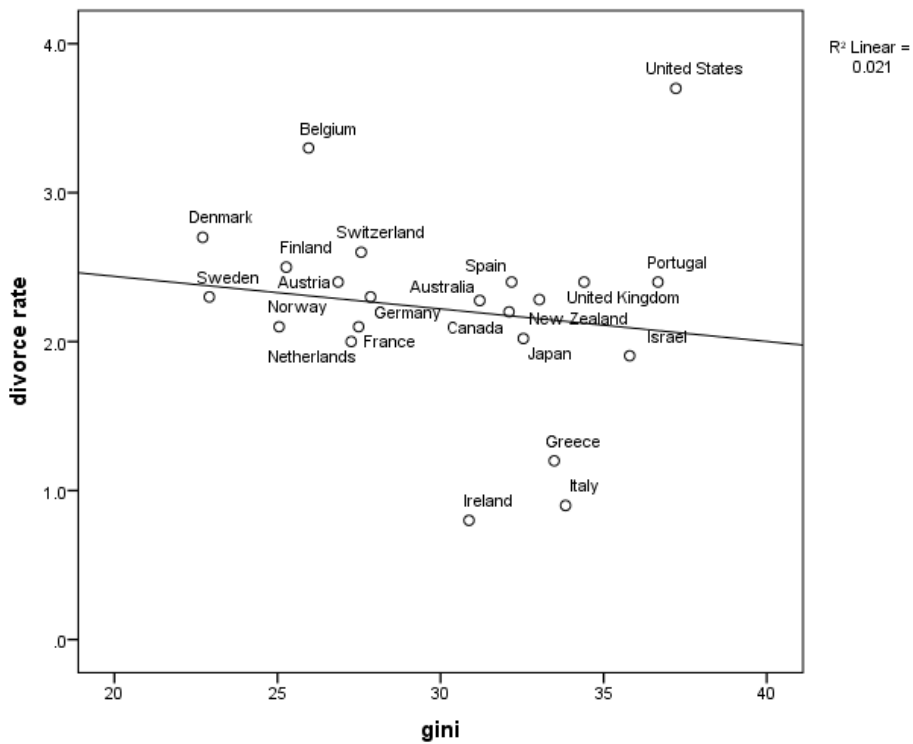Figure 2: Divorce rate and income inequality (22 'rich' OECD countries)

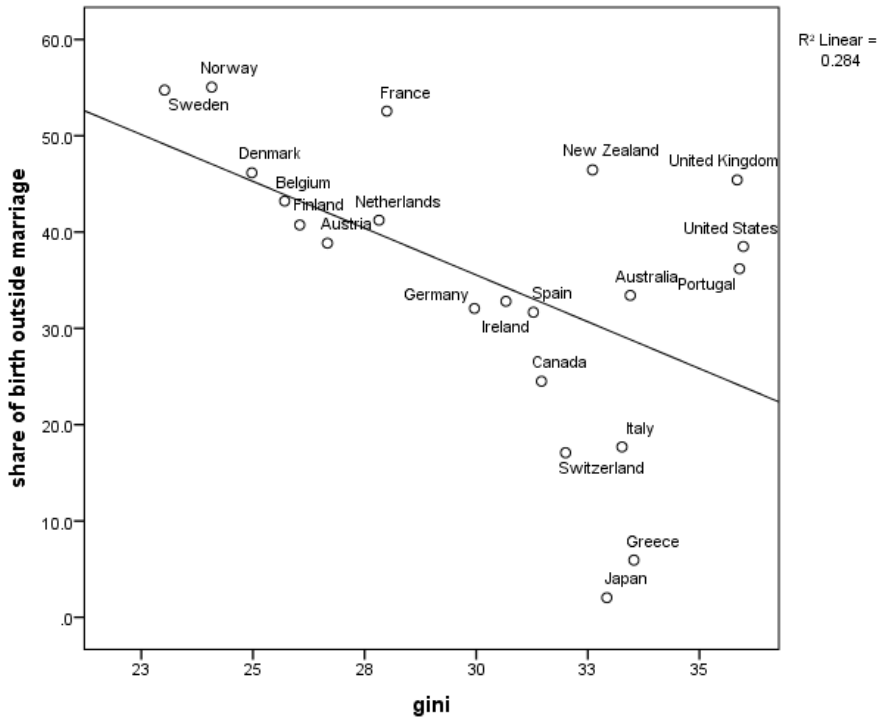Figure 3: Births outside marriage and income inequality (21 'rich' OECD countries)

Figure 4: Cohabiting and income inequality (22 'rich' OECD countries)