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Love and Money: Intergenerational Mobility and Marital Matching on Parental Income

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Table of contents

Abstract

This paper investigates the interactions between intergenerational mobility and marital matching for young couples in Canada. We show how assortative mating contributes to intergenerational household income persistence. The strength of the association between sons-in-law's income and women's parental income means that the intergenerational link between household incomes is stronger than that found for daughters' own incomes alone. This is also the case when viewed from the other side, so that daughters' and their partners' earnings are related to partners' parental income. These results indicate that assortative matching magnifies individual-level intergenerational persistence.

In the second part of the paper we consider assortative mating by parental income. We find that daughter's parental income has an elasticity of almost 0.2 with respect to her partner's parental income. This association is of approximately the same magnitude as the intergenerational link between parents' and children's incomes. We investigate variations in the correlation between the parental incomes across several measured dimensions; cohabiting couples have lower correlations, as do those who form partnerships early, those who live in rural areas and most interestingly, those who later divorce. We interpret this last result as evidence that, on average, couples with parental incomes that are more similar enjoy a more stable match.

JEL classification: J12, J62

Keywords: Intergenerational mobility, Marriage, Family income

1. Introduction

Intergenerational mobility is the extent to which incomes are independent from one generation to the next. The converse of mobility is persistence; strong intergenerational persistence means that an individual's family origins will have a large influence on their later economic success. Many policy makers and commentators are concerned that strong intergenerational persistence indicates a lack of equality of opportunity.

Intergenerational persistence is usually measured as the coefficient in a regression of the adult child's income on their parental income, where the most common measures of income used are son's and father's earnings (see Solon, 1999 for a review). However, we may think that the underlying concept of interest is the extent to which economic welfare is transmitted from one generation to the next. If income is pooled within couples, then the most natural measure of intergenerational persistence is the strength of the relationship between total family incomes between the two generations; consequently the income of the child's partner (where there is one) will play a role.

Once the role of partnership formation for intergenerational persistence is acknowledged, it is clear that how individuals sort themselves into couples will matter for the extent of intergenerational persistence. The economics and sociology literature (discussed further below) indicates that individuals tend to match assortatively with those with similar characteristics to their own. If assortative mating is strong, individuals will marry those with similar levels of income to their parents; this will contribute to intergenerational income persistence.

As noted above, most of the estimates of intergenerational mobility in the literature have been focused on the relationship between sons' earnings and their fathers' earnings or parental income. In general, the intergenerational mobility of daughters has been less studied, due to the complexities introduced by women's labour market participation decisions. Chadwick and Solon (2002) are motivated by the difficulty in measuring women's intergenerational earnings mobility to consider the role played by husbands' earnings in the United States. They find evidence of strong assortative mating as the link between husband's earnings and parental income contributes to strong intergenerational total income persistence for daughters, despite the fact that daughters' own earnings make a minority of family income.

Another related paper is Blanden (2005a): here the relationship between intergenerational mobility and assortative mating is considered for both sons and daughters in two British cohorts, one born in 1958 and the other born in 1970. In both cases, a strong association is found between daughter's partner's earnings and her parental income. The key interest here is on how the relationships change between the cohorts, and an interesting finding is that an increase in intergenerational earnings persistence for sons is coupled with a strong rise in the relationship between son's partner's earnings and his parents' income. It appears, however, that much of this change is generated by the changing selection of women into work rather than through a change in the underlying matching mechanism.

In this paper we use unique data to explore intergenerational mobility and assortative mating in Canada. We measure the relationship between parental income and the earnings of sons, daughters and their partners, as well as the link between parental income and the combined income of children and their partners' in the next generation. Estimates of the intergenerational mobility relationship for sons indicate that Canada is particularly mobile by standard measures (Corak and Heisz, 1999 and Blanden, 2005b); it is therefore of interest to compare the results on assortative mating with those found for the U.S. and the U.K.

The data used here are the Intergenerational Income Data (IID) developed by Statistics Canada. The dataset was established in order to provide evidence on the relationship between the incomes and earnings of parents and children. The derivation of the data from tax records means that the number of observations is large enough so that a majority of the daughters' partners in 1998 are also included in the sample. This enables matching of women with income information from their own parents, their partner, and their partner's parents; a wealth of information not explored in any other dataset.

The nature of the data means that as well as providing the first results for Canada on the relationship between intergenerational mobility and assortative mating, we are also able to explore the link between the parental incomes of couples. This is the other side of the interrelationship between partnership formation and intergenerational mobility. Not only does partnership formation affect intergenerational mobility but parental characteristics also influence how couples match. We interpret the strength of the link between parental incomes as an additional measure of the extent of assortative mating.

At first glance, we may think that assortative mating by parental characteristics is not important in a modern society such as Canada where individuals generally choose their own marriage partner and marry for love. However, sociologist William Goode succinctly illustrates why this will not be the case, as individuals tend to associate with, and therefore marry, others from similar backgrounds.

> Since the marriage population in the U.S. (and increasingly as well as in other countries) is gradually segregated into pools with similar social class backgrounds, even a free dating pattern with some encouragement to fall in love does not threaten the stratification system. That is, people fall in love with the 'right' kind of people.[1]

The economic literature also has contributions to make concerning how individuals match into couples. A class of mathematical model called assignment models consider how agents sort themselves into pairs. In general, these tend to indicate that couples will be matched positively on most characteristics, including education and parental income. A fuller discussion of the marital matching literature will follow in Section 2.

1. Goode (1982) page 54.

To explore assortative mating explicitly, we begin by examining how individuals match on educational levels. As the IID is based on tax data and contains no information on educational attainment, the Canadian Survey of Labour and Income Dynamics (SLID) is used to explore this question. We find substantial matching on education. The extent of assortative mating by educational levels has been considered for Canada by Magee, Burbidge and Robb (2000). This paper uses 25 years worth of data from the Survey of Consumer Finances to analyse whether couples have become more or less strongly matched on education level over time. The authors find that, on average, the correlation between the education levels of husbands and wives is greater than 0.6. In addition, it appears to have fallen for young couples over the 1990s.

We then move on to estimate the association between the parental incomes of spouses. To our knowledge, the only other research to consider matching on family background is Ermisch and Francesconi (2002). In this paper, the authors regress Hope-Goldthorpe occupational scores of parents (a measure of economic and social status) on those of parents-in-law. They find that the elasticity between the occupational indices of parents and parents-in-laws is around 0.16 while the intergenerational elasticity between parents and children's occupational indices is around 0.2. There is evidence, therefore, that the association between parental status within couples is strong.

If the strength of the link between parents-in-laws' incomes is interpreted as a measure of assortative mating, then we can make a number of predictions about how the extent of assortative matching will vary with the characteristics of couples. We consider the degree to which these predictions are borne out in the data. As we shall see below, the information available about characteristics is limited in the administrative data used here, but nonetheless, the aspects that can be observed confirm expectations. Young people who form unions later appear to be more closely matched on parental income, as do those who are married rather than cohabiting and those brought up in urban compared with rural areas.

In the final section of empirical work, we consider whether the strength of matching on parental income is related to divorce and separation probabilities. We find that weaker matches between parental incomes are associated with early divorce. This analysis has a precedent in Weiss and Willis (1997) who use data on a cohort of American youth who graduated from high school in 1972 to investigate the determinants of divorce. Weiss and Willis find that individuals with similar education levels are less likely to divorce; this result is also true of common ethnicity and religion.

In the next section, we discuss the theoretical background and empirical approach used in this paper. Section 3 describes the construction of the data set in some detail and reviews the evidence on whether the samples used are representative of the full Canadian cohort. In Section 4, results on intergenerational mobility for individuals and couples in Canada are presented, while Section 5 concentrates on presenting the results for assortative mating. Section 6 concludes.

2. Theoretical background and estimation issues

Intergenerational mobility and assortative mating

We begin with a simple model of the relationship between assortative mating and intergenerational mobility. This model is taken from Ermisch, Francesconi and Siedler (forthcoming). Essentially, the model combines a very simple representation of marital matching with a simple model of intergenerational mobility to generate a number of predictions about the relationships between the education and income of children and their partners and their parents' incomes.

The starting point of this model is that marital sorting results in a positive correlation between the human capital of husbands and wives.

$$Corr(H_{wi}, H_{hi}) = \rho \qquad (1)$$

Where H_{wi} and H_{hi} indicate the human capital of wives and husbands respectively in couple *i*.

For both husbands and wives, income is positively related to human capital although the return to human capital may vary across genders as in equations (2) and (3) below.

$$\ln Y_{wi} = \tau_w + \gamma_w H_{wi} + v_{wi} \qquad (2)$$

$$\ln Y_{hi} = \tau_h + \gamma_h H_{hi} + v_{hi} \qquad (3)$$

In this formulation, the intergenerational relationship is driven by parents' optimising behaviour.[2] The parental utility function includes parental consumption and the child's household income, so that their child's partner's income is also included, π indicates the extent to which parents are altruistic and care about their child's income.[3]

$$U_{wi}^{parents} = (1-\pi)\ln C_{wi}^{parents} + \pi \ln E(Y_{wit} + Y_{hit}) \qquad (4)$$

2. This is not essential. Lam and Schoeni (1994) are much more ambiguous about the mechanism behind intergenerational links in their model and very similar conclusions are reached.

3. For illustration, the model is derived from the utility function of the wife's parents so that parental income and utility is subscripted w, however, it can be expressed symmetrically from the son's point of view.

Parents solve this model subject to their budget constraint, which enables them to spend their current income (no debt or bequests) on either own consumption or the education of their children. Each unit of human capital is produced with a marginal cost p_H .

Solving the model gives the following solution for the intergenerational parameter, β , the coefficient from a log-log regression of child's income on parents' income. Intergenerational persistence is positively related to parental altruism and the returns to education for women, but negatively related to the cost of investment.

$$\ln Y_{wi} = \alpha_1 + \beta_w \ln Y_{iw}^{parents} + \varepsilon_{wi} \text{ where } \beta_w = \pi\gamma_w / p_H \tag{5}$$

Similar factors are important for the relationship between husband's income and his wife's parental income. In this case, the male return to education features and the relationship is moderated by assortative mating and the differences in the distribution of education between husbands and wives, where σ^H is the standard deviation of human capital.

$$\ln Y_{hi} = \alpha_2 + \delta_w \ln Y_{iw}^{parents} + \varepsilon_{hi} \text{ where } \delta_w = \rho\pi\gamma_h / p_H \frac{\sigma^{H_h}}{\sigma^{H_w}} \tag{6}$$

Putting β and δ together enables us to understand more about the expected relationship between these two parameters. If the model is worked through in terms of son's parental income, the relationship is symmetric so that:

$$\frac{\delta_w}{\beta_w} = \rho\frac{\sigma^{H_h}}{\sigma^{H_w}}\frac{\gamma_h}{\gamma_w} \text{ and } \frac{\delta_h}{\beta_h} = \rho\frac{\sigma^{H_w}}{\sigma^{H_h}}\frac{\gamma_w}{\gamma_h} \tag{7}$$

There is a strong relationship between β_w (the intergenerational elasticity for daughters) and δ_w (the intergenerational elasticity between the daughter's partner's income and her parents' incomes). The similarity between these parameters is clearly closely related to the extent of assortative mating, with larger ρ meaning that β_w and δ_w are closer to each other.

As discussed in the introduction, one of the motivations behind this paper is to show the link between assortative mating and the intergenerational mobility of family income. Indeed, if all agents worked, then there would be a very close link between the intergenerational correlation of joint income, and the wife's own and partner's elasticities, β_w and δ_w .

$$\ln(Y_{hi} + Y_{wi}) = \alpha_3 + \mu_w \ln Y_{wi}^{parent} + \varepsilon_{wi} \tag{8}$$

Where $\mu = \frac{\partial(Y_{hi} + Y_{wi})}{\partial Y_{wi}^{parents}} \cdot \frac{Y_{wi}^{parents}}{(Y_{hi} + Y_{wi})}$ (9)

Equally,

$\beta_w = \frac{\partial Y_{wi}}{\partial Y_{wi}^{parents}} \cdot \frac{Y_{wi}^{parents}}{Y_{wi}}$ and $\delta_w = \frac{\partial Y_{hi}}{\partial Y_{wi}^{parents}} \cdot \frac{Y_{hi}^{parents}}{Y_{wi}}$ (10)

It is simple to show that

$$\frac{\partial(Y_{wi} + Y_{hi})}{\partial Y_{wi}^{parents}} \cdot \frac{Y_{wi}^{parents}}{(Y_{hi} + Y_{wi})} = \frac{\partial Y_{wi}}{\partial Y_{wi}^{parents}} \cdot \frac{Y_{wi}^{parents}}{Y_{wi}} \cdot \frac{Y_{wi}}{(Y_{hi} + Y_{wi})} + \frac{\partial Y_{hi}}{\partial Y_{wi}^{parents}} \cdot \frac{Y_{wi}^{parents}}{Y_{hi}} \cdot \frac{Y_{hi}}{(Y_{hi} + Y_{wi})} \quad (11)$$

which is equivalent to $\mu_w = (1-s)\beta_w + s\delta_w$, where s is the share of husband's income in $(Y_{iw} + Y_{ih})$. However, as it is not the case that β_w, δ_w and μ_w can all be estimated on the same samples of couples, we would not expect to see this precise relationship in the actual data. Nonetheless, it is suggestive and shows that as the share of income contributed by male partners is greater than that contributed by female partners; the extent of assortative mating would have a particularly strong influence on the household income persistence of daughters.

We shall estimate all of the individual intergenerational parameters β_w, δ_w, β_h, and δ_h, as well as the measures of mobility for the couple's joint earnings; μ_w and μ_h. These parameters allow the assessment of the degree of intergenerational mobility and assortative mating in Canada and the comparison of it with the results for the U.S. and U.K. from Chadwick and Solon (2002) and Blanden (2005a).

Search models and assortative mating

The second stage of this paper considers the association between parental incomes in couples, while the motivating model presented above relies on a positive association between the education levels of husbands and wives. Before proceeding, we shall therefore spend some time discussing the early literature on marital matching. We also discuss the additional predictions which emerge from a search model of the marriage market.

The early formal models of marital sorting were based on mathematical assignment models, where all individuals share the same ranking of potential marriage partners. In this case, a pure sorting equilibrium will result; the nth ranked woman and the nth ranked man will be matched, and so on throughout the distribution. Becker's model (1973, 1974) introduced a richer description of the benefits of marriage and modelled the incentives for behaviour within families.

For Becker, all potential marriages have an output Z; Z includes the earnings of both partners, the gains from the division of labour within marriage, as well as the utility from rearing children and from receiving affection within the family. In a utility maximizing framework, all individuals will be seeking the marriage with the highest possible Z. In a sorting model with no frictions, Pareto efficiency requires that men and women will sort into partnerships which maximize the total amount of Z. The mathematical properties of submodularity and supermodularity state that output is maximized if 'likes' are matched when male and female traits are complements in producing Z and 'unlikes' match when male and female traits are substitutes in producing Z.

It then follows that couples will be positively matched on characteristics such as education and ability that are complements in the production of high-quality children and negatively matched on wage rates (conditional on other characteristics) as these are substitutes in the production of market goods. Of course, the strong correlation between education, ability and wages, means that it would be very difficult to separately identify a negative relationship between the wage rates of couples. Moreover, Lam (1988) argues that in the presence of household public goods, wage rates should be positively correlated, even conditional on other characteristics. All these models, therefore, point towards a positive correlation in human capital between members of couples, as represented in equation (1).

These strong predictions of positive assortative mating on characteristics also encourage us to expect a positive correlation between the parental incomes of individuals in a couple. This is, in part, because of the positive match on characteristics like ability and education, which will be related to parental income through intergenerational mechanisms. In addition, partners may match on parental income if bequests are complements in household production.

A further mechanism will operate if there are direct preferences to match with someone from a similar background. Fernandez et al. (2004) find that intergenerational transmissions affect preferences about women working, so that men tend to marry women with the same work status as their mothers. It is possible that other preferences could be similarly transmitted leading to a direct connection between the parental incomes of partners. For all of these reasons, we would expect to find positive assortative mating on parental income.

In the original assignment models of the marriage market, searching for partners is costless, and the matches that form are stable; leaving no room for divorce or remarriage. In order to place the marriage market in a more realistic framework Burdett and Coles (1997, 1999) and Shimer and Smith (2000) formalize search and matching models of the marriage market to parallel the literature for the labour market. In these models, search frictions mean that individuals meet only infrequently. They must decide to either accept each other or wait for the next potential match to come along. Due to these frictions, individuals are willing to accept partners who are quite far from the perfect allocation, leading to weaker assortative mating than under a pure assignment model.

Consequently, assortative mating will be weaker for couples whose search is less intensive, perhaps because of higher search costs. In our empirical work we test a number of predictions that stem from this argument. We might expect that cohabiting partners, who may have weaker attachments, to have weaker assortative mating than those who are married. In addition, a longer search will lead to a better match so variation in matching by age at marriage is considered. The cost of search may vary by region, and in particular is likely to be higher in rural areas.

Mortensen (1988) explores the predictions of search models for divorce and remarriage. In this framework, there are two reasons for divorce. As noted above, search frictions mean that it is hard to find your 'perfect' partner, consequently matches may end if a better alternative is found, even if partners are fully informed about the quality of the match. Divorce is more likely if individuals are far from the optimal allocation. Alternatively, divorce may result from uncertainty when individuals only learn about the quality of the match after marriage. In this case, the probability of divorce will be positively related to the variance of the unanticipated part of match quality.

Becker, Landes and Michael (1977) and Weiss and Willis (1997) have used similar frameworks to empirically investigate the covariates of divorce. The studies find that couples who are similar on the grounds of religion, education and ethnicity are less likely to divorce. This confirms that couples who are less well-matched on characteristics (far from the optimal allocation) are more likely to split up. In addition, unexpected events such as infertility or deviations from expected wages are related to higher divorce probabilities. The authors interpret this as demonstrating the effect of unanticipated match quality, although we might imagine that the correlation may result from the additional stresses and strains which go hand-in-hand with negative shocks.

If the extent of parental income matching acts as a signal of match quality, this implies that we might expect that those who are well matched on parental income are less likely to divorce. This hypothesis is possible to test using the IID as partnership histories can be generated for individuals aged up to 30. This interpretation of assortative mating clearly rests on very strong assumptions about the way the marriage market operates. It is obvious that unobserved match quality is an extremely important determinant of who marries and divorces, and that this may work to counteract differences in parental background. If we believe that the interpretation of assortative mating as a measure of match quality is too strong, there are alternative interpretations which can be placed on the finding that coming from similar parental backgrounds reduces the probability of union dissolution. For example, it could be that coming from similar family backgrounds lowers the variance of unanticipated shocks as individuals are better informed initially, in line with Mortensen's (1988) second prediction. Of course, it could also be that there is less tension in marriages when couples are well-matched on parental income.

Estimation issues

The first results estimated are the elasticity between the earnings of individuals and their parents' income and between their partner's earnings and parental income, these are

found by estimating the coefficients β, δ, and μ from equations (5), (6) and (8), while controlling for the age and age-squared of both generations. As an alternative measure of the link between incomes across generations, we report the equivalent partial correlations for all the relationships considered here. The partial correlations and coefficients will differ when income distributions have difference dispersion across the generations, as shown below. This is particularly important in this case, as women's incomes tend to be more dispersed than men's, and not adjusting for this will paint a misleading picture of the relative extent of persistence for different dependent variables.

$$(\mathrm{Corr}_{\ln Y^{parent}|age,\ \ln Y^{child}|age}) = \beta\left(\frac{SD^{\ln Y^{parent}|age}}{SD^{\ln Y^{child}|age}}\right) \tag{12}$$

The measurement of these intergenerational parameters is far from straightforward, and there are a number of important estimation issues relevant to the work presented here. As discussed in Solon (1999) a number of these problems can lead to substantial downward biases in the literature, and as they have been successively resolved the U.S. consensus estimate of β has risen from Becker and Tomes' (1986) 0.25, to Solon's 1999 '0.4 or a bit higher', Solon (1999, p. 1784).

Measurement error in the explanatory variable is a perennial theme in this literature. Ideally, the measure of parental income used would approximate permanent income, imperfect measures are likely to lead to downward biased estimates of intergenerational persistence. The parental income measured used here is a five-year average of parents' total annual income, taken from the year when the son or daughter was 14 until the year they turned 18, which should reduce year-on-year fluctuations. The administrative nature of the data (it is generally derived directly from payslips) means that inaccuracy in the income reports themselves should be substantially lower than in surveys, which are the usual source for data used in measuring intergenerational mobility.

One of the most important problems with the early intergenerational mobility work discussed by Becker and Tomes is the reliance on limited samples of fathers and sons, which are by no means representative of the population as a whole. Solon (1992) shows that limiting the sample to a particular subgroup substantially reduces the estimated intergenerational parameter. Indeed, the shift to a representative sample is shown to make more difference to the estimate than time-averaging to reduce measurement error. The nature of the derivation of the IID means that representativeness is a concern, and one we discuss at length in the data section.

Recent work (Grawe, 2003 and Haider and Solon, 2004), has highlighted the importance for estimation of the age when children's incomes are measured. In general, measurement error in the dependent variable is regarded as non-problematic by economists but Haider and Solon demonstrate that if children's incomes are measured at an early age, measurement error will be systematically correlated with permanent income, meaning that the observed parameter will be downward biased. Unfortunately the most recent data

available is for 1998, which given the sample are born in 1967-1970 means they are rather young, especially compared to Haider and Solon's recommendation that earnings are measured for both fathers and sons at age 42. Updating the data into the 2000s could potentially have important impacts on the quality of the intergenerational estimates available from this data.

The annual nature of the IID data means we are able to experiment with different measures of the dependent variable. To get closer to the permanent income of children we use three-year averages of children's and partners' earnings from 1996 to 1998, where children must have positive earnings in all three years. Taking three-year averages means using earnings information for some individuals who are as young as 26. We therefore report both results using the latest data from 1998 and using a more permanent measure of earnings averaged between 1996 and 1998.

We present the full set of results for both genders, meaning that estimates of intergenerational mobility must necessarily be based on current incomes. We have already noted that researchers have generally avoided using the earnings of women as dependent variables in intergenerational regressions. In this paper, both daughters' and female partners' earnings will be used as dependent variables. This generates two difficulties. The first is that some women will not report income from work in a given year, and these women will be excluded from the sample. As the decision to work in a year is not exogenous to intergenerational factors; this will result in selection bias. The second is that women will have different working patterns over the year; so that annual earnings will be related to labour market participation. This will complicate interpretation of the estimates further. If women from poorer backgrounds are likely to work less, upward biased estimates of intergenerational persistence will result. There is no information on hours worked in this data to help disentangle these effects.

Returning to the first point, the classic analysis of the problems caused by selection bias is presented in Heckman (1979). There are two equations governing the processes, an earnings equation for all women (where, in this case, the explanatory variable would be parental income) and a latent variable relationship governing the decision to participate.

$$Y_i = \alpha + \beta X_i + u_i \tag{13}$$

$$Z_i = \xi_o + \xi_1 Q_i + \varepsilon_i \tag{14}$$

The woman participates only if Z_i>0. Therefore, the regression of the observed Y_i (daughter's earnings) on X_i (parental income) will be biased by an additional error term, similar to an omitted variable bias. If those with higher earnings are more likely to work, and X_i is positively correlated with earnings, β will be upward biased for women.

$$Y_i = \alpha + \beta X_i + E(u_i \mid \varepsilon_i > -\xi_0 - \xi_1 Q_i) \text{ for the employed sample.} \tag{15}$$

In Blanden (2005a), this selection problem is addressed using the Heckman selection correction procedure, where participation is predicted on the basis of characteristics, and β is estimated using a two-equation model. This approach is always difficult due the paucity of variables which are available to predict participation but do not affect earnings, but it is not possible to even attempt in this paper. The main limitation of the IID is that very little additional information on the characteristics of individuals is provided. The U.K. evidence suggests this may cause the intergenerational elasticities to be upward biased when women's earnings are the dependent variable.

3. Data and description of matching procedure

Data description

The data used here is from the Intergenerational Income Data (IID). The IID has been constructed from the T1 Family File held by Statistics Canada. The tax records provide information on all income tax returns in Canada between 1979 and 1998. Information on names, addresses and ages included in the data allowed Statistics Canada to match individuals born between 1963 and 1970 with their parents. This was possible provided both generations filed a tax return while the child was living at home in his or her late teens.[4]

As the data is based on administrative records, its size is considerable: Statistics Canada estimates that the data include around 70% of the relevant age group (Cook and Demnati, 2000). Another advantage of using data based on administrative records is that there is considerably less concern about measurement error and attrition; although the unique structure of this data does bring with it additional worries. The main concern is that the methods used to match the data may lead to some fundamental sample selection biases, a question we shall return to below.

A second disadvantage of the IID has already been mentioned; there are very few background characteristics available in the data. The information used here is restricted to what is given on the T1 tax return. Very basic information is available about the individual; age, sex, marital status, spousal Social Insurance Number (SIN), whether the individual filed in French or English and some more demographic information concerning the family in the year the child is matched with their parents. The remaining variables are taken directly from the earnings and income information required on the tax return. In this analysis, the main variables used are total employment income (earnings), and "total income" which is the sum of all the income required to be declared on the T1. "Total income" is earnings, self-employment income and asset income (including rents, interest, capital gains and dividends) plus transfers. Which transfers are included varies somewhat by year; for example, welfare payments are included in later years, so they are

4. The precise structure of the matching procedure is as follows: individuals are split into three cohorts, those aged 16-19 in 1982, those aged 16-19 in 1984 and those aged 16-19 in 1986. Individuals are matched with parents at any time in the five years surrounding 1982, 1984 and 1986 for each cohort respectively.

present in the measure of total income for adult children's income, but not for their parents.

Individual intergenerational sample

Before considering assortative mating we present estimates of intergenerational mobility by gender and partnership status. These samples include all sons and daughters born between 1967 and 1970. We extract two measures of income for the two generations: annual earnings and annual total income. Parental income is defined as the average of income when the child was 14 to 18. We exclude income/earnings reports of less than $1 for parents and $2[5] for the adult children.

Matching spouses

There are two features of the data which allow the matching of couples with both sets of parents. First, there is information on the SIN of spouses and cohabitees. Second, the near universality of the data means that many of the spouses/cohabitees of those included in the data will have intergenerational records. A limitation is that SINs are not obtained for all cohabitees. Married individuals are always asked to state their spouse's SIN on their tax return but individuals were not asked for their cohabitee's SIN until after 1992. Also, the definition of cohabitation is more restrictive than in surveys. Partners are defined as cohabitees if they are the natural or adoptive parent of the individual's children, if they have lived together continuously for a year or had lived together for a year in the past. This means that the matches found will miss the shortest cohabitations, a limitation which has advantages and disadvantages. The sample will not be representative of all couples, but results will not be distorted by the inclusion of very temporary cohabitations.

In order to construct the spousal sample, we focus on daughters born between 1967 and 1970. We are then able to search for the 'spouses' of these women from the entire IID sample of men born between 1963 and 1970, allowing for the fact that women often match with men somewhat older than themselves. We will comment more on this feature of the match when discussing how representative the data is.

1998 Spouse sample

The first sample used is couples who are married/cohabiting in 1998. The first stage is to match daughters who filed for tax in 1998 with their spouse's tax return for 1998. Fortunately, 98% of those who declare themselves to be married or cohabiting in 1998 include their spousal SIN on their tax return. As shown in Table 1, there are 511,636 women born between 1967 and 1970 in the dataset, 294,251 of whom file tax returns in 1998 and state that they are married or cohabiting, 179,341 couples are matched on the basis of their 1998 returns, 60% of all the women who report having partners in 1998.

5. There is some bunching at very low levels of income and earnings in all years. It is important to take account of these observations as they are almost certainly a consequence of mis-measurement. We have experimented with a variety of methods and the precise approach used appears to make little difference to the results obtained.

There may be a concern that the requirement that both members of a couple file in 1998 will introduce a selection bias. This would be a particular difficulty if women filed less than men because of weak labour market attachment. The evidence suggests this is less of a problem than we might imagine with 7% of males in the IID not filing in 1998 compared with 11% of females. In order not to miss individuals who do not file in 1998, I adopt a second stage to the match based on all years on data. This adds an additional 5,000 couples to the sample.

Divorce and separation sample

The first sample of couples created is of all surviving partnerships in 1998. However, this will not enable exploring the dissolution of partnerships. To do this we create a separate sample which matches couples in the year that the partnership is first observed in the IID, i.e., the first year that a spousal SIN is listed. This approach means that we are able to track all the partnerships listed by an individual, and match partners when they are included in the IID.[6] The obvious difficulty is that we can only match partners when the sample individuals are young, up to 31 at the oldest, so only early partnerships and dissolutions are included.

In the 1998 sample of couples, we match both those who are legally married and those who are cohabiting. As the marital status "cohabiting" was not included on the tax return until 1992 this is not possible for the full relationship history, so before 1992 cohabiting partners are necessarily excluded. In the empirical work, this is dealt with in two ways. One approach is to use both types of partnerships but exclude any first observed before 1992, the second is to consider only those partnerships which resulted in marriage, and take the starting point from the year the individual first reported herself as married.

Are the IID samples representative?

Owing to the sample selections inherent in the intergenerational matching procedure employed in the construction of the dataset, it is important to establish that the samples obtained from the IID are representative of the population of interest. Individuals are only included in the sample if at least one parent files for tax in a year that the child is living at home and also files for tax. Compulsory tax filing in Canada means that children will file even if they are only undertaking part-time or holiday work while in education, but concerns remain. Families who are excluded from the IID may come from the lower part of the income distribution (parents have no labour market attachment, children are unemployed or work in the underground economy) or the upper end (children are in education and do not work at all). As explained by Oreopoulos (2003) the likelihood of the second outcome is reduced by the ability of those in full-time education to obtain tax credits and deductions by filing.

Oreopoulos (2003) and Corak and Heisz (1999) both explore the representativeness of the IID. Oreopoulos finds that those who are missing from the IID tend to have somewhat

6. Further work is needed to understand how this sample may be affected by the sample selection issues inherent in the IID.

worse socio-economic characteristics than the average, while Corak and Heisz find that the IID is somewhat better at picking up observations at the very extremes of the distribution. In addition, Corak and Heisz estimate a sample selection correction model for those who are matched to fathers and find that the correction makes essentially no difference to their estimates of intergenerational mobility. Cook and Demnati (2000) design weights to deal with the sample selections, in Blanden (2005b), the author demonstrates that the application of these weights has very little impact on the intergenerational coefficients, depressing them by 0.005, from a base of between 0.16 and 0.20. Of course, all these comments apply only to the IID in general; matching spouses within the IID may result in an additional pattern of selection.

Tables 2 and 3 present our own investigation of these issues. First, we compare the key characteristics of all women in the IID born 1967–1970 who are single in 1998 with those with partners (according to the tax definition), and most importantly, those who can be matched with partners in the IID. In Table 3 we show the characteristics of women from the same cohort observed in the 1998 SLID sample, again by partnership status. This demonstrates the features of the IID sample in comparison with a nationally representative, if small, sample.

Our comparison of single women in the IID with those with partners (Table 2) indicates that women with partners are slightly less likely to file positive earnings, and have somewhat lower earnings and parental income (this is likely to be a result of a negative relationship between parental income and the age at which women form partnerships). More interesting is the comparison of all women with partners with women matched with their partners in the IID. There is evidence that daughters and their parents who are matched are slightly better off. Their own earnings are, on average, $400 higher than all women with partners, and their parents' incomes are $1000 greater. This indicates that a bias towards better off women is introduced by restricting the sample to those with partners in the IID.

Table 3 shows the characteristics of women born between 1967 and 1970 in the 1998 SLID. For both single women and those with partners, average annual earnings in 1992 dollars are about $1,500-$2,000 higher for the IID samples than they are in the comparable samples in the SLID.[7] However, this cannot be seen purely as confirmation that the IID misses some poorer individuals, as it may indicate that the administrative data is better at capturing the incomes of the better off.

The SLID data shows the consequence of the strict definition of a cohabiting couple in the tax data. The proportion of the sample that is recorded as having partners is larger in the SLID than in the IID sample (58% have partners in the IID compared to 65% in the

7. There is also some evidence of a different regional composition in the two samples. The IID has a lower proportion of the sample than the SLID in Ontario and British Columbia. A lower proportion in the IID in Montréal and Vancouver is found in Corak and Heisz and is attributed to the exclusion of recent immigrants from the IID.

SLID). Also, a slightly lower proportion of women in partnerships are married rather than cohabiting in the SLID compared with the IID.[8]

The SLID data can also be used to provide information on partner's age for the women in this cohort. This is important as the structure of the IID means it is only possible to match up those spouses born between 1963 and 1970. Of women in the SLID with partners in 1998, 72% are with men born between 1963 and 1970. Assuming that the age distribution of partners is the same in the IID as in the SLID (a strong assumption as the definition of cohabitation used to construct the samples is not comparable), and given that we know that the IID covers 70% of the cohort, we would expect to match just over 50% of women with their partners. In fact, 63% are matched. This suggests either that women in the IID are more likely to be cohabiting with or married to men born between 1963 and 1970 than those in the SLID, or that the coverage rate for these partners is higher than 70%. A higher than average coverage rate for the partners of women in the sample suggests that the probability of women and their partners being in the IID is positively correlated. This is not surprising as we think they are positively matched on the basis of characteristics which determine if they are included in the IID.[9]

4. Results on intergenerational mobility

Intergenerational mobility for sons and daughters in Canada

Table 4 shows the intergenerational mobility of sons and daughters in Canada by partnership status. This provides a background to the discussion of the contribution of assortative mating to intergenerational persistence. We show two sets of results for each gender, one based on a single year of earnings data, and another based on earnings data averaged through 1996 to 1998. In all cases, we report the regression coefficient β and the partial correlation.

All the results indicate comparatively high mobility in Canada, with estimates of β ranging from 0.15 to 0.21, and estimates of the partial correlation coming in at a somewhat lower range. The estimates are very much in line with those reported in Corak and Heisz (1999) using the same data. They encourage the conclusion that Canada is among the more mobile of developed countries. In particular, there is a marked difference in the extent of mobility in Canada compared with the United States. The possible explanations for this are obviously intriguing, but are not a focus of this paper.

Here we are interested in how estimates compare for sons and daughters and for those who are single compared with those in couples. The elasticities suggest that intergenerational persistence in Canada is approximately equal for sons and daughters;

8. At this stage in the research, it is not possible to construct a sample in which cohabitation is defined in a way more similar to the tax data. This will be attempted in subsequent analysis.

9. Cook and Demnati (2000) design weights to account for the differences between the IID data and unmatched tax records. These change the intergenerational results only very slightly by around 0.005, however, they would not account for any additional bias introduced through the matching procedure.

however, the correlations show that persistence for men is stronger than for women. Although the difference in the correlations by gender is small, the large sample size means that it is statistically significant for those in couples. Results based on the average dependent variable show that the intergenerational correlation for sons with partners is 0.185 (0.002) compared with 0.168 (0.002) for daughters with partners.

In all but one case, Table 4 reveals that intergenerational mobility is weaker for those in couples than for single individuals, for both men and women. For women, this may be because lower annual hours among married women are correlated with low parental income. Another explanation is that the difference between single and partnered individuals is associated with age within the cohort: single individuals are likely to be younger and this is associated with lower estimates of earnings persistence. This will be investigated in further work.

In this section, we have explored the relationship between the earnings of adult children and parental income. The tax data include a number of alternative income measures that could be used as both the dependent and explanatory variable. For reasons of space, we do not show the full range of results here. However, one particularly striking result is that in every case but one (daughters in couples), the elasticity and correlation between the child's total income and total parental income are stronger than those between the child's earnings and parental income. In the total income specifications, the intergenerational correlation approaches 0.2. This implies that parental endowments and investments affect welfare in ways additional to labour market performance.

Intergenerational mobility and assortative mating

The next step in the analysis is to examine how assortative mating and individual intergenerational mobility interact to drive intergenerational persistence between family incomes. In Table 5, we use matched sample of couples in 1998 to show results for individual intergenerational mobility, alongside the elasticity between partners' earnings and parents' income and between parental income and the total earnings of the couple.

The first two panels of Table 5 show results where the daughter's parental income is used as the explanatory variable. As the IID data also provides information on her partner's parental income, the lower panels report estimates for the same sample of couples where the husband's parental income is used as the explanatory variable.

Turning initially to the results for individual persistence, it is reassuring that these are very similar to those obtained for all sons and daughters in couples in Table 4. Even though the descriptive statistics in Table 2 showed that women who are matched with their partners tend to be slightly better off, this suggests that the rest of the results presented for matched couples should not be biased by selection into this sample.

The first clear result is that relationship between parental income and the partner's earnings is strong and significant in all cases; there is evidence of strong intergenerational assortative mating. More interesting, however, is the way in which the relationships

compare, both across different dependent variables, and between explanatory variables, i.e., whether we are looking from the point of view of the husband's or wife's parental income.

Taking the daughter's results first (top two panels), these vary somewhat depending on whether the measure of intergenerational mobility considered is the elasticity (regression coefficient) or the partial correlation. By the elasticity measure, the strongest relationship is between the daughter's parental income and her own earnings; this is followed by the couple's joint earnings and then her husband's earnings. For the partial correlation measure however, the relationship between joint earnings and parental income is stronger than for either the husband's or wife's earnings. The explanation for the difference between the elasticity and partial correlation measures is that the wider variance in earnings for daughters inflates the coefficient of β_w relative to the partial correlation in comparison to the results for sons.

That $\mu_w > \beta_w$ and $\mu_w > \delta_w$ may seem counterintuitive in the context of the earlier discussion around equation (11), where the coefficient on joint earnings was shown to be a weighted average of those for the two partners. However, it is important to remember that not everyone is working in this sample. In this case, those who have no earnings will be included in the joint earnings sample, but not in the individual sample. If parental income is lower for the couples where one partner has zero earnings, then we would naturally expect μ_w to be larger. This pattern is confirmed when the husband's parental income is the explanatory variable; then joint earnings is more closely related to individual earnings in all cases.

Another noticeable difference between the results based on daughter's parental income and her husband's parental income is the strength of the relationship between partners and parents. The partner-parent relationship seems slightly stronger when the daughter's parental income is the explanatory variable, both $\delta_w > \delta_h$ in an absolute sense and δ_w is much closer to β_w than δ_h is to β_h. The traditional view is that marriage is important for securing the social position of women, but less so for men[10] and while there is some evidence of that here, the differences are small, indicating that assortative mating also has an important role on the intergenerational transmission of income for men.

Comparisons can be drawn between these results and the similar ones shown in Blanden (2005a) for the U.K. In the 1958 cohort when son's parental incomes are linked to his later earnings, his partner's earnings and his household earnings, assortative mating does not appear to be important, δ_h is insignificant and $\mu_w < \beta_w$. However, results for the 1970 cohort are much more similar to those for Canada (albeit with stronger levels of persistence in all cases), with daughter-in-laws making an important contribution to intergenerational mobility. For daughters, assortative mating makes an important contribution to intergenerational mobility for both cohorts.

10. Note that in Glenn, Ross and Tully's (1974) study of social mobility, women's mobility is considered solely in terms of their husband's occupation.

The results in Chadwick and Solon (2002) for the U.S. are not entirely comparable with those shown here as estimates are not reported for models where the dependent variable is female earnings (either for daughters or sons' partners). Also, only the estimates coefficients are reported, not the partial correlations. The results do show that when daughter's parental income is the explanatory variable, δ_w is greater than μ_w, suggesting very strong assortative mating. In contrast when son's parental income is the explanatory variable, β_h is very slightly larger than μ_h. In summary, the picture from other countries confirms what is found for Canada; assortative mating is important for the intergenerational persistence for both genders, but somewhat more so for women.

5. Results on assortative mating

Assortative mating by education

In this section, we consider assortative mating directly. As the IID has little information about personal characteristics, we cannot compare our new approach to measuring matching based on parental income with a more standard model of matching based on education. We therefore begin by using the SLID to investigate matching on education level.

Table 6, shows the distribution of educational attainment for the sample drawn from the SLID. This sample is based on 1998 data and includes all couples where the 'wife' is aged 25 to 40 at the time of the survey. The tabulation of education levels reveals a strong concentration of the sample at the 'further education' level; almost half of both the male and female partners are in this category. It also demonstrates that women tend to be slightly more educated than men in this sample, being less likely to drop out of school, and somewhat more likely to obtain a degree.

Table 7 shows the relationship between the education levels of couples in this sample. The first number displayed in the upper panel is the proportion of couples with each combination of education levels. We show the proportion expected in each cell if education levels are independent within couples (i.e., simply by multiplying the probabilities of the two outcomes). This compares the actual distribution with the counterfactual distribution if there were random matching. The lower panel makes this comparison more explicit by showing the ratio of the two (in other words, how much more likely the combination is for couples than would be expected).

As we would expect, there is evidence of assortative mating by education levels. In all cases, the number on the leading diagonal of the lower panel is greater than one, indicating that individuals are more likely to marry those with similar education levels. Also, cells that are further away from the leading diagonal have smaller ratios. For example, combining the independent probabilities that men and women drop out means that 2% of couples would be formed of men and women who are both high-school drop outs. In fact, 5% of couples have this outcome, meaning it is more than two and-a-half times more likely than we would expect. Similarly, 3% of couples would be expected to

consist of a drop-out husband and a graduate wife, less than 1% of actual couples have this combination.

In order to aggregate the results shown in Table 7, we find the proportion of couples which share the same education level and compare this with the proportion expected to do so if education levels were independent. We find that 49% of individuals match with someone in the same education group, while 32% would be expected to do so. Taking the ratio of these gives 1.514, the aggregate measure of assortative mating on education. Expanding the definition of matching to also include those who match with a partner in the adjacent education group reduces this measure to 1.174. To put these results in context, they can be compared with similar figures derived in Blanden (2005a) for the U.K. In this data, comparable numbers are 1.4-1.6 for the same category and 1.3-1.4 for the same or adjacent categories. Matching on education in Canada therefore appears to be at approximately the same level as found in the U.K.

Assortative mating by earnings, income and family background

Table 8 reports elasticities and correlations between alternative measures of economic status for couples in the IID.[11] Three sets of results are presented, those for earnings and incomes for the couple in 1998, results for these measures averaged over 1996-1998, and results for five-year averages of parents' and parents-in-laws' earnings and income. The elasticities and partial correlations provide average measures of assortative mating, meaning that it is straightforward to compare the extent of assortative mating by different variables.

In Becker's analysis of assortative mating, he predicts that individuals will match negatively on wages and positively on unearned income, because wages are substitutes within the couple in the production of market goods. However, negative matching on wages will only be found if all of the correlation between wages and non-market productivities can be stripped out, as these will be complements in producing household goods. We would expect, therefore, to find an unconditional positive relationship between the wages of a couple. To complicate the issue further, information is only available on annual earnings not wages, meaning that joint household labour supply decisions will also drive the results.

The strongest correlation observed between partners' income or earnings is for the three-year average of earnings: the correlation in this measure between 'husbands' and 'wives' is 0.16. Assortative mating is stronger on own earnings than on own income. However, the correlations between the market and total income of partners are difficult to interpret as in some cases, joint assets may be assigned to one partner on the tax return in order to attain the optimal tax treatment. As expected, the use of averaged measures of incomes raises the observed correlation between couples.[12]

11. Descriptive statistics for this sample are shown in the appendix.
12. The sample sizes are smaller for the second panel as not all couples were couples in all years, but differing sample sizes do not explain the difference between the single year and averaged results.

The lower panel of the table reports the elasticities and partial correlations of daughter's parental income with respect to her partner's parental income. It is clear that the extent of matching on parental income is very similar to the extent of matching on earnings within a couple. The correlation between earnings with the couple is 0.16 while the correlation between parental incomes is 0.19. Results for parental income are stronger than they are for parents' earnings, illustrating that total resources may be a more important driver of matching on parental characteristics.

Ermisch and Francesconi (2002) explore the correlation in occupational indices of parents using data from the U.K., and find it to be around 0.16, slightly lower than the correlation in occupational status between parents and their children in the same sample. For Canada, the correlation between the incomes of parents-in-law is 0.19. This is stronger than the relationship between parental income and children's earnings but very similar to the correlation in total incomes between generations, which we find to be close to 0.2. To borrow terms from Ermisch and Francesconi, this implies that, in Canada, the degree of horizontal income persistence (between parents-in-law) is similar to the degree in vertical income persistence (between parents and children).

Variations in assortative mating

Table 9 shows how assortative mating on parental income varies with some of the characteristics observed in the IID. The motivation behind this is to test if assortative mating on parental income is low in cases where we would expect the search to be less intensive. We, therefore, test the relationship between assortative mating and the following variables: cohabitation, age at the start of the relationship and urban/rural residence. The table shows the coefficient on daughters' partners' parental income in a regression of her parent's income, and the coefficient on this variable when interacted with the characteristic of interest. We do not show partial correlations to account for different variances, as this adjustment has little effect for the parents-in-law results.

Cohabitation in Canada, as in many other developed countries, has risen rapidly over recent years. Wu (2000) provides an extremely thorough investigation of this change, the possible reasons behind it and its implications. Between 1981 and 1996, the number of families that included an unmarried couple rose from 1 in 17 to 1 in 7 (Wu, 2000, p.1). As shown in Table 2, in our sample, 15% of the matched couples are in cohabiting unions rather than marriages. How can these cohabiting unions be interpreted? Clearly, they do not have the legal standing of marriages and we may therefore expect they will, on average, be entered into more casually. In addition, cohabitations are frequently short: half end within three years. However, the majority of cohabitations that end within three years become marriages. This implies that cohabitations (particularly for the young) can be thought of as trial marriages. Wu (2000, p.3) puts this explicitly in terms of assortative matching.

> …cohabitation can be seen to perform the function of a 'trial marriage', weeding out the 'bad matches' from the assortative matching process and keeping the good ones.

With this hypothesis in mind, we may expect cohabiting unions to have lower associations between parents-in-laws incomes than marriages. The first result shown in Table 9 shows that this is, indeed, the case: while the average elasticity between parents-in-law's incomes is 0.183, the elasticity for those in cohabiting unions is 0.03 lower than for those who are married. This result has indirect support from studies examining matching for couples in the U.S. 1990 Census. Both Blackwell and Lichter (2000) and Jepsen and Jepsen (2002) find that correlations between the education and race of partners is lower among cohabiting couples.[13]

The second hypothesis tested, is whether the parents-in-law elasticity varies with the age when the partnership is formed. The educational homogamy literature (Mare, 1991, Chan and Haplin, 2003) has stressed the importance of the number of years between age at marriage and age left education in determining the closeness with which couples match on educational level. If marriages form soon after school leaving age they are more likely to be with former classmates, implying a negative relationship between the closeness of matching and age at marriage. Other studies have stressed that a later age at marriage means that individuals have searched more. Weiss and Willis (1997) show that a later age at first marriage is associated with a lower probability of divorce.

The second result presented in Table 9 shows the interaction between the age the relationship began and the parents-in-law elasticity. This interaction is small, but significant; for every year that individuals wait before beginning a partnership the association between their parental incomes is increased by 0.002, so if individuals wait five years, the elasticity is increased by 0.01. This provides some support for the Weiss and Willis finding that longer search leads to a 'better' match.

Another dimension on which theory has implications is population density. If assortative mating is interpreted as the outcome of a search process, we would imagine that young people in rural areas will find it more difficult to match. Once again this hypothesis finds backing in the IID data; the elasticity of daughter's parental income with respect to her partner's parental income is 0.018 lower for daughters who grew up in rural areas. This result is robust to controlling for parental province and for province interacted with partner's parental income.

We might also be interested in how mobility varies by region, particularly for Quebec, as marital patterns in this province differ from elsewhere. A feature of family formation in Quebec is extremely high rates of cohabitation and low rates of marriage in the province. Wu (2000, p. 47) shows that in 1996, almost 25% of unions in Quebec were cohabitations compared with around 10% in the rest of Canada. Results show that Quebec is fairly typical in the extent of assortative mating on parental income.

13. Of course, this result has other possible interpretations which lie outside a search framework. It could be that individuals from similar family backgrounds find more family support for their union and therefore, are encouraged to marry more often/earlier.

The results presented in Table 9 show that the extent of matching on parental income varies along some dimensions of daughters' and parents' characteristics. In terms of cohabitation, age at union and rural residence, these variations are consistent with a search framework of the marriage market where the extent of parental income matching provides a measure of assortative mating.

Divorce and assortative mating

If the extent of parental income matching provides a measure of match quality we should expect that those couples who are more closely matched have more stable relationships and are less prone to divorce and separation. This final empirical section explores this question using partnership histories for daughters. As described in the data section, this enables us to have information on all partners who are also included in the IID since 1992 (and their parental incomes) and all marital partners who are within the IID. By using information about spousal SIN and marital status, we are able to observe if the daughter is still with each partner by 1998.

Table 10 provides descriptive statistics on partnership formation and dissolution for both samples. The upper panel of Table 10 presents the descriptive statistics for all marriages from 1986 onwards. Few marriages begin in the early years of the data and this rises steadily through the data, peaking in 1993 when 12.4% of marriages begin. It is clear that early marriage is an important determinant of whether a partnership lasts; annualized divorce and separation rates are higher for those who marry early.

In the lower panel, descriptive statistics are considered for the post-1992 sample. These reveal some difficulties of definition. The divorce rates indicate that partnerships formed more recently are much more likely to end in divorce or separation. Of partnerships formed in 1992, 4% of couples are divorced by 1998 and 12% are separated, this is 0.07% and 2% per year respectively. Of those formed in 1997, 8% are divorced by 1998 and 21% separated. While we might anticipate that cohabitations are short and frequently end in separation, it seems unlikely that the result for divorces is correct, particularly as it is not found for the sample of marriages. Our proposed explanation for this is that people who are actually cohabiting are reporting themselves as divorced in reference to an earlier relationship.[14] This problem means that the results for cohabiting couples should be treated with more caution than those for the sample of marriages.

The relationship between divorce, separation and parental income matching is explored in Tables 11 and 12. Table 11 considers all marriages. In the first column of Table 11, we control only for the ages of the daughter, her partner and both sets of parents. The results show that those partnerships which end in divorce had a substantially lower correlation between the parental incomes of the woman and her partner, the coefficient on the interaction is -0.056 (0.008) and there is also a negative relationship between separation and matching on parental income, at -0.017 (0.007) in the last column. In the remaining columns, we attempt to control for explanatory factors which may be related to both

14. An alternative way to consider the end of cohabitations would be to look at changes in the reported spousal SIN.

partnership dissolution and the extent of assortative mating. Adding controls for parents' province and the year in which the couple began cohabiting does reduce the interaction effects but they remains strong at -0.049 (.008) for divorce and -0.17 (0.007) for separation.

Table 12 considers the sample that began their partnerships post-1991, as before, and in addition, whether the couple are legally married or not. Once again, there is a strong negative interaction effect between divorce and parental income, while there is no difference between the extent of matching for couples who separate compared with other couples. As noted above, these results should be treated with caution, but the fact that they are similar to the more solid data for marriage is reassuring.

Evidence for Canada strongly suggests that couples who are more closely matched on parental income are less likely to divorce or separate. It is possible that this result is driven by particularly high divorce probabilities for couples from very different backgrounds. To explore this, we divide parental incomes into quintile groups for both partners and compute divorce probabilities by parental income pairs. We do this by comparing the probability of divorce for a couple if divorce was independent of the interaction of parental income and compare this with the actual divorce probability for couples with that combination of parental income quintiles. As shown in Appendix Tables A2 and A3, we find no clear pattern that the relationship between parental income matching and divorce is non-linear.

6. Conclusion

This paper has attempted to evaluate the contribution of assortative mating to intergenerational correlations in household earnings. Analyses which take account of the role of partners' income are rare in the intergenerational income mobility literature and we have been able to add results from Canada to build upon the recent analysis for the U.K. in Blanden (2005a) and the U.S. in Chadwick and Solon (2002). As in these studies, assortative mating is shown to add an important dimension. The relationships between partners' earnings and parental incomes are strong, and result in higher partial correlations between the couple's earnings and parental income than those found between individual earnings and parental income. The Canadian data confirm the evidence found in the other studies that this effect is more important for the intergenerational persistence of women, but it is also important for men, an aspect often overlooked.

Due to the unique data available for Canada, we are able to explore the level of matching on parental income within couples. This provides evidence on a new dimension through which parents and children are linked. We show that matching on parental income is substantial; indeed the correlation between parents-in-laws' incomes is very similar to the correlation found in income for parents and their offspring in Canada.

This finding is interesting in itself; however, owing to the correlation of parental income with many other characteristics of the two partners, we interpret the match on parental

income as a general purpose measure of assortative mating. Consequently, we test a number of hypotheses which would emerge from a search-theoretic framework. In all cases, the results justify the approach; the extent of assortative mating rises with the length of search (age at which the partnership is formed) and the thickness of the market (urban vs rural area) and weaker assortative mating is associated with a higher probability of the match dissolving.

This preliminary exploration of parental matching has opened up a number of avenues for future research. It is striking that evidence is found to confirm the intuitive predictions of a search interpretation of the marriage market. Ideally, we would want to be able to test if these variations in matching are found for other characteristics, such as education. At the moment, matching on parental income is an omnibus measure of matching, but it would also be interesting to try and understand the importance of matching on parental income conditional on other characteristics. Unfortunately, the limited nature of the data available prevents these extensions, and an interesting future route would be to consider these issues using Nordic register data that have many more variables matched in.[15]

15. Røed and Raaum (2003) provide an interesting discussion of the development and use of these data in Norway.

Table 1 Number of daughters matched

	Number	Proportion of the cohort
Women born 1967-1970	511,636	-
Women who file in 1998	483,908	0.945
Women cohabiting/married in 1998	294,251	0.575
Women matched with men from the IID, born 1963-1970, both file in 1998	179,341	0.351 (0.609 of those with partners in 1998)
Women matched with men from the IID, wives only file in 1998	2,452	0.005 (0.008 of those with partners in 1998)
Women matched with men from the IID, husbands only file in 1998	2,596	0.005
Women matched with men from the IID, born 1963-1970	184,389	0.360

Source: Intergenerational Income Data (IID).

Table 2 Characteristics of the matched sample compared with all women in the IID

	All single women	All women with partners	Women matched with partners
Married	-	0.815	0.843
>$2 Earnings filed in 1998	0.861	0.821	0.819
1998 Earnings	23,510 (15,413)	22,111 (40,063)	22,545 (16,506)
>$2 Market income filed in 1998	0.897	0.885	0.883
1998 Market income	23,836 (17,252)	21,994 (49,290)	22,444 (37,010)
>$2 Total income filed in 1998	0.986	0.916	0.909
1998 Total Income	23,665 (16,393)	23,073 (46,808)	23,612 (33,169)
Average of parental earnings 14-18 years	51,049 (41,153)	49,752 (37,643)	50,543 (37,942)
Average of parental market income 14-18 years	56,711 (55,087)	54,693 (62,801)	55,791 (53,815)
Average of parental total income 14-18 years	56,095 (53,400)	54,912 (57,349)	56,183 (50,571)
Parental province			
Atlantic provinces	10.39	10.57	10.80
Quebec	21.76	25.65	24.53
Ontario	40.31	37.23	38.88
Prairies	16.05	17.11	17.07
British Columbia	11.24	9.24	8.57
Territories	0.24	0.21	0.15
Sample	171,590	269,940	171,588

Notes:

1. Income and earnings are all expressed in 1992 Canadian dollars, standard deviations are in parentheses.
2. Samples are restricted to those daughters for whom parents report incomes of >$1 in all years used for the average. However, samples used in the calculation of each mean differ slightly, as only observations with valid measures for that variable are used (i.e. ,>$1 for parents and >$2 for daughters).
3. The high standard deviation for 1998 earnings among all women with partners is inflated by some large observations above the 90th percentile for this group. If observations above the 99th percentile are eliminated, the means and standard deviations for all women all the IID become 22,854 (13,743) and 21,361 (13,684) for earnings, 23,008 (14,170) and 20,982 (14,236) for market income and 22,928 (13,706) and 22,120 (14,107) for total income.
4. Earnings are total employment income.
5. Market income is employment income plus self-employment income plus asset income.
6. Total income is the sum of all the income sources listed on the tax return; the components included vary somewhat by year.

Source: Author's calculations based on Intergenerational Income Data (IID).

Table 3 Characteristics of women in the SLID in 1998

	Women born 1967-1970	
	Single	**With a partner**
Proportion of sample	0.353	0.647
Proportion married	…*	0.786
Worked during the year	0.854	0.821
Earnings	21,958 (15,414)	19,808 (14,240)
Market income	21,650 (15,635)	19,724 (14,272)
Atlantic provinces	0.079	0.074
Quebec	0.189	0.252
Ontario	0.449	0.363
Prairies	0.133	0.173
British Columbia	0.149	0.138
Partners aged 28-31	…*	0.639
Partners aged 28-36	…*	0.717
Sample size	637	1,524

Notes:

1. All figures are weighted to population means using the 1998 cross-sectional weight.
2. Once again earnings and income are in 1992 Canadian dollars.
3. Figures in parentheses are standard deviations.

* … = not applicable

Source: Survey of Labour and Income Dynamics (SLID).

Table 4 Intergenerational mobility in Canada by gender and partnership status

	1998 Earnings as dependent variable		
Sample	Coefficient	Partial correlation	Sample
Single sons	0.188 (0.003)	0.137 (0.002)	203,688
Sons in couples	0.193 (0.003)	0.155 (0.002)	229,406
	1996-1998 Averaged earnings as dependent variable		
	Coefficient	Partial correlation	Sample
Single sons	0.151 (0.002)	0.155 (0.002)	166,846
Sons in couples	0.160 (0.002)	0.185 (0.002)	208,999
	1998 Earnings as dependent variable		
	Coefficient	Partial correlation	Sample
Single daughters	0.188 (0.004)	0.130 (0.003)	147,589
Daughters in couples	0.212 (0.004)	0.127 (0.002)	221,593
	1996-1998 Averaged earnings as dependent variable		
	Coefficient	Partial Correlation	Sample
Single daughters	0.149 (0.003)	0.149 (0.003)	126,488
Daughters in couples	0.178 (0.002)	0.168 (0.002)	196,875

Notes:

1. Explanatory variable is parents' combined total income averaged over the years when the son or daughter was aged 14 to 18.
2. Only parental reports over $1 and daughter/son-in-law reports over $2 are included in the estimations.
3. Controls are included for age for both generations.
4. Standard errors are shown in parenthesis.

Source: Survey of Labour and Income Dynamics (SLID).

Table 5 Intergenerational mobility and assortative mating

Dependent variable		Women's parents' income as the explanatory variable Elasticity	Partial correlation	Sample
Women's 1998 earnings	β_w	0.207 (0.005)	0.124 (0.003)	131,337
Men's 1998 earnings	δ_w	0.148 (0.003)	0.120 (0.003)	143,899
Couple's 1998 earnings	μ_w	0.182 (0.003)	0.158 (0.003)	155,444
		Women's parents' income as the explanatory variable		
		Elasticity	Partial correlation	Sample
Women's 1996-1998 earnings	β_w	0.174 (0.003)	0.163 (0.003)	98,983
Men's 1996-1998 earnings	δ_w	0.130 (0.003)	0.150 (0.003)	112,901
Couple's 1996-1998 earnings	μ_w	0.166 (0.002)	0.190 (0.003)	125,735
		Men's parents' income as the explanatory variable		
		Elasticity	Partial correlation	Sample
Men's 1998 earnings	β_h	0.165 (0.003)	0.140 (0.003)	143,899
Women's 1998 earnings	δ_h	0.147 (0.004)	0.093 (0.003)	131,337
Couple's 1998 earnings	μ_h	0.177 (0.003)	0.163 (0.003)	155,444
		Men's parents' income as the explanatory variable		
		Elasticity	Partial correlation	Sample
Men's 1996-1998 earnings	β_h	0.152 (0.002)	0.185 (0.003)	112,901
Women's 1996-1998 earnings	δ_h	0.128 (0.003)	0.126 (0.003)	98,983
Couple's 1996-1998 earnings	μ_h	0.162 (0.002)	0.195 (0.003)	125,735

Notes:

1. Explanatory variable is parents' combined total income averaged over the years when the son or daughter was aged 14 to 18.
2. Only parental reports over $1 and daughter/son-in-law reports over $2 are included in the estimations.
3. Controls are included for age for both generations.
4. Standard errors are shown in parenthesis.

Source: Intergenerational Income Data.

Table 6 The education levels of couples in the SLID

	Men	Women
High school drop out	0.158	0.112
High school	0.164	0.190
Further education	0.480	0.484
Completed degree	0.199	0.212
Sample	6,339	6,339

Notes:

1. The sample used here is of all couples (both married and cohabiting) where the wife is aged 25-40 at the time of the survey in 1998.
2. Cross-sectional weights are used to derive all proportions

Source: Survey of Labour and Income Dynamics (SLID).

Table 7 Evidence for assortative mating on education from the SLID

	Woman's education			
Man's education	Drop out	High school	Further education	Completed degree
Drop out	0.049 (0.018)	0.042 (0.030)	0.060 (0.077)	0.007 (0.033)
High school	0.019 (0.018)	0.051 (0.031)	0.085 (0.079)	0.009 (0.035)
Further education	0.041 (0.054)	0.083 (0.091)	0.274 (0.232)	0.083 (0.102)
Completed degree	0.003 (0.022)	0.014 (0.038)	0.067 (0.096)	0.115 (0.042)
	Ratio of actual to predicted proportions			
	Woman's education			
Man's education	Drop out	High school	Further education	Completed degree
Drop out	2.722	1.366	0.789	0.212
High school	1.055	1.645	1.076	0.257
Further education	0.759	0.912	1.181	0.814
Completed degree	0.136	0.368	0.698	2.738

Notes:

1. The numbers in parentheses are the proportion of couples we would expect to observe in that cell if matching was random (predicted proportion).
2. As for Table 6.
3. Sample size is 6339 couples.

Source: Survey of Labour and Income Dynamics (SLID).

Table 8 Measures of assortative mating on earnings and income

	Regression of woman's 1998 income on partner's 1998 income		
	Beta	Partial correlation	Sample size
Earnings	0.125 (0.004)	0.093 (0.003)	136,839
Market income	0.130 (0.004)	0.082 (0.003)	157,451
Total income	0.116 (0.004)	0.070 (0.002)	163,303
	Regression of woman's 1996-1998 income on partner's 1996-1998 income		
	Beta	Partial Correlation	Sample Size
Earnings	0.196 (0.004)	0.160 (0.003)	98,524
Market income	0.193 (0.004)	0.138 (0.003)	116,879
Total income	0.180 (0.004)	0.122 (0.003)	124,405
	Regression of 5-year average of woman's parental income on partner's parental income		
	Beta	Partial correlation	Sample size
Earnings	0.111 (0.002)	0.153 (0.003)	125,981
Market income	0.166 (0.002)	0.187 (0.003)	149,730
Total income	0.182 (0.002)	0.192 (0.002)	160,058

Notes:

1. The sample in the second panel is smaller than the sample in the first panel because not all of those who are together in 1998 were together in 1996 and 1997.
2. The income/earnings measure for all three years must be >2 for both spouses. However, these more stringent sample restrictions are not responsible for the higher correlations for the average measures.

Source: Intergenerational Income Data.

Table 9 Variations in assortative mating by characteristics

Regressions on daughter's parental income on her husband's parental income	
Variation by marital status	
Husband's parents' income	0.183 (0.003)
Husband's parents' income × Cohabiting	-0.028 (0.005)
Variation by age relationship started	
Husband's parents' income	0.123 (0.019)
Husband's parents' income × Age relationship started	0.002 (0.0008)
Variation by growing up in a rural area	
Husband's parents' income	0.142 (0.003)
Husband's parents' income × Rural	-0.018 (0.004)

Notes:

1. All regressions control for age effects and main effects alongside the interactions specified.
2. Controls for province are added to the regression by urban/rural. The results do not change if controls for the interaction of province and husband's parental income are also added (the rural interaction is reduced slightly to -0.017 (0.005)).

Source: Intergenerational Income Data.

Table 10 Descriptive statistics for divorce and separation

All marriages started 1986 or later			
Year first observed	Proportion of sample	Proportion divorced by 1998	Proportion separated by 1998
1986	0.007	0.293	0.245
1987	0.020	0.240	0.218
1988	0.043	0.207	0.191
1989	0.073	0.169	0.183
1990	0.102	0.134	0.162
1991	0.110	0.101	0.140
1992	0.118	0.067	0.113
1993	0.124	0.048	0.091
1994	0.119	0.030	0.083
1995	0.113	0.014	0.077
1996	0.095	0.006	0.066
1997	0.078	0.001	0.067
All partnerships started in 1991 or later			
Year first observed	Proportion of sample	Proportion divorced by 1998	Proportion separated by 1998
1992	0.184	0.039	0.121
1993	0.198	0.038	0.119
1994	0.173	0.039	0.138
1995	0.166	0.044	0.157
1996	0.151	0.057	0.183
1997	0.127	0.079	0.206

Notes:

1. Sample sizes are 130,919 for the first panel and 117,532 for the second panel.
2. The sample used here in the upper panel is of all marriages formed in 1986 or later. There are, therefore, some individuals with multiple partnerships; 96% of observations are for women with only one partnership included in the sample.
3. The sample used in the lower panel consists of all partnerships formed in 1991 or later. There are, therefore, some individuals with multiple partnerships; 95% of observations are for women with only one partnership included in the sample.

Source: Intergenerational Income Data.

Table 11 Assortative mating and divorce for those ever married

	Dependent variable: Parental income		
Husband's parents' income	0.182 (0.003)	0.152 (0.003)	0.144 (0.003)
Husband's parents' income × divorced by 1998	-0.056 (0.008)	-0.049 (0.008)	-0.049 (0.008)
Husband's parents' income × separated by 1998	-0.025 (0.007)	-0.019 (0.007)	-0.017 (0.007)
Main effects of divorce and sparation	Yes	Yes	Yes
All age controls	Yes	Yes	Yes
Parents' province dummies	No	Yes	Yes
Year married dummies	No	No	Yes
Sample size	130,919	130,919	130,919

Note:

Controlling for daughter's province rather than parents province gives results of 0.145 (0.003), -0.047 (0.008), -0.015 (0.0065).

Source: Intergenerational Income Data.

Table 12 Assortative mating, divorce and separation, post-1991 partnerships

	Dependent variable: Parental income		
Husband's parents' income	0.174 (0.003)	0.148 (0.003)	0.145 (0.003)
Husband's parents' income × divorced by 1998	-0.064 (0.010)	-0.058 (0.010)	-0.056 (0.010)
Husband's parents' income × separated by 1998	-0.007 (0.006)	-0.002 (0.006)	-0.005 (0.006)
Main effects of divorce and separation	Yes	Yes	Yes
All age controls	Yes	Yes	Yes
Ever married dummy	Yes	Yes	Yes
Parents' province dummies	No	Yes	Yes
Year started cohabiting dummies	No	No	Yes
Sample size	117,532	117,532	117,532

Note:

Controlling for daughter's province rather than parents' province gives results of 0.145 (0.003) for husband's parents incomes, -0.054 (0.010) for the husband's parents x divorce interaction and 0.001 (0.006) for the husband's parents x separation interaction.

Source: Intergenerational Income Data.

Appendix Further descriptive statistics

Table A.1. Descriptive statistics for the couples sample

	Women matched with partners	Partners
>$2 Earnings filed in 1998	0.821	0.900
1998 Earnings	22,571 (16,479)	39,430 (35,900)
>$2 Market income filed in 1998	0.884	0.968
1998 Market income	22,470 (38,978)	39,860 (41,802)
>$2 Total income filed in 1998	0.910	0.978
1998 Total income	23,645 (33,940)	40,641 (40,290)
Average of parental earnings 14-18 years	50,612 (37,988)	49,811 (39,129)
Average of parental market income 14-18 years	55,880 (54,231)	55,039 (54,423)
Average of parental total income 14-18 years	56,281 (50,857)	56,389 (51,959)
Sample	160,058	160,058

Notes:

1. Income and earnings are all expressed in 1992 Canadian dollars, standard deviations are in parentheses.
2. The sample is restricted to all couples where the daughter and her partner's parental incomes are >$1 in all years.

Source: Intergenerational Income Data.

Table A.2 Divorce rates by parents' income quintiles

Daughter's parental quintile	Sample divorce rate	Partner's parental quintile	Sample divorce rate
Bottom	0.046	Bottom	0.048
2nd	0.049	2nd	0.050
3rd	0.049	3rd	0.049
4th	0.052	4th	0.049
Top	0.044	Top	0.045

Source: Intergenerational Income Data.

Table A.3 Threshold effects and divorce

Divorce rates by parental quintiles					
Husband's parent's quintile	Wife's parents' quintile				
	Bottom	2nd	3rd	4th	Top
Bottom	0.043	0.046	0.043	0.054	0.060
2nd	0.044	0.051	0.050	0.059	0.044
3rd	0.052	0.047	0.049	0.046	0.051
4th	0.045	0.052	0.054	0.053	0.041
Top	0.052	0.048	0.047	0.047	0.037
Ratio of actual to predicted divorce rates					
Husband's parent's quintile	Wife's parents' quintile				
	Bottom	2nd	3rd	4th	Top
Bottom	0.904	0.962	0.907	1.164	1.216
2nd	0.906	1.037	1.000	1.161	0.902
3rd	1.076	0.981	0.981	0.910	1.117
4th	0.942	1.057	1.074	1.036	0.902
Top	1.160	1.020	1.019	0.981	0.816

Notes:

Cells show the ratio of the actual proportion of couples in the cell getting divorced compared with the prediction of this proportion if there were no interaction effect between the cells. i.e., if 6% of couples with the wife's parents in the bottom quintile obtain a divorce and 4% of couples with the husband's parents in the top quintile obtain a divorce, the prediction for a couple with this combination would be the average of those two, or 5%.

A ratio of >1 therefore means there is a higher probability of divorce than we would expect.

Source: Intergenerational Income Data.

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