

# Household income, education and transition to third birth

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## Short abstract

The UK continues to show relatively high levels of progression to third birth, despite increases in childlessness. Much debate as to who has large families in the UK has taken place in the absence of robust empirical evidence. We use newly available household panel data from a large nationally representative study to explore associations between couple's income level, education, and the propensity to have third births. We use the UKHLS waves 1 to 5 (2009-2014), taking woman aged 20-44 as the unit of analysis. Discrete-time event history analyses are used to model factors associated with the annual probability of experiencing a conception leading to a third birth. Key explanatory variables are household income, receipt of child tax credits, and education (derived from highest educational qualification). We also control for the woman's age, the age of her youngest child, religion, shared children, partnership history and women's labour market attachment. In bivariate analyses, all of the socioeconomic variables show a negative association with third birth. Logistic regression models further show that the propensity for women to have a third birth is most strongly associated with her own age and the age of her youngest child. Once these variables are included, the associations between income/education and third birth are no longer statistically significant. We discuss our findings in relation to economic and sociological theories regarding the inter-relationship between the timing of childbearing and family size, and how this interacts with financial, cultural and social capital.

## Extended abstract

The UK continues to show relatively high levels of progression to third birth, despite concomitant increases in childlessness (Berrington et al., 2015). The proportion of women having at least three children was as high as 40% for women born in 1940 and has remained constant at around 30% for cohorts born thereafter (Office for National Statistics, 2015). Thus the proportion of women progressing to third births remains high in the UK within a European context (Wood et al., 2014). It is often assumed that the persistence of large families in the UK is a consequence of the relatively high levels of immigration from source regions which traditionally have large families. Some migrant groups, particular those from Pakistan, Bangladeshi and African countries including Nigeria and Somalia are seen to have significantly higher fertility rates than UK born women (Dorman, 2014, Robards and Berrington, 2016 forthcoming). Furthermore, fertility rates are also higher among some second generation ethnic minorities born in the UK, especially women of Pakistani and Bangladeshi heritage (Coleman and Dubuc, 2010). However, as shown by Berrington and Stone (2016 forthcoming), parity progression rates to third birth among cohorts born 1940-1969 have remained relatively constant among women born in the UK, to UK born parents. In other words, immigration, although a factor, is not the main driver of large families among women currently aged 45+ in the UK.

A second discourse about large families in the UK relates to an assumed U-shaped distribution according to income. The pervasive assumption that large families are found among “the poor” and the “very well off” is often made in media reports (though not based on much empirical evidence). The following quote from the Daily Telegraph (08 July 2015) is typical “The reality is that there are only two groups of people in this country who get to choose how many children they have without worrying about the costs of raising them: the very rich, and the very poor.”(Hartley-Brewer, 2015).

It is suggested that the rich can afford to have as many children as they like since they can use their financial capital to ease the conflict between highly paid work and childcare responsibilities, e.g. by paying for nannies and other childcare, or the partner’s income is assumed to be so large that the woman can remain at home. On the other hand, poorer couples are argued to have more children because of the generosity of the UK welfare support, which is targeted at low income families (and has become particularly so in the last decade or so) (Cribb and Joyce, 2015). A prominent Conservative, charged with cutting the welfare budget in the face of austerity, Ian Duncan Smith, was reported to have said in 2012 that “People who are having support from welfare are often freed from that decision. Can there be not be a limit to the fact you need to cut your cloth in accordance with what capabilities and finances you have?” (BBC News Online, 2015). Empirical support for a small positive role of e.g. the introduction of child tax credits, can be found in the academic literature (Brewer et al., 2012). More generally, the liberal state – characterised by low levels of employment protection via the state – is seen to encourage early family formation (eg.Schmitt, 2012) – and, in turn, starting early is associated with higher likelihood of larger families (Berrington et al., 2015). Very recently, attention has once again been placed on the presumed link between welfare benefits and large families as a result of a decision by the Conservative Government to limit child tax credits (which can be worth up to £2,780 a year for each child) to the first two children in a family, for children born after April 2017, or for those

who take a break in claiming of more than 6 months (House of Commons Work and Pensions Committee, 2015). The announcement was welcomed by some lobby groups who demand that couples take financial responsibility for their children (e.g. Population Matters), but decried by others (eg. Church of England, 2015) who highlight the fact that most poor parents are in work, but that the work is too low paid and that this policy announcement is incompatible with Government aims to reduce child poverty.

### **Study aim**

Much of the debate as to who has large families in the UK has taken place in the absence of nationally representative longitudinal data which would allow for the analysis of the association between progression to higher order births and the characteristics of both members of the couple to be examined, including educational homogamy and household income. In this paper we use newly availability panel data from a large-scale nationally representative household panel to explore associations between couple's levels of income, their educational homogamy and the propensity to have third births. We do not aim in this paper to establish causal relationships, but to establish whether the observed associations correspond to the mechanisms currently assumed by policy makers and the media. We only look at families who have at least two children, thus the observed associations e.g. between income and childbearing must be interpreted as being conditional upon having already had two children. So, for example, much previous work has shown that the impact of education on fertility is conditional upon becoming a mother in the first place ((Kreyenfeld, 2002, Kravdal, 2001). We test the following hypotheses:

**H1:** Household income will have a u-shaped relationship with the propensity to have a third birth.

**H2:** Power couples – couples where both partners have high levels of education – are more likely to have a third than other couples where at least one of the partners does not have a high level of education.

**H3:** Couples who receive a high proportion of their income via welfare state benefits will be more likely to have a third.

This paper thus adds to our knowledge by providing new longitudinal insights for the UK, not available from analyses based on retrospective fertility histories (since income is not usually measured retrospectively); and by taking a couple-level approach and to examine how household income and educational homogamy are associated with the transition to third birth (Dribe and Stanfors, 2010, Begall, 2013, Nitsche et al., 2015).

### **Data and Methods**

#### *The UKHLS.*

Our sample comes from the UKHLS waves 1 to 5, carried out between 2009 and 2014 (Mcfall, 2013). We use a paired years approach, which allows for the inclusion in the analysis sample of any respondent who takes part in at least two consecutive panel waves. Thus our sample includes members of the British Household Panel Study who were incorporated into the main UKHLS sample in wave 2. Analyses are weighted using the cross-sectional weights which

adjust for complex survey design, non-response in wave 1 and subsequent attrition in the sample. We take the woman in the couple as the unit of analysis since fertility is more obviously constrained by the limits to her reproductive life time. Since few teenagers already have two births we only include women aged 20-44 in the analysis.

### *The statistical model*

Discrete-time event history analyses are used to model factors associated with the annual probability of experiencing a conception leading to a third birth. In order to avoid reverse causality we only include those respondents who were not pregnant at t0 but who had achieved two children. All the women were in a co-residential partnership. Union dissolution is treated as a censoring event.

*Key explanatory variables* included in the analysis are described in Table 1. *Educational homogamy* is derived from the highest level of educational qualification as reported at the time of the interview. A high level of education is defined as those who have Advanced or Degree level qualifications. Power couples are couples where both partners have a degree, whereas low educated couples are where neither have an advanced or higher level qualification. *Household income* refers to net equivalized income. The income distribution is split into tertiles such that couples with low, medium and high levels of income are identified. *Benefit income* refers to the proportion of overall household income that is derived from benefit income, and is also split into tertiles. Universal benefit income e.g. from child benefit is not included.

*Control variables.* We control for other factors known from the existing literature to be associated with higher rates of progression. *Demographic control variables* include the woman's age and the age of her youngest child (both negatively associated with progression to further births). We also control for country of birth / generation which has been found previously to be important (Dubuc, 2012, Andersson et al., 2008), and partnership history. In terms of fertility, the overall impact of increasing levels of partnership dissolution on fertility is difficult to predict. For some women union dissolution may lead to smaller completed family sizes due to the interruption of an individual's opportunities for childbearing, or due to a reduction in fertility stemming from a perception that the marriage is unstable (Lillard and Panis, 1998). However, repartnering may offset this to an extent – previous research suggests that new partnerships, in particular, are associated with higher parity progressions (Thomson et al., 2012, Beaujouan and Solaz, 2013, Van Bavel and Nitsche, 2013). Thus there may be a '*union commitment effect*' (Vikat et al., 1999), whereby couples desire a joint child, irrespective of parity<sup>1</sup>. Finally, we control for the *woman's labour market attachment* which has been found to be significantly associated with higher order births – though the results are not consistent across studies (Kravdal, 2002, Kreyenfeld and Andersson, 2014, Andersson et al., 2008, Wright et al., 1988). Recent UK research, using the same panel study found that progression to first and second birth is more common for women who are not in the labour market (Stone and Berrington, 2016 ).

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<sup>1</sup> In this preliminary version of the analysis we include rather crude indicators of partnership and repartnering dynamics. Essentially we identify whether the respondent is married or cohabiting, and whether any of the co-resident children are the biological children of both partners. In future analyses a more dynamic measure of the timing of repartnering and the presence of a shared child will be included.

## Results

The descriptives charts shown in Figures 1a and 1b indicate that the age of the woman at interview and the age of her youngest child both show a strong, negative association with the probability of making the transition to third birth. Table 2 shows the results of the discrete-time event history analysis for third births. Model one for both parity progressions confirms the strong association with the woman's age and the age of her youngest child, and the probability of having a third birth. Also in model 1, the indicator of educational status within the couple, indicates that couples in which both members have a low level of education are the most likely group to go on to have a third birth, although not statistically significant. Although contrary to our hypothesis and to previous research, which showed that couples both with higher educational levels had a higher propensity to progress to third birth (Nitsche et al., 2015), this supports previous work showing that socioeconomic disadvantage is associated with increased fertility in the UK population (Stone and Berrington, 2016 ).

Household income is included in model 2 (Table 2) for third births. For third births, the results support our hypothesis of a u-shaped relationship with fertility – women classified as having a 'medium' level of household income are the group least likely to have a third birth, compared with those with the highest or lowest levels of income. Model 3 (Table 2) adds benefit income as a final predictor of third births. The relationship is similar to that observed for overall income – those in the middle category are the least likely to have a third birth, as compared to women for whom benefits make up a high or low proportion of their income. This only partially supports our hypothesis, which predicted that couples who receive a high proportion of their income via welfare state benefits would be more likely to have a third child. In fact, women with the lowest proportion of their income from benefits (the reference group) are the most likely to go on to have a third birth. Moreover, this is clearly not just a reflection of household income as the odds ratio for household income is virtually unchanged in the final model. Further analysis will be needed to disentangle these associations.

### *Control variables*

Women born outside the UK are more likely than those born in the UK to have an additional child. Second-generation migrants are similar to those born in the UK to UK-born parents. However, the fact that we are having to group migrant groups with high (e.g. Pakistani and Bangladeshi) and low fertility (e.g. Indian, Polish) means that heterogeneity in this group is obfuscated. In these preliminary analyses, we use whether the respondent has at least one shared child with their current partner as a proxy for partnership history. This variable is not significantly associated with the transition to third birth. As previously mentioned this variable is rather crude and subsequent work will identify dynamics and union commitment effect more effectively. The addition of economic activity in model 3 also fails to produce any significant findings – contrary to previous findings for earlier cohorts in the UK (Wright et al., 1988) and for transition to parity two (Stone and Berrington, 2016 ).

## Summary and next steps

Using newly available, longitudinal data, our preliminary results suggest that in the UK, the propensity for women to have a third birth (given that a woman already has two or three children) is strongly associated with her own age and the age of her youngest child. Of the variables included in the present study, these key demographic factors are by far the most powerful predictors of parity progression. However, some evidence emerged suggesting that socioeconomic characteristics are also associated with the transition to third birth. In particular, our findings point to a 'U-shaped' association between household income and progression to third birth. Current discourse would suggest that this association reflects that more financially advantaged couples have the economic resources to pay for childcare while more disadvantaged households can afford to have more children due to the generosity of the UK welfare support. However, even after controlling for the percentage of income from benefits, the association with overall household income remained significant. Moreover, women who received the lowest proportion of their income from benefits were the most likely to go on to have a third birth, and we can speculate that the affordability/availability of childcare may play a key role in this association.

Our results also emphasise that education and income should be considered as separate, if related, measures. Although the results relating to our educational homogamy variable were not statistically significant, they show a slightly different picture to that observed for the income measures, in that the most disadvantage couples – those in which both partners had low education – were most likely to have a third birth. Moreover, couples who both had high levels of education were the least likely to have a fourth birth, which was in direct opposition to our hypothesis. Overall, our results suggest that further exploration is required to disentangle the associations between financial resources, human capital and parity progression.

### ***Next steps***

To investigate these preliminary results further, we plan to introduce women's age at first birth into our analyses to explore the role of the 'time squeeze' effect that may mean birth spacing is shorter for women who start childbearing later (Kreyenfeld, 2002). We will also consider the role of housing tenure, which has also been shown to be important in previous research looking at family formation in the UK. We will also take advantage of the detailed partnership and fertility histories available in the UKHLS dataset to measure repartnering and shared parenting more precisely.

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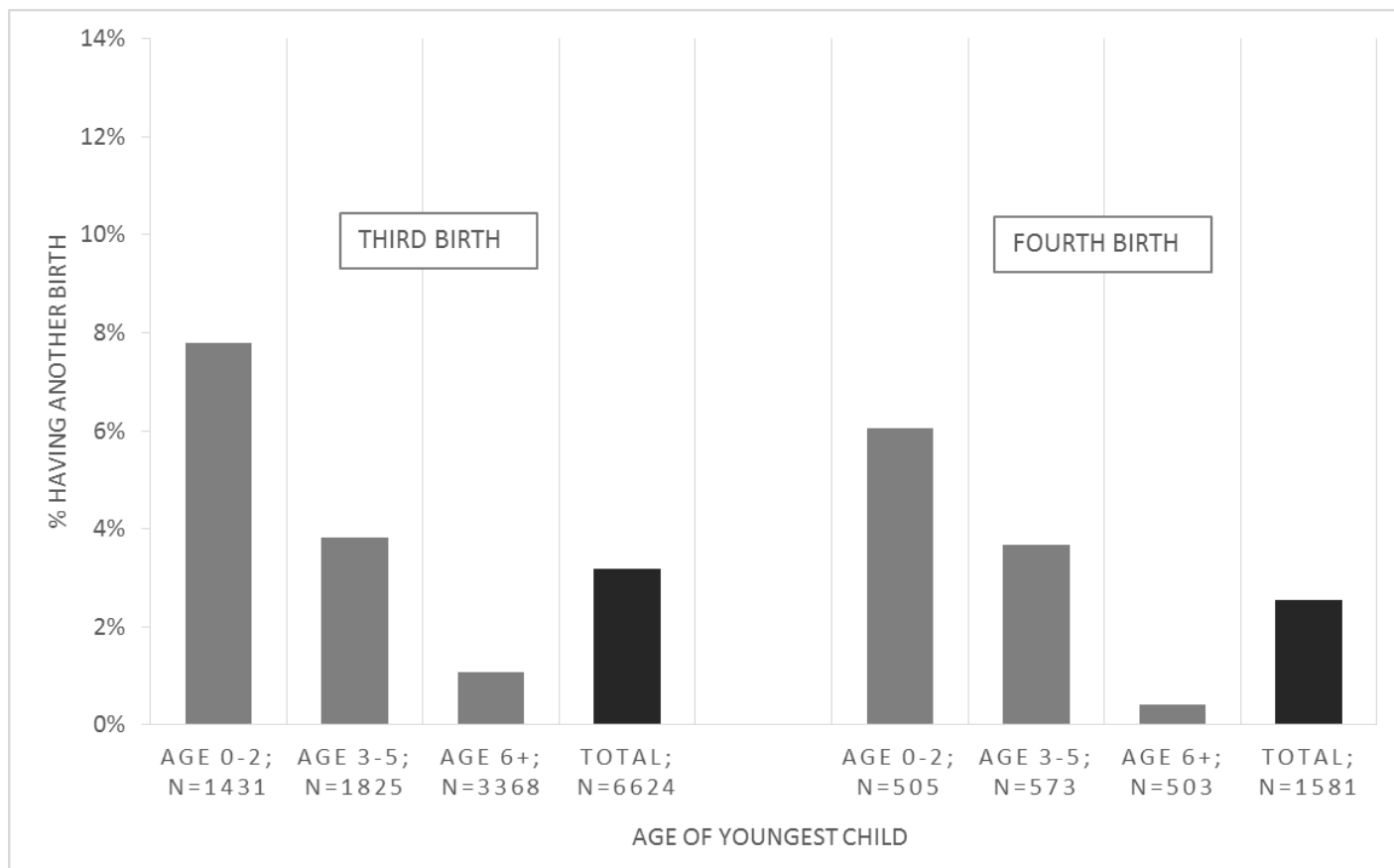
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#### **Acknowledgements**

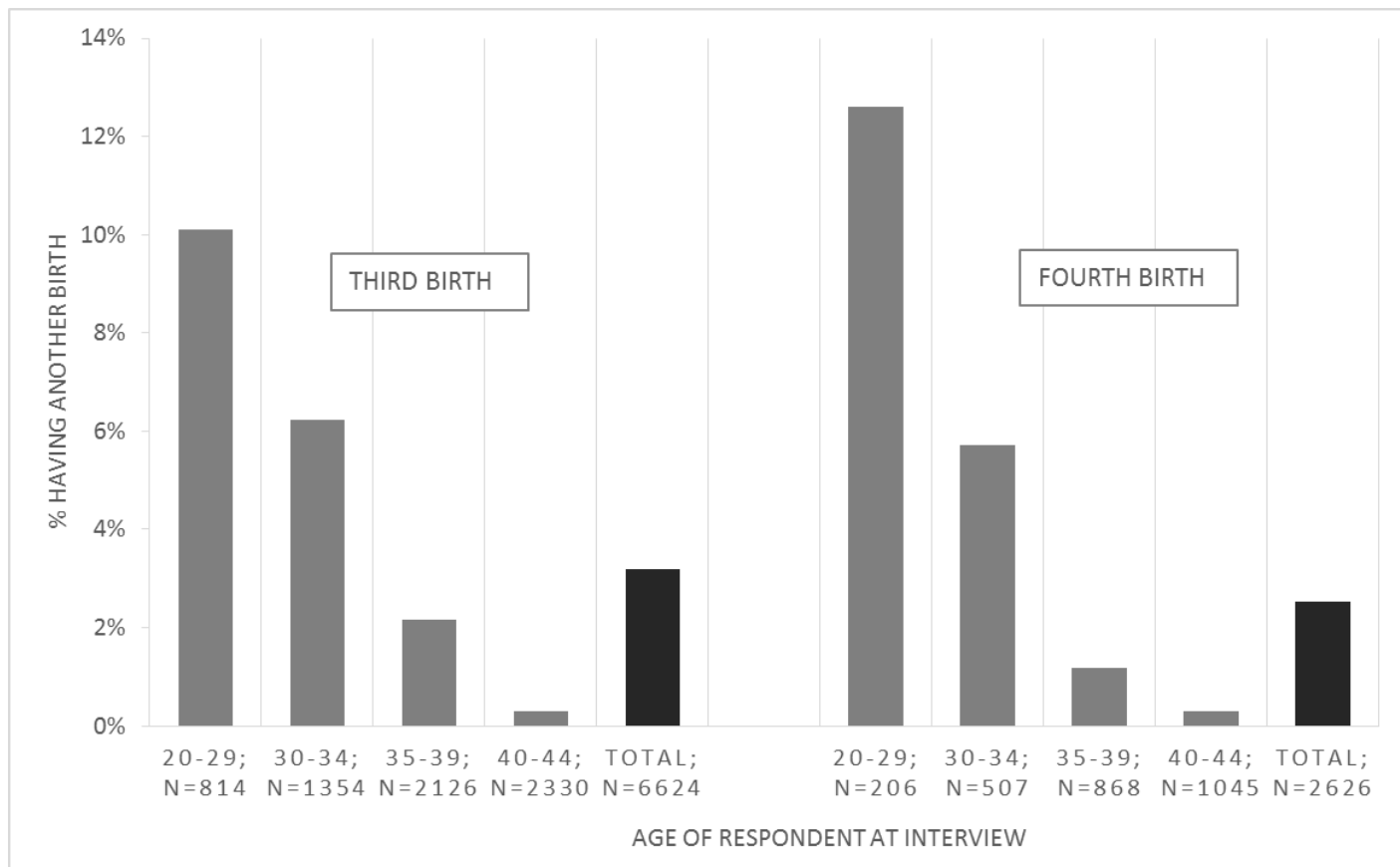
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**Figure 1a: Annual proportion of women having a third birth according to age at interview: women aged 20-44 with two children (third births) or three children (fourth births) at baseline.**



**Figure 1b: Annual proportion of women having a third birth according to age of youngest child: women aged 20-44 with two children (third births) or three children (fourth births) at baseline.**



**Table 1: Description of covariates and their distribution.**

	<b>Parity 2</b>	
	<b>n</b>	<b>%</b>
<b>Age group</b>		
20-29	814	11.7%
30-34	1,354	19.4%
35-39	2,126	31.9%
40-44	2,330	37.0%
<b>Age of youngest child</b>		
0-2	1,431	20.0%
3-5	1,825	28.1%
6+	3,368	51.9%
<b>Current marital status</b>		
Married	5,502	81.7%
Cohabiting	1,122	18.3%
<b>At least one shared child with current partner</b>		
No	848	13.2%
Yes	5,776	86.8%
<b>Country of birth</b>		
UK	4,667	77.0%
UK – 2 <sup>nd</sup> Generation	610	7.6%
Non-UK	1,347	15.5%
<b>Economic activity</b>		
Employed full-time	2,224	34.0%
Employed part-time/temp	2,443	38.4%
Inactive/in education	1,746	24.5%
Unemployed	211	3.2%
<b>Education of couple</b>		
Respondent high, partner high	3,110	46.7%
Respondent high, partner low	1,178	17.9%
Respondent low, partner high	981	14.8%
Respondent low, partner low	1,355	20.6%
<b>Equivalent household income (percentile)</b>		
Low	2,208	31.1%
Medium	2,208	33.8%
High	2,208	35.1%
<b>Percentage of income from benefits (percentile)</b>		
Low	2,264	34.3%
Medium	2,156	33.7%
High	2,204	32.0%
<b>TOTAL</b>	<b>6,624</b>	<b>100.0%</b>

**Table 2: Odds ratios for the annual probability of 3<sup>rd</sup> or 4<sup>th</sup> birth among women aged 20-44 with two children and a co-resident partner.**

	Odds ratio for transition to third birth		
	Model 1	Model 2	Model 3
<b>Age group – respondent’s age (ref 20-29)</b>			
30-34	0.70+	0.72	0.71
35-39	0.27***	0.28***	0.26***
40-44	0.05***	0.05***	0.05***
<b>Age of youngest child (ref 0-2)</b>			
3-5	0.79	0.80	0.81
6+	0.42***	0.42***	0.42***
<b>Current marital status (ref married)</b>			
Cohabiting	0.94	0.92	0.91
<b>At least one shared child with current partner (ref no)</b>			
Yes	0.70	0.70	0.70
<b>Country of birth (ref UK)</b>			
UK – 2 <sup>nd</sup> Generation	1.01	0.99	0.96
Non-UK	1.39+	1.37	1.30
<b>Economic activity (ref employed full-time)</b>			
Employed part-time/temp	1.05	1.02	1.13
Inactive/in education	0.81	0.75	0.75
Unemployed	1.38	1.27	1.25
<b>Education of couple (ref respondent high, partner high)</b>			
Respondent high, partner low	1.02	1.00	1.01
Respondent low, partner high	1.01	0.99	1.01
Respondent low, partner low	1.37	1.31	1.33
<b>Equivalised household income (percentile) (ref low)</b>			
Medium		0.67+	0.69+
High		0.86	0.81
<b>Percentage of income from benefits (percentile) (ref low)</b>			
Medium			0.67+
High			0.83
<b>N (person-years)</b>	6624	6624	6624

+ p<0.10, \* p<0.05, \*\* p<0.001, \*\*\* p<0.001

Source: Understanding Society Waves 1-5 (2009-2014)