"The less you Discount, the more it shows you really care": Interpersonal discounting in households

Rong Rong [a,*], Matthew Gnagey [b], Therese Grijalva [b]

[a] Department of Resource Economics, University of Massachusetts Amherst, 80 campus center way, Amherst, MA 01003, USA
[b] Department of Economics, Weber State University, 1337 Edvalson St, Dept 3807, Ogden, UT 84408, USA

ABSTRACT

Household members make monetary tradeoffs across time. Classical economics treats these decisions as if one rational individual makes them. This assumption masks important other regarding concerns between spouses. We designed an artefactual field experiment and collected data from 94 pairs of cohabiting couples to capture the complex nature of intrahousehold time preferences. Estimation results show that (1) the interpersonal discount rate, the rate used to tradeoff intertemporal payoffs between one's own payoff and the spouse's payoff, is significantly different from the individual discount rate, and (2) the interpersonal discount rate may provide an alternative way for people to express their other-regarding preferences towards their spouses.

© 2018 Elsevier B.V. All rights reserved.

1. Introduction

Households frequently make intertemporal decisions that are crucial to the family and the entire economy. This includes household decisions on savings, education, insurance, and even household efforts to conserve environmental resources. Standard unitary models view these household decisions as if they are made by one rational individual. This approach has received many criticisms as it assumes away the complex processes of bargaining and control in household decision-making (Manser and Brown, 1980; Browning and Chiappori, 1998; Vermeulen, 2002; Mazzocco, 2007; Mazzaco, 2008). Following these theoretical advances, empirical studies began to unpack the black box of household decision processes on issues such as expenditure patterns, health, and children's schooling (see, e.g., Thomas, 1990; Doss, 2013; Ashraf et al., 2014), all of which involve making tradeoffs across time. In this paper, we examine household members' intertemporal preferences. In particular, we investigate whether individuals makes these choices differently for themselves and for their spouses as well as how these individual preferences compare to joint household decisions.

Most empirical time preference studies focus on estimating individual discount rates (IDRs, see Frederick et al., 2002 for a comprehensive review). An IDR measures how an individual makes tradeoffs for his or her *own* consumption over time. But what rate do people use to discount future benefits for another person (in our case, one's spouse)? A simple case of that

involves decisions under delegation where an individual makes tradeoffs between current and future payments for another person. An example of delegated temporal decisions includes forms of savings made by parents for the benefit of their children's future rather than increasing their children's consumption today. Delegated individual discount rates (DIDRs) are often found to be lower than IDRs, implying that people make more patient choices on behalf of others (Pronin et al., 2008; Shapiro, 2010; Albrecht et al., 2011; Lusk et al., 2014; Howard, 2013).[1]

Many investments impose costs on someone today for the benefit of another person in the future, where the discounting of those future amounts cannot be represented by either the traditional IDR or a DIDR. In this paper, we label the rate used in this unique form of discounting as the "interpersonal discount rate" (IPDR). An example occurs when spouses hold individual or joint saving accounts, providing opportunity for shifts in personal consumption over time and across individuals. The application of an IPDR goes beyond the family environment. Environmental conservation efforts, a critically important mission for the current generation, is a large-scale intertemporal decision that represents a tradeoff between the current generation's consumption on behalf of future generations. An example includes situations when households actively recycle or mitigate wasteful behavior (e.g., turning off lights, install low-flow toilets, etc.) and preserve environmental resources in order to protect the consumption capacity for future generations. Neither the IDR nor the DIDR match the above cases. Our paper provides the first empirical estimation of a household IPDR. The IPDR is informative for determining optimal public policies related to household saving decisions as well as environmental decisions.

To measure an IPDR, we design an artefactual field experiment where 188 urban household members make decisions that yield financial consequences for the self as well as for their spouse over time. In particular, we ask subjects to allocate tokens in a Convex Time Budget task (Andreoni and Sprenger, 2012a) under several discounting situations including the IDR, the DIDR, two different situations for the IPDR, and finally a joint decision. Specifically, the five discounting situations are: (1) tokens yield payment for oneself only (IDR); (2) tokens affect the payment for the spouse only (DIDR); (3) one can decrease their own payment in a sooner period to increase the payment for the spouse in a later period (Bequest Discount Rate or BDR); (4) one can decrease one's own payoff in a later period to increase the payoff of the spouse in a sooner period (Reverse Bequest Discount Rate or RBDR); and (5) a consensus allocation that would yield a joint payment to both spouses in both sooner and later periods (Joint Discount Rate or JDR). Therefore, both BDR and RBDR are important variations of an interpersonal discount rate (IPDR). By varying token exchange rates, the design allows us to observe within-subject shifts of the number of tokens allocated to the sooner and later payment period across the above five scenarios.

To provide parameter estimation for the self–spouse tradeoff, we create a utility aggregation framework by combining individual intertemporal tradeoff decisions with an existing atemporal model for other-regarding preferences (Barro and Becker, 1989; Falk and Stark, 2001; Andreoni and Miller, 2002; Shapiro, 2010). Unlike classical dictator games, where participants share their instant monetary reward with others, the modified model describes cases where the dictator (the self) and the recipient (the spouse) reap the payoff at different times. Other regarding preferences are measured by including a parameter in the utility function that captures the weight an individual places on their spouse's consumption relative to their own. The strength of this relative weight could be interpreted as altruism, perceptions of fairness, paternalism, or aversion to inequality, etc.

We conduct a hypothesis test to determine if the discount rate for one's own intertemporal consumption (IDR) is equal to the discount rate associated with the intertemporal payoffs made on behalf of one's spouse (DIDR), or whether different discounting strategies are employed when decisions affect oneself only versus others only. The estimates for the annual IDR and DIDR are 33.1% and 29.4%, respectively, a rate comparable to the existing literature (Frederick et al., 2002), yet not statistically different from one another ($p = 0.119$). The model also produces a BDR of 8.1%, an estimate that is significantly smaller than the IDR, DIDR, and the RBDR estimates (p values between 0.021 and 0.068 for pairwise comparisons of the BDR and the other discount rates). This wide gap between the IDR and interpersonal discount rates (BDR and RBDR) persists after controlling for other-regarding preferences. These results perhaps suggest that the expression of love and care within a family may take dual forms. Couples can put positive weight on each other's utility as well as express it through intertemporal preferences. Hence, we titled the paper "The less you discount, the more it shows you really care."[2] To check the robustness of the results, we compare the estimates obtained here with those from an earlier study using random strangers as the subject pool (Rong et al., 2016). The comparison of the estimation results for both the discount rate and the atemporal altruism parameter reveal closer ties among family members than random strangers.

We prefer to use incentivized experiments to study intra-household decisions for a few reasons. First, it is often difficult to elicit honest responses in non-incentivized exercises. Inflated self-reports on altruism are costless and could happen either intentionally or subconsciously. Incentivized tasks, on the contrary, simulate behavior comparable to what happens in the household when income and consumption are at stake. Second, observational data may not allow clear identification of intra-household behavior. For example, it is difficult, and sometimes impossible, to distinguish consumption streams that are shared, or not shared, between spouses. Our payment design allows us to enforce the separation of payment to each household member. Based on the points listed above, we adopt an experimental approach.

To the best of our knowledge, this study is the first to provide parameter estimation on *interpersonal* discount rates based on household decisions and use a general utility aggregation framework. A robust finding of an IPDR, statistically different

---

[1] Oliveira and Jacobson (2017) found the opposite is true when the payoffs are in the loss domain.

[2] We thank John Spraggon for the title suggestion.