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HYPEROPIA IN PUBLIC FINANCE

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Human time preferences are complicated. People often seem to behave myopically, placing a heavy premium on present consumption over future consumption (see, e.g., Baron 2000, 470). However, at other times, people appear to do just the opposite, weighting future payoffs more heavily than present ones (Loewenstein 1987; Loewenstein & Prelec 1991). This latter category of behavior has been termed “far-sighted” (Loewenstein 1987) or “hyperopic” (Kivetz & Simonson 2002, 201, 214).¹ While myopia has received much greater attention in the cognitive literature, behaviors consistent with hyperopia have been identified as well (see, e.g., Prelec & Loewenstein 1998, 19). In this paper, I examine the relevance of hyperopic time preferences to public finance.

In Part I, I describe and illustrate hyperopic choices – that is, choices that diverge from the usual pattern of positive discounting – and considers their relevance for public finance. Part II discusses the positive and normative challenges posed by increasingly complex models of human time preferences, to which the idea of hyperopia contributes. To motivate the analysis in the first two Parts, I use the familiar puzzle of income tax overwithholding as a primary example. Part III examines the implications of hyperopic choices for a variety of other public finance settings. Specifically, I suggest how the study of hyperopic choices might inform our understanding of taxpayer behavior and

enrich policy design in areas such as retirement savings and social insurance.

I. HYPEROPIC CHOICES

Before beginning, it is helpful to define how I will be using the terms hyperopia, hyperopic preferences, and hyperopic choices. Hyperopia itself might be narrowly understood as a perceptual rendering of temporally offset options that sharpens or enhances more distant payoffs relative to closer ones. Likewise, we might say that someone has “hyperopic preferences” when she prefers distant payoffs over near payoffs, other things equal. This will typically be manifested by a willingness to accept a later payoff of lower present value.

However, we can observe neither perceptual renderings nor underlying preferences; we can only observe behavior. Hence, it is often more accurate and useful to speak of hyperopic conduct or hyperopic choices, which can be defined as follows: *choosing a later payoff that is smaller in present value (monetary) terms over an earlier payoff that is larger in present value terms*. Notice that this definition focuses only on objective, observable conduct and not on the reasons for it. Therefore, a choice that we would classify as “hyperopic” based on the present value payoffs could well be caused by factors that have little to do with time preferences as such. It will not always be possible to infer from hyperopic choices that hyperopic preferences are responsible for generating the conduct. People often make hyperopic choices in situations where sequences of money or lump sums are at stake, as the next section explores.

A. *Sequences and Lumps*

It has been well-documented in a variety of contexts that people prefer improving

sequences, rather than flat or declining ones (see Frederick et al. 2003, 28-29 (reviewing literature); Ariely & Carmon 2003 p. 372 (same); Loewenstein & Sicherman 1991; Loewenstein & Prelec 1993). Loewenstein and Prelec (1993) conclude that “for sequences of outcomes, negative time preference is the rule rather than the exception.” (105). This cuts against the usual assumption of positive time discounting, which would call for moving the most favorable outcomes to as early in the sequence as possible (ibid., 91).

Adaptation offers an explanation for improving-sequence preferences. People adapt quickly to changes, incorporating them into a new baseline (see Kahneman & Varey 1991). If this is so, then any drop from a previously-attained level of consumption may be experienced as a painful loss. Because losses hurt more than failures to achieve gains (Shafir & Tversky 1995), falling from a previously high level of consumption will be more aversive than deferring gains until later in the sequence (Loewenstein & Prelec 1993, 92). By engineering improving sequences for themselves, individuals not only avoid painful downward shifts from new levels of adaptation, but also provide themselves with a continuing stream of favorable contrasts with past experiences (ibid., 92-93). In addition, saving the best episodes of consumption until later in the sequence allows people to derive value from anticipation (see Loewenstein 1987).

The fact that one prefers an improving sequence of *consumption* should not necessarily lead one to prefer an increasing sequence of *income*, however, given the ability to carry money forward from the past into the future (Loewenstein & Sicherman 1991; Neumark 1995; see Frederick et al. 2003, 31). In some of the “sequence” studies, the sequences in question involved in-kind consumption goods, such as fancy dinners

(Loewenstein & Prelec 1991). Because these items must be consumed at a given moment in time and cannot be carried forward for later consumption, it is impossible to draw a distinction between the time these items are “credited” to the individual and the time they are experienced or consumed. If improving-sequence preferences were limited to such situations, the implications for public finance would be rather thin.

However, similar sequence preferences were observed in studies involving payments of money, such as wages (Loewenstein & Sicherman 1991). Of course, there might be independent reasons for wanting wages to increase, apart from consumption preferences. For example, perhaps an increasing wage profile acts as a proxy for recognition of increasing skill at one’s chosen occupation (*ibid.*, 69-70). Loewenstein and Sicherman compared reactions to sequences of wages and sequences of other payments unrelated to personal merit or skill (rental income from an inherited building) to test this possibility (*ibid.*). They found that while a larger majority rejected present-value maximization in favor of upward-sloping sequences where wages were involved, a majority also preferred such sequences for the non-merit-based payments (*ibid.*, 75). In addition, people at a given salary level will often choose non-maximizing payment options such as spreading a nine-month salary over twelve months (*ibid.*, 81; Kahneman & Varey 1991, 147). These salary distribution preferences cannot be explained by the proficiency-recognition hypothesis.

Next, consider preferences for lump sums. Because people attach value to income received in the form of a lump sum, they are willing to forgo some increment of present value in order to obtain income configured in this manner. At times, this can generate hyperopic choices.² An individual might opt for a lower present value lump sum bonus at

the end of the year, for example, over an incremental increase in each paycheck (Kahneman & Varey 1991, 147). The past use of Christmas clubs also illustrates that people are sometimes willing to give up an increment of present value in order to obtain a lump sum at a later date (Thaler & Loewenstein 1992, 98).

It is easy to understand why people would want to *consume* in lumps. Many desirable consumer goods (cars, vacations, down payments on homes) require a significant outlay of cash. In many cases, it is possible to finance these large expenditures and to make small payments over time. However, not all individuals have the ability to borrow, not all expenditures lend themselves to financing, and some consumption experiences (such as vacations) appear to be more valuable when they are entirely prepaid (Prelec & Loewenstein 1998). In these cases, enjoyment of the consumption experience requires spending, all at once, a large sum of cash. A preference for lumpy consumption does not require that the money be *received* in a lump, however; it could instead be received in dribs and drabs and saved up until it is of sufficient size to finance the consumption item in question.

Because people could choose the higher present value option and generate for themselves a larger lump sum or engineer for themselves an increasing sequence of higher dollar value, these hyperopic choices require some explanation. Standard economic analysis assumes that individuals can spread their lifetime earnings over the life cycle to accomplish any consumption timing pattern they desire (see, e.g., Souleles, 1999; Wertenbroch, 2003; Ando & Modigliani, 1963). On this account, we would not expect preferences for a particular kind of *consumption* pattern to have any impact on preferences for *income* patterns. Instead, people would simply seek to maximize the

present value total of lifetime earnings. Because moving money backwards in time (from the future to the present) is costly in present value terms, and moving money forwards in time (from the present to the future) generates income (interest), we would expect people to always want money sooner rather than later, regardless of how and when they planned to spend it.

Reality diverges from the life-cycle model significantly. In fact, income and expenditure patterns do affect consumption patterns (Shefrin & Thaler 1991). For example, Nicholas Souleles (1999) found that income tax refunds – a source of income that is “both predictable and transitory” -- had a positive impact on consumption. Other work has identified changes in consumption associated with fluctuations in income (see Shefrin & Thaler 1991). The marginal propensity to consume out of income also seems to depend on how the income is framed, with bonuses and windfalls triggering different levels of consumption than ordinary income (see *ibid.*, 115-18).

There are at least two explanations for hyperopic choices involving lumps and sequences of money. The first relates to self-control problems, and the second relates to mental accounting and personal financial rules. The next two subparts discuss these explanations.

B. Self-Control and Intrapersonal Tragedies of the Commons

To examine the connections between liquidity, self-control, and precommitment, we might think of the life cycle not as a flat surface across which lifetime earnings can be effortlessly spread like jam on bread, but rather as a series of discrete rooms through which one moves temporally.³ One has an interest, let us assume, in having each of these

temporal rooms furnished in a suitably comfortable fashion and in enjoying certain consumption goods while in each of the rooms. Cash flows into only some of the rooms, and the amount varies from room to room; likewise, cash is demanded in varying amounts in each room. Mechanisms for reaching into future rooms to drag cash backwards into the room one presently occupies are imperfect, expensive, and sometimes absent. Even when such mechanisms work reasonably well, some of the money that is captured from the future is dissipated in the process. Carrying cash forward does not usually involve payments to third parties, but it is cognitively cumbersome for many people. Such people can only carry cash into the future in a leaky bucket (cf. Okun, 1975, 91-92 (using leaky bucket metaphor in the context of redistribution)). The leaks of relevance here involve unplanned consumption during the periods in which the money is available.

The problem can be posed as an intrapersonal tragedy of the commons (see Ainslie 1992, 161-62), featuring incentives both to underinvest in the commonly-held resource and to overuse it (cf. Ostrom et al. 1994, 14-15). Consider again an indivisible lump of consumption that an individual might rationally view as more valuable than the sum of the many separate consumption opportunities that could be funded by an equivalent amount of cash (see McCaffery 1994b). To obtain the more valuable lump sum consumption opportunity, various short-run consumption opportunities held by different temporal selves must be relinquished. This presents a strategic dilemma for an individual's successive selves (Ainslie 1992, 160-64). Consider an individual, Adam, who wishes to fund a lump sum of consumption from bits of cash that arrive in each paycheck. Adam is made up of temporal selves: "Adam at Payday 1", "Adam at Payday

2”, and so on, some significant number of whom must cooperate in assembling the lump sum. In order for the lump sum to actually become available on a future date, intervening selves must not only faithfully set aside some portion of “their” paychecks, but also must refrain from raiding the store of funds already set aside by other selves.

Here, the lumpy consumption experience might be thought of as a “step good” (see Erev & Rapoport 1992 (defining step good)) that requires the cooperation, through savings behaviors, of a series of selves. Without the participation of a sufficient number of these selves, the savings will fall short of the goal, and the desired indivisible lump of consumption becomes unavailable. Suppose a desirable lump of consumption can be funded by *some subset* of the temporal “Adams” over the course of a given year, so that some of the Adams need not contribute at all. Each Adam will be tempted to believe that he should be exempt from the contribution requirement, on the grounds that the other Adams are better-positioned to make the contribution; of course, the other Adams will reason the same way as well (see Ainslie 1992, 160-61). Each Adam may also fear that his own contribution is likely to be either futile or superfluous, rather than pivotal in achieving the goal (cf. Dawes et al. 1986, p. 1178 (discussing a similar dynamic in the context of multi-party decisionmaking about the provision of step-level public goods)).

Savings accounts from which withdrawals are not permitted until a specified date, such as Christmas clubs, attempt to overcome this dilemma by offering a period of illiquidity followed by a window of complete liquidity (Thaler & Loewenstein 1992, 98-99; Fetherstonhaugh & Ross 1999, 194-95). Successive selves still must place money into such an account rather than spend it immediately, however, or the desired lump of cash will not be available during the window of liquidity. A system of automatic

paycheck deductions can help in this regard (Fetherstonhaugh & Ross 1999, 195). Such a system requires each self to affirmatively “opt out” of the contribution plan, rather than requiring each self to “opt in” by making a contribution (cf. Thaler & Benartzi, 2004). Once the money is in place, the external control on liquidity keeps it from being raided on an impulse.

Similar challenges confront those who would engineer an upward-sloping consumption profile in situations where real income is not rising over time, or where future large expenditures are anticipated. A series of short-run sacrifices would be necessary to amass the resources to maintain an upward-tending consumption profile in the face of flat or declining real income or shocks to liquidity in the form of large expenditures. The problem contains elements of “scale mismatch” (see Prelec & Bodner 2003, 278; Prelec 1991). Each successive self may fail to see a connection between the small consumption choice in front of her at a given moment and any later impact on the overall shape of her consumption profile. The cost, in consumption profile terms, of deferring a plan of austerity until after one has enjoyed any given short-run consumption opportunity is likely to be miniscule (*ibid.*; see also Herrnstein & Prelec 1992). As in other contexts, the mismatch between the immediate pain of undertaking an unpleasant program now and the trivial impact of waiting a little longer makes procrastination attractive (O’Donoghue & Rabin 1999b). Of course, in the aggregate, the enjoyment of short-run consumption opportunities will erase any possibility of an upward-sloping consumption profile unless one’s income profile already takes that shape. Unsurprisingly, savings difficulties are a common explanation for the observed robust preference for increasing wage profiles (see Neumark 1995).

In sum, do-it-yourself “cash-assembly” and “sequence-building” efforts are costly and often do not work out well. We should not be surprised to see people attaching positive value to the pre-assembled lumps or upward-tending sequences. The value added by external cash-assembly services and upward-sequencing plans could make such options preferable to streams of payments with a higher present value, resulting in hyperopic choices.

C. Mental Accounting and Personal Rules

People do not view all money as fungible, but rather engage in mental accounting that codes money in particular ways based on factors such as when and how it was received (Thaler 1992). People often use these mental designations to construct personal rules for dealing with financial matters (Shefrin & Thaler 1991, 95-103; Thaler 1992, 109; see also Ainslie 1992, 142-73 (discussing personal rules generally)). Mental accounting thus impacts the way in which different kinds of receipts will be spent (Shefrin & Thaler 1991; Thaler 1992), and may even affect the enjoyment one can obtain from consumption that is funded in various ways (Prelec & Loewenstein 1998).

The transformation of small increments of income into a large lump of consumption ordinarily requires turning income into savings. People who operate according to the rule of “spend what you make” (Thaler 1992) may never accomplish this transformation due to self-control problems. But even people without self-control problems who are excellent savers can still lack good “stopping rules” for their savings behaviors. This can impede their ability to engage in desired types of consumption (see Kivetz & Simonson, 2002). Once money is coded as “savings,” personal rules may step in to limit the uses that may be made of it (Thaler 1992, 109). Making exceptions to one’s own rules is a

tricky business, even when doing so would truly be in one's interest; there is a risk that any loophole will expand to swallow the rule (Ainslie 1992, 164). Hinted-for gifts from someone with whom one shares a bank account provide one way to circumvent personal rules about money (Baron 2000, 480-81; Thaler 1985, 199, 212-13). Likewise, unusual receipts such as windfalls, refunds, and bonuses are likely be coded in a different manner than ordinary income (Souleles 1999; Shefrin & Thaler 1991, 115-18; Thaler 1992, 112-14). They may, therefore, represent useful solutions to the "loophole problem" by offering a bounded opportunity to depart from ordinary financial habits.

Here, notice that the temporal positioning of these special receipts is important because it marks those receipts as unique and out of the ordinary – distinct from merely routine, recurrent forms of income that must be treated according to the usual financial rules. If an individual must interpose a sufficient temporal buffer between lumpy receipts in order to mentally code them for special treatment, the results might appear hyperopic. Similar to the self-control rationale discussed above, such an explanation suggests the operative preference is not necessarily for *later* consumption, but rather for the sort of consumption experience that can only be funded in a given fashion. Given mental accounting constraints, pushing the receipts forward in time is a necessary adjunct to the desired consumption experience.

A closely related consideration has to do with adaptation to changes in consumption levels – one of the factors that explains sequence preferences. There is significant evidence that people can enjoy special increases in consumption without suffering from an adaptation effect, if they can manage to mentally segregate the special consumption episodes (Kahneman & Varey 1991). This is one explanation for the popularity of

bonuses (ibid., 147). Here, the ability to code particular receipts as unique and nonrecurring prevents people from readjusting their consumption baselines in a way that would result in a painful drop in the next period.

An analogous body of empirical work examines the impact of the degree of mental “coupling” of consumption with payments (Prelec & Loewenstein 1998). In general, consumption appears to be more enjoyable the more it is decoupled from payment (ibid). Consumption-enhancing decoupling can be accomplished in a variety of ways, including interposing temporal distance between consuming and paying (whether through prepayment or delayed billing), using tokens to mask the link between marginal consumption and payment, purchasing an all-inclusive plan so that marginal consumption does not come with a price tag, or delegating payment to another individual (see ibid., 19-24; Baron 2000, 480-81; Thaler 1985, 199, 212-13). Likewise, shifting income forward in time might have the effect of decoupling it from the sacrifices that made it possible, making the consumption it can fund more enjoyable. A year-end bonus might therefore be preferred over a salary increase if it feels more like a gift of “found money” than like a quid pro quo for work performed.

D. Introducing a Public Finance Application: Overwithholding

Armed with a definition of hyperopic choices and some idea of the preferences that may underlie such choices, we can now make an initial foray into public finance. At first blush, the notion of hyperopia seems to offer a wealth of transferable insights. Spotting hyperopic choices (defined above simply as choices featuring a later payoff of lower present value) is relatively easy, and there are a wide variety of policy design issues that would be importantly impacted by hyperopia. To work through some of the

issues associated with adapting lessons about negative time preferences to public finance settings, I will begin by introducing just one example here – the familiar puzzle of income tax overwithholding. This example is somewhat trivial,⁴ yet it nicely illustrates both the potential relevance of cognitive literature on hyperopia to public finance and some of the dangers associated with too-facile incorporation of psychological insights into positive and normative accounts. Later in the paper, I will discuss a variety of other public finance applications.

About three-fourths of U.S. taxpayers have more income tax than necessary withheld from their paychecks, or make excess estimated payments (IRS 2004; Ayres et al. 1999). Likewise, low-income people who qualify for the Earned Income Tax Credit rarely take advantage of the opportunity to receive advances on that credit during the year; most opt instead for a single lump-sum payment at the end of the tax year (*e.g.*, Hotz & Scholz 2003 (less than 1.1 % of eligible EITC recipients took the advance payment option in 1998)). Through these behaviors, substantial segments of society -- including some of its most liquidity-constrained members -- make interest-free loans to the government (*e.g.*, Ayers et al. 1999; Carroll 1992, 517). These individuals appear willing to accept a larger overall tax burden (or smaller tax credit) in present value terms for the dubious privilege of receiving money later. Rational taxpayers should remit to the IRS only the minimum interim amounts necessary to avoid a penalty, pay the balance at tax time, and pocket the interest. On its face, the overwithholding choice is a hyperopic one.

But, as the reader will no doubt have perceived already, overwithholding and similar conduct is overdetermined, with myriad plausible explanations. Because some of these explanations relate in some measure to hyperopic preferences and others do not, it offers

a useful case study for highlighting and sharpening some of the criticisms that will be explored later in the paper. Indeed, some of the most obvious explanations for overwithholding and related conduct have nothing to do with time preferences. A considerable proportion of observed overwithholding behavior can be explained by a lack of familiarity with the applicable withholding rules, the complexity of the required paperwork, and the stickiness of default selections (Ayres et al. 1999 (citing Schmedel 1997); cf. Choi et al., 2005).⁵ Overwithholding may also be produced by the fear of underpaying taxes and having to suffer a penalty (or, in the case of the EITC, having to repay amounts erroneously dispensed) – outcomes that may be perceived as particularly onerous given aversion to losses and penalties (see, e.g., McCaffery 1994a, 1905-06).

However, recent empirical work found that many well-informed subjects (MBA students screened for their understanding of the operative rules) actually preferred making excess interim tax payments, even when given full control over the amounts that would be withheld or remitted in the form of estimated payments (Ayres et al. 1999). Such preferences might seem to suggest a negative discount rate, or hyperopia (e.g., Korobkin & Ulen 2000, 1119 n.274). A standard explanation for such preferences relates to the difficulty people often face in saving money rather than spending it. On this account, interim payments to the government represent precommitments designed to overcome anticipated self-control problems. The precommitment in question might be designed merely to overcome the difficulty individuals might have in saving up to pay the outstanding tax liability (Ayres et al. 1999, 59), or it might be designed to facilitate especially desirable consumption patterns (see Souleles 1999, 948-49 & n9).

Consider the preference for improving sequences. If a large tax payment is required

all at once, and if previous consumption has not been carefully orchestrated to compensate for its cost, the outlay will produce a painful downward notch in the consumption profile. Efforts to save up the money on one's own may give rise to unplanned consumption that will thwart efforts to build an upward-tending sequence. Likewise, self-control problems may make it difficult for an individual to realize the theoretical possibility of translating small amounts of money into a lump sum. The overwithholding system provides an easy way to generate a lump sum in the form of a tax refund at the end of the year.

Income tax withholding incorporates two features that can help to coordinate temporal selves. First, the automatic payroll deduction system harnesses inertia by making the default option that of contributing in each period (see, e.g., Thaler & Benartzi 2004, S185; cf. Korobkin 1998; Choi et al. 2005). Second, the system augments that inertia with a bureaucratic delay that limits momentary temptations to change the default selection. A requested change in withholding arrangements may not be reflected in one's paycheck for nearly two months.⁶ Even very modest delays before the availability of an earlier payoff can lead to more patient choices (Solnick et al., 1980).

One need not believe that people have difficulty coordinating their temporal selves in order to arrive at a plausible explanation for overwithholding, however. There is an alternative set of explanations that relates to the anesthetic and consumption-enhancing properties of the withholding system. It appears that "withholding is important in cutting the pain of paying [taxes]" (Carroll 1992, 517). Framing effects and loss aversion provide an explanation. People dislike costs framed as losses more than they dislike forgoing gains of an equal amount. Whether or not a cost is perceived as a loss or a gain

depends on the implicit baselines in use, and on whether the specific cost is bundled with other losses or gains (Tversky & Kahneman 1981). In the case of income tax withholding, individual withholding amounts are bundled with much larger gains (paychecks) and may not be perceived as losses. In contrast, having to write a large check to the government in April is very likely to be coded as a loss (see Carroll 1992).

Another pain relief argument relates to the dread associated with taxpaying (Ayres et al. 1999, 58-59). Consistent with preferences for improving sequences, studies have shown that people often prefer to get dreaded events out of the way earlier rather than later (Loewenstein 1987). Taxpaying seems to be a painful experience for most Americans, and getting it over with early through withholding might help to diminish the pain (Ayres et al. 1999, 58-59). Pain relief can also explain overwithholding that generates refunds, if we consider the paperwork burden of filling out tax returns as a painful event in its own right. About two-thirds of those interviewed in a recent Gallup Poll survey indicated that they either “dislike” or “hate” doing their income taxes (e.g., Newport 2001, 44). Significant refunds effectively bundle the costs of completing tax paperwork with a larger reward (the refund), and hence could significantly reduce the pain associated with the task.⁷ People probably do not have this notion consciously in mind when they overwithhold, but the positive reinforcement associated with having a large, attractive reward paired with an unavoidable and distasteful task could play a role in perpetuating overwithholding behaviors.

Another intriguing possibility is that people are using the withholding system to enhance their other consumption experiences. Overwithholding accomplishes a temporal and contextual “decoupling” of the enjoyment of consumption financed by the refund

from the pain of the series of payments which made it possible (see Prelec & Loewenstein 1998). The mild element of surprise involved in later receiving a refund arguably contributes to the decoupling. Decoupling usually comes at a high price: Payments that are not attached to any benefits tend to be perceived as especially painful (ibid., 23 & n.14). But in the overwithholding context, the fact that payments are bundled with paychecks may help to buffer the pain. Payroll withholding also distracts people from the fact that they are deferring gratification by keeping the money entirely out of reach (Weiss, 1991, p. 1313) while at the same time allowing them to enjoy the anticipation of future consumption.

An annually-delivered refund check may also offer a nicely-bounded exception to personal rules about the use of money. Withholding effectively transforms part of one's ordinary income into something that mental accounting renders markedly distinct from ordinary savings (see Thaler 1992). It might be used to fund different kinds of consumption than those associated with ordinary income or savings, or to heighten the enjoyment associated with such consumption. This might help to explain the uptick in durables purchases following tax refunds among households that are not liquidity constrained (Souleles 1999).⁸ Significantly, refund checks may be sufficiently distinguishable from ordinary income to avoid adaptation effects. A tax refund provides one way of effectively delivering to oneself a bonus -- a lump of money that is distinct from a salary increase and that does not alter one's overall expectations about consumption.

Finally, if people experience "tax aversion" -- additional disutility associated with the fact that the payment one is making is a *tax*⁹ -- a converse phenomenon might accompany

getting money back from the government. One might feel freer to spend “the government’s” money than one’s own and an additional element of enjoyment might therefore accompany the expenditures. While everyone recognizes that the money is really one’s own and that one could have held onto it all along, the withholding-and-refund process likely works some important transformations from the standpoint of mental accounting.

All of these explanations provide minimally plausible accounts of a type of behavior that involves receiving what is in economic terms a smaller reward at a later time. Some of the explanations, however, seem more tenuously linked to “time preferences” than do others. Even to the extent it seems plausible to say that “time preferences” drive these behaviors, there are different factors driving those time preferences. This example highlights the need to take a step back and consider in more general terms the appropriate role of the study of time preferences in legal theory and in public finance scholarship.

II. THINKING ABOUT TIME PREFERENCES

The notion of hyperopia offers a window onto two sets of difficulties that confront scholars interested in incorporating time preferences into public finance work. The first problem concerns the accuracy of the positive account generated by a focus on time preferences. When we turn to real-world phenomena rather than controlled experiments, alternative explanations typically exist for observed choices between earlier and later payoffs, and competing time preferences may also be in play. Simply labeling such conduct “hyperopic” or “myopic” may be at best meaningless, and at worst misleading. It may also be unhelpful for making predictions in other contexts, given that

people's time preferences seem to vary (both interpersonally and intrapersonally) in intensely context-sensitive ways.

The second difficulty stems from heterogeneity in the root causes of time preferences, which often generates mixed policy signals. Looking behind temporal choices to underlying preferences often means confronting a tangle of divergent behavioral determinants. Because these underlying determinants may point in different normative directions, knowing a lot about time-related behavior may still tell us little about policy. For example, it may be impossible to tell whether a particular hyperopic choice represents a mistake that should be corrected by the government through policy, or merely a preference that should be vindicated.

A. When Is Choice Over Time About Time?

As the discussion of overwithholding illustrates, it is not always possible to infer from a choice between temporally offset options that a time preference is truly responsible for generating the result. When a lump sum is chosen over a larger payoff that must be accumulated over time, it may be chosen in spite of its temporal position, without regard for its temporal position, or (in whole or in part) because of its temporal position. Upward-tending consumption experiences, unlike lump-sum consumption experiences, are always dependent on the relative temporal positioning of different episodes. But this observation does not clarify the role of time in preferences for *cashflow* sequences. These difficulties with developing meaningful positive accounts for time-situated behavior raise questions about the usefulness of efforts to pin down a model of intertemporal behavior.

As George Loewenstein (1992) explains, a model of intertemporal behavior must balance three criteria: generality, manageability, and realism (ibid., 30). The exponential discounted utility (“DU”) model developed in 1937 by Paul Samuelson scores high on manageability, but, as research is increasingly demonstrating, low on realism. DU is elegant and highly tractable, but at odds with a great deal of readily observable human behavior. For example, a person who prefers a larger reward in two years over a smaller reward in one year will often change her mind after the first year has elapsed, when she is faced with a choice between an immediately available smaller reward, and a larger reward one year hence (see, e.g., Camerer 1990, 793 n. 7 (discussing this “immediacy effect”)).

The hyperbolic discount function shows how preference reversals of the sort just described could occur as a set of rewards grows closer in time. As a result, it has attracted significant attention and enthusiasm.¹⁰ However, it has some shortcomings. For example, it cannot explain why some kinds of goods produce preference reversals and others do not (Loewenstein 1988; Read 2001). Moreover, it does not explain why people sometimes exhibit negative time preferences. It is possible to posit that hyperopic choices represent precommitments made by sophisticated agents aware of their own hyperbolic discount functions, but this is only one of several positive accounts that would fit with hyperopic choices.

The hyperbolic discount function remains prominent, but scholars continue to tweak and critique it (Loewenstein 2003). Alternative explanations continue to be explored for the time-inconsistent behavior that prompted the search for, and seemed to be so cleanly explained by, the hyperbolic discount function. For example, Daniel Read has recently

suggested that subadditive time preferences may account for time-inconsistent behavior that we have been interpreting as stemming from hyperbolic discounting (2001). Likewise, Ariel Rubinstein has suggested focusing on whether options situated in time are viewed as similar or dissimilar (2003). Moreover, interpersonal and intrapersonal variations, as well as contextual factors, caution against generalizations about time preferences (see, e.g., Loewenstein 1987, 680).

How, then, are we to think about time preferences? By developing increasingly nuanced models that account for more and more sorts of interpersonal and intrapersonal heterogeneity in time preferences, have we sacrificed generality and tractability? As John Harsanyi (1968) observed in a related context, “If we make our motivational assumptions complicated enough then we can always explain every conceivable form of social behavior in terms of these assumptions, which means that we are actually explaining nothing” (316). Loewenstein and Sicherman (1991) offer the following perspective on time preferences:

Given the wide range of discounting behavior observed in even a single individual’s behavior, . . . perhaps the question of whether people discount the future positively or negatively is moot. As a research agenda, it may be more fruitful to address the more nuanced question of why intertemporal choice behavior is so variable and to attempt to uncover the situational determinants of time preference (81-82 (footnote omitted)).

Making our inquiries more context-specific offers promise, but it also calls into question the usefulness of temporal distortions as an explanatory category. If we assemble a large enough catalogue of possible distortions, it becomes both easy and meaningless to formulate a post hoc reason for any behaviors that we actually observe. Hence, relying on “time preferences” as an all-purpose explanation risks substituting apparatus for substance and reverse-engineered conclusions for real explanations.

Focusing on time preferences might even be positively harmful if it distracts us from more important features of the choice situation that are actually responsible for behavior.

Yet even though time preferences may work poorly as final explanations, they can still provide helpful clues for working through the causes of puzzling behaviors. Indeed, there may be cognitive reasons why recognizing a category of “time preferences” is useful, even if it serves mostly as a placeholder that reminds us to dig deeper for explanations. It is impossible for human beings to notice everything, and categories like incoherent time preferences offer simple and salient entries on a public policy checklist.

Attitudes toward risk offer a useful analog. Although the basic presumption of risk aversion remains robust in many settings, behavioral work continues to demonstrate instances in which individuals will act in risk-preferring ways. Manipulation of contextual factors, such as perceived baselines, can cause individuals to flip from risk-averse to risk-preferring, and vice versa (Tversky & Kahneman 1981). All of these complications make risk attitudes difficult to pin down. However, they do not in any way detract from the utility of recognizing a conceptual category “attitudes towards risk” that stands as a placeholder for all of the ways in which risk preferences may influence behavior. Likewise, the fact that time preferences are enormously complicated and driven by a host of contextual factors does not alter the utility of using the notion as a shorthand term.

B. When Should We Worry About Intertemporal Choice?

The question of whether or not time-related behavior is “mistaken” has surfaced repeatedly in the literature. The use of terms like “myopia” and “hyperopia” in the time-

preference context suggests that choosers suffer from distortions in perceiving the relative size or attractiveness of rewards that are situated at different temporal distances. There are some difficulties with this analogy. George Ainslie (1992) points out that people can readily compensate for other known distortions in the perception of other inputs, such as light and distance; why cannot they do the same for time? (82). Another problem inheres in defining the baseline of “perfect vision.” On one view, discounting future consumption at all is irrational, except to the extent that the risk of death or other uncertainties make the more distant option less likely to be enjoyed (Pigou 1920, 24-29). The interest rate offers another possible benchmark for rational discounting, although the nature of the relationship between interest rates and time preferences is not necessarily straightforward (see Baron 2000, 470-75; Kelman 1983). Some would maintain that any method of discounting the future can be rationally adopted, as long as it does not produce internal inconsistencies. For example, Derek Parfit (1984) has suggested that a discount rate can rationally take into account lesser degrees of “connectedness” to one’s future selves (314-15).

Perhaps easiest to categorize as mistakes are decisions that are internally inconsistent with an individual’s earlier and later preferences, or decisions that are regarded by the actor herself as mistaken. When discounting generates time-inconsistent choices (as when it follows a hyperbolic pattern) it might be deemed to violate some principle of well-ordered preferences (see Baron 2000, 473). In addition, if the individual making the choice views it as a mistake after being confronted with information on the anomaly or inconsistency in question (see Loewenstein & Sicherman 1991), this is a clue that the choice is not functional in achieving the individual’s longer-range interests. But this

analysis raises the question of which temporal versions of the individual we should view as having the final word about what is and is not a mistake (see Strotz 1956, 179). The earlier self might take the position that a choice inconsistent with its plans represents a mistake, but a later self might argue that the earlier self was wrong to make such plans in the first place.

Two observations seem apt. The first is that we cannot label a choice as a mistake without looking at the reasons behind it and considering its context. Choices that look mistaken in isolation may in fact be functional in counterbalancing other unfortunate behavioral tendencies. The second is that identifying behavior as mistaken does not resolve debate about the appropriate policy intervention (see Sunstein & Thaler 2003; Camerer et al. 2003). Some corrections may be unduly costly or intrusive, or, where causes of behaviors are heterogeneous, may disadvantage those for whom the behavior is not a mistake.

Consider again the case of overwithholding. If people are effectively making mistakes in the government's favor (as they arguably are when they offer the government interest-free loans) how should government respond? Here we might usefully distinguish between departures from a maximizing model that have the effect of correcting for other biases that are not in the individual's interest, and those that represent harmful errors without any compensating benefits. In this first category, we might readily include conscious precommitment activities which represent sophisticated responses by an individual to her own known cognitive shortcomings (see, e.g., O'Donoghue & Rabin, 1999a (distinguishing "sophisticated" from "naïve" actors)).

But what of the anesthetic effect of overwithholding? It seems clear that certain kinds

of government-initiated, government-administered “painkillers” (hiding taxes or tricking taxpayers) would be problematic and could interfere with the responsiveness of the democratic process (McCaffery & Baron 2003, 22; see also Lane 2000, 230 (discussing the role of pain in a democratic system)). We might therefore view with skepticism any tendency for the tax system to “gravitate towards taxes that impose the minimal psychic pain” (McCaffery & Baron 2003). However, there is certainly no obligation on the part of government to make taxpaying maximally painful. Moreover, if taxpaying is *already* coded as particularly aversive, then easing the pain a bit might merely counteract an existing distortion. Notably, compliance levels are much higher when no positive amounts are due at tax time (see Ayres et al. 1999, 56 (collecting sources)). Because all taxpayers benefit when administrative and enforcement costs are minimized, we might imagine that taxpayers would consent to a system of limited, mutually-administered painkillers to reduce the costs of providing tax-funded services.¹¹

Consider next the possibility that overwithholding generates more carefree (“decoupled”) consumption at refund time. Prelec & Loewenstein (1998) discuss the tension between “outcome or decision efficiency” that requires paying attention to the costs of consumption and the “hedonic efficiency” of decoupling (25-26). This echoes in some regards the tension between anesthetized taxpaying and political optimality (see e.g., McCaffery & Baron 2003). People aware of their own longer-term interests might still decouple to some extent because it makes consumption more enjoyable (or payments less painful) but they will not do so to such a degree that they lose the ability to monitor what consumption patterns are in their own best interest. It may also be useful to think of withholding system as a decoupler that competes with other popular forms of decoupling,

such as credit card usage (see Prelec & Loewenstein 1998). If people are choosing *this* method of enhancing consumption over some much less desirable method, then any “mistake” involved might still be regarded as corrective or preventative in nature.

Another normative concern relates to the willingness of some people expecting refunds to pay high interest rates in order to receive those lump sums a few days or weeks early (Barr 2004, 166-77). In 1999, 39% of EITC recipients and 4% of non-EITC recipients purchased refund anticipation loans (Berube et al. 2002, 11). We might be tempted to assume that these individuals are hyperbolic discounters – patient as long as the lump sum is far away, but extremely myopic as soon as the lump sum comes within reach. But the discussion above should make us cautious in drawing such inferences. An individual’s preferences might, in fact, be stably fixed on a particularly desirable consumption configuration that requires lump sum funding. A person who desires lumpy consumption as soon as possible, but cannot manage to assemble a lump sum for herself, might quite consistently first make choices that look hyperopic (to assemble the lump sum), and then switch to choices that look myopic (to obtain the now-assembled lump sum). We cannot be certain that either choice is a mistake.

Of particular interest here are mechanisms that would allow people to make their own advance judgments about the desirability of refund anticipation loans. For example, the IRS might add a “refund guard” option to the W-4 which would allow people to code their tax refunds or credits in advance so that they cannot later be used as collateral for a loan. Tax preparation services offering refund anticipation loans could then be required to check the taxpayer’s Social Security number against an IRS database of “guarded” credits and refunds before making a loan, on pain of losing recourse against the taxpayer

for the loan. If presented with this precommitment option at a time when the lump sum is not in immediate view, people might choose to take advantage of it.

Finally, it is sometimes suggested that the government ought to correct taxpayer overwithholding by paying interest on overwithheld amounts (Carroll 1992). The IRS routinely corrects other sorts of mistakes that taxpayers make in the government's favor, and it is not immediately obvious why this mistake should be treated any differently. The fact that overwithholding helps the government minimize collection and enforcement costs seems to strengthen this case (*ibid.*). But paying interest on overwithholding is not costless; it necessarily means taking money from someone else. Given that most people overwithhold without any inducement at all, we might question whether interest payments would generate a sufficient marginal improvement in compliance to justify the costs involved. Nor is it clear that the government's failure to shift money from other taxpayers to provide interest payments to overwithholders is unfair as a distributive matter. By analogy, people who choose to put money in non-interest bearing bank accounts are not generally believed to have a claims against other citizens for the interest that their money would have earned if it were better invested.

III. OTHER PUBLIC FINANCE APPLICATIONS

The preceding part hints at some of the positive and normative difficulties that attend efforts to translate lessons about time preferences into policy. With these cautions in mind, an examination of hyperopic choices yields some interesting and fresh perspectives on public finance policy.

A. *Engineering Patience*

As discussed above, preferences for improving sequences can drive hyperopic choices (Loewenstein & Prelec 1991, 351). Policies that encourage people to view a series of events as part of a sequence could, therefore, lead people to accept smaller payoffs in exchange for an upward sloping payoff profile. For example, distaste for downward-sloping profiles arguably helps to explain the endurance of Social Security, despite redistributive features that make it an actuarially poor bargain for many people.

The desire to turn one's life into an upward-tending narrative may also elucidate some aspects of health care policy. For example, Medicare provides health coverage for nearly all people over 65, helping to safeguard in some ways the quality of the final life stages. However, Medicare does not cover most long-term care (Kaplan 2001, 66). When people learn they must exhaust nearly all of their personal resources on long-term care before they can qualify for government assistance under the means-tested health insurance program, Medicaid, they are often astonished that a lifetime of work and taxpaying could end in such a way (see *ibid*, 67-73). Of course, *someone* must pay for the long-term care, and arguably the person needing the care is in the best position to do so if she has remaining assets. But perhaps the psychic pain associated with an extremely negative and costly final episode has not been fully appreciated by policymakers. To put it in a more positive light, the fact that people are willing to pay extra to fund upward-tending sequences (or to avoid downward-tending sequences) arguably offers some unexploited policy space for improving outcomes.

Similarly, we know that lump sums can be attractive enough to induce hyperopic choices. Substituting lump sums for streams of payments could, therefore, offer a

powerful and inexpensive way of leveraging patience and inducing desirable behavioral shifts. There have already been policies, proposals, and experiments involving lump sums in lieu of a stream of periodic payments in welfare and unemployment settings (Woodbury & Spiegelman 1987; Maloy et al. 1999, 55-71; Leonhardt 2003), suggesting that the potential attractiveness of lump sums as policy instruments has not gone unnoticed. Such programs are designed to induce individuals to work harder in the short run to recover from setbacks and obtain employment, and in that sense could be understood as targeting time preferences and tendencies towards procrastination.

Similarly, Fetherstonhaugh and Ross (1999) conducted a survey that asked respondents whether a lump sum or a stream of higher retirement payments would be more likely to induce them to retire at age 68 rather than age 65 (ibid, 203).¹² Although the lump sum had a lower present value, it was overwhelmingly chosen – by some 76 percent of respondents (ibid). To be sure, the researchers posed the lump sum as an alternative to increases in a *later* stream of payments that would continue throughout retirement; hence the lump sum was presented as the earlier of the two alternatives open to subjects. However, the respondents were asked to assess their willingness to give up an *earlier* stream of payments (retirement payments from age 65 to 68) in order to obtain that lump sum. The research design asked only whether the later stream of increased payments or the lump sum would be *more likely* to induce later retirement, without asking whether subjects would actually be willing to exchange the stream of payments available through the earlier retirement date for either of the options presented. The latter question, which would more directly address whether parties were likely to make hyperopic choices, would be well worth asking in a follow-up study.

The observation that lump sums can motivate patient as well as impatient choices also helps to dispel the assumption, commonplace in the literature, that the choice of an earlier lump sum over a later stream of payments necessarily reflects a myopic time preference. It may instead be the case, as suggested above, that lump sums add value that will induce deviations from present-value maximization, regardless of the relative temporal orientation of the stream and lump options. The study of hyperopic choices thus helps to underscore a broader point: If behavioral economics can identify particularly valuable configurations of present-value-equivalent monetary payments (by isolating, through experimental work, attractive features such as lumpiness, timing, frequency, source, frame, and mental coding), these configurations could represent nearly costless incentive mechanisms for moving behavior in socially desirable directions. People might be cheaply induced to retire later, save more, become reemployed earlier, escape poverty sooner, pay taxes more promptly, purchase appropriate insurance, and so on. In sum, policymakers should focus on exploiting the full policy potential of particular payment configurations, rather than mistakenly chalk up behavior involving those configurations to myopic tendencies on the part of citizens.

B. Buying a Dream: Lottery Play and Tax Cuts

This preceding discussion has focused on rather rosy possibilities for inducing patient choices through policy design. Of course, the mere fact that a policy induces patience does not, on its own, tell us anything definitive about the policy's normative valence. For example, it would be problematic for people to couch distributive events in their lives as early parts of an upward-sloping narrative if the latter part of the imagined story is not realistic. In short, patience is not always a virtue.

Suppose a segment of the population chooses to accept higher distributive burdens on the basis of illusory beliefs that they will be compensated later in the sequence. People will often accept arrangements or outcomes that are not in their immediate interest if they believe that their future selves have received adequate compensation. This willingness of people to accept future rewards as substitutes for present rewards offers great policy flexibility, as discussed above. But it also raises difficult normative questions if people systematically misgauge probabilities or overweight future payoffs. The degree of objective risk or uncertainty associated with a given set of future payoffs seems relevant to this normative question. We might be unambiguously content to have people accept valid promissory notes that shift receipts into the future, but more uneasy when people accept lottery tickets with negative expected value.

Concerns about people taking bad gambles are not new, but an understanding of hyperopia adds a fresh dimension to the story. Part of what might make people accept unfavorable bets is not just overoptimism about the likelihood of future payoffs (that is, a misgauging of the probability term in the expected value calculation), but also an overweighting of certain kinds of future consumption – that which is part of an upward-tending sequence, or that which comes in a large, indivisible lump. Two public finance contexts involving significant uncertainty about future payoffs help to flesh out these worries: state-run lotteries, and tax changes that reduce the degree of overall progressivity in the tax system.

1. Lotteries

The lottery is both a familiar public finance instrument and an object of academic curiosity. Here we see governments raising money by offering citizens deals that are, in

expected value terms, losing propositions. Whether or not we should be troubled by this as a normative matter depends in part on what we believe is happening as a positive matter. One way of thinking about the problem is to recognize that people are effectively purchasing a two-part product when they buy a lottery ticket (see McCaffery 1994b, 90). Because the expected value of the ticket is too low to induce the purchase on its own, it must be bundled together with a second component that makes the purchase worthwhile. The difficulty is defining the content of that second component.

On one view, the extra component is merely a recreational consumption good that we might term “lottery fun” (see, e.g., Cohen 2001, 707; but see McCaffery 1994b, 89-93 (contesting this view)). But perhaps the second component is instead a cognitive factor that magnifies the first, expected value component in some fashion. There are two or three ways it could do so. First, people could be subject to a cognitive bias that artificially inflates the probability term in the expected value calculation. This could be due to overoptimism or magical thinking or some other cognitive factor that makes people believe that *their* odds of winning exceed the statistical odds (see McCaffery 1994b, 86-88; Cohen 2001, 733). Second, people might be subject to a cognitive bias that artificially inflates the payoff term of the expected value calculation. For example, the payoff might be cognitively inflated because it would represent the large, indivisible good of great wealth (McCaffery 1994b).

A third explanation would posit that people accurately gauge both the probability term and the payoff term, but that they add in a factor that relates to a preference for risk. It is worth considering carefully, however, whether this is really an additional explanation or just another way of getting to the second explanation. A lottery player’s goal might

be to achieve a particular absolute level of wealth, perhaps understood in functional terms (for example, enough money to never have to work again) (McCaffery 1994b, 102-05). If we assume a person starts with a fixed amount of money to invest, we can reverse engineer the amount of risk she would have to take on in order to have any possibility of attaining that absolute wealth level. The fact that she takes the risk may not, then, manifest an inherent “love of the gamble” but rather a desire for something that, given her budget constraints, can *only* be achieved through a gamble. Another setting in which we see positive risk preferences involves recovery from an earlier loss position – the “gambling to break even” phenomenon (Thaler & Johnson, 1990). Here again, the continuing series of gambles represents a means for achieving the goal of “not losing money tonight” that is unachievable through less risky endeavors. The exhibited risk-taking behavior may therefore say less about a desire for risk than about the strength of the desire for an underlying goal achievable only through risk-taking.

Our ability to only observe behavior rather than its underlying determinants makes us unable to know the mix of factors that drive real-world lottery play – or to say whether such play should be regarded as a “mistake” – without further empirical study. Perhaps a better way of approaching the lottery question is to consider what features of lotteries might be transplanted into other public finance contexts to achieve desirable ends. For example, Alm, Jackson, & McKee (1992) found that adding a lottery feature to the audit environment in their tax compliance study increased tax compliance more than did a fixed reward for compliance (323-24). Subjects in the study whose tax payments were checked and who were found to be compliant were entered in a lottery with a 1 in 25 chance of winning a prize that was the rough equivalent of a whole session’s earnings

(319). This result offers one tentative illustration of how the extra value associated with particular payment configurations might yield policy outcomes that would leave no one worse off.

2. Progressivity-Reducing Tax Cuts

There have been many recent changes to the tax system that, if made permanent, will involve moving the system in the direction of reduced progressivity (see, e.g., Gale 2004). One high-profile change of this sort was the temporary phase-out of the estate tax (subject to a sunset provision that will bring back the tax in 2011 in the absence of further congressional action). Because a lighter tax burden for the wealthy means either a heavier tax burden for the less well-off or a society that provides fewer services, it is difficult to understand why rational individuals occupying the great bulk of the income scale would not oppose tax benefits for the rich (and especially for the *very* rich) (see, e.g., Fennell 2003, 593-95). Although a variety of explanations have been offered, to my knowledge none has yet considered the possibility that temporal elements might play a role. Including time preferences in the analysis might lead to new insights.

Two caveats are in order. First, I readily acknowledge that some proportion of the apparent lack of opposition to the favorable tax treatment of the wealthy could be illusory -- the product of the dominance of wealthy interests and of opinion survey manipulations (see, e.g., Alstott, 1996; Lewis, 1982). Second, I acknowledge that people's political behavior in the public finance realm may not be driven by financial self-interest. Perhaps broad-based support for less progressive tax policies stems from deeply-held beliefs that it is just unfair for wealthy people to have to pay high taxes, or from particular understandings about the meaning of property and of pre-tax earnings (see

Murphy & Nagel 2002, 175). However, some of the standard explanations for acquiescence in tax breaks for the well off have focused on the possibility that the less well off mistakenly believe that these tax changes will benefit them financially. To the extent such explanations are in play, it makes sense to consider all of the cognitive factors that might contribute to such a misperception, rather than focusing on a subset of them.

Consider one very simple explanation for widespread support of progressivity-reducing tax policies -- that people simply do not appreciate the fact that these policies could harm their interests. The failure to connect up decreased tax burdens for the well-off with increased burdens (or decreased services) for the less well off might be understood in terms of the federal tax system's extraordinary temporal and conceptual decoupling of payments from benefits (see, e.g., Rosenberg 1996, 179-83). We might imagine that this decoupling helps to make tax payments feel more painful and less justifiable, because the payment is not cognitively linked to any benefit (Prelec & Loewenstein 1998, 23 & n.14). It is also possible that this same decoupling makes *other people's tax payments* look less necessary or justifiable as well. Decoupling may even have the surprising effect of conceptually turning the IRS into a common enemy of both the well-off and the less well-off, and suppressing the fact that the well-off and less well-off are actually engaged in an distributive game that simply happens to be administered through the tax system.

Another common explanation is that the less well-off are overly optimistic about their prospects for future wealth. On this account, a less well-off individual making an expected value calculation associated with a proposed tax change correctly evaluates the size of the payoff that she would receive were she later to become wealthy, but greatly

overestimates the probability of becoming wealthy enough to benefit from that change. But, as in the lottery case, it is also possible that a distortion enters into the expected value calculation when the individual considers the *magnitude* of the payoff. Wealth for a poor person is necessarily in the future. If time preferences cause future receipts to be overvalued relative to present-day receipts, perhaps the payoff in question is magnified by virtue of its temporal positioning. The earlier discussion suggests some reasons why that might be so, including a strong preference for an upward-sloping income profile.

While direct analogies between the tax attitudes of the lower and middle classes and their lottery play seem farfetched, similar cognitive features may be present in both cases. Just as a lottery player may enjoy a higher-stakes game more than a lower-stakes one because of the higher-quality fantasizing that it allows (notwithstanding the correspondingly lower probability of winning), the less well-off may enjoy participating in a system in which rich people are left free to enjoy their riches largely untroubled by tax burdens. To put it another way, heavy tax burdens on wealth might tarnish the dreams that many people hold for future riches, and turn the top prizes that society offers into something decidedly less fabulous. People might prefer to pay somewhat heavier taxes now in order to keep open a shot at what may be perceived as an indivisible package – big wealth without big taxes. If this is so, we might say that less well-off people who uncomplainingly accept (or affirmatively support) tax breaks for the wealthy are in some sense “buying a dream.”

While more study is necessary to separate out the various possible explanations for current tax attitudes – and, indeed, to pin down the content of those attitudes – looking at the factors that drive hyperopic choices in other contexts could lead to fresh insights

about the popular perception of tax reform. These insights should take their place in the developing literature about the impact of cognitive factors on tax perceptions (see, e.g., McCaffery & Baron 2003).

C. Tax Timing Preferences

It is helpful at this point to distinguish policy preferences driven by *unrealistic* expectations about future wealth from those that simply grow out of preferences about the allocation of tax payments over the life cycle. For analytic purposes, consider the polar case of a worker who can predict with perfect accuracy the rate at which her earnings profile will grow over her working life. That worker, who by hypothesis harbors no illusions about her future wealth, might still have time preferences that relate to the allocation of her lifetime tax burden between her younger and poorer selves and her older and wealthier selves. A progressive income tax operates to flatten somewhat the upward-tending slope of increases in earnings. Given preferences for improving sequences, it is possible that some individuals would wish to preserve or enhance the slope associated with earnings increases by moving heavier tax burdens into earlier portions of the life cycle. One way to do this is through less progressive tax policies.

If the desire to preserve the upward slope in an expected wage profile is driving support for progressivity-reducing tax policies, it would be possible to formulate policies that would respond to that desire in a more tailored fashion. For example, taxes might be customized based on age or number of years as a taxpaying wage-earner. If coupled with additional liquidity-enhancing measures to allow people to make appropriate investments in education and family in the earlier parts of their life cycle, such customization need not have distributive effects that are as severe as those that accompany blanket tax cuts for

the very well-off.

As a first step, we should further explore preferences for lifetime tax patterns – for example, whether people might prefer to pay a lower (or flat) percentage in taxes as their lives progress and as their fortunes presumably rise. An examination of investments in the Roth IRA, which permits prepayment of taxes on retirement savings, might shed light on these preferences. I do not mean to suggest that Roth investors are necessarily acting hyperopically. For a person who rationally expects her future marginal tax rate to be higher than her present rate, investing in a Roth constitutes a maximizing choice (see, e.g., Poterba, 2004, 7). Nevertheless, the Roth versus traditional IRA choice may generate useful data that can shed light on tax timing preferences. For example, we would expect someone who anticipates no change in tax rates to be indifferent about whether to invest in a Roth or a regular IRA. Preferences about tax timing could break the tie.

Tax code provisions that allow penalty-free withdrawals from IRA accounts for certain kinds of pre-retirement expenditures, such as first home purchases and certain higher education expenses, add an interesting wrinkle (Kaplan 1999 (discussing I.R.C. § 72(t)(2)). The fact that taxes must be paid immediately when money is withdrawn from a regular IRA could discourage pre-retirement withdrawals even when no penalty applies – especially in the case where the pre-retirement marginal tax rate is higher than the expected marginal tax rate at retirement (see *ibid.*, 296-97). Penalty-free withdrawals from Roth IRAs, in contrast, require no accompanying payment to the government, because the taxes were paid at the outset. Richard Kaplan has argued that, as a result, “the temptations and pressures jeopardizing the retiree’s long-term retirement security in

that situation are even greater than for a regular IRA” (ibid., 295). If withdrawals from the two kinds of accounts are indeed viewed differently based on whether tax has already been paid or is still due, we might see choices between these two kinds of accounts turning not only on tax timing preferences, but also on grounds relating to factors like precommitment and self-control.

CONCLUSION

This paper considers the relevance of negative time preferences or “hyperopia” for public finance. The cognitive literature on such preferences has been relatively neglected in public finance discussions. Incorporating it can enrich our understanding of financial behavior over time. However, it must be adapted with care. Examination of hyperopia opens up important questions about the extent to which time preferences can offer a useful theoretical construct or basis for policy. Time preferences should, I conclude, be included on a public policy checklist, along with other complex preferences. Rather than providing final explanations of behavior, apparent temporal anomalies hold diagnostic potential. Only by examining the heterogeneous determinants of temporal choices can we make meaningful headway in enriching positive accounts or informing normative policy judgments.

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ENDNOTES

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¹ Paul Caron (1996) paired the optical terms “myopia” and “hyperopia” in a tax context when critiquing another scholar’s work, although his focus was the appropriate frame of scholarly inquiry rather than systemic distortions in human decisionmaking.

² In other instances, it can lead to apparently myopic choices – as where one chooses an immediately available lump sum over a stream of future payments representing a higher present value total. The possibility that the lumpiness of a payment rather than its timing may determine behavior suggests one difficulty with attributing choices situated in time to time preferences.

³ The idea suggested by this metaphor -- that time “passes” or that we “pass through time” -- is not uncontroversial. *See* PARFIT, 1984, at 178-79.

⁴ To be sure, the aggregate amount refunded in a given tax year is quite substantial – about \$206 billion in tax year 2002 (IRS, “Tax Stats at a Glance,” <http://www.irs.gov/taxstats/article/0,,id=102886,00.html>). However, the overwithholding phenomenon looks insignificant when considered at the individual level. If the average individual refund of just over \$2000 in 2002 (*ibid*) equates to an approximate average overpayment throughout the year of \$1000, applying current savings account interest rates of 2% yields just \$20 in forgone interest. I thank Larry Zelenak for emphasizing this point and providing this numeric example, and Richard Kaplan for adding that the interest would also have to be taxed, making the amount forgone even lower. Interest rates have not always been this low, of course, and an interesting further investigation would be to see whether real interest rates are negatively correlated with overwithholding behavior.

⁵ The IRS now offers an “online withholding calculator” that is supposed to make calculating withholding easier and more accurate (<http://www.irs.gov/individuals/article/0,,id=96196,00.html>, visited July 7, 2004). Although the online calculator requires the user to input significant amounts of information, it likely provides a more appealing interface than the W-4 worksheets.

⁶ To change withholding arrangements, one must file a replacement W-4 form with one’s employer. According to IRS Publication 919 “How Do I Adjust My Tax Withholding” (revised 1/2004), “[i]f the change is for the current year, your employer must put your new Form W-4 into effect no later than the start of the first payroll period ending on or after the 30th day after the day on which you give your employer your revised Form W-4.” For example, if an employee who is paid on the last day of each month filed a new W-4 on June 2, her employer would be required to withhold based on the replacement W-4 starting with the July pay period. The employee would receive her first paycheck reflecting the new withholding arrangement on July 31.

⁷ The refund can also reduce the paperwork burden by providing a ready funding source for professional tax preparation services. I thank Leandra Lederman for this point.

⁸ Some insight into what people who presently overwithhold might otherwise be doing with the extra take-home pay can be gleaned from Shapiro & Slemrod’s (1995) study of consumers’ plans for the extra paycheck money they received following changes in the withholding rules. Their findings suggested “that a substantial fraction of consumers simply spend their current paychecks,” perhaps based on some personal “rule of thumb” (*ibid.*, 281-82). The fact that few taxpayers reported responding to the change in default withholding rules by making compensating adjustments to hold the amounts withheld constant also suggests a significant role for inertia (see *ibid.*, 276 (36 of 381 households “claimed to have adjusted their withholding to offset the mandated change”)).

⁹ For a discussion of tax aversion, see Fennell & Fennell 2003; see also McCaffery 1994b (using the term “tax aversion”). McCaffery & Baron (2003) examined whether labeling the funding source for particular benefits a “tax” or a “payment” made a difference in how favorably it was viewed. They found that the preferred label differed depending on the service under consideration and also differed among

individuals (*ibid.*, 13-14). The phenomenon of tax aversion might be more broadly conceived to encompass negative attitudes towards any compulsory payment collected by the government, rather than just reactions to items that are labeled as taxes.

¹⁰ Six out of fifteen chapters of a 1992 edited volume on time preferences (Loewenstein & Elster, *Choice Over Time*) focused on hyperbolic discounting (Loewenstein, 2003, at 3).

¹¹ Individuals could also derive benefits from their *own* increased tendency to comply. Indeed, individuals might choose to withhold at least the full liability amount as a kind of moral or ethical precommitment, recognizing their own tendency to be tempted to evade taxes in circumstances where positive sums are due at tax time.

¹² The survey data were drawn from airport and ballgame “convenience samples.” The authors caution that “[b]ecause the samples are not representative of the U.S. population, especially with respect to income, broad generalizations are hazardous.” (Fetherstonhaugh & Ross 1999, 196).