# "For richer, for poorer": assortative mating and savings preferences

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## Abstract

Do couples share the same values? The social sciences have mainly concentrated on comparing the socioeconomic characteristics of spouses, but rarely their attitudes to risk and time. In this paper, we use conventional measurements and an original method of scoring. We find that spouses are very similar in their savings preferences, even when we control for the individual characteristics. Our results suggest that most of this relationship comes from marital sorting. These conclusions are decisive in explaining the extent of cooperation within households and also wealth inequalities between households since homogamy causes a divide in the population.

JEL codes: J12, D31, D14

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# Introduction

> "... because I think that love,
> real love, has got nothing to do
> with statistics..."
>
> *Meetic advert* [translated from the French]

Do risk-lovers tend to choose partners who share their love of risk? And what about the other dimensions of individual preference? In other words, do couples share the same values? This is the question, as yet somewhat neglected, that we address in this paper.

The literature in the social sciences has underlined the existence of a strong similarity between spouses in terms of education, income and inherited wealth. But few studies have investigated the question of similarity in more subjective characteristics such as individual preferences, and in particular those involving saving and wealth management decisions (risk aversion, preference for the present, altruism, etc.). The seminal theoretical works predict heterogamy in attitudes to risk; in other words, risk-lovers should choose risk-averse partners. In addition to better identifying the choice of spouse and empirically testing the validity of these models, this question plays a role in other important debates, such as how to explain wealth inequalities. On this subject, two well-established conclusions have been highlighted by the economic literature.

Firstly, homogamy increases wealth inequalities between households and also affects intergenerational mobility. The similarity between spouses in terms of education, income or inherited wealth leads to a concentration of wealth among households. Along these lines, Atkinson (1975) showed that perfect homogamy would be equivalent to every brother, in each family, marrying his sister, his female "clone".

Secondly, preferences for saving explain a significant part of the differences in household wealth. Wealth accumulation can be driven by several different motives, notably precautionary, life-cycle and bequest considerations. *Ceteris paribus*, the individuals who are most sensitive to these motives will tend to save and therefore accumulate more wealth. However, some papers defend the reverse causality and show that wealth can

affect preferences.

The first aim of this article is to reconcile these two strands of literature by examining the relationship between spouses in terms of risk and time preferences. But this work also provides a useful contribution to the analysis of the formation of preferences and their transmission between generations. The literature on this subject is scarce and very recent, and many questions remain unexplored. By studying homogamy in terms of attitudes to risk and time, we are focusing on the stage which precedes the formation and transmission of preferences, but which may nevertheless be helpful for understanding them.

One of the difficulties of our analysis lies in the measurement of individual preferences. Conventional measurements like lotteries or self-evaluation scales have several drawbacks. The criticisms that are levelled at them fall into two categories: lotteries are accused of being too abstract or artificial, while scales can be judged irrelevant and imprecise. In this paper, we use a new indicator that overcomes these defects, proposed by Arrondel and Masson (2013) and based on a method of scoring. In particular, this new measurement of preferences turns out to perform better than the conventional measurements. To implement this new method, we draw on an original survey (PATER). In addition to the sociodemographic and economic description of each household, this survey contains a large number of questions aiming to measure savers' preferences on the basis of the different methodologies (lottery, scale and score). Using these questions, we have constructed synthetic and ordinal scores for each individual.

We observe a similarity between partners in their attitude to risk, whatever the indicators used. The correlation between individuals' preferences is positive and significant, ranging from 0.2 or 0.3 for lotteries and scales to 0.5 for the scoring method. Homogamy is also present in terms of life-cycle motives, with similar results for the correlations. The similarity of spouses' attitudes to risk and time only slightly grows with the age of spouses. Young (and so recent) couples are barely less similar than old couples. This effect of time is almost absent for risk attitudes but more pronounced for time attitudes like patience and, to a lesser extent, foresight. Our results suggest that most of the positive correlation between spousal preferences comes from marital sorting. Econometric

analysis shows that this homogamy in psychological profiles remains valid even when we take the other socioeconomic or demographic characteristics of spouses into account. The positive relationship for risk attitudes is at odds with the theoretical predictions of the seminal models of matching by preferences. Limited commitment between spouses and intergenerational motives help to rationalize these results.

These results also shed light on the mechanism by which preferences are transmitted from parents to children, by showing that both parents play a role in the transmission of values. Moreover, this article points up the relationship between marital sorting and wealth accumulation. Preferences with regard to time and risk may have a direct effect on wealth accumulation (people who are more precautionary, farsighted and altruistic accumulate more wealth) but the reverse causality may also exist. The mutual attraction between people with similar savings profiles can reinforce the role of preferences.

Section 1 relates our work to the existing literature. We then address the theoretical framework before introducing the data and the different ways of measuring these preferences. In section 4, we present the results, starting with the measurements of homogamy, before concluding with a discussion about the interpretation and the implications of our findings.

# 1 The homogamy of preferences: a question neglected by the socioeconomic literature

The origins of the economic literature on the question of the choice of spouse lie in the works of Becker (1973, 1974 and 1981). Most existing empirical works provide evidence of positive assortative mating for traits such as income (Becker 1981, Lam 1988, Zimmer 1996, Nakosteen *et al.* 2004, Schwartz 2010 among others), education (Pencavel 1998, Schwartz and Mare 2005, Chiappori *et al.* 2011) and to a lesser extent wealth (Charles *et al.* 2013, Frémeaux 2014). Many sociological works have also examined this question (Girard 1964, Bozon 1991, Kalmijn 1991, Unuk, Ganzeboom and Robert 1996).

Several papers tackled the issue of the shared values in couples. Specifically, Weiner

(1978) considers the political preferences while Bisin et al. (2004) focus on the religion. Biological and medical papers look at personality traits including Feng and Baker (1994) about general attitudes and well-being, McLeod (1995) about psychological disorders, Krueger et al. (1998) about antisocial behavior, Speakman et al. (2007) and Reynolds et al. (2006) about health related behaviors (obesity and tobacco/alcohol consumption). Other authors have studied the psychological characteristics of the spouses. For example, Mascie-Taylor and Vanderberg (1988) and Smith *et al.* (2010) find positive correlations for cognitive abilities. Again, most papers provide evidence of positive assortative mating. As a consequence, the influence of partners or selection effects cannot be ruled out in some papers.

Research about homogamy in terms of savings preferences is scarcer. Several competing models study matching based on risk preferences (see section 2). Only Dohmen *et al.* (2012) and Kimball *et al.* (2009) have empirically tested the presence of selective matching on these variables of preference. In the first article, using self-evaluation scales, the authors obtain a correlation between spouses of 0.4 for risk aversion and slightly more (0.45-0.5) for trust.[1] In the second article, risk preferences are measured by means of lotteries and the correlation obtained is of the same order.

In line with the literature on non-unitary models (Chiappori, 1992; Browning, 2000), several papers consider the decision process about savings. Specifically, Mazzocco (2004) and Apps et al. (2014) focus on households in which spouses have different preferences. Risk sharing implies that an increase in the prudence of one spouse can lead to a fall in the prudence of the household and consequently in its level of savings. The research work presented in our paper is above all empirical, but it does shed some light on the decision-making process within the household and more precisely within the couple. Examining the degree of similarity between the spouses in this respect gives us some idea of the extent to which there is cooperation or, on the contrary, negotiation between the two spouses. Therefore, our results may indicate whether non-unitary models are relevant for studying the household decisions regarding wealth.

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[1] Here "trust" is defined as the willingness to rely on other members of society.

The choice of spouse is closely linked to the intergenerational transmission of capital and preferences. The choice of spouse has long-term effects, because it affects not only what will be transmitted from parents to children but also the very mechanism of transmission[2]. On the issue of preferences, Knowles and Postlewaite (2005) and Dohmen *et al.* (2012) provide evidence of positive correlation between parents and children, respectively for the propensity to plan for the future and the attitudes to risk. Charles and Hurst (2003) and Arrondel (2013) make the connection between the transmission of preferences and the intergenerational wealth elasticity. These two articles demonstrate the existence of positive correlations between parents and children for both wealth and preferences but they diverge about the explanatory power of preferences in the wealth elasticity[3]. In this article, we seek to bring to light the role of preferences in the choice of spouse and intergenerational transmission.

# 2 Theoretical framework

## 2.1 Marital sorting

In this paper, we investigate the relationship between the preferences of spouses. The basic question we address is: should we observe a similarity of preferences between spouses? The first models of marital sorting by preferences predict negative assortative mating in competitive equilibrium (Chiappori and Reny, 2006; Legros and Newman, 2007; Schulhofer-Wohl, 2006). In other words, we could expect the spousal attitudes to risk to be largely different. The main intuition is that "*a less risk-averse agent is a good seller of insurance while a more risk-averse agent is a good buyer of it*" (Li et al., 2013). However, these models are not consistent with direct empirical evidence about sorting by preferences (Kimball et al., 2009; Dohmen et al., 2012) and more generally with positive assortative mating on education, income or wealth that drive individual preferences.

Intuitively there are several reasons why we would expect positive assortative mating.

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[2]See Black and Devereux (2011) for a survey.

[3]The share of elasticity explained by preferences is 4 to 5 times greater for Arrondel than it is for Charles and Hurst

If people share the same tastes, they are more likely to meet. Moreover, the fact to agree on decisions regarding the household also makes the couple less likely to get separated, implying attrition effects. Intergenerational motives may also be invoked to predict positive assortative mating. If people have a preference for children with attitudes similar to their own, they should be determined in being in couple with someone with risk and time attitudes also close to their own.

Another way to question the seminal models is to challenge their main hypotheses: first, we can introduce endogenously determined income (instead of the exogenous income assumed by the seminal models); second, we can consider the effect of commitment. Li et al. (2013) enrich the seminal models by assuming that spousal incomes are endogenously determined. They show that when agents can manage the risk they face, the most risk-averse agents prefer to avoid the least risk-averse agents because the latter are reluctant to make efforts to reduce their income variance. Symmetrically, the least risk-averse agents prefer to avoid partners who want them to make efforts to reduce risk. This effect may overcome the insurance effect pointed out by the seminal models and so it may lead to positive assortative mating. The second way to question the first category of models is to introduce commitment. Laczo and Gierlinger (2013) demonstrate that limited commitment affects sorting based on preferences since the least risk-averse spouses can only provide inefficient risk sharing rules to the most risk-averse partners. The lack of constraints resulting from less enforceable transfers can lead to positive assortative mating. The absence of formal contracts in marriages and the difficulty to enforce promises makes limited commitment a crucial issue for our research question. When partners cannot fully trust each other then it becomes difficult to introduce co-insurance (by decoupling income risk from consumption allocation through state-contingent budget shares, for instance) if they prefer, and so want, opposite things. These two papers show that relaxing key assumptions of the seminal models leads to a complete change in the predictions about matching behaviors.

So far, the theoretical predictions about marital sorting by preferences only focus on risk preferences. It would be interesting to extend this debate to time preferences. Having

a more patient or far-sighted partner could be a solution to commitment issue. However, Mazzocco (2007) provides evidence that the hypothesis of intra-household commitment is strongly rejected for time preferences. As a consequence, the issue of limited commitment raised by Gierlinger and Laczo (2013) can be also applied to time preferences. As for risk preferences, the impossibility to enforce promises in marriages creates incentives to look for a partner with similar preferences. Similarly, time preferences can be endogenous to marital choices. A short-sighted person can become far-sighted because of the influence of his/her spouse. But again this effort can be costly and it can create disincentives to be with someone with opposite preferences. Intuitively, the basic idea of alternative theories, that it can be costly to reconcile diverse preferences, may also apply to time preferences. However, the formal extension of the alternative theories to time preferences is beyond the scope of this paper.

## 2.2   The standard theory of the saver

Before describing and illustrating our method for measuring savers' preferences, let us address the problem of the number of parameters of taste that should be introduced.

The standard life-cycle model assumes that saving behaviour is independent and prospective: the subject only looks ahead (towards the future), neither behind (to the past) nor to the sides (what the neighbours are doing). Proof of rationality, his choices are also time-consistent: if his expectations are verified over time, his initial consumption plan is implemented as anticipated and not modified.[4] Under these hypotheses, the standard model, which is very parsimonious, only uses the three parameters of preference relating to the dimensions of risk, time and family:

- The (relative) aversion to risk determines in particular the level of precautionary saving and the share of low-risk assets in the portfolio: the higher the risk aversion, the larger (proportionally) the risk or insurance premium the agent is willing to pay

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[4]A famous counter-example is that of Ulysses and the Sirens, where Ulysses suffers a lack of self-control of which he is perfectly aware. Facing a conflict of personality (or of preferences) between his present self and his future self, the former places the latter (who will want to swim to the Sirens) under tutelage by having himself tied to the mast.

to cover himself against a given risk;

- The time discount rate over the life cycle or the degree of preference for the present, which reduces the importance attached to satisfaction of the future self compared with that of the present self, causes an equivalent reduction in the decision horizon of an agent with a given life expectancy: saving for retirement varies inversely with this parameter;

- The degree of family "altruism", in other words the importance attached to the well-being of one's children compared with the satisfaction derived from consumption for oneself, determines the strength of the transmission motive.[5]

The life-cycle model thus identifies three main motives for the accumulation of household wealth: *precaution*, linked to "prudence" and risk aversion; *intertemporal smoothing* of consumption and saving for retirement, which is a function of the degree of "foresight"; and the wealth destined for *transmission*, which depends on the degree of family altruism; in this context, the choice of portfolio depends above all on the level of risk aversion.

However, it is now accepted that this basic model is inadequate for describing savers' behaviour: in particular, other parameters of preference are needed in order to take into account their limited rationality. Thus, both theory and data lead us to adopt four parameters of preference:[6]

- $\gamma$ represents attitudes to risk (aversion, prudence, etc.);

- $\delta$ represents long-term preference for the present, in other words the time discount rate over the life cycle;

- $\beta$ represents short-term impatience, which generally testifies to time-inconsistent choices (limited rationality) related to a weakness of will or lack of imagination - see Laibson (1997);

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[5] *Technical note*: the standard model assumes a time-additive and isoelastic utility function with an exponential discount rate (the time discount rate may depend on age but not on the distance from the present). Under uncertainty, the saver maximizes his expected utility. The inverse of the intertemporal substitution elasticity, the constant parameter of relative risk aversion determines the degrees of "prudence" for precautionary saving and of "temperance" for the management of multiple risks.

[6] For a justification of this choice, see Arrondel and Masson (2013).

- $\theta$ measures the degree of family altruism, in other words the importance attached to one's children's well-being rather than one's own consumption.

For each (type of) preference that we seek to measure - attitude to risk ($\gamma$), preference for the present ($\delta$), short-term impatience ($\beta$), family altruism ($\theta$) -, we have selected *a priori* a certain number of questions; some of them, of a polysemous nature, have been assigned to two indicators at the same time, notably $\gamma$ and $\delta$ (the future is both uncertain and distant from the present).

# 3 The PATER survey and the measurement of savings preferences

Our body of data is composed of five successive surveys, the main aim of which was to study the wealth of households in parallel to their saving preferences. In this article, we only use the 2007 wave, which allows us to make a direct comparison between the two partners. In this section we shortly present the data and describe the methodology. Appendix A provides more detailed information about the scoring method.

## 3.1 Presentation of the data

Conducted by the INSEE (French National Institute for Statistics and Economic Studies) in 1998, the first PATER survey[7] was a complementary module to the "*Patrimoine 1998*" survey. The four subsequent PATER surveys (2002, 2007, 2009 and 2011) were commissioned from the TNS-Sofres institute on a representative sample of the French population. Unlike the other waves, the 2007 survey applied the questionnaire to each member of the couple separately[8], to better analyse the financial decision-making process in the household. We therefore use this wave in order to estimate the degree of similarity between spouses.

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[7]PATER for "*Préférences et Patrimoines face au TEmps et au Risque*" ("preferences and wealth in relation to time and risk").

[8]In 2007, there are a total of 3826 households in our sample (including 2417 couple-headed households); for 905 of them, the questionnaire was applied to each member of the couple (with a period of time between the two partners.). We focus on this specific subsample

The information collected in the surveys (including 2007) involves a sociodemographic description of the household, the value, composition and management of its wealth, an inventory of its incomes, the existence of intergenerational transfers given or received, together with more subjective data about expectations of growth and risk (at five years, for example) on personal income and the price of assets. The survey contains a large number of more qualitative questions aiming to measure individual preferences with respect to risk and time (lottery choices) but also according to attitudes (opinions and behaviour in different areas of life).

## 3.2 Measuring savers' preferences: the different methods

Each PATER questionnaire includes a series of measurements of preferences obtained using different methods. Two of these methods, the "conventional" ones, are proposed in the literature. The third is the product of an original approach, based on a procedure of scoring, which has been developed and improved between 1998 and 2011.

### 3.2.1 The traditional methods: lotteries and scales

As far as attitudes to risk are concerned, one of the most well-known and widely used measurements is that of relative risk aversion pioneered by Barsky *et al.* (1997). It is based on hypothetical lottery choices concerning the individual's permanent income. The individual is proposed different job contracts in place of his actual one, generating a life-cycle income $Y$. In the first question, the contract proposed is the following: the individual has a 0.5 probability of earning $2Y$ and a 0.5 probability of only earning $2/3\ Y$. If the individual is willing to participate in this first lottery, he is proposed a second, more risky lottery, where the probabilities remain the same but the scale of the loss increases, since he now has a 0.5 probability of only earning $1/2\ Y$. If he refuses the first lottery, he is proposed a second, less risky one, where the probabilities of winning or losing still remain the same but in the event of loss, his income only falls by 20%. In the end, this method allows individuals to be classified into four categories, from the most risk-averse to the most risk-tolerant.

Other measurements of the attitude to risk ask the interviewee to place himself on a scale from 0 to 10, according to what he perceives to be his attitude to risk: 0 corresponds to "very prudent" and 10 to "audacious" (the two items are described in greater detail). These self-evaluation scales ranging from 0 to 10 can be asked "in general" (as in the PATER survey) or for specific areas of life: health, sport and leisure, work, finance, etc. (Dohmen *et al.*, 2012).

The measurements of preference for the present, and more precisely the time discount rate, are not so robust, as demonstrated in the somewhat deprecatory survey by Frederick *et al.* (2002). Nevertheless, we do have a self-evaluation scale of preference for the present ranging from 0 ("taking each day as it comes") to 10 ("concerned about the future"). These scales also exist to measure patience, running from 0 for "very impatient" to 10 for "very patient".

Arrondel and Masson (2013), among others, highlight a number of shortcomings in these standard indicators. On the one hand, Barsky's gambles only focus on professional life and as a consequence, the respondent's answer is influenced by his/her current situation. Moreover, lotteries can be also considered as too abstract or artificial because of the substantial share of non-response and the high level of noise affecting the replies (low correlation from one survey to the next). On the other hand, scales may be considered as too generalised and irrelevant notably because of the subjects do not have any point of reference for their evaluation. Specifically, scales suffer from a well-known problem of anchoring in the middle of the interval.In their survey on the measurement of personality traits, Borghans et al. (2008) strongly recommend "a multidimensional and domain-specific approach" to the measurement of risk preferences. This is the solution we use in the paper.

### 3.2.2 An original alternative method: the calculation of synthetic, ordinal "scores"

The scoring method consists in calculating scores to "profile" individuals according to their propensity for risk and the way they approach the future. The basic principle of the

scoring method is that no one question is by itself satisfactory. As a consequence, these synthetic, ordinal scores are calculated on the basis of a large set of questions that cover a wide range of areas of life, including consumption, leisure, investments, work, family, health and retirement. In all, more than a hundred questions are used, of different kinds: most of them, of a practical nature or relating to daily life, are questions about behaviour, opinion or intentions; others concern reactions to imagined scenarios or more abstract lottery choices. From these questions, the aim has been to construct consistent relative indicators or "scores" of preferences or attitudes in the four fields distinguished by theory: risk or uncertainty, the long term (preference for the present), the short term (impatience), and the (family) altruism, bearing in mind that the models often distinguish several parameters of preference within each field[9]. Appendix A presents the set of questions used to build the scores.

The first step consists in *a priori* allocation of each of the questions asked to one of the four fields of preference. Inevitably, there is some overlapping (the future is both uncertain and far-removed from the present). More generally, one may face difficulties in interpreting the answers because of effects of context and non-relevant factors. Consequently, the idea underlying the new method is that only the aggregate score is significant, provided that the aggregate allows us to more or less eliminate these elements of interference. As a second step, therefore, the statistical method consists in encoding the answers, generally with three values (for example: - 1 for a short-term view; 0 for a mid-term view; + 1 for a long-term view). The final score is the sum of marks reduced solely to those items which are seen, *ex post*, to form a statistically consistent whole.

So the scores are aggregate, qualitative and ordinal measurements, assumed to be representative of the answers supplied by the survey to various questions. The problem then arises of the number of different scores that should be introduced into each field of preference, especially that of uncertainty. The (non-standard) theory identifies several different parameters of preference in this field. The experimental data tend to show that

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[9]This is notably the case for risk or uncertainty, which may include aversions to risk, to loss and to ambiguity, "temperance" (in the management of multiple risks), "pessimism" or "optimism" (in the evaluation and subjective transformation of probabilities), etc.

subjects do not react in the same way to small risks as they do to large risks, and one cannot, therefore, consider the answers given to trivial questions of choice on the same level as crucial decisions. Lastly, attitudes to risk are likely to vary from one area of life to another: after all, paragliding and tax evasion are both risky activities, but they have little else in common.

Here it is the data that have the last word. As far as risk is concerned, we kept more than sixty questions in the 2007 wave. On all PATER surveys, it is verified that one sole score is always sufficient for an ordinal characterisation of the interviewee's attitudes to risk and uncertainty. Less surprisingly, preference for the present, short-term impatience and altruism in favour of the children can each be characterised by one sole representative score in each PATER sample. The constancy of these results already reveals something of the robustness of the scoring method used.

This aggregation of answers also affects the interpretation of the scores. The exact parameter measured (risk aversion or prudence for instance) is not a crucial issue as long as the departure from expected utility and homothetic preferences is limited. The scores measure a general attitude more than a specific parameter.

Arrondel and Masson (2013) show that the preferences measured by synthetic scores perform better (in terms of explanatory power, stability, time correlation, etc.) than conventional measurements, in particular lotteries and scales. In Appendix A, we provide detailed evidence of the consistency and robustness of the scoring method..

# 4 Birds of a feather?

## 4.1 What are the determinants of preferences?

Table 1 presents the distribution of the indicators of time and risk preferences. The aim here is to detail both the differences between men and women and the effect of marital status on preferences. These results concern the whole of the PATER 2007 sample, and not just the 905 couples. The table is divided into three parts: in panel A, we use lotteries, in panel B, self-evaluation scales, and in panel C, the scoring method.

This first descriptive analysis produces two main results. Firstly, there are differences between men and women, and they are slightly less pronounced in the scores than in the other two indicators. Whatever the method used, men are clearly more risk-tolerant than women. Women are more altruistic and more patient and have a lower preference for the present than men. However, these differences between the genders are only significant with the scoring method.[10] These results are in keeping with existing literature for risk preferences[11] and with Andreoni and Vesterlund (2001) for altruism even though the comparison is complex.[12]. It is however difficult to compare the size of the gender gap between surveys given the variety of measurements and specifications.

The second result concerns marital status. We observe no difference between married and single individuals as far as patience is concerned. On the other hand, unmarried, divorced and widowed individuals are generally less prudent, less farsighted and less altruistic than married individuals. Several effects are involved here: age, the presence of children and of course the presence of the spouse can explain these differences.

More generally, when we look at individual characteristics with regard to preferences, the results, not presented in this table, are generally in the expected sense: men are more risk-tolerant than women, and the young more than their elders; one is more likely to have a long-term view (a low time preference) when one is older, more educated, married or has children (and foresight also appears to be transmitted by the interviewee's mother); one is more altruist if one is educated; but the most impatient individuals over the short-term do not have any particular characteristics.

General descriptive statistics are presented in appendix B, distributions of scores in appendix C.

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[10]The results in the form of regressions are presented in Appendix C.

[11]See Croson and Gneezy (2009)

[12]Actually, the gender gap in Andreoni and Vesterlund (2001) depends on the cost of altruism. When it is costly to give, women are more altruistic.

## 4.2  Opinions on homogamy

Many works have sought to measure the degree of homogamy but the importance that individuals themselves attach to homogamy is rarely studied. In the PATER survey, individuals are asked about the role of homogamy as a factor of stability for the couple.[13] Several variables are detailed: income, social origin, political sensibility, religious or philosophical orientations, tastes (leisure activities, lifestyle, etc.) and ethnic origin.

Table 2 presents the answers to this question. For 80% of interviewees, for a couple to endure it is preferable for the spouses to share the same tastes. Then, in decreasing order of importance, come social origin, religious or philosophical orientations, ethnic origin, political sensibility and lastly income (less than 20% of interviewees). Marital status and gender do not change the order of preferences, but there are differences in terms of level. Individuals are looking for spouses that share the same lifestyle. However, the link between lifestyle and the other dimensions is strong, and may conceal a social or religious motivation, for example. Nevertheless, this variable of taste is still the one that best approaches the concept of risk and time preferences that we shall subsequently measure.

Is there homogamy concerning the opinion on homogamy? For each of the six variables studied above, we have created matrices to measure the degree of similarity between spouses (Tables 3a to 3f). The result is clear: people choose partners who have similar opinions to their own. For example, 80% of the men who think that "for a couple to endure, a similar social origin is preferable" are married to women who share the same opinion (Table 3b). Thus, spouses generally share a similar opinion about the important factors for the longevity of the couple. The Chi-square test provides us with a precise evaluation of the independence of preferences. For each of the dimensions of homogamy, independence between spouses is rejected.

In this first analysis, we see that the couples themselves consider tastes and lifestyles to be key parameters for the stability of the couple. The next part of the article examines whether this subjective judgement is verified in the data.

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[13]The exact wording of the question is the following: "In your opinion, apart from feelings, for a couple to endure, it is preferable for the spouses to...". This is followed by a list of the different dimensions described in the text.

## 4.3   The relationship between spouses' attitudes to time and risk

In this section, the aim is not only to analyse the extent of the similarity between spouses' preferences but also to compare the different measurements with each other. This comparison will allow us to relate our results to the existing work and to bring to light the differences between measurements in a single sample.

### 4.3.1   Empirical strategy

The empirical strategy is the same for all measurements. To estimate the relationship between spouses, we regress the measurement of preference of the male partner on that of the female partner for all cohabiting married and non-married couples[14].

$$Preferences_M = \alpha + \beta Preferences_F + \gamma X + u \tag{1}$$

where $X$ is a set of control variables and $u$ is an error term. Estimates are from OLS regressions.

In order to identify the correlation between preferences only, we control for the relevant observable characteristics that can influence the correlations between preferences: age, education, occupation, social origin, presence of children, inequality between spouses, religion, opinion regarding marriage, type of city of residence... The complete list of control variables and their definition are detailed in appendix D.1.

Last but not least, a crucial question is to determine whether the similarity between spouses is the result of matching, of attrition or due to the influence of one spouse on the other. A common issue in papers analysing homogamy is that they rely on a representative population of surviving couples (i.e. existing couples at the time of the survey).

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[14]We preferred this strategy in order to directly compare our estimates with the existing literature. An alternative to this specification consists in estimating the Pearson's $r$ between partners' preferences. Our results remain unchanged.

This type of estimate depicts the relationship between spouses at one point in time but it is also important to know how similar were the partners when they met in order to measure the extent of assortative mating and those of time or selection. To do so, we decompose the sample according to the age of the male partner in three categories: under 40, between 40 and 60 and above 60 years old. In the absence of the date of formation of the couple in our data, we use the man's age as an approximation of the duration of the couple's relationship. Surveys with representative samples of French couples[15] confirm that young couples are significantly more recent than couples with older male partners. Specifically, in 2010, the couples for whom the male partner is below 40 met less than 8 years before the survey in average. This duration equals 22 years when the male partner is between 40 and 60 and 41 years when he is above 60. In Appendix D.3 we implement robustness tests to confirm the relationship between the partner's and the couple's age.

### 4.3.2  Lotteries

We start our comparison of spouses with Barsky lotteries. To compare them with the other measurements used, we have made these measurements continuous. The combinations are ranked so as to create a progression in risk tolerance. This approach makes it easier to read the results, but causes a loss of information on the degree of similarity between spouses at different points on the distribution. The wording of the question allows us to classify individuals according to their degree of risk tolerance as follows:

1. Reject both lotteries (L1)

2. Reject the first; accept the second (L2)

3. Accept the first; reject the second (L3)

4. Accept both lotteries (L4)

Given the low numbers in categories L2, L3 and L4, we present a simplified matrix (Table 4) by combining these three categories. The values presented along the diagonal

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[15]The *Patrimoine* surveys (INSEE)

of the matrix, indicating the degree of similarity between the spouses, are high. Thus, 60% of the men who rejected both lotteries have spouses who made the same choice. Independence between the spouses, again measured by the Chi-square test, is rejected.

The correlation, calculated from the four positions, provides us with a more synthetic estimation of the similarity in the preference for risk (Table 5)[16]. We obtain a statistically significant correlation (at the level of 1%) of 0.308. In column [2], we see that the correlation remains unchanged even after the inclusion of our set of control variables. Our results suggest that homogamy in preferences is slightly stronger in the United States than it is in France. A stronger taste for a similarity of preferences, institutions (difference of social systems) but also the measurement of preferences[17] can explain this gap.

The analysis by age categories indicates that correlation is already strong for young couples, but it increases when the male partner is more than 60 years old (0.38). When we control for individual and household characteristics (columns [4], [6] and [8]), the effect of age is lower since the coefficient increases by 13% between the youngest and the oldest households. The positive correlation for young couples suggests that partners already have similar attitudes when they meet. There are several competing explanations to explain why this similarity slightly grows with age. First, couples may become more similar with age (by influencing each other) and as a consequence the correlation would grow. Second, there may be a selection in place if couples whose members are similar in tastes are more likely to survive. In this case, the couples with opposite attitudes disappear from the sample when they get older. Third, it could be a cohort effect if the preferences of older cohorts are more homogeneous. These explanations have very different empirical and theoretical implications. Unfortunately, it is impossible to disentangle between these theories in the absence of panel data (or of multiple cross sections).

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[16]To be consistent with Kimball *et al.* (2009), we regress the log of risk tolerance measured by the lotteries and not the absolute value. However, the comparison with Kimball et al. (2009) is not perfect given that, in absence of panel data, we cannot reproduce the ex post correction they implement.

[17]Kimball et al. (2009) use the panel dimension of their data to perform an *ex post* correction of measurement issues.

### 4.3.3 Self-evaluation scales

The scales measure preferences differently, inasmuch as they are self-evaluated measurements. So it is now the perception that individuals have of their own attitudes that serves as the measurement. Three parameters are evaluated: patience, risk aversion[18] and time preference.[19] Once again, we regress male partner's preferences on those of female partner to measure the presence of homogamy in the preferences studied.

Table 6 presents the correlations of these scales for our sample of 905 couples. In columns [2], [4], [6] and [8], we add control variables to our specification. Again, we observe similarity between spouses in terms of risk attitude. Although they are not entirely comparable with lotteries (because of differences in the possible amplitude of values), the correlation of scales is slightly weaker. For patience, the correlation is negative, significant at the level of 10%, suggesting that the impatience of one spouse is offset by the patience of the other. Finally, we observe a positive and significant coefficient of 0.29 for time preference. The effect of age appears to vary from one dimension to another. While the correlation in attitudes to risk is rather stable, the similarity in time preferences increases with age. However, on top of the time/cohort/selection effects this change can be due to the influence of the spouse or to the subjective nature of the measurement, because of which an individual's perception of his attitude to time may change according to his age at the time of the survey (even if the attitude itself remains unchanged). The control variables do not seem to affect the results for risk and patience. However, for time preference, the effect of age is modified since the inverted U-shaped curve disappears.

Once again, it is possible to compare these results with the existing works. Using the same scales and (almost) similar controls[20], Dohmen *et al.* (2012) find a correlation between spouses of 0.35 (0.27 with controls). The degree of homogamy in attitudes to risk therefore appears to be slightly lower in France than in Germany.

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[18]However, the comparability remains limited, since the lotteries measure a relative aversion to risk (under the hypothesis of CRRA preferences).

[19]In a concern for comparability between the scales and the scores, we use the neutral term of "time preference" here to measure preference for the present.

[20]See Appendix D.1

### 4.3.4 Scoring

The last type of measurement used is the scoring. Four parameters are studied here: family altruism, patience, risk aversion and time preference. Table 7 presents the relationship between the spouses' scores. For each of the parameters, we observe a positive and significant coefficient (at the level of 1% for each coefficient), but there are differences in level. Homogamy is very strong for risk attitude, with a coefficient above 0.6. The similarity between spouses is slightly weaker for time preference (0.5) and family altruism (0.47) and weaker, but still largely positive, for patience (0.37).

Measured in this way, spouses appear to be more similar than they are when the measurement is based on one single question (see below for a discussion). This result is reassuring in that there is consistency between all three methods. However, one noteworthy difference stands out in these analyses. For patience, the correlations vary widely between scales and scores. In this case, it seems that there is divergence between the two methods. Appendix D.2 examines this question in detail.

The analysis of the effect of age on the extent of similarity between spouses appears to confirm the results obtained with the previous indicators. The similarity between spouses in terms of attitude to risk is somehow "set" at the time the couple is formed since the coefficients for men below 40 and for men above 60 are very close. For the parameters involving time, the man's age appears to have an more limited effect for altruism and preference for the present than for patience. For all preferences, the effect of age significantly declines when we include the control variables. All in all, spouses' attitudes to risk do not seem to converge or diverge over time, and for the parameters involving time, there is some convergence between spouses, but this effect remains weak. Appendix D.3 presents supplementary results. We implement the same econometric specifications for younger couples (male partner's age below 35) and we divide the sample of young couples according to the presence of children[21]. The estimates confirm the existence of positive assortative mating. In that sense, our findings are in line with Dohmen et al. (2012)

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[21]The presence of children is a proxy for the couple's age. Surveys based on a representative sample of French couples indicate that the age of couples for whom the male partner is below 40 is around 5 years in absence of children instead of 10 years if there is at least one child.

and Feng and Baker (1994) because these papers rule out attrition, convergence and age covariation as explanations for homogamy of attitudes.

The control variables play a more substantial role for scores than for the standard measurements but the effect remains limited. More specifically, the estimate for risk decreases from 0.635 to 0.443 when all the individual and household characteristics are controlled for. The size of this reduction is smaller for the attitudes to time. The effect of age is more limited when all controls are added (except for patience). Appendix D.4 details the explanatory power of each control variable and shows that the effect of age on risk and patience is rather large. For time preference, income, occupation and religion are the most decisive control variables while family characteristics and religion are crucial for altruism. The low part that we succeed in explaining means that for all the dimensions studied, it is chiefly preferences that explain the similarity between spouses. So for a given social origin or position (among other things), individuals tend to choose a partner who is very similar as regards attitudes to risk and time. The choice of partner in terms of preferences therefore appears to be primarily a matter of tastes.

An important robustness test consists in replicating the study regarding the global score on the different subscores computed for the different areas of life. This test allows us to provide a better linkage between our analysis and the economic theory of decision making in families. Specifically, co-insurance between partners could lead to a decoupling of income risk from consumption allocation through state-contingent budget shares. This kind of agreement between spouses could make difficult the identification of heteroga-mous couples with such multidimensional measurement like scores because a globally homogamous couple could actually appear to be heterogamous if we only considered the willingness to take risk on the labor market or on consumption habits. We tackle this issue by decomposing the risk score[22] into 6 subscores in order to consider separately each field: labour (and retirement), family, financial managing, health, consumption and others. Table 8 presents the results. We use the specification with the full set of controls. The estimate for the general attitude is confirmed by positive and significant relationships

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[22]The more limited number of questions for the other parameters does not allow us to replicate the same analysis.

for all subscores. The coefficient is around 0.3-0.4 for family, financial managing, health and consumption but slightly lower (and somehow expected) for labour and other. Our results do not confirm a decoupling of the different areas of life. This robustness test provides evidence about the consistency of the scoring method.

We may wonder why the coefficients are higher for scores than for conventional measurements. There are several competing explanations. First, this gap exists because the conventional measurements are probably more noisy. One way of measuring the noise is to compare the individual preferences across several waves of a given survey. On this point, the scores perform better than lotteries and scales. More generally, the *ex ante* correction provided by the scoring methodology (as well as the *ex post* correction proposed by Kimball et al. (2009)) allows to reduce measurements errors. Kimball et al. (2009) obtained a degree of assortative mating more comparable to our scores (correlation 0.41) for these corrected measure of risk. Second, the difference could be the results of biases. It is known that lotteries suffer from selection issues because of a high non-response rate. Moreover, for lotteries and scales, the wording of the question also affects the way respondents answer (see Kimball et al. (2009) for lotteries or Frederick et al. (2002) for scales). This can bias the estimation of the relationship between spouses. Moreover, we cannot exclude a bias for the scores. For example, if for unobserved reasons, spouses are more likely to give the same answer to any given question then our estimate would be upward biased. Third, it may be caused by a difference in terms of approach. While the Barsky's lotteries focus on professional life, the scoring method includes questions on several fields: professional life but also health, family, wealth management, consumption, etc. However, even if a difference exists when we compare the global scores with lotteries, Table 8 shows that the coefficient for the subscore about labour issues is very similar to the correlation obtained with lotteries (around 0.3). As a consequence, the higher correlation for the global score probably comes from the higher degree of similarity for the other dimensions that are taken into account only by the scores. This remark may be also valid for the scales because even respondents are asked about their general behavior, we cannot control

for the dimension the respondents thinks about when he chooses a figure on the scales[23]. All in all, even if the measurements are consistent with each other, they do not measure the preferences for saving in the exact same way. The difference in terms of approach but also measurement errors may explain why the estimates differ. As a consequence, we should interpret the differences between conventional measurements and scores with caution.

The conclusion we can draw is that there is a positive assortative mating for risk and time attitudes. One of the contributions of this paper is to show that the homogamy of preferences is also valid for time preferences. Moreover, attrition or the common experience shared by spouses has a limited effect since spouses' attitudes do not seem to significantly converge or diverge over time. Placing these results in perspective, we can see that homogamy in attitudes to risk and time is close to homogamy in terms of education but much stronger than similar estimates in dimensions such as labour income or inherited wealth, for which the correlations observed in France are of the order of 0.25 (Frémeaux, 2014).

# 5    Discussion

The positive relationship for risk attitudes is at odds with the theoretical predictions of the seminal models. The taste for similar attitudes between partners seems to overcome the potential gains to specialization arising from opposite attitudes. Limited commitment between spouses can explain the homogamy in terms of preferences. Our results are in line with existing empirical work on the relationship between spouses' preferences. Moreover, it is also important to consider the intergenerational transmission of preferences to interpret this result. Arrondel (2013) provides evidence of a similarity between parents and children for risk and time preferences. Although substitutability between spouses' attitudes is possible[24], the existence of a transmission of preferences from parents to

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[23]Imagine a civil-servant who practices base-jumping. We cannot tell about which dimension (labor market status or hobbies) he thinks about when he answers the question.

[24]The absence of homogamy would implied that intergenerational transmission is effected by only one of the two parents.

children makes the similarity between spouses of previous generations more likely notably because people may prefer to have children with similar preferences to their own. As a consequence, this intergenerational motive creates an incentive to look for a partner with similar preferences. On the question of transmission, Dohmen *et al.* (2012) also show that mothers play a more important role than fathers, notably in the transmission of trust.

The similarity of attitudes between partners has important implications about the joint decision process at the household level. Indeed, our results suggest that spouses agree when they made saving decisions. In other words, we can say that spouses probably cooperate more than they negotiate (at least for this type of decisions). However, this paper does not mean that there exist only couples for whom partners have similar attitudes and that we should simply add individual preferences to estimate household preferences. Heterogeneity within households may exist but there is only a minority of couples with this profile. Besides, even when preferences are homogenous, joint decisions are still more complex than individual decisions.

The interest of analysing the choice of spouse lies not only in estimating the homogamy, but also in examining its implications (Burtless, 1999; Schwartz, 2010; Greenwood et al., 2014). The existing literature about preferences tackles this issue either at the individual level (Arrondel and Masson, 2013) or from an intergenerational perspective (Charles and Hurst, 2003; Dohmen *et al.*, 2012; or Arrondel, 2013). Evidence regarding the role of preferences at the household level are scarcer. Studying the extent of assortative mating is the first step in studying the relationship between marital choices and wealth inequality. The association in preferences can cause a divide in the population in terms of attitudes, since for given individual characteristics, the spouses are very similar. The whole literature about life cycle theory identifies risk and time preferences as parameters for wealth accumulation. Moreover, the general aim of the exogenous feature of the scoring method is to identify the role of preferences[25]. In Arrondel and Frémeaux (2014), we study the

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[25]One can also consider the reverse causality and think that wealth accumulation can have a direct effect on time and risk preferences. Becker and Mulligan (1997) provide a model indicating that wealth, among other factors, causes patience. However, the debate about the direction of the causality is beyond the scope of this paper.

relationship between our findings and wealth accumulation. Specifically, we analyse the impact of intra-household heterogeneity of preferences on savings and wealth. Preliminary results indicate that the heterogeneity of risk preferences (i.e. the gap between the spousal scores) has a negative impact on the household saving rate. We also show that the larger the difference in terms of attitudes, the lower the saving rate. Furthermore, when partners' attitudes differ more substantially their behavior is close to that of tolerant households (i.e. both partners are risk-tolerant) meaning that the most risk-tolerant spouse imposes his/her will. This finding is in contradiction with Mazzocco (2004)'s and Apps et al. (2014)'s predictions. Our estimate suggests that the heterogeneity of risk preferences does not have significant effects on financial wealth. However, risk averse couples (i.e. both partners are risk-averse) are significantly richer than the average[26]. This result suggests that there is a link between marital sorting by preferences and wealth accumulation.

# 6   Conclusion

Homogamy has often been studied in terms of income, education and, to a lesser extent, inherited wealth. Works focusing on the role of savings preferences in marital choices are much scarcer. The main empirical analyses bring to light a similarity between spouses in their attitudes to risk and time, in line with models introducing limited commitment or endogenously determined income. Moreover, recent research has demonstrated that there is intergenerational transmission of these same preferences.

This article has exploited an original survey that includes the standard measurements of preferences and also allows the development of a scoring method. The empirical tests conducted in the article bring to light strong similarity in attitudes to time and risk. The coefficients for measurements of risk are of the order of 0.2-0.3 for the conventional measurements and 0.5 for the scores. The orders of magnitude are quite similar for time preferences. For family altruism, measured solely by scores, the correlation between

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[26]Our estimation includes a set of control variables: age, income, education, presence of children and inheritance

spouses is 0.45. For all indicators, the similarity of spouses' attitudes to risk and time slightly grows with the age of spouses but the correlations are already positive for young couples. This indicates that most of the similarity we observe comes from marital sorting. Furthermore, the similarity between spouses remains strong despite the addition of several controls meaning that for all the types of preferences studied, it is mainly preferences that explain the similarity between spouses.

The other important contribution of this article, in relation to the existing literature, is that it highlights the consequences of these results in terms of joint decision process and wealth inequalities. This article opens up wide prospects for future research. It would be interesting to relate this work more closely to collective choice models, in order to study decisions taken by households in whom the spouses have contrasting, or on the contrary very similar, attitudes. We could focus on the portfolio choice and on decisions affecting household wealth, but also on broader themes related to the decision-making process in the household.

# Acknowledgements

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Table 1: Descriptive statistics of preference measurements

| | All | | | Couples | | | Unmarried, divorced or widowed | | |
|---|---|---|---|---|---|---|---|---|---|
| | Men [1] | Women [2] | Difference [1 - 2] | Men [1] | Women [2] | Difference [1 - 2] | Men [1] | Women [2] | Difference [1 - 2] |
| **Panel A: Lotteries** | | | | | | | | | |
| L1 | 42.4% | 46.3% | -3.9 | 45.0% | 45.0% | 0.0 | 35.3% | 48.7% | -13.4 |
| L2 | 26.0% | 26.1% | -0.1 | 25.6% | 27.3% | 1.6 | 26.9% | 24.0% | 2.9 |
| L3 | 22.9% | 20.3% | -2.6 | 21.6% | 20.8% | 0.8 | 26.7% | 19.4% | 7.3 |
| L4 | 8.7% | 7.3% | 1.4 | 7.8% | 7.0% | 0.8 | 11.1% | 8.0% | 3.1 |
| **Panel B: Scales** | | | | | | | | | |
| Prudent/Risk-loving | 4.9 (2.33) | 4.5 (2.43) | 0.4 | 4.8 (2.36) | 4.4 (2.39) | 0.4 | 5.1 (2.22) | 4.8 (2.49) | 0.3 |
| Impatient/Patient | 5.5 (2.61) | 5.8 (2.54) | -0.3 | 5.5 (2.62) | 5.7 (2.50) | -0.2 | 5.6 (2.60) | 5.9 (2.62) | -0.3 |
| Myopic/Farsighted | 6.4 (2.62) | 6.8 (2.51) | -0.4 | 6.6 (2.58) | 7.0 (2.36) | -0.4 | 5.9 (2.85) | 6.4 (2.74) | -0.5 |
| **Panel C: Scores** | | | | | | | | | |
| Family altruism | 6.4 (1.50) | 6.6 (1.39) | -0.2 | 6.5 (1.47) | 6.7 (1.38) | -0.2 | 6.0 (1.50) | 6.4 (1.41) | -0.4 |
| Impatience | 4.2 (1.53) | 4.0 (1.43) | 0.2 | 4.2 (1.55) | 3.9 (1.40) | 0.3 | 4.2 (1.50) | 4.0 (1.47) | 0.2 |
| Risk aversion | 5.7 (1.39) | 6.2 (1.27) | -0.5 | 5.8 (1.41) | 6.3 (1.24) | -0.5 | 5.4 (1.31) | 6.1 (1.31) | -0.7 |
| Time preference | 4.5 (1.39) | 4.4 (1.31) | 0.1 | 4.4 (1.37) | 4.3 (1.31) | 0.3 | 4.9 (1.35) | 4.6 (1.30) | 0.3 |
| Observations | | 4731 | | | 3321 | | | 1410 | |

Standard deviation in parentheses. For the sake of comparability, the scores are normalised from 0 to 10.
Note 1: L1 = reject both lotteries; L2 = reject lottery 1, accept lottery 2; L3 = accept lottery 1, reject lottery 2; L4 = accept both lotteries.
Note 2: in panel B, individuals are asked to place themselves on a scale from 0 to 10. Prudence: 0 = you are very prudent, 10 = you like taking risks; Patience: 0 = extremely impatient, 10 = extremely patient; Time preference: 0 = you take each day as it comes, 10 = you think of the future

Table 2: Opinion on homogamy

| For a couple to endure, it is preferable for the two spouses to have... | All | | Couples | | Unmarried | | Divorced | | Widowed | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M | W | M | W | M | W | M | W | M | W |
| The same income level | 18% | 20% | 15% | 14% | 27% | 26% | 38% | 37% | 15% | 29% |
| The same social background | 55% | 61% | 55% | 60% | 48% | 54% | 71% | 72% | 69% | 72% |
| The same political sensibility | 29% | 38% | 28% | 35% | 33% | 42% | 49% | 43% | 22% | 46% |
| The same religious or philosophical orientations | 47% | 54% | 46% | 53% | 49% | 54% | 58% | 57% | 41% | 63% |
| The same tastes | 78% | 80% | 77% | 77% | 80% | 81% | 84% | 86% | 87% | 88% |
| The same ethnic origin | 36% | 41% | 37% | 40% | 28% | 27% | 50% | 49% | 48% | 66% |
| Observations | 2086 | 2557 | 1599 | 1671 | 347 | 446 | 81 | 222 | 59 | 218 |

Interpretation: in the whole sample, 18% of men think that for a couple to endure, it is preferable for the two spouses to have the same income level. For women, the proportion is 20% (first line).
Note: M: men and W: women

## Table 3a: Income

| M/F | Yes | | No | |
|-----|-----|-----|-----|-----|
| Yes | **64** | | **69** | |
| | 48.1% | *44.8%* | 51.9% | *9.4%* |
| No | **79** | | **661** | |
| | 10.6% | *55.2%* | 89.4% | *90.6%* |

Chi-square = 112.69 (dl=1)

## Table 3b: Social origin

| M/F | Yes | | No | |
|-----|-----|-----|-----|-----|
| Yes | **406** | | **102** | |
| | 79.9% | *75.5%* | 20.1% | *29.8%* |
| No | **132** | | **241** | |
| | 35.3% | *24.5%* | 64.7% | *70.2%* |

Chi-square = 177.53 (dl=1)

## Table 3c: Political sensibility

| M/F | Yes | | No | |
|-----|-----|-----|-----|-----|
| Yes | **184** | | **84** | |
| | 68.7% | *59.8%* | 31.3% | *14.8%* |
| No | **124** | | **484** | |
| | 20.4% | *40.2%* | 79.6% | *85.2%* |

Chi-square = 187.93 (dl=1)

## Table 3d: Religion or philosophy

| M/F | Yes | | No | |
|-----|-----|-----|-----|-----|
| Yes | **321** | | **122** | |
| | 72.5% | *70.0%* | 27.5% | *28.9%* |
| No | **138** | | **299** | |
| | 31.6% | *30.0%* | 68.4% | *71.1%* |

Chi-square = 145.71 (dl=1)

## Table 3e: Tastes, leisures

| M/F | Yes | | No | |
|-----|-----|-----|-----|-----|
| Yes | **589** | | **94** | |
| | 86.2% | *86.2%* | 13.8% | *47.5%* |
| No | **95** | | **105** | |
| | 47.5% | *13.8%* | 52.5% | *52.5%* |

Chi-square = 130.76 (dl=1)

## Table 3f: Ethnic origin

| M/F | Yes | | No | |
|-----|-----|-----|-----|-----|
| Yes | **233** | | **109** | |
| | 68.1% | *65.5%* | 31.9% | *21.3%* |
| No | **123** | | **404** | |
| | 23.3% | *34.5%* | 76.7% | *78.7%* |

Chi-square = 176.19 (dl=1)

Table 4: Lotteries - Matrices

| Men/Women | L1 | L2 - L3 - L4 |
|---|---|---|
| L1 | **227** | **148** |
| | 60.6%  *64.7%* | 39.4%  *33.3%* |
| L2 - L3 - L4 | **124** | **296** |
| | 29.5%  *35.3%* | 70.5%  *66.7%* |

Test: Chi-square = 76.35 (dl=1)

Note: L1 = reject both lotteries; L2 = reject lottery 1, accept lottery 2; L3 = accept lottery 1, reject lottery 2; L4 = accept both lotteries.

Interpretation: (first line) out of the 794 couples who answered this question, there are 227 in which both spouses rejected both lotteries. 60.6% of the men who rejected both lotteries are in a couple with women who made the same choice; 64.7% of the women who rejected both lotteries are in a couple with men who made the same choice. The percentages for men are read horizontally, those for women (in italics) vertically.

Table 5: Lotteries - Relationship between spousal preferences

| Dependent variable: male partner | All | | Age categories | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Age < 40 | | 40 ≤ Age < 60 | | Age ≥ 60 | |
| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| Female partner | 0.308*** | 0.299*** | 0.273*** | 0.322*** | 0.279*** | 0.295*** | 0.379*** | 0.364*** |
| | (0.035) | (0.037) | (0.066) | (0.078) | (0.053) | (0.059) | (0.065) | (0.085) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 794 | 794 | 233 | 233 | 355 | 355 | 206 | 206 |
| $R^2$ | 0.089 | 0.185 | 0.070 | 0.380 | 0.072 | 0.266 | 0.144 | 0.497 |

Standard errors in parentheses, * $p<0.1$, ** $p<0.05$, *** $p<0.01$. The dependent variable is the preference of the male partner. Columns [1], [3], [5] and [7] present specifications without control variables; columns [2], [4], [6] and [8] with controls. See Appendix D.1 for the full list of control variables.

Table 6: Scales - Relationship between spousal preferences

| Dependent variable: | All | | Age categories | | | | | |
| | | | Age < 40 | | 40 ≤ Age < 60 | | Age ≥ 60 | |
| male partner | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
|---|---|---|---|---|---|---|---|---|
| **Panel A: patience** | | | | | | | | |
| Female partner | -0.061* | -0.071* | -0.186*** | -0.158* | -0.074 | -0.027 | 0.004 | -0.033 |
| | (0.035) | (0.037) | (0.069) | (0.083) | (0.054) | (0.059) | (0.064) | (0.080) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 879 | 879 | 239 | 239 | 382 | 382 | 258 | 258 |
| $R^2$ | 0.003 | 0.130 | 0.030 | 0.344 | 0.005 | 0.220 | 0.000 | 0.290 |
| **Panel B: risk** | | | | | | | | |
| Female partner | 0.192*** | 0.185*** | 0.241*** | 0.265*** | 0.158*** | 0.136** | 0.188*** | 0.211*** |
| | (0.034) | (0.035) | (0.071) | (0.090) | (0.053) | (0.056) | (0.059) | (0.073) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 872 | 872 | 237 | 237 | 380 | 380 | 255 | 255 |
| $R^2$ | 0.036 | 0.155 | 0.046 | 0.291 | 0.023 | 0.260 | 0.039 | 0.307 |
| **Panel C: time preference** | | | | | | | | |
| Female partner | 0.294*** | 0.234*** | 0.127* | 0.097 | 0.368*** | 0.242*** | 0.288*** | 0.278*** |
| | (0.036) | (0.036) | (0.072) | (0.082) | (0.053) | (0.057) | (0.068) | (0.077) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 877 | 877 | 238 | 238 | 383 | 383 | 256 | 256 |
| $R^2$ | 0.069 | 0.243 | 0.013 | 0.303 | 0.113 | 0.370 | 0.065 | 0.471 |

Standard errors in parentheses, * $p<0.1$, ** $p<0.05$, *** $p<0.01$. The dependent variable is the preference of the male partner. Columns [1], [3], [5] and [7] present specifications without control variables; columns [2], [4], [6] and [8] with controls. See Appendix D.1 for the full list of control variables. Interpretation: for each variable, individuals are asked to place themselves on a scale from 0 to 10. Prudence: 0 = you are extremely prudent, 10 = you like to take risks; Patience: 0 = extremely impatient, 10 = extremely patient; Time preference: 0 = you take each day as it comes, 10 = you think of the future

Table 7: Scores - Relationship between spousal preferences

| Dependent variable: | All | | Age categories | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Age < 40 | | 40 ≤ Age < 60 | | Age ≥ 60 | |
| male partner | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| **Panel A: altruism** | | | | | | | | |
| Female partner | 0.468*** | 0.413*** | 0.393*** | 0.358*** | 0.463*** | 0.407*** | 0.489*** | 0.346*** |
| | (0.032) | (0.034) | (0.062) | (0.078) | (0.051) | (0.059) | (0.054) | (0.059) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 905 | 905 | 242 | 242 | 391 | 391 | 272 | 272 |
| $R^2$ | 0.193 | 0.330 | 0.144 | 0.424 | 0.175 | 0.364 | 0.231 | 0.611 |
| **Panel B: patience** | | | | | | | | |
| Female partner | 0.368*** | 0.266*** | 0.217*** | 0.203*** | 0.324*** | 0.263*** | 0.396*** | 0.351*** |
| | (0.035) | (0.037) | (0.065) | (0.077) | (0.057) | (0.062) | (0.061) | (0.070) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 905 | 905 | 242 | 242 | 391 | 391 | 272 | 272 |
| $R^2$ | 0.108 | 0.269 | 0.044 | 0.415 | 0.076 | 0.285 | 0.134 | 0.421 |
| **Panel C: risk** | | | | | | | | |
| Female partner | 0.635*** | 0.443*** | 0.546*** | 0.481*** | 0.512*** | 0.450*** | 0.528*** | 0.498*** |
| | (0.033) | (0.036) | (0.060) | (0.071) | (0.052) | (0.064) | (0.065) | (0.079) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 905 | 905 | 242 | 242 | 391 | 391 | 272 | 272 |
| $R^2$ | 0.289 | 0.465 | 0.257 | 0.527 | 0.199 | 0.375 | 0.198 | 0.533 |
| **Panel D: time preference** | | | | | | | | |
| Female partner | 0.499*** | 0.426*** | 0.408*** | 0.418*** | 0.499*** | 0.433*** | 0.518*** | 0.434*** |
| | (0.032) | (0.032) | (0.067) | (0.071) | (0.047) | (0.057) | (0.056) | (0.065) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 905 | 905 | 242 | 242 | 391 | 391 | 272 | 272 |
| $R^2$ | 0.232 | 0.372 | 0.149 | 0.475 | 0.230 | 0.390 | 0.269 | 0.524 |

Standard errors in parentheses, * $p<0.1$, ** $p<0.05$, *** $p<0.01$. The dependent variable is the preference of the male partner. Columns [1], [3], [5] and [7] present specifications without control variables; columns [2], [4], [6] and [8] with controls. See Appendix D.1 for the full list of control variables.

Table 8: Robustness test - Subscores for risk preferences

| Dependent variable: male partner | Global [1] | Labour [2] | Family [3] | Finance [4] | Health [5] | Consumption [6] | Other [7] |
|---|---|---|---|---|---|---|---|
| Female partner: | | | | | | | |
| Global | 0.442*** (0.036) | | | | | | |
| Labour | | 0.268*** (0.035) | | | | | |
| Family | | | 0.305*** (0.034) | | | | |
| Finance | | | | 0.408*** (0.033) | | | |
| Health | | | | | 0.374*** (0.037) | | |
| Consumption | | | | | | 0.428*** (0.034) | |
| Other | | | | | | | 0.250*** (0.036) |
| Observations | 905 | 905 | 905 | 905 | 905 | 905 | 905 |
| $R^2$ | 0.465 | 0.193 | 0.434 | 0.318 | 0.276 | 0.341 | 0.195 |

Standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is the preference of the male partner. All specifications include control variables. See Appendix D.1 for the full list of control variables.

# Appendices

## A   The methodology of scoring

In this appendix, we present in greater details the methodology of scoring and more especially the questions that we used. However, this article is an application of this methodology to a specific topic. Arrondel and Masson (2013) fully describe the technical details and the philosophy of the scoring method. This paper also presents the robustness tests that have been implemented to validate this scoring method (justifications regarding the choice and number of questions, robustness tests across the four surveys, internal consistency...). As a consequence, the goal of our appendix is to provide to the reader all the information needed to understand our work. In case the reader needs more specific information, we invite him to read this publication.

### A.1   Basic principles

The PATER surveys have enabled us to develop a methodology, drawing on all these questions, to measure savers' preferences with regard to risk and time. This method, tried and tested on the different data, produces synthetic ordinal measurements, in the form of scores, of individuals' attitudes to risk, their preference for the present, and their family altruism. The multiplication of the data has allowed us to verify that these indicators are especially robust (in relation to the type of questions used, the characteristics and factors explaining the scores, their correlations and their effects on wealth, etc.). First developed on the data of the INSEE "Patrimoine 1998" survey and then the TNS-Sofres survey 2002, this method was repeated on the last three waves of the PATER survey, in 2007, 2009 and 2011.

The five surveys contain a large number of more qualitative questions aiming to measure individual preferences with respect to risk and time on the basis of lottery choices, but also according to attitudes, opinions and behaviour in different areas of life (health, work, leisure, family, consumption, retirement, etc.). Thus, there are 57 questions measuring

the attitude to risk, 27 for time-preference, 13 for family altruism and 16 for patience.

Let us give some examples of these questions. Concerning the attitude to risk, some of the questions are somewhat trivial, of the kind: "Do you take an umbrella with you when the weather forecast is uncertain?", or "Do you park your car illegally?", some are lottery choices, and others relate to consumption practices: "Do you ever go to see a show rather at random, at the risk of sometimes being disappointed?" or opinions: "Do you agree with the statement that 'marriage is a form of insurance'?" or: "Are you concerned by current health issues (AIDS, contaminated blood products, etc.)?". One of the questions of reference for identifying the time discount rate, for example, is: "Because of an unexpectedly heavy workload, your employer asks you to forgo a week's holiday this year, in return for $x$ extra days' holiday next year. Would you agree?". The proposed answers are sometimes yes or no but for some questions the respondents can precise their opinion (never, rarely, often or always for instance)[27].

The first step consists in *a priori* allocation of each of the questions asked to one of the four fields of preference. Inevitably, there is some overlapping, concerning the distinction between short- and long-term, for example, and even more the fact that the future is both uncertain and far-removed from the present. Thus, questions like "Do you think that it is worth depriving yourself of some of life's pleasures to gain a few extra years of life?" and "To avoid health problems, do you watch your weight or your diet; do you practice a sport?" have been allocated both to the category of risk preferences and to the category of time preferences. Then, the marks are summed to obtain the final score.

Table A.1a presents examples of questions used to built the risk preference score; in Tables A.2a and A.3 we do the same thing for time preference and altruism, respectively. These tables also indicate the Cronbach's alpha which measures the internal consistency of scores. For all parameters, his score thus exhibits an acceptable degree of consistency.

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[27]For the sake of presentation we did not report in Tables A.1a, A.2a and A.3 the exact wording of the answers. Specifically, when there are more than 2 possible answers, we only present the "extreme" answers (i.e those which define clear preferences - risk-loving or risk averse for risk, short-sighted or far-sighted for time preference etc) but not the remaining answer(s) defining neutral preferences. As a consequence, the answer "other" in the tables does not appear as such in the questionnaire. For instance, when we ask people if parks in no-parking zones, "very often" or "often" increase their risk tolerance, "never" or "rarely" increases their risk aversion. The other possible answer is "sometimes". Of course, depending on the question, this category varies.

## A.2 Potential methodological issues

Like for the methodological aspects, the full details can be found in Arrondel and Masson (2013). In this section, we respond to the main criticisms that can be made with the scoring method.

*Why choosing these specific questions and fields? What do we exactly measure with these scores?*

This approach has three main characteristics: the scoring method follows a piecemeal (i), empiricist (ii) and agnostic (iii) approach.

- (i) The choice of questions and the life domains to be covered by these questions is in part arbitrary but also contingent to the type of behaviour to be explained.

- (ii) For the four types of preferences, the number of selected questions is a purely empirical issue. In other words, statistical analysis will alone tell if the global score show a sufficient degree of internal consistency or if it preferable to introduce different sub-scores per domain.

- (iii) The third characteristic of the scoring method is to be agnostic regarding what the scores precisely measure. More specifically, we can wonder if the attitude towards risk represent rational or irrational attitudes. Moreover, what theoretical preference parameter would be this score most associated: risk aversion, prudence, loss aversion, pessimism?

We are fully aware that no one question can bring accurate information of a given preference. If a question is targeted on theory, it can appear to be too abstract and generates too much noise. On the contrary, if it is more practical, its interpretation remains too vague. In some situations, it is not possible to determine which preference parameter is precisely revealed by the question under consideration. Moreover, some questions show, alone, little explanatory power of wealth. For a question like "Do you often park

in a forbidden zone?", confounding factors can introduce some noise in the answer. The method of aggregation might solve all these problems. Indeed, even if there is no such thing like a central limit theorem that would allow us to treat framing effect, endogeneity biases or other types of error, aggregation eliminates, globally and *ex ante*, the biases and parasitic measurement errors (contrary to measurement like scales or lotteries). Regarding (iii), this aggregation of answers also affects the interpretation of the scores. The exact parameter measured (risk aversion or prudence for instance) is not a crucial issue as long as the departure from expected utility and homothetic preferences is limited: if Pierre is more risk-averse than Paul, then he should be also more prudent most of the time.

*Are the scores internally consistent?*

The value of each score is the sum of the marks obtained in the coding procedure. Our basic assumption is that most questions affected to risk or time preferences have a common component and that the summation of these questions form a coherent whole.

Several precautions are taken in order to guarantee the internal consistency of scores. First, we eliminate the questions that show a too small correlation with the sum of all other items. Only few questions have to be dropped. Then in order to test the internal consistency of the scores we compute the Cronbach coefficient alpha. This coefficient is equal to:

$$\kappa = \frac{n}{n-1}(1 - \sum_{i-1}^{n} \frac{\sigma_i^2}{\sigma^2})$$

where $n$ is the number of questions introduced in the score, $\sigma^2$ the total variance of the score and $\sigma_i^2$ the variance of question $i$.

This coefficient is close to 0.7 for risk, which is the threshold of totally credible consistency for psychometricians, and lower but still acceptable for time preference (around 0.5). It expresses the greater difficulty in identifying this parameter of preference

Other indirect validations developed such as the principal component analysis as well as the correlations between "sub-scores" provide evidence of the quality of the score. Arrondel and Masson (2013) compare the results of the five waves (1998-2002-2007-2009-

2011) and demonstrate the stability of scores across surveys. The content of the scores is constant over time: the time correlations (across survey) for scores is around 0.7, much stronger than scales or lotteries; the rankings of the questions that the most relevant in explaining the scores are very similar from one survey to another.

## A.3  PATER-2002 to 2011: consistency and robustness of the scoring method

For France, we have constructed a panel data set with five waves, from 1998 to 2011, in order to measure individual preferences of savers through a method of scoring: synthetic and ordinal scores of preferences are derived from the responses given to a large number of various questions covering different domains of life (consumption, leisure, health, investments, work, retirement, family). No single question is satisfactory by itself, but if a number of questions possess a common relevant dimension, the latter should be isolated by aggregating the replies, thus eliminating most framing effects and measurement errors. This scoring method has proved very consistent and robust. In each survey, the data lead to isolate four internally consistent scores, concerning risk attitudes, short-term impatience, time preference, and parental altruism, with very similar properties from one wave to the next (see Arrondel and Masson, 2013).

*Still 4 scores of preference*

Comparative analysis of the results in the different waves of the survey confirm the main conclusions drawn from the initial data of PATER-1998. More precisely, the characteristics of the scores obtained display remarkable consistency and robustness between one wave and the next:

- The preferences of the saver can still be represented by four consistent scores: one score for attitudes to risk, two for time preference (short term and long term) and one for altruism.

- The scores possess a high degree of internal consistency: the value of Cronbach's

alpha for the score for risk is around 0.70 with 50 to 60 questions, which is the threshold of totally credible consistency for psychometricians; the corresponding value, close to 0.55, obtained for the score for time preference in these four surveys remains acceptable and expresses the greater difficulty in identifying this parameter of preference.

- The consistency of the scores can also be visualised on the circle of correlations of the PCAs carried out on the different waves. These graphs (see Arrondel and Masson, 2013) show that the scores (introduced as additional variables) are projected closely on the first axis, which represents risk-taking. It is also worth noting the great similarity in all the waves between the projections of the different questions on the first two axes.

*The similar content and meaning of the scores from one wave to the next*

So the scoring method developed on the different waves of the PATER survey allows to characterise the saver's preferences in four internally consistent scores. The question that remains is whether these indicators always measure the same thing. Several statistical observations suggest that this is the case, while highlighting the superiority of scores over the other measures of preferences:

- The bar charts of the scores display the required properties of dispersion and regularity, and they are, moreover, comparable from one survey to the next. These properties cannot be observed in the other measures: the risk aversion measure based on career lotteries (Barsky et al., 1997) only has four modalities; the distributions obtained for the scales from 0 to 10 for time and risk preferences have chaotic profiles, with peaks that fluctuate in size and location between one survey and the next, notably in 0 and 5.

- The "content" of the scores is remarkably constant: the rankings of the questions that are most relevant in explaining the scores (those that contribute the most, in the sense that they have the highest correlation with the rest of the score) are very similar from one date to the next, as Tables A4 and A5 show, for example, for the

first ten questions in the 2007 and 2009 waves. For the score for risk, the ranking of items that contribute the most is even invariant over the three years 2007, 2009 and 2011: 1. The precautions taken in the event of uncertain weather; 2. Bad driving behaviour; 3. Illegal parking. In the case of the score for time preference, the three questions concerning whether the savers (i) seek to give their children a taste for saving, (ii) think that retirement should be prepared for in advance and (iii) are concerned about their health and fitness, come out top in all three surveys.

- The time correlation of individual preferences between 2007, 2009 and 2011 for example, is a good indicator of the consistency of measures from one survey to the next. The self-correlation of scores is by far the highest: 0.75 over two years and 0.70 over four years for the risk score; 0.67 over two years and 0.60 over four years for the time preference score. The lottery of Barsky et al. (1997), on the contrary, presents the highest variability from one survey to the next, with a rank correlation that does not exceed 0.30; this variability can be explained notably by a certain inconsistency in the replies between the successive waves of the PATER survey.

The similarity between the empirical properties of the scores constructed from different waves of the PATER survey testify to the robustness of the method, both at the level of their statistical consistency and at the level of their information content. This robustness is a necessary step but not sufficient. The second step consists in showing (which was the initial aim of the research project) that these measures allow us both to better characterize the savers and to better explain their wealth management behaviour, the idea being to bring to light the constancies in these two domains from one survey to the next.

*Tastes and savings: the best-performing scores for explaining wealth* A systematic comparison of the different indicators of preference shows that our synthetic scores perform better than the usual measures, especially lotteries and scales, when it comes to explaining savers' preferences and wealth management choices:

- "Who is what in terms of preferences?": analysis of the individual determinants of the scores reveal effects of observable characteristics that are highly comparable between one survey and another and which generally go in the expected direction. Thus, men are more risk-tolerant than women and young people are more risk-tolerant than older ones. Married people and children of self-employed parents are also more risk-tolerant. On the other hand, the idea that education favours risk-taking is only confirmed in two surveys, the two others not revealing any significant result. Furthermore, as one might have expected, the respondents are more likely to be far-sighted (have low time preference for the present) if they are older, more highly-educated or living in a couple. On the contrary, the idea that women are more far-sighted is only substantiated in the last three waves of the survey, admittedly the most reliable ones.

- Original information from the PATER data, the correlations between the different scores of individual preferences are very similar from one survey to the next: for example, lower risk tolerance goes with greater far-sightedness, with a correlation of the order of 0.40 for the three dates, but also with less impatience (correlation of the order of 0.35) and stronger altruism (correlation of 0.30); the correlation between preference for the present and short-term impatience is positive but weaker (0.20-0.25).

- The quantitative effects of the scores on savings and portfolio choices are more significant than for the other measures and also very comparable from one survey to the next. Thus, the specific effect of the score of time preference on the levels of total or financial wealth is significant and comparable in 2007, 2009 and 2011: between the first and last quartiles of the score distribution, financial wealth is multiplied by a factor of about 2. The same is true for the specific effect on the ownership of diverse assets.

Remember, moreover, that these effects of scores on the level and composition of wealth have the decisive advantage of not suffering from the same endogeneity biases

as the other measures of preference: by construction, the scores are synthetic indicators that largely resemble a collection of "natural instruments". Regarding risk attitudes, the question about whether the individual "takes his/her umbrella if there is a chance of rain", which appears strongly correlated with the risk score, has no direct effect on the amount of wealth. Similarly, the "ability to forego current pleasure in order to live longer", which is strongly correlated with the time discount score, does not explain household assets. Following on from the above, it is natural to think that the scores can be used as instruments for other preference parameters. The variables which are instrumented thus become, in a sense, "disguised" scores. It is thus shown that the risk-attitude and time-preference scores are very good instruments for the corresponding scales.

Table A.1a:  Response frequencies and score construction: risk aversion

| Nature of the question | Risk-loving (%) (-) | Risk-averse (%) (+) | Neutral (%) |
|---|---|---|---|
| *Consumption/leisure/travel* | | | |
| Parks in no-parking zones (Very often, often = -1; Never, rarely = +1; Other = 0) | 8.1 | 53.1 | 38.8 |
| *Health/health risks/life expectancy* | | | |
| Precautionary visits to the doctor or dentist (Yes = +1; No = 0) | 38.2 | 60.2 | |
| Non-compulsory vaccinations (No = -1; Yes = +1; Other = 0) | 15.8 | 41.0 | 43.2 |
| Wears seatbelt, respects speed limit (Very often, often = -1; Never, rarely = +1; Other = 0) | 17.5 | 32.3 | 50.2 |
| Sacrifice today in order to live longer (No = -1; Yes = +1; Other = 0) | 7.1 | 16.3 | 76.7 |
| Careful to keep in shape (No = -1; Yes = +1; Other = 0 ) | 13.8 | 21.6 | 64.6 |
| Booster vaccination for ones children (Yes = 0; No = -1) | 5.0 | 95.0 | |
| *Work/income/career* | | | |
| Looks for novelty and responsibility in a job (Yes = -1; Other = 0) | 19.4 | 80.6 | |
| Has taken risks in their career (Yes = -1; No = 0 ) | 37.3 | 62.7 | |
| Leisure behaviour represents a potential risk for career (Yes = -1; No = 0) | 9.5 | 90.5 | |
| Risky job changes (Yes = -1; No = 0) | 30.7 | 69.3 | |
| Recommends to family/friends to take risks in their careers (Yes definitely = -1; No, never = +1; Other = 0) | 10.0 | 6.1 | 83.1 |
| Would change economic sector in the face of substantial economic risk | 50.0 | 50.0 | |

Table A.1b: Response frequencies and score construction: risk aversion (ctd)

| Nature of the question | Risk-loving (%) (-) | Risk-averse (%) (+) | Neutral (%) |
|---|---|---|---|
| **_Retirement_** | | | |
| Worried that might end their life in a retirement home (Yes = +1; No = 0) | 42.9 | 57.1 | |
| Saves in order to avoid ending their life in a retirement home (Yes = +1; No = 0) | 78.5 | 21.5 | |
| Would prefer lower social security contributions against a less generous pension (Yes, without precautionary saving = -1; No, too risky = +1; Other = 0) | 1.4 | 28.7 | 69.9 |
| **_Family/Intergenerational Transfers_** | | | |
| "Marriage is an insurance policy" (Strongly disagree = -1; Strongly agree = +1; Other = 0) | 17.7 | 10.5 | 71.8 |
| "Choosing a partner is risky" (Strongly disagree = -1; Strongly agree = +1; Other = 0) | 4.9 | 23.1 | 72.0 |
| "You can't sign up for marriage without testing it first" (Strongly disagree = -1; Strongly agree = +1; Other = 0) | 8.5 | 24.4 | 67.1 |
| "Having children is an insurance policy for ones old age" (No = -1; Yes = 0) | 80.2 | 19.8 | |
| "The decision to have children is a risky one" (Strongly disagree = -1; Strongly agree = +1; Other = 0) | 18.5 | 12.7 | 68.8 |
| The decision to have children is a lifelong commitment (No = -1; Yes = 0) | 5.0 | 95.0 | |
| Wishes to protect their spouse financially in case of their own death (No = -1; Yes = 0) | 6.8 | 93.2 | |
| Constantly keeps watch over their children (No = -1; Yes, always = +1; Other = 0) | 10.9 | 33.0 | 56.1 |
| Would encourage their children to take risks (Yes, definitely = -1; No = +1; Other = 0) | 2.6 | 28.9 | 68.5 |

Table A.1c: Response frequencies and score construction: risk aversion (end)

| Nature of the question | Risk-loving (%) (-) | Risk-averse (%) (+) | Neutral (%) |
|---|---|---|---|
| **Gambling** | | | |
| Bets on horses (very or fairly often=-1, rarely=0, never=1) | 4.5 | 80.4 | 15.1 |
| Plays the lottery (very often=-1, fairly often or rarely=0, never=1) | 8.9 | 61.2 | 29.9 |
| Plays slot machines (very or fairly often=-1, rarely=0, never=1) | 1.2 | 77.4 | 21.4 |
| Bets at the casino (very or fairly often=-1, rarely=0, never=1) | 0.3 | 90.2 | 9.5 |
| **Other** | | | |
| Buys transport tickets well in advance (No = -1; well in advance = +1; a little in advance = 0) | 8.8 | 27.7 | 63.6 |
| Turns up well in time for trains and planes (No = -1; well in time = +1; a little in advance = 0) | 4.2 | 20.1 | 75.7 |
| Takes precautions in case the weather turns out nasty (No, never = -1; Yes, always = +1; other = 0) | 44.7 | 53.3 | 2.0 |
| Cronbach's alpha | 0.68 | | |

Source: PATER 2007

Table A.2a: Response frequencies and score construction: time preference

| Nature of the question | Lives from (%) day to day (-) | Farsighted (%) (+) | Neutral (%) |
|---|---|---|---|
| *Consumption/leisure/travel* | | | |
| Wishes to enjoy windfalls as quickly as possible (Yes = +1; No = 0) | 24.7 | 75.3 | |
| Buys transport tickets well in advance (No = -1; well in advance = +1; a little in advance = 0) | 8.8 | 27.7 | 63.6 |
| Turns up well in time for trains and planes (No = -1; well in time = +1; a little in advance = 0) | 4.2 | 20.1 | 75.7 |
| Would put holidays off for one year in order to increase their duration (No = +1; Yes, with at most only one or two more days= -1; Other = 0) | 21.4 | 17.5 | 61.1 |
| *Health/health risks/life expectancy* | | | |
| Sacrifice today in order to live longer (No = -1; Yes = +1; Other = 0) | 7.1 | 16.3 | 76.7 |
| Plays sport or goes to the gym (Regularly= -1; Never= +1; Occasionally= 0 ) | 54.4 | 25.9 | 19.7 |
| *Work/income/career* | | | |
| Favours free time in choice of job (Yes = 1; No = 0) | 31.5 | 68.5 | |
| Would prefer National Service to be as short as possible, rather than a longer service which is spread out over time (No = +1; Yes = 0) | 39.7 | 60.3 | |
| *Retirement* | | | |
| Worried that might end their life in a retirement home (Yes = +1; No = 0) | 42.9 | 57.1 | |
| Would have trouble in paying for a retirement home (Yes if saved more= -1; Yes without saving more= +1; No = 0) | 47.0 | 11.4 | 41.6 |
| Would prefer early retirement against a lower pension after the age of 65 (No = -1; Yes = +1; Other = 0) | 27.1 | 18.7 | 54.3 |

Table A.2b: Response frequencies and score construction: time preference (ctd)

| Nature of the question | Lives from (%) day to day (-) | Farsighted (%) (+) | Neutral (%) |
|---|---|---|---|
| *Family/Intergenerational Transfers* | | | |
| "Having children is an insurance policy for ones old age" (No = -1; Yes = 0) | 80.2 | 19.8 | |
| The decision to have children is a lifelong commitment (No = -1; Yes = 0) | 6.5 | 93.5 | |
| Wishes to protect their spouse financially in case of their own death (No = -1; Yes = 0) | 6.8 | 93.2 | |
| My parents tried to teach me to save money (Yes=-1; No=+1; Other=0) | 22.9 | 75.4 | 1.7 |
| We should teach children and teenagers how to save money (Yes = -1; No = +1; Other=0) | 4.9 | 43.4 | 51.7 |
| *Other* | | | |
| Aware of environmental problems (No = +1; Other = 0) | 20.8 | 79.2 | |
| Ready to sacrifice their standard of living to leave the world in good shape (Yes, very much so = -1; No = +1; Yes, to an extent = 0) | 15.4 | 42.3 | 42.3 |
| Cronbach's alpha | 0.56 | | |

Source: PATER 2007

Table A.3: Response frequencies and score construction: altruism

| Nature of the question | Egoist (%) (-) | Altruist (%) (+) | Neutral (%) |
|---|---|---|---|
| The decision to have children is a lifelong commitment (No = -1; Yes = 0) | 5.0 | 95.0 | |
| Wishes to protect their spouse financially in case of their own death (No = -1; Yes = 0) | 6.8 | 93.2 | |
| Should leave to our children as much as we received ourselves (Strongly agree = +1; Strongly disagree = -1; Other = 0) | 72.4 | 25.2 | 2.4 |
| Inheritance behaviour inspired by that of my parents (Yes = +1; No = -1) | 52.9 | 47.1 | |
| Parents should spend their money as they wish, even if it means leaving no legacy (Strongly agree = +1; Strongly disagree = -1; Other = 0) | 87.9 | 11.1 | 1.0 |
| It is a good thing that parents make sacrifices for their children (Strongly agree = +1; Strongly disagree = -1; Other = 0) | 92.4 | 6.3 | 1.3 |
| Would favour lower inheritance taxes on transmission to blood relatives (Strongly agree = +1; Strongly disagree = -1; Other = 0) | 5.5 | 85.9 | 8.6 |
| Is in favour of the freedom to bequeath (Strongly agree = +1; Strongly disagree = -1; Other = 0) | 46.5 | 52.1 | 1.3 |
| Cronbach's alpha | 0.45 | | |

Source: PATER 2007

Table A.4: Top ten questions contributing to the risk score

| Items | Rank 2009 | Rank 2007 | Risk tolerance High (%) | Low (%) | Median (%) |
|---|---|---|---|---|---|
| Takes precautions in case the weather turns out nasty | | 1 | 44,7 | 53,3 | 2,0 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 1 | | 45,8 | 52,8 | 1,4 |
| Wears seatbelt, respects speed limit, respects traffic light | | 2 | 17,5 | 32,3 | 50,2 |
| (Yes, very often, often = - 1 ; no, never or rarely = + 1 ; other = 0) | 2 | | 14,9 | 37,0 | 48,1 |
| Parks in forbidden zones | | 3 | 8,1 | 53,1 | 38,8 |
| (Yes, very often, often = - 1 ; no, never or rarely = + 1 ; other = 0) | 3 | | 8,2 | 36,9 | 55,0 |
| Sacrifice today pleasures of life in order to live longer | | 6 | 7,1 | 16,3 | 76,7 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 4 | | 7,6 | 16,2 | 76,2 |
| Thinks that homogamy explains longevity of the couples (same income, social origin, political orientation, religion, tastes...) | | 7 | 23,5 | 33,6 | 42,9 |
| (Yes strongly= + 1; no, not really = - 1; other = 0) | 5 | | 26,3 | 31,3 | 42,4 |
| "Marriage is an insurance policy" | | 8 | 17,7 | 10,5 | 71,8 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 6 | | 20,9 | 9,0 | 70,1 |
| "Home ownership ensures that you will always have a roof over your head" | | 4 | 16,9 | 35,7 | 47,4 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 7 | | 14,8 | 34,3 | 51,0 |
| Recommends to close to take risks in their career | | 12 | 10,0 | 6,1 | 83,1 |
| (Yes, often = + 1 ; no = - 1 ; other= 0) | 8 | | 16,0 | 4,8 | 79,3 |
| Has taken risks in their career, and/or sports and/or sexual activities | | 9 | 24,4 | 33,9 | 41,7 |
| (Yes, often = + 1 ; no = - 1 ; other= 0) | 9 | | 22,2 | 36,7 | 41,1 |
| Have practiced the following sports : off-piste skiing, paragliding, microlighting, parachuting, bungee jumping, mountaineering, rock-climbing, rafting or canyoning, diving... | | 5 | 18,3 | 52,6 | 29,1 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 10 | | 17,2 | 55,9 | 26,9 |

Source: PATER 2007 and 2009

Table A.5:  Top ten questions contributing to the time preference score

| Items | Rank 2009 | Rank 2007 | Foresight High (%) | Low (%) | Median (%) |
|---|---|---|---|---|---|
| "Retirement has to be prepared well in advance" | | 2 | 21,3 | 21,7 | 57,0 |
| (Yes = - 1; no, I have time = + 1 ; other = 0) | 1 | | 24,4 | 21,2 | 54,4 |
| Careful to keep in shape | | 4 | 13,8 | 21,6 | 64,6 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 2 | | 15,5 | 21,0 | 63,5 |
| We should teach children and teenagers how to save money | | 1 | 4,9 | 43,4 | 51,7 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 3 | | 4,3 | 45,2 | 50,5 |
| Plan his holidays well in advance | | 6 | 12,6 | 22,3 | 65,1 |
| (No = -1; Yes, well in time = +1; a little in advance = 0) | 4 | | 14,0 | 20,0 | 66,0 |
| Sacrifice today pleasures of life in order to live longer | | 7 | 7,1 | 16,3 | 76,7 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 5 | | 7,6 | 16,2 | 76,2 |
| Your children refuse to give up their leisure activities, hobbies or friends for their studies. Do you agree? | | 3 | 4,2 | 37,2 | 58,7 |
| (Yes = + 1 ; no = - 1 ; other= 0) | 6 | | 4,8 | 35,0 | 60,2 |
| I am someone who makes plans for the future | | 11 | 31,6 | 64,9 | 3,5 |
| (No = +1; Yes = -1; Other = 0) | 7 | | 37,9 | 59,6 | 2,5 |
| Would prefer early retirement against a lower pension after the age of 65 | | 10 | 27,1 | 18,7 | 54,3 |
| (No = -1; Yes = +1; Other = 0) | 8 | | 25,4 | 23,2 | 51,4 |
| Does the possibility that you could end up your life in a nursing home preoccupy you ? | | 12 | | 42,9 | 57,1 |
| (Yes = - 1 ; other= 0) | 9 | | | 44,2 | 55,8 |
| Buys transport tickets well in advance | | 14 | 8,8 | 27,7 | 63,6 |
| (No = +1; well in advance = -1; a little in advance = 0) | 10 | | 8,3 | 29,0 | 62,7 |

# B General descriptive statistics

Table B.1: Characteristics of households

| | |
|---|---|
| Number of children | 1.98 |
| Children living at home | 1.04 |
| | |
| **Marital status** | |
| Married | 86.2% |
| Non-married | 13.8% |
| | |
| **Housing situation** | |
| Home-owner (or home-buyer) | 77.5% |
| Tenant (council flat) | 7.5% |
| Tenant (other) | 11.6% |
| Rent-free tenants | 2.7% |
| Other | 0.6% |
| | |
| **Comparison of wealth on first meeting:** | |
| Man > Woman | 21.1% |
| Man < Woman | 19.6% |
| Man = Woman | 19.1% |
| Man = Woman = 0 | 40.2% |
| | |
| **Who holds the purse strings?** | |
| Man | 25.4% |
| Woman | 33.8% |
| Both | 40.7% |
| | |
| Existence of a joint account | 86.2 |
| **Overall wealth of household** | |
| Less than 8000€ | 8.1% |
| Between 8000 and 14999€ | 4.2% |
| Between 15000 and 39999€ | 5.0% |
| Between 40000 and 74999€ | 5.0% |
| Between 75000 and 149999€ | 18.0% |
| Between 150000 and 224999€ | 22.9% |
| Between 225000 and 299999€ | 13.2% |
| Between 300000 and 499999€ | 14.9% |
| Between 450000 and 749999€ | 6.4% |
| More than 750000€ | 2.3% |
| | |
| **Net monthly income of the household** | |
| Less than 300€ | 0.2% |
| Between 300 and 600€ | 0.4% |
| Between 601 and 900€ | 0.6% |
| Between 901 and 1200€ | 4.9% |
| Between 1201 and 1500€ | 8.6% |
| Between 1501 and 1900€ | 15.8% |
| Between 1901 and 2300€ | 17.4% |
| Between 2301 and 2700€ | 13.3% |
| Between 2701 and 3000€ | 10.8% |
| Between 3001 and 3800€ | 15.3% |
| Between 3801 and 5300€ | 9.0% |
| Between 5301 and 6900€ | 2.9% |
| More than 6901€ | 0.9% |
| Observations | 905 |

Field: All cohabiting households for which we have information about both spouses.
Source: PATER 2007

Table B.2: Assets

| Types of financial investment: | |
|---|---|
| None | 11% |
| CEL, PEL (home-purchase saving account) | 50% |
| Livret A, livret bleu (tax-free saving accounts) | 63% |
| Other savings accounts | 31% |
| PERP (pension savings plan) | 6% |
| PER, PEP (pension savings plan) | 12% |
| Assurance-vie (investment/insurance plan) | 45% |
| Life insurance | 15% |
| Complementary retirement savings plan | 10% |
| French-listed shares | 20% |
| Foreign-listed shares | 5% |
| Bonds | 6% |
| SICAV or FCP (mutual funds) | 15% |
| PEE, FCPE (employee savings plans) | 18% |
| PEA (equity savings plan) | 24% |
| | |
| **Value of financial investments** | |
| Less than 1500€ | 12% |
| Between 1500 and 2999€ | 9% |
| Between 3000 and 7999€ | 16% |
| Between 8000 and 14999€ | 14% |
| Between 15000 and 29999€ | 14% |
| Between 30000 and 44999€ | 10% |
| Between 45000 and 74999€ | 10% |
| Between 75000 and 149999€ | 8% |
| More than 150000€ | 6% |
| | |
| **Share of these investments...** | |
| Considered risky | 11% |
| *If > 0* | 21% |
| Invested in pension schemes | 12% |
| *If > 0* | 28% |
| Observations | 905 |

Field: All cohabiting households for which we have information about both spouses.
Source: PATER 2007

Table B.3: Individual characteristics

|  | Man | Woman |
|---|---|---|
| Age | 51.5 | 49.2 |
| Divorced in the past | 8.7% | 6.9% |
| | | |
| **Current professional activity:** | | |
| Employed | 62.6% | 55.6% |
| Job seeking | 1.9% | 4.9% |
| Inactive having worked in the past | 33.0% | 23.8% |
| Inactive having never worked | 2.6% | 12.5% |
| Other | 0.0% | 3.2% |
| | | |
| **Individual yearly income:** | | |
| Less than 8000€ | 6.4% | 26.1% |
| Between 8000 and 11999€ | 12.6% | 16.0% |
| Between 12000 and 15999€ | 16.6% | 16.6% |
| Between 16000 and 19999€ | 21.1% | 12.3% |
| Between 20000 and 29999€ | 25.9% | 17.2% |
| Between 30000 and 39999€ | 10.7% | 3.6% |
| More than 40000€ | 6.7% | 1.9% |
| No reply | 0.1% | 6.3% |
| | | |
| Inheritance or gifts received | 41.9% | 43.5% |
| | | |
| **Social origin (subjective):** | | |
| Well-off | 9.1% | 12.5% |
| Modest | 16.7% | 18.0% |
| Neither | 74.2% | 69.4% |
| | | |
| **Level of education attained:** | | |
| Primary | 10.9% | 9.5% |
| Secondary | 7.0% | 9.2% |
| Vocational certificate (CAP, BEP) | 32.6% | 25.2% |
| High school studies | 21.2% | 26.4% |
| Higher vocational certificate (IUT, BTS) | 11.7% | 11.6% |
| Higher education 1st cycle | 3.9% | 6.4% |
| Higher education 2nd cycle | 5.7% | 8.1% |
| Higher education 3rd cycle | 7.1% | 3.7% |
| | | |
| **Socioeconomic position (7 categories:)** | | |
| Farmers | 3.8% | 1.8% |
| Tradesmen, shopkeepers, entrepreneurs | 7.1% | 3.1% |
| Liberal professions | 17.3% | 7.4% |
| Intermediate professions | 21.8% | 20.1% |
| Employees | 15.6% | 44.3% |
| Unskilled workers | 33.0% | 8.1% |
| Inactive | 1.4% | 15.3% |
| Observations | 905 | 905 |

Field: All cohabiting households for which we have information about both spouses.
Source: PATER 2007
Remark: For the socio-professional category, retired people are classified in the most recent category they were in before retiring.

# C    Distributions of risk and time preferences

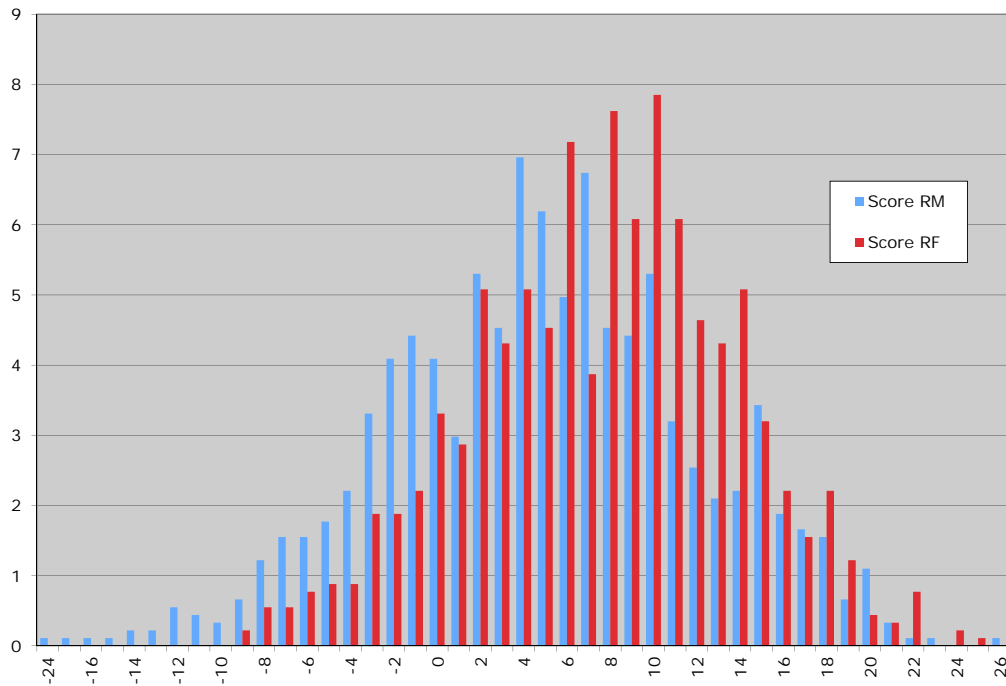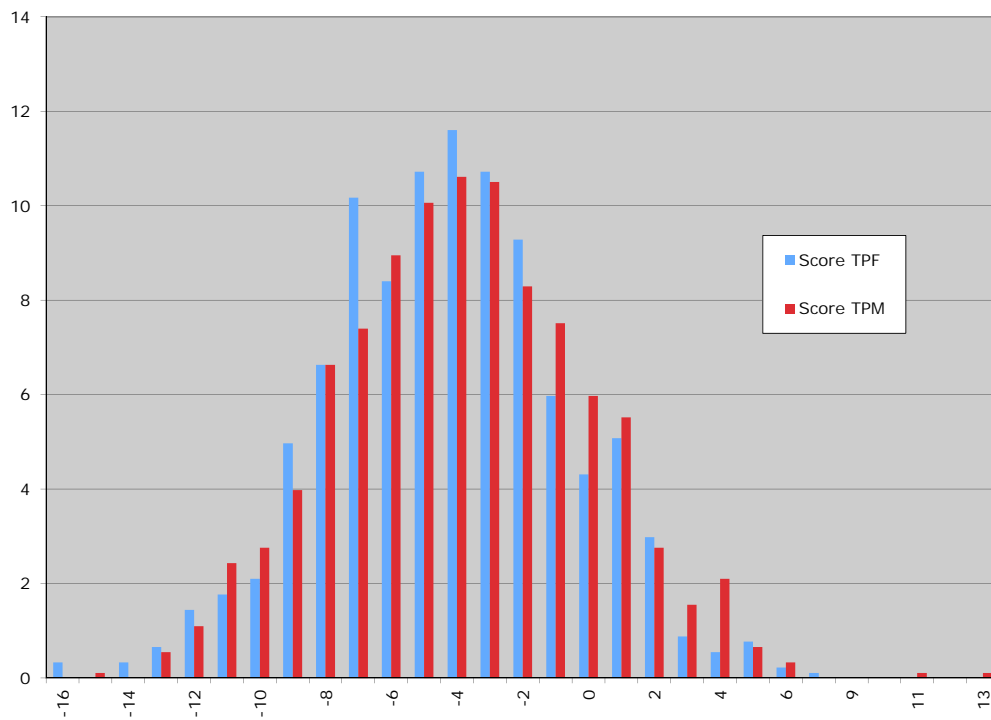Figure 1: Distribution - Attitudes to risk



Figure 2: Distribution - Time preferences



Note: the distribution for the male partner is in blue; the distribution for the female partner is in red.

Table C.1: Preference measurements - distributions

| | Lotteries | Scales | | | Scores | | | |
| | | Risk | Patience | Foresight | Altruism | Impatience | Risk | Time pref. |
|---|---|---|---|---|---|---|---|---|
| Male | 0.097*** | -0.036 | -0.055 | -0.035 | -0.170*** | 0.145*** | -0.497*** | 0.138*** |
| | (0.001) | (0.615) | (0.475) | (0.642) | (0.000) | (0.000) | (0.000) | (0.000) |
| Age | 0.000 | 0.009*** | 0.021*** | 0.022*** | 0.003** | -0.027*** | 0.028*** | -0.013*** |
| | (0.964) | (0.000) | (0.000) | (0.000) | (0.026) | (0.000) | (0.000) | (0.000) |
| Married | 0.028 | -0.208 | -0.043 | 0.525*** | 0.008 | 0.013 | 0.204*** | -0.461*** |
| | (0.684) | (0.177) | (0.795) | (0.001) | (0.930) | (0.881) | (0.007) | (0.000) |
| Non-married | 0.172** | -0.014 | 0.126 | 0.150 | -0.242** | 0.178 | -0.234** | -0.260*** |
| | (0.041) | (0.048) | (0.944) | (0.466) | (0.030) | (0.107) | (0.014) | (0.009) |
| Single | 0.199** | 0.169 | 0.273 | -0.031 | -0.628*** | -0.028 | -0.040 | -0.060 |
| | (0.014) | (0.359) | (0.165) | (0.876) | (0.000) | (0.793) | (0.659) | (0.531) |
| Divorced | 0.017 | 0.350* | 0.212 | -0.285 | -0.214* | 0.170 | -0.157 | -0.290*** |
| | (0.850) | (0.083) | (0.324) | (0.183) | (0.064) | (0.140) | (0.114) | (0.005) |
| Constant | 1.81*** | 4.33*** | 4.61*** | 5.25*** | 6.58*** | 5.27*** | 4.75*** | 5.19*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $R^2$ | 0.01 | 0.01 | 0.02 | 0.04 | 0.04 | 0.11 | 0.21 | 0.06 |
| Observations | 4368 | 4616 | 4625 | 4619 | 4731 | 4731 | 4731 | 4731 |

P-value between brackets; * p<0.1, ** p<0.05, *** p<0.01

For the scales and scores, the dependent variable is expressed as an absolute value. For the sake of comparability between scores and scales, we have normalised the scores from 0 to 10 (as in table 1). For marital status, the reference category is widowed.

Interpretation: the coefficient -0.170 (1st row, 4th column) signifies that, for family altruism, the men's score is, on average, 0.17 points lower than that of women (when the score has been normalised from 0 to 10).

# D  Empirical strategy and supplementary results

## D.1  The construction of control variables

In this appendix, we provide full information regarding the control variables and their construction. The full list of individual control variables is the following: age, income, occupation (7 positions: farmer; tradesman, shopkeeper or entrepreneur; liberal profession; intermediate profession; employee; unskilled worker; inactive), education (8 positions: primary, secondary, vocational certificate, high school studies, higher vocational certificate, higher education 1st cycle, higher education 2nd cycle, higher education 3rd cycle), inheritance/gifts received (dummy), occupation of the father (5 positions: farmer; tradesman, shopkeeper or entrepreneur; liberal profession; intermediate profession; employee and unskilled worker), existence of past divorce, religious beliefs ("Do you believe in any religion?"), religious education ("In which religion have you been raised?": Catholic, Anglican, Protestant, Orthodox Christian, Jewish, Muslim, other or none), opinion on homogamy and on marriage and probable divorce (see below).

Some variables are measured at the household level: presence of children, inequality between spouses (see below), duration of relationship before cohabitation (less than three months, between 3 and 6 months, between 6 and 12 months, between 1 and 2 years, between 2 and 5 years or between 5 and 10 years). Given the absence of precise geographical information, for each specification with control variables we control for the size of the city of residence: rural area, between 2,000 and 5,000 inhabitants, between 5,000 and 10,000, between 10,000 and 20,000, between 20,000 and 50,000, between 50,000 and 100,000, between 100,000 and 200,000, more than 200,000 or parisian urban area.

We can classify the variables we use into several categories: demography, human or physical endowments, social prestige, social origin, religious or familial beliefs. These controls cover most of the dimensions that can somehow influence the choice of spouse on top of preferences. By controlling for these variables, we assume that the correlation of residuals is the relevant relationship we want to measure. This list of control follows the econometric specification used by Dohmen et al. (2012). Some variables are missing in our data: height, health status and ethnicity. However, Dohmen and his coauthors do not

provide full details about the effect of these variables on the relationship between spouses.

**Inequalities between partners:**

One category of variables is used to describe the degree of inequality between spouses. Several dimensions are studied: income, social origin, wealth at the time of meeting and age. For income, a couple is considered unequal if the man is in the top decile of the income distribution for men and the woman is below the median of the income distribution for women (or vice versa). For social origin, we consider the origin of individuals to be well-off if their father is (or was) a skilled tradesman, shopkeeper or entrepreneur, a liberal professional, executive or in an intermediate profession. If this variable does not have the same value for both partners, then they have different social origins. We also compare the wealth at the time of meeting by using use a question asking individuals about their comparative wealth at the moment of their meeting. There are four possible replies: larger, smaller, equal or not applicable (no wealth). Thus, the couple is considered unequal if one of the first two answers is chosen. Lastly, if the age difference between the two partners is more than 5 years, then the couple is considered unequal.

**Opinion on homogamy:**

To synthesise the opinion on homogamy, we return to the questions used in section 4.2. We consider that a person has a positive opinion of homogamy if they think that it is preferable that the two partners have the same income level, the same social origin and the same tastes.

**Marriage perceived as risky:**

To construct this variable, we use a series of questions addressing individuals' opinions about the family. We construct three binary variables, (one for each question). For the first variable, we consider that marriage is perceived as risky if the individual does not agree that marriage represents "security" (individual, emotional, etc.) (1st variable); if the individual thinks that choosing one's partner is not without risk (2nd variable); or if,

before getting married, one should live together for a trial period (3rd variable).

**Probable divorce:**

To calculate the possibility of future divorce, we use a series of questions addressed to the interviewees. They are asked to indicate, on a scale of 0 to 10, the probability that a given event will occur in the next five years. The variable "Probable divorce" is equal to 1 if the interviewee situates between 5 and 10 the probability for the event "experiencing a separation or divorce".

## D.2 How are partners perceived?

One of the particularities of the results is that the correlation between spouses in terms of patience varies according to the indicator used. With self-evaluation scales, the correlation is negative (Table 6), whereas it is positive when we use scores. The aim of this appendix is to explain where this difference comes from and why it can be partly explained by the relevance of the scale as an appropriate measure of preferences (at least as far as patience is concerned).

Firstly, there is a factor that reduces the importance of this divergence between the two results. Patience is the parameter for which we obtain the weakest correlation with the scores. So although differences in level appear, scales and scores still tend to share the same hierarchy of correlations. Secondly, it appears that patience, much more than prudence or foresight, is poorly taken into account by scales. To demonstrate this, we use a series of questions that inform us about the perception by one spouse of their partner's attitudes to risk and time. Concretely, for each parameter measured by the scales (prudence, patience and time preference), we have two questions: "on a scale of 0 to 10, where would you place yourself?" and "on the same scale, where would you place your partner?" These two questions, addressed to both spouses, allow us to measure the correlation between the way the individual perceives him/herself and the way their partner perceives them. For more clarity, we designate $E_H$ the judgements that men make on themselves via the scales and $E_H*$ the judgements that women make on their respective partners. We carry out the same operation for women, with $E_F$ denoting their self-evaluations and $E_F*$ the judgement of their partners. Table D.1 presents the results of these correlations for each parameter.

The main information that we can draw from the first part of this table is that individuals are not very good judges of their partners' attitudes, although women appear to do better than men. More importantly for our purpose, we can see that it is for the parameter of patience that we obtain the weakest correlation. In the second part of the table, we observe the individuals' perception of homogamy. When compared with the results in table 11, it can be seen that individuals tend to believe that their partners

resemble them more than we actually observe in reality. This observation is also valid for patience, where we move from a negative correlation (-0.06) to a positive correlation (+0.10). Thus, we can see that the subjective nature of this indicator tends to produce noticeably different results according to the identity of the "judge". All in all, this divergence in results partly explains the difference between scales and scores, notably as regards the parameter of patience.

Table D.1: Preferences and partner's perception

| Correlations | Patience [1] | Risk [2] | Time pref. [3] |
|---|---|---|---|
| $\rho\ E_H\ E_H{}^*$ | 0.238*** | 0.323*** | 0.445*** |
| $\rho\ E_F\ E_F{}^*$ | 0.168*** | 0.228*** | 0.402*** |
| | | | |
| $\rho\ E_H\ E_F{}^*$ | 0.097*** | 0.594*** | 0.551*** |
| $\rho\ E_F\ E_H{}^*$ | 0.112*** | 0.588*** | 0.557*** |
| Observations | 869 | 861 | 870 |

* p<0.1, ** p<0.05, *** p<0.01

Interpretation: the first line in the table presents the correlation between the score (on the scale of 0 to 10) that the man gives himself, $E_H$, and the score that his partner gives him, $E_H{}^*$; in the second line, the roles are reversed ($\rho\ E_F\ E_F{}^*$). The third line measures the correlation between the score that the man gives himself, $E_H$, and the score he gives his partner, $E_F{}^*$; in the fourth line the same operation is repeated for women ($\rho\ E_F\ E_H{}^*$).

## D.3 Robustness tests for age

Table D.2: Scores - Robustness test for age

| Dependent variable: | Age<35 | Age<40 | | |
| | | All | Without children | With children |
| male partner | [1] | [2] | [3] | [4] |
|---|---|---|---|---|
| **Panel A: altruism** | | | | |
| Female partner | 0.471*** | 0.358*** | 0.501** | 0.299*** |
| | (0.121) | (0.078) | (0.185) | (0.072) |
| | | | | |
| Controls | Yes | Yes | Yes | Yes |
| $N$ | 131 | 242 | 47 | 195 |
| $R^2$ | 0.637 | 0.424 | 0.503 | 0.162 |
| **Panel B: patience** | | | | |
| Female partner | 0.404*** | 0.203*** | 0.0852 | 0.208*** |
| | (0.120) | (0.077) | (0.192) | (0.075) |
| | | | | |
| Controls | Yes | Yes | Yes | Yes |
| $N$ | 131 | 242 | 47 | 195 |
| $R^2$ | 0.558 | 0.415 | 0.347 | 0.167 |
| **Panel C: risk** | | | | |
| Female partner | 0.469*** | 0.481*** | 0.719*** | 0.495*** |
| | (0.117) | (0.071) | (0.139) | (0.068) |
| | | | | |
| Controls | Yes | Yes | Yes | Yes |
| $N$ | 131 | 242 | 47 | 195 |
| $R^2$ | 0.601 | 0.527 | 0.552 | 0.305 |
| **Panel D: time preference** | | | | |
| Female partner | 0.226* | 0.418*** | 0.503** | 0.396*** |
| | (0.132) | (0.076) | (0.204) | (0.068) |
| | | | | |
| Controls | Yes | Yes | Yes | Yes |
| $N$ | 131 | 242 | 47 | 195 |
| $R^2$ | 0.576 | 0.475 | 0.438 | 0.259 |

Standard errors in parentheses, * $p<0.1$, ** $p<0.05$, *** $p<0.01$. All specifications include the full set of control variables. See Appendix D.1 for the full list of control variables.

## D.4 The decomposition of scores

In this section, the aim is to identify the role of control variables in the comparison of spouses. We focus on scores only because this measurement is the most affected by control variables. Table D.3 presents the decomposition of correlations for the four dimensions studied. For the attitude to risk, the correlation obtained without any control is 0.635. In other words, if the man is twice as risk-averse as the average, then his spouse will herself be 63.5% more risk-averse than the average for women. The raw correlations for the other parameters are all significant (at 1%) and vary between 0.37 and 0.5. The part explained by the different specifications is relatively low, since we explain, at the most, 30% of the relationship between spouses.

For family altruism, we observe a raw correlation of 0.47. With the introduction of individual characteristics, the coefficient is equal to 0.41. Thus, all the control variables taken together do not explain more than 12% of the elasticity between spouses. Two categories of variables explain most of this reduction: the family situation (presence of children and divorce of (at least) one partner) and religious beliefs/education.

Spouses are less similar in terms of patience, but the part explained is much larger. The raw correlation is 0.37; the net correlation is 0.27. Adding the age of the spouses into the specification reduces the coefficient by nearly 20%. However, the other specifications do not perceptibly increase the level of explanation.

Risk aversion is the variable for which we observe the strongest correlation between spouses, with a coefficient of 0.635. Moreover, the part explained by the different specifications is nearly one third (net correlation equal to 0.44). Three categories of variables tend to significantly reduce this correlation: age (which alone explains more than 20% of the elasticity), the religious beliefs/education and the opinion on marriage.

Lastly, time preference has a profile fairly similar to that of family altruism. The correlation is quite strong (0.5) but the part explained by the different specifications is very low (less than 15%). Social position, income and religious beliefs/education are the main explaining factors.

Table D.3: Individual determinants of similarity between spouses (scores)

| Dependent variable: male partner | Family altruism | | | Patience | | | Risk | | | Time pref. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coeff. | $R^2$ | % explained | Coeff. | $R^2$ | % explained | Coeff. | $R^2$ | % explained | Coeff. | $R^2$ | % explained |
| Female partner: | | | | | | | | | | | | |
| Without control | 0.47*** | 0.193 | | 0.37*** | 0.108 | | 0.64*** | 0.289 | | 0.50*** | 0.232 | |
| Age | 0.47*** | 0.193 | 0.2% | 0.29*** | 0.161 | 21.2% | 0.51*** | 0.361 | 19.4% | 0.49*** | 0.241 | 2.6% |
| Income, occupation, education | 0.45*** | 0.244 | 3.6% | 0.27*** | 0.219 | 25.5% | 0.51*** | 0.396 | 20.0% | 0.46*** | 0.314 | 8.2% |
| Inheritance/gifts received, father's occupations | 0.46*** | 0.277 | 1.7% | 0.27*** | 0.229 | 26.9% | 0.50*** | 0.403 | 20.6% | 0.46*** | 0.329 | 8.0% |
| Children, divorce | 0.43*** | 0.293 | 7.3% | 0.27*** | 0.235 | 26.9% | 0.50*** | 0.404 | 21.1% | 0.46*** | 0.330 | 8.0% |
| Inequality between spouses (age, social origin, wealth, income) | 0.43*** | 0.296 | 7.7% | 0.27*** | 0.238 | 26.4% | 0.51*** | 0.405 | 20.5% | 0.46*** | 0.334 | 8.2% |
| Duration of relationship before cohabitation | 0.43*** | 0.298 | 8.5% | 0.27*** | 0.243 | 26.9% | 0.49*** | 0.415 | 23.1% | 0.46*** | 0.339 | 8.4% |
| Religious beliefs and education | 0.41*** | 0.316 | 12.8% | 0.28*** | 0.253 | 25.0% | 0.47*** | 0.434 | 26.8% | 0.43*** | 0.363 | 13.0% |
| Opinion on homogamy and marriage, probable divorce | 0.41*** | 0.330 | 11.8% | 0.27*** | 0.269 | 27.7% | 0.44*** | 0.465 | 30.2% | 0.43*** | 0.372 | 14.6% |
| Observations | 905 | | | 905 | | | 905 | | | 905 | | |

* p<0.1, ** p<0.05, *** p<0.01. The control variables are added one after another. The first specification has no control variable; in the second, we control for age; in the third, we control for age, income, occupation and education of the spouses and so on.

Interpretation: for each type of preference, the first column indicates the coefficient of correlation corresponding to the specification, the second column indicates the $R^2$, and the third column indicates the share of the initial elasticity that is explained by the addition of control variables. For example, for patience, controlling for the age of the spouses reduces the correlation from 0.37 to 0.29; we therefore explain 1 - (0.29/0.368)=21.2% of the initial correlation.