



Intergenerational transmission of risk attitudes in Burkina Faso

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Abstract

Previous research shows that transmission of attitudes in the family is gendered. However, there are limited findings about intergenerational transmission of risk attitudes and whether it is gendered. This study replicates the findings by Dohmen et al. (Rev Econ Stud 79(2):645–677) for Germany by using quantitative data from Burkina Faso in 2014 to analyze three different self-reported risk questions. Our results show a strong intergenerational transmission of attitudes from parents to children in which positive assortative mating strengthens the parents' transmission of attitudes to her child. Mothers' transmissions are stronger for their daughters than sons. For fathers, the pattern is inverted. Our findings also show the existence of heterogeneity in intergenerational transmission within a male- and female-dominated risk domain. This supports the gender-specific role model hypothesis. Furthermore, we find support for the transmission of attitudes from the local environment to the child, but the strength and significance of this transmission decrease when controlling for parents' attitudes.

Keywords Risk attitudes · Intergenerational transmission · Socialization · Gender · Burkina Faso

JEL Classification D81 · J6 · Z1

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1 Introduction

During the past century, risk taking has emerged as a central concept for understanding economic behavior under uncertainty (e.g., Hartog et al. 2003; Guiso and Paiella 2005; Tanaka et al. 2010). Previous research has looked at which individual characteristics determine risk taking in developed (Dohmen et al. 2011) and developing (Yesuf and Bluffstone 2009) countries. The findings indicate that individual characteristics such as gender, parental education, own education, and age are important determinants of risk attitudes. However, the literature remains sparse and several gaps exist, particularly regarding the intergenerational transmission of risk behavior and whether it is gendered. Understanding if the process of risk-attitude transmission and, hence, formation is gendered is important as it could be a potential mechanism for understanding the long-lasting effects on individuals' outcomes and the rise of, for instance, the gender gap. This is because the willingness to take risks is a crucial determinant of economic decision making (Emran and Shilpi 2019). Therefore, the aim of this paper is to provide evidence regarding the existence of an intergenerational transmission of risk attitudes in a developing country and investigate whether risk attitudes are gendered depending on specific risk domains. This is in line with the recent literature within the intergenerational transmission of other outcomes in which not only father–son transmission is studied, but also the transmission of both parents on their respective sons and daughters (e.g., Niknami 2010; Eriksson 2015). For instance, Fessler and Schneebaum (2012) find that, in terms of intergenerational transmission of educational outcomes, parents' same-gender relationship to their children is stronger than the cross-gender relationship.

By using a dataset from Burkina Faso, we make several contributions to the literature. By replicating the finding by Dohmen et al. (2012) for Germany, first we analyze whether intergenerational transmission of risk attitudes from parents to children exist in a development setting for risk taking in general, traffic, and financial matters. We also investigate whether prevailing attitudes in the local environment are transmitted to the child (in addition to attitudes from parents) and test as a robustness check if parents, through positive assortative mating, instill their own attitudes in the child. Second, since there are strong traditional gender roles in Burkina Faso, we test whether mothers' and fathers' transmission of risk attitudes to their daughters is the same as to their sons. This is important due to the fact that Burkina Faso lacks strong and stable institutions; thus, the role of the family and the norms within it becomes more relevant for individual decision making. Third, as traffic is a male-dominated domain, while the daily financial transaction performed in a household is female dominated in Burkina Faso, we would analyze whether children are more or less influenced by their father or mother in the gendered risk domains of traffic and financial matters.

We use the third and fourth rounds of the multipurpose Household Budget Survey (HBS) of Burkina Faso, collected during 2014. Each round of the HBS is representative of the Burkinabé population and includes 10,800 households across the 13 regions in the country. The analysis focuses on self-reported risk attitudes collected from all household members with the age of 18 years and older.

Our findings are consistent with Dohmen et al. (2012), showing a positive and strong transmission of risk attitudes between generations. We see a transmission of

attitudes from both mother and father to their child's risk taking within different domains. The intergenerational transmission is robust even with the inclusion of the local environment's influence. Moreover, since there are strong gender roles in Burkina Faso, we also find exceptions when compared to Dohmen et al. (2012). We find that the transmission of attitudes from mothers has a stronger associative effect on their daughters' risk attitudes compared to their sons. For fathers, we see the inverse effect. This is in contrast to Dohmen et al. (2012) as they find that the gender of the child does not matter for the transmission of attitudes. Furthermore, our results show that a heterogeneity exists in the intergenerational transmission of risk attitudes across risk domains. For instance, in the male-dominated risk domain (traffic), the transmission of risk attitudes from fathers to daughters is relatively stronger than in the female-dominated risk domain (financial matters). This gender heterogeneity in risk domains implies that children are socialized more by the parents in the domain that they are more exposed to.

2 Burkina Faso

Burkina Faso, as a country of study, is of particular interest as it is one of the most economically underdeveloped countries in the world, with a per capita gross domestic product (GDP) of \$704 USD in 2014. Formal financial services and social security are scarce or underdeveloped, the political climate is highly volatile, structural transformations are low, and demographic changes result in a constant pressure on labor markets and infrastructure (e.g., Sepahvand 2019). In such harsh conditions of uncertainty about the imminent future, investments are impeded. Thus, risk-taking behavior may be of particular importance to explain economic as well as social behavior on the individual level in the country. Moreover, there are inequalities in terms of who has access to scarce services in Burkina Faso. Those who need social services the most (the poor in rural areas) have less access to it (INSD 2015). This has led to rapid urbanization. The large share of urbanization will increase the competition for urban jobs, which creates challenges for the institutions to create more opportunities in the urban non-agricultural occupational sector. As the institutions are still underdeveloped, individual's willingness to take the risk of seeking an occupation opportunity increases.

3 Transmission of (risk) attitudes and why it should take place

Economists have long assumed that individuals possess stable attitudes over time that are identical across individuals (Stigler and Becker 1977). Until recently, there has been limited discussion of how and/or from whom these attitudes are endowed. The literature focusing on intergenerational transmission assumes the family to be an important institution for the endowment of attitudes, in particular the transmission from parents to children (Bisin and Verdier 2000). Moreover, intergenerational transmission of attitudes can be gendered and be affected both by the person who is transmitting the attitude (father or mother) but also the person to whom it is transmitted (son or

daughter). But why should transmission of risk attitudes between generations take place and be gendered?

The issue of what causes the transmission of risk attitudes between generations is important to address. One channel for the transmission of risk attitudes between parents and children is clearly nature. There is a branch in the literature that argues that the influence of parents on a child's personality is solely determined by genetics (Harris 1995). However, another side argues that parents or other adults, in their role as caregivers, are able to socialize children by exerting effort and transmitting their attitudes to them. This does not rule out whether genetics plays a role as well, but rather makes the point that socialization and genetics are not mutually exclusive processes. There are many socialization theories with somewhat different mechanisms that how socialization across generations would take place. The aim of this paper is not to distinguish these underlying mechanisms from each other, rather the purpose is to offer explanations as to why there should be transmission across generations and that the transmission is likely to be gendered. Therefore, this paper takes its starting point from the model proposed by Bisin and Verdier (2000) by first testing two channels for attitude transmission: the influence of parents and the influence of risk attitudes from the surrounding population. Thereafter, through social-learning theory (Bandura 1977) and role modeling, explain how transmission of risk attitudes across generations can be gendered.

3.1 Direct and oblique socialization

The model proposed by Bisin and Verdier (2000) starts by assuming that parents are endowed with some paternalistic altruism and respect for their children. Parents care for the (future) well-being of their children, but can only envision their children's future situation through their own preferences. That is why parents have a motivation to transmit their own preferences to their children. Bisin and Verdier (2000) assume that children are born with poorly defined attitudes and acquire their subsequent attitudes through observation, imitation, and adoption (i.e., socialization) of attitudes that they encounter either through direct or oblique/indirect transmission of attitudes between generations.

The direct socialization goes through parents. The incentive for parents to socialize their children is assumed to exist because of altruism. However, parents' altruism is guided by the belief that their own attitudes are the best for the child to have,¹ predicting a positive correlation between parents' and children's attitudes. One extension of this direct socialization is that parents engage in positive assortative mating; in order to be sure that they transmit their attitude to their children, they actively seek out a similar partner. Becoming a single parent (either due to divorce, separation, or deciding to raise the child individually) might be an indication of not having similar attitudes, thereby predicting a weaker association between transmissions from single parents to children.

¹ This particular form of "empathy" from the parents is crucial in the analysis, as it assumes that parents always want to socialize their children to their own attitudes, because children with attitudes different from their parents would choose actions that do not maximize their parents' attitudes.

Oblique socialization occurs when the socialization efforts of the parents fail (e.g., absence or death), and a randomly determined individual from the surrounding population influences the child. Oblique socialization can be operationalized by taking the average regional risk attitudes (Dohmen et al. 2012). Thus, oblique socialization can be a confounder between the transmissions from parents' to children's attitudes.

3.2 Gendered transmission of attitude

Models of transmission of attitudes within the family have typically been abstracted away from aspects such as gender, as the models are adopted for the institutional settings of developed countries. Dohmen et al. (2012) is a notable exception. In this paper, since we are looking at attitude transmission in a developing country with scarce or underdeveloped institutions, the family becomes a highly important and vital institution in shaping individuals' attitudes. Therefore, an additional explanation is included that could capture other mechanisms of socialization, such as the role of gender. Social-learning theory is one such explanation that provides a framework for understanding how individuals develop their attitudes across generations and how it can be gendered (Bandura 1977). For instance, children observe and pay attention to their surrounding and might imitate that behavior. This is true for both their local environment (neighborhood) and their parents. Although this imitation does not need to be gender appropriate, there are several elements that make it more likely for girls and boys to reproduce the behavior the society (and/or their nearest environment) considers appropriate for their gender. First, children are more likely to imitate the parents or role models if they are similar to one other, i.e., having the same sex. Second, parents (and other adults in the children's surrounding) will respond to the behavior of their children with either reinforcement or punishment. For instance, parents might be more encouraging toward a boy going outside of the home, thus being more exposed to traffic. Even if parents might not punish a girl if she were to venture outside of the household (thus being more exposed to traffic), they are more likely to discourage the action entirely. In all, if children view their same-sex parent performing a distinct set of activities, they will be more likely to model their own behavior and attitudes after those exhibited by the parents. This presumes that the transmission from mothers to daughters will be stronger than from fathers to daughters, and the transmission from fathers to sons will be stronger than from mothers to sons.

However, given the fact that gender is not only an inborn quality in individuals but instead a social construction that appears in daily life activities (West and Zimmerman 1987), it is not surprising that some specific activities are mostly performed by either men or women in Burkina Faso. Examples of these gender-specific activities are exposure to traffic and financial transactions. Men tend to a larger extent, go on long trips (for migration and/or seasonal work), and work longer periods outside of the household. Women conduct more of the household work and work that is in close proximity of the household. They are also more likely to stay home when it is dark outside (to prepare the meal, take care of the children, etc.), and if they go out, they tend not to do it alone. Therefore, both girls and boys are more likely to be exposed to traffic when accompanied by their fathers than mothers. When it comes to finan-

cial transactions, the opposite applies. For instance, women usually manage the daily financial transactions, such as buying groceries at the market (most likely accompanied by the children). Men manage larger but less-frequent financial transactions, such as buying a house or motorcycle, thereby predicting that fathers exert a relatively stronger influence in traffic on their daughters than they do in financial matters and mothers have a relatively stronger influence in financial matters on their sons than they do in traffic.

3.3 Previous literature on transmission of (risk) attitudes

Even though previous research on the transmission of risk attitudes from parents to children is limited, one exception being the study by Dohmen et al. (2012), the transmission of attitudes in other areas has received more attention in the economic literature (for an overview, see Guiso et al. (2006)).² In order to demonstrate the importance of socialization within the family, this section provides first a brief overview of previous empirical studies regarding the transmission of attitudes with diverse economic outcomes and then links it to the literature on how intergenerational transmission can be gendered.

Fernández et al. (2004) use World War II as a shock to women's labor force participation in order to look at their daughters' labor force participation. They found that married women whose mothers worked during the Second World War were more likely to work themselves when compared to those married women whose mothers did not work. Furthermore, they also found that sons of working mothers show preferences for working wives compared to sons of non-working mothers. Bisin and Verdier (2000) analyze whether or not there is an intergenerational transmission of ethnic and religious traits of marital-segregation decisions in the USA. They find that homogamy (i.e., intragroup marriage) is more prevalent in minority groups. They argue that the mechanism is family socialization of ethnic and religious traits. Tabellini (2008) focuses on the determinants behind which individuals choose to cooperate with each other, i.e., attitudes toward trust and social capital. His study relies on a cultural explanation that is transmitted from parents to their children in order to explain attitudes such as trust. Jennings et al. (2009) utilize longitudinal data in the USA in order to analyze political socialization within the family. Their findings show that children are more likely to adopt their parents' political orientation if the family is highly politicized.

The only previous study analyzing whether the intergenerational transmission of risk attitudes is gendered or not is Dohmen et al. (2012). They do not find any heterogeneity in Germany. However, in a country such as Burkina Faso, where the differences between men and women are larger than Germany and traditional gender roles more established, it is not unconceivable to assume intergenerational transmission to be gendered. Furthermore, there is extensive literature about the intergenerational transmission of gender roles based on time use data, which focuses on parental influences

² Previous research has shown a positive relationship between parents and their children in the choice of risky occupations (Lindquist et al. 2015), children's criminal behavior (Hjalmarsson and Lindquist 2013), and drunk driving (Hjalmarsson and Lindquist 2010). Our study is, in fact, closely related to this strand of the literature, since there is a clear connection between risky behaviors and risk preferences (de Walque 2013).

on children's gendered division of housework (Blair 1992; Cunningham 2001a; Cunningham 2001b; Evertsson 2006; Álvarez and Miles-Touya 2012). All of the findings indicate that children tend to take on similar gender behavior and attitudes as their same-sex parent when it comes to household work. The underlying argument is that gender-role acquisition occurs rather early in life and becomes fixed and unalterable (Cunningham 2001b; Wight 2008).

4 Data

Our data are from the multipurpose Household Budget Survey (HBS) conducted in Burkina Faso as a panel during the four quarters (rounds) of 2014. The HBS is a national representative survey including 10,800 households. Three questions on willingness to take risk in general, financial matters, and in traffic have been asked separately to 31,677 individuals aged 18 years and older in rounds three and four.³ The overall household response rate is approximately 95 percent for the third and fourth rounds.

Previous research has examined the validity of the same self-reported risk questions that we use by comparing them to incentivized lottery-type field experiments in developed countries (e.g., Dohmen et al. 2011; Lönnqvist et al. 2015), emerging countries (e.g., Hardeweg et al. 2013), and developing countries comparatively for 30 countries (Veider et al. 2015). These findings show that self-reported risk questions have a high validity. There is an ongoing scholarly discussion about the reliability of self-reported risk attitudes. Some argue that risk attitudes are more prone to have a measurement error that must be dealt with (e.g., Beauchamp et al. 2017), while others argue that any changes in risk attitudes between two time periods could be due to an exogenous shock (e.g., Dohmen et al. 2016). Sepahvand and Shahbazian (2017) have analyzed the test–retest reliability of this study's risk questions and find that they are satisfactory and, to a large extent, comparable to other test–retest reliability analyses by previous research using the same self-reported risk questions. Since the data used in this paper contain self-reported risk attitudes at two time periods, the average of the two time periods is used to increase the reliability of the measures, which is an additional strength of this study.

Previous research has addressed the importance of paying attention to data issues when discussing gender differences in risk taking. For instance, Nelson (2016) criticizes the line of research that claims to have found gender differences in risk attitudes without having enough statistical power to be able to claim such a finding and suggests that studies should at least have a sample size of 130 observations. Moreover, self-reported risk measurements are an easy and cost-effective way to elicit risk preferences (for an overview, see Charness et al. 2013) and can be used in different contexts and across time. This opens up the possibility for researchers to compare their results in a transparent way by using and analyzing the same measures as previous literature in order to deepen our understanding of how individual's risk attitudes are shaped

³ The interviewers were instructed to ask all individual questions separately and alone with the respondent, as there are other sensitive individual questions asked separately such as questions about sexual practices and domestic violence.

and to what extent they are gendered. This illustrates the importance of reliability and reproducibility of scientific findings (Dreber et al. 2015; Camerer et al. 2016).

The analytical sample consists of those children aged 18 years and older who have valid self-reported risk responses for both the third and fourth rounds, as well as both of their parents⁴: The analytical sample consists of 2120 children (as well as mothers and fathers) from 1339 households.⁵ By doing so, we are able to test for the presence of direct transmission of attitudes and control for and address the degree of assortative mating of parents. We would also be able to analyze how similar the risk attitudes are depending of gender. In other words, we analyze whether boys (or girls) are more likely to have similarities to their fathers' or mothers' risk attitudes. Moreover, since we measure risk attitudes in different domains, we are able to address whether the degree of transmission between generations is similar for risk taking in general, traffic, or financial matters. Furthermore, we have unique household denominations areas and region identifiers that enable us to analyze the impact of the surrounding population (i.e., local environment) on children's risk attitudes and thus test for the presence of oblique transmission of attitudes.

4.1 Descriptive data and variables

If there is a relationship between parental risk attitudes and their children's, there has to be a variation in parents' willingness to take risk, as the risk attitudes of mothers and fathers are the main explanatory variables in this study.

Figure 1 shows the fraction of mothers' and fathers' response (on a scale from 1 to 10) to the three different self-reported questions, illustrated in Panels A to C. Figure 1 clearly shows that mothers are less willing to take risks than fathers. The fact that women tend to report to be less risk willing in their response has also been found by Sepahvand and Shahbazian (2017); they use a larger sample in their analysis than in this study. This is also in line with the gender effect that Dohmen et al. (2012) find, as they show that mothers are less willing to take risks than fathers in Germany.

5 Result

In this section, we investigate the transmission of risk attitudes between generations and whether it is gendered. To do this, we start by examining the intergenerational transmission of attitudes. We also examine positive assortative mating and the transmission of attitudes from the local environment.

⁴ In order to get a more reliable measurement of risk attitudes and decrease measurement error, we use the average of the two time periods. However, all analyses have been performed with responses for both third and fourth rounds separately and the results are similar. Results are available upon request.

⁵ We have excluded all polygamous households from our analytical sample.

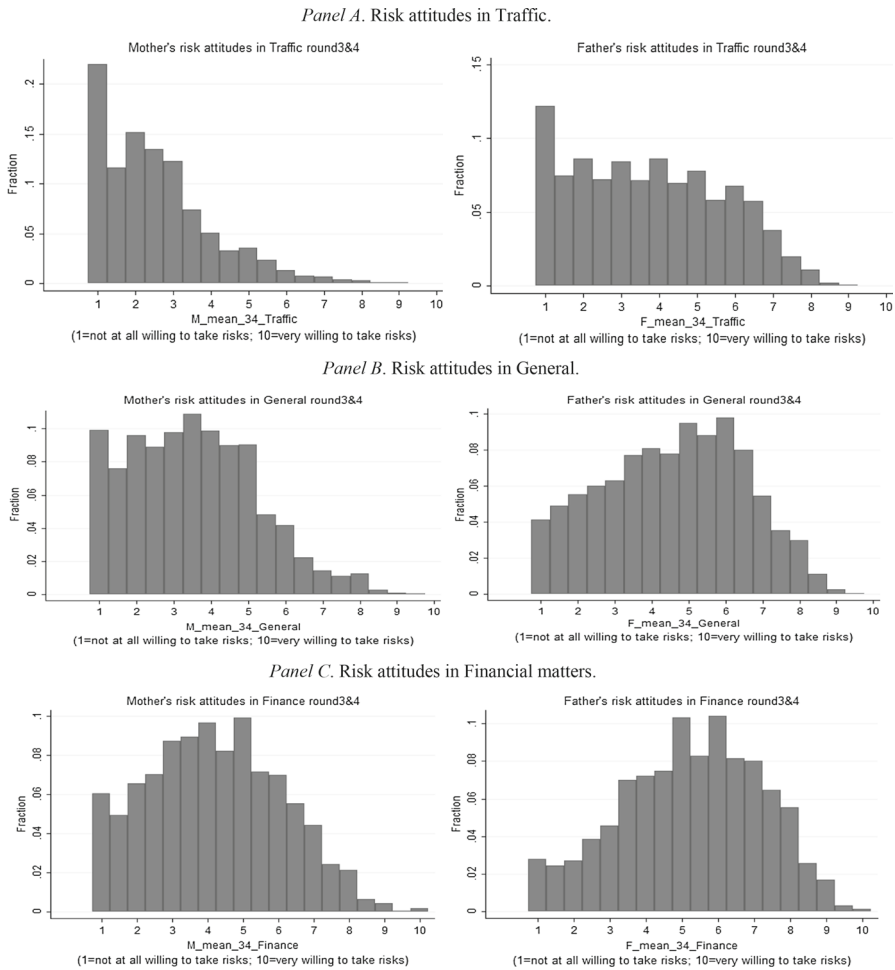


Fig. 1 Parents' willingness to take risks, average of 3 and 4. *Note:* On the *x*-axes, we have the distribution of responses for mothers and fathers to the risk questions in traffic, general, and financial matters on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk as the average of the third and fourth rounds. And the *y*-axes are in fractions

5.1 Transmission from parents to children

Previous research has indicated that willingness to take risk is correlated across domains, in which taking risk in general could be a proxy for other risk domains (e.g., Dohmen et al. 2011). However, with the recent integration of individual-difference psychology into economics (e.g., Almlund et al. 2011; Borghans et al. 2008), risk attitudes could arguably be domain specific (Weber et al. 2002) and gendered. Therefore, we would conduct our analysis with the general self-reported risk question and deepen our analysis by checking our results for risk attitudes in traffic and financial matters.

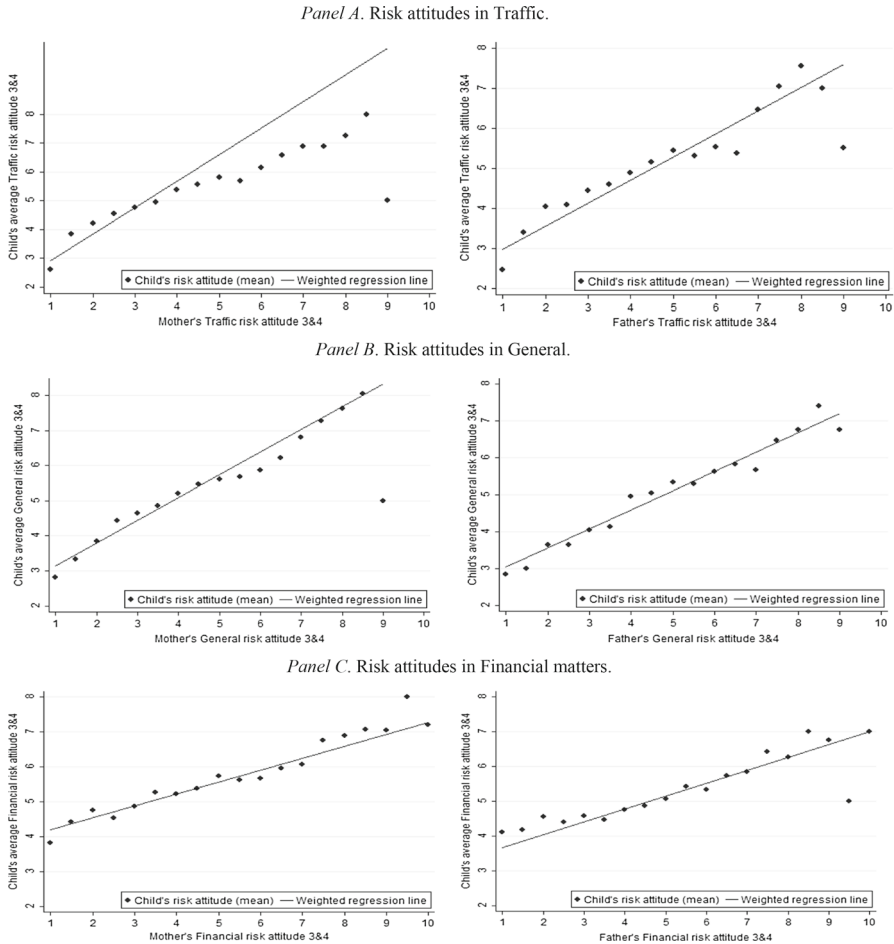


Fig. 2 Relationship between the risk attitudes of parents and children, average 3 and 4. *Note:* On the x-axes, we have the distribution of responses for mothers and fathers to the risk questions in general, traffic, and financial matters on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk as the average of the third and fourth rounds. And the y-axes are the children’s average self-reported willingness to take risks for a given willingness to take risks of mothers and fathers in general, traffic, and financial matters as the average of the third and fourth rounds

We begin our analysis by looking at Fig. 2, which gives us a first glimpse of the pattern in willingness to take risk in general between parents and children. Figure 2 shows children’s average willingness to take risk in three domains (illustrated in Panels A to C) for each given scale (from 1 to 10) of their parents self-reported risk attitudes. The regression lines in Fig. 2 are based on a weighted regression of children’s general risk attitudes on their mother’s and father’s general risk attitudes.⁶

⁶ The weights include the amount of children whose mothers or fathers state a particular value on the self-reported risk question.

Figure 2 indicates, in line with Dohmen et al. (2012), a positive relationship between children's willingness to take risk and their mother's or father's willingness to take risk in general. However, extending the findings of Dohmen et al. (2012) that concentrate only on the general risk domain, the same positive relationship is also seen for risk taking in traffic and financial matters.⁷

The average age of children in the sample is 24.4 years (SD 6.27). The oldest child is 56 years old. Half of the children in the sample are older than 22 years old. The average age of mothers is 49.8 (SD 8.97) and fathers 60.6 years old (SD 10.75).

Table 1 shows children's willingness to take risk in general as the dependent variable regressed on the main explanatory variables being children's mother's and father's willingness to take risk in general, while controlling for several confounding factors.⁸ For a detailed overview of the control variables used in this study, see Sepahvand and Shahbazian (2017). The same procedure has been performed for risk taking in traffic and in financial matters.⁹

Starting with risk attitudes in general, as shown in Table 1, M1 indicates that on average children show a higher willingness to take risk in general as their parents' willingness to take risk in general increases. The coefficient estimates for mother's and father's willingness to take risk are significant and have the same sign as previous research (Dohmen et al. 2012), indicating that children's risk attitudes are correlated with parents' attitudes. However, compared to the findings of Dohmen et al. (2012), who show that the coefficients for the mother and the father are both of comparable size, the magnitude of our coefficient is different for mothers and fathers. This provides an initial indication that a heterogeneity might exist in terms of gender in the intergenerational correlation between parents and children. This is an issue that we analyze in detail in the section about gender differences below.

M2 and M3 in Table 1 include additional control variables, such as sex and age as controls, which previous research has shown to have a significant association with risk attitudes in Burkina Faso. We see that the positive relationship between children's and mother's and father's willingness to take risk continues to stay intact and significant.¹⁰

⁷ We note that there are outliers for mothers and fathers at value 9 on the traffic risk question, mothers at value 9 on the general risk question, and fathers at value 9.5 on the risk question for financial matters. These outliers have little impact on the slope of the weighted regression lines of Fig. 2, as there are very few mothers and fathers at value 9 for traffic, mothers at value 9 for general, and fathers at value 9.5 in financial matters as shown in Fig. 1 Panel A (traffic), Panel B left (general), and Panel C right (financial matters).

⁸ We use standardized version of the risk measures in all of the tables and as similar controls as possible in order to have a transparent comparison of coefficients with previous (e.g., Dohmen et al. 2012) and future studies. The standardization is conducted separately of the child, the mother, the father, and the regional risk attitudes, for the sample in which the child, both parents, and those in the local environment have answered all risk-attitude questions in both survey rounds.

⁹ More formally, our baseline regression estimations in Table 1 are based on the following linear equation: $r_{childi} = \beta_0 + \beta_1 r_{motheri} + \beta_2 r_{fatheri} + \beta_3 \mathbf{X}_i^T + \varepsilon_i$, where r_{childi} is the risk attitudes of child i and $r_{motheri}$ and $r_{fatheri}$ are the risk attitudes of mother i and father i . The vector \mathbf{X}_i^T is a set of control variables.

¹⁰ A mechanism that could affect socialization is the number of children in the family. For instance, parents may be able to invest less time in a child as the number of children increases, reducing the strength of socialization. In other words, there may be a quality versus quantity trade-off in the number of children. In line with Dohmen et al. (2012), we find indications that the correlation between mother and child risk attitudes is larger for children with no siblings compared to children with siblings. However, we do not have

Table 1 Relationship between children's and parents' risk attitudes in general, traffic, and finance

Dependent variable	Child's general risk			Child's traffic risk			Child's finance risk		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Mother's willingness to take risk	0.40*** (0.03)	0.37*** (0.03)	0.36*** (0.03)	0.26*** (0.03)	0.21*** (0.03)	0.22*** (0.03)	0.30*** (0.03)	0.31*** (0.03)	0.33*** (0.03)
Father's willingness to take risk	0.26*** (0.03)	0.34*** (0.03)	0.33*** (0.03)	0.38*** (0.04)	0.46*** (0.04)	0.45*** (0.04)	0.17*** (0.03)	0.26*** (0.03)	0.22*** (0.03)
Additional controls									
Female (= 1)	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Age of child and both parents (years)	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Education of child and both parents (years)	No	No	Yes	No	No	Yes	No	No	Yes
Living in a urban area (ref: rural area)	No	No	Yes	No	No	Yes	No	No	Yes
Region in Burkina Faso (13 regions)	No	No	Yes	No	No	Yes	No	No	Yes
Religion of child and both parents	No	No	Yes	No	No	Yes	No	No	Yes
Indicators of household consumption	No	No	Yes	No	No	Yes	No	No	Yes
Indicators of household welfare	No	No	Yes	No	No	Yes	No	No	Yes
Health status of child and both parents	No	No	Yes	No	No	Yes	No	No	Yes
Marital status	No	No	Yes	No	No	Yes	No	No	Yes
Constant	0.11*** (0.02)	-0.87*** (0.12)	-0.02 (0.61)	0.35*** (0.02)	-0.01 (0.13)	0.66** (0.66)	-0.01 (0.02)	-1.27 (0.15)	-0.44 (0.69)
Observations	2120	2120	2120	2120	2120	2120	2120	2120	2120
R ²	0.431	0.525	0.555	0.353	0.448	0.476	0.191	0.317	0.391

Shows coefficient estimates (OLS) for risk attitudes in general, traffic, and financial matters. Models (1) to (3) use the child's average risk attitude in general, traffic, and financial matters between rounds three and four as the dependent variable. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, traffic, and finance. Welfare and consumption controls are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant
 ***, **, * indicate significance at the 1%, 5% and 10% level, respectively

To see whether the intergenerational correlation in risk attitudes is robust, an identical re-estimation of risk attitudes in general is conducted, with the sole difference being that the main explanatory variables are willingness to take risk in traffic and financial matters. Table 1 shows that the coefficient estimates for mother's and father's risk attitudes are significant for the domains of risk taking in traffic and financial matters. Thus, the estimates show that the results remain robust. However, there is a heterogeneity in risk attitudes across domains. For instance, the strong association detected from mothers' risk attitudes on children's willingness to take risk in general is reversed for risk taking in traffic. Instead, in Table 1, we see that fathers seem to have a stronger effect than mothers on children's willingness to take risk in traffic.

5.1.1 Heterogeneity in risk attitudes across domains

The results so far have indicated a heterogeneity in risk attitudes across domains. It could be that risk attitudes in one domain (such as financial) predict risk attitudes in other domains (such as traffic). If that were the case, it would be quite damaging to the interpretation of our results as this could be an indication that the transmission of attitudes, within domains, is rather unspecific and vague; taking risk in a particular domain is explained equally well by risk attitudes in that domain or any other domain. If, on the other hand, the domain-specific measure captures distinct attitudes toward risk, we would see that risk measurement in the corresponding domain has the greatest explanatory power. Consequently, it is necessary to conduct a detailed analysis of whether parents' risk attitudes in all three domains can predict the children's risk attitude in a specific risk domain. In Table 2, children's willingness to take risk in one particular domain has been regressed on parents' willingness to take risk in all domains simultaneously.¹¹

Table 2 indicates a positive and significant diagonal pattern of estimated coefficients, in line with previous literature (Dohmen et al. 2012). This implies that when we control for risk attitudes in all domains, children's risk attitudes in a given domain have a higher association and is more significant with those of their parents risk attitudes in the same domain. Moreover, the pattern shown in Table 2 is a further evidence of similarity across generations and risk domains.

5.2 Positive assortative mating

According to Bisin and Verdier (2000), one mechanism behind the socialization from parents to their children is positive assortative mating. However, theoretically assortative mating could be either positive or negative (Lam 1988). For instance, assuming

Footnote 10 continued

enough statistical power for the sample of no siblings ($n = 23$) compared to with siblings ($n = 2097$) to be able to state that the difference is statistically significant.

¹¹ More formally, in principle it is the same baseline regression as Table 1 but with the following modification: $r_{childij} = \beta_0 + \beta_1 r_{motherij} + \beta_2 r_{fatherij} + \beta_3 r_{motherik} + \beta_4 r_{fatherik} + \beta_5 r_{motheril} + \beta_6 r_{fatheril} + \beta_7 \mathbf{X}_i^T + \varepsilon_i$, where $r_{childij}$ is the risk attitudes of child i in domain j and $r_{motherij}$ and $r_{fatherij}$ are the risk attitudes of mother i and father i for domain j , k and l where $j, k, l \in \{General, Traffic, Finance\}$ and $j \neq k \neq l$. The vector \mathbf{X}_i^T is the same set of control variables as shown in Table 1.

Table 2 Robustness of the relationship between children's and parents' risk attitudes across domains

Dependent variable: child's risk in	General	Traffic	Financial
Mother's willingness to take risk in general	0.44*** (0.04)	0.03 (0.05)	0.11** (0.05)
Father's willingness to take risk in general	0.30*** (0.04)	0.02 (0.05)	- 0.06 (0.05)
Mother's willingness to take risk in traffic	- 0.07* (0.03)	0.18*** (0.04)	- 0.00 (0.04)
Father's willingness to take risk in traffic	0.09** (0.04)	0.46*** (0.05)	0.03 (0.04)
Mother's willingness to take risk in finance	- 0.05* (0.03)	0.04 (0.04)	0.26*** (0.04)
Father's willingness to take risk in finance	- 0.03 (0.03)	- 0.06* (0.03)	0.23*** (0.04)
Additional controls	Yes	Yes	Yes
Constant	- 0.07 (0.61)	0.53 (0.67)	- 0.47 (0.69)
Observations	2120	2120	2120
R^2	0.559	0.479	0.395

Shows coefficient estimates (OLS) for general, traffic, and financial risk attitudes. It uses the child's average risk attitude in general, traffic, and financial matters between rounds three and four as the dependent variable. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, traffic, and financial matters. Additional controls are the same as M3 in Table 1. Welfare and consumption controls are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant
***, **, * indicate significance at the 1%, 5%, and 10% level, respectively

that the family is a provider of the production of a joint utility, the couple could optimize its utility in certain production decisions by being diversified in its risk attitudes, such as one being a risk lover and the other more averse (Chiappori and Reny 2006). Hence, there could be an urge for negative assortative mating by the couples. Consequently, whether there is a negative or positive assortative mating between couple becomes an empirical question.

Table 3 shows the results for the transmission of risk attitudes between spouses.¹² The dependent variable is the female partner (mother's) risk attitudes. The results show that there is a strong positive association between the male partner (fathers) risk attitudes and their spouses' risk attitudes (mothers). The coefficient estimates are robust across model specifications, as shown from M1–M3 in Table 3. This is an indication of positive assortative mating along the dimension of risk taking, i.e., individuals are paired with other individuals that have similar attitudes. It is important to note, extending the findings of Dohmen et al. (2012) who only investigate one risk

¹² More formally: $r_{motheri} = \beta_0 + \beta_1 r_{fatheri} + \beta_2 X_i^T + \varepsilon_i$ (3), where $r_{motheri}$ is the risk attitudes of mother i and $r_{fatheri}$ is the risk attitudes of father i .

domain as shown in Table 3, that the same strong and positive effect in traffic and financial matters is found, i.e., the effect is not domain driven.

5.2.1 Homogeneous and heterogeneous risk attitudes

To deepen our analysis about positive assortative mating and the transmission of attitudes further, we return to our initial estimations from Table 1 but now with the focus on mothers with homogeneous attitudes compared to single mothers, which are more frequent in Burkina Faso than single fathers. If positive assortative mating is in line with the theory of attitude transmission, then those mothers who have similar or homogeneous attitudes as their partners should have a stronger influence on their child's attitudes (i.e., direct transmission of attitudes) compared to single mothers. According to the theory of attitude transmission, it is assumed that single or divorced parents are less effective in socializing the child than homogeneous parents (Bisin and Verdier 2000). This is another reason as to why individuals tend to seek a partner with similar attitudes, i.e., positive assortative mating.

In Table 4, we estimate the relationship between the child and mother's risk attitudes for those children who live with a single mother and those who live with a mother living together with a spouse with homogeneous attitudes. Our coefficient estimates are in line with the theory. We see that single mother's influence on their child's risk attitudes is less than those mothers living with a spouse with similar risk attitudes. For instance, mothers living with a partner who has homogeneous attitudes, as indicated by M2 in Table 4, have a stronger association on their child's risk attitudes in general compared to single mothers in M1. This effect is consistent across domains for traffic and financial matters. Dohmen et al. (2012) find the reverse effect, more in line with the idea that children with single mothers are influenced somewhat to the same degree as children with mothers in homogeneous parent couples. Their finding could be contextual. In a German context, if there is no optimal match of partner, the institutional setting allows the single mother to have a stronger influence on the child as a role model, as she can choose not to match with a randomly chosen individual and thus continue to be a single parent.¹³ However, this does not hold for developing countries such as Burkina Faso with weak underdeveloped institutions and strong gender roles. Societal norms make it more difficult to be a single parent.¹⁴

¹³ This would require that fathers less interested in socializing the child or in getting custody of the child, or that the child lives the majority of the time with his or her mother. Otherwise, fathers would resist this strategy on the part of the mother.

¹⁴ We have also investigated how similarity of the parents affects the strength of transmission. In line with Dohmen et al. (2012), we run separate regressions relating child attitudes to parental attitudes, for children with homogeneous parents (absolute difference between parental attitudes of less than 1 S.D.) and children with heterogeneous parents (difference of more than 1 S.D.). We find the same pattern as previous research; homogeneous parents have a stronger impact on the child's risk attitudes than heterogeneous parents. Extending the findings of Dohmen et al. (2012), our results seem to indicate that the transmission of risk attitudes in the male- and female-dominated risk domains is stronger within homogenous parents, i.e., the mediated effect of gender roles on attitude transmission is stronger for homogenous parents. Results are available upon request.

Table 3 Relationship between female and male parents' risk attitudes in general, traffic, and finance

Dependent variable	Mother's general risk			Mother's traffic risk			Mother's finance risk		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Father's willingness to take risk in general	0.78*** (0.02)	0.80*** (0.03)	0.79*** (0.03)	-	-	-	-	-	-
Father's willingness to take risk in traffic	-	-	-	0.81*** (0.03)	0.84*** (0.03)	0.82*** (0.03)	-	-	-
Father's willingness to take risk in finance	-	-	-	-	-	-	0.58*** (0.03)	0.59*** (0.03)	0.58*** (0.03)
Additional controls									
Age of both parents (years)	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Education of both parents (years)	No	No	Yes	No	No	Yes	No	No	Yes
Living in a urban area (ref: rural area)	No	No	Yes	No	No	Yes	No	No	Yes
Region in Burkina Faso (13 regions)	No	No	Yes	No	No	Yes	No	No	Yes
Religion of both parents	No	No	Yes	No	No	Yes	No	No	Yes
Indicators of household consumption	No	No	Yes	No	No	Yes	No	No	Yes
Indicators of household welfare	No	No	Yes	No	No	Yes	No	No	Yes
Health status of both parents	No	No	Yes	No	No	Yes	No	No	Yes
Constant	0.15*** (0.08)	- 0.22* (0.11)	1.53* (0.79)	0.20*** (0.03)	- 0.30*** (0.12)	- 0.04 (0.97)	0.11*** (0.03)	0.08*** (0.15)	2.22*** (0.83)
Observations	2120	2120	2120	2120	2120	2120	2120	2120	2120
R ²	0.610	0.616	0.645	0.585	0.596	0.629	0.360	0.364	0.430

Shows coefficient estimates (OLS) for risk attitudes in general, traffic, and financial matters. Models (1) to (3) use the mother's average risk attitude in general, traffic, or financial matters between rounds three and four as the dependent variable. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, traffic, or financial matters. Welfare and consumption controls are in logs. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant

***, **, * indicate significance at the 1%, 5%, and 10% level, respectively

Table 4 Relationship between children's and similarity of mothers' attitudes in general, traffic, and finance

Dependent variable	Child's general risk		Child's traffic risk		Child's finance risk	
	M1	M2	M1	M2	M1	M2
Mother's willingness to take risk in general	0.60*** (0.03)	0.68*** (0.02)	–	–	–	–
Mother's willingness to take risk in traffic	–	–	0.50*** (0.03)	0.65*** (0.03)	–	–
Mother's willingness to take risk in finance	–	–	–	–	0.40*** (0.03)	0.56*** (0.03)
Additional controls						
Female (= 1)	Yes	Yes	Yes	Yes	Yes	Yes
Age of child and mothers (years)	Yes	Yes	Yes	Yes	Yes	Yes
Constant	– 0.09 (0.14)	– 0.61*** (0.12)	0.40*** (0.15)	0.15 (0.13)	– 0.04 (0.15)	– 0.85*** (0.15)
Observations	1126	1828	1126	1776	1126	1517
R ²	0.403	0.521	0.316	0.399	0.188	0.358

Shows coefficient estimates (OLS) for general, traffic, and financial risk attitudes. Models (1) to (2) use the child's average risk attitude in general, traffic, or financial matters between round three and four as the dependent variable. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, traffic, or financial matters. Model (1) shows estimates for single mothers and Model (2) for homogeneous mothers (absolute difference between parental risk attitudes of less than 1 S.D). Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant

***, **, * indicate significance at the 1%, 5%, and 10% level, respectively

5.3 Transmission from local environment to children

The previous results above indicate a strong positive impact of intergenerational transmission of attitudes, i.e., parents' risk attitudes influence child's risk attitudes. However, other individuals could be in the surrounding environment who influence the child's risk attitudes, such as local role models as stated by oblique transmission of attitudes between generations, mediating the direct transmission from parents to children.

5.3.1 Regional risk attitudes

Table 5 shows the step-wise results for including parents' risk attitudes (M1), the average regional risk attitude (M2), and additional control variables (M3).¹⁵ Starting with risk attitudes in general, the regional willingness to take risk has a positive and significant associative effect on child's general risk taking. In line with Dohmen et al. (2012), average regional willingness to take risk does not mediate the influence of

¹⁵ When calculating the risk attitudes of the child's local environment, we follow previous literature (Dohmen et al. 2012) and obtain an average of the risk attitudes for all the residents living in that environment.

parents. However, when taking a closer look at our estimations, we see a difference across domains. For risk taking in general and traffic, the effect from regional attitudes is strong and positive, but never stronger in magnitude than the parental transmission of risk attitudes (except for mothers in traffic). However, for risk taking in financial matters, we see a stronger regional associative effect on the child's risk attitudes, which is stronger than their parents'.

We concluded that our results are consistent with the theory of transmission of attitudes that a channel of transmission of attitudes exists from the local environment on the child's attitudes. Moreover, our coefficient estimation from M3 indicates that the local environment risk attitudes are in line with previous research. For instance, we see that estimations on mother's and father's willingness to take risk are robust across model specifications in Table 5, i.e., they do not fundamentally change when including regional attitudes. This is also consistent with our results from Table 1 M3 and with previous literature (Dohmen et al. 2012), showing that when controlling for region, it does not affect the intergenerational transmission of attitudes between parents and children.¹⁶

5.4 Gender differences

As discussed earlier, in Burkina Faso, traffic is more male dominated, while the daily financial transactions are female dominated. Thereby, the fact that different risk domains are gendered is likely to affect the transmission of attitudes between generations.

As a first step, in order to detect any gender difference across domains, we turn to the results in Table 1, in which a clear shift is seen when it comes to parents' influence on their child's risk attitudes between risk taking in traffic and financial matters. Table 1 shows that the association between fathers and their children in traffic is stronger than the association between mothers and their children. The opposite is evident for risk taking in financial matters; the association between mothers and children is stronger than that between fathers and children. Since risk domains are gendered, the socialization of daughters and sons might also be gendered.

Table 6 divides the sample by child's gender and re-estimates the same regressions as shown in Table 1. Table 6 shows a strong gender difference between mother's and father's depending on whether the child is a girl or boy. Mothers have a stronger associative influence on their daughter's willingness to take risk, independent of domain. For instance, daughters are more associatively influenced by their mother's willingness to take risk in general compared to their fathers. Furthermore, mothers also associatively have a lesser influence on their sons' risk taking in general compared to their spouses. Focusing on fathers, Table 6 shows that they affect their son's risk taking more when compared to their wives. Also, fathers associatively influence their daughters risk taking less compared to their spouses. These patterns are indications that strong gender roles exist in terms of transmission of risk attitudes between generations. To ensure that these patterns are not reflected by issues related to our relatively smaller

¹⁶ When re-estimating our results for risk attitudes from the closer neighborhood (enumeration area), we see in principle the same results as Table 6. (Results are available upon request.)

Table 5 Relationship between children's, parents', and regional risk attitudes in general, traffic, and finance

Dependent variable	Child's general risk			Child's traffic risk			Child's finance risk		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Mother's willingness to take risk	0.37*** (0.03)	0.35*** (0.03)	0.36*** (0.03)	0.21*** (0.03)	0.20*** (0.03)	0.20*** (0.03)	0.31*** (0.03)	0.28*** (0.03)	0.29*** (0.03)
Father's willingness to take risk	0.34*** (0.03)	0.32*** (0.03)	0.32*** (0.03)	0.46*** (0.04)	0.45*** (0.04)	0.45*** (0.04)	0.26*** (0.03)	0.24*** (0.03)	0.23*** (0.03)
Average regional willingness to take risk		0.21*** (0.04)	0.21*** (0.04)		0.20*** (0.05)	0.23*** (0.05)		0.43*** (0.06)	0.40*** (0.06)
Additional controls									
Female (= 1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age of child and both parents (years)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education of child and both parents (years)	No	No	Yes	No	No	Yes	No	No	Yes
Living in a urban area (ref: rural area)	No	No	Yes	No	No	Yes	No	No	Yes
Region in Burkina Faso (13 regions)	No	No	Yes	No	No	Yes	No	No	Yes
Constant	-0.87*** (0.12)	-0.85*** (0.12)	0.05 (0.87)	-0.01 (0.13)	0.00 (0.12)	0.25 (0.97)	-1.27*** (0.15)	-1.18*** (0.15)	-1.78 (1.06)
Observations	2120	2120	2120	2120	2120	2120	2120	2120	2120
R ²	0.525	0.533	0.535	0.448	0.453	0.455	0.317	0.342	0.353

Shows coefficient estimates (OLS) for risk attitudes in general, traffic, and financial matters. Models (1) to (3) use the child's average risk attitude in general, traffic, or financial matters between round three and four as the dependent variable. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, traffic, and financial matters. Average willingness to take risk is based on per region calculation. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant

***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. Additional controls include number of residents and age and gender composition of the region

Table 6 Relationship between son–daughter and parents' risk attitudes in general, traffic, and financial matters

Dependent variable: Child's risk in	General		Traffic		Financial	
	Daughter	Son	Daughter	Son	Daughter	Son
Mother's willingness to take risk in general	0.58*** (0.05)	0.27*** (0.04)	–	–	–	–
Father's willingness to take risk in general	0.22*** (0.05)	0.40*** (0.04)	–	–	–	–
Mother's willingness to take risk in traffic	–	–	0.46*** (0.05)	0.11*** (0.03)	–	–
Father's willingness to take risk in traffic	–	–	0.30*** (0.06)	0.53*** (0.04)	–	–
Mother's willingness to take risk in finance	–	–	–	–	0.50*** (0.05)	0.23*** (0.04)
Father's willingness to take risk in finance	–	–	–	–	0.23*** (0.05)	0.27*** (0.04)
Additional controls						
Female (= 1)	Yes	Yes	Yes	Yes	Yes	Yes
Age of child and both parents (years)	Yes	Yes	Yes	Yes	Yes	Yes
Constant	– 1.63*** (0.19)	– 0.79*** (0.14)	– 1.06*** (0.20)	0.08 (0.14)	– 2.08*** (0.25)	– 1.14 (0.17)
Observations	564	1556	564	1556	564	1556
R ²	0.660	0.449	0.564	0.365	0.433	0.228

Shows coefficient estimates (OLS) for general, traffic, and financial risk attitudes for daughters and son separately. Use the child's average risk attitude between round three and four as the dependent variable. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, traffic, or financial matters. Robust standard errors in parentheses are clustered at the household level. All model specifications include a constant
 ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively

sample size for daughters (564) compared to sons (1556), we compare, as sensitivity tests, the mean value of risk attitudes for daughters and other female non-relatives in the same household. The average risk attitudes for daughters (female non-relatives) are 3.9 (4.0) for risk taking in general, 3.4 (3.3) for risk taking in traffic, and 4.3 (4.2) for risk in financial matters. As another sensitivity test, we compare the mean value of women in our analytical sample to all other women that have answered our risk-attitude questions. The difference between the analytical sample women (other women) is 3.7 (3.6), 2.9 (2.7), and 4.3 (4.2) for risk taking in general, traffic, and financial matters. We see the same pattern but with higher mean values when doing the same comparison for men. When comparing the mean value for risk attitudes of unmarried daughters and sons living in the same household, we get a correlation of 0.97. These tests give us an indication that the daughters in our sample are not a selective group.

The results in Table 6 also indicate that different risk domains are gendered, extending the results of Dohmen et al. (2012) that do not find any such effects in Germany. In the male-dominated risk domain (traffic), the transmission of risk attitudes from fathers to daughters is relatively stronger than in the female-dominated risk domain (financial matters), while the transmission of risk attitudes from mothers to sons is relatively stronger in the female-dominated risk domain (financial matters) than in the male-dominated risk domain (traffic). This gender heterogeneity in risk domains implies that the parents in the domain that they are more exposed to socialize children more in that setting.

6 Economic implications of direct and oblique socialization

Our results show support for a direct socialization: Parents are important in transmitting their risk attitudes to their children. These findings can be relevant for the literature in intergenerational transmission of other outcomes. For instance, a strong and positive correlation between parents' and children's attitudes could provide an explanation as to why mother's and fathers' same-gender relationships to their children are stronger than cross-gender relationship of intergenerational transmission of education (Fessler and Schneebaum 2012), occupation (Eriksson 2015), and land (Quisumbing 1994). This is particularly important for understanding the patterns of choices in developing countries with underdeveloped institutions. One mechanism behind the transmission of risk attitudes could be that parents engage in positive assortative mating, as they have partners with similar risk attitudes and that the transmission of attitudes from single mothers toward children is weaker compared to mothers living with a partner with similar attitudes. This finding could add to the understanding of why couples engage in similar risky behavior. For instance, smoking is an issue in developing countries. Studies such as Fernandez et al. (2005) show that there is a correlation in smoking among couples, i.e., if you smoke, then your partner smokes as well. This could be related to positive assortative mating in terms of risk attitudes, such as engaging in the risky behavior of smoking (de Walque 2013). Our findings also show support for the existence of an oblique socialization: The local environment has a positive association on the child's risk attitudes. However, the role of parents on the child's risk attitudes remains robust even when including the risk taking of the local environment. These findings contribute to the understanding of neighborhood effects. For example, why would you engage in risky behaviors such as drug use or crime if your parents were not engaged in those behaviors? Previous research shows that drug use and crime by individuals are linked to other role models in the local environment (e.g., Case and Katz 1991). Putting this in a development setting, in which access to police, social security, and other related institutions is scarce, it becomes even more important to understand the transmission of attitudes from the local environment to the child.

7 Conclusion

In developing countries, there is a great need for individuals to take risk in order to reach unforeseen opportunities: to venture into new occupations, adopt new technologies, increase the mobility in the labor market, or invest in new upcoming opportunities. However, in developing countries, formal financial services and social security are scarce or underdeveloped, making the family, as an institution, an important arena for shaping individuals risk taking. This paper replicates the findings of Dohmen et al. (2012) by analyzing the intergenerational transmission of risk attitudes in three different domains (general, traffic, and financial matters) in Burkina Faso, one of the poorest countries in the world. The paper's findings are consistent with Dohmen et al. (2012), with some exceptions. In particular, the findings of this study show gendered differences of the intergenerational transmission of risk attitudes.

We find that intergenerational transmission of risk attitudes is gendered compared to previous literature (Dohmen et al. 2012). Mothers have a stronger association on their daughters' risk attitudes, compared to their sons. Fathers have a stronger associative effect on their sons than their daughters' risk attitudes, i.e., the effect on transmission is inverted compared to mothers. Moreover, our findings show that a heterogeneity in the transmission of risk attitudes exists across risk domains and gender. In the male-dominated domain of risk taking in traffic, the intergenerational transmissions of risk attitudes for fathers to their daughters are relatively stronger than risk attitudes in financial matters (i.e., the female-dominated risk domain). For mothers, we see the opposite effect; mothers have a relatively stronger effect on their sons in financial matters, which is a more female-dominated domain than in the male-dominated domain of traffic. These findings show that models of intergenerational attitude transmission applied to a developing country setting should include aspects such as gender, in particular as previous research has shown that mothers and fathers have different preferences for investment in children's outcome (Majlesi 2016).

Overall, our findings indicate that, compared to previous research on developed countries, a gender dimension for attitudes transmission from parents to child exists in risk domains that are male and female dominated.

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Agency (Sida, or in French: *Agence suédoise de coopération internationale au développement*, Asdi). The data that support the findings of this study are available from INSD, but restrictions apply to the availability of these data, which were used under license for the current study, and thus are not publicly available. Instructions for how other researchers can obtain the data, and all the information needed to proceed from the dataset to the results of the paper (including code), are, however, available from the corresponding author upon reasonable request and with permission of INSD.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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