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Title: Intertemporal choices of children and adults from poor Roma communities: A case study from Slovakia

Abstract: Poverty may have negative consequences on people's economic behaviour and literature has documented close links between time discounting and poverty. This paper investigates intertemporal choices made by children and adults from segregated Roma communities in Slovakia. The study finds that fewer children than adults prefer smaller-sooner to larger-later amounts (referred to as 'quasi-impatience'). The study further examines the decisions of individuals assigned into random teams by cohorts (children, parents, grandparents), and finds no statistically significant differences in the proportions of quasi-impatient teams across the cohorts. The results also suggest that children's decisions are correlated with those of their parents.

Keywords: Intertemporal choices; Impatience; Roma; East-Central Europe; Slovakia.

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Intertemporal choices of children and adults from poor Roma communities: A case study from Slovakia

I. INTRODUCTION

Over their lifetimes, people make various intertemporal choices for which the benefits and costs are realized over time (Loewenstein and Thaler, 1989). Previous research has identified *self-control*, i.e., the ability to control tensions that arise when individuals face immediate temptation when making a choice with future consequences, as one mechanism of intertemporal choice (Berns, Laibson, and Loewenstein, 2007)¹. Self-control is particularly important when it comes to making intertemporal choices, as literature suggests that people try to maximise the immediate utility of consumption, even when they come into conflict with the goal of maximizing long-term utility (Puri, 1996; Ramanathan and Menon, 2006). In this vein, Vollmer et al. (1999) refer to self-control as situations in which “*responding produces larger delayed reinforcers at the expense of immediate smaller reinforcers*” (p. 451), which is opposed to impulsive behaviour that occurs when “*responding produces more immediate, relatively smaller reinforcers at the expense of delayed larger reinforcers*” (p. 451). From an economic perspective, when it comes to intertemporal choices, there is a close relationship between impulsiveness and impatience. In a broad sense, “*impatience is a preference for something to happen sooner rather than later*” (Prelec, 2004, p. 523) and can be observed most often in people with high rates of time discounting, i.e., people who find it difficult to delay gratification (Frederick, Loewenstein and O’Donoghue, 2002).

Self-control and the inverse of impulsiveness have been shown to have significant implications for economic decisions made by individuals. Textbook examples of consumer behaviours typifying a lack of self-control include situations such as paying in advance for activities one is intended to participate in over a longer period in the future, and subsequently dropping out of those activities prematurely (DellaVigna and Malmendier, 2006), such as gym memberships and various types of subscriptions. Clearly, weaknesses in self-control can ultimately have harmful effects on individuals’ future living standards, such as for those who prefer immediate consumption over generating savings and investing money (O’Donoghue and Rabin, 1999).

Impatience, or a preference for sooner over later rewards, has been shown to be closely related to numerous negative outcomes. Literature suggests that people with higher levels of impatience are more likely to make impulsive decisions (Kirby et al., 2005). Impatience is also related to lower cognitive ability and academic performance (Dohmen et al., 2010). People who discount the future more highly are more likely to drop out of high school and tend to perform less well academically in general (Kirby et al., 2005; Castillo et al., 2019). Such findings are consistent with the results of a meta-analysis performed by Shamosh and Grey (2008) which found that, across studies, higher intelligence was associated with lower levels of delay discounting. Sutter et al. (2013) further observe that time preferences are a strong predictor of child and adolescent health-related field behaviour, savings decisions, and

¹ Other mechanisms identified by Berns, Laibson and Loewenstein (2007) include *anticipation* (individuals imagine the pleasure or pain of a future event) and *representation* (how an individual’s brain interprets a set of choices).

conduct at school. A preference for a smaller-sooner sum as opposed to a larger-later one has been further associated with several demographics: younger age, lower income, less education; and more impulsive behaviours: earlier age of first sexual activity and more frequent relationship infidelity, smoking, and higher body mass index (Lawrance, 1991; Reimers et al., 2009). Increased impulsivity is also associated with greater tendencies towards procrastination (O'Donoghue and Rabin, 2001).

Literature further recognizes close links between time discounting and poverty. Living in poverty and deprivation can negatively affect numerous aspects of people's lives. Recent findings, e.g., suggest that the poor often behave in ways which can make it difficult to escape poverty (Mani et al., 2013). Poor people tend to save too little and borrow too much (often at high interest rates) and fail to enrol in, or drop out of assistance programs (Shah et al., 2012). This can, in part, be attributed to the concept of scarcity (Shafir and Mullainathan, 2013), which forces individuals to get along with less than they need. Poverty has also been shown to cause negative affect, including more stress and lower cognitive functioning, which in turn can make poor people more impatient and risk averse, resulting in lower levels of investment (including into education) and savings (Mani et al., 2013; Shah et al., 2012; Haushofer and Fehr, 2014; Carvalho et al., 2016). This can lead to low educational attainments, poor labour market outcomes, low future income and wealth, vulnerability to shocks, and can contribute to a feedback loop which traps people in poverty (Bernheim et al., 2015). This relationship, however, is not one-directional. In one direction, evidence suggests that poverty may have negative consequences on people's economic behaviour, in turn making it more difficult to escape poverty (Haushofer and Fehr, 2014). In the other direction, impatient people have been shown to accumulate less wealth (Tanaka, Camerer, and Nguyen, 2010), which contributes to perpetuating poverty. As impatience is also related to lower educational outcomes, higher drop-out rates and lower future incomes; taken together, the negative impacts of impatience are ultimately likely to have adverse consequences on economic situations. Ultimately, this reverse causality problem makes it challenging to answer questions about the extent to which poverty makes people impatient, and to what extent impatience traps people in poverty.

This study aims to contribute to empirical literature on the intertemporal choices of individuals in the context of poor Roma communities in East-Central Europe. Roma face multiple disadvantages including high rates of poverty and social exclusion, along with discrimination and prejudice. The estimated number of Roma in Europe is between 10 and 12 million (European Commission, 2020), of which a substantial proportion lives in Eastern and Central European countries. According to a joint survey conducted by the EU Agency for Fundamental Rights, UNDP, World Bank, and the European Commission in eleven EU member states, about 90 % of Roma live below the national income poverty line, and fewer than a third are in paid employment (FRA, 2014). It is further estimated that only around 20 % of Roma adults have attained more than primary education (FRA, 2018).

The living conditions of European Roma have been unfavourable since their arrival in Europe from Northern India during the middle ages. The first attempts to force an end to Roma nomadism were adopted under Empress Maria Theresa in the Habsburg Monarchy in the 18th century (Crowe, 2007). In the post-WWII period, many socialist governments aimed to achieve equalized societies, and little attention was given to the needs of specific minorities.

At the end of the 1950s, Roma Travellers were forced to settle by the communist governments of many socialist countries. Assimilation attempts resulted in Roma children struggling to adapt to mainstream schools (Roth and Moisa, 2011), and quite often they were segregated into schools and classes for the ‘mentally retarded’ (Gheorghie and Mirga, 2001), which only further separated Roma from the majority. The unfavourable socio-economic situation of Roma shortly after the transition to free market societies across the region led to further deterioration in their living conditions. Roma, most of whom were unskilled or low-skilled workers, were among those most vulnerable to unemployment, and many Roma have become dependent on social benefits systems across generations. This has only worsened the negative stereotypes of Roma, who “*began to be perceived as a community which not only parasitizes on the labour of the society but is allowed to do so.*” (Marushiakova and Popov, 2016: 159). These untruthful stereotypes are a consequence of a lack of knowledge of Roma communities, and is escalated by the use of xenophobic anti-Roma rhetoric by some politicians (Carrera, Rostas and Vosyliūtė, 2017). As documented by previous research, negative stereotypes can have negative effects on the performance of Roma (Želinský, 2021), they reinforce discrimination; and ultimately reduce employment opportunities and wages (Bertrand and Mullainathan, 2004), and access to housing (Ahmed and Hammarstedt, 2008) and education (Hinnerich, Höglin, and Johannesson 2015). These factors all contribute to the adverse socio-economic outcomes of Roma.

This study was conducted in the setting of segregated Roma communities in Eastern Slovakia. Anecdotal evidence suggests that numerous Slovak Roma families often spend high proportions of their income in the short term (Žulátáková, 2007). Such behaviour can indeed be considered impulsive.² I focus on intertemporal choices in which participants prefer a smaller-sooner to a larger-later choice. As discussed above, this behaviour is regarded as impatient, and suggests a tendency towards impulsive behaviour.

The contribution of this study is at least threefold. It contributes to empirical literature on intertemporal choices among children and adults in a specific cultural setting – marginalized Roma communities in Eastern Slovakia. Secondly, it investigates correlations between the choices made by children and their parents, which enriches the literature on transmission of preferences across generations. Specifically, I examine the similarity between children’s and parents’ intertemporal choices, contributing to the literature on transmission of time preferences from parents to children (Kosse and Pfeiffer, 2013; Brown, 2015; Gaulty, 2017). Lastly, the paper contributes to the growing literature on economic behaviour in teams by examining intertemporal choices elicited in randomly created familial-generation groups. To explore the role of peers, after making an initial individual choice, participants were assigned to random teams, made a joint team decision; and afterwards made an additional individual decision. This simple intervention addresses a facet of traditional cultural traits in Roma communities: collective decision-making, which is often considered more important than individual responsibility and individual ambition by many Roma (Koupilova et al., 2001). The exercise hence also contributes to the discussion on the differences between joint team and individual decisions (e.g., Kugler et al., 2007, 2012) and how team membership can influence decisions made by individuals (Borek and Abraham, 2018). As discussed in the

² However, other explanations beyond buying larger amounts of goods less frequently can include, e.g., earning discounts by buying greater amounts, and saving transport costs spent on travel to and from shopping centres.

following section, numerous authors have studied the roles of parents and communities in shaping preferences, including the time preferences of children. This paper not only compares individual decisions with team decisions, it also elicits individual decisions made after a joint team decision, allowing me to explore differences between the two.

The paper is organized as follows. The second section discusses literature on shaping intertemporal decisions, including the roles of parents and community in shaping preferences, particularly time preferences. In the third section, I describe how participants were recruited and the methods employed in this study. The fourth section reports the results of the study, followed by the fifth section discussing the findings. The last section wraps up the main findings and presents final remarks.

II. SHAPING OF INTERTEMPORAL DECISIONS

There is growing literature studying children's intertemporal behaviour, and researchers in education and psychology suggest that development of time preferences occurs in childhood and varies by child and family characteristics (Bettinger and Slonim, 2007). This paper complements the literature on transmission of behaviour across generations and through social interaction with peers. The literature provides evidence of clustering preferences along family and community lines (Volland, 2013). Preferences, norms, and beliefs are partly transmitted through generations and are influenced by social interactions outside the family. As noted by Bisin and Verdier (2011), cultural transmission plays a central role in the formation of preference traits such as time discounting, risk aversion, altruism, cultural traits, social norms, and ideological tenets. Bisin and Verdier (2011) conceptualize cultural transmission as a result of interactions between socialization decisions inside the family and other socialization processes. According to Dohmen et al. (2012) several findings indicate that socialization plays an important role in the transmission process, and that children reproduce the specific variation in attitudes across contexts observed in the parents.

In their transition to adulthood, children and adolescents naturally encounter increasing numbers of decisions involving long-term consequences. The findings of literature studying preferences of children suggest that, on average, children and adolescents are more risk averse, ambiguity averse, and impatient than adults (Sutter et al., 2013). Doepke and Zilibotti (2008) argue that learning to be future-oriented is a part of childhood development and that parents have a substantial role in guiding the process. It is also generally believed that, in addition to parents, peers and the social and cultural environment also have important roles in shaping preferences. While the number of studies investigating transmission of time preferences from parents to their children is growing, literature remains rather sparse when it comes to the effects of peers on individuals' intertemporal choices.

Investigations into the transmission of preferences and attitudes from parents to children are often based on survey data. For example, Blau et al. (2013) used the 1995–2011 US Current Population Survey and 1970–2000 US Census data to examine the relationship between fertility and labour supply and intergenerational transmission of gender roles. They found that the transmission rates for immigrant fertility and labour supply between generations are higher than those for education. Similarly, Notten et al. (2012) used the 2003 and 2009 Family Survey of the Dutch Population data to analyse the intergenerational transmission of

book reading and television viewing behaviours. The authors conclude that both parental socioeconomic status and media socialization activities play important roles in the intergenerational transmission of media tastes. The US Panel Study of Income Dynamics (PSID) is a valuable set of data used, e.g., by Waldkirch et al. (2004) to investigate familial relationships in consumption patterns which suggest a parent-specific effect on children's consumption. In addition, the authors argue that income is not the only source of a parental effect in the consumption behaviour of children. Schmidt and Tauchmann (2011) find gender-specific heterogeneity in the intergenerational transmission of alcohol consumption, and a similar pattern is found for smoking habits. However, a same-sex parent-child link is not found for teenagers living in single-mother households (Loureiro et al, 2010). Wilhelm et al. (2008) investigated the association between the charitable generosity of parents and that of their adult children. They found that the correlation between religious giving of parents and children is stronger than the correlation between children's and parents' secular giving.

Gourskova et al. (2010) present a theoretical model of preference formation shaping children's rate of time preferences, using data from PSID and the Survey of Consumer Finances. They suggest that more patient parents may have more patient children because it is easier for patient parents to teach their children to be patient. This contrasts with the conclusions of Becker and Mulligan (1997), who argued that such a correlation was explained by the intergenerational correlation of wealth. One of the most influential papers on preference transmission across generations (Dohmen et al., 2012) investigates transmission of attitudes towards risk and trust. They use 2003 and 2004 waves of the German Socio-Economic Panel Study data, which included questions on trust and risk. They observe three aspects of the attitude transmission process, and show that attitudes towards risk and trust are strongly positively correlated between parents and children. Further empirical evidence based on survey data has been reported by, e.g., Gauly (2017), who utilized a measure that was incentive-compatible with an intertemporal choice experiment for impatience on a German Socioeconomic Panel, and showed that fathers were more important than mothers in the transmission of patience and impulsiveness. Similar results were obtained by Brown and van der Pol (2015) using multiple waves of the Australian Annual Household Survey (the HILDA survey), showing that there is a significant relationship between parents and their young adult offspring's risk and time preference measures.

In addition to evidence based on survey data, Cipriani et al. (2013) were the first to study the association between the behaviour of children and their parents using a lab-in-the-field experimental setup. They used a standard public goods game to study transmission of prosocial values from parents to their children. Their results do not support horizontal transmission of prosocial values. Somewhat similar results were obtained by Ben-Ner et al. (2017), who experimentally studied the generosity of 3 to 5-year-old children and their parents (mostly of African-American and Hispanic ethnicity) from a predominately low-income area in Chicago. They found little association between the giving of parents and that of their preschool-age children in a dictator game. Another recent piece of evidence on the transmission of preferences from parents to children was provided by Alan et al. (2017), who used an incentivized risk preference elicitation task to show that risk preferences are correlated between mothers and their children. When it comes to experimental investigation of the transmission of time preferences from parents to their children, the evidence is mixed. For example, Kosse and Pfeiffer (2012) found a correlation between a child's and the

mother's levels of impatience using German data. The same authors also found support for intergenerational transmission of 'quasi-hyperbolic' time preferences between mothers and their children (Kosse and Pfeiffer, 2013). On the contrary, Andreoni et al. (2019) do not observe a correlation between the time preferences of parents and their children in their experimental data from the US.

Literature further investigates how socialization with one's local community influences people's behaviour. It discusses potential causal mechanisms that connect neighbourhood characteristics to individual behaviour (Miltenburg, 2015). Neighbourhoods, together with schools and other contexts, have the potential to act as collective socialization agents, and thus can have an impact on children's behaviour (Gibson et al, 2009). Nonetheless, it is important to note that children typically do not choose neighbourhoods, but are born or brought into them by their parents. Hence, it would be challenging to cleanly identify the respective roles of parents and of neighbourhoods in shaping children's preferences.

Church et al. (2012) explored how neighbourhood socioeconomic status, individual children and parents, and household characteristics influence behaviour of children. Their results suggest that decreases in poverty rates and increases in neighbourhood socioeconomic status can lead to decreases in negative behaviour by children. Similar results were obtained by Teasdale and Silver (2009), who argue that neighbourhoods are an important structural source of self-control. They control for demographics, family characteristics, and social integration; their results indicate that living in a disadvantaged neighbourhood is a significant predictor of lower adolescent self-control. Special attention is paid to residential segregation, and the results suggest that segregation is a primary cause of geographical concentrations of poverty. Massey et al. (1991) studied the individual behaviour of White, Black and Hispanic participants in large metropolitan areas, and concluded that male joblessness, teenage childbearing and single-parent families are related to the overall rate of poverty in a group, and its segregation in a society. Examining the effects of neighbourhood histories on individual outcomes for adults suggested that individuals who lived with their parents in a poor neighbourhood experienced negative effects on their income later in life (Hedman et al., 2015). Similar findings were obtained by van Ham et al. (2013), who further suggest that ethnic minorities tend to have the longest cumulative exposure to poor neighbourhoods. This stream of literature provides strong evidence of the negative effects of living in poverty on the later outcomes of individuals.

Literature on the effects of neighbourhoods on intertemporal decisions of individuals finds consistent evidence across different settings that being directly observed by peers makes adolescents more impatient than when they make decisions individually (O'Brien et al., 2011; Weigard et al., 2014; Tymula 2019). Empirics also provides evidence of peer effects on self-control as a concept related to time preferences. For example, Grohmann and Sakha (2019) studied the effects of peer observation on a choice of temptation goods vs. money on a sample of individuals from rural villages in Thailand, and found evidence of peer effects. They further demonstrated that the consumption choice was influenced by the number of people who made the same decision previously, but not by the identity of those people. Battaglini, Díaz, and Patacchini (2017) empirically assessed the predictions of the model on self-control in peer groups proposed by Battaglini, Bénabou, and Tirole (2005), and found that students embedded in social circles have more self-control than those who acted alone.

Interestingly, being observed by peers (O'Brien et al., 2011; Weigard et al., 2014; Tymula 2019) has different effects on an individual's self-control than being a member of a social group (Battaglini, Díaz, and Patacchini, 2017). While the former often results in less self-control, the latter leads to more self-control.

III. DESCRIPTION OF DATA AND METHODS

3.1 Participants

The study was conducted in four municipalities in Eastern Slovakia in May-June 2014 and November-December 2014, i.e. before and after the summer break. The main reason for conducting data collections in these four municipalities was an established data collection infrastructure in the locations. Each municipality had one primary school for students from the municipality and potentially also some students from neighbouring villages lacking a primary school. All students (aged 8+) from the four schools (together with their parents and grandparents) were invited to take part. Participation of Roma students differed across schools and the estimated participation rates provided by the teachers responsible for inviting participants were around 80 – 90 %. Although these are relatively high participation rates, I cannot rule out systematic bias resulting from non-participation of certain groups of Roma, hence the representativeness of the results is limited. For example, the teachers who invited the participants noted that employed people were less likely to participate, since sessions were organized in the afternoons.

Data was collected on 1,901 individuals from 494 families (885 children, 718 parents and 298 grandparents). More than 90% (1,724) were of Roma ethnicity. Observations of individuals who misunderstood the tasks and those whose responses were not complete were excluded from the sample. Exclusion of such individuals may lead to selection bias, which may affect the generalizability of the results even at the municipal level. Three rounds of pilot sessions were conducted prior to the experiment (pilot data are not included in the sample). The first two pilots were aimed to assess participants' understanding of the tasks, and the third pilot assessed the logistics of the data collection. The analyses in this study are performed only on observations of Roma participants, with the exception of Subsection 4.5, where the differences between Roma and non-Roma are compared. Importantly, the non-Roma subsample includes only a very small number of observations and hence this element of the results should be interpreted very cautiously.

To recruit participants, the directors of primary schools in selected villages were contacted to obtain permission to conduct research in the school. One social community worker and one teacher from the local school in each village were hired and trained to select and invite households. All local households with children aged 8+ studying at primary school were invited to take part. Parent's and grandparent's ability to read and write without difficulties was another eligibility criterion. Again, this criterion may lead to another source of systematic bias, since people who are unable to read and write are excluded.

Approximately two weeks in advance, students were given leaflets advertising the experiment, and were asked to pass the leaflets to their parents. The leaflets informed the parents about the research to be conducted at a primary school, and the possibility to earn, on

average, 50 EUR per family of two children, two parents, and two grandparents in a period of approximately 90 minutes. One week after the leaflet distribution, households were contacted by the social community worker and/or the teacher. Since the goal was to focus on Roma students and their families, the main focus was on schools with high proportions of Roma. However, students of all ethnicities were invited. Approximately 80 – 90% of Roma households with children at the schools agreed to participate, while families from the majority population turned up only in very small numbers. The day before their slot, all participants were contacted by telephone/in person and informed of the time of their session. Finally, on the morning of the day of the survey, participants were again reminded by telephone. Eight to ten families were invited to each session, and multiple sessions were held.

Basic socio-economic and demographic characteristics of participants are reported in Table 1.

TABLE 1

3.2 The task

The surveys were conducted at local primary schools in the afternoons. Upon arrival, the participants were screened for eligibility, and information consent was read aloud. The participants were informed that the whole survey would last up to 90 minutes. Each participant was assigned a unique ID in order to assure their anonymity. Each participant received their own envelope and a set of stickers with printed unique IDs, and then drew a card which indicated random assignment to a team. The participants were instructed to place a sticker on their envelope and on each of their answer sheets (they were reminded of this again at the beginning of each task). Familial-generational groups (children, parents and grandparents) were separated into different rooms.

Two measures of impatience were elicited using a simple binary choice task method (Cardenas and Carpenter, 2005) designed to elicit time preferences in two time frames (the *current time frame* (CTF): today versus three months; and the *future time frame* (FTF): six months versus nine months). Participants made ten decisions in each set. The ‘sooner’ choice was reimbursed at 5 EUR and the ‘later’ choice started at 6 EUR and increased by 1 EUR for each decision. The maximum amount for the later choice was 15 EUR, which corresponded to approximately one day’s net income of a person earning minimum wage. Children earned half the adult rates for the same tasks. All answer sheets contained visual aids (pictures of banknotes/coins of corresponding values).

The original plan was to implement an incentivised approach but to pay for a randomly selected decision by each participant. After the pilot aimed to assess the timing and organisational part of the research finished, community workers reported problems that appeared in the settlement afterwards. People participating in the pilot session were discontent that they received different amounts, and because they had to wait for months to receive their rewards. In order to prevent similar problems in the future sessions (running multiple sessions in each municipality in order to include as many families from each settlement as possible), hypothetical decisions were elicited and all participants were rewarded equally. The participants were thus paid for their participation, not based on the decisions they made in the experiment.

Hypothetical versions of experimental tasks similar to these (binary choices between an immediate payment or a larger payment with a delay) were experimentally validated, e.g., among German university students (Falk et al., 2016). A similar strategy has recently been implemented among representative samples of individuals in more than seventy countries within the Global Preference Survey (Falk et al., 2018). An experimental validation in the context of a developing country was recently conducted among low-income individuals in Nairobi, Kenya, suggesting that a hypothetical version of experimental tasks of time preferences is also a good predictor of choices in incentivized experiments in a developing country setting (Bauer, Chytilová, and Miguel, 2020). Ultimately, this approach appears to be suitable in both developed and developing country contexts, and can be considered a suitable task for eliciting intertemporal choices in the setting of a poor, marginalized community in an economically developed country.

The task involved a number of stages that varied by how decisions were made. In the first stage, all participants made their decisions in private, answering the question: *“In each of the rows you have to decide whether you would prefer 5 EUR [2.50 EUR if child] today [in six months] or a higher amount in three months [nine months].”* They were given two decision sheets one at a time: the first contained the current time frame variant (today versus three months) and the second contained the future time frame (six versus nine months).

In the second stage, subjects were assigned to a random team of three or four participants from the same generation group (children, parents, grandparents). Within each team, participants were given one decision sheet identical to that used in stage one. However, in this case subjects were asked to make their decisions collectively: *“In each of the rows you have to decide jointly whether you would prefer 5 EUR [2.50 EUR if child] today [in six months] or a higher amount in three months [nine months]. Each of you will receive the amount you agree to together.”* They were given time to discuss and then to record their decisions on one team decision sheet. For both time frames, each team received an individual answer sheet. In the third stage, after making their collective decision, participants were again separated and given the same set of questions as in stage 1: *“Within your team you decided what amount and when you would like to receive it. If the decision were only up to you, how would you personally decide? Would you prefer 5 EUR [2.50 EUR if child] today [in six months] or a higher amount in three months [nine months]?”*

Different cultural conceptualizations of intertemporal choices may challenge the internal and external validity of time preferences (Tucker, 2017); and thus also impact intertemporal choice experiments. Examining choices in different cultural settings may also shed light on the consistency and external validity of results. The standard set-up³ used in this study has previously been adopted in developing (e.g., Bauer, Chytilová, and Morduch, 2012) and in developed (Sutter et al., 2013) countries, suggesting its applicability across different settings, including a setting of a disadvantaged minority in a developed country. For example, from the perspective of ethnicity in the context of developed countries, although with limited generalizability, Castillo et al. (2011) conducted a study in a rural county school district in

³ It is important to note that the standard set-up applied in this study elicits intertemporal choices as “one-shot” tasks at a single point in time, and is not usually applied to observe the behaviour of individuals across longer periods of time.

the US state of Georgia, and found that minority (Black) children are more impatient than the majority (White) children, and Black boys have the highest discount rates of both groups. Similar results were obtained by Andreoni et al. (2019) who examined children participating in the Chicago Heights Early Childhood Center (CHECC) study, and found that Black children were more impatient than White or Hispanic children.

Similarly to research conducted by other scholars, the results presented here are based on a one-shot intertemporal choice task. Even if participants strictly preferred smaller-sooner to larger-later choices, considering (all of) them to be impatient individuals would be too simplified to be correct. Identifying an individual as impatient requires further evidence on decisions and preferences related to different domains of time discounting. For the sake of simplicity, I refer to those participants who always preferred the smaller-sooner option over the whole set of ten binary choices as *participants who make quasi-impatient intertemporal choices*, or simply *quasi-impatient participants*. This measure is constructed in both the current and future time frames.

IV. RESULTS

Throughout this section, I report the main results broken down by cohorts (familial-generation-based groups): children, parents (younger adults), and grandparents (older adults). During the data collection, age group cohorts were created by separating participants belonging to different age groups into different rooms. This was necessary in the stage eliciting joint team decisions, where participants were randomly assigned into teams. The approach also makes it simple to provide a summary of the results by cohorts. Although such a breakdown indirectly suggests a relationship between intertemporal choices and age, I examine this particular relationship in detail using regression analysis in subsection 4.3. Note that since all regression models reported in this paper are controlled for age, I report the results based on all observations pooled into one sample, and broken down by children and adults (pooling parent and grandparent cohorts).

Participants were asked to make a set of binary choices between smaller-sooner and larger-later amounts. A significant majority of participants always preferred smaller-sooner to larger-later amounts. Hence, the main results are based on identifying the proportions of quasi-impatient participants instead of using the actual discount rates. I consider quasi-impatient participants to be those who never switched from a smaller-sooner to a larger-later amount in either CTF or FTF.⁴

The results are presented in the same order as the stages of data collection. I first present the results of the initial individual decisions. Next, I describe the joint decisions made in random teams, and finally the second round of individual decisions. The third subsection investigates the relationship between being quasi-impatient and age, the fourth last subsection explores the correlation between children's and parents' decisions, and the last compares the differences between the Roma and non-Roma samples. The results are analysed separately for the current time frame (CTF) and the future time frame (FTF).

⁴ The design also allows me to identify participants who made time-inconsistent choices. Since the share of participants who made such choices was very small, I do not report these results.

4.1 Initial individual decisions

Participants first made private individual decisions. The results (Table 2) suggest that the proportion of quasi-impatient children in the CTF (76.5 %) is significantly lower than the proportion of quasi-impatient parents (82.7 %) and grandparents (89.7 %). From the perspective of the FTF, the proportions of quasi-impatient participants are lower (in comparison to the CTF), suggesting that a fraction of participants made different decisions in different time frames. Although this result is in accordance with the phenomenon of time-inconsistent intertemporal choice, due to their relatively low numbers, these are not analysed in detail.

TABLE 2

The results (in Table A1 in the Appendix) further suggest that larger household size is positively associated with the probability of making quasi-impatient intertemporal choices, while higher household income is negatively associated. The differences between genders are not statistically significant. Adult participants with more than primary education are less likely to be quasi-impatient. The likelihood of making quasi-impatient intertemporal choices is higher for economically inactive participants (retired, unemployed, on maternal leave). However, note that the differences are not statistically significant for older adults (grandparents).

To demonstrate the differences in the shares of quasi-impatient participants across municipalities, Table A2 (in the Appendix) reports the main results broken down by municipality, together with the basic characteristics of the municipality. The results suggest that the share of quasi-impatient adult participants (both parents and grandparents) sampled from the urban municipality (column M-4) is, on average, lower than the share of quasi-impatient adult participants from predominantly rural municipalities. However, this is not the case for child participants. With the exception of one municipality (M-2), the shares of quasi-impatient child participants are rather similar across the remaining three municipalities.⁵

4.2 Decisions made jointly in teams

After making initial individual decisions, the participants were randomly assigned to a team of three or four community members of the same generation (children, parents, grandparents). Each team was asked to make a joint decision. In order to agree on their joint decision, the participants were allowed to discuss, and were asked to record the final team decision on one collective sheet provided per team.

As suggested by Table 3, in general, there are no statistically significant differences between the generational-group teams. Indirectly, this may suggest that when individuals make decisions collectively, the proportions of quasi-impatient teams converge to similar levels. As

⁵ Table A2 suggests that the proportion of quasi-impatient children in municipality M-2 is substantially larger than in all other municipalities. Excluding observations from M-2 and re-estimating all results yields qualitatively the same findings (some of the results become somewhat stronger), suggesting robustness of the results.

is further suggested by Table 3, very high shares of teams agreed on quasi-impatient intertemporal choices (exceeding 80 % in the CTF and 70 % in the FTF).

TABLE 3

After completing the joint team decisions, participants were asked *how they personally would decide if the team decision were up to them*. Consistently with the previous results, the proportion of quasi-impatient individuals is largest among grandparents (see Table 4). Further, the differences between children and parents diminish.

TABLE 4

The design included three main stages (initial individual; joint team; individual post-team) and it enables disaggregation of participants according to the pattern of their choices along the stages. In total, there are eight different patterns which can be categorized into four simplified types. Participants whose choices were consistent across all three stages, i.e.; were initially quasi-impatient, were members of a team that agreed on a quasi-impatient choice, and who ultimately made a quasi-impatient choice in the third stage are referred to as “*always consistent*” individuals (analogously, the same applies to the quasi-patient pattern). Another pattern, denoted as “*team effect*”, refers to participants who changed their initial individual decision and followed the joint decision made by their team. The third pattern, “*individually consistent*”, includes participants who were consistent in their initial individual decision, and for whom the collective team decision did not affect their final individual choice. The last pattern, “*inconsistent*”, includes participants who changed their final individual decision despite the joint team decision being consistent with their initial decision.

As the results reported in previous sections suggest, the share of participants who were consistently quasi-impatient along all three stages is the largest across all patterns (Table 5). The results also suggest that the shares of consistently quasi-impatient participants are larger in the CTF than in FTF, whereas the shares of consistently quasi-patient participants are smaller in the CTF than in FTF. Indirectly, these results again indicate the prevalence of individuals with present-biased intertemporal choices. A deeper examination of such individuals is, however, beyond the scope of this study. All other patterns are significantly less frequent (most often below 5 %).

TABLE 5

The team effects reported in Table 5 suggest that children and grandparents were more likely to “copy” a quasi-impatient than a quasi-patient team decision, whereas the reverse is found for the parents’ cohort. Note, however, that most of the differences are only marginally statistically significant ($p < 0.1$). The results further suggest that initially quasi-impatient children who were members of quasi-patient teams were equally likely to “copy” the team decision and to switch back to their initial choice ($p = 0.784$). Initially quasi-patient children who participated in quasi-impatient teams were more likely to follow the team decision than to switch back to their original choice ($p = 0.020$). Further, initially quasi-impatient parents

on quasi-patient teams were more likely to “copy” the quasi-patient team decision than to switch back to their initial quasi-impatient choice ($p = 0.029$). Initially quasi-patient parents participating in quasi-impatient teams were also more likely to “copy” the quasi-impatient team decision than to switch back ($p = 0.095$). However, as noted, parents are more likely to “copy” a quasi-patient than a quasi-impatient team decision.

4.3 Quasi-impatient intertemporal choices and age

When all observations are pooled, the relationship between the probability of making quasi-impatient intertemporal choice and age is not unequivocal (columns 1 – 4 of Table 6). In the case of the initial individual decisions (Panel A), the relationship appears to be linear and positive. However, according to Panel B (individual post-team), both linear and quadratic relationships are statistically significant. Such inconsistencies may be a consequence of different levels of shares of quasi-impatient participants among children and adults. When estimating separate models for children (columns 5 – 6) and adults (columns 7 – 8), the results indirectly suggest a U-shaped relationship between the probability of making quasi-impatient intertemporal choices and age.⁶ In other words, younger children are, on average, more likely to be quasi-impatient than older children; while younger adults are, on average, less likely to be quasi-impatient than older adults. This relationship is robust for both the initial individual and post-team individual decisions, as well as for both current and future time frames.

TABLE 6

4.4 Correlation between children’s and parents’ choices

As suggested by columns 1 through 4 in Table 7, the probability of a child being quasi-impatient is approximately 10–12 percentage points higher if their parent is quasi-impatient. As a robustness check, I perform a similar analysis using the subsample of adults. Note, however, that these results are based on considerably lower numbers of observations. Nevertheless, results reported in columns 5 through 8 suggest that adults (the cohort of parents) are more likely to be quasi-impatient if they have quasi-impatient parents (the cohort of grandparents). Although the results on initial individual choices reported in columns 5 and 6 are not statistically significant (though they are weakly significant if control variables are excluded), they are in the expected direction.

TABLE 7

4.5 Differences between the Roma and the majority populations

In this subsection I explore differences in intertemporal choices between Roma and non-Roma. This subsection is based on observations from two villages in which a small number of non-Roma individuals participated in the study. The subsample includes 177 observations on non-Roma and on 501 Roma individuals. The results reported for the non-Roma

⁶ However, as suggested by columns 2 and 4 in Panel A of Table 6, one should not think of a standard U-shaped relationship. The pattern of the relationship is depicted in Figure A1 in the Appendix.

subsample must be interpreted cautiously due to the relatively low number of observations. Nevertheless, the findings provide at least partial evidence of differences in the intertemporal choices between the Roma and non-Roma populations in Slovakia.

Table 8 shows that the proportions of quasi-impatient Roma are considerably higher than those of quasi-impatient non-Roma. The results further indicate that when controlling for basic socio-economic characteristics (age, gender, household size, household income, and village dummy), the differences between the two groups drop considerably, although they remain statistically significant. In contrast to findings reported by other authors, this study finds no statistically significant gender differences in impatience.

Grandparents are the only cohort showing no statistically significant differences between Roma and non-Roma. This is in line with previously published results demonstrating that older adults are generally less patient than younger adults. The findings of this study suggest that this tendency is invariant with respect to ethnicity.

TABLE 8

V. DISCUSSION

The first important observation from this study is that a considerably high share of participants are quasi-impatient, i.e., preferred a smaller-sooner over a larger-later sum. Although such choices are often described as “impulsive” (Reimers et al., 2009), these findings do not necessarily suggest that a substantial proportion of the individuals surveyed in this study face difficulties related to impulsiveness. Intertemporal choices were elicited as “one-shot” decisions at one point in time. Such decisions do not necessarily predict reactions or behaviours in other situations or domains.⁷ The choices elicited within this study hence do not necessarily represent the “true” time preferences of individuals, which, generally speaking, reflect different domains of individuals’ decisions and behaviours involving long-term consequences. The shares of quasi-impatient individuals reported in this study are considerably higher than, e.g., those reported by Želinský (2015) in a similar context (marginalized Roma in Slovakia), which were estimated at levels of around 15 %. However, Želinský (2015) examined a very specific subpopulation, not a typical subject pool: individuals participating in a micro-saving programme, which might have affected participants’ choices and hence cannot be thought of as representative estimates. I am not aware of any representative data on the Slovak population to which I could compare the findings obtained in this study. Slovakia was not included in the Global Preference Survey (Falk et al., 2018) which contains data on 76 countries world-wide.

In this study choices were elicited in a current time frame (present-oriented) and in a future time frame (future-oriented). Although this portion of data is not analysed in detail, the shares of quasi-impatient participants are lower in the future time frame than in the current time frame. Traditionally, literature refers to such individuals as individuals with present-biased, or in general, time-inconsistent preferences (O’Donoghue and Rabin, 1999). However, the choices were elicited as “one-shot” tasks at one point in time. Under this approach, making

⁷ This framing differs, e.g., from the classic marshmallow experiment which measures whether young children can control their desires (Peake, 2017).

different strategic choices in different time frames does not necessarily indicate time inconsistent preferences.

Assessing heterogeneity in the levels of quasi-impatience suggests consistency with studies previously published by other authors. For example, as suggested by Lawrance (1991), Green et al. (1996), Reimers et al. (2009), and Castillo et al. (2019), in the present study I also find that quasi-impatient choices are negatively correlated with income and educational attainments. Quasi-impatient participants are also more likely to be unemployed and to live in larger households. Note that these SES characteristics are related, as higher-income households are more likely to be smaller, and individuals living in such households are more likely to be employed and better educated.

The initial results reported in Section 4.1 suggest that the shares of quasi-impatient participants are lowest among children, followed by the cohorts of parents and grandparents. Comparing these results with those obtained by other researchers suggests that findings presented in this study are not entirely consistent with those of the existing literature. It is generally believed that children discount the future more than adults (Green, Fry, and Myerson, 1994; Green et al., 1996; Green, Myerson, and Ostadzowski, 1999), while this study finds that the proportion of children making quasi-impatient choices is lower than the proportion of quasi-impatient adults.

Nonetheless, caution is needed when interpreting the relatively greater proportion of quasi-impatient children than adults in this study. As argued by Read and Read (2004, p. 32): “...[the] results cannot be interpreted as saying that young adults are relatively patient, in the sense of not being impulsive, but only that they are relatively patient in the sense that in a cool moment if they think seriously about whether it is better to have A sooner or B later, they are more likely than an older adult to agree it is better to wait for B.” Though this argument was originally adopted to explain differences between younger and older adults, and in a different context, a similar intuition can be applied to this study – to explain the differences between children and (younger) adults (i.e., the cohorts of children and parents). For example, while children may prefer larger-later to smaller-sooner sums more often than adults, this may to some extent reflect children’s beliefs that larger, although later, is better than smaller. Adults’ preferences may be affected by their thoughts of making immediate ends meet, hence believing that having money earlier, although less, is better than receiving more money later. Unfortunately, the design of this survey does not allow us to investigate this channel.

Consistently with previously published results obtained by other scholars, younger children are more likely to be quasi-impatient than older children. A one-year-increase in a child’s age is associated with an average 1.5-percentage-point decrease in the probability that a child will make a quasi-impatient choice in the CTF (1.3-point decrease in the FTF). These results are consistent with recent findings obtained by Sutter et al. (2019) and Andreoni et al. (2019), suggesting that children and adolescents become more patient as they grow older. Next, as proposed by Read and Read (2004), this study also demonstrates that young adults are less likely to be quasi-impatient than older adults. The results hence suggest (at least indirectly) the presence of a U-shaped relationship between the probability of making quasi-impatient intertemporal choices and age.

It is important to note that the results on the relationship between making quasi-impatient choices and age are based on cross-sectional data. Though the data suggests a U-shaped relationship, it does not support a claim that age itself affects intertemporal choices. For example, as suggested by Dohmen et al. (2017), as people grow older, it is not only age that changes. It is also important to consider changes across cohorts and the periods of observation. Different generational groups (cohorts) share historical and social experiences which influence attitudes and values (Westerman and Yamamura, 2007). For example, Smola and Sutton (2002) examined work values and the beliefs of workers in the US and suggested that work values were more influenced by generational experiences than by age and maturation.

Also, the differences in results between this and earlier studies may be caused to some extent by differences in the procedures adopted. People may react differently to face-to-face testing (e.g., Green, Fry, and Myerson, 1994; Green, Myerson, and Ostażewski, 1999); a computerised experiment (e.g., Read and Read, 2004); or decisions elicited privately using a pencil and paper setting as in this study. An examination of differences in procedures is beyond the scope of this paper.

Understanding the transmission of preferences across generations helps explain how preferences are shaped, and is currently an important research topic. Previously, correlations between children's and parents' intertemporal choices have been investigated by Kosse and Pfeiffer (2013) and Gauly (2017), using a representative sample of the German Socio-Economic Panel (SOEP) data, and Brown (2015), using a representative sample of the Household Income Labour Dynamics of Australia (HILDA) data, among others. These empirical studies suggest a significant correlation between children's and their parents' intertemporal choices in two different contexts. The present study is focused on a Slovak subpopulation experiencing multiple disadvantages including severe material deprivation, high unemployment rates, and overall low educational attainment. Yet the findings obtained in this particular setting are consistent with those from studies of general populations in Germany and Australia, suggesting a strong correlation between children's and their parents' intertemporal choices. In addition, as a robustness check, I examined the correlations between adults' (parent cohort) and their parents' (grandparent cohort) choices. Strong correlations between both children's and adults', and grandparent's intertemporal choices suggest a potentially important role of parents in shaping children's choices, which is consistent with the stream of literature on the vertical transmission of preferences (Bisin and Verdier, 2011).

After the joint team decision, participants were asked to make individual choices stating how they personally would have decided if the team decision were up to them. In this case, the differences between children and younger adults (parent cohort) diminish. There may, however, be numerous potential explanations for how the preceding team decision might have affected individual decisions. For example, previous research has demonstrated that decision-making in groups can be modelled as more rational and suffers less from biases and cognitive limitations (Charness and Sutter, 2012; Kugler, Kausel, and Kocher, 2012). Also, individuals may update their preferences based on the collective decision; they simply mimic the collective decision; or discussing the decision with other individuals helped them to understand the task better. Again, these considerations are beyond the scope of this paper.

In addition to the main data on Roma individuals, supplementary data on a small sample of non-Roma ($N = 177$) was collected, and the results suggest that the proportions of quasi-impatient Roma are significantly higher than quasi-impatient non-Roma. This is in accordance with results of similar studies conducted in different cultural settings, comparing White (majority population) to Black and Hispanic (Castillo et al., 2011; Andreoni et al., 2019) individuals. These results must, however, be interpreted cautiously due to the relatively low number of observations and extremely high selection bias. Nevertheless, the findings provide some evidence of differences in the intertemporal choices between the Roma and the non-Roma populations of Slovakia.

VI. CONCLUSIONS

This paper aims to contribute to empirical literature on intertemporal choices among children and adults in a specific cultural setting – marginalized Roma communities in Eastern Slovakia. These communities experience multiple types of disadvantages, which have been suggested to be related to time discounting. Examining intertemporal choices in this context is particularly important since these disadvantages are transmitted across generations (UNICEF, 2007).

The decisions of children are central to this study. Most of the findings obtained are consistent with previously published results in different settings. However, some of the results differ. For example, in most studies, children are found to be less patient than adults, but this study finds the opposite: the share of participants making quasi-impatient choices is lowest among children. Future research may answer the question of what factors may contribute to these findings. Nevertheless, consistently with previous studies, the probability children will behave in a quasi-impatient manner decreases as children grow older. Further, as suggested by other researchers, including in this specific setting, children's decisions are closely related to those of their parents.

This paper also examines the choices of individuals assigned into random teams of generational cohorts. Overall, there are no statistically significant differences in the proportions of quasi-impatient teams among the subsamples of children, younger adults (parent cohort), and older adults (grandparent cohort). Participants were also asked to make an individual decision following the team decision. The differences between children and younger adults (parent cohort) diminish at this stage. Future research is necessary to examine the mechanisms behind this result.

One of the simplest and most commonly used approaches to the elicitation of intertemporal choices was utilised in this study. Although substantial proportions of individuals are found to be quasi-impatient (preferring smaller-sooner to larger-later rewards), the SES of the individuals can play an essential role. The majority of Roma live below the national poverty line, they have hardly any savings, and making intertemporal choices can be too abstract for them. The extremely high overall levels of quasi-impatience reported in this study do not necessarily mean that such high percentages of quasi-impatient individuals would be reported if a different procedure for eliciting time preferences were adopted. In addition, even high shares of quasi-impatient participants do not necessarily suggest that these participants are “truly impatient”. Within the design, only “one-shot” abstract choices at one point in time

were elicited. Clearly, participants making quasi-impatient choices are more likely to be impatient, and more prone to impulsive behaviour. However, impatience is a complex construct and examination of various types of behaviours, preferences, and attitudes is required to identify “truly impatient” individuals.

This study clearly suffers from some drawbacks, including its focus on a small number of municipalities instead of sampling individuals from more settlements across the region. Also, the adoption of hypothetical questions instead of real monetary incentives may potentially have led to some sort of bias. Participants were sampled from a very limited number of municipalities; the results nevertheless suggest that shares of quasi-impatient individuals differ across them. A sample of only four municipalities does not support any general claims regarding unobservable “qualities” of municipalities that may help to explain the differences in the levels of quasi-impatience among them. Nevertheless, I believe that the results presented in this study enrich the general knowledge of the decision-making of people living in poor segregated Roma communities in Slovakia. Importantly, the paper touches a topic understudied in this particular setting, and opens numerous questions for the further research. Nonetheless, a takeaway from this study is that any potential interventions considering people’s time preferences need to consider specificities of the respective environment.

The results of this study can be useful for policymakers designing anti-poverty tools targeting this particular subpopulation. Such policies and tools are often criticised for being implemented nation-wide, and ignoring differences between subpopulations. This particular study indicates that a substantial proportion of poor Roma living in segregated settlements make quasi-impatient intertemporal choices, which can potentially suggest that these individuals are likely to face difficulties related to impulsive behaviour.

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Table 1: Descriptive statistics (Roma participants)

Age	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	
Children	12.9	2.5	8.0	18.0	
Parents	35.5	7.2	18.0	60.0	
Grandparents	56.1	6.7	40.0	76.0	
<hr/>					
Gender [%]	<i>Females</i>				
Children	48.9				
Parents	58.2				
Grandparents	66.8				
<hr/>					
Econ. activity [%]	<i>Employed</i>	<i>Unemployed</i>	<i>Government programme*</i>	<i>Maternal leave</i>	<i>Retired</i>
Parents	15.3	31.0	28.2	18.0	2.5
Grandparents	7.6	18.1	32.1	0.0	35.4
<hr/>					
Education [%]	<i>Unfinished primary</i>	<i>Primary</i>	<i>Higher</i>		
Parents	19.7	46.9	25.7		
Grandparents	32.1	45.1	15.5		
<hr/>					
HH level	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	
Income	361.2	333.9	150.0	2000.0	
No. of adults	3.6	1.9	1.0	12.0	
No. of children	4.7	3.1	0.0	20.0	
Members total	8.3	4.1	2.0	26.0	

Notes: This table reports basic socio-economic and demographic characteristics of Roma participants in the study.

**Government programme* refers to participants who were unemployed and participated in small community services – as a tool of active labour market policy.

Table 2. Initial individual decisions

	CTF		FTF		FTF – CTF
Children	76.5		70.7		–6.0 p=0.008 (0.024)
Parents	82.7		72.7		–9.9 p<0.001 (<0.001)
Grandparents	89.7		82.8		–7.0 p=0.025 (0.076)
Ch-Pa	–6.2	0.005 (0.016)	–2.1	0.426 (>0.999)	
Ch-Gp	–13.3	<0.001 (<0.001)	–12.1	<0.001 (<0.001)	
Pa-Gp	–7.0	0.009 (0.027)	–10.1	0.002 (0.005)	

Notes: The table reports proportions of quasi-impatient participants. The differences in proportions between the CTF (current time frame) and FTF (future time frame) are based on subsamples of observations with non-missing values in both time frames. P-values adjusted for multiple hypotheses testing in parentheses.

Table 3. Collective team decisions

	CTF		FTF		FTF – CTF
Children	80.2		73.3		-7.4 p=0.085 (0.255)
Parents	80.7		72.6		-7.9 p=0.118 (0.354)
Grandparents	92.0		82.9		-8.0 p=0.209 (0.627)
Ch-Pa	-0.5	0.997 (>0.999)	0.7	0.963 (>0.999)	
Ch-Gp	-11.8	0.029 (0.086)	-9.6	0.127 (0.380)	
Pa-Gp	-11.3	0.042 (0.126)	-10.3	0.115 (0.344)	

Notes: The table reports proportions of quasi-impatient participants. The differences between the CTF (current time frame) and FTF (future time frame) are based on subsamples of observations with non-missing values in both time frames. P-values adjusted for multiple hypotheses testing appear in parentheses. The results are robust to estimating proportions of quasi-impatient participants and controlling for the size of the group (3 or 4 members).

Table 4. Individual decisions made after a collective team decision

	CTF		FTF		FTF – CTF
Children	80.4		75.6		–4.8 p=0.028 (0.084)
Parents	79.3		71.2		–7.8 p=0.002 (0.006)
Grandparents	89.6		85.3		–3.7 p=0.249 (0.748)
Ch-Pa	1.1	0.681 (>0.999)	–4.4	0.083 (0.249)	
Ch-Gp	–9.2	0.002 (0.005)	–9.7	0.002 (0.007)	
Pa-Gp	–10.3	<0.001 (0.002)	–14.1	<0.001 (<0.001)	

Notes: The table reports proportions of quasi-impatient participants. The differences between the CTF and FTF are based on subsamples of observations with non-missing values in the both time frames. P-values adjusted for multiple hypotheses testing appear in parentheses.

Table 5. Consistency in choices across initial, joint team, and post-team decisions [%]

	Quasi-impatient in stage:			Frame	Cohort		
	Initial	Team	Post-Team		Children	Parents	Grandparents
Always consistent	YES	YES	YES	CTF	68.2	70.3	84.4
				FTF	60.2	60.6	76.2
	NO	NO	NO	CTF	11.4	10.1	3.8
				FTF	15.8	18.1	7.9
Team effect	YES	NO	NO	CTF	3.8	6.7	0.8
				FTF	4.9	8.2	2.6
	NO	YES	YES	CTF	6.0	3.9	2.3
				FTF	7.3	5.6	3.8
Individually consistent – no team effect	YES	NO	YES	CTF	3.4	3.8	1.5
				FTF	5.4	2.6	3.4
	NO	YES	NO	CTF	3.3	2.1	3.1
				FTF	3.6	2.6	3.4
Inconsistent	NO	NO	YES	CTF	2.3	0.7	0.8
				FTF	2.0	1.0	1.9
	YES	YES	NO	CTF	1.6	2.5	3.4
				FTF	0.8	1.3	0.8

Notes: The table reports the breakdown of participants according to the pattern in their choices along the three stages.

Table 6. Regression analyses results: Quasi-impatience and age

	<i>Dependent variable:</i>							
	<i>1 = quasi-impatient; 0 = otherwise</i>							
	All observations				Children subsample		Adults subsample	
	CTF		FTF		CTF	FTF	CTF	FTF
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Panel A								
<i>Initial individual</i>								
Age	0.0032*** (0.0006)	0.0004 (0.0027)	0.0029*** (0.0006)	-0.0034 (0.0031)	-0.0153** (0.0059)	-0.0132* (0.0062)	0.0030** (0.0011)	0.0055*** (0.0013)
Age ²		<0.0001 (<0.0001)		0.0001* (<0.0001)				
<i>N</i>	1549	1549	1554	1554	709	712	840	842
Nagelkerke R ²	0.163	0.165	0.139	0.144	0.190	0.208	0.177	0.139
Panel B								
<i>Individual after joint team decision</i>								
Age	0.0019*** (0.0005)	-0.0074** (0.0027)	0.0023*** (0.0006)	-0.0117*** (0.0030)	-0.0230*** (0.0053)	-0.0174** (0.0059)	0.0049*** (0.0011)	0.0055*** (0.0013)
Age ²		0.0001*** (<0.0001)		0.0002*** (<0.0001)				
<i>N</i>	1572	1572	1569	1569	729	724	843	842
Nagelkerke R ²	0.185	0.197	0.166	0.187	0.259	0.239	0.228	0.139

Notes: The table reports binary probit average marginal effects (robust standard errors in parentheses). “*Quasi-impatient*” refers to participants who preferred smaller-sooner to larger-later amounts across all ten choices. CTF: current time frame; FTF: future time frame. Models are controlled for municipality dummies, gender, number of household members, and household income. Differences in the numbers of observations (*N*) between CTF and FTF columns are a consequence of excluding different individuals in the CTF/FTF set-ups. Estimating models with the same sets of individuals for CTF and FTF set-ups results in negligible differences from the estimates reported in this table.

*** denotes $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, and · $p < 0.1$

Table 7. Regression analyses results: Correlations between *children's*---*parents'* and *parents'*---*grandparents'* decisions

	Dependent variable:							
	<i>I = quasi-impatient; 0 = otherwise</i>							
	Children subsample				Adults (parents cohort) subsample			
	Initial		After team		Initial		After team	
	CTF	FTF	CTF	FTF	CTF	FTF	CTF	FTF
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parent's response	0.1242*** (0.0368)	0.1037** (0.0348)	0.1090*** (0.0290)	0.1127*** (0.0307)				
Grandparent's response					0.0875 (0.0816)	0.0933 (0.0669)	0.2757** (0.0921)	0.2393* (0.0974)
<i>N</i>	1069	1064	1105	1096	147	150	148	149
Nagelkerke R ²	0.189	0.223	0.278	0.262	0.396	0.211	0.500	0.437
AIC	951	1075	855	991	134	155	142	172
BIC	1031	1154	935	1071	181	204	190	220

Notes: The table reports binary probit average marginal effects (robust standard errors in parentheses). “*Quasi-impatient*” refers to participants who preferred smaller-sooner to larger-later amounts across all ten choices. CTF: current time frame; FTF: future time frame. Models are controlled for municipality dummies, gender, number of household members, household income; and child’s and parent’s age and gender. Columns (1) – (4) report correlations between children’s and their parents’ decisions. Columns (5) – (8) report correlations between adults’ (parent cohort) and their parents’ (grandparent cohort) choices. When no control variables are used in models (5) – (6), average marginal effects are (weakly) statistically significant (CTF: $dy/dx = 0.2018$, $p = 0.080$; FTF: $dy/dx = 0.2183$, $p = 0.034$). Differences in the numbers of observations (*N*) between CTF and FTF columns are a consequence of excluding different individuals in the CTF/FTF set-ups. Estimating models with the same sets of individuals for CTF and FTF set-ups results in negligible differences from the estimates reported in this table.

*** denotes $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, and · $p < 0.1$

Table 8. Comparing intertemporal choices of Roma and non-Roma

			Differences between Roma and non-Roma subsamples			
	Roma	non-Roma	Raw difference		Including control variables	
CTF						
Children	69.1	23.5	45.6	<0.001 (<0.001)	22.3	0.005 (0.015)
Parents	74.5	38.2	36.3	<0.001 (<0.001)	25.5	0.004 (0.012)
Grandparents	81.5	69.6	11.9	0.393 (>0.999)	-3.8	0.801 (>0.999)
FTF						
Children	57.7	15.5	42.2	<0.001 (<0.001)	23.4	0.004 (0.011)
Parents	71.0	29.9	41.1	<0.001 (<0.001)	32.4	<0.001 (<0.001)
Grandparents	75.9	60.9	15.0	0.288 (0.863)	11.5	0.534 (>0.999)

Notes: The table reports proportions of quasi-impatient participants. The differences in the last two columns are controlled for village dummies, gender, age, number of household members, and household income. P-values adjusted for multiple hypotheses testing in parentheses.

Appendix

Table A1. Differences in the shares of quasi-impatient participants broken down by subgroups

	Parents		Grandparents		Children	
	CTF	FTF	CTF	FTF	CTF	FTF
Δ HH size	+0.011*	+0.007	+0.019*	+0.009	+0.018***	+0.014**
Δ HH income	-0.036**	-0.007	-0.023	-0.030	-0.036*	-0.030
<i>Gender</i>						
<i>Female</i>	0.824	0.734	0.901	0.829	0.742	0.698
Δ Male	+0.007	-0.016	-0.009	-0.003	+0.044	+0.016
<i>Education</i>						
<i>Unfinished primary</i>	0.848	0.696	0.943	0.841		
Δ Primary	-0.009	+0.038	-0.055	+0.022		
Δ Unfinished secondary	-0.111*	-0.003	-0.152*	-0.213*		
<i>Economic activity</i>						
(Δ) <i>Employed</i>	0.750	0.643	-0.029	+0.005		
(Δ) <i>Retired</i>	+0.097·	+0.102·	0.887	0.804		
Δ Government programme	<0.001	+0.045	-0.007	+0.012		
Δ Unemployed	+0.093·	+0.109·	+0.022	+0.050		
Δ Maternal leave	+0.093·	+0.089	N/A	N/A		

Notes: Rows highlighted in grey represent shares of quasi-impatient participants with respect to the given category (a reference category). Categories denoted with the “ Δ ” symbol represent the difference in the share of quasi-impatient participants between the reference category and the category in the respective row. Results reported in the first two rows (size and income) represent average marginal effects based on a binary probit model.

*** denotes $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, and · $p < 0.1$

Table A2. Differences between municipalities

		M-1	M-2	M-3	M-4
Settlement type		Rural	Rural	Rural	Urban
Total population		3000–3500	3000–3500	3500–4000	5500–6000
Percentage of Roma		90–95	40–45	15–20	15–20
<i>N</i> of Roma sampled		717	504	198	303
Parents	CTF	80.1	96.4	90.9	63.5
	FTF	64.7	88.3	89.9	57.9
Grandparents	CTF	90.2	95.5	94.1	75.7
	FTF	81.7	90.9	94.1	67.6
Children	CTF	66.2	93.9	68.7	69.4
	FTF	60.4	92.3	62.2	54.3

Notes: The table reports selected municipality-level characteristics and the shares of quasi-impatient participants. “Rural” refers to settlements located in a village. “Urban” refers to a settlement located in a city.

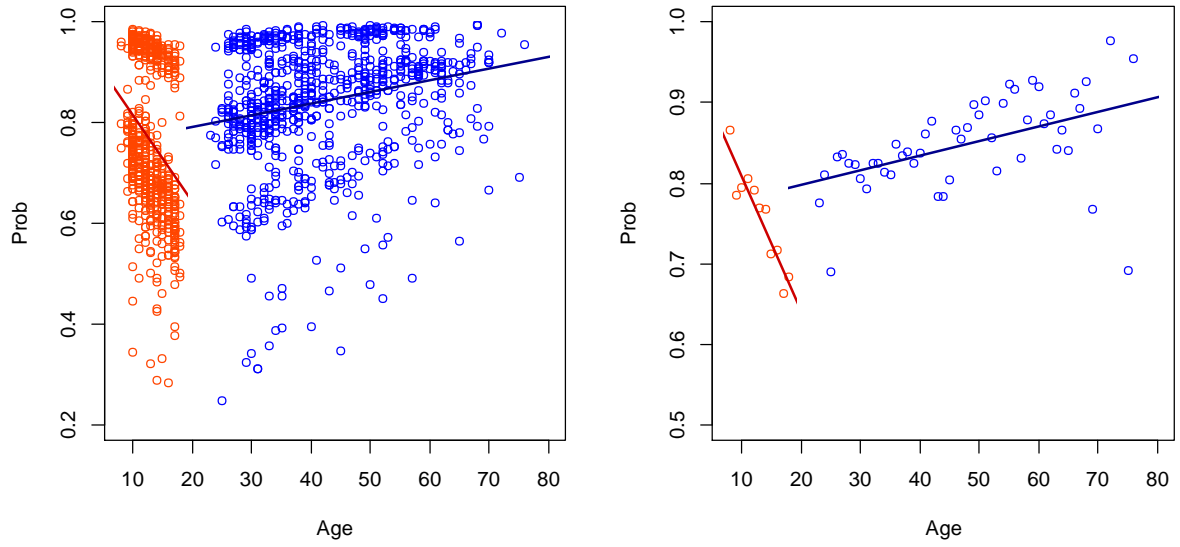


Figure A1. Relationship between the probability of being quasi-impatient and age

Notes: The left panel depicts the relationship based on individual (raw) observations. The right panel depicts the relationship based on probabilities averaged for each value of age.