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What Does Financial Literacy Training Teach Us?

Bruce Ian Carlin and David T. Robinson

The authors use data from a finance-related theme park to explore how financial education changes investment, financing, and consumer behavior. Students were assigned fictitious life situations and asked to create household budgets. Some students received a 19-hour financial literacy curriculum before going to the park, and some did not. After controlling for demographic variables, the authors show that the treatment effects of the financial literacy program are strong. Students were more frugal, delayed gratification, paid off debt faster, and relied less on credit financing after training. Students who attended training showed greater uptake of decision support that was offered in the park, which indicates that decision support and financial literacy training are complements, not substitutes.

Keywords *decision support, financial literacy training*

JEL codes *A21, D14, D18*

Financial literacy is defined as "the ability of people to make financial decisions in their own best short- and long-term interests" (Mandell 2008). Unfortunately, this skill is in short supply, which may erode both personal and aggregate welfare (e.g., Lusardi and Mitchell 2007). To date, three main avenues of research have been proposed to address this scarcity: (1) directly improving education (e.g., Bernheim, Garrett, and Maki 2001); (2) improving access to timely decision support (Lynch 2009); or (3) implementing judicious default options to limit the harm that people can do by not making an informed choice (Thaler and Sunstein 2003).

Several important issues remain unresolved, however. First, it is unclear whether financial literacy training actually affects individual behavior, even if it does increase knowledge about

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financial decisions. Indeed, many of the cited papers above analyze the uptake of information by subjects, not the effect of training on financial decisions.[1] Second, it remains unclear how people extrapolate such training to other circumstances that are not specifically included in the training program, and whether this leads to unintended consequences. Finally, it remains unknown how financial literacy training interacts with the other channels noted above.

In this article, we evaluate the efficacy of education in a novel way by studying a population of newcomers to finance: Los Angeles students aged 13–19 years old who participated in a simulated finance experience at the Junior Achievement Finance Park of Southern California. Junior Achievement (JA) developed their curriculum and the Finance Park experience to educate young adults about personal finance and improve their ability to make sound financial decisions. JA of Southern California provided us with data from their program during the 2008 academic year.

Our purpose is not to perform a program evaluation of the JA curriculum. Instead, our goal is to use the JA theme park as a laboratory for understanding how exposure to financial literacy training affects actions. The key to our identification strategy is the fact that some participants in the program had received financial literacy training before the park experience, while others had not. Contrasting those with and without exposure to financial literacy training allows us to explore the treatment effects of literacy training in a novel setting. Moreover, differences in the availability of information supporting financial decisions in the park allow us to further ask how financial literacy and decision support interact.

The remainder of the article is structured as follows. In the next section, we describe the JA curriculum and the Finance Park simulation. In the following section, we describe the school demographics underlying the data that we obtained from the Finance Park, and the identification strategies that we use. The section after that presents our main findings on the efficacy of the training program. The subsequent section explores the interaction between exposure to in-class training and exposure to in-park decision support, and the last section concludes.

THE JA FINANCE PARK

JA was founded in 1919 with a mission to educate young people about business, economics, and free enterprise through hands-on experiences. Our sole emphasis in this article is the Finance Park at JA. The JA Finance Park offers students personal financial management and career exploration through classroom instruction and active participation in a simulated finance setting. The curriculum includes 19 hours of didactic (in-classroom) study of financial institutions, taxes, credit, and personal budgeting. The educational experience culminates in an all-day visit to JA Finance Park, which is a simulated experience where students get hands-on practice in personal budgeting.[2]

In the curriculum, students receive three primary messages: (1) be wary of the costs of credit; (2) plan for the future; and (3) take future costs into account when maximizing wealth today. Students participate in many concrete exercises that solidify these ideas. For example, they are given the costs of consumption goods with and without financing (e.g., gasoline: $35 cash, $42 credit). They are shown that money grows in a savings account, and how this changes with the interest rate and length of time. They are given budget example exercises where the stated goal is to save 20 percent of their net monthly income (e.g., $300 savings for an income of $1,500).[3]

The Finance Park experience appears to improve understanding of financial decisions. A 2008 program study showed that both JA and non-JA students improved their financial literacy as measured by pre- and post-test questionnaires (ETI 2008). A 2006 study of middle school students arrived at the same conclusion (ETI 2006). While both of these studies show that students' factual background increased as a result of the training, neither study evaluated the effect of the training on the choices participants made while in the park. As such, it is clear that students do learn, but it remains an open question how the education affects their decisions.

During the Finance Park simulation, students are randomly given a fictitious identity, which includes their age, employment, marital status, number of dependents, personal income, and taxes. Students report to their place of employment, which is one of the 17 kiosks at the park where financial decisions are made. Each kiosk is staffed by a volunteer, who assists them. They begin by calculating their Net Monthly Income (NMI), which is their monthly take-home income net after taxes, Medicare, and Social Security contributions. Following this, students are asked to create a personal budget, which includes housing choices, health insurance, credit management, recreation, investment in continuing education, charity, cell phone plan, and home improvement. Then students travel to each kiosk around the park, entering their choices in the computer, with the specific goal of creating a balanced budget that is responsible and represents their preferences.

The data that we used in the present analysis were the completed budget review statements that reflected the choices the students made while engaged in the role play.[4] The age of the profile characters ranged from 25–35 years of age, with a median of 30. The annual gross income ranged from $20,000 to $65,000 per annum. To put the income numbers in perspective, data from the U.S. Census (U.S. Census Bureau 2007) indicate that the median household income for metropolitan Los Angeles in 2008 was around $55,000 per year.

Details regarding the 17 kiosks are as follows. Bank of America (kiosk #1) was where students paid for the housing choices they made. Students chose between six housing plans that ranged from cozy apartments to larger houses, although no distinction was made between renting and owning. While students were given discretion over what they must spend on housing, the costs of the six housing options were scaled to the participant's net monthly income.

Kiosks 2, 3, and 5 (Gas, SoCal Edison, and Water/Sewer/Trash, respectively) were choices that were directly impacted by the housing choice they made and their family size. In particular, their expenditures at the Gas Company and SoCal Edison were linked to the size of their dwelling, while their Water/Sewer/Trash expenditure was linked to the number of people in their family. The Phone kiosk (#4) allowed students to choose among a variety of phone packages. Some of these packages were based on land-line coverage, while a la carte cell phone plans were also offered.

The Toyota kiosk (#6) was where students made the automobile choice. The choice they made here, along with their housing choice, affected the baseline amounts they would owe at the State Farm kiosk (#10). The choices that they made for groceries (kiosk #7) and clothing (kiosk #8) were not based on household size, but rather on their preferences.

Kiosk #9, the Union Bank kiosk, was the place where students made savings decisions. Understanding their savings behavior is complicated by two factors. One, there was no explicit mention of an annual interest rate earned on savings. Therefore, students were not being asked to consider how their money would grow over time when they made savings decisions. Second, as we explain in detail below, because savings decisions were made in conjunction with other

decisions, the implicit adding-up constraint meant that we could not really test whether students had a higher propensity to save as a consequence of being exposed to the park.

Kiosk #11 was where students made health insurance choices. Although there was no difference in the unconditional mean choice between those with and without literacy training, this partly reflected the fact that price masks important variation in the terms of care provided by the health insurance. We take this issue up in greater detail in the section covering training, decision support, and unintended consequences.

Kiosk #13 was where students invested in home improvement. Students were randomly assigned an amount that they must spend on home improvement. This amount exceeded their available monthly income, so it must be financed; students were then given freedom to choose how to finance the mandatory, random home improvement. The annual interest rate was 21 percent and students chose how fast to pay off the principal balance. As we discuss in detail below, this fact is important for our analysis because it affects the interpretation of the connection between financial literacy exposure and both the savings results and the home improvement results.

The remaining kiosks allowed students to take community college classes to further their education (kiosk #12), and to spend money on a variety of leisure items like entertainment, sporting equipment, and dining out (kiosks #14 to #16, respectively). Students also gave a portion of their income to charity (kiosk #17), which was discretionary within a prescribed range of choices.

SCHOOL DEMOGRAPHICS AND IDENTIFICATION STRATEGIES

While the preceding section discussed the data in terms of the fictitious identities used in the park, it was silent on the underlying characteristics of the student populations who attended the park. In this section, we explore actual student demographics. This allows us to lay out our identification strategy in greater detail.

Table 1 provides a snapshot of the schools that participated in the Finance Park in our sample period. The names of the schools have been masked to preserve the anonymity of the participating organizations. The column labeled "Math" is the proportion of students at the school who were at grade-level proficiency for mathematics. As the column indicates, many of these schools scored poorly on this dimension. Many schools in our sample had fewer than one in four students at math grade-level. The "Rank" column is a decile ranking of the school's Academic Performance Index (API) score. One is the lowest decile, ten is the highest. Thus, many of the schools have low overall rankings.

The remaining columns indicate that many of these schools also serve economically challenged communities. AVGPE is the average parental education level at the school; numbers here range from 1 (did not finish high school), 2 (high school, no college), 3 (attended college), 4 (completed college), to 5 (attended post-graduate school). The averages indicate that with the clear exception of School W, most schools served areas with very low levels of parental education. Similarly, FRPM is the fraction of students eligible for free and reduced-price meals. Since this statistic is tied to the poverty line, it indicates that average household wealth levels in the areas served were low. The columns under the District/School and Black/Hispanic headings indicate the proportion of students of black or Hispanic origin, either in the school itself or on average in the district in which the school is located. The figures indicate that for the most part, the schools in our

TABLE 1
Participation and School Demographics

	School demographics									JA participation	
						District		School			
Name	Math	Rank	AVGPE	Size	FRPM	Black	Hisp.	Black	Hisp.	Attendance	Finance educated
School A										79	None
School B	35	1	1.91	396	94	10	73	2	90	32	All
School C	20	—	—	1,139	75	10	73	2	82	31	All
School D	48	3	2.11	3,339	66	10	73	9	71	71	All
School E	70	7	3.26	2,666	31	2	25	2	35	60	None
School F	67	8	3.04	2,750	25	3	35	2	42	34	None
School G	58	7	2.97	2,239	60	10	73	14	39	174	All
School H	24	1	2.1	2,530	79	23	74	25	74	59	All
School I	17	1	2.4	2,023	78	10	73	65	33	45	All
School J	—	2	2.26	333	41	1	22	2	47	76	All
School K	59	4	2.44	2,691	67	10	73	16	54	75	All
School L	31	4	2.21	1,949	68	10	73	13	67	16	All
School M	59	3	1.96	578	84	23	75	5	94	50	All
School N	59	7	2.92	4,683	58	17	52	28	27	32	All
School O	67	9	3.03	591	15	4	31	3	26	39	All
School P	13	1	1.95	1,287	81	10	73	50	48	117	All
School Q	47	3	2.45	4,374	72	10	73	1	68	29	None
School R	36	1	3.75	1,306	62	21	56	32	61	94	None
School S	22	1	2.21	2,420	74	10	73	27	64	58	All
School T	34	1	1.73	4,648	81	10	73	0	99	358	300
School U	32	1	1.67	3,302	45	10	73	1	97	116	93
School W	75	10	4.19	930	2	1	4	1	3	47	All
School X	18	1	1.47	671	95	10	73	30	69	41	All
School Y	69	8	3.33	3,533	21	10	73	7	25	33	All

Notes: School names are masked to preserve the anonymity of the participating organizations. Math is the fraction of students who are at grade-level proficiency for math in that school. Rank is a decile ranking (1 = low, 10 = high) of the school's Academic Performance Index (API) scores. AVGPE is the average parental education at the school. Size is the number of students who attend the school. FRPM is the fraction of students who are eligible for free and reduced-price meals. Black and Hisp. indicate the fraction of black and Hispanic students in the district and school level. Attendance is the number of participants who completed the experience at the JA Finance Park, with the final column indicating the number of students from the school who attended the 19-hour training course beforehand. Data were obtained from http://www.cde.ca.gov/ds/sh/cw/filesafdc.asp and www.city-data.com.

data served heavily black and Hispanic populations, even compared to the districts in which they operate.

The final columns indicate the number of students who successfully completed the park, and the number from each school that attended the financial literacy training course beforehand. The columns indicate that, with the exception of Schools T and U, all other schools sent batches of students who either completely attended or completely did not attend the prior training.

In terms of establishing an appropriate strategy for identifying a treatment effect associated with exposure to the curriculum, table 1 demonstrates an important point. There are pronounced differences in school demographics based on whether the school attended the park with or

TABLE 2
Task Completion and Financial Literacy Training

	(1)		(2)		(3)	
Trained	0.366*	(0.19)	0.369**	(0.19)	0.368**	(0.19)
Profile characteristics						
Kids = 1	—		−0.020	(0.02)	−0.020	(0.02)
Kids = 2	—		−0.060***	(0.02)	−0.060***	(0.02)
Married	—		−0.023*	(0.01)	−0.028*	(0.01)
log(NMI)					0.021	(0.02)
Income fixed effects	No		Yes		No	
School fixed effects	Yes		Yes		Yes	
Observations	2,357		2,357		2,357	

Notes: This table reports probit regressions in which the dependent variable is a dummy for whether the respondent completed the park experience. Because there is scope for substantial heterogeneity in completion rates based on day-to-day circumstances, the regressions include school fixed effects, and the standard errors are clustered at the school level. Trained is a dummy for whether the students received the financial literacy training course prior to the park experience. All coefficients are reported as marginal changes in probability.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

without the training. Thus, simply specifying a dummy for whether a student attended the finance park training and identifying this parameter cross-sectionally is unlikely to provide a good measure of the effects of the treatment, since it is muddied by the fact that students from better performing schools and less economically disadvantaged backgrounds were likely to have skipped the training. Given the evidence in Lusardi, Mitchell, and Curto (2010) on the importance of parental education and financial literacy for predicting childhood financial literacy, this suggests that a cross-sectionally identified dummy variable for Finance Park training would severely underestimate the true effect of the financial literacy training on behavior. Indeed, when we compare average school characteristics for treated and untreated schools, we see that the schools in the treatment group have higher rates of FRPM eligibility, lower parental education levels, are located in districts with larger black and Hispanic populations, serve largely black students within those districts, and have lower test scores and graduation rates.[5] Therefore, simply comparing across schools would provide a severely biased estimate of the treatment effect.

Instead, our identification strategy is based on Schools T and U. Since these schools sent students with and without training, our strategy is to estimate the effect of training by including school fixed effects, thereby identifying the treatment effect through the variation in exposure within these schools. Even still, this is a within-school, not a within-class estimate. Later we also discuss additional steps we have taken on smaller samples to further estimate average treatment effects in our data.

DOES FINANCIAL LITERACY TRAINING AFFECT BEHAVIOR?

In this section we explore the basic question of whether the curriculum affected the behavior of the students who were exposed to it. Table 2 examines completion rates by training status across the entire sample. This table illustrates that holding constant average differences attributable to school effects, students with literacy training were significantly more likely to complete the

budget reviews. This means that they were able to turn in a completed, balanced budget within the time frame allotted to them more often than the untreated group. The point estimate suggests that this effect is economically large, around 35 percent.

Table 3 shows how the financial literacy training affected the students' choices. The dependent variable in each column is the percentage of total income allocated to each category. The broad takeaway from this table is that the students who received the financial literacy training were more attuned to making choices that can be described as investments in the future and delaying gratification. For example, students in the treatment group spent more to pay off their debt obligations on their home improvement, and thus incurred lower interest charges on their loans. The students also spent less on clothing and chose to dine out less.

Nevertheless, students in the treatment group saved a smaller fraction of their overall income. While this clearly cuts against the stated intent of the training they received, there is an important shortcoming in the park's design (from a research perspective) that prevents us from drawing sharp conclusions from this fact. Namely, there was no rate of interest associated with the savings account. Students were simply asked to allocate a fraction of their income to savings and were not given any information about the rate of interest their savings would earn. In view of the fact that other choices had explicit interest rates tied to them, this complicates the interpretation of the savings estimates, especially in light of the mechanical adding-up constraint imposed by the structure of the exercise. For example, some students may have felt that they were saving by choosing to avoid higher interest expenses on home improvement packages, which faced a 21 percent interest rate. Indeed, because students in the treatment group amortized their home improvement packages more quickly, they faced larger monthly home improvement expenditures (this can be seen from the loading on the Finance Park dummy in column [13] of table 3), and consequently had less to save. Therefore, it is important to bear in mind the limitations of the park's design when considering the difference in savings rates across the treated and untreated groups.

In unreported tabulations, we also verified the treatment effect using a second, smaller set of students from a high school in Los Angeles who went through the program twice during the 2009–10 academic year.[6] These students attended the park, then took the curriculum, and then went through the park a second time. This group includes 81 students who attended in early February and 44 who attended in late April. All students attending in late April had completed the training, and none in February had received any training. Only 20 students attended both sessions. This group is small in size but allows us to best control for variation in demographic variables in assessing the treatment effect associated with the classroom training. However, this is not a perfect experiment; we do not have a control group at our disposal who went to the park twice without receiving training, and are therefore not able to control for the effect that the first park experience had on behavior during the second park experience.

Nevertheless, this group displayed pronounced differences before and after the curriculum exposure. After receiving the classroom training, the fraction that students saved was nearly four times larger than their pre-treatment amount. Post-treatment students paid off their home improvement faster and spent significantly less on clothing. Taking these decisions together, this indicates that the post-treatment students favored delayed over immediate gratification in their decision-making.[7]

In summary, this section illustrates that the financial literacy training had an effect on the students who were exposed to it. Students who were exposed to training completed the program faster, and they made many choices that are consistent with delaying immediate gratification in

TABLE 3
Within-School Estimates of the Effects of Financial Literacy Training

	B of A (1)	Gas co. (2)	SoCal Ed (3)	Phone (4)	Util. (5)	Toyota (6)	Groc. (7)	Clothing (8)	Union Bk (9)	State Farm (10)	Prov. & St. Joe (11)	LA Coll. (12)	Home imp. (13)	Entert. (14)	Sport (15)	Dine out (16)	Charity (17)
Trained	0.455***	−0.012***	0.160***	−0.057***	0.078***	0.134***	−0.196***	−0.292***	0.108***	0.032***	0.127***	0.371***	−0.004	0.009***	−0.025***	0.582***	−0.566***
	(0.005)	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)	(0.001)	(0.001)	(0.002)	(0.004)	(0.003)	(0.002)	(0.002)	(0.006)	(0.011)
Profile characteristics																	
Kids = 1	0.442***	0.131***	−0.007	−0.135**	0.543***	−0.238***	−0.017	0.221***	0.135***	0.491***	−0.006	−0.208**	−0.270***	−0.077**	−0.017	−0.065	−0.616***
	(0.064)	(0.027)	(0.033)	(0.060)	(0.022)	(0.061)	(0.066)	(0.063)	(0.024)	(0.041)	(0.033)	(0.083)	(0.042)	(0.037)	(0.026)	(0.056)	(0.154)
Kids = 2	1.045***	0.266***	0.105**	−0.240***	0.740***	−0.406***	0.181*	0.024	0.178***	0.385***	−0.017	−0.170*	−0.286***	−0.076**	0.093**	0.021	−0.650***
	(0.124)	(0.026)	(0.046)	(0.073)	(0.031)	(0.071)	(0.101)	(0.067)	(0.029)	(0.051)	(0.025)	(0.100)	(0.046)	(0.036)	(0.040)	(0.094)	(0.177)
Age	0.000	−0.003	0.011***	0.006	−0.000	−0.002	−0.010	−0.002	−0.000	0.006	0.007*	−0.008	−0.001	0.006	0.003	0.010	−0.009
	(0.008)	(0.003)	(0.004)	(0.008)	(0.004)	(0.011)	(0.010)	(0.007)	(0.005)	(0.007)	(0.004)	(0.010)	(0.005)	(0.004)	(0.004)	(0.011)	(0.018)
Married	0.228***	0.035**	0.127***	0.039	0.402***	−0.106**	0.021	−0.071	−0.087***	0.147***	0.045*	−0.098	0.035	0.019	0.099***	−0.089	−0.321*
	(0.062)	(0.018)	(0.024)	(0.068)	(0.014)	(0.044)	(0.062)	(0.063)	(0.013)	(0.038)	(0.026)	(0.067)	(0.048)	(0.028)	(0.024)	(0.117)	(0.171)
log(NMI)	−1.509***	−1.783***	−0.329***	−0.068	−2.381***	0.574***	0.917***	0.625***	−2.085***	−0.472***	−0.474***	0.756***	0.341***	0.085	−0.270***	0.288***	1.830***
	(0.100)	(0.046)	(0.058)	(0.070)	(0.049)	(0.096)	(0.091)	(0.129)	(0.038)	(0.051)	(0.029)	(0.113)	(0.063)	(0.063)	(0.035)	(0.053)	(0.321)

Notes: This table reports Tobit estimations in which each dependent variable is the percentage of income allocated to a spending category. School fixed effects are included, but suppressed. Standard errors are clustered at the school level. Please see text for descriptions of spending categories. A total of 1,672 observations are included in the regressions.

$^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

favor of investing in longer-term outcomes. This is especially significant when one considers that the students in the study were not from advantaged backgrounds.

TRAINING, DECISION SUPPORT, AND UNINTENDED CONSEQUENCES

While the previous section focused primarily on the effectiveness of the training in terms of the choices made by treated students, this section focuses on two different questions. First, does training induce unintended consequences? Second, are education and decision support complements or substitutes? This latter question is important because implicit in most policy analyses of consumer literacy is the assumption that education replaces decision support, or vice versa.[8] Indeed, in this section we present evidence suggesting that one of the primary benefits of education may be to increase the uptake of timely decision support.

We exploit some specific features of the park experience that students faced. In particular, we compare the students' decisions regarding home improvement and health care. Each student was required to purchase a home improvement package on credit. While the size of the purchase was randomly assigned to the student, they had discretion over how fast they amortized their loan. The annual interest rate for these loans was approximately 21 percent. The students could choose to make lower monthly payments, but by doing so they faced higher interest costs over the life of the credit plan. Or they could choose to make larger payments, leaving them less money each month, but saving money over the life cycle of the credit plan.

When students made their health insurance choice, they could choose among six plans: three with slightly lower premiums and three with higher premiums. The low premium plans all required the policy holder to pay a percentage of the total bill as a co-pay if health care was needed (e.g., a 15 percent co-pay). The higher premium plans offered fixed-rate co-pays (e.g., a $15 co-pay). In some sense, the choice faced here mirrored the choice faced at the home improvement kiosk, because in both settings, students must choose between paying more today for lower payouts in the future, or paying less today but more in the long run. To be sure, there are important differences in the types of decisions students were being asked to make. The choices varied in terms of where they sat in a student's locus of control (ample research in psychology indicates that people understate the probabilities of bad outcomes when they think they can exert influence over those outcomes). They also had important risk differences. In the case of home improvement, there was no uncertainty surrounding future payments. In the case of health insurance, students were exposing themselves to potential income volatility by adopting percentage co-payment plans.

Importantly, the two kiosks also differed in terms of the structure of decision support that was offered. At the home improvement kiosk, attendants actively prescribed one type of choice over another. Specifically, they reminded students that credit financing is expensive and nudged them toward paying more today to avoid higher costs in the future. In contrast, attendants at the health insurance kiosk did not advocate for one package or another, but instead simply explained concepts such as co-pays and premiums. Drawing on this difference allows us to consider the interaction between decision support and financial literacy exposure.

Panel A of table 4 presents the results regarding home improvement in two ways. In the first two columns, the dependent variable is the log of the ratio of interest cost to total credit package size. The second two columns report regressions of log ratio of monthly payment to total credit plan size. All columns include school fixed effects, while columns (2) and (4) replace log income

TABLE 4
Prudent and Imprudent Financial Choices

	Panel A: Home Improvement Loan Decisions							
	(1)		(2)		(3)		(4)	
	Interest payments:				Amortization:			
log(NMI)	0.787***	(0.034)			−0.588***	(0.025)		
Kids = 1	0.074**	(0.033)	0.052*	(0.026)	−0.056**	(0.025)	−0.049**	(0.020)
Kids = 2	0.024	(0.034)	0.046	(0.028)	−0.015	(0.025)	−0.044**	(0.021)
Age	−0.012**	(0.005)	0.002	(0.004)	0.008**	(0.003)	−0.002	(0.003)
Married	0.075***	(0.020)	0.019	(0.019)	−0.069***	(0.016)	−0.020	(0.015)
Trained	−0.110***	(0.001)	−0.114***	(0.004)	0.080***	(0.001)	0.085***	(0.003)
R-squared	0.268		0.594		0.274		0.566	
	Panel B: Health Insurance Decisions							
	(1)		(2)		(3)		(4)	
	Prob (underinsured):				Prob (flat-fee co-pay):			
log(NMI)	0.003	(0.011)			0.883***	(0.043)		
Kids = 1	0.006	(0.009)	−0.006	(0.006)	−0.198***	(0.034)	−0.256***	(0.037)
Kids = 2	−0.012	(0.009)	−0.022***	(0.005)	−0.134***	(0.027)	−0.196***	(0.028)
Age	0.001	(0.001)	0.001	(0.001)	0.001	(0.004)	−0.005	(0.005)
Married	0.019**	(0.008)	0.028***	(0.007)	−0.255***	(0.021)	−0.223***	(0.026)
Trained	−0.033***	(0.003)	−0.029***	(0.002)	−0.161***	(0.005)	−0.187***	(0.007)

Notes: When students in the park were randomly assigned an amount to spend on home improvement, they chose a monthly payment plan. Panel A explores how exposure to classroom training impacts the decision to amortize the loan more quickly. The first two columns report the log of the total interest payments to the total package size. When this variable is smaller, it indicates that the student has chosen to amortize the package more quickly by making larger payments that result in lower overall interest charges. The second two columns report OLS regressions of the log of the ratio of the size of the monthly payment to the total package size. Panel B explores health insurance choices. In columns (1) and (2) the dependent variable is a dummy variable that accounts for whether the respondent has a family but does not have insurance that covers the family (i.e., they appear to have chosen individual instead of family insurance). In Columns (3) and (4), the dependent variable is a dummy for whether the person chose a plan with high premiums that has fixed-payment copays ($15 per visit) versus slightly lower premiums with percentage copay (15% of cost). Columns (2) and (4) replace log(NMI) with income fixed effects in each panel. School fixed effects are included in all estimations. 1,672 observations are included.
$^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

with fixed effects for the 10 income categories to allow for income to enter nonparametrically in the estimation. Income is included as a control variable in these regressions because the random home improvement package was scaled to the income level of the student (so that no participant had to manage an unmanageable home improvement amount). In general, the loadings on the family profile characteristics indicate that larger fictitious family sizes tended to be associated with higher interest costs and slower amortization, presumably as a consequence of the higher expenses faced in the family budget elsewhere.

The effect of financial literacy training on the amortization of the home improvement plan is pronounced. Focusing on the first two columns, we see that the financial literacy exposure reduces the interest payments by about 11 percent of the total credit plan size. Columns (3) and

(4) express the same finding in a complementary manner by showing that the finance training raises the monthly payout on the credit plan by about 8 percent.

Thus, the results in panel A of table 4 indicate that there was a significant interaction between prior exposure to financial literacy training and the presentation of timely advice about financial management. Attendants in the park frequently reminded students to consider paying off their debt earlier. However, even though the students who did not receive financial literacy training prior to the park experience heard the same advice, many did not take it. One interpretation is that the prior literacy training primed people to act on advice, or that the advice itself recalled past training that people had received.

The results regarding health insurance choice are presented in panel B of table 4. The first two columns examine whether someone is "under-insured." In our setting, this simply means that the respondent's character had a family (i.e., was married and/or had children), but only had individual insurance. Given the complexity of the overall budgeting problem that the students faced at the park, this variable measures task comprehension and effective budget preparation more than it measures attitudes toward risk. We determine this by comparing the character's family size to the reported cost of the plan they chose to see if they chose a policy that only covered a single person when their profile character was married or had children. From the profile characteristics, it is clear that this occurred most often among people who were married without children. The presence of children made this much less likely. One reasonable explanation here is that the respondent assumed that their profile character's fictitious spouse had their own insurance somewhere else.

In the first two columns, we see that students who received financial literacy training were significantly less likely to inappropriately choose a lower cost plan that did not provide adequate coverage for their family. Therefore, they behaved as if they possessed a better understanding of the overall planning task faced at the health insurance kiosk.

The second two columns examine a dependent variable that is a dummy for whether the respondent chose a more expensive plan that offered flat-fee co-payments. The results are striking. Students with financial literacy exposure were much less likely to choose these plans. In doing so, they economized on monthly premiums, but faced potentially higher out-of-pocket costs, and indeed, potentially more volatile income.

Comparing the results in panels A and B allows us to explore the interaction between decision support and financial literacy. In panel A, when students received decision support in the form of a nudge, trained students acted on the information while untrained did not. In panel B, when students received decision support that merely clarified terminology without offering prescriptive advice, trained students fell back on heuristics (economized on costs, etc.) that were ill-suited to the task at hand.

CONCLUSION

There are three central messages that emerge from our analysis in this article. First, financial literacy can indeed be taught, but with important limitations. Trained students in many cases adopted the decision-making that the program stressed, but often had difficulty extrapolating the underlying principles to new settings.[9] The second lesson is that education may have unintended consequences. The students who received the training even made some choices that were in

some sense contrary to the spirit of the instruction they received. Because of this, it is probably optimal to monitor the effect of education on people's behavior over time and adjust the education accordingly. The third lesson, and perhaps the most important one, is that education and timely decision support are not distinct channels for improving consumer financial decision-making. They interact. Decision support was better utilized among the group that received financial literacy training. Timely decision support and financial literacy training are complements, not substitutes. In this light, it is likely to be optimal in the future to coordinate educational efforts with the advice channels offered in the market to maximize people's ability to make good decisions.

NOTES

1. One exception is Bernheim and Garrett (2003), who show that financial education leads to higher aggregate savings; however, behavior at the individual level is not measured in their study.
2. A full description of the curriculum is available in Carlin and Robinson (2009), and at http://www.jasocal.org.
3. Examples are taken from the JA Finance Park Student Workbook, which is available upon request.
4. Additional details can be found online at http://www.nber.org/papers/w16271.
5. Tables are available upon request.
6. Confidentiality requirements prevent us from disclosing the name of the school. However, it is in the South Los Angeles area, and is approximately 52 percent black and 47 percent Hispanic in student makeup. It has an API score of 1, placing it in the lowest decile, and has around two percent of students at or above California state-level math proficiency.
7. These results can be found in greater detail online at http://www.nber.org/papers/W16271.
8. This question is also explored in greater detail in Carlin and Robinson (2012).
9. Difficulty in extrapolating beyond the scenarios used to illustrate educational principles is discussed in the educational psychology literature. See, for example, Thompson, Gentner, and Lowenstein (2000) or Gentner, Lowenstein, and Thompson (2003).

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