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Savings Education: Learning the Value of Self-Control

Patricia A. Hutton
Canisius College

James M. Holmes
SUNY at Buffalo

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Abstract

This article proposes a funded school-based allowance and savings program targeted at economically disadvantaged students with poor educational outcomes to help poor children develop less present-biased time preference patterns so as to increase student effort and skills acquisition, avoid the pitfalls that pave the path of adolescence and move from poverty to middle class status as adults. Time orientation is associated with low educational investments, poor educational outcomes, out-of wedlock and teenage childbirth, criminality, and poverty, and nothing better characterizes the role of time preferences in distinguishing socioeconomic classes than attitudes and behavior with respect to money income. In poverty, money income is to be spent whereas in the middle class and the wealthy, money is to be managed and invested and children are taught the value of self-control and delayed gratification through the accumulation, savings and investment of regular allowances. We propose a model program parameterized in a way that children, given complete freedom of choice, should develop more future oriented preferences resulting in greater effort and skills acquisition in school, and the habits of conduct necessary for productive work life. Program cost, which cannot exceed program design, can be reasonably

anticipated and is directly related to the benefit - the more that a child saves, the higher the cost, but the more likely that the child has acquired a future time orientation. We present evidence that even if the estimated maximum disbursements occurred and only a minimal percent of participating students changed their lives, the estimated benefits should outweigh disbursement costs.

I. Introduction

Recent educational reform initiatives have focused on school voucher programs to provide school choice, increased resources, improved teacher qualifications, the provision of economic incentives for schools that achieve improvements in school accountability measures and disincentives for those that fail, and tests, tests, and more tests. However, at the heart of all of this upheaval are children - children who need to learn so that they can become responsible and productive citizens.

What do children need in order to learn? The most important resource with which a child can be endowed is an intact family with well-educated parents who can teach and model values and habits of conduct that are critical for success. Policies designed to increase the endowments of disadvantaged children cannot duplicate this resource but they can attempt to mitigate the relationship between disadvantaged family background characteristics and low investments in children.

The current national movement for character development - learning to be honest, kind, courteous, and responsible – is one such policy response. Sanford N. McDonnell (2000), chairman of the Character Education Partnership, argues that feeling an obligation to consider not only one's own personal well-being but also that of others can create a moral and caring school community in which students work harder, leading to greater skills acquisition and, ultimately, increased productivity in adulthood and responsible citizenship.

In this article, we argue that a more significant character issue is that many disadvantaged children are unable to choose what is in their *own* long-run self-interest because they have not been socialized to have future oriented time preferences, delay gratification, exercise self-control and acquire habits of conduct that reflect that socialization. Time orientation is associated with low educational investments, poor educational outcomes, out-of wedlock and teenage childbirth, criminality, poverty, and adults who "lack the temperament, character and intellect to function effectively in the workplace" (Loury 1998, p.52).

Among the socioeconomic factors associated with time preference patterns (LeShan 1952, O'Rand and Ellis 1974), poverty stands out. Unlike the middle class and wealthy for whom the future is important and decisions are made against future ramifications because individuals believe that they can change the future with good choices now, families in poverty are oriented to the present and decisions are made for the moment based on feelings or survival because individuals believe that they cannot do much to mitigate chance (Sennett and Cobb 1972, 1993; Fussel (1983); Lewis 1972; Mayer 1997; Payne 2001). In turn, nothing better characterizes the role of time preferences in distinguishing socioeconomic classes than attitudes and behavior with respect to money income. In poverty, money income is to be spent. Without a strong connection to the past and to the future, "it is as well to spend your money as it comes in and be sure of your enjoyments" (Hamilton, 1898, p.56). In the middle class and the wealthy, money is to be managed and invested. A quintessential characteristic of middle class families is that their children are taught the value of

self-control and delayed gratification through the accumulation, savings and investment of regular allowances.

Hence, in this article, we propose that a funded school-based allowance and savings program be developed and implemented in grades K (or pre-K) through 12 in schools with economically disadvantaged students and poor educational outcomes. The goal is to help poor children develop less present-biased time preference patterns so as to increase student effort and skills acquisition, avoid the pitfalls that pave the path of adolescence and move from poverty to middle class status as adults.

The proposed program is substantially different from the typical family-based plan or existing voluntary school-based savings programs. The goal is *not* to teach why saving is important, how to save, or the mechanics of saving. The goal is to create within a child an internal locus of control and more future-oriented time preferences by creating rewards and opportunity costs substantial enough that it is rational for the child to *choose* to save *and* influence his time orientation. The program must not only substitute for, but also overcome, the absence of parental reinforcement of self-control and delayed gratification.

We describe a model program parameterized in a way that we believe will influence time preferences because students will learn that seemingly inconsequential, bad choices in the present can have substantial negative future consequences because the effects of bad decisions in the present tend to compound, and that decisions should be made against future ramifications. The program provides an economic incentive to the student to attend school and graduate from high school, reinforcing habits of conduct that are necessary for productive school and work life. In addition, it offers the potential to create a sense of school community and connectedness because all students would have the ability to participate and reap equal rewards.

The cost of a funded savings program can be reasonably anticipated and is directly related to the benefit - the more that a child saves, the higher the cost, but the more likely that the child has acquired a future time orientation. The program is designed to have a ceiling on accumulated savings so that disbursement costs cannot exceed program design. We present evidence that even if the estimated maximum disbursements occurred and only a minimal percent of participating students changed their lives, the estimated benefits should out-weigh disbursement costs.

II. Why Target Time Orientation?

Economic theory suggests that individuals make choices by balancing discounted returns with opportunity costs. Consequently, students with lower rates of time preference should choose greater effort and acquire more skills. Empirical evidence supports this theory. Different time-horizon perspectives are good predictors of school investment by secondary education students (Peetsma 2000) and are inversely correlated with income and educational achievement (Lawrence 1991). Eckstin and Wolpin (1999) report that teenagers who drop out of high school have less motivation and lower expectations about the rewards from graduation.

Deep-seated socioeconomic factors determine time preference patterns (LeShan 1952, O'Rand and Ellis 1974) and create a cycle and pattern of intergenerational poverty and out-of-wedlock childbirth. Thirty-five years of antipoverty programming has lifted many of the working poor out of poverty but largely failed to impact families headed by a working-age but *nonworking* adult. As a consequence, the percent of heads of poor households with children under age 18 who do not work at all has grown from 18% in 1960 to 36% in 1999.[1] As Mead (1997) points out, the

[1] Current Population Survey (March 2000), Table 17. Work Experience of Family Members, by Poverty Status of

poor are typically poor because they do not work steadily at any wage. Why not? With present-biased preferences, individuals tend to make impulsive choices, driven by a tendency to overweight rewards and costs that are in close temporal or spatial proximity or are salient (Thayler and Shefrin (1980); Akerlof 1991; Thayler 1991; Thayler and Loewenstein 1992).

Also contributing to the intergenerational transmission of poverty is out-of-wedlock childbirth (Bronars and Grogger 1994, Furstenberg et al 1987, Trussell 1988). The poverty rate for female-headed households is three times that of all households.[2] The percentage of all births that are to unmarried women reached 33.2 percent in 2000.[3] 30 percent of these out-of-wedlock births are to teenagers,[4] and 83 percent of these births are to poor or low-income youth. Survey evidence indicates that about 80 percent of teen pregnancies are unplanned,[5] and only 18% of teenage pregnancies end in the formation of two-parent families.[6] The majority who give birth apply for and receive welfare benefits and end up on welfare for years. Less than 35 percent of teenage women who begin their families before age 18 complete high school, compared to 85 percent of those who delay childbearing.[7] Their children have a greater likelihood of experiencing health problems, abuse and neglect, poverty, poor school performance, committing crimes, repeating the cycle of teenage parenting and the creating a pattern of intergenerational poverty.

Empirical evidence suggests that teenage parenthood is less likely the result of a lack of concern for the welfare of others than it is the consequence of present-oriented time preferences. As Maynard (1997, p.90) reports, interviews suggest that teenage parenthood is at odds with the stated values of the very adolescents who have become teenage parents. Furthermore, teenage mothers want to be good mothers and provide a good life for their children, yet fail miserably in achieving these goals. Lundberg and Plotnick (1995) and Plotnick (1992) report that having a strong internal locus of control (the extent to which individuals believe they control their lives through self-motivation and self-determination as opposed to a belief that change, fate or luck controls their lives) has a significant negative effect on the likelihood of premarital pregnancy, as do high educational expectations and religiosity.

III. Why Savings Education?

Savings education can help to mitigate the effects of disadvantaged family background characteristics in several ways.

1. A savings program specifically targets time orientation by providing the understanding and guarantee of significant rewards in the future associated with self-control and of a significant opportunity cost associated with making a decision for the moment and teaching that decisions should be made against future ramifications.

2. A savings program directed at children in K-12 grades would provide reinforcement of the behavioral modification goals and outcomes of subsidized prenatal and infant care, parent training, and compensatory education programs, such as Head Start and Title I, already directed at

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Families: 1999.

[2] Current Population Reports

[3] National Vital Statistics Report (2001)

[4] Statistical Abstract of the United States: 2000, Table No. 86. Births to Unmarried Women by Race of Child and Age of Mother: 1990 to 1998.

[5] Henshaw S.K (1998), Table 1.

[6] Susan McElroy and Kristen Moore (1997).

[7] Maynard (1997), p.94.

disadvantaged children. These programs develop effective social and behavioral skills in participating children and children succeed in kindergarten and first grade, as measured by low rates of grade retention and referral to special education. However, the effectiveness of such programs in increasing high school graduation rates, preventing adolescent childbearing or reducing the incidence of later criminal behavior is less certain. One can expect decay - over time, the influence of these programs will likely wear off, absent continued reinforcement.

3. Early socialization is imperative to create future-oriented time preferences and an internal locus of control. Achievement levels of third grade students have been demonstrated to be a good predictor of long-term school performance (Husen 1969) and adult status (Kraus 1973) and there is evidence that time preferences are firmly established, for life, by adolescence (Maital and Maital 1977). There is even evidence that intervention in the teenage years may be too late to offset the detrimental effects on long term wages and employment of the time preference patterns which the average disadvantaged teenager has acquired by age sixteen (Keane and Wolpin 2000).

4. Savings education creates an opportunity for economically disadvantaged students to learn the power of choice to bring about change which they are less likely to learn within their families because of differences in the role and form of discipline in many poor families. In middle class families, discipline is about choice and change. However, the limited resources available to the poor imply limited opportunities for choice and to learn the power of choice to bring about change. One cannot develop an internal locus of control without opportunities for decision-making in which it is self–governance and good choices in the present that are rewarded in the future. Parents without an internal locus of control cannot teach self-discipline to their children. Consequently, discipline in poor families is often about penance and forgiveness (Payne 2001) rather than choice and change.

5. Savings education increases "sophistication" - the ability to foresee that one will have self-control problems in the future (O'Donoghue and Rabin 1999). Effective parenting develops within children a self-awareness of their impatience and the potential for experiencing impatience as adults, as well as the possibility that costs are potentially more immediate or greater than perceived. This can mitigate the effects of present-bias preferences and is most likely to help when costs are immediate. For example, O'Donoghue and Rabin (1999) report that sophistication has been demonstrated to increase savings and decrease consumption of addictive products compared to naifs who under-save (because the increased future payoff that saving allows is delayed) and overindulge in addictive products (rewards are immediate and costs are delayed). Furthermore, sophistication can also develop less present-biased preferences in children because their preferences are still formative.

6. A school savings program that helps students achieve a lower rate of time preference toward money income can be the centerpiece of a curriculum designed to help students generalize the relationship between early effort and later reward. When students generalize that relationship, they are more likely to both develop a lower rate of time preference with respect to other choices and base their academic effort decision on the balance between its discounted return and its opportunity cost, resulting in greater academic effort and skills acquisition.

7. A specialized curriculum can enhance school identification and increase student academic effort. Related family, neighborhood, and school characteristics affect the process of being educated (Entwisle and Alexander 1993), which also affects returns to schooling (Wilson 2001). Akerlof and Kranton (2002) theorize that when students do not identify with their school, the discounted return to skills in the labor market will not even enter their effort decision. Instead, a students' effort will depend only upon their current social situation. Akerlof and Kranton report that this is supported by the findings of ethnographies that high school students' identities are the dominant influence on

achievement. On the other hand, both anecdotal evidence[8] and Akerlof and Kranton's theory suggest that it is possible to produce significant changes in education outcomes through special curricula that create school communities by inventing a new, different social category with which both students and teachers can identify. Special curricula can reduce how different from the school ideal a student feels so that the discounted return to skills enters the effort decision, raise school academic ideals and overcome the effect of students' backgrounds on school participation and effort.

IV. Why a Funded School-Based Savings Education?

Voluntary school savings programs have existed in the U.S. off and on since the 1870s but have not persisted on a widespread basis since the 1950s. The funded school-based savings education program that we propose can and must do what voluntary programs have not done and cannot do.

1. Voluntary programs have placed too much reliance and burden on teachers and the individual school. Developments such as *Save For America*,[9] a U.S. Department of Education approved curriculum designed for use by teachers or parents to teach students in grades 4-6 basic principles of personal economics and help them practice the skills they have learned by participating in a school-based banking program have made it possible to reduce that burden. However, as designed currently and in the past, such programs are inadequate to transform the values and behavior of children in poverty in such a way as to transform their lives.

2. The intention of voluntary programs is to teach why saving is important, how to save, and the mechanics of saving whereas the fundamental goal of our proposal is to create within a child an internal locus of control and more future-oriented time preferences.

3. To participate in a voluntary program, children must save out of money provided by families. However, families in poverty may have little or no money to provide. Furthermore, this requirement creates an obvious inequity and divisiveness within schools between the haves - those students whose parents can provide an allowance for saving - and the have-nots.

4. Children do not participate in these programs long enough to develop life-long changes in attitudes and behavior nor do they begin early enough. It requires eighteen years to raise a child and to instill life-long values and habits of conduct, and time-orientation education must begin before the third grade.

5. Existing voluntary programs require the school to find a sponsoring bank that pays all of the costs. It is the sponsoring bank that funds the interest payments. Consequently, the incentive to forgo current expenditures for savings is miniscule because students can earn only the market rate of interest on savings. The market rate of interest on savings may be sufficient to encourage target savings but it is unlikely to engender values that would carryover to lifelong behaviors and attitudes. There is no substantial reward for forgoing current expenditures for saving and most children quite reasonably find it difficult to do so without substantial parental reinforcement.

6. Savings cannot and should not depend upon the parental reinforcement. Firstly, it is likely absent in families mired in intergenerational poverty. Secondly, it is not enforcement that is desired. It is desirable that a child exercise free choice and free will with respect to the decisions to save and withdraw savings because it is through choice that the preferences, behaviors and attitudes that are necessary for a middle class standard of living are internalized. There is little pride in achievement,

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[8] Comer (1980), Meier(1988)

[9] "Save for America" (1998) *Teaching PreK-8* (28), 58-9

the responsibility for which is carried by others, and little responsibility accepted for opportunity costs that can even marginally be blamed on somebody else. It is essential that the opportunity to accumulate savings out of the earned allowance create rewards and opportunity costs substantial enough that it is rational for the child to *choose* to save *and* influence his time orientation.

V. A Funded Savings Education Plan

We propose a funded savings education program with the following characteristics.

1. **An Attendance-Based Allowance**. To avoid inequity and divisiveness within schools between the haves and the have-nots, an allowance earned on a daily attendance basis should be funded. Allowances establish routine and routine provides structure – something that is often missing in the lives of those living in poverty. One of the indicators of lack of structure is a higher rate of school absenteeism. Basing the allowance on attendance links it to a habit of conduct that is necessary for productive school and work life and provides an economic incentive to attend school.

2. **Above-Market Rate of Interest**. In middle class and wealthy families it is common for parents to enforce savings. However, it is both unreasonable to expect reinforcement from families mired in poverty and coercion is not desirable. It is desirable that a child exercise free choice and free will with respect to the decisions to save and withdraw savings because it is through choice that the preferences, behaviors and attitudes that are necessary for a middle class standard of living are internalized. To influence time orientation, the size of the allowance should be small, but the consequence of not earning and saving should be dramatically larger than current voluntary programs can offer. Influencing time orientation depends upon understanding that seemingly inconsequential decisions can have significant rewards or costs. This requires an above-market rate of interest.

3**. Time Horizon**. Time orientation education cannot start too early and, as those of us who are parents know, it requires eighteen years (and sometimes longer) to raise a child and to instill life-long values and habits of conduct. It is proposed that the savings education begin in kindergarten or even pre-kindergarten and continue until graduation from high school.

3. **Potential Accumulated Savings**. What amount of potential accumulated savings would be sufficient to develop long-term savings behavior and the time-orientation it represents, but result in an expense that taxpayers and donors would be willing to underwrite? We believe that the behavior of a child in poverty, certainly a young child, can be influenced by the expectation of accumulating savings of $100 by the end of the school year. It could perhaps be much less. The younger children are when they begin the program, the smaller the required economic incentive to influence time orientation. For the purpose of further discussion and the determination of disbursement costs, we will assume that the amount is $100 per year.

The assumption that the maximum annual accumulation should be approximately $100 can be achieved with a variety of combinations of daily allowance earned, rate of interest and frequency of compounding. Consider a one-cent per day allowance (5 cents per week) and 40-week school year. If the child does not save at all, the maximum annual allowance disbursement per child is $2.00. Earning a weekly interest rate of 15% compounded over a 40-week school year will result in a maximum accumulated savings of $102.30.

4. Rewards and Opportunity Costs. Table 1 presents the weekly maximum accumulation, or rewards, of savings, as well as the weekly opportunity cost of forgoing savings.

Table 1
Weekly Maximum Accumulated Savings and Opportunity Cost of Forgone Savings Based on a 5 Cent Weekly Allowance Earning a 15% Rate of Interest Per Week

Week	Allowance	Interest Rate %	Accumulated Allowance Plus Interest	Opportunity Cost of Not Saving 5 Cent Allowance
1	$0.05	15	$0.06	$13.39
2	$0.05	15	$0.12	$11.65
3	$0.05	15	$0.20	$10.13
4	$0.05	15	$0.29	$8.81
5	$0.05	15	$0.39	$7.66
6	$0.05	15	$0.50	$6.66
7	$0.05	15	$0.64	$5.79
8	$0.05	15	$0.79	$5.03
9	$0.05	15	$0.97	$4.38
10	$0.05	15	$1.17	$3.81
11	$0.05	15	$1.40	$3.31
12	$0.05	15	$1.67	$2.88
13	$0.05	15	$1.98	$2.50
14	$0.05	15	$2.33	$2.18
15	$0.05	15	$2.74	$1.89
16	$0.05	15	$3.20	$1.65
17	$0.05	15	$3.74	$1.43
18	$0.05	15	$4.36	$1.24
19	$0.05	15	$5.07	$1.08
20	$0.05	15	$5.89	$0.94
21	$0.05	15	$6.83	$0.82
22	$0.05	15	$7.91	$0.71
23	$0.05	15	$9.16	$0.62
24	$0.05	15	$10.59	$0.54
25	$0.05	15	$12.24	$0.47
26	$0.05	15	$14.13	$0.41
27	$0.05	15	$16.31	$0.35
28	$0.05	15	$18.81	$0.31
29	$0.05	15	$21.69	$0.27
30	$0.05	15	$25.00	$0.23
31	$0.05	15	$28.81	$0.20
32	$0.05	15	$33.18	$0.18
33	$0.05	15	$38.22	$0.15
34	$0.05	15	$44.01	$0.13
35	$0.05	15	$50.67	$0.12
36	$0.05	15	$58.32	$0.10
37	$0.05	15	$67.13	$0.09
38	$0.05	15	$77.26	$0.08
39	$0.05	15	$88.90	$0.07
40	$0.05	15	$102.30	$0.06

The information in Table 1 can help children understand the relationship between early effort and later reward and nothing can make clearer the contrast between the short-run benefits of a choice and the long-run opportunity cost of a choice forever foregone than the first row of values in Table 1. The short run benefit of saving the first week's allowance is the difference between the values in columns 4 and 2. The decision not to save the first week's allowance may seem inconsequential if the child only sees that saving initially only adds an additional penny. The student may perceive that forgoing that week's savings involves only a loss of a penny.
However, we know that decisions should be made on the basis of future ramifications because the bad effects of bad decisions in the present tend to compound. The actual opportunity cost of not saving the first week's allowance is actually $13.39 (last column) because the student foregoes the opportunity to have the initial savings grow at a rate of 15% per week for 39 more weeks. That amount is also the difference between the values of accumulated savings in rows 39 and 40 of column 4, which represents the difference between saving for 39 weeks rather than 40 weeks. If time occurs only in the present for children, then let them learn, understand and, if need be, experience the 275-fold opportunity cost of a seemingly inconsequential decision made in the moment to delay saving 5 cents for one week. Give children with limited opportunities for decision-making in which it is self–governance and good choices in the present that are rewarded in the future an opportunity for informed, rational choice and to learn the power of choice to bring about change.

It is arguable that 5 cents per week, earning an interest rate of 15%, compounded weekly does not create sufficient *initial* interest earnings or incentive to save. At this rate, the child must wait 19 weeks before a total of $5.00 is accumulated. Table 2 presents accumulations and opportunity costs associated with an interest rate that starts higher but then diminishes.

In Table 2, the interest rate is 100 percent during the first four weeks, declines to 50 percent at week five, to 20 percent by the seventh week, to 10 percent at week eight where it remains until week thirty eight when it drops to 7 percent and then to 5 percent for the last two weeks. Beginning with a higher rate of interest creates a stronger incentive to save. One can then reduce the rate of interest because the compounding of accumulated savings will offset that decrease. This parameterization generates a maximum accumulation of approximately $100 but results in a $5.00 accumulation in less than half the time (between weeks 8 and 9) of that associated with a constant rate of interest of 15 percent (week 19). It keeps the dollar value of interest earnings (additions to savings) fairly even over the 40-week period, but magnifies the opportunity costs of postponing investments in the first weeks.

Again, the decision not to save the first week's allowance may seem inconsequential if the child only sees that saving initially only adds an additional five cents. The student may perceive that forgoing that week's savings involves only a loss of five cents. However, as the first value in column 5 indicates, fully 45 percent of the potential accumulated savings for the entire school year are associated with the decision to save 5 cents the first week of school.

Table 2
Weekly Maximum Accumulated Savings with a Declining Rate of Interest and Weekly Opportunity of Foregoing Savings of Weekly Allowance

Week	Allowance	Interest Rate %	Accumulated Allowance Plus Interest	Opportunity Cost of Not Saving 5 Cent Allowance
1	$0.05	100	$0.10	$44.46
2	$0.05	100	$0.30	$22.23
3	$0.05	100	$0.70	$11.12
4	$0.05	100	$1.50	$5.56
5	$0.05	50	$2.33	$2.78
6	$0.05	50	$3.57	$1.85
7	$0.05	20	$4.34	$1.24
8	$0.05	10	$4.83	$1.03
9	$0.05	10	$5.37	$0.94
10	$0.05	10	$5.96	$0.85
11	$0.05	10	$6.61	$0.77
12	$0.05	10	$7.33	$0.70
13	$0.05	10	$8.11	$0.64
14	$0.05	10	$8.98	$0.58
15	$0.05	10	$9.93	$0.53
16	$0.05	10	$10.98	$0.48
17	$0.05	10	$12.13	$0.44
18	$0.05	10	$13.40	$0.40
19	$0.05	10	$14.80	$0.36
20	$0.05	10	$16.33	$0.33
21	$0.05	10	$18.02	$0.30
22	$0.05	10	$19.88	$0.27
23	$0.05	10	$21.92	$0.25
24	$0.05	10	$24.17	$0.22
25	$0.05	10	$26.64	$0.20
26	$0.05	10	$29.36	$0.19
27	$0.05	10	$32.35	$0.17
28	$0.05	10	$35.64	$0.15
29	$0.05	10	$39.26	$0.14
30	$0.05	10	$43.24	$0.13
31	$0.05	10	$47.62	$0.11
32	$0.05	10	$52.43	$0.10
33	$0.05	10	$57.73	$0.09
34	$0.05	10	$63.56	$0.09
35	$0.05	10	$69.97	$0.08
36	$0.05	10	$77.02	$0.07
37	$0.05	10	$84.78	$0.06
38	$0.05	7	$90.77	$0.06
39	$0.05	5	$95.36	$0.06
40	$0.05	5	$100.18	$0.05

The only cost of failing to save is a pure opportunity cost – it does not create an out-of-pocket loss for the child, only an opportunity forgone always followed by a renewed opportunity to learn and change. If she decides not to delay further, the child incurs the opportunity loss and it will be a sunk cost, never to be recovered. On the other hand, the child has repeated opportunities to learn from her regrets. She is immediately presented with the opportunity to begin saving again through her earned attendance allowance. The potential reward for delaying can never be as great as it originally had been, but there always remains a reward.

The information contained in Tables 1 and 2 is instructional to both teachers and students although an alternative visual devise should be used with young children. These tables make it easier for a teacher to understand why a disadvantaged child would find it difficult to marshal the self-discipline required to learn habits of conduct or to read when she cannot understand the opportunity cost of failing to do so. Both have rewards and opportunity costs that are well represented by the numbers in these tables. The benefits are small in the short run and accumulate slowly. Children born into intergenerational poverty have very limited opportunity to observe those who invested early and reaped the long-term benefits. By the time they begin to experience the significance of the opportunity forgone, it has become a sunk cost.

The information in these tables helps children understand the relationship between early effort and later reward. Both tables clearly demonstrate that it is the early investment that has the greatest return. Postponing savings results in a missed opportunity to obtain the greatest returns and can never be regained. There are many alternative parameterizations that will satisfy the criteria that the size of the allowance should be small but the consequence of not earning the allowance and saving it should be large.

These tables provide children with the opportunity to learn that rational choice requires full information. An individual cannot make an optimal decision without fully understanding the opportunity cost of alternative choices. The student must be informed of the opportunity cost of withdrawing and spending any fraction of his savings at any time. Because of the effects of compounding, this opportunity cost will change over time as the savings accumulate and the time horizon changes. It is easy to provide the teacher with a programmed software spreadsheet in which the rewards and opportunity costs are automatically recalculated when the teacher enters a withdrawal or addition to savings. Such a spreadsheet, accompanied with appropriate visual devises such as jars filled with monopoly money, has tremendous instructional value because the teacher can demonstrate the effects of alternative decisions with respect to savings and withdrawals, thereby demonstrating the opportunity cost of alternative decisions. It is of vital importance that even young students be given complete freedom to make the decision to withdraw savings at any time. The goal of the program is not to accumulate savings. The goal is to change time preferences. Some children will need to actually experience the opportunity loss and sunk cost of withdrawing savings in order to experience regret and change their time preferences.

The savings plan and the instructional value it contains provide an opportunity for educators to help children generalize the relationship between early effort and later reward. It should be emphasized to children that many of life's choices have rewards and opportunity costs similar to those displayed in Table 1 and 2, but with less certainty attached. Learning habits of conduct, reading, writing and mathematics skills all have small benefits in the short run, but the long-run opportunity cost of failing to do so is immense. The evidence that third grade achievement level is a good predictor of long-term school performance and adult status is consistent with the example of a very high interest rate in the early years, which declines thereafter. The imperative of learning early is abstract for children. However, savings education can make it concrete.

VI. Disbursement Costs

Students participating throughout K-12 grades, accumulating the maximum of $100 per year, could graduate with $1300. This amount could be higher if a rate of interest was applied to savings accumulated year to year and the student chose to accumulate savings year after year. For example, the student could be provided an incentive to accumulate his savings from year to year by allowing each year's accumulated savings to earn an additional 15% annual rate of interest compounded annually. Assuming that $100 was accumulated each year, the maximum accumulated savings would be approximately $4000 per student at the end of 13 years.

Consider this cost in comparison to alternative proposals. It is comparable to the $300-$3,000 range of "Last Dollar Scholarships" that the Philadelphia Educational Fund Philadelphia Scholars program provides to over 250 public school students per year who have been admitted to college but face financial need, approximately 85% of whom are the first members of their families to attend college.[10] On the other hand, it is considerably less than alternative economic incentives such as high school graduation bonuses that have been proposed. For example, the Rand Institution has considered four years of cash and other incentives, expected to cost almost $13,000 per student, to induce disadvantaged high school students to graduate.[11] One would expect that the cost of a savings program would be less because the younger a student is when s/he begins the program, the smaller the required economic incentive to influence time orientation. Waiting until s/he is a teenager should require a considerably higher economic incentive to influence self-control.

Compare the maximum disbursement cost of $4000 per student over 13 years to the cost of early childhood interventions. The High/Scope Perry Preschool Project (a widely cited high quality early childhood education program) costs more than $12,000 per child (in 1996 dollars) and the Early Childhood Initiative of Allegheny County costs almost $13,000 per child.[12] The Rand Institute estimated the cost of the home visits and day-care costs of an intervention program designed to reduce the incidence of later criminal behavior over six years to be almost $30,000 per child.

If implemented on a national basis, the total disbursement costs would depend upon accumulated savings per year per student and the number of participants. Although the ideal is to direct the program at only children identified as below poverty level, it is reasonable to anticipate that, because of the importance of neighborhood effects, equality of treatment and school identification, the program would be targeted at those schools with high proportions of students receiving free or reduced-price lunches (indicating SES or low income) and all students, both high and low SES, would participate. Approximately 15 million K-12 students receive a free or reduced–price school lunch. Let us assume a uniform distribution of the number of students by grade level (1.15 million per grade). A child participating in the program for all thirteen years of schooling could accumulate $4000. If all participating students accumulated the maximum possible savings accepting disbursement at graduation from high school, annual disbursement cost of this program could be as high as $4.6 billion in current dollars.

Consider this cost in relation to what is already being spent on these children. The 15 million students eligible for reduced–price or free lunches represent approximately one-third of all students enrolled in public schools and one-third of the $400 billion annual expenditure on public education. If the program is successful in developing savings behavior, the additional cost increases the annual public education expenditures by slightly more than 1 percent. If the proposed program turned out to be an abject failure in influencing savings behavior and each of the 15 million students

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[10] http://philaedfund.org/collegeaccess/index.htm.

[11] Greenwood et al (1998)

12 Karoly et al. (1998). Gill, Brian, Jacob W. Dembosky, and Jonathon Caulkins (2002).

merely collected their attendance allowance each week, the annual cost would be only $30 million. This is insignificant in relation to what is currently being spent.

VII. Outcomes/Benefits

The goal of this program is to lower students' rate of time preference, and increase school participation, student effort and skills acquisition. The direct measurements of time preference and increased school participation are school attendance and savings disbursement expenditures. Expenditures within each school are a direct measure of the effectiveness of the program in developing savings behavior.

It is unimaginable that a student able to graduate from high school with two or three or four thousand dollars of wealth accumulated a penny per day would not be transformed in ways other than savings behavior with respect to money. One would expect that a lower rate of time preference and better attendance will increase student effort and skills acquisition, resulting in higher standardized test scores and social-evaluation marks, higher rates of high school graduation, higher rates of participation in post-secondary education and/or the military, higher rates of employment, labor force participation and marriage, and reduced rates of criminality, teenage pregnancy and childbirth, drug and alcohol abuse, and dependence on public assistance. These should be correlated with the length of time a student participates in the program and the amount of disbursements. Another measure of the benefits of the program is what the student does with the disbursement. Does the student continue to save the disbursement, invest it in education, buy a car, or is it expended on current consumption and how?

The degree to which these benefits are realized will depend upon how the program is implemented. Implementing such a program on a school-wide basis and incorporating it in curricula can further support development of an internal locus of control and a lower rate of time preference within individual students, build a school community and allow a school to incorporate the philosophy it represents into the academic ideal, increasing both student effort and skills acquisition.

What amount of benefit is required to justify the cost of this program? Assume for a moment that the only benefit is a reduction in births to low-income teenagers. Each year there are nearly 500,000 births to teenage mothers, 83 percent of who come from poor or low-income families. One estimate of the taxpayer cost of each family that begins with a birth to a teenager is about $14,000 annually over 20 years (Trussell 1988), or a total cost of $280,000 per birth per year. This implies that if annual births to low-income teenagers decreased by 16,000 – a reduction of only 4 percent - that alone would justify the annual disbursement costs.

Lower rates of criminality could potentially justify the program as well. The Rand Corporation concluded that the program of four years of cash and other incentives to induce disadvantaged high school student to graduate, costing $13,000 per student, would have a crime prevention rate of 50 percent and that the benefits would totally offset the costs. It is arguable that the savings proposal could have similar results because students would have a longer exposure to this "values" education and because of the school identification effects. It is improbable that a student could earn the maximum disbursement of $4000 and not have learned the self-discipline to avoid criminal behavior.

Finally, the proposed disbursements are tiny compared to the estimated $400 billion in local, state and federal government income-tested benefits[13] that existing low income and poor families

[13] Based on 1998 benefits of $391,733,000,000 (Statistical Abstract of the U.S. 2000, Table 604).

receive each year, with the vast majority of that money spent on remediating the effects of poverty on the ability to purchase medical care, housing, food, etc., but doing little to interrupt the cycle of intergenerational poverty, out-of-wedlock childbirth and crime.

VIII. Implementation

Although it is the role of education experts, with appropriate consultation, to develop the materials necessary to deliver this program as well as developing methods and materials that support the generalization of the relationship between early effort and later reward throughout the school curriculum, we offer several suggestions.

No doubt, some children will find it extraordinarily difficult to delay gratification for 13 years without parental reinforcement, the likelihood of which is very small. Indeed, some children may even be pressured by their parents to make withdrawals. Hence, parental support should be encouraged. Despite their poverty, virtually every family owns a television and a VCR or DVD player. A video and education materials should be created and distributed to each family that describes and demonstrates the not only the potential for each child to accumulate savings, but the correspondence between delayed gratification and significant future rewards.

This program can and should be administered locally but with oversight. In addition to educational materials, schools need computer access (already available) and a programmed student accounts spreadsheet (part of the educational materials) in which to record savings and withdrawals. There should be administrative oversight of these records to protect against fraud. Schools need access to a supply of money, for which there should be local administrative oversight, to fund student cash withdrawals. Alternatively, local banks could sponsor the accounts, as is done with the *Saving for America* program, with the interest disbursements underwritten by the government. The extent to which schools incorporate the savings program into everyday curriculum should be a local decision, at least during a pilot project, and the variation would allow for measurement of the impact of the curriculum support on the effectiveness of the program.

IX. Conclusions

Some leading poverty experts have concluded that economic models that attempt to explain poverty and dependency in terms of rationality and incentives and disincentives cannot be successful because many of the poor are not rational. Lacking foresight and self-control, their behavior is best described as impulsive (Mead 1992, p. 182). It is precisely for that reason that we believe that the long-run solution to education reform, poverty and its associated problems must include educating and socializing students to have an internal locus of control, a time orientation towards the future, and an appreciation of opportunity costs that are not immediate. It is foresight and delayed gratification based on experience and learning that distinguish the behavior of responsible adults from the behavior of their children.

For the families that begin with an out-of-wedlock childbirth and void of family traditions and histories of middle class values and behavior, it is the responsibility of society to intervene in the lives of their children in a way that (1) helps them learn to value achievement, learn self-governance and self-sufficiency, and to believe in choice and the power of choice, but also (2) respects the balance between "self-reliance and altruism" (Solow 1998, p.5) that middle class taxpayers quite reasonably expect.

We have proposed a model program in which children and adolescents can experience significant rewards from choosing to postpone current consumption in favor of savings and

investment and, in so doing, develop the behaviors and attitudes that will cause them to increase effort in school, acquire skills and move from poverty to middle class. We have chosen parameters that we believe are reasonable in so far as they may be sufficient to motivate a child in poverty but result in an expense that taxpayers and donors would be willing to underwrite, given the potential to produce responsible citizens and taxpayers.

Our belief in the role that an allowance, savings and investment plan can potentially play in time orientation and character formation is reflected in the plan we implemented for each of our own three children. At approximately age three, each child began to receive an allowance (pennies). Until age seven the entire amount of each child's accumulated savings was doubled at the end of the calendar year – representing an annual rate of return of 100 percent at the beginning of the year but approaching infinity as the end of the calendar year approached. This was compounded over three years. After age seven, past savings were not doubled but were placed in a savings account to earn the market rate of interest. However, the annual addition to savings (including this earned interest), which can increase as the allowance is increased and we help them invest in mutual funds, is doubled.

The most important aspect of the plan we devised for our own children is the information we have provided them on the rewards and opportunity costs of their savings and spending decisions. We calculated the potential accumulations of savings over their childhood based on alternative scenarios with respect to their decisions to consume and save from their weekly allowance, which increased with age and inflation. We have never required our children to save. Indeed, we encourage them to spend and explain to them that spending their allowances reduces *our* disbursement costs.

We had evidence that our first-born had internalized the concept of opportunity cost by the age of seven. While standing with her in a grocery store cashier line on December 26th, her four year-old brother found a quarter on the floor. As he pondered the candy on the shelves, she advised him not to spend it – "in six days, it will be worth twice as much," she told him, adding "and don't spend it on this candy – you can get more in the bulk section." He took her advice.

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About the Authors

Patricia A. Hutton
Professor of Economics
Department of Economics and Finance
Canisius College
2001 Main St.
Buffalo, N.Y 14208

James M. Holmes
Professor of Economics
Department of Economics
State University of New York at Buffalo
Buffalo, NY 14260

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