Assimilation in the risk preferences of couples*

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Abstract

We experimentally measure the risk preferences of 347 couples representative of rural couples in the Ethiopian highlands. Using aggregate measures we replicate previous findings from the West. The richness of our measures allows us to move beyond previous results by obtaining correlation coefficients at the couple level. We find a strong correlation between the strength of the correlation in risk preferences and how long a couple has been married. The results thus provide direct evidence for assimilation in the risk preference of spouses. Assortative mating appears to be much less important. This implies that preferences can change over the lifetime rather than being innate. It furthermore sheds light on the speed with which preferences may change within a population.

Keywords: risk preferences; transmission of preferences; gender effects;

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1 Introduction

Risk preferences play a fundamental role for almost all economic decisions. It may thus seem all the more surprising that relatively little is known to date on how risk preferences are determined. This can in part be explained by the traditional economic assumption that preferences are innate. We add to recent accounts casting doubt on the innate nature of preferences by presenting evidence on the correlation of risk preferences within couples in the Ethiopian highlands. By obtaining correlation coefficients and regressing those coefficients on the average age of the couple as a proxy for how long they have been married, we provide direct evidence for assimilation as the most important driver of the correlation. This suggests that preferences can change over the lifespan, and additionally sheds light on the speed with which preferences may be transmitted.

It has been known for some time that preferences are correlated within the family (Charles and Hurst, 2003; Kimball, Sahm and Shapiro, 2009). Cesarini, Dawes, Johannesson, Lichtenstein and Wallace (2009) and Zhong, Chew, Set, Zhang, Xue, Sham, Ebstein and Israel (2009) presented evidence of genetic transmission of risk preferences from parents to their children using twins, although the estimated strength of the effect differs considerably between the two studies. In a seminal paper, Dohmen, Falk, Huffman and Sunde (2012) showed that risk preferences are highly correlated within couples, as well as between parents and children (see also Kimball et al., 2009). They concluded that such similarities in the couple were due to positive assortative mating, i.e. the selection of partners based on similar risk preferences.

We revisit the issue of whether correlations of risk preferences within the couple are due to positive assortative mating or to the assimilation of preferences over time. The difference is important for several reasons. For one, positive assortative mating is in principle compatible with innate preferences—people choose spouses who are similar in risk preferences to start with. Assimilation, on the other hand, constitutes a clear departure from an account in which preferences are innate. This also has implications for theories that incorporate risk preferences. For instance, Galor and Michalopoulos (2012) presented a model in which risk preferences act as a determinant of long term growth processes through their role as determinants of entrepreneurship. The speed at which risk preferences can be transmitted is thereby of prime importance, as it determines how quickly transitions between different growth regimes might be observed (see Vieider, Chmura and Martinsson, 2012, for a discussion). By pointing to the possibility that risk preferences may be transmitted between peers rather than just from parents to children, evidence of assimilation suggests that such transitions could take place very rapidly. Assimilation also allows for accounts in which parents consciously manipulate the risk preferences of their children (Doepke and Zilibotti, 2014; Klasing, 2014).

We present evidence on the correlation of risk preferences in couples selected from a representative sample of the rural Ethiopian highlands. Ethiopia constitutes a good testing ground for our question. Other than in most Western countries, couples do generally not cohabit before marriage, and divorce is virtually unheard of, eliminating some potential confounds in Western data. The wide geographical spread of our sample allows us to test for correlations in counterfactual couples by geographical proximity and distance. We were able to obtain very rich measures of risk preferences using high real incentives. This allows us to obtain a correlation coefficient at the level of the couple, and then to enter this coefficient in regression analysis. This promises to provide more direct and stronger evidence for potential assimilation than previous approaches in which samples had to be subdivided into groups according to how long they had been married, which prevented the inclusion of additional controls.

We start by replicating a number of results observed in the previous literature. We find strong correlations in the couple using aggregate measures, which hold both with our incentivised measures and using hypothetical survey measures employed in some of the previous literature. We also replicate results indicating that risk preferences are similar for geographically proximate counterfactual couples. We find no difference in the overall risk preferences of men and women within our couples, which is consistent with recent evidence showing that gender effects may be dependant on subtle social clues (Booth and Nolen, 2012). We then move beyond the previous literature by analysing the determinants of correlations in regression analysis. The regressions clearly show that the correlation of risk preferences within the couple is strongly increasing in the average age of the couple, taken to be a proxy for how long the couple has been married. This effect is stable to inserting a number of controls. We conclude the paper by discussing the implications of this finding.

2 Experimental setup and method

The data were collected in the context of a larger survey study collecting data from 1000 households in the wider Nile Basin in Ethiopia. The study area included four regions of the Ethiopian highlands, in which twenty Woredas (administrative districts) were selected in a stratified selection process based on representation of agro-climatic zones. From each Woreda, 50 households were randomly selected from municipal household lists. We then randomly selected 350 couples from all couples who take part in the survey. The selection of only 350 couples was due to budget constraints. Three couples could not be found at home after repeated visits, which leaves us with a complete sample of 347 couples. All experiments and surveys were run in May and June 2013.

Ethiopia has some characteristics that make it well suited for the investigation of our topic. For one, couples typically start cohabiting only after marriage, which minimises issues of previous cohabitation confounding findings. Divorce is virtually unheard of, which excludes confounds deriving from higher divorce rates amongst poorly matched couples. Marriage age is almost universally young, with median marriage age of 16 years for women and of 24 years for men (ORC, 2006). This makes the average age in the couple a good proxy for how long a couple has been married. Relatively little migration means that we can test for the similarity of preferences by geographical proximity (Dercon and Porter, 2014; Di Falco and Bulte, 2013).

We elicit certainty equivalents (*CEs*) to measure risk preferences (Abdellaoui, Baillon, Placido and Wakker, 2011; Bruhin, Fehr-Duda and Epper, 2010; Sutter, Kocher, Glätzle-Rützler and Trautmann, 2013). CEs are easy to explain, and the sure amounts of money to be used are naturally limited between the lower and upper amount of the prospect. They are also flexible enough to allow for the detection of risk-seeking as well as risk neutral and risk averse behaviour. Overall, we elicited 14 CEs per subject using binary prospects varying in probabilities and outcomes. The design follows the one employed by Vieider, Lefebvre, Bouchouicha, Chmura, Hakimov, Krawczyk and Martinsson (2015) with students across 30 countries, but we restricted ourselves only to known probabilities and gains due to time constraints. Every time a major change occurred in the decision tasks (e.g. a change in probabilities or outcomes, or from gains to losses), the enumerator pointed out the change and gave additional explanations of what this would involve. In the course of the explanation, subjects were also shown bags containing numbered ping pong balls that would be used for the random extraction, and were encouraged to examine their contents. This served to make the decision problems more tangible and concrete.

The prospects were presented to subjects in a fixed order, whereby first 50-50 prospects were presented in order of ascending expected value, and then the remaining prospects were presented in order of increasing probability. The fixed order was kept so as to make the task less cognitively demanding for subjects, since in the fixed ordering only one element would change from one decision task to the next, which could be easily pointed out by the enumerator. To test whether such a fixed ordering of tasks might influence decisions, we ran a large-scale pilot at Ho-Chi-Minh-City University involving 330 subjects.[1] The pilot revealed no differences between the fixed ordering used here and a random ordering.

CEs were elicited in individual interviews by a team of 20 enumerators. The enumerators were extensively trained before going to the field, and acquired experience by running pilot experiments. The experiment was preceded by a careful explanation of the decision tasks. Subjects were told that they would face choices between amounts of money that could be obtained for sure and risky allocations, in which different amounts would obtain with some probabilities indicated next to them. At the end, one of the tasks would be extracted at random, and one of the choices between a sure amount and the prospect would be played for real money (the standard procedure in this type of task). A risk neutral decision maker stood to win the PPP-equivalent of €18—a substantial sum in Ethiopia, corresponding to an income of about two weeks for the median participant. The experiments in the couple were generally run at the same time. First, the two spouses were separated so that they could not see or hear each others decisions. Two enumerators would then elicit the risk preferences of the spouses at the same time. They payout took place separately, and discretely out of sight from the spouse.

We also asked subjects about their willingness to take risks to obtain an alternative measure of risk taking behaviour. The question has been validated by Dohmen, Falk, Huffman, Sunde, Schupp and Wagner (2011) for a representative sample of the German population, and by Vieider et al. (2015) for an international sample of students across 30 countries. The question reads as follows:

[1]The pilot was run in Vietnam as it was meant to inform a number of experiments to be conducted with the same type of tasks. This also explains the large number of subjects in the pilot, which were included to guarantee enough statistical power to make this test meaningful.

How do you see yourself? Are you generally a person who is fully willing to take risks or do you try to avoid taking risks? Please tick a box on the scale below, where 0 means "risk averse" and 10 means "fully prepared to take risks":

risk averse										fully prepared to take risks
0	1	2	3	4	5	6	7	8	9	10
O	O	O	O	O	O	O	O	O	O	O

We normalise our CEs to make them more comparable across prospects. We use $\tau_i = \frac{ce_i - y_i}{x_i - y_i}$ as a measure of risk tolerance, where $x_i > ce_i > y_i \; \forall i$. This makes sure that our measure is always contained within the unit interval, which reduces distortions in the correlation analysis due to different ranges in the prospects. The normalised risk tolerance can be compared directly to the probability of winning, with $\tau_i > p_i$ indicating risk seeking, $\tau_i = p_i$ risk neutrality, and $\tau_i < p_i$ risk aversion. Using alternative normalisations does not alter our results.

3 Results

3.1 Descriptive data and gender effects

Descriptives of risk preferences are shown in figure 1, separately for the male household heads and their spouses. To avoid informational overload, the graph shows only risk tolerance for prospects resulting in either €20 or 0 PPP, by probability level (results for other prospects are similar and can be found in the appendix). Both spouses are risk seeking on average, as can be seen by directly comparing the normalised risk tolerance to the probability of winning, traced in the graph. Only for the prospects offering the largest probability of winning do we observe slight risk aversion. This corresponds to previous evidence from the Ethiopian highlands obtained using similar measures (Vieider, Beyene, Bluffstone, Dissanayake, Gebreegziabher, Martinsson and Mekonnen, 2014). It amounts to a generalisation to the overall trends found in international comparisons using student data (Rieger, Wang and Hens, 2014; Vieider et al., 2012), which found students from poorer countries to be systematically more risk tolerant than students from rich countries.

There is no difference in risk tolerance between spouses on average across the 14 tasks ($z = 1.584, p = 0.113$; signed-rank test). In individual prospects there are no differences

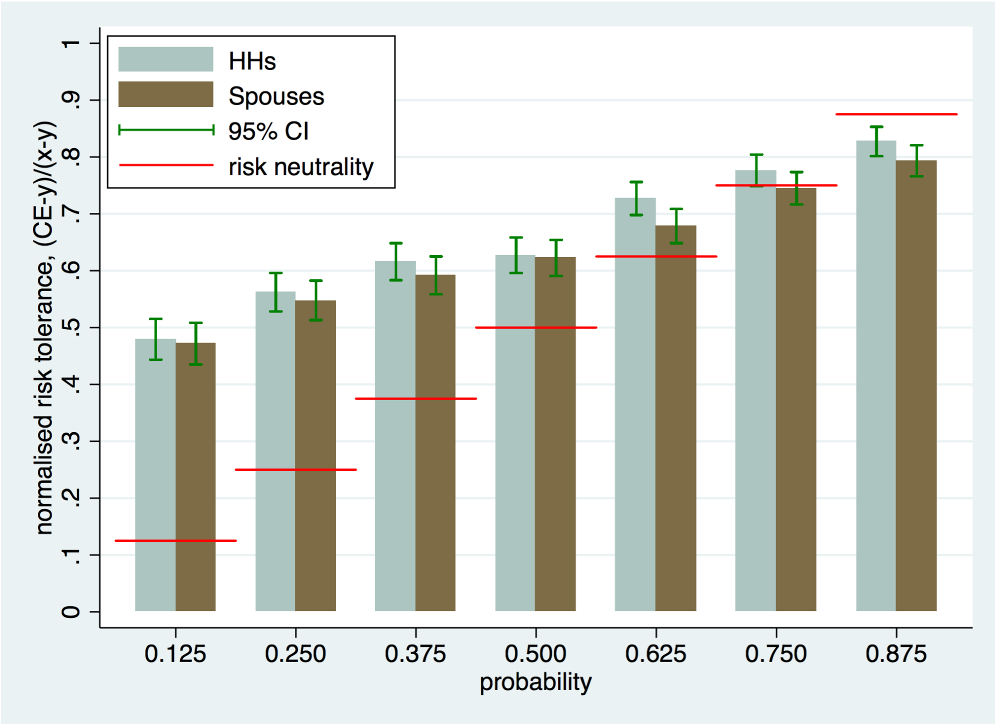

Figure 1: Risk premia by prospect and gender, for $(20, p_i; 0)$

between spouses up to and including a probability of 0.5. For very large probabilities, however, women are somewhat more risk averse than their husbands (statistics and tests for all the prospects can be found in appendix A). This corresponds to findings in structural models showing that gender effects may interact with the probability of winning in a prospect, rather than having a uniform effect on risk preferences (L'Haridon and Vieider, 2015). It is also consistent with recent evidence from a large meta-analysis showing that gender effects may be weak or non-existent when measured in multiple choice lists (Filippin and Crosetto, 2015). The results show that gender effects may vanish once one keeps the economic background characteristics constant. Comparing male and female household heads in Ethiopia, Vieider et al. (2014) found large differences, which are likely driven by the vulnerability of female household heads.

Our findings stand in marked contrast to those of Dohmen et al. (2012), who found strong gender effects within the couple, with women more risk averse than men. To determine whether the difference in findings is due to the differences in tasks or differences in subject pools, we further examine the gender effect in terms of self-declared willingness to take risks. We find a significant correlation between our average incentivised measure and self-declared willingness to take risk for both men ($\rho = 0.235, p < 0.001$; Spearman rank correlation) and women ($\rho = 0.182, p < 0.001$). Other than for our incentivised measures, self-declared willingness to take risks is significantly lower for women than for men ($z = 3.425, p < 0.001$, signed-rank test). The difference with the findings of Dohmen et al. (2012) thus appears to derive from the task used rather than from the subject sample.

Table 1: Regressions of risk tolerance, HHs and spouses

	I		II		III	
	HH	SP	HH	SP	HH	SP
age	-0.004	-0.019	-0.009	-0.024	-0.009	-0.025
	(0.014)	(0.015)	(0.013)	(0.015)	(0.013)	(0.015)
literate	0.030	0.031	0.023	0.026	0.014	0.021
	(0.029)	(0.035)	(0.028)	(0.037)	(0.028)	(0.037)
land size			0.060***	0.052***	0.055***	0.052***
			(0.011)	(0.015)	(0.012)	(0.015)
steep					-0.493***	-0.376***
					(0.093)	(0.091)
total wealth					0.016	0.001
					(0.012)	(0.018)
constant	0.640***	0.631***	0.642***	0.630***	0.651***	0.635***
	(0.021)	(0.017)	(0.021)	(0.016)	(0.020)	(0.017)
N	342	327	336	321	336	321
R^2	0.005	0.010	0.061	0.048	0.099	0.068

Robust standard errors in parentheses
** $p < 0.05$, *** $p < 0.01$

Before we move on to correlation analysis, we investigate determinants of risk preferences for household heads and spouses. This serves to make sure that any effects found below are not mechanical or artificial, which could happen if differing effects for men and women push preferences across some dimensions closer to each other. We are particularly interested in age effects, as we intend to use the average age in the couple as a proxy for how long they have been married. Table 1 shows the regressions. Neither age nor being literate show any effects. Regression II adds land size, which in rural Ethiopia may act as a proxy for income (Vieider et al., 2014). Risk tolerance is strongly increasing in land owned, in accordance with most previous evidence. Finally, we add steepness of the land and total wealth as additional controls. Steepness usually lowers the productivity of land in the Ethiopian highlands, and we find the expected negative effect on risk tolerance. Wealth shows no significant effect. Most importantly, the predictors are perfectly aligned for the spouses, making mechanical causes for correlations unlikely. Notwithstanding these significant correlates, the variance explained in the regression remains very low—large amounts of unexplained heterogeneity are indeed the norm for risk preferences (von Gaudecker, van Soest and Wengström, 2011).

3.2 Correlation analysis using aggregate measures

We start by examining aggregate risk preferences, using the simple mean of the 14 risk tolerance measures per subject. The correlations we find within the couple are strong, with Pearson's $r = 0.498, p < 0.001$ (we use Pearson correlations inasmuch as we are interested in absolute similarities beyond ranks; all results are stable if we use Spearman correlations instead). Kimball et al. (2009) reported a correlation in the couple of 0.41 based on a hypothetical task gauging risk taking in labor markets. Dohmen et al. (2012) found a correlation of 0.34 in a representative sample of the German population using the survey question on general willingness to take risks. Our measure, being a mean of several CEs, is likely less affected by noise than either of those measures. It also has a finer resolution. Using the qualitative scale instead, we find a correlation of $r = 0.335, p < 0.001$, which is almost identical to the one in the German sample.

We next explore the measure for the 120,062 counterfactual couples obtained by pairing all household heads with all spouses but their own. This allows us to establish a baseline, and to rule out that correlations in our aggregate measure are purely driven by mechanical factors. For instance, de Brauw and Eozenou (2014) found no correlation in couples in Mozambique once they controlled for this type of baseline correlation. We would expect the correlations for these artificial pairings to be zero on average, which is indeed what we find $r = -0.001, p = 0.566$ (the same holds for the willingness to take risk question: $r = -0.001, p = 0.748$). Having established this benchmark, we can further explore the correlations by subgroups of the counter-factual couples.

We start from the regional level. We have four regions in our sample, Tigray (64 couples), Amhara (80 couples), Oromiya (157 couples), and SNNP (43 couples). Including only counterfactual pairings with both spouses from the same region ($N = 33,118$), we obtain a correlation coefficient of $r = 0.116, p < 0.001$. If we further reduce our geographical focus to the level of the Kebele (an administrative district; $N = 12,374$), the correlation further increases to $r = 0.234, p < 0.001$. The smallest administrative level in our data is the Got, or village level. If we only consider counterfactual couples at this level ($N = 2,480$), the correlation further increases to $r = 0.261, p < 0.001$. This provides an indication that geographic proximity results in similar preferences, and corresponds closely to results reported for Germany by Dohmen et al. (2012).

3.3 Determinants of within-couple correlations

The next step will be to investigate the determinants of the correlations in real couples. To this end, we obtain correlation coefficients at the level of the couple. Table 2 shows a regression of our 347 correlation coefficients on background characteristics of the couple. We are most interested in age, which is taken to be the average age of the couple, and normalised to be 0 for the youngest couple in our sample. At 20.5 years, the average age of the youngest couple is indeed almost identical to the statistical age of the median Ethiopian couple (ORC, 2006). We take this variable to serve as a proxy for how long a couple has been married, since we do not have direct data on this. In case of assortative mating, we would expect there to be no effect of age on the correlation. If, on the other hand, the correlation is due to assimilation, then we would expect a positive correlation with average age.

Regression I show that age has a strong positive effect on the correlation of risk preferences within the couple. Regression II adds age squared to look for non-linear effects, but finds none. Regression III further adds the age difference in the couple, which also shows no effects. Finally, regression IV adds our income proxy, land size, and a variable capturing the difference in literacy within the couple. These controls serve the purpose of determining whether it is purely income effects that drive similarities in the risk preferences of couples over time. None of these variables shows an effect, indicating that the correlations are not purely driven by income effects. The age effect remains strong and highly significant throughout. The effect is also stable to using the age of either spouse instead of the average age in the couple.

The average age variable used is normalised such that the youngest couple in our data set is normalised to 0. The constant may thus be interpreted as the correlation found for the youngest couple in our data, which presumably got married very recently. At 0.313, that value is not much larger than the correlation found for counterfactual couples from the same administrative district or Kebele, which is $r = 0.310$.[2] Indeed, the two are not significantly different at conventional levels ($z = 1.641, p = 0.101, N = 12,180$). This seems to indicate that assortative mating does not play a strong role in our sample to start with.

[2]The couple-level correlations are higher than the aggregate correlations discussed above. This derives from the fact that the lotteries employed have certain chracteristics that produce a positive base correlation due to both mechanical and behavioural factors.

Table 2: Regressions of correlation coefficients, real couples

	I	II	III	IV
mean age norm	0.007***	0.007***	0.007***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
mean age sqr		-0.002	-0.001	-0.007
		(0.012)	(0.012)	(0.012)
age diff			0.000	-0.000
			(0.003)	(0.003)
land size				-0.037
				(0.025)
literacy diff				-0.006
				(0.029)
constant	0.313***	0.312***	0.311***	0.297***
	(0.050)	(0.050)	(0.058)	(0.067)
N	345	345	345	323
R^2	0.034	0.034	0.030	0.041

Robust standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4 Conclusion

Risk preferences have been found to be highly correlated within the couple, as well as between parents and children. What drives such correlations promises to shed light on the determinants of risk preferences more in general. Genetic explanations might suggest that preferences are innate (Cesarini et al., 2009). Such an account would also be consistent with positive assortative mating within the couple. By showing direct evidence for the assimilation of risk preferences within the couple, we posit that risk preferences can change over time and adapt to changing circumstances. This is consistent with accounts showing the dependence of risk preferences on subtle social cues (Booth and Nolen, 2012; Booth, Cardona-Sosa and Nolen, 2014). The results thus support theories that rely on quick transitions in risk preferences between generations, either wilfully instilled by parents into children to adapt to economic circumstances (Doepke and Zilibotti, 2014; Klasing, 2014), or transmitted culturally with potential tipping points accelerating the spread (Galor and Michalopoulos, 2012; Vieider et al., 2012).

Our conclusion of assimilation being the main driver of the correlation of risk preferences in the couple departs from the conclusions reached in previous studies. In particular, Dohmen et al. (2012) concluded that the correlation of risk preferences found within couples is due to assortative mating. They based this conclusion on splitting the sample into sub-samples that had been married relatively shortly and for much longer period, and then compared the correlation coefficients. They concluded that the coefficients were very similar, taking this as evidence for assortative mating. Reanalysing the same data and using the same technique of splitting the sample into different age groups (but different econometric techniques accounting for errors), Bacon, Conte and Moffatt (2014) found some evidence for correlations increasing in years of marriage. They nevertheless concluded that positive assortative mating was the main factor underlying correlations in the risk preferences of couples.

The difference in our results may stem from a number of factors. For one, even recently married couples may have been together and may have cohabited for long periods in Germany. The same is very unlikely to be true in Ethiopia. Furthermore, simply comparing correlations in two different groups is a relatively coarse method for determining potential effects of assimilations, as the groups may differ along other dimensions that cannot be controlled for. We can directly estimate the effect of years of marriage (as proxied by average age in the couple) on the couple-level correlation coefficient. This is clearly a much more powerful method, which at the same time permits us to control for other potentially relevant group characteristics.

A Comparison of risk premia in the couple by prospect

Table 3: Summary measures of aggregate risk preferences by prospect

p	x	y	$\frac{ce_i - y_i}{x_i - y_i}$ HHs	$\frac{ce_i - y_i}{x_i - y_i}$ spouses	Ranksum test
0.50	40	0	0.712	0.726	$z = -0.298, p = 0.765$
0.50	80	0	0.671	0.665	$z = 1.129, p = 0.259$
0.50	160	0	0.627	0.622	$z = 0.781, p = 0.435$
0.50	240	0	0.595	0.591	$z = 1.217, p = 0.223$
0.50	240	80	0.591	0.575	$z = 0.936, p = 0.334$
0.50	240	160	0.621	0.632	$z = -0.735, p = 0.462$
0.125	160	0	0.306	0.296	$z = 0.956, p = 0.339$
0.125	160	40	0.653	0.650	$z = 0.470, p = 0.638$
0.250	160	0	0.562	0.548	$z = 1.028, p = 0.304$
0.375	160	0	0.616	0.592	$z = 1.680, p = 0.093$
0.625	160	0	0.727	0.678	$z = 2.833, p = 0.005$
0.750	160	0	0.776	0.745	$z = 1.912, p = 0.056$
0.875	160	0	0.827	0.793	$z = 2.084, p = 0.037$
0.875	160	40	0.822	0.791	$z = 1.964, p = 0.049$
mean			0.652	0.635	$z = 1.584, p = 0.113$

References

Abdellaoui, Mohammed, Aurélien Baillon, Lætitia Placido, and Peter P. Wakker (2011) 'The Rich Domain of Uncertainty : Source Functions and Their Experimental Implementation.' *American Economic Review* 101, 695–723

Bacon, Philomena M., Anna Conte, and Peter G. Moffatt (2014) 'Assortative mating on risk attitude.' *Theory and Decision* 77(3), 389–401

Booth, Alison L., and Patrick Nolen (2012) 'Gender differences in risk behaviour: does nurture matter?*.' *The Economic Journal* 122(558), F56–F78

Booth, Alison, Lina Cardona-Sosa, and Patrick Nolen (2014) 'Gender differences in risk aversion: Do single-sex environments affect their development?' *Journal of Economic Behavior & Organization* 99, 126–154

Bruhin, Adrian, Helga Fehr-Duda, and Thomas Epper (2010) 'Risk and Rationality: Uncovering Heterogeneity in Probability Distortion.' *Econometrica* 78(4), 1375–1412

Cesarini, David, Christopher T. Dawes, Magnus Johannesson, Paul Lichtenstein, and Björn Wallace (2009) 'Genetic Variation in Preferences for Giving and Risk Taking.' *Quarterly Journal of Economics* 124(2), 809–842

Charles, Kerwin Kofi, and Erik Hurst (2003) 'The Correlation of Wealth Across Generations.' *Journal of Political Economy* 111(6), 1155–1182

de Brauw, Alan, and Patrick Eozenou (2014) 'Measuring risk attitudes among Mozambican farmers.' *Journal of Development Economics* 111, 61–74

Dercon, Stefan, and Catherine Porter (2014) 'Live aid revisited: Long-term impacts of the 1984 Ethiopian famine on children.' *Journal of the European Economic Association* 12(4), 927–948

Di Falco, Salvatore, and Erwin Bulte (2013) 'The Impact of Kinship Networks on the Adoption of Risk-Mitigating Strategies in Ethiopia.' *World Development* 43, 100–110

Doepke, Matthias, and Fabrizio Zilibotti (2014) 'Culture, Entrepreneurship, and Growth.' In 'Handbook of Economic Growth,' vol. 2

Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde (2012) 'The Intergenerational Transmission of Risk and Trust Attitudes.' *Review of Economic Studies* 70(2), 645–677

Dohmen, Thomas, Armin Falk, David Huffman, Uwe Sunde, Jürgen Schupp, and Gert G. Wagner (2011) 'Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences.' *Journal of the European Economic Association* 9(3), 522–550

Filippin, Antonio, and Paolo Crosetto (2015) 'A Reconsideration of Gender Differences in Risk Attitudes.' *Management Science, forthcoming*

Galor, Oded, and Stelios Michalopoulos (2012) 'Evolution and the Growth Process: Natural Selection of Entrepreneurial Traits.' *Journal of Economic Theory* 147(2), 759–780

Kimball, Miles S., Claudia R. Sahm, and Matthew D. Shapiro (2009) 'Risk Preferences in the PSID: Individual Imputations and Family Covariation.' *American Economic Review, Papers and Proceedings* 99(2), 363–368

Klasing, Mariko J. (2014) 'Cultural change, risk-taking behavior and implications for economic development.' *Journal of Development Economics* 110, 158–169

L'Haridon, Olivier, and Ferdinand M. Vieider (2015) 'All over the map: Heterogeneity of risk preferences across individuals, contexts, and countries.' *Working paper*

ORC, Macro (2006) *Ethiopia Demographic and Health Survey* (Addis Ababa, Ethiopia: Central Statistical Agency)

Rieger, Marc Oliver, Mei Wang, and Thorsten Hens (2014) 'Risk Preferences Around the World.' *Management Science* 61(3), 637 – 648

Sutter, Matthias, Martin G Kocher, Daniela Glätzle-Rützler, and Stefan T Trautmann (2013) 'Impatience and Uncertainty: Experimental Decisions Predict Adolescents' Field Behavior.' *American Economic Review* 103(1), 510–531

Vieider, Ferdinand M., Abebe Beyene, Randall A. Bluffstone, Sahan Dissanayake, Zenebe Gebreegziabher, Peter Martinsson, and Alemu Mekonnen (2014) 'Measuring risk preferences in Ethiopia: Further evidence on a risk-income paradox, and on risk and religion.' *WZB Working Paper*

Vieider, Ferdinand M., Mathieu Lefebvre, Ranoua Bouchouicha, Thorsten Chmura, Rustamdjan Hakimov, Michal Krawczyk, and Peter Martinsson (2015) 'Common components of risk and uncertainty attitudes across contexts and domains: Evidence from 30 countries.' *Journal of the European Economic Association* 13(3), 421–452

Vieider, Ferdinand M., Thorsten Chmura, and Peter Martinsson (2012) 'Risk Attitudes, Development, and Growth. Macroeconomic Evidence from Experiments in 30 Countries.' *WZB Working paper*

von Gaudecker, Hans-Martin, Arthur van Soest, and Erik Wengström (2011) 'Heterogeneity in Risky Choice Behaviour in a Broad Population.' *American Economic Review* 101(2), 664–694

Zhong, Songfa, Soo Hong Chew, Eric Set, Junsen Zhang, Hong Xue, Pak C. Sham, Richard P. Ebstein, and Salomon Israel (2009) 'The Heritability of Attitude Toward Economic Risk.' *Twin Research and Human Genetics* 12(1), 103–107