# The Intergenerational Transmission of Attitudes: Analyzing Time Preferences and Reciprocity

Gauly, Britta

Postprint / Postprint
Zeitschriftenartikel / journal article

**Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:**

GESIS - Leibniz-Institut für Sozialwissenschaften

Mitglied der

Leibniz-Gemeinschaft

Diese Version ist zitierbar unter / This version is citable under:
https://nbn-resolving.org/urn:nbn:de:0168-ssoar-59073-1

### The Intergenerational Transmission of Attitudes: Analyzing Time Preferences and Reciprocity

Britta Gauly[1]

**Abstract** The present research adds to the question on intergenerational correlation of attitudes between parents and children. So far, it is not clear whether the transmission process is purely genetic or whether parents take an active role in socializing their children. The transmission of time preferences and reciprocity is analyzed by focusing on three aspects: (1) direct transmission from parents to children; (2) the impact of prevailing attitudes in children's surrounding environment; (3) parents' positive assortative mating. The findings support all three channels. Differences in the size of the intergenerational correlation according to family or parental characteristics suggest that the process is not purely genetic. The present analysis is of even greater importance, as the analyzed attitudes determine economic success sustainably.

### Introduction

Traditionally, the persistence of economic status between generations was thought to be mainly depending on core economic factors as income and education. The earnings of parents and their children as well as their educational attainments are positively correlated across nations (Hertz et al. 2008; Solon 2002). To reduce the sustained social inequality arising from this, it is important to find the main drivers of these correlations. It is widely accepted that cognitive and non-cognitive skills are important determinants of educational success and earnings (see e.g., Heckmann et al. 2006). Therefore, the correlation of income and education between generations could at least partly be due to the transmission of these skills from parents to their children. In fact, Bowles and Gintis (2002) assumed "that the intergenerational transmission of economic status is accounted for by a heterogeneous collection of mechanisms, including the genetic and cultural transmission of cognitive skills and noncognitive personality traits" (p.4).

Results concerning the intergenerational transmission of cognitive and non-cognitive skills for Germany were given by Anger and Heineck (2010) and Anger (2012). They found a positive relationship between parents' and children's measures of intelligence as well as several personality traits. Furthermore, there have been several studies on twins indicating strong heritability in personality traits inside families (see e.g., Eaves et al. 1999).

But although there seems to be agreement on the intergenerational correlation of attitudes, only a low number of studies has dealt with the details of the transmission process. An intuitive question would be whether it is a purely genetic process or whether parents have preferences for certain attitudes of their children and are able to determine those by actively socializing them.

A possible way to answer this question is given by the model of intergenerational transmission by Bisin and Verdier (2000). They suggested that parents want to shape certain traits of their children according to their own traits. To strengthen the intra-family correlation between attitudes, individuals engage in a search of a partner that is similar to them in the attitudes they want to transmit. In that way they can be sure that their children will be influenced according to their own attitudes. Furthermore, Bisin and Verdier (2000) suggested that children are not only influenced by parents but also by individuals in their surrounding environment. Those aspects of the transmission process would not be consistent with a pure genetic but an active socialization process. In that way the model supports the idea that human behavior is developed through genetic as well as cultural evolution and goes back to early work of Boyd and Richerson (1988).

In a recent work, Dohmen et al. (2012) used the model of Bisin and Verdier to test whether the intergenerational transmission of attitudes and non-cognitive skills might also be explained by active socialization of parents and found evidence that parents are able to transmit their own risk and trust attitudes to children.

Britta Gauly
britta.gauly@gesis.org
[1] Department of Survey Design and Methodology,
GESIS – Leibniz Institute for the Social Sciences,
P.O. Box 12 21 55, 68072 Mannheim, Germany

The present work complements the work of Bisin and Verdier (2000) and Dohmen et al. (2012) and deals with the intergenerational correlation of further non-cognitive- skills – namely patience, impulsiveness and reciprocity – that goes beyond genetic inheritance and provides evidence that parents are able to transmit their attitudes to children by actively socializing them. In that way, this work contributes to the literature on social mobility and intergenerational correlations in personal attitudes as well as the role of socialization. The results are especially important as the attitudes of interest in this paper have been found to be of great relevance for economic success in terms of educational achievement and wages or other life domains, such as consumption behavior and health. When influencing their children on these attitudes, parents sustainably shape the socioeconomic status of their children.

Three different aspects of the attitude transmission were tested: First of all, children can directly be socialized inside their families. Second, in addition to socialization inside the family, children can be influenced outside the family by peers or role models. And third, the wish to socialize future children will lead individuals to engage in the search of a partner who has similar attitudes to themselves. Looking at different aspects of attitude transmission that go beyond genetic inheritance, the present results give more information on transmission process than previous studies. Furthermore, as several characteristics concerning the structure and the relationship inside families were taken into account, the results show how the transmission process between parents and children could be strengthened.

The data for the analysis were drawn from the waves 2008 and 2010 of the German Socio-Economic Panel Study (SOEP). Patience and impulsiveness were assessed by two single questions where individuals had to classify themselves between "very impatient" and "very patient" or "not at all impulsive" and "very impulsive" respectively. Reciprocity was measured by several items capturing individuals' tendency to respond to the behavior of other individuals.

In the main analysis, the attitudes of children were regressed on the respective attitudes of their parents. By including further controls on individual and environmental characteristics, it was possible to investigate whether the intergenerational correlation was explained by similarity in other characteristics. The results indicated evidence for all three aspects of attitude transmission suggested by Bisin and Verdier (2000). Children's attitudes were found to be positively correlated with those of their parents. This correlation was stronger for reciprocity than for patience and impulsiveness. The prevailing attitudes in the region of residence additionally impacted children's attitudes without reducing parents' influence. Finally, the results showed a strong and positive correlation between the attitudes of spouses which refered to positive assortative mating.

Although other studies have suggested that genetic factors mainly account for the intergenerational transmission of attitudes (e.g., Duncan et al. 2005), several of the results in this work indicated that socialization played a role. First, from a genetics point of view, the impact of regional attitudes on attitude formation of children would be hard to explain. Second, the results in the present work showed that fathers were more important in the transmission of patience and impulsiveness whereas mothers mattered more for reciprocity which might not be expected by a pure genetic process. Additionally, the results for several sub-samples, differing in family and parental characteristics suggested that the intergenerational correlation was stronger in families with several children and "harmonic" parents.

The remainder of this paper is organized as follows. The next section gives evidence for the economic relevance of time preferences and reciprocity. The subsequent sections give the results for the three different channels of attitude transmission, and finally results for different sub-samples are reported.

## Economic Relevance of Non-cognitive Attitudes

The intergenerational transmission of attitudes is of particular importance if the respective attitudes are relevant for economic outcomes. It is widely accepted among economist that not only cognitive, but also non-cognitive skills matter for economic success (see e.g., Heckmann et al. 2006). Time preferences and reciprocity have been shown to play an important role for economic success or social interactions. This section gives the results from several studies concerning the influence of patience, impulsiveness, and reciprocity on educational and labor market behavior, social interactions, as well as other life outcomes. "Essentially all economic decisions involve a time dimension and thus a trade-off between payoffs or costs that accrue at different points in time" (Vischer et al. 2013, p. 142). As a result, the rate of time preferences will influence the decision making of individuals in various aspects of their life when there is a choice to make between immediate and delayed rewards. An individual's time preference can be defined as "the amount of future utility that is equivalent to the current utility of consuming a good or service" (Lawless et al. 2013, p. 1). A higher time preference rate should then go together with a higher degree of impatience. To be more concrete, impatient individuals might have more problems in restricting their current expenses. Conse-

quentially, they might have more problems concerning their saving behavior, including saving for retirement. Meier and Sprenger (2010) found that individuals who show present-biased preferences – a high degree of impatience – are 15% more likely to have any credit card debt at all and borrow around 25% more than dynamically consistent individuals. Finke and Huston (2013) modeled the importance individuals place on savings for retirement as a function of time preferences. According to their results, the importance of retirement savings correlated significantly with nearly all measures of time preferences.

Several studies examined the relationship between time preferences and human capital formation. Kirby et al. (2005) found that discount rates and college GPA were negatively correlated. As school performance is associated with important life outcomes such as employment or wages, the discount rates might also have an effect on economic success via academic achievement. In addition, Castillo et al. (2011) focused on the question whether patience and educational success, in terms of the number of a student's disciplinary referrals, were related. Their results indicated that patience was significantly correlated with discipline even when controlling for socio-demographics or cognitive ability.

Furthermore, time preferences are very likely to influence individuals' risky behavior in the health domain. Less future oriented individuals might prefer the present satisfaction of unhealthy behavior (smoking, obesity, risky sexual behavior) over long-term health damages (see Lawless et al. 2013).

Reciprocity describes an individual's tendency to reply to actions of others depending on their own treatment. Positive reciprocity is defined as the reward to kind actions whereas negative reciprocity implies punishment of hostile actions. Reciprocal behavior is included in many social interactions. Even small signs of kindness can lead to positive reciprocal behavior as smiling waitresses get tipped more than less friendly ones (Tidd and Lochard 1978). On the other hand, the outburst of violence and war is often related to negative reciprocity as individuals (on the aggregate level: nations and organizations) take revenge for wicked and degrading behavior (Fehr and Gachter 2000).

Fehr and Gachter (2000) conducted several laboratory experiments to show the importance of reciprocity in enhancing collective actions and enforcing social norms. They found that the existence of negative reciprocity among individuals can help to solve the problem of free riding in the provision of public goods as well as social norms. Furthermore, Fehr and Gachter (2000) illustrated the important role of reciprocity for the enforcement of incomplete contracts. Labor market contracts are often characterized by fixed wages but without explicit performance incentives and in that way incomplete. Employers can influence the job attitude by the generosity of the work compensation and in response positive reciprocal individuals might be willing to increase their job effort.

Leaving the laboratory, Dohmen et al. (2009) used data from the 2005 wave of the SOEP to analyze the impact of reciprocity on labor market behavior and overall success in life. They found evidence that positive reciprocity predicted higher economic success. It was positively correlated with work effort and labor income. Moreover the probability of being unemployed was lower for positive reciprocal individuals. In contrast, negative reciprocity was negatively related to work effort. But the impact of reciprocity is not restricted to labor market behavior. When it comes to overall life success, Dohmen et al. (2009) also showed that positive reciprocal individuals had a higher number of close friends and reported a higher degree of subjective well-being.

Summing up, the reported results show that the attitudes in this work are of particular importance for individual success. By engaging in direct socialization and transmitting their own attitudes to their children, parents crucially determine their children's prerequisites. The next section will give a more detailed understanding how the attitudes of interest were measured and how the transmission process was analyzed.

**Model and Data**

How do individuals acquire the attitudes and skills they possess? And how are those related to the attitudes and skills of their parents or other family members? In theory, there are two possible explanations: First, the transmission of personal characteristics might take place through a purely genetic process. Parents pass their genes to their children and it is not possible to influence characteristics on purpose, neither by their parents nor by other individuals. On the other hand, the development of attitudes might take place through socialization. In contrast to the genetic model, attitudes are then not determined before a child is born but develop through the influence of parents, other role models, and in some cases through life experience. In reality, it seems most plausible that the development of individual attitudes takes place through both channels. However, it is most interesting to analyze in what way and to what degree parents are able to determine certain attitudes of their children. This might help to overcome social inequality arising from intergenerational persistence in socio-economic status.

Following Dohmen et al. (2012) the intergenerational transmission of attitudes from parents to children was analyzed according to the model of Bisin and Verdier (2000). The model is based on the assumption that parents have well-defined preferences concerning the cultural traits developed by their own children and hence want to influence or socialize them. The process of socialization is assumed to be driven by parents' altruism, which can be seen as "paternalistic," as parents prefer to transmit their own characteristics regardless of their children's preferences (Dohmen et al. 2012).[1]

**The Model of Intergenerational Transmission**

According to the model of Bisin and Verdier (2000) the intergenerational transmission process of attitudes takes place through three different channels. First, there is the process of "direct vertical" socialization, which describes the direct correlation between parents' and children's attitudes. For a strong intergenerational correlation, parents have to exert effort to transmit their own bundle of attitudes to their children. Additionally, the strength of the correlation depends on how successful children copy the behavior of their parents. Again, the latter might depend on the effort parents put in showing off their own attitudes. The second channel describes socialization outside the family and includes the possibility that children are not influenced by their parents but by individuals in their surrounding environment. The third aspect of the transmission process regards the marriage behavior of individuals. It implies that individuals value their own bundle of attitudes highly and want to transmit it to their children. Therefore they exert effort in finding a mate who has similar attitudes in order to transmit them to their children in the most efficient way. The latter is called positive assortative mating. It is based on the assumption that parents who share the same attitudes have a greater chance to transmit their attitudes to their children as they do not have to compete with their partner whether they should influence their child according to the mother's attitude or according to the father's attitude. In that way they have a more efficient "socialization technology" than parents with different attitudes. Thus, an individual's choice of a marriage mate might include the decision on how high the transmission of one's own characteristics towards the children is valued. The wish to socialize children should solely lead to homogeneous marriages if the search for a similar marriage mate would be costless. Individuals with a higher desire to shape the characteristics of their children will invest more in the search of a marriage mate similar to themselves. But as nearly any other market, the marriage market is assumed to have search frictions, which makes the search costly and explains why heterogeneous marriages also come up frequently (Bisin and Verdier 2000).

The socialization process can be modeled as follows: Suppose there are two types of attitudes in the population, a and b. When both parents hold the same attitude a, the direct socialization of the attitude will take place with probability $\tau^a$. If the direct socialization fails – with probability $(1 - \tau^a)$ - a child will be supplied with the trait of an arbitrary individual from its surrounding population. That is what will also happen to all children whose parents do not hold the same attitudes. Under the assumption that there is a fraction $q^a$ of individuals with trait a in the population the children will then receive attitude a with probability $q^a$ and attitude b with probability $q^b = (1 - q^a)$.

**Data Description**

The data for the analysis of the transmission process were drawn from the waves 2008 and 2010 of the German Socioeconomic Panel (SOEP), a large representative panel survey that provides a wide range of socio-economic information on private households and their individuals in Germany.[2] The SOEP was first conducted in 1984 and repeated in every subsequent year (for more detailed information see e.g., Haisken-DeNew and Frick 2005; Richter et al. 2013; Wagner et al. 1993). The SOEP is especially suited for this kind of analysis as it contains various measures of personality traits and non-cognitive skills. The focus in the present work was on the waves 2008 and 2010, as they assessed measures of patience and impulsiveness, and reciprocity. Furthermore, as the SOEP includes information on the relationships between individuals, it was possible to assign children to their parents in the data, which was the key in the analysis of attitude transmission. No other study allowed creating such a large sample consisting of child and parents triplets. From wave 2008 and wave 2010 there were 4524 individuals for whom one could identify their biological mother and their biological father. In the following those are called children, regardless of their age, in order to illustrate their position in the family.[3]

---

[1] Paternalism captures the extent to which parents disagree with the natural preferences of their children and try to interfere with their own choices (Zilibotti and Doepke 2014).

[2] Version 29, SOEP, 2013, doi:10.5684/soep.v29.

[3] There was no information on all these attitudes for all of the individuals, as some individuals who where interviewed in 2008 did not answer some of the questions in 2010 and vice versa. Summing up, there were 2395 observations for patience and 2394 for impulsiveness. Furthermore there were 2246 observations for positive and 2221 observations for

**Table 1** Spearman's rank correlation coefficients

| | Child's attitude | | | |
| | Patience | Impulsiveness | Positive reciprocity | Negative reciprocity |
|---|---|---|---|---|
| Mother's attitude | 0.0515** | 0.1015*** | 0.2271*** | 0.2411*** |
| | N=2830 | N=2828 | N=2639 | N=2611 |
| Father's attitude | 0.0911*** | 0.1407*** | 0.1999*** | 0.2361*** |
| | N=2540 | N=2539 | N=2383 | N=2369 |

Spearman's rank correlation coefficient between parents and their children. All measures were standardized. *p < .05; **p < .01; ***p < .001

## Survey Measures

Patience and impulsiveness were measured in the wave of 2008 with two ultra-short survey measures. Respondents had to describe themselves with two items: "Are you generally an impatient person, or someone who always shows great patience?" (Scale: 0 – "Very impatient" to 10 – "Very patient") and "Do you generally think things over for a long time before acting – in other words, are you not impulsive at all? Or do you generally act without thinking things over a long time – in other words, are you very impulsive?" (Scale: 0 – "Not at all impulsive" to 10 – "Very impulsive").[4] Evidence for these measures was given by an incentive-compatible intertemporal choice experiment for impatience, conducted with a representative sub-sample of SOEP-respondents (Vischer et al. 2013).

The wave of 2010 included six items on positive and negative reciprocity. Reciprocity describes the tendency to respond to the behavior of other individuals by behaving in the same way (Perugini et al. 2003). Kind behavior follows kind behavior and hostile behavior follows hostile behavior. Using a seven-point-scale, individuals had to state how much they agreed on the following items:[5] (1) "If someone does me a favor, I am prepared to return it." (2) "If I suffer a serious wrong, I will take revenge as soon as possible, no matter what the cost." (3) "If somebody puts me in a difficult position, I will do the same to him/her." (4) "I go out of my way to help somebody who has been kind to me before." (5) "If somebody offends me, I will offend him/her back." (6) "I am ready to undergo personal costs to help somebody who helped me before." (Scale: 1 – "Does not apply to me at all" to 7 – "Applies to me perfectly"). Items (1), (4), and (6) measured positive reciprocity, whereas items (2), (3), and (5) measured negative reciprocity. Two of the items additionally assessed whether individuals would undertake personal costs to act in a reciprocal manner (item (6) for positive reciprocity and item (2) for negative reciprocity). As suggested by Dohmen et al. (2008), the multiple measures on reciprocity were summarized into two indices. The first captured an individual's overall tendency to behave positively reciprocal and the second captured an individual's overall tendency to behave negatively reciprocal. The averages of the answers on the three questions on positive and negative reciprocity were used to derive these single measures, respectively.

An interesting question might be to what extend positive and negative reciprocity are correlated. It seems plausible that an individual who has a high tendency to behave positively reciprocal also tends to behave negatively reciprocal. In that case positive and negative reciprocity might be two different reflections of the same underlying trait (Dohmen et al. 2008). However, calculating the correlation of positive and negative reciprocity in the present sample gave a rather small correlation of 0.008. This result was similar to that of Dohmen et al. (2008) who found a correlation of 0.021 using the whole sample of the 2005 wave of the SOEP, and suggested that positive reciprocity and negative reciprocity are two distinct traits rather then two sides of the same underlying trait.

## Intergenerational Correlation of Attitudes

Table 1 provides a first look at the intergenerational correlation of attitudes. Spearman's rank correlation coefficient was calculated for the attitudes of children and their parents, showing a positive relationship of attitudes between the generations.[6] For patience, a weak but positive and significant correlation was found. The attitude of the father seemed to play a larger role. The same was found for impatience whereby the correlation on the whole was larger than for patience. Positive and negative reciprocity showed an even

---

negative reciprocity, for children and both of their parents.
[4] German and English versions of the questionnaires are available at www.diw.de.
[5] The six items were based on the measure developed by Perugini et al. (2003) which consists of 27 items, measuring reciprocity as well as beliefs on reciprocity. A shortened version with the six items mentioned above was used in the main SOEP survey.
[6] Spearman's rank correlation coefficient was used as the attitudes were measured on an ordinal scale (Conover 1995, p. 245).

higher correlation. In contrast to patience and impulsiveness, the attitude of the mother had a greater impact on the reciprocal tendencies of children.

OLS estimates were used in all following regressions. The dependent variables was the attitudes of the children and the key explanatory variables were the respective attitudes of their mothers and fathers. Several variables which have shown a significant influence on the attitudes of interest were used as controls when regressing children's attitudes on the attitudes of their parents.[7]

**Direct Socialization**

To investigate the intergenerational transmission of patience and impulsiveness from parents to their children, children's standardized answers on the survey questions were regressed on the standardized answers of their mothers and their fathers. Several control variables were added to find out whether the relationship between the attitudes of children and their parents holds when taking into account the similarity in their personal characteristics.

Column (1)-(4) of Table 2 give the results for patience. Column (1) shows that on average children were more patient when their parents were. The coefficients were rather small but significant for both parents. The coefficient of the father (0.09) was nearly twice as high as the coefficient of the mother (0.05). When mother's or father's attitude was included in the regression separately (unreported), the coefficients were unchanged.[8]

The specification in Column (2) of Table 2 included personal characteristics, plausibly exogenous to the individual: age, gender, and height.[9] One can see that the coefficients for the patience measure of mother and father were only slightly decreased and remained significant when these exogenous controls were added.

As a relationship between patience and impulsiveness seemed plausible (correlation: -0.17), each measure was included in the regression of the other. Another important question concerns the relationship between risk and time preferences. In most intertemporal decisions, there exists a combination of certainty and uncertainty. While the present is certain, the future is inherently associated with uncertainty (Andreoni and Sprenger 2012). It might be possible that present biased behavior is created by risk of the future. To account for this, a measure of general risk aversion from the survey in 2010 was included in the regression.[10] Column (3) reports results when measures for impulsiveness and risk were included for children and parents. An increase in child's impulsiveness significantly reduced patience. Risk played no significant role once controlling for impulsiveness. Looking at parents' attitudes on patience, the mother's coefficient was slightly increasing in this specification, whereas father's coefficient was slightly decreasing.

In Column (4), several other characteristics of individuals and their environment that showed impact on the attitudes in the previous regressions were added as control variables. Those included years of schooling as well as household income in the respective years, for the children and their parents.[11] Additionally, characteristics of the region where individuals were raised up to the age 15 (large city, medium city, small city, countryside, missing) and religion (Catholic, Protestant, Islamic, other Christian, other religion, no religion, missing) were included. Furthermore, the regressions contained a variable indicating whether individuals are German and information whether their mother and father lived in East Germany (German Democratic Republic) before the reunification.

---

[7] No alternative estimation techniques were used as Dohmen et al. (2012) showed in their analysis of intergenerational correlation that results from OLS estimations were robust to using other estimation techniques such as IV regression or using a binary measure as the dependent variable.

[8] For all subsequent analysis, further results on the regressions including only father's or mother's attitude are available upon request.

[9] Those variables have been found to determine not only patience, but also positive and negative reciprocity (see e.g., Dohmen et al. 2008; Vischer et al. 2013) and were therefore included in all following analysis.

[10] On a scale ranking from 0 – "risk averse" to 10 – "fully prepared to take risks" individuals had to assess whether they are fully prepared to take risks or try to avoid them. Validity for the use of the general risk question was given by Dohmen et al. (2011) who showed that responses to this question were good predictions of the actual risk behavior of individuals in a lottery experiment.

[11] There were several missing observation for years of schooling in the data set. To avoid dropping these observations, all missings were replaced with the mean of the schooling-variable and an indicator for missing schooling information was included. Additionally, (unreported) specifications included indicator variables for school-leaving degree (upper secondary or technical school degree, intermediate school degree, secondary school degree, dropout, missing) instead of years of schooling. The results were qualitatively and quantitatively similar.

**Table 2** Intergenerational transmission of patience and impulsiveness

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Mother's patience | 0.050* | 0.047* | 0.058** | 0.039 | | | 0.038 | 0.052** |
| | (0.022) | (0.022) | (0.022) | (0.022) | | | (0.020) | (0.019) |
| Father's patience | 0.092*** | 0.090*** | 0.083*** | 0.070*** | | | 0.007 | 0.021 |
| | (0.021) | (0.021) | (0.022) | (0.024) | | | (0.019) | (0.019) |
| Mother's impulsiveness | | | 0.020 | 0.014 | 0.105*** | 0.099*** | 0.095*** | 0.089*** |
| | | | (0.023) | (0.026) | (0.021) | (0.021) | (0.021) | (0.024) |
| Father's impulsiveness | | | -0.029 | -0.046 | 0.135*** | 0.128*** | 0.109*** | 0.110*** |
| | | | (0.025) | (0.028) | (0.021) | (0.021) | (0.022) | (0.024) |
| Child's patience | | | | | | | -0.139*** | -0.131*** |
| | | | | | | | (0.021) | (0.022) |
| Child's impulsiveness | | | -0.181*** | -0.173*** | | | | |
| | | | (0.027) | (0.028) | | | | |
| Child's general risk | | | 0.022 | 0.017 | | | 0.399*** | 0.400*** |
| | | | (0.027) | (0.025) | | | (0.022) | (0.024) |
| Mother's general risk | | | -0.002 | 0.009 | | | -0.017 | 0.015 |
| | | | (0.024) | (0.026) | | | (0.022) | (0.025) |
| Father's general risk | | | 0.019 | 0.016 | | | -0.046* | -0.047* |
| | | | (0.025) | (0.032) | | | (0.021) | (0.022) |
| 1 if female | | -0.012 | 0.010 | 0.026 | | 0.099 | 0.239*** | 0.280*** |
| | | (0.059) | (0.060) | (0.064) | | (0.055) | (0.052) | (0.057) |
| Child's age (years) | | 0.003 | 0.003 | 0.004 | | -0.004 | 0.001 | 0.000 |
| | | (0.005) | (0.004) | (0.006) | | (0.004) | (0.004) | (0.004) |
| Child's height (cm) | | 0.001 | 0.002 | 0.002 | | 0.001 | 0.000 | 0.003 |
| | | (0.003) | (0.003) | (0.004) | | (0.003) | (0.003) | (0.003) |
| Mother's age (years) | | 0.008 | 0.005 | 0.007 | | -0.017** | -0.009 | -0.010 |
| | | (0.007) | (0.007) | (0.007) | | (0.006) | (0.006) | (0.006) |
| Father's age (years) | | -0.006 | -0.005 | -0.007 | | 0.010 | 0.006 | 0.007 |
| | | (0.006) | (0.006) | (0.006) | | (0.005) | (0.005) | (0.005) |
| Mother's height (cm) | | 0.002 | 0.002 | 0.004 | | -0.004 | -0.002 | -0.001 |
| | | (0.004) | (0.004) | (0.004) | | (0.004) | (0.003) | (0.003) |
| Father's height (cm) | | -0.005 | -0.005 | -0.002 | | 0.003 | 0.003 | 0.002 |
| | | (0.003) | (0.003) | (0.003) | | (0.003) | (0.003) | (0.002) |
| Further controls | No | No | No | Yes | No | No | No | Yes |
| Observations | 2395 | 2376 | 2374 | 2224 | 2394 | 2375 | 2374 | 2224 |
| Adjusted $R^2$ | 0.010 | 0.010 | 0.037 | 0.038 | 0.031 | 0.040 | 0.213 | 0.221 |

The dependent variable in Columns (1)-(4) measured patience on a 11-point scale. The dependent variable in Columns (5)-(8) measured impulsiveness on a 11-point scale. All dependent variables were standardized. The explanatory risk variable was measured on a 11-point scale and standardized, as were the explanatory patience and impulsiveness variables. Coefficients in all columns are OLS estimates. Robust standard errors are reported in brackets; Additional controls – each for child and parents – included years of schooling, corresponding indicator variables for missing schooling information; gross annual household income; indicator variables for characteristics of the residence of youth before the age of 16 (large city, medium city, countryside, missing; reference category is small city); indicator variables for religion (Catholic, Protestant, Islamic, other non-Christian, no religion, missing religion; reference category was other Christian); dummies indicating whether nationality is German and subjective health status (five response category); additional dummies indicating whether parents lived in East Germany before the reunification. Fixed effects for region were included. *p < .05; **p < .01; ***p < .001

Finally, fixed effects for the region of residence of children and their parents were included.[12] When including additional variables in Column (4), the coefficients for mother's and father's patience slightly decreased and the coefficient for the mother's attitude was not significant anymore. Still, the results suggested that a father's and child's patience were correlated even when controlling for other personal characteristics.

Column (5)-(8) of Table 2 show the regression for the intergenerational transmission of impulsiveness. The

---

[12] The SOEP included information on the households' region of residence on the level of the spatial planning regions (in German: *Raumordnungsregionen, ROR*). Germany was divided into 97 spatial planning regions, which were defined by the Federal Office for Building and Regional Planning. Thus, it was possible to add variables that indicated in which of these regions survey participants lived at the time of the interview in the analysis (for more detailed information see Knies and Spiess 2007).

impulsiveness of the children depended positively on the impulsiveness of their parents.

As reported for patience, the impulsiveness of the father seemed to play a larger role. However, in contrast to patience, the coefficient of the mother was twice as high (0.11) and the coefficient of the father was increased by roughly 50% (0.14). When the attitude of only one parent was included in the regression the coefficients only changed slightly (mother: 0.10, father: 0.14). In Column (6), age, gender, and height were included, but the coefficients for mother's and father's impulsiveness barely changed. Column (3) gives the regression results including the measures of patience and risk for children and parents. Both, the measures on risk and patience of the child, were significantly related to impulsiveness: Higher willingness to take risks was associated with higher impulsiveness whereas higher patience was associated with lower impulsiveness. The impulsiveness coefficients of both parents in Column (7) were slightly decreased but still significant. Adding the wide list of additional controls in Column (8) slightly decreased the mother's coefficient but the overall positive relationship between children's and parents' impulsiveness persisted. Summing up the previous results, there was at least some evidence for an intergenerational correlation in time preferences. However, the size of the estimated coefficients was rather small and especially smaller than those Dohmen et al. (2012) found for the intergenerational transmission of risk and trust. This might indicate that children were indeed influenced by the time preferences of their parents but part of the intergenerational correlation might have been determined by other factors. It could be the case that children were influenced by other persons in their surrounding environment, which was analyzed in further regressions. Another reason could be a weak measure of patience. As reported before, time and risk are most likely intertwined (Andreoni and Sprenger 2012). When analyzing time preferences, a high degree of impatience could be generated by uncontrolled risk preference instead of intrinsic temptation. Andreoni and Sprenger (2012) conducted an experiment where individuals had to make intertemporal choices under varying risk conditions. They showed that individuals had a preference for certainty when available but prefered future rewards over immediate rewards, when the future rewards were certain. This indicates that risk plays a major role in time preferences and should be taken into account when measuring those. Although Vischer et al. (2013) controlled for risk preferences when validating the measure of patience, they might have missed some underlying factor. Therefore the measure of patience might include unobserved characteristics which additionally explains the rather weak intergenerational correlation which was found in the data.

The following regressions concern the intergenerational transmission of reciprocal behavior. Column (1)-(4) of Table 3 show the results for positive reciprocity. In Column (1) no controls but the attitude of the mother and the father were included in the specification. It was interesting to see that both coefficients were larger than for patience and impulsiveness and highly significant. In contrast to the previous regressions in Table 3, the attitude of the mother seemed to play a more important role here. When the measure for only one parent was included, mother's coefficient was slightly increased (0.22) and the father's coefficient was nearly twice as high as in the specification in the first column (0.18). In Column (2), additional controls for age, gender, and height were included. The positive relationship between child's and parents' positive reciprocity did not change in size or significance.

An interesting question was whether trust and reciprocity were related. Dohmen et al. (2008) used data from the SOEP wave 2005 and analyzed the determinants of trust and reciprocity as well as their relationship. For positive reciprocity one could expect a positive correlation with trust as individuals could believe that their own positive reciprocal tendencies are also present among other individuals. However the authors did not find empirical support for this hypothesis (but only a weak correlation of 0.015), suggesting that trust and positive reciprocity do not go hand in hand. For negative reciprocity, a negative relationship with trust seemed likely. Individuals get disutility from being betrayed and negative reciprocal individuals suffer most from a breach of trust. The data from 2005 supported this, as the correlation between negative reciprocity and trust was -0.113, significant at a level of 5% (Dohmen et al. 2008).

The combined trust measure for the child, mother and father was included in Column (3).[13] The relationship between children's and parents' measure of positive reciprocity remained and the parents' coefficients remained highly significant. The coefficients of the other controls changed slightly but their direction and significance levels also remained the same. Parents' trust attitude played no significant role, the own trust attitude had small but positive and significant influence. In Column (4), additional control variables on

---

[13] The measure of trust came from three questions from the 2008 wave of the SOEP which were combined into a single item measuring generalized trust (Richter et al. 2013). In the original three questions individuals had to state their agreement on general trust, reliance on others, and need for caution in dealing with strangers using a four- point scale (1-"Agree completely" – 4 -"Disagree completely").

individual and environmental characteristics were included in the regression. The coefficients of both parents were slightly decreased but still of remarkable size and significance.

**Table 3** Intergenerational transmission of reciprocity

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Mother's pos. reciprocity | 0.187*** | 0.185*** | 0.184*** | 0.157*** |  |  |  |  |
|  | (0.022) | (0.022) | (0.025) | (0.027) |  |  |  |  |
| Father's pos. reciprocity | 0.109*** | 0.108*** | 0.119*** | 0.113*** |  |  |  |  |
|  | (0.023) | (0.023) | (0.026) | (0.030) |  |  |  |  |
| Mother's neg. reciprocity |  |  |  |  | 0.217*** | 0.228*** | 0.222*** | 0.183*** |
|  |  |  |  |  | (0.023) | (0.023) | (0.025) | (0.031) |
| Father's neg. reciprocity |  |  |  |  | (0.023) | 0.161*** | 0.168*** | 0.162*** |
|  |  |  |  |  | 0.167*** | (0.023) | (0.025) | (0.024) |
| Child's general trust |  |  | 0.053* | 0.041 |  |  | -0.132*** | -0.111*** |
|  |  |  | (0.025) | (0.025) |  |  | (0.025) | (0.026) |
| Mother's general trust |  |  | 0.032 | (0.033) |  |  | 0.011 | 0.021 |
|  |  |  | (0.027) | 0.028 |  |  | (0.026) | (0.026) |
| Father's general trust |  |  | -0.037 | -0.028 |  |  | -0.005 | 0.000 |
|  |  |  | (0.024) | (0.027) |  |  | (0.023) | (0.025) |
| 1 if female |  | 0.021 | 0.030 | 0.018 |  | -0.297*** | -0.308*** | -0.273*** |
|  |  | (0.062) | (0.073) | (0.070) |  | (0.053) | (0.062) | (0.061) |
| Child's age (years) |  | 0.010* | 0.009 | 0.012 |  | -0.006 | -0.006 | -0.009 |
|  |  | (0.004) | (0.005) | (0.006) |  | (0.004) | (0.005) | (0.005) |
| Child's height (cm) |  | -0.000 | 0.001 | (0.005) |  | 0.002 | 0.001 | 0.004 |
|  |  | (0.004) | (0.005) | 0.000 |  | (0.003) | (0.004) | (0.004) |
| Mother's age (years) |  | -0.008 | -0.008 | -0.009 |  | -0.010 | -0.009 | -0.004 |
|  |  | (0.006) | (0.006) | (0.007) |  | (0.006) | (0.007) | (0.007) |
| Father's age (years) |  | 0.004 | 0.004 | 0.004 |  | 0.004 | 0.005 | 0.007 |
|  |  | (0.005) | (0.005) | (0.007) |  | (0.005) | (0.006) | (0.006) |
| Mother's height (cm) |  | 0.000 | -0.003 | 0.002 |  | -0.002 | -0.001 | -0.003 |
|  |  | (0.004) | (0.004) | (0.005) |  | (0.003) | (0.004) | (0.004) |
| Father's height (cm) |  | (0.003) | (0.004) | (0.005) |  | -0.002 | -0.001 | 0.000 |
|  |  | 0.007 | 0.008 | 0.009 |  | (0.003) | (0.004) | (0.004) |
| Further controls | No | No | No | Yes | No | No | No | Yes |
| Observations | 2246 | 2231 | 1878 | 1781 | 2221 | 2206 | 1853 | 1756 |
| Adjusted $R^2$ | 0.061 | 0.062 | 0.069 | 0.063 | 0.103 | 0.134 | 0.149 | 0.146 |

The dependent variable in Columns (1)-(4) is the measure of positive reciprocity, derived by taking the average on the three questions on positive reciprocity on a 7-point scale. The dependent variable in Columns (5)-(8) is the measure of negative reciprocity, derived by taking the average on the three questions on negative reciprocity on a 7-point scale. All dependent variables were standardized. The explanatory trust variable was derived by taking the average from agreement with the three statements regarding trust (general trust, reliance on others, need for caution in dealing with strangers) measured on a 4-point scale and was also standardized. Coefficients in all columns are OLS estimates. Robust standard errors are reported in brackets; Additional controls – each for child and parents – included years of schooling, corresponding indicator variables for missing schooling information; gross annual household income; indicator variables for characteristics of the residence of youth before the age of 16 (large city, medium city, countryside, missing; reference category is small city); indicator variables for religion (Catholic, Protestant, Islamic, other non-Christian, no religion, missing religion; reference category is other Christian); dummies indicating whether nationality is German and subjective health status (five response category); additional dummies indicating whether parents lived in East Germany before the reunification. Fixed effects for region were included. *p < .05; **p < .01; ***p < .001

Columns (5)-(8) of Table 3 show the results for negative reciprocity. Again, one can see that parents' attitudes mattered for the attitude formation of their children. The negative reciprocal inclinations of children increased with those of their parents. And again, the coefficient for the mother was found to be larger than for the father, while both coefficients were highly significant. Including only one parent's attitude slightly increased the coefficients again (mother: 0.26, father: 0.24).

Among all attitudes for which the intergenerational correlation has been analyzed in this paper, the strongest effect was found for negative reciprocity. This was already suggested by the Spearman's rank correlation coefficient in Table 1. When adding further controls in Column (6) – age, gender, and height – the coefficients remained roughly unchanged in size and significance. In Column (7), the trust measure of children and both mother and father was included again. Higher trust of the child was associated with lower negative reciprocity, which one might have expected from previous results (see Dohmen et al. 2008). The

trust attitudes of both mother and father played no significant role. When adding additional controls in column (8), the positive relationship between child's and parents' negative reciprocal inclinations persisted: both parents' coefficients decreased only slightly and stayed significant.

Summing up, the results from Table 3 provided evidence for a strong and significant relationship between children's and parents' reciprocity, even when it was controlled for similarity in other characteristics. The highest transmission in the full specification was found for negative reciprocity where the coefficients for mother and father are 0.183 and 0.162, respectively. Compared to the results on reciprocity, the intergenerational correlation for patience with coefficients of 0.039 (mother) and 0.070 (father) was rather low.

**Table 4** Spearman's rank correlation coefficients across years

|  | Child's attitude 2005 | | Child's attitude 2010 | |
|---|---|---|---|---|
|  | Pos. reciprocity | Neg. reciprocity | Pos. reciprocity | Neg. reciprocity |
| Mother's attitude 2005 | 0.2546*** | 0.2733*** | **0.1347***** | **0.1758***** |
|  | N=2406 | N=2394 | N=2862 | N=2660 |
| Mother's attitude 2010 | **0.1287***** | **0.1934***** | 0.2271*** | 0.2411*** |
|  | N=2202 | N=2191 | N=2639 | N=2611 |
| Father's attitude 2005 | 0.2986*** | 0.2759*** | **0.1358***** | **0.1690***** |
|  | N=2148 | N=2144 | N=2455 | N=2439 |
| Father's attitude 2010 | **0.1353***** | **0.1572***** | 0.1999*** | 0.2361*** |
|  | N=1956 | N=1954 | N=2383 | N=2369 |

Spearman's rank correlation coefficient between children's reciprocity in 2005 and parents' reciprocity in 2010 and the other way round. Correlations between child's attitude in one year and the respective attitude of the parents' in the other year are in bold for a better comparison. All measures were standardized. ***$p < .001$

*Robustness Check*

Although the survey measures of the attitudes in this paper were validated, there existed the possibility of a measurement error.[14] As attitudes of children and parents were measured at the same point in time, the measurement error could be correlated across parents and children. It was therefore important to know whether intergenerational correlation in attitudes was actually driven by the measurement error of parents and children. It might be the case that their true values were correlated but part of the correlation could also come from the correlation of measurement errors. This problem was addressed by analyzing the correlation between the measure of children's attitudes in one year and the measure of parents' attitudes in another year. The only attitudes for which there were observations from different waves of the SOEP were positive and negative reciprocity, which were measured in 2005 and 2010. Thus, the correlation of children's reciprocity in 2005 and parents' reciprocity in 2010 and the other way round was analyzed. Spearman's rank correlation coefficients can be found in Table 4. The results showed that the correlation across different years was somewhat smaller although still sizable. As an additional robustness check the regression for the intergenerational correlation of reciprocity was repeated using the average for the reciprocity measures from 2005 and 2010 for parents and children. However, results were only slightly different from those obtained in the specification in Table 3.[15] Both of these results suggested that even if there was a correlation in children's and parents' measurement error, it was not the main driver of the intergenerational correlation in attitudes.

**The Impact of Regional Attitudes**

In the previous section it was shown that parents' attitudes on patience, impulsiveness, and reciprocity, had a positive and significant impact on the attitudes of their children. However, children and adolescents might not only use their parents but also teachers, sport coaches, or their friends' parents as role models. In the model of Bisin and Verdier (2000) the influence of attitudes from the local environment referred to the second channel of the transmission process.

To analyze the impact of regional attitudes on the attitude formation of children, the regressions from the previous section were repeated but the respective average attitudes within the region of residence were included as additional controls. The regional averages for patience and impulsiveness were calculated with

---

[14] For an overview on measurement errors see Greene (2012).
[15] Detailed results available upon request.

all participants of the wave 2008 and the regional average for reciprocity was calculated with all participants of the wave 2010. Children's attitudes were excluded when doing so. Additionally, the age and gender composition of the regions were added as control variables in all subsequent regressions in this section. By including those variables, it should have been ruled out that region-specific differences in those characteristics were the drivers of the correlation between the regional average and the children's attitudes.[16]

**Table 5** The role of regional attitudes

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Mother's patience | 0.058** | 0.056* | 0.038 | 0.038 |
|  | (0.022) | (0.022) | (0.020) | (0.020) |
| Father's patience | 0.083*** | 0.081*** | 0.007 | 0.007 |
|  | (0.022) | (0.022) | (0.019) | (0.019) |
| Average patience |  | 0.184 |  |  |
|  |  | (0.220) |  |  |
| Mother's impulsiveness | 0.020 | 0.021 | 0.095*** | 0.094*** |
|  | (0.023) | (0.023) | (0.021) | (0.021) |
| Father's impulsiveness | -0.029 | -0.030 | 0.109*** | 0.108*** |
|  | (0.025) | (0.025) | (0.022) | (0.022) |
| Average impulsiveness |  |  |  | 0.066 |
|  |  |  |  | (0.166) |
| 1 if female | 0.010 | 0.012 | 0.239*** | 0.239*** |
|  | (0.060) | (0.060) | (0.052) | (0.052) |
| Child's age (years) | 0.003 | 0.003 | 0.001 | 0.001 |
|  | (0.004) | (0.004) | (0.004) | (0.004) |
| Child's height (cm) | 0.002 | 0.002 | 0.000 | 0.000 |
|  | (0.003) | (0.003) | (0.003) | (0.003) |
| Mother's age (years) | 0.005 | 0.005 | -0.009 | -0.009 |
|  | (0.007) | (0.007) | (0.006) | (0.006) |
| Father's age (years) | -0.005 | -0.005 | 0.006 | 0.006 |
|  | (0.006) | (0.006) | (0.005) | (0.005) |
| Mother's height (cm) | 0.002 | 0.002 | -0.002 | -0.003 |
|  | (0.004) | (0.004) | (0.003) | (0.003) |
| Father's height (cm) | -0.005 | -0.005 | 0.003 | 0.003 |
|  | (0.003) | (0.003) | (0.003) | (0.003) |
| Further controls | Yes | Yes | Yes | Yes |
| Observations | 2374 | 2374 | 2374 | 2374 |
| Adjusted $R^2$ | 0.037 | 0.037 | 0.213 | 0.212 |

The dependent variable in Column (1) and (2) measured patience on a 11-point scale. The dependent variable in Column (3) and (4) measured impulsiveness on a 11-point scale. All dependent variables were standardized. The explanatory risk variable was measured on a 11-point scale and standardized, as were the explanatory patience and impulsiveness variables. Average patience and average impulsiveness in the region were based on the full 2008 SOEP sample and were also standardized. Children were excluded from the calculation of the average. Column (1) and (3) show the results without the regional average for comparison. Coefficients in all columns are OLS estimates. Robust standard errors are reported in brackets; Additional controls in all columns included the gender and age composition of the region, as well as the standardized risk attitudes of children and parents. Columns (1) and (2) additionally include standardized measures of impulsiveness, whereas Column (3) and (4) included standardized measures of patience, each for child and parents. *p < .05; **p < .01; ***p < .001

The results for patience and impulsiveness can be found in Table 5. The regional average was included in the regression in Column (2) (patience) and (4) (impulsiveness). Column (1) and (3) contain the same regressions as Column (3) and (7) from Table 2 and serve for comparison. Both average patience and average impulsiveness in the region were found to be positively related to the child's respective attitude. But in both cases the coefficients were not significant. Compared to the specification without the regional average, the coefficients for parents' time preferences hardly changed. The missing significant influence from the regional average on child's attitudes might again be due to the rather weak measure for patience (and here also impulsiveness).

Table 6 gives the results for reciprocity. The regional average was included in Column (2), and (4), whereas

---

[16] The aggregation of the attitudes on the regional level has to be treated carefully, as one has to keep in mind that the SOEP data should not be taken as representative of the whole regional population (Knies and Spiess 2007).

Column (1), and (3), serve for comparison again and show results when the prevailing attitudes in the environment were not taken into account. For positive and negative reciprocity the regional average was positively and significantly associated with the attitude of the child. This indicated that there was also socialization outside the family and children were indeed affected by attitudes from their surrounding environment. Thus, the second channel from the model of Bisin and Verdier (2000) was supported. Moreover, it was important to recognize that the second channel did not conflict the first channel – direct socialization of parents. The coefficients on parents' reciprocity only slightly decreased compared to the specification excluding the regional average and remained significant.

It could have been possible that children were not influenced by the average attitude in their region of residence but that they sorted themselves into regions where the average attitude was similar to their own. To control for this, the regression including the regional average was repeated only for those children, who lived with at least one of their parents in the year of the survey interview. Those children presumably did not choose their region of residence themselves. The sorting of parents was taken into account as their attitudes additionally were included in the regressions. The results differed slightly from those in Tables 5 and 6 when all children were included in the regressions.[17] These results provided more evidence for the influence of the prevailing attitudes in the region on children's attitude formation. Furthermore, consciously sorting into regions would have implied that average attitude in region was observable for all individuals. Moreover, it would have required that the regional average of all but not only one attitude was according to a child's attitudes. Both of these assumptions were unlikely to hold.

One could still argue that there is no intergenerational transmission of attitudes but that both parents and children were influenced by the prevailing attitudes in their region

**Table 6** The role of regional attitudes

| Dependent variable | Child's positive reciprocity | | Child's negative reciprocity | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Mother's pos. reciprocity | 0.184*** | 0.177*** | | |
| | (0.025) | (0.025) | | |
| Father's pos. reciprocity | 0.119*** | 0.116*** | | |
| | (0.026) | (0.026) | | |
| Average pos. reciprocity | | 0.383** | | |
| | | (0.140) | | |
| Mother's neg. reciprocity | | | 0.222*** | 0.211*** |
| | | | (0.025) | (0.025) |
| Father's neg. reciprocity | | | 0.168*** | 0.163*** |
| | | | (0.025) | (0.024) |
| Average neg. reciprocity | | | | 0.383** |
| | | | | (0.145) |
| 1 if female | 0.030 | 0.031 | -0.308*" | -0.310*** |
| | (0.073) | (0.073) | (0.062) | (0.062) |
| Child's age (years) | 0.009* | 0.009* | -0.006 | -0.007 |
| | (0.005) | (0.005) | (0.005) | (0.005) |
| Child's height (cm) | 0.001 | 0.001 | 0.001 | 0.001 |
| | (0.005) | (0.005) | (0.004) | (0.004) |
| Mother's age (years) | -0.008 | -0.007 | -0.009 | -0.008 |
| | (0.006) | (0.006) | (0.007) | (0.007) |
| Father's age (years) | 0.004 | 0.003 | 0.005 | 0.005 |
| | (0.005) | (0.006) | (0.006) | (0.006) |
| Mother's height (cm) | -0.003 | -0.002 | -0.001 | -0.001 |
| | (0.004) | (0.004) | (0.004) | (0.004) |
| Father's height (cm) | 0.008 | 0.007 | -0.001 | -0.001 |
| | (0.004) | (0.004) | (0.004) | (0.004) |
| Further controls | Yes | Yes | Yes | Yes |
| Observations | 1878 | 1878 | 1853 | 1853 |
| Adjusted $R^2$ | 0.069 | 0.072 | 0.149 | 0.152 |

The dependent variables in Columns (1)—(4) are the measures of positive and negative reciprocity, derived by taking

---

[17] The results for those regressions are available upon request.

the average on the three questions on positive and negative reciprocity on a 7-point scale, respectively. All dependent variables were standardized. The explanatory trust variable was derived by taking the weighted average from agreement with the three statements regarding trust (general trust, reliance on others, need for caution in dealing with strangers) measured on a 4-point scale and was also standardized. Average reciprocity in the region were based on the full 2010 SOEP sample and were also standardized. Children were excluded from calculation of the average. Column (1), and (3) show results without the regional average for comparison. Coefficients in all columns are OLS estimates. Robust standard errors are reported in brackets; Additional controls in all columns included the gender and age composition of the region and the trust measure in Column (1)-(4). *p < .05; **p < .01; ***p < .001

of residence. In this case, the correlation of attitudes between parents and children should have been similar to the correlation between any other individuals within the same region. To test this hypothesis, children were randomly rematched with other parents in the region of residence and the Spearman's rank correlation coefficient for these artificial parent-child combinations was calculated (a similar procedure was also applied by Dohmen et al. 2012). Under the hypothesis that the correlation between children and parents came from the fact that they shared the same region of residence, there should be no difference in the correlations compared to real families. Table 7 gives the results.

The intergenerational correlation of attitudes in artificial families was smaller than in real families and of less significance. Furthermore, the difference between the intergenerational correlation between real and artificial families was found to be significant beside in the case of mothers' patience. Hence, one can conclude that the membership to a region was not the main driver of the positive correlation between children's and parents' attitudes. However, as nearly all of the coefficients for the artificial families were still positive, it strengthens the assumption that the regional attitudes indirectly contributed to the attitude formation of children.

## Assortative Mating

According to the model of Bisin and Verdier (2000), the socialization technique of homogenous parents should be more efficient than those of heterogeneous parents. The wish to socialize future children in the direction of their own attitudes should drive parents to seek for a mate with similar attitudes to themselves. The positive assortative mating describes the third channel in the model of intergenerational transmission of attitudes. An important prerequisite for assortative mating is the fact that both mother and father have influence on the attitudes of their children. This has been shown in the previous sections. The whole samples of the waves 2008 and 2010 as well as a sub-sample of parents, for whom information on their children's attitudes was available, were used to analyze the correlation of attitudes among married and non-married couples.

Columns (1)-(3) of Table 8 give the results for all couples in the sample and Columns (4)-(6) give the results for all couples with children in the sample. The attitude of the female spouse was regressed on the attitude of the male spouse and several additional variables. Exogenous controls on age, height as well as attitudes on risk and impulsiveness for both partners were included in Column (2) and (5) in Part 8-1. The regressions in Column (2) and (5) in Part 8-2 included age, height as well as attitudes on risk and patience for both partners. The specifications concerning reciprocity in Part 8-3 and 8-4 of Table 8 included age, height, and in the case of reciprocity, the measure of trust, in Columns (2) and (5). The same control variables on individual and environmental characteristics of both partners as in Tables 2 and 3 were included in Column (3) and (6) in all parts of Table 8.

Surprisingly, there was a significant negative relationship between female and male spouse's patience. This was found for the full sample as well as for the sub-sample of parents. Becker (1993) suggested that there might not only be positive but also negative assortative matching between individuals on the marriage market. This would result in individuals with dissimilar attitudes mating with each other and reduces the similarities within a family. Whether positive or negative mating is optimal, depends on whether traits, on which a mating decision is based, were substitutes or complements. If these traits were substitutes, individuals should engage in positive assortative mating, while complements would need a partner that is different on the respective trait (Becker 1993). Two studies on inter-personal attraction conducted by Figueredo et al. (2006) showed that individuals sought partners similar to themselves but also sought mates who showed differences in personality traits. As it seems plausible that patience is not an overall preferred attitude but there might be situations in which one could also benefit from a higher degree of impatience, individuals might seek for a partner who is complementary in time preferences. Further research should point into the direction which attitudes are substitutes, which would suggest positive assortative mating, and which attitudes are complements, which would suggest negative assortative mating.

**Table 7** Spearman's rank correlation coefficients in artificial families

|  | Child's attitude | | | |
|---|---|---|---|---|
|  | Patience | Impulsiveness | Positive reciprocity | Negative reciprocity |
| Real mother's attitude | **0.0515**** | **0.1015***** | **0.2271***** | **0.2411***** |
|  | N=2830 | N=2828 | N=2639 | N=2611 |
| Random mother's attitude | **0.0058** | **0.0113** | **-0.0365** | **0.0330** |
|  | N=2831 | N=2829 | N=2638 | N=2615 |
| Difference | 0.0457 | 0.0902*** | 0.2636*** | 0.2081*** |
| Real father's attitude | **0.0911***** | **0.1407***** | **0.1999***** | **0.2361***** |
|  | N=2540 | N=2539 | N=2383 | N=2369 |
| Random father's attitude | **0.0024** | **0.0218** | **0.0101** | **0.0394** |
|  | N=2541 | N=2540 | N=2380 | N=2366 |
| Difference | 0.0887** | 0.1189*** | 0.1896*** | 0.1968*** |

Spearman's rank correlation coefficient for children and their real parents, as well as for children and randomly assigned parents. Significance tests for differences between the correlation in real and artificial families were obtained by using bootstrapping methods. All measures were standardized. *p < .05; **p < .01; ***p < .001

For impulsiveness and reciprocity the assumption of positive assortative mating was confirmed. The strongest correlation among couples in the full sample was found for positive reciprocity and the strongest correlation among parents was found for negative reciprocity. This added to the results from the previous sections, where the results showed the strongest intergenerational correlation between children's and parents' negative reciprocity.

**Further Evidence on the Socialization Mechanism**

An important question for the present research was whether parents were actively able to form the attitudes of their children or whether the transmission process was purely genetic. This refers to the discussion on "nature vs. nurture" – skill transmission through inheritance of genes vs. transmission through a productivity effect of parental skills. In their analysis on the intergenerational transmission of cognitive and non-cognitive skills, Anger and Heineck (2010) and Anger (2012) found results which suggested that parental investments played an important role. They provided evidence for an own-gender effect: fathers mattered more for the fluid intelligence of their sons, whereas mothers mattered more for their daughters. Furthermore, they found stronger intergenerational correlations for skills which are based on past experience then for those based on innate abilities. Both findings could hardly be explained by a purely genetic model.

Results supporting the influence of genetic factors in the intergenerational transmission of attitudes were given by Duncan et al. (2005). They assessed the relationship between several personal characteristics between mothers and their children. Finding that most of mothers' traits were only associated with the respective trait of their children, whereas family background and parenting style did not matter for the transmission, they suggested that correlation of attitudes between generations was mainly due to a genetic influence. As it was not possible to make a clear distinction between "nature" and "nurture" with the SOEP data, it was concluded that both contributed to the transmission of cognitive and non-cognitive skills from parents to their children (Anger and Heineck 2010)

Several of the previous findings in this work supported the hypothesis that socialization did play a role in the transmission process. The results in the previous sections indicated that the attitude of the father was more important for the transmission of patience and impulsiveness whereas the attitude of the mother was more important for reciprocity. From a genetics point of view, there was no explanation for this. Moreover, the previous results gave evidence for the impact of attitudes from the surrounding environment.

This section gives the results for the transmission of attitudes for several sub-samples differing in parental characteristics, family structure, and relationships inside the family. From the genetic perspective there should be no difference in the transmission process between these groups. Table 9 gives the results.

**Table 8** The relationship between female and male spouses' attitudes

| Dependent variable | 8-1: Female spouse's patience | | | | | |
|---|---|---|---|---|---|---|
| | Full sample 2008 | | | Parents in sample | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Partner's patience | -0.056*** | -0.037** | -0.031 | -0.042* | -0.029 | -0.070* |
| | (0.013) | (0.013) | (0.017) | (0.021) | (0.021) | (0.028) |
| Age, height, risk, impulsiveness | No | Yes | Yes | No | Yes | Yes |
| Further controls | No | No | Yes | No | No | Yes |
| Observations | 6368 | 6336 | 4593 | 2396 | 2384 | 2232 |
| Adjusted $R^2$ | 0.003 | 0.049 | 0.058 | 0.002 | 0.037 | 0.072 |
| Dependent variable | 8-2: Female spouse's impulsiveness | | | | | |
| | Full sample 2008 | | | Parents in sample | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Partner's impulsiveness | 0.050*** | 0.040** | 0.047** | 0.050* | 0.029 | 0.004 |
| | (0.014) | (0.015) | (0.018) | (0.022) | (0.024) | (0.034) |
| Age, height, risk, patience | No | Yes | Yes | No | Yes | Yes |
| Further controls | No | No | Yes | No | No | Yes |
| Observations | 6363 | 6336 | 4593 | 2397 | 2384 | 2232 |
| Adjusted $R^2$ | 0.002 | 0.180 | 0.192 | 0.002 | 0.197 | 0.223 |
| Dependent variable | 8-3: Female spouse's positive reciprocity | | | | | |
| | Full sample 2010 | | | Parents in sample | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Partner's reciprocity | 0.410*** | 0.410*** | 0.407*** | 0.341*** | 0.343*** | 0.329*** |
| | (0.014) | (0.016) | (0.021) | (0.022) | (0.022) | (0.025) |
| Age, height, trust | No | Yes | Yes | No | Yes | Yes |
| Further controls | No | No | Yes | No | No | Yes |
| Observations | 5941 | 4973 | 3694 | 2258 | 2219 | 2086 |
| Adjusted $R^2$ | 0.162 | 0.161 | 0.173 | 0.111 | 0.111 | 0.124 |
| Dependent variable | 8-4: Female spouse's negative reciprocity | | | | | |
| | Full sample 2010 | | | Parents in sample | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Partner's neg. reciprocity | 0.366*** | 0.363*** | 0.354*** | 0.366*** | 0.371*** | 0.339*** |
| | (0.013) | (0.014) | (0.019) | (0.021) | (0.021) | (0.027) |
| Age, height, trust | No | Yes | Yes | No | Yes | Yes |
| Further controls | No | No | Yes | No | No | Yes |
| Observations | 5917 | 4959 | 3690 | 2243 | 2204 | 2072 |
| Adjusted $R^2$ | 0.147 | 0.158 | 0.168 | 0.147 | 0.160 | 0.157 |

The dependent variable in Part (a) measured patience on a 11-point scale. The dependent variable in Part (b) measured impulsiveness on a 11-point scale. The dependent variables in Part (c) and (d) are the measures of positive and negative reciprocity, derived by taking the average on the three questions on positive and negative reciprocity on a 7-point scale, respectively. All dependent variables were standardized. The measures for the male partners were derived by the same procedures. Coefficients in all columns are OLS estimates. Robust standard errors are reported in brackets; Additional controls included years of schooling; gross annual household income; indicator variables for characteristics of the residence of youth before the age of 16; indicator variables for religion; dummies indicating whether nationality is German; subjective health status; dummies indicating whether partners lived in East Germany before the reunification. Fixed effects for region were included. *p < .05; **p < .01; ***p < .001

**Table 9** Further evidence on the socialization mechanism

| Dependent variable | 9-1: Similarity of parents | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | Homogenous | Heterogenous | Homogenous | Heterogenous | Homogenous | Heterogenous | Homogenous | Heterogenous |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mother's attitude | 0.056 | 0.062 | 0.154 | 0.089*** | 0.280*** | 0.132*** | 0.307*** | 0.218*** |
| | (0.047) | (0.036) | (0.093) | (0.025) | (0.056) | (0.031) | (0.059) | (0.033) |
| Father's attitude | 0.076 | 0.108** | 0.092 | 0.122*** | 0.057 | 0.069* | 0.086 | 0.167*** |
| | (0.049) | (0.033) | (0.094) | (0.026) | (0.059) | (0.032) | (0.061) | (0.032) |
| Observations | 1371 | 1005 | 947 | 1428 | 1650 | 592 | 1419 | 812 |
| Adjusted $R^2$ | 0.008 | 0.012 | 0.046 | 0.034 | 0.048 | 0.039 | 0.082 | 0.032 |

| Dependent variable | 9-2: Only mothers | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | Single | Homogenous | Single | Homogenous | Single | Homogenous | Single | Homogenous |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mother's attitude | 0.102 | 0.111** | -0.100 | 0.239*** | 0.202 | 0.332*** | -0.002 | 0.386*** |
| | (0.152) | (0.034) | (0.167) | (0.039) | (0.136) | (0.029) | (0.149) | (0.029) |
| Observations | 58 | 1377 | 58 | 950 | 52 | 1421 | 53 | 1315 |
| Adjusted $R^2$ | -0.070 | 0.006 | -0.066 | 0.044 | -0.028 | 0.082 | -0.058 | 0.153 |

| Dependent variable | 9-3: Brothers and sisters | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | One or more | None | One or more | None | One or more | None | One or more | None |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mother's attitude | 0.046 | 0.028 | 0.090*** | 0.167** | 0.183*** | 0.179** | 0.219*** | 0.282*** |
| | (0.024) | (0.063) | (0.022) | (0.053) | (0.024) | (0.062) | (0.025) | (0.061) |
| Father's attitude | 0.090*** | 0.084 | 0.129*** | 0.093 | 0.116*** | 0.059 | 0.164*** | 0.157* |
| | (0.023) | (0.066) | (0.022) | (0.063) | (0.025) | (0.066) | (0.024) | (0.062) |
| Observations | 2073 | 303 | 2072 | 303 | 1961 | 281 | 1949 | 282 |
| Adjusted $R^2$ | 0.011 | 0.011 | 0.038 | 0.077 | 0.048 | 0.106 | 0.066 | 0.034 |

| Dependent variable | 9-4: Relationship with parents | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | Fights | Harmonic | Fights | Harmonic | Fights | Harmonic | Fights | Harmonic |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mother's attitude | -0.013 | 0.054* | 0.087 | 0.097*** | 0.160*** | 0.190*** | 0.272*** | 0.216*** |
| | (0.054) | (0.025) | (0.049) | (0.022) | (0.048) | (0.025) | (0.055) | (0.026) |
| Father's attitude | 0.040 | ***0.098 | 0.018 | 0.154*** | 0.085 | 0.112*** | 0.065 | 0.184*** |
| | (0.048) | (0.024) | (0.044) | (0.023) | (0.049) | (0.026) | (0.054) | (0.025) |
| Observations | 376 | 2000 | 376 | 1999 | 398 | 1844 | 397 | 1834 |
| Adjusted $R^2$ | -0.016 | 0.011 | 0.024 | 0.043 | 0.072 | 0.049 | 0.042 | 0.063 |

| Dependent variable | 9-5: Gender effects | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | Daughters | Sons | Daughters | Sons | Daughters | Sons | Daughters | Sons |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mother's attitude | 0.113*** | -0.005 | 0.082** | 0.116*** | 0.176*** | 0.195*** | 0.241*** | 0.216*** |
| | (0.033) | (0.030) | (0.031) | (0.028) | (0.033) | (0.031) | (0.033) | (0.033) |

Table 9 (continued)

| Dependent variable | 9-5: Gender effects | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | Daughters | Sons | Daughters | Sons | Daughters | Sons | Daughters | Sons |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Father's attitude | 0.053 | 0.121*** | 0.090** | 0.161*** | 0.089* | 0.119** | 0.121*** | 0.195*** |
| | (0.031) | (0.029) | (0.030) | (0.029) | (0.035) | (0.031) | (0.032) | (0.032) |
| Observations | 1120 | 2056 | 1119 | 1256 | 1049 | 1193 | 1045 | 1186 |
| Adjusted $R^2$ | 0.019 | 0.013 | 0.022 | 0.053 | 0.030 | 0.054 | 0.056 | 0.065 |

| Dependent variable | 9-6: Parents' life satisfaction | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Patience | | Impulsiveness | | Pos. recirocity | | Neg. reciprocity | |
| | High | Low | High | Low | High | Low | High | Low |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Mother's attitude | 0.030 | 0.085 | 0.091*** | 0.144* | 0.158*** | 0.288*** | 0.234*** | 0.222*** |
| | (0.025) | (0.054) | (0.022) | (0.057) | (0.024) | (0.055) | (0.026) | (0.055) |
| Father's attitude | 0.097*** | 0.043 | 0.133*** | 0.094* | 0.105*** | 0.099 | 0.157*** | 0.171*** |
| | (0.024) | (0.049) | (0.023) | (0.047) | (0.025) | (0.060) | (0.025) | (0.058) |
| Observations | 1908 | 468 | 1907 | 468 | 1821 | 421 | 1814 | 417 |
| Adjusted $R^2$ | 0.009 | 0.011 | 0.042 | 0.026 | 0.062 | 0.034 | 0.050 | 0.116 |

The dependent variable in Part (a) measured patience on a 11-point scale. The dependent variable in Part (b) measured impulsiveness on a 11-point scale. The dependent variables in Part (c) and (d) are the measures of positive and negative reciprocity, derived by taking the average on the three questions on positive and negative reciprocity on a 7-point scale, respectively. All dependent variables were standardized. Coefficients in all columns are OLS estimates. Robust standard errors are reported in brackets; Additional controls in all columns included gender of the child, as well as age and height of child and both parents. In Part (b) only gender of the child, as well as age and height of child and mother were included. *p < .05; **p < .01; ***p < .001

Part 9-1 of Table 9 concerns the similarity between parents. According to Bisin and Verdier (2000) parents who are more similar to each other according to their attitudes, have a more efficient socialization technology. Thus, it was an interesting question whether homogenous parents showed stronger effects in the intergenerational transmission. They were defined as those, whose difference in attitudes was less than one standard deviation. Overall, it was not possible to make a clear statement whether homogenous couples were more efficient in the transmission of the specific attitudes. For patience the coefficients of homogenous couples were smaller than those of heterogeneous couples and not even significant. For positive and negative reciprocity at least the coefficient of the mother was larger in homogenous couples, while father's coefficients were smaller and nonsignificant.

Additionally, the transmission process was analyzed for single parents, or more precisely, for single mothers. There were two possible ways in which they could differ from homogenous couples in the transmission process. On the one hand, the effect of the single mother could be greater, as she was the only one directly influencing the child. On the other hand, as a single mother had to organize household and children alone, she had less time to socialize her children which leads to a lower effect. The results in Part 9-2 indicated the latter as the coefficients for mothers in homogenous couples were larger and highly significant compared to those of a single mother. It was interesting to notice, that the correlation of impulsiveness and negative reciprocity between single mothers and children was even negative. Most of these results pointed into the direction that single mothers were less efficient in transmitting their own attitudes. However, the results and a possible interpretation here have to be seen with caution as there was a very low number of observations for children growing up with their single mothers. Furthermore, although children stated that they only lived with their mothers for the first 15 years of their life, it does not mean that they were fully separated from their fathers and not influenced by them.

The number of brothers and sisters might also influence the strength of the intergenerational correlation of attitudes. Again there might have been two possible ways in which the existence of siblings could affect the socialization of parents. On the one hand, there was less one-on-one time for each child, which could reduce the strength of the socialization. On the other hand, children could have spent a lot of time with their

siblings. Under the assumption that children were impacted by individuals in their local environment and as their brothers and sisters got the same attitudes from their parents, this might have strengthend the intergenerational correlation. The results in Part 9-3 supported the second hypothesis. For patience and positive reciprocity the intergenerational correlation seemed larger for children with at least one brother or sister. For impulsiveness mother's coefficient was slightly larger in the case of no siblings whereas the father's coefficient was larger in the case of one or more siblings.

Furthermore, the relationship between children and their parents seemed intuitively important for the intergenerational correlation of attitudes. If children and parents had a critical relationship, children were more likely to be influenced by other role models in their surrounding environment. The quality of the relationship was measured by the fighting frequency of children with their parents when growing up.[18] Besides mother's coefficient for negative reciprocity, the results showed a greater transmission effect in harmonic families and suggested that children who had a critical relationship with their parents looked for other role models and were less socialized by their parents.

Anger and Heineck (2010) showed gender-specific effects in the transmission of cognitive skills. Table 9 also give results for sons and daughters separately. For patience and negative reciprocity, there seemed to be own-gender effects as mother's attitude seemed to be more important for daughters and father's attitude seemed to be more important for sons. However, looking at impulsiveness, and positive reciprocity, both father's and mother's attitudes were stronger correlated to those of their sons.

The last line in Table 9 concerns parents' life satisfaction.[19] The model of Bisin and Verdier (2000) assumed that parents want to transmit their own attitudes to their children, regardless of their children's own preferences. From that point of view, it should have played no role for the transmission effect whether parents had a high or low life satisfaction. The results in Part 9-6 of Table 9 supported this hypothesis, as there were no consistent differences between the parents with a high or low life satisfaction.

Even if not all results in this section clearly supported the hypothesis from the model of Bisin and Verdier (2000), they still showed that there were differences in the strength of intergenerational correlation of attitudes in different subsamples. These differences were hardly compatible with a purely genetic model and suggest that mothers and fathers were indeed able to directly socialize their children.

**Conclusion**

The present work provides evidence for the intergenerational transmission of patience, impulsiveness, and reciprocity. The three channels from the model of Bisin and Verdier (2000) were supported: (1) Parents transmit their own attitudes to children via direct socialization. (2) The prevailing attitudes in the region of residence additionally influence the attitude formation of children. (3) Parents engage in positive assortative mating which could help them to socialize their children in a more efficient way. The highest intergenerational correlation was found for negative reciprocity and the lowest correlation for patience.

When analyzing the transmission process in sub-samples differing in family structure and parental characteristics, further differences were found. Children showed greater correlation with their parents' attitudes when more siblings were present in the family. The relationship might have been strengthened as a lot of time was spent with siblings who were also socialized. Furthermore, children who had a critical relationship with their parents showed a lower correlation as they might have looked for other role models and were less socialized by their parents.

From a genetics point of view there is no explanation why the transmission process should differ according to family structure and parental characteristics, as was found here, or why individuals from the surrounding environment should play a role. Thus, the present results indicated that the transmission process might not be purely genetic, but that socialization by parents and other individuals was important for the formation of childrens' attitudes. In that way, the results contribute to the discussion on "nurture vs. nature" in intergenerational correlation on attitudes.

The results on the intergenerational transmission of attitudes are of particular significance as several other studies provided evidence that the attitudes analyzed in this work are important determinants of individual success. Similarity between individuals could be driven by the fact that they have similar parents, which

---

[18] The SOEP included two questions on whether one had arguments or fights with the mother or father at age 15. The five answering categories range from "very often" to "never". If children indicated that they fought "sometimes", "seldom", or "never" with one of their parents during their childhood, the relationship was seen as harmonic. If children indicated that they fought "often" or "very often", the relationship was called "Fights" in Part 9-4.

[19] Overall life satisfaction was measured with a single item, where individuals had to indicate on a scale from 0 to 10 whether they are completely dissatisfied or completely satisfied. When mother's or father's life satisfaction was above the average satisfaction of all parents in the sample, it was seen as "High", otherwise as "Low" in Table 9.

most likely leads to an intergenerational persistence of attitudes and low social mobility between generations. The results are important for a more detailed understanding of the persistence of core economic outcomes, such as income or education (see e.g., Blanden et al. 2007; Bowles and Gintis 2002) and might help politics to understand where to start when enforcing greater social equality. Children from families with difficult conditions, for example, adverse parental characteristics, should not be left behind in a vicious circle. As they would most likely inherit their parents' characteristics and attitudes, they would also inherit lower chances for educational or economic success. However, the results in this paper suggest that children can also be influenced by individuals in their surrounding environment. Thus, it becomes necessary to provide those children with individual support by qualified teachers or social workers.

Although the results found in this paper provide evidence for transmission of attitudes beyond a pure genetic process, the study shows some limitations. First, even though the main transmission of attitudes was most likely from parents to their children, there is evidence that children might also influence their parents' behaviors (Ge et al. 1996). For example, having an impatient child might change parents' attitude on patience. As the measure included in the SOEP are current measures and no measures on parents' attitudes before they had children are included, there might also be reverse causality in these study (see also Anger 2012). To rule out the reverse causality, one would need strong instruments for patience, impulsiveness, and reciprocity. Those have not been found in the SOEP data. Parental characteristics that are related to the attitudes of interest (parents' measures on risk and trust), as well as variables, that are plausible exogenous to the attitudes of children (parents' age, height, health and education) have only been found to be weak instruments.[20]

Second, although Becker (1976) stated that preferences do not to change over time, it might be questionable how stable the attitudes of interest are over the life-span. In this paper, only single measures of the attitudes of parents and children were used. If attitudes were highly dependent on specific situations, there might have been less room for direct socialization of children by their parents. However, there have been several studies on the temporal stability of time preferences and reciprocity. There is evidence for a stable aggregate distribution of time preferences over time and high correlation in time preferences on the individual level (see e.g., Chuang and Schechter 2015; Meier and Sprenger 2015). For reciprocity, Chuang and Schechter (2015) found no stable level over time. However, this is contradicted by Guttman (2000) who found stable population preferences for reciprocity. Thus, one cannot reject that there is some underlying stable level of time preferences and reciprocity for individuals. A data set to satisfactorily deal with the two issues mentioned above would need to include several measures of the attitudes over a sufficient time span which also includes measure of parents' attitudes before children were born.

An additional interesting question for further analysis might be whether there exist parental investments, besides assortative mating, that could strengthen the transmission of attitudes. Zumbuehl et al. (2013) have already shown that parents can use involvement in the life of their children as an instrument to shape their risk and trust preferences on purpose. Their results indicated that higher levels of parental involvement are associated with more similarity in attitudes between generations.

Furthermore, there should be deeper research on the question how alternative parenting styles work in the transmission process. In a recent work, Zilibotti and Doepke (2014) analyzed the determinants and varying effects of parenting styles, which arise from the interaction of different degrees of paternalism and the economic environment. In contrast to Bisin and Verdier (2000), even fully paternalistic parents had no exogenous drive to reproduce their own traits in their children. Instead, depending on the nature of the respective attitudes, different parenting styles went together with different levels of attitude transmission and with different levels of economic success across generations.

And finally, it should be clear that there are many more cognitive and non-cognitive skills that determine success over the life-span, which are most likely transmitted from parents to their children. Thus, there should be ongoing research on intergenerational attitude transmission.

## References

Andreoni, J., & Sprenger, C. (2012). Risk preferences are not time preferences. American Economic Review, 201(7), 3357-3376. doi:10.1257/aer.102.7.3357.

Anger, S. (2012). The intergenerational transmission of cognitive and non-cognitive skills during adolescence and young adulthood.

---

[20] According to Stock and Watson (2007) the *F*-test for a single endogenous regressor should be above 10, otherwise the instruments are assumed to be weak.

SOEPpapers on Multidisciplinary Panel Data Research, 473. doi:10.2139/ssrn.2142491.

Anger, S., & Heineck, G. (2010). Do smart parents raise smart children? The intergenerational transmission of cognitive abilities. Journal of Population Economics, 23(3), 1105-1132. doi:10.1007/s00148-009-0298-8.

Becker, G. S. (1976). The economic approach to human behavior. Chicago: University of Chicago Press.

Becker, G. S. (1993). A treatise on the family. Cambridge: Harvard university press.

Berg, J., Dickhaut, J., & Mc-Cabe, K. (1995). Trust, reciprocity and social history. Games and Economic Behavior, 10, 122-142.

Bisin, A., & Verdier, T. (2000). "Beyond the Melting Pot": Cultural transmission, marriage, and the evolution of ethnic and religious traits. The Quarterly Journal of Economics, 115, 955-988. Retrieved from http://www.jstor.org/stable/2586900

Blanden, J., Gregg, P., & Macmillan, L. (2007). Accounting for intergenerational income persistence: Noncognitive skills, ability and education. The Economic Journal, 117, 43-60. doi:10.1111/j.1468-0297.2007.02034.x.

Bowles, S., & Gintis, H. (2002). The inheritance of inequality. The Journal of Economic Perspectives, 16(3), 3-30. doi:10.1257/089533002760278686.

Boyd, R., & Richerson, P. J. (1988). Culture and the evolutionary process. Chicago: University of Chicago Press.

Castillo, M., Ferraro, P. J., Jordan, J. L., & Petrie, R. (2011). The today and tomorrow of kids: Time preferences and educational outcomes of children. Journal of Public Economics, 95, 1377-1385. doi:10.1016/j.jpubeco.2011.07.009.

Chuang, Y., & Schechter, L. (2015). Stability of experimental and survey measures of risk, time, and social preferences: A review and some new results. Journal of Development Economics, 117, 151-170. doi:10.1016/j.jdeveco.2015.07.008.

Conover, W. J. (1995). Practical nonparametric statistics. New York: Wiley.

Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2008). Representative trust and reciprocity: Prevalence and determinants. Economic Inquiry, 46, 84-90. doi:10.1111/j.1465-7295.2007.00082.x.

Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2009). Homo reciprocans: Survey evidence on behavior outcomes. The Economic Journal, 119, 592-612. doi:10.1111/j.1468-0297.2008.02242.x.

Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2012). The intergenerational transmission of risk and trust attitudes. Review of Economic Studies, 79, 645-677. doi:10.1093/restud/rdr027.

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. G. (2011). Individual risk attitudes: Measurement, determinants and behavioral consequences. Journal of the European Economic Association, 9, 522-550. doi:10.1111/j.1542-4774.2011.01015.x.

Duncan, G., Kalil, A., Mayer, S. E., Tepper, R., & Payne, M. R. (2005). The apple does not fall far from the tree. In S. Bowles, H. Gintis, & M. Osborne Groves (Eds.), Unequal chances: Family background and economic success (pp. 23-79). Princeton: Princeton University Press.

Eaves, L., Heath, A., Martin, N., Maes, H., Neale, M., Kendler, K., et al. (1999). Comparing the biological and cultural inheritance of personality and social attitudes in the Virginia 30 000 study of twins and their relatives. Twin Research, 2(02), 62-80.

Fehr, E. & Gachter, S. (2000). Fairness and retaliation: The economics of reciprocity. Journal of Economic Perspectives, 141, 159-181. Retrieved from http://www.jstor.org/stable/2646924

Figueredo, A. J., Defcek, J. A., & Jones, D. N. (2006). The ideal romantic partner personality. Personality and Individual Differences, 41, 431-441. doi:10.1016/j.paid.2006.02.004.

Finke, M. S., & Huston, S. J. (2013). Time preference and the importance of saving for retirement. Journal of Economic Behavior and Organization, 89, 23-34. doi:10.1016/j.jebo.2013.03.004.

Ge, X., Conger, R. D., Cadoret, R. J., Neiderhiser, J. M., Yates, W., Troughton, E., et al. (1996). The developmental interface between nature and nurture: a mutual influence model of child antisocial behavior and parent behaviors. Developmental Psychology, 32(4), 574. doi:10.1037/0012-1649.32.4.574.

Greene, W. H. (2012). Econometric analysis. New York: Pearson Education Limited.

Guttman, J. M. (2000). On the evolutionary stability of preferences for reciprocity. European Journal of Political Economy, 16(1), 31-50. doi:10.1016/S0176-2680(99)00046-4.

Haisken-DeNew, J. P., & Frick, J. R. (2005). Desktop companion to the German Socio-Economic Panel Study (SOEP)-version 8.0. update to Wave 21. German Institute for Economic Research.

Heckmann, J. J., Stixrud, J., & Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. Journal of Labor Economics, 24(3), 411-482. doi:10.3386/w12006.

Hertz, T., Jayasundera, T., Piraino, P., Selcuk, S., Smith, N., & Verashchagina, A. (2008). The inheritance of educational inequality: International comparisons and fifty-year trends. The B.E. Journal of Economic

Analysis & Policy, 7. doi:10.2202/1935-1682.1775.

Kirby, K. N., Winston, G. C., & Santiesteban, M. (2005). Impatience and grades: Delay-discount rates correlate negatively with college GPA. Learning and Individual Differences, 15, 213-222. doi:10.1016/j.lindif.2005.01.003.

Knies, G., & Spiess, C. K. (2007). Regional Data in the German Socio-Economic Panel Study (SOEP). DIW Berlin - Data Documentation, 17.

Lawless, L. J. R., Nayga, R., & Drichoutis, A. (2013). Time preference and health behaviour: A review. Agricultural and Food Economics, 1, 1-17. doi:10.1186/2193-7532-1-17.

Meier, S., & Sprenger, C. (2010). Present-biased preferences and credit card borrowing. American Economic Journal: Applied Economics, 193-210. Retrieved from http://www.jstor.org/stable/25760198

Meier, S., & Sprenger, C. (2015). Temporal stability of time preferences. Review of Economics and Statistics, 97(2), 273-286. doi:10.1162/REST_a_00433.

Perugini, M., Gallucci, M., Presaghi, F., & Ercolani, A. P. (2003). The personal norm of reciprocity. European Journal of Personality, 17, 251-283. doi:10.1002/per.474.

Richter, D., Metzing, M., Weinhardt, M., & Schupp, J. (2013). SOEP scales manual. SOEP survey papers, 138.

Solon, G. (2002). Cross-country differences in intergenerational earnings mobility. The Journal of Economic Perspectives, 16(3), 59-66. doi:10.1257/089533002760278712.

Stock, J. H., & Watson, M. W. (2007). Introduction to econometrics. New York: Pearson Education.

Tidd, K. L., & Lochard, J. S. (1978). Monetary significance of the affiliative smile: A case for reciprocal altruism. Bulletin of the Psychonomic Society, 11, 344-346. doi:10.3758/BF03336849.

Vischer, T., Dohmen, T., Falk, A., Huffmann, D., Schupp, J., Sunde, U., et al. (2013). Validating an ultra-short survey measure of patience. Economic Letters, 120, 142-145. doi:10.1016/j.econlet.2013.04.007.

Wagner, G., Burkhauser, R. V., & Behringer, F. (1993). The english language public use file of the German socio-economic panel study. The Journals of Human Resources, 28(2), 429-433.

Zilibotti, F., & Doepke, M. (2014). Parenting with style: Altruism and paternalism in intergenerational preference transmission. 2014 Meeting Papers, No. 343, Society for Economic Dynamic.

Zumbuehl, M., Dohmen, T., & Pfann, G. A. (2013). Parental investment and the intergenerational transmission of economic preferences and attitudes. IZA Discussion Papers, 7476. doi:10.2139/ssrn.2304090.

**Britta Gauly** is a researcher in the department for Survey Design and Methodology at GESIS-Leibniz Institute for the Social Sciences in Mannheim, Germany. Her main research interests concern labor market chances of low-skilled individuals, and the changes in returns to skills and education over the life cycle. She is currently working in an international comparative study on the assessment of skills and competencies of the working age population (Programme for the International Assessment of Adult Competencies - PIAAC). She received her Master degree in Economics at the University of Bonn, Germany