LITERACY, TRUST AND 401(K) SAVINGS BEHAVIOR

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Abstract

At three large firms offering 401(k) plans, we assess the impact of financial literacy and trust on 401(k) savings behavior in voluntary and automatic enrollment 401(k) plans. Financial literacy plays a critical role in improving 401(k) savings behavior — it reduces both the proportion of non-joiners in voluntary 401(k) plans and the proportion of quitters in automatic enrollment plans. Trust is critical as well in improving quit rates in automatic enrollment plans. Both financial literacy and trust appear to have more sizeable marginal effects than do those from income. We also find no initial evidence that non-participants are low-income rational agents who fail to participate in a 401(k) plan due to anticipated income support from Social Security. Our findings underscore the importance of ongoing workplace education for both voluntary and automatic enrollment plans and highlight the unique issue of trust in automatic enrollment plans.

I. Introduction

Over the past fifteen years, a substantial body of 401(k) savings research has posited a number of reasons why employees participate or fail to participate in voluntary 401(k) arrangements. These include neoclassical explanations, such as employee budget constraints, employer matching contributions, or employee-own preferences for tax-deferred savings, as well as behavioral explanations, including procrastination, peer effects, or choice overload. Meanwhile, recent efforts to understand financial decision-making more broadly have focused on the critical role played by financial literacy, where researchers attempting to understand banking and other financial relationships have drawn attention to the role of mistrust in influencing financial choices, especially among low-income households. Overall it would appear that financial decision-making is influenced by a complex set of factors, yielding to both neoclassical and behavioral explanations.

Our current research effort is the first attempt to extend the critical issues of financial literacy and trust to the domain of 401(k) savings behavior. Moreover, it does so in the context of a rapid change occurring in the nature of the 401(k) plan participation decision. Increasingly employers offering 401(k) plans are availing themselves of a plan design strategy known as automatic enrollment, under which eligible workers have 401(k) contributions automatically deducted from their paychecks, with the legal right to opt out if they choose.[1] While automatic enrollment plans improve plan participation rates dramatically (Madrian and Shea, 2001), it is still the case that some population of eligible workers, possibly as high as 20%, choose to exercise their opt-out rights and quit

[1] Automatic enrollment was first authorized by the U.S. Internal Revenue Service in 1997. The Pension Protection Act of 2006 also included several provisions to encourage its wider adoption.

an automatic enrollment plan. As a result, two types of non-savers have emerged today in the U.S. 401(k) system: "non-joiners," those who fail to join voluntary 401(k) arrangements; and "quitters," those who exercise their opt-out rights under an automatic enrollment plan.

The trend towards automatic enrollment raises an intriguing set of questions about the 401(k) plan participation decision: Are quitters (of automatic enrollment plans) fundamentally different from non-joiners (of voluntary plans)? Do neoclassical models help explain the variations between the two types of savers — or are broader questions of financial literacy or trust important as well? The goal of this paper is to paint a more complete picture of the participation decision in the context of both voluntary and automatic enrollment plans. We rely on administrative and survey data drawn from large firms sponsoring 401(k) plans, two offering automatic enrollment plans and one offering a voluntary plan. The survey data in particular permit us to delve into the psychological motivations behind employee savings decisions, which would be impossible to address through administrative data alone.

Perhaps not surprisingly, we find that financial literacy measures play a critical role in influencing savings behavior, whether on an opt-in voluntary or opt-out automatic enrollment arrangement. Higher financial literacy among workers is associated with higher voluntary 401(k) participation rates or lower quit-rates in automatic enrollment plans. Indeed, the marginal effects of low financial literacy appear to be economically more meaningful than the effects of higher income. Meanwhile, trust appears to be very important in influencing savings behavior in automatic enrollment plans, with participants more likely to opt out if they lack a fundamental trust of financial

institutions. These findings underscore the importance of ongoing financial literacy efforts in the workplace, whether for participants in voluntary or automatic enrollment plans. It also points to the central question of trust and its role in influencing quit rates in automatic enrollment plans.

This paper is organized as follows. Section II provides a brief literature review. Section III describes the administrative data used in the study. Section IV discusses the survey instrument and the representativeness of the survey respondents to the survey sample. Section V discusses the financial literacy and trust measures used. Section VI reports the results of the econometric analysis. Section VII provides further survey evidence for non-participation and Section VIII concludes.

II. Literature Review

Most prior research on the 401(k) participation decision has used either administrative data or survey evidence to explore the influence of plan features and individual characteristics on the participation decision. This research has focused mainly on voluntary enrollment plans. Munnell, Sundén and Taylor (2001/2002) provide an informative summary of the past literature. For voluntary enrollment plans, one of the most important variables predicting participation at the individual level is income, with all prior studies finding a strong positive relationship between income and 401(k) saving. Munnell, Sundén and Taylor (2001/2002) offer several reasons for this finding: low-income households are more likely to be financially constrained; they face lower (or negative) tax rates and derive little (or no) tax benefit from 401(k) saving; and they need to save less because of the progressive benefits structure of Social Security.

Age has also been found to be positively related to participation. Munnell, Sundén and Taylor (2001/2002) posit that it is because individuals become more interested in retirement savings as they age. Job tenure is also positively related to participation. This may be because vesting of benefits rises with job tenure, or because workers become more informed (possibly through group dynamics) about the 401(k) plan over time.

Plan features such as employer matches and access to funds through loans also appear to make 401(k) plans more attractive to employees and therefore are associated with higher participation rates (Mitchell, Utkus and Yang, 2005). Yet they find that the matching incentive explains only a small portion of aggregate plan participation, with employee own-preferences for savings being more important in determining 401(k) savings behavior.

Lack of both financial knowledge and plan knowledge may also contribute to non-participation. Moore (2003) argues that financial knowledge is related to financial behaviors and experiences. As people become better educated and gain more financial experience, they become more sophisticated in their financial behaviors. The study shows that those with lower levels of financial literacy were less likely to engage in positive financial behaviors (e.g., paying bills on time, budgeting and tracking expenses, and saving/investing money out of every paycheck). Therefore, we would expect that individuals with lower levels of financial knowledge would be less likely to participate in a 401(k) plan. Moore also argues that people with low financial literacy are naïve when it comes to evaluating financial options. This is supported by Agnew and Szykman (2005), who find that individuals with lower levels of financial literacy were more likely to take a default option when making asset allocations than individuals with higher levels

of financial literacy. Finally, Lusardi and Mitchell (2006) demonstrate that those with higher financial literacy are more likely to save and invest in more complex assets.

Plan knowledge may also be critical in the participation decision. Researchers have found that participants make more optimal decisions when they understand their plan features. Choi, Laibson and Madrian (2005) found that 21% of participants contributing below their plan's match threshold knew their plan's match rate compared to 41% of those above the match threshold. Furthermore, Chan and Stevens (2006) find that knowledgeable participants are five times more responsive to plan features than the average individual. Finally, Bernheim and Garrett (1996) find that individuals that use employer-provided informational materials are significantly more likely to participate in their plan than those who do not receive them or simply do not use them. Clark and Shieber (1998) and Nyce (2005) found that increasing the quality of communication increased participation rates in plans.

From the behavioral perspective, there are several studies that support the influence of behavioral biases. For example, the number of options offered in the plan can influence participation. Sethi-Iyengar, Huberman, and Jiang (2004) find that plan participation rates fall modestly as the number of investment options increases. In effect, workers face a form of "choice overload" where too many fund choices discourages participation in the 401(k) plan.

Procrastination is another likely explanation why some individuals do not participate in voluntary plans. Choi, Laibson, Madrian and Metrick (2006) asked participants after they attended a 401(k) educational program offered at work whether they planned on joining the plan. Almost all of the employees that did not participate said

that they intended to participate. The authors then looked at the administrative data several months later and found that only 14% of these participants actually did join their plan. These types of findings helped motivate the introduction of auto-enrollment and auto-saving increase plans (Madrian and Shea 2001; Thaler and Benartzi, 2004). Both features appear to raise 401(k) participation and savings levels dramatically. The success of auto-enrollment plans offers support for the hypothesis that many employees are subject to procrastination as a behavioral bias, and the reframing of the saving decision from an opt-in to an opt-out regime can substantially alter behavior.

Beliefs about savings and plans to save may also influence the participation decision. Lusardi (2000) summarizes some of her earlier work on planning for retirement. She finds that households that do not plan have lower savings than those who have thought about retirement. Looking at voluntary enrollment plans, Munnell, Sundén and Taylor's (2001/2002) study of the Survey of Consumer Finances (SCF) found those with shorter planning horizons are less likely to participate than those with longer horizons. There is evidence that even among 401(k) participants there is a substantial heterogeneity among participants' attitudes about savings and money. MacFarland, Marconi and Utkus (2004) find that half of all eligible 401(k) participants have strong planning skills — while 14% of respondents are considered "Live-for-Today Avoiders" who are not interested in saving for the future, and 19% are considered "Stressed Avoiders" who find financial matters confusing and stressful.

Finally, a behavioral variable that has not been studied in the context of 401(k) plan participation is trust. However, findings from past research suggest it might have an important influence. At a broader level, researchers have shown that trust can have a

positive effect on a company's financial performance and on a society's economy. Specifically, La Porta et al. (1997) found that large organizations perform better and have a larger share of the economy when trust levels increase. Similarly, Knack and Keefer (1997) found that the economy of countries where trust levels are higher grows faster than countries that have lower overall levels of trust.

Trust is commonly measured using the following question: "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" While this question does a good job measuring general trust levels, it has been criticized as being ambiguous and vague (Glaeser et al., 2000). In addition, it does not do a good job of predicting trust behaviors or more specific trust attitudes. Specifically, Glaeser et al. (2000) find that respondents' answer to this question did not predict whether they performed trusting behaviors in an experiment.

In addition, Alesina and La Ferrara (2002) show that while an average of 40% of survey respondents report that they trust other people, the percentage drops dramatically when they are asked about their confidence in certain institutions. Specifically, an average of only 27% of people report having confidence in financial institutions. More recently and most related to our study, Guiso et al. (2007) found that lack of trust can explain why some people do not invest in the stock market. Their study measured respondents' general sense of trust as well as their more specific attitude toward their own bank officer or financial advisor.

While the issue of trust has been shown to be significant in these studies, it has not been previously addressed in the context of 401(k) plans. Moreover, research in other domains has found that some consumers, particularly those in the lower socio-economic

strata, have a culture of distrust of financial institutions and consciously avoid doing business with them (Bertrand et al. 2006; Szykman et al, 2005). In a related focus group conducted by Szykman et al, (2005), respondents expressed feelings of alienation as well as an underlying belief that banks cannot be trusted to do the right thing. The participants also stated that they avoided doing business with banks because of these perceptions.

Generally speaking, the prior literature can perhaps be grouped into three broad theories of 401(k) saving behavior, both in the case of quitters of automatic enrollment plans and non-joiners in voluntary plans:

Hypothesis 1: Neoclassical Agents Theory: Under this theory, both quitters and non-joiners are forward-looking, rational agents and their decision not to participate is rationally explained by income-related budgetary effects, their own preferences for tax-deferred saving, or by the recognition that Social Security will provide adequate income in retirement.

Hypothesis 2: Rational Information Gap Theory: Under this theory, quitters and non-joiners are impeded by lack of information on basic savings and plan features and the transaction costs needed to accumulate that information. They are rational agents impeded by information or financial literacy problems.

Hypothesis 3: Behavioral Theory: Under this theory, quitters and non-joiners are impeded by psychological biases such as procrastination and mistrust that interfere with a purely rational assessment of their savings choices.

These theories are not necessarily mutually exclusive. For example, List (2004) examines how people with experience and without experience perform in an experiment using a well-functioning marketplace. Interestingly, he finds prospect theory (a

behavioral theory) adequately explains the behavior of inexperienced consumers in the experiment. In contrast, those with intense market experience react more in line with neoclassical predictions. Thus, it is possible that in 401(k) plans we can observe both rational and irrational behavior consistent with all three theories. In fact, it is difficult to determine from prior research whether the decision to participate in a 401(k) plan is rationally motivated or a function of behavioral biases. In many cases, the empirical evidence can support both rational and behavioral theories.

III. Administrative Data

This study is based on an analysis of administrative data and survey data from three 401(k) savings plans. The three plans studied were selected based on similar plan features and because the plan sponsors operated in similar industries. Administrative data, including employee demographics and certain plan features, were extracted from Vanguard recordkeeping systems under restricted access conditions. The date the administrative data were collected for each company plan varies slightly (Plan A- May 2006, Plan B- June 2006, and Plan C- June 2006).

Table 1 highlights the main features of each plan. The most important difference between the plans studied is the use of voluntary versus automatic enrollment. Plan A is a voluntary enrollment plan; eligible employees receive communication materials inviting them to join the plan upon employment. Plans B and C have an automatic enrollment feature; eligible employees receive communication materials notifying them that they are automatically enrolled after a given period following employment — 90 days in the case of Plan B and two months in the case of Plan C.

On other parameters the plans are quite similar. All three plans offer employer matches, catch-up contributions and the standard immediate vesting of *employees'* contributions. The employer match and the vesting schedules for these contributions vary by plan. In terms of investment options, all three plans offer individual fund options ranging from 11 funds to 14 funds. In addition to individual fund choices, Plans A and C also offer pre-mixed life cycle portfolios.

Table 1 reports the participation rate for new hires in each plan. An employee is considered an active participant if they were making positive *employee* contributions to the plan at the time the administrative data was extracted. The analysis in all three plans is limited to relatively new hires because Plan B and Plan C did not institute automatic enrollment until very recently and the feature did not apply to existing non-participating employees. The hire cut-off date is based on when auto-enrollment was introduced in each plan. We set the cut-off date for the voluntary plan, Plan A, to equal Plan C. Future studies will extend the analysis to examine the participants that were hired before these dates.

As expected given prior research, the automatic enrollment plans, Plans B and C, have higher new-hire participation rates, 85% and 78% respectively, than the voluntary plan, Plan A, at 63%.[2]

The administrative data provided includes several demographic variables including each participant's age, 2006 annualized income, hire date, marital status, gender, and ethnicity. The data also include each participant's total dollar balances in each 401(k) investment fund and total year to date 2006 contributions to each fund.

[2] Plan A survey employees have tenure ranging from 0 to 5.5 years. Vanguard reports overall participation rates of 38% for eligible employees with tenure of 0-1 years; 54% for eligible employees with tenure of 2-3 years; and 66% for eligible employees with tenure of 4-6 years. Vanguard, 2006.

Table 2 (under the "sample" column) presents descriptive statistics for our employee population.[3] Perhaps the most notable feature is the much higher income of employees in Plan A. Mean income for Plan A employees is approximately $70,000, compared with an approximate mean income of $38,000 for Plan B and $34,000 for Plan C. This disparity in income makes the higher new-hire participation rates under automatic enrollment for Plans B and C even more striking.

IV. Survey Data

Our telephone survey was administered to a random subset of the employees through the market research firm Greenwald Associates. Relevant questions from the survey can be found in Section V and Section VII. Table 2 presents the summary statistics associated with the survey respondents in total and by plan. The 817 survey respondents have very similar characteristics to the overall sample and to their respective plans.

Our goal was to survey 250 employees in the following four categories: automatic enrollment plan, non-participant; automatic enrollment plan, participant; voluntary plan, non-participant; voluntary plan, participant. Given the small total number of automatic enrollment non-participants, however, we were unable to reach our target in this one category. Table 3 presents the number of respondents in each category. There are approximately 250 respondents in each category except automatic enrollment non-participants, where the sample size is 62.

[3] Our sample includes the overwhelming majority of the employees eligible to participate in each plan who were hired after their respective cut-off dates. It excludes employees who had participated in the past year in market research for Vanguard or who previously asked not to be contacted. Although not reported here, the demographic statistics for the entire population of employees are very similar to our sample data. These results are available upon request.

A comparison of the survey respondents by participation status and plan type in Table 4 reveals once again that the respondents are very similar to the overall sample they are drawn from. Panel A compares participants and non-participants from the total sample to the survey respondents for the voluntary plan. Panel B does the same for the automatic enrollment plans. In all cases, the age, mean salary, salary distribution, job tenure, and sex of the respondents are very close to the overall sample statistics. Not too surprisingly, the reported mean salaries and distribution of salaries are lower for non-participants in both automatic enrollment and voluntary enrollment plans.

Table 5 provides more details about the survey respondents. Already from Table 2 we have observed that employees of Plan Sponsor A have higher salaries than the employees of Plan Sponsors B and C. Table 5 provides two possible reasons for the observed differences. First, Plan Sponsor A employees have significantly higher levels of educational attainment. Nine percent of employees in Plan Sponsor A have a high school education or less compared to 20% in Plan Sponsor B and 37% in Plan Sponsor C. Twenty-seven percent of Plan Sponsor A's employees have taken or completed post graduate work. This contrasts with 11% and 10% of employees in Plan Sponsors B and C, respectively. Second, Plan Sponsors B and C have a higher percentage of hourly workers (57% and 56%, respectively) compared to 28% in Plan Sponsor A.

V. Financial Literacy and Trust Measures

This section describes the financial literacy and trust measures used in this study. As a foundation for the later econometric analysis in Section VI, this section also provides a basic analysis of these measures and how they relate to education, salary, plan type and participation status.

V.1 Financial Literacy

V.1.A Construction of the Literacy Measure

Our literacy measure is derived from a seven question quiz that included three basic financial knowledge questions and four questions related to plan knowledge. The measure is a binary measure separating the participants into a high literacy group and a low literacy group. Participants scoring a six or seven on the quiz are considered part of the high literacy group, those scoring from zero to five are considered to be part of the low literacy group. Overall, 56% of the total survey sample are in the high literacy group. Broken down by plan, 51% of the automatically enrolled plans are part of the high literacy group and 59% of the voluntary enrollment plan are in the high literacy group.

V.1.B Further Description of the Individual Question Responses to the Literacy Quiz

Although the aggregate measure will prove to be important later on, we found studying the answers to each individual question informative as well. Therefore, this section will provide the additional insight we gained from analyzing the responses to the financial literacy questions.

The individual financial literacy questions are summarized below. Some of these questions were based on questions used in previous studies.

Basic Financial Knowledge Questions:

Question 1: If you are saving for a future goal, it's better to start early. That way your money earns more and builds up faster over time. True or False. (Source: Based on Hilgert and Hogarth(2003))

Question 2: If you were to invest $1,000 in a stock mutual fund, it would be possible to have less than $1,000 when you withdraw your money. True or False. (Source: John Hancock Financial Services (2002))

Question 3*:* In which ONE of the following products would you choose to invest your money for the highest expected long term growth? (Answer Choices: Stock Mutual Fund, Savings Account, CD, Insurance Policy, Don't Know/Refused)

Plan Knowledge Questions:

Question 4: Does your company currently offer a retirement plan? Yes or No.

Question 5: Do you currently contribute part of your paycheck to your company's retirement savings plan? Yes or No.

Question 6: Some employers offer a matching contribution in their retirement savings plan. With a matching contribution if you put in your money, the employer also adds some money to your account. Does your plan offer matching contributions? Yes or No.

Question 7: Are your participants allowed to take loans from your retirement savings account? Yes or No.

Overall, the respondents demonstrated a strong understanding of the concepts of time value of money and basic compounding (Question 1). Ninety-seven percent of the respondents recognized that savings should start early so that "your money earns more and builds up faster over time." Relatively fewer respondents understood that you could lose money in a stock fund (Question 2). Sixty-seven percent of the respondents answered this correctly. Finally, a similar percentage of people knew that stock mutual funds offer higher expected long-term growth compared to savings accounts, CDs, and insurance policies (Question 3). It is noteworthy that the percentage of participants answering each question correctly is higher than the percentage expected from random chance. Nearly half of the sample (49 percent) answered all three questions correctly. In addition, in Question 1 and 2 more people answered not sure (Question 1: 2%, Question 2: 20%) than incorrectly (Question 1: 1%, Question 2: 13%). This may indicate that some people understand what they do not know.

Questions 4 through 7 were asked to determine how much the employees know about the features offered by their company's 401(k). In addition to these questions, we also asked respondents what exactly was their employer match in their plan. The results for this question still need to be coded but will be included in the later analysis. Almost all respondents knew that their company offered a retirement savings plan (Question 4). Those answering this question correctly were asked Questions 5 through 7. Interestingly, almost all *active participants* knew they were participating (Question 5). One hundred

percent of the voluntary enrollment participants knew they were participating and 99% of the automatically enrolled participants knew. Most likely they are reminded quarterly by the arrival of their 401(k) statement.

On the other hand, non-participants in both types of plans often thought they were participating when they were not. Thirty-five percent of the non-participants in the voluntary enrollment plan incorrectly thought they were participating. Their confusion might have been caused by the fact that employees in the voluntary plan hired after January 1, 2005 receive a 4% employer contribution annually whether they make elective employee contributions or not. The 4% employer contribution may have caused some respondents to believe they are personally contributing when they are not. However, the large percentage (23%) of non-participants in the automatic enrollment plan answering not sure or yes is more puzzling because the explanation above does not hold for the automatically enrolled plans. Furthermore, all the non- participants in automatically enrolled plans must have actively opted to not participate.

Question 6 asks whether an employer match is offered in the plan. All three plans do offer a match. Once again, we observe a higher percentage of participants in both types of plans (Automatic: 96%, Voluntary: 97%) answering the question correctly than non-participants (Automatic: 78%, Voluntary: 88%). The percentage of not sure answers is also higher for non-participants (Automatic:10%, Voluntary:8%) than participants (Automatic: 2%, Voluntary: 2%) in both plans. This may suggest that one reason people fail to participate is that they don't understand the features in their plan.

Finally, question 7 inquires whether loans are available. Both Plan A and Plan B offer loans but Plan C does not. What is interesting is that the percentage of correct

answers is much lower than other questions. This might be because many employees might not be interested in taking a loan out of their 401(k) plan so they have not taken the time to learn about this particular option. Indeed, this question also generated a substantially higher percentage of "not sure" answers for all respondent types and plan types. The most knowledgeable group was the participants in the voluntary plan (58% answered correctly). This might be because they had to opt into the plan so they may have spent more time learning about the plan features relative to those who do not participate (42% answered correctly) or who were automatically enrolled into a plan (automatic enrollment, non-participants: 28%; automatic enrollment, participants: 32%) . This theory might also explain the large difference between plan types and participation status of those who get every question right. Fifty six percent of the participants in the voluntary enrollment plan got every question correct compared to 18% of the voluntary non-participants. In the automatic enrollment plans, the findings are similar. Thirty percent of the automatic enrollment participants got all the questions correct versus 15% of the non-participants. The difference between participants in voluntary plans (56%) and participants in automatic enrollment plans (30%) is also substantial. However, this difference might be a factor of the educational differences between the voluntary and automatic enrollment plan participants. It could also be the difference in effort required to join the plan.

V.1.C Financial Literacy, Education, Salary, Plan Type, and Participation Status

Figure 1 is a bar chart showing the number of survey respondents in each literacy category (low and high) by education. Interestingly, the only education category where

there are more individuals in the low literacy category than the high literacy category is high school. Figure 2 shows the number of participants in each literacy category by salary quartile. The quartiles were calculated using the entire respondent sample. The first quartile includes respondents earning less than $32,106, the second quartile includes respondents earning between $32,106 and $49,891, the third quartile includes respondents earning between $49,891 and $73,605, and the fourth quartile includes respondents earning more than $73,605. In the first quartile, the number of low literacy participants is greater than the number of high literacy participants. This pattern reverses for the subsequent quartiles. In addition, the percentage of high literacy respondents increases from quartile two to quartile four. Thus, these two figures suggest that individuals with low literacy are more likely to be individuals with a low level of education and/or earnings.

Figure 3 then breaks down these categories further by participation status and plan type. The results are dramatic. Non-participants (look at the bars over AN and VN) show low literacy individuals dominating high literacy individuals. On the other hand, this pattern reverses for participants (look at the bars AP and VP). This is an indication that literacy may play a role in the participation decision. However, another straightforward explanation is that non-participants tend to be less educated and lower salaried workers. Given that Figures 1 and 2 demonstrate that these groups tend to fall more into the low literacy group, this could also easily explain this result.

Therefore, it is necessary to look further. Figure 4 looks at the literacy categories based on education, plan type and participation status. What is striking is that for non-participants in *every* education category the number of individuals in the low literacy

category continues to dominate the number of individuals in the high literacy category. Once again, for the participant samples this pattern reverses. In *every* education category but one (high school in the automatically enrolled plan), individuals in the high literacy category dominate the number of individuals in the low literacy category.

Likewise, the patterns stay consistent when we break down the literacy category by salary quartiles, plan type and participation status (Figure 5). The number of low literacy individuals dominates the number of high literacy individuals for non-participants. On the participant side, high literacy dominates low literacy with the exception of respondents in the first salary quartile in the automatic plan. These graphs support the theory that literacy matters in the participation decision and that it *is not* driven by the relationship between literacy and education and salary.

V.2 Trust Measure

V.2.A Construction of the Trust Measure

As discussed earlier, many studies ask individuals if they are generally trusting. Consistent with Guiso et al. (2007) study of Italian data, we ask a more specific trust question. Our specific question is:

> ***Trust Question***: For the most part, financial institutions are trustworthy. Respondents must answer either strongly disagree, disagree, neither, agree, or strongly agree.

From the responses, we created a binary trust measure that equals one if the respondent answered agree or strongly agree (256 individuals) and zero if they gave one of the three other answers (541 individuals) or did not answer (20 individuals).

V.2.B Trust, Education, Salary, Plan Type and Participation Status

We completed a parallel analysis to Section V.1.C for trust. Figure 6 shows that in all education categories there are more trusting people than not. The category that has the highest percentage of individuals with low trust is high school. In the high school category, 42% of individuals have low trust versus 58% with high trust. Likewise, in Figure 7, in every salary quartile there are more high trust individuals than low trust. Similar to literacy, it seems that low trust can be associated more with lower educated individuals.

Figure 8 shows that nearly half of the automatically enrolled, non-participants have low trust. This is a much higher percentage than participants in either type of plan and non-participants in voluntary plans. What can explain the difference between non-participants across voluntary and automatic enrollment plan types? One explanation is that in voluntary enrollment plans individuals tend to procrastinate. The dramatic increase in participation rates for plans that switch to automatic enrollment suggests this could be a very significant factor. This effect may be dominating the effect of trust in voluntary plans. In contrast, someone who quits an automatically enrolled plan is not a procrastinator because they must take action not to participate. What drives them not to participate and take action could be effects like trust or literacy.

Figure 9 breaks down the trust categories by education, participation status and plan type. Low trust individuals only dominate for non-participants in automatically enrolled plans in the high school educated category and for the very small number of participants in the high school educated category of voluntary plans. What is interesting is that high trust individuals clearly dominate in the automatically enrolled participants high school category (33% vs. 67%). Given that the overall proportion of low trust to high trust individuals in high school is less pronounced (42% vs. 58%), the difference here is noteworthy. Figure 10 repeats the analysis looking at salary categories.

VI. Econometric Analysis

The figures discussed in the previous section suggest that literacy and trust may play a role in the participation decision. This section will test the significance of these measures and standard demographic variables used in previous work. Consistent with previous work, we use a probit regression to assess the probability of participation for each variable.

Table 6 presents the results for the standard specification used in previous literature using the entire plan sample. These results are reported to compare with the results from the smaller survey sample and to previous literature. Two specifications are included. One specification includes the following variables: salary (in $10,000), age, age squared, and dummy variables for gender (the omitted variable is female) and race (the omitted variable is white). The second specification includes two additional variables, a marriage dummy and an interactive variable for married males, which is motivated by Sundén and Surette (1998). While the second specification is preferred, we were

concerned by the large number of missing data on marital status for many individuals in both plans. The first specification allows us to retain more individuals in the regression analysis.

The majority of previous literature examines voluntary enrollment plans and our results reported in the first column are fairly consistent. Salary is strongly significant and so is marriage. We also find that race plays a role with minorities less likely to participate. This could be related to trust. Age, a variable that is typically significant, is not significant in this study. This is most likely because of how we restricted the sample to only new hires. Furthermore, we did not include job tenure, a variable that is generally significant in prior research, because once again we limited our sample to a group of new hires and the short time-span of the sample makes this variable less relevant.

Past research has shown that automatic enrollment plans tend to equalize enrollment across demographic groups (Madrian and Shea, 2001). Therefore, we would expect that demographic variables would be less significant in this regression. The results show that salary is still important and that Hispanics are less likely to participate than Whites. Once again this race finding could be related to trust.

Table 7 reports the probit results for survey respondents only. The standard specification is reported in the first columns. Focusing first on the voluntary plan, race no longer plays a role. This is most likely because of the very low number of minorities in the respondent sample. Consistent with the larger sample in Table 6, salary and marriage are significant. The table also reports the marginal effects for each variable. These variables are calculated at the mean of the continuous variables (age and salary) with all other dummy variables set to zero. The marginal effects for the dummy variables are the

change in probability given a change from zero to one of the relative dummy variable. Since the salary variable is in tens of thousands of dollars, a $10,000 increase in salary for a white unmarried woman with average age and average salary is 4.24 %. [4] In addition, marriage increases the probability of participating for this type of person by 18% .

On the automatic enrollment side, none of the variables are significant, which is what you would expect with this type of a plan. However, salary and race did have an effect in the larger sample.

The next column adds a low literacy dummy variable and the number of dependents (elderly and children) to the specification.[5] For the voluntary plan, marriage and salary stay significant. Each dependent reduces the probability of participating by 5%. This might be because the extra costs associated with dependents decrease funds available for savings. For example, children lead to education costs and elderly lead to health costs. Low literacy is significant. Someone with low literacy is 34 % less likely to participate. The standard demographic variables remain insignificant for the automatic enrollment plan but literacy is also important. While the marginal effect is smaller than the voluntary plan, it is meaningful. Someone in the low literacy category is 21% less likely to participate.

In the next column, this analysis is repeated by adding our trust measure and the dependent measure. In this case, trust is not important in the voluntary plan but very

[4] Going forward, please assume the marginal effects related to a white unmarried woman with average age and salary.

[5] Consistent with the previous regression, the marginal effects are calculated at the means of the continuous variables and with the dummy variables set to zero. The mean number of dependents is one and the low literacy variable is set to zero. This means that these new marginal effects consider an individual with one dependent and that is considered highly literate.

important in the automatically enrolled plan. Someone with high trust is 17% more likely to participate. This is consistent with the theory that procrastination may be overshadowing the influence of trust in the voluntary plan but not a factor in the automatic plan.

The final specification uses both the trust and literacy measure. Interestingly, the marginal effects are relatively stable across specifications and literacy is important in both plans. Low literacy individuals are 34% less likely to participate in the voluntary plan and 26% less likely to participate in the automatic plan. Trust is once again only important in the automatically enrolled plan, increasing the probability of participation by 14%.

This analysis is repeated by substituting education for salary in Table 8. The results stay very similar for trust and literacy. In sum, the econometric analysis is consistent with previous research but contributes to the literature by showing a very important role of financial literacy in both type of plans and trust in automatic enrollment plans.

V.II. A Closer Look at Reported Reasons for Non-Participation

We were able to directly ask non-participants why they do not participate and their answers are discussed in this section. Their responses complement the previous econometric analysis and allow us to specifically address rational theories for non participation, including confidence in Social Security and money constraints, and behavioral theories, such as peer effects.

These questions were only raised to individuals that *correctly* identified their participation status. For example, a large number of actual non-participants (34%) in the voluntary plan thought they were participating (see the discussion on page 18). We did not ask these employees why they were not participating because they thought they were contributing to the plan. Table 9 provides more details about the subset of individuals asked these questions. Of the 62 non-participants in the automatic enrollment plan, 46 employees correctly identified their participation status and 5 were not sure. These 51 employees were asked several questions about why they were not participating. For the voluntary plan, out of the 250 actual non-participants, only 151 knew they were not participating and 4 were unsure. This group of 155 employees was also asked questions regarding why they were not participating.

Table 10 provides the tabulated and mean responses to the questions. Contrary to hypothesis one, it does not appear that non-participants think Social Security will be enough when they retire (Question 8). Ninety-four percent of the non-participants in the automatic enrollment plans and 85% of non-participants in the voluntary plan disagreed or strongly disagreed with this statement. Nor does it appear that employees believe that they are too young to save (Question 5). Ninety percent of the automatic enrollment, non-participants and 91% of the voluntary, non-participants disagreed or strongly disagreed with this statement. Supporting this, 92% of the automatic enrollment, non-participants and 86% of the voluntary, non-participants disagreed or strongly disagreed with the comment that retirement is too far away to worry about saving for it now (Question 6).

The answers do suggest that one reason some people may not be participating is because they are financially constrained. Question 2 in Table 10 asks participants how strongly they agree with the statement: "You can't afford to save in your company's retirement savings plan." Fifty-one percent of automatic enrollment, non-participants and 37% of voluntary, non-participants agreed or strongly agreed with this statement. The difference in the response between the two types of plans could be because the voluntarily enrolled employees earn on average more than the automatically enrolled employees and may be less financially constrained. It may also be because procrastination – *not money* – may be causing some employees not to participate in the voluntary plan. Under auto-enrollment, procrastination cannot be a factor in non-participation because the default option is enrollment.

A final rational reason why people may not participate is because they are using the 401(k) plan of their spouse to save for retirement. Forty-nine percent of automatic enrollment, non-participants and 38% of voluntary, non-participants agreed or strongly agreed with this statement.

Finally, the answers do not support peer effects (Question 7). Those who were not participating disagreed or strongly disagreed (94% of automatic enrollment, non-participants, 85% of voluntary, non-participants) with the statement "You're not in the retirement savings plan because most of your co-workers aren't in it either."

VIII. Conclusions

Prior research on 401(k) savings has focused on the importance of neoclassical variables in explaining variation in employee saving behavior, or on behavioral biases such as procrastination as impediments to rational decision-making. This paper highlights the importance of two other factors — financial literacy and trust — in the 401(k) savings choice, and assesses their impact in both voluntary and automatic enrollment arrangements.

We find that financial literacy is a critical variable in explaining variations in 401(k) saving behavior, both in voluntary and automatic enrollment plans, while trust plays an essential role in determining quit rates in automatic enrollment plans. The marginal effects of both financial literacy and mistrust appear substantial, especially when compared with the responsiveness of 401(k) saving to income. Our results support both a rational information gap theory — that some participants are impeded by a lack of adequate financial information — and a behavioral bias theory — that others may be influenced by the psychological level of trust they have in institutions. In addition, non-participants in both plans do not appear confident that Social Security will adequately provide for them when they are old. This attitude contradicts a purely rational-agents theory that employees choose not to save in their 401(k) plan because of anticipated support from Social Security.

Our findings contribute to the previous literature on 401(k) participation behavior, and underscore the notion that 401(k) savings behavior is driven by a complex set of factors, including neoclassical employee and plan design variables, information or transaction cost problems such as financial literacy, and psychological or behavioral

biases such as procrastination and mistrust. These findings highlight the importance of ongoing efforts at 401(k) education in the workplace. Increased employee education appears to enhance voluntary 401(k) saving, and it reduces quit rates in automatic enrollment plans. Our findings also suggest that trust plays a crucial role in influencing quit rates in automatic enrollment plans, and that employers confronting high quit rates in automatic enrollment plans may wish to consider efforts not only to improve financial literacy but to reduce employee mistrust of financial institutions, particularly among the lowest paid.

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Table 1: Plan Features

This table describes the main plan features of each plan.

	Plan A	Plan B	Plan C
Company Description	Global electronics firm.	Service company providing integrated technology solutions to clients.	Manufacturer of packaging products, merchandising displays and recycled paperboard.
Enrollment Method	Voluntary	Automatic enrollment introduced 7/1/2003	Automatic enrollment introduced 1/1/2001
Participation Rate for New Hires after Cut-Off Date	63.34% (Hires after 1/1/2001)	84.49% (Hires after 7/1/2003)	77.84% (Hires after 1/1/2001)
Eligibility	As soon as administratively feasible provided employees are schedule to work at least 1,000 hours per year.	Employees are auto-enrolled the first day of the month after they have completed 90 calendar days of employment.	Full-time or part-time salaried employees age 18 or older are automatically enrolled after two months.
Employee Contributions	1%-50% in 1% increments or up to federal limits. The employee can contribute 1% to 15% on an after-tax basis. All contributions combined may not exceed 50%. Pre-tax and Roth contributions combined subject to IRS limits.	Participants hired after 7/1/2003 are auto-enrolled at 3%. Recommended to contribute 6% to maximize the match. Contributions can range from 1%-50% in 1% increments or up to the federal limits	Participants hired after 1/1/2001 are auto-enrolled at 2% in the target retirement fund most closely related to when the participant reaches 65. Contributions can range from 1-75% in 1% increments on a pre-tax basis or up to federal limits.
Catch-up Contributions	Yes. If the employee reaches 50 or older in 2006 and contributes the maximum allowed, the employee may contribute an extra $5,000 on a pre-tax or Roth basis.	Yes. If the employee reaches 50 or older in 2006 and contributes the maximum allowed, the employee may contribute an extra $5,000 on a pre-tax basis.	Yes. If the employee reaches 50 or older in 2006 and contributes the maximum allowed, the employee may contribute an extra $5,000 on a pre-tax basis.
Auto increase	Yes. It is a voluntary program. The participant must specify whole percentage point increases from 1 to 3 percentage points. The auto increase stops at the IRS limit or 50% on a pre-tax or Roth basis.	Yes. It is a voluntary program. The participant must specify whole percentage point increases from 1 to 3 percentage points. The auto increase stops at the IRS limit or 50% on a pre-tax basis.	Participants are automatically enrolled in the program. The contributions increase by 1% each year. Participants may opt out.
Match	For every $1 contributed, Plan A contributes $.50 on the first 6%.	For participants hired after July 1,2003, the employer contributes one dollar to the employee's account for every dollar saved up to 3% of the employee's pay and $0.50 for every dollar saved from 3% to 6% of pay. The company may also vote during the first quarter of each year, to make an additional matching contribution. The matching funds are invested in the company's stock fund for at least 12 months then may be transfered out.	For participants hired after 1/1/2005, the company may make a matching contribution of $1 for every $1 up to 3% and $0.50 for every $1 contributed for the next 2%. All salaried and non-union hourly employees who, on 12/31/04 are under age 35 and who also have less than 5 years of vesting service receive the enhanced match (100% on the first 3% and 50% on the next 2%). All other employees had the choice of freezing the DB benefit and receiving the enhanced match or receive the prior match (50% up to 6%) and the new reduced pension plan formula.
Vesting	Participants are 100% vested in their own contributions. The vesting schedule for the matching contributions is as follows: 0 % for less than one year, 50% for one year, 100% for two years. For those who receive the 4% additional company contribution the vesting schedule is as follows: for less than 5 years 0%, after 5 years 100%.	Participants are 100% invested in their own contributions. For participants hired after 7/1/2003 matching contributions are 100% vested after three years of service or if the employee is terminated due to retirement on or after the normal retirement age, "disability" or death.	Participants are 100% vested in their own contributions. Participants are 100% vested in their match after three years.
Investment Options	Tier One: Four pre-mixed portfolios. Recommended to invest 100% in one. Tier Two: 11 individual fund options.	14 individual fund options.	Tier One: 6 target retirement funds. Tier two: 14 individual fund options.
Advice	Financial Engines and paper quiz fund advice	Financial Engines	Financial Engines
Loans	Yes, one loan only.	Yes, two loans only for hardship reasons.	No.
Withdrawals	Rollover, After-tax, Age 59 1/2, Hardship withdrawals	Age 59 1/2	Age 50 1/2, Hardship withdrawals.
Roth Feature	Yes	No	No
Account Access	Fund transfers, starting and stopping contributions, changing payroll deduction, changing the future investment direction of contributions, and requesting loans can by made at anytime by phone or online. Withdrawals can be made at any time via the telephone.	24 hour automated phone or online. Participants can make fund transfers or changes to future investment direction at anytime.	24 hour automated phone or online. Participants can make fund transfers or changes to future investment direction anytime.
Other Retirement Plans Offered	Defined benefit plan for employees employed before 1/1/2005. Employees joining after January 1, 2005 are not offered this option. This group receives a 4% contribution to the DC plan whether they participate or not.	Defined benefit plan offered to employees hired before 7/1/2003.	Defined benefit plan offered to employees hired before 1/1/2005.

Table 2: Demographic Comparison of Survey Sample and Survey Respondents

This table compares summary statistics estimated from the survey sample and subsample of the respondents to the survey in total and by plan.

Type of Enrollment	**Voluntary and Automatic**		**Voluntary**		**Automatic Enrollment**			
Plan	**All Three Plans**		**Plan A**		**Plan B**		**Plan C**	
Sample	*Sample*	*Respondents*	*Sample*	*Respondents*	*Sample*	*Respondents*	*Sample*	*Respondents*
Cutoff Date			1/1/2001		7/1/2003		1/1/2001	
N	9,521	817	5,925	502	1,269	116	2,327	199
Age								
Mean	40	40	40	40	39	41	39	40
Median	39	39	39	38	38	40	38	39
Std	10	10	9	10	11	12	10	11
Min	21	21	21	21	21	22	21	22
Max	78	69	77	69	74	66	78	65
Salary								
Mean	$57,905	$55,791	$69,803	$66,463	$37,994	$35,784	$34,380	$39,808
Median	$50,929	$49,891	$65,510	$62,509	$34,004	$34,039	$28,873	$30,603
Std	$35,687	$32,109	$35,011	$30,349	$16,884	$12,327	$28,691	$32,607
Min	$1,040	$3,090	$1,040	$19,760	$9,149	$9,149	$1,105	$3,090
Max	$450,000	$236,588	$450,000	$236,588	$175,000	$91,052	$286,133	$230,984
Salary Categories								
$ 0- $ 10,000	2%	1%	0%	0%	1%	1%	7%	3%
$ 10,000-$ 20,000	4%	5%	0%	0%	4%	3%	14%	20%
$ 20,000-$ 30,000	14%	15%	8%	10%	26%	25%	23%	23%
$ 30,000-$ 40,000	16%	15%	9%	8%	40%	43%	19%	18%
$ 40,000-$ 50,000	11%	13%	11%	13%	13%	16%	7%	12%
$ 50,000-$ 60,000	10%	11%	13%	14%	6%	6%	5%	7%
$ 60,000-$ 70,000	9%	10%	13%	14%	5%	4%	2%	3%
$ 70,000-$ 80,000	9%	10%	14%	14%	2%	0%	1%	3%
$ 80,000-$ 90,000	6%	6%	9%	9%	2%	0%	1%	2%
$ 90,000-$100,000	5%	5%	7%	7%	1%	1%	1%	2%
$100,000+	10%	8%	15%	11%	1%	0%	3%	5%
Missing	4%	1%	0%	0%	0%	0%	17%	5%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Tenure (years as of 6/30/2006)								
Mean	2.34	2.25	2.41	2.12	1.55	1.52	2.63	3.00
Median	2.06	1.93	2.14	1.61	1.50	1.59	2.57	2.93
Std	1.55	1.55	1.60	1.61	0.77	0.78	1.61	1.45
Min	0.12	0.12	0.12	0.12	0.20	0.20	0.18	0.28
Max	5.49	5.49	5.49	5.49	3.00	2.90	5.49	5.45
Sex								
Female	30%	28%	34%	30%	22%	22%	25%	25%
Male	66%	71%	66%	70%	78%	78%	58%	71%
Missing	4%	1%	0%	0%	0%	0%	17%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Ethnic Group								
White	72%	79%	75%	78%	79%	85%	62%	80%
Black/African-American	8%	6%	7%	4%	11%	6%	10%	9%
Hispanic	6%	4%	5%	4%	6%	6%	9%	5%
Other	9%	9%	13%	13%	4%	3%	2%	3%
Missing	5%	1%	1%	1%	0%	0%	17%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 3: Number of Respondents by Plan Type and Participation Status

This table reports the number of respondents by plan type (automatic and voluntary) and participation status.

	Non-Participant	Participant	Total
Automatic	62	253	315
Voluntary	250	252	502
Total	312	505	817

Table 4: Demographic Comparison of Survey Sample and Survey Respondents by Plan Type and Participation Status

These tables compare summary statistics for the survey sample and the subsample of survey respondents by plan type (voluntary or automatic enrollment)

Panel A: Voluntary Enrollment Plan

Type of Enrollment	**Voluntary Enrollment**			
Participation Status	**Non-Participant**	**Non-Participant**	**Participant**	**Participant**
Sample	*Sample*	*Respondents*	*Sample*	*Respondents*
N	2,172	250	3,753	252
Age				
Mean	39	39	41	40
Median	38	37	40	39
Std	10	10	9	10
Min	21	22	21	21
Max	77	69	69	62
Salary				
Mean	$57,841	$58,468	$76,722	$74,395
Median	$53,019	$55,308	$70,846	$68,768
Std	$30,438	$27,784	$35,615	$30,754
Min	$1,040	$19,760	$13,198	$20,452
Max	$345,000	$220,207	$450,000	$236,588
Salary Categories				
$ 0- $ 10,000	0%	0%	0%	0%
$ 10,000-$ 20,000	1%	0%	0%	0%
$ 20,000-$ 30,000	17%	16%	3%	3%
$ 30,000-$ 40,000	15%	10%	6%	6%
$ 40,000-$ 50,000	13%	14%	10%	12%
$ 50,000-$ 60,000	12%	14%	13%	13%
$ 60,000-$ 70,000	10%	10%	14%	17%
$ 70,000-$ 80,000	11%	15%	15%	13%
$ 80,000-$ 90,000	7%	10%	10%	9%
$ 90,000-$100,000	5%	4%	8%	10%
$100,000+	8%	5%	19%	16%
Missing	0%	0%	0%	0%
Total	100%	100%	100%	100%
Tenure (years as of 6/30/2006)				
Mean	1.86	1.60	2.72	2.63
Median	1.43	1.18	2.56	2.46
Std	1.46	1.37	1.59	1.67
Min	0.12	0.12	0.16	0.22
Max	5.49	5.49	5.49	5.49
Sex				
Female	35%	33%	33%	28%
Male	65%	67%	67%	72%
Missing	0%	0%	0%	0%
Total	100%	100%	100%	100%
Ethnic Group				
White	70%	76%	78%	80%
Black/African-American	11%	5%	5%	4%
Hispanic	7%	5%	3%	3%
Other	12%	12%	13%	14%
Missing	1%	2%	0%	0%
Total	100%	100%	100%	100%

Panel B: Automatic Enrollment Plans

Type of Enrollment	**Automatic Enrollment**			
Participation Status	**Non-Participant**	**Non-Participant**	**Participant**	**Participant**
Sample	*Sample*	*Respondents*	*Sample*	*Respondents*
N	713	62	2,885	253
Age				
Mean	38	38	39	41
Median	37	38	39	40
Std	10	10	11	11
Min	21	24	21	22
Max	74	59	78	66
Salary				
Mean	$26,670	$30,372	$38,167	$40,212
Median	$23,660	$27,814	$32,698	$33,561
Std	$14,114	$19,375	$26,288	$28,050
Min	$1,636	$12,529	$1,105	$3,090
Max	$145,116	$145,116	$286,133	$230,984
Salary Categories				
$ 0- $ 10,000	5%	0%	5%	3%
$ 10,000-$ 20,000	25%	26%	7%	11%
$ 20,000-$ 30,000	31%	26%	22%	23%
$ 30,000-$ 40,000	20%	31%	28%	26%
$ 40,000-$ 50,000	5%	6%	10%	15%
$ 50,000-$ 60,000	2%	3%	6%	8%
$ 60,000-$ 70,000	1%	3%	3%	3%
$ 70,000-$ 80,000	1%	0%	2%	2%
$ 80,000-$ 90,000	0%	0%	1%	2%
$ 90,000-$100,000	0%	0%	1%	2%
$100,000+	0%	2%	2%	4%
Missing	9%	3%	12%	3%
Total	100%	100%	100%	100%
Tenure (years as of 6/30/2006)				
Mean	2.48	2.43	2.18	2.45
Median	2.18	2.07	1.92	2.33
Std	1.41	1.59	1.47	1.39
Min	0.18	0.20	0.19	0.25
Max	5.45	5.45	5.49	5.26
Sex				
Female	29%	32%	23%	22%
Male	63%	66%	66%	75%
Missing	8%	2%	12%	3%
Total	100%	100%	100%	100%
Ethnic Group				
White	64%	84%	69%	81%
Black/African-American	12%	10%	10%	7%
Hispanic	14%	5%	6%	6%
Other	3%	0%	3%	3%
Missing	8%	2%	12%	3%
Total	100%	100%	100%	100%

Table 5: Summary of Survey Responses

This table provides additional summary statistics based on the survey responses.

Type of Enrollment Plan	All	Voluntary	Automatic	
Plan	Plans A,B and C	Plan A	Plan B	Plan C
Marital Status				
Single	19%	21%	15%	17%
Married	64%	62%	74%	66%
Divorced	11%	12%	9%	12%
Widowed	0%	0%	2%	1%
Living with Partner	5%	6%	1%	5%
Refused	0%	0%	0%	0%
Total	100%	100%	100%	100%
Dependents				
Zero	42%	45%	35%	41%
One	19%	19%	22%	19%
Two	23%	25%	19%	23%
Three	10%	9%	16%	12%
More than Three	4%	3%	6%	6%
Missing	0%	0%	1%	0%
Total	100%	100%	100%	100%
Education				
High School	18%	9%	20%	37%
Some College	26%	23%	38%	28%
College	35%	40%	31%	25%
Post Graduate Work or Degree	21%	27%	11%	10%
Refused	0%	0%	0%	1%
Total	100%	100%	100%	100%
Home Ownership				
Rent	22%	26%	14%	16%
Own	72%	70%	78%	74%
Live in Other Person's House	6%	4%	8%	10%
Refused	0%	0%	0%	1%
Total	100%	100%	100%	100%
Full-time/ Part-time				
Full time	99%	99%	98%	100%
Part time	1%	0%	2%	1%
Refused	0%	0%	0%	0%
Total	100%	100%	100%	100%
Type of Job				
Hourly	39%	28%	57%	56%
Administrative	8%	9%	11%	7%
Management	16%	18%	5%	15%
Other Salary	36%	44%	27%	22%
Refused	1%	1%	0%	1%
Total	100%	100%	100%	100%

Table 6: Probit Regression Results for Plan Sample

This table reports the coefficients estimates for a probit regression. The dependent variable is a binary variable that equals one if the employee participated in his 401(k) plan or equals zero if he did not. Salary is measured in $10,000 units and age is measured in years. Male is a dummy variable that equals one if the employee is male and zero if the employee is female. Black, Hispanic and Other are dummy variables for race. Married is a dummy variable the equals one if the respondent is married. Married and Male is an interactive variable.The omitted variable is White. Robust standard errors are reported in parentheses. ** (*) indicates a significance of 1% (5%). The coefficients in these regressions are adjusted for heteroskedacity related to salary.

	Standard Specification One				Standard Specification Two			
	Voluntary Enrollment		Automatic Enrollment		Voluntary Enrollment		Automatic Enrollment	
Dependent Variables	Coefficient		Coefficient		Coefficient		Coefficient	
Constant	-1.521	**	0.196		-1.638	**	0.131	
	(0.522)		(0.396)		(0.608)		(0.405)	
Salary	0.3840	**	0.2950	**	0.3633	**	0.3006	**
	(0.040)		(0.041)		(0.044)		(0.042)	
Age	-0.003		-0.011		-0.003		-0.010	
	(0.026)		(0.000)		(0.030)		(0.020)	
Age Squared	0.000		0.000		0.000		0.000	
	(0.000)		(0.000)		(0.000)		(0.000)	
Male	-0.218	**	0.111		-0.194		0.183	
	(0.069)		(0.066)		(0.102)		(0.093)	
Black	-0.355	**	-0.008		-0.281	*	0.014	
	(0.111)		(0.091)		(0.136)		(0.093)	
Hispanic	-0.322	*	-0.497	**	-0.263		-0.508	**
	(0.140)		(0.101)		(0.155)		(0.102)	
Other	0.115		-0.097		0.078		-0.103	
	(0.105)		(0.181)		(0.118)		(0.181)	
Married					0.530	**	0.072	
					(0.127)		(0.113)	
Married and Male					-0.292		-0.158	
					(0.158)		(0.133)	
Wald chi2	107.50		70.37		97.27		71.38	
Prob>chi2	0.00		0.00		0.00		0.00	
N	5,884		3,184		4,220		3,149	

Table 7: Probit Regressions for Survey Sample Using Salary

This table reports the coefficients estimates for a probit regression. The dependent variable is a binary variable that equals one if the employee participated in his 401(k) plan or equals zero if he did not. Salary is measured in $10,000 units and age is measured in years. Male is a dummy variable that equals one if the employee is male and zero if the employee is female. Black, Hispanic and Other are dummy variables for race. The omitted variable is White. Married is a dummy variable the equals one if the respondent is married. Married and Male is an interactive variable. Number of Dependents is equal to the number of children or elderly living in the household not including the spouse. Low literacy is a dummy variable that equals one if the employee got 5 or less questions correct on the literacy test. Trust is equal to 1 if the participants strongly agrees or agrees to the statement "For the most part, financial institutions are trustworthy." Robust standard errors are reported in parentheses. ** (*) indicates a significance of 1% (5%). Marginal effects are calculated at the mean of the continuous variables with all the dummy variables set to zero. The marginal effects for the dummy variables are the change in probability given a change from zero to one of the relevant dummy variable.

Table 7: Probit Regressions for Survey Sample Using Salary (Cont.)

	Standard Specification				Standard Plus Literacy and Dependent Measures				Standard Plus Trust and Dependent Measures				Standard Plus Literacy, Trust and Dependent Measures			
	Voluntary		Automatic Enrollment		Voluntary		Automatic Enrollment		Voluntary		Automatic Enrollment		Voluntary		Automatic Enrollment	
Dependent Variables	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect
Constant	-0.791		0.854		-0.637		1.272		-1.526		0.497		-0.618		1.027	
	(0.970)		(1.213)		(1.014)		(1.336)		(1.012)		(1.320)		(1.024)		(1.396)	
Salary	0.113 **	0.0424	0.096	0.0302	0.086 **	0.0341	0.067	0.0162	0.108 **	0.0402	0.090	0.0344	0.086 **	0.0341	0.060	0.0200
	(0.025)		(0.057)		(0.025)		(0.050)		(0.026)		(0.056)		(0.025)		(0.048)	
Age	-0.015	-0.0052	-0.046	-0.0141	0.015	0.0057	-0.039	-0.0090	0.027	0.0099	-0.043	-0.0150	0.014	0.0053	-0.048	-0.0155
	(0.049)		(0.061)		(0.052)		(0.067)		(0.052)		(0.068)		(0.052)		(0.071)	
Age Squared	0.000		0.001		0.000		0.001		0.000		0.001		0.000		0.001	
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Male	0.214	0.0826	0.605	0.1474	0.241	0.0947	0.617	0.1052	0.218	0.0837	0.625	0.2047	0.241	0.0944	0.679	0.1750
	(0.196)		(0.334)		(0.210)		(0.348)		(0.197)		(0.342)		(0.210)		(0.358)	
Black	0.083	0.0316	-0.049	-0.0156	0.015	0.0061	0.022	0.0053	0.139	0.0529	0.125	0.0466	0.013	0.0054	0.139	0.0445
	(0.285)		(0.301)		(0.310)		(0.321)		(0.290)		(0.305)		(0.310)		(0.310)	
Hispanic	-0.295	-0.1036	0.111	0.0334	-0.054	-0.0216	0.164	0.0363	-0.292	-0.1019	0.253	0.0919	-0.057	-0.0229	0.321	0.0963
	(0.356)		(0.382)		(0.346)		(0.376)		(0.361)		(0.370)		(0.349)		(0.366)	
Other	0.006	0.0024	dropped		0.195	0.0771	dropped		-0.004	-0.0117	dropped		0.195	0.0771	dropped	
	(0.179)				(0.187)				(0.179)				(0.187)			
Married	0.457 *	0.1796	0.071	0.0218	0.578 *	0.2163	0.170	0.0375	0.525 *	0.2060	0.207	0.0760	0.578 *	0.2153	0.260	0.0797
	(0.208)		(0.338)		(0.228)		(0.359)		(0.210)		(0.348)		(0.228)		(0.362)	
Married and Male	-0.421	0.0972	-0.417	0.0738	-0.497	0.1257	-0.489	0.0613	-0.338	0.1584	-0.472	0.1276	-0.497	0.1251	-0.600	0.1008
	(0.258)		(0.409)		(0.279)		(0.421)		(0.261)		(0.417)		(0.280)		(0.430)	
Number of Dependents					-0.130 *	-0.0518	-0.045	-0.0107	-0.143 **	-0.0534	-0.053	-0.0202	-0.130 *	-0.0517	-0.031	-0.0105
					(0.058)		(0.075)		(0.054)		(0.070)		(0.058)		(0.074)	
Low Literacy					-0.982 **	-0.3421	-0.674 **	-0.2131					-0.982 **	-0.3434	-0.679 **	-0.2576
					(0.132)		(0.189)						(0.132)		(0.194)	
Trust									0.000	0.0000	0.496 **	0.1692	-0.014	-0.0056	0.503 **	0.1401
									(0.122)		(0.173)		(0.130)		(0.178)	
Pseudo R-Squared	0.062		0.049		0.156		0.098		0.070		0.076		0.156		0.123	
N	498		298		497		297		497		297		497		297	

Table 8: Probit Regressions for Survey Sample Using Education Variables

This table reports the coefficients estimates for a probit regression. The dependent variable is a binary variable that equals one if the employee participated in his 401(k) plan or equals zero if he did not. High School, Some College, College are dummy variables for education. The omitted category is some graduate work. Age is measured in years. Male is an dummy variable that equals one if the employee is male and zero if the employee is female. Black, Hispanic and Other are dummy variables for race. The omitted variable is White. Married is a dummy variable the equals one if the respondent is married. Married and Male is an interactive variable.Number of Dependents is equal to the number of children or elderly living in the household not including the spouse. Low literacy is a dummy variable that equals one if the employee got 5 or less questions correct on the literacy test. Trust is equal to 1 if the participants strongly agrees or agrees to the statement "For the most part, financial institutions are trustworthy." Robust standard errors are reported in parentheses. ** (*) indicates a significance of 1% (5%). Marginal effects are calculated at the mean of the continuous variables with all the dummy variables set to zero. The marginal effects for the dummy variables are the change in probability given a change from zero to one of the relevant dummy variable.

Table 8: Probit Regressions for Survey Sample Using Education Variables (Cont.)

	Standard Specification with Education instead of Salary				Standard Plus Literacy and Dependent Measures				Standard Plus Trust and Dependent Measures				Standard Plus Literacy, Trust and Dependent Measures			
	Voluntary		Automatic Enrollment		Voluntary		Automatic Enrollment		Voluntary		Automatic Enrollment		Voluntary		Automatic Enrollment	
Dependent Variables	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect	Coefficent	Marginal Effect
Constant	-0.540		1.089		-0.498		1.424		-1.471		0.741		-0.493		1.192	
	(0.999)		(1.272)		(1.051)		(1.375)		(1.047)		(1.350)		(1.064)		(1.425)	
High School	-1.170 **	-0.3853	-0.828 *	-0.2436	-0.954 **	-0.3635	-0.513	-0.1165	-1.149 **	-0.3707	-0.845 *	-0.3023	-0.954 **	-0.364	-0.538	-0.1675
	(0.247)		(0.405)		(0.279)		(0.414)		(0.251)		(0.398)		(0.279)		(0.410)	
Some College	-0.483 **	-0.1869	-0.843 *	-0.2491	-0.413 *	-0.1620	-0.625	-0.1499	-0.421 *	-0.1623	-0.910 *	-0.3284	-0.413 *	-0.162	-0.695	-0.2266
	(0.171)		(0.399)		(0.178)		(0.400)		(0.173)		(0.391)		(0.178)		(0.394)	
College	-0.163	-0.0648	-0.351	-0.0845	-0.116	-0.0443	-0.139	-0.0254	-0.118	-0.0468	-0.337	-0.1074	-0.116	-0.044	-0.176	-0.0478
	(0.146)		(0.413)		(0.152)		(0.422)		(0.147)		(0.410)		0.152		(0.419)	
Age	0.015	0.0059	-0.014	-0.0026	0.042	0.0154	-0.017	-0.0020	0.065	0.0254	-0.010	-0.0021	(0.042)	0.0155	-0.025	-0.0053
	(0.049)		(0.060)		(0.052)		(0.066)		(0.051)		(0.065)		0.052		(0.069)	
Age Squared	0.000		0.000		0.000		0.000		-0.001		0.000		0.000		0.001	
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Male	0.189	0.0747	0.570	0.0790	0.211	0.0760	0.551	0.0627	0.186	0.0741	0.574	0.1226	0.211	0.0759	0.607	0.1096
	(0.197)		(0.324)		(0.215)		(0.341)		(0.199)		(0.334)		(0.215)		(0.352)	
Black	-0.048	-0.0190	-0.090	-0.0190	-0.055	-0.0210	-0.008	-0.0013	0.021	0.0086	0.083	0.0227	-0.056	-0.0212	0.112	0.0266
	(0.287)		(0.302)		(0.311)		(0.326)		(0.294)		(0.297)		(0.311)		(0.308)	
Hispanic	-0.223	-0.0885	0.086	0.0162	0.044	0.0164	0.153	0.0230	-0.225	-0.0888	0.219	0.0560	0.043	0.0160	0.315	0.0671
	(0.319)		(0.363)		(0.322)		(0.364)		(0.320)		(0.346)		(0.325)		(0.355)	
Other	-0.038	-0.0152	dropped		0.165	0.0601	dropped		-0.039	-0.0154	dropped		0.165	0.0601	dropped	
	(0.184)				(0.198)				(0.186)				(0.198)			
Married	0.484 *	0.1843	-0.005	-0.0010	0.628 **	0.2001	0.086	0.0135	0.569 **	0.2165	0.131	0.0349	0.628 **	0.1997	0.177	0.0407
	(0.213)		(0.334)		(0.241)		(0.353)		(0.216)		(0.343)		(0.241)		(0.358)	
Married and Male	-0.321	0.1368	-0.271	0.0488	-0.420	0.1429	-0.334	0.0411	-0.228	0.2023	-0.317	0.0913	-0.420	0.1426	-0.452	0.0702
	(0.262)		(0.403)		(0.287)		(0.416)		(0.266)		(0.414)		(0.287)		(0.426)	
Number of Dependents					-0.164 **	-0.0615	-0.044	-0.0074	-0.174 **	-0.0694	-0.056	-0.0157	-0.163 **	-0.0614	-0.029	-0.0072
					(0.058)		(0.079)		(0.055)		(0.076)		(0.058)		(0.078)	
Low Literacy					-1.021 **	-0.3853	-0.657 **	-0.1603					-1.021 **	-0.3854	-0.665 **	-0.2152
					(0.131)		(0.189)						(0.131)		(0.195)	
Trust									-0.010	-0.0038	0.508 **	0.1124	-0.004	-0.0014	0.522 **	0.0989
									(0.124)		(0.176)		(0.131)		(0.180)	
Pseudo R-Squared	0.063		0.062		0.167		0.109		0.075		0.092		0.167		0.135	
N	496		298		495		297		495		297		0.495		297	

Table 9: Sample Being Asked Reasons for Participation and Non-Participation

Do you currently contribute part of your paycheck to your company's retirement savings plan?

	Automatic Enrollment		Voluntary Enrollment	
	Non-Participant	Participant	Non-Participant	Participant
Yes	9	**244**	85	**248**
No	46	5	151	1
Not Sure	5	1	4	0
Missing*	2	3	10	3
Total	62	253	250	252

*These are missing because these employees said their company did not offer a retirement plan. Therefore, they were not asked this question.

The shaded employees are asked the non-participation questions. The bolded employees are asked the participation question.

Table 10: Reasons for Not Participating

Question 1: My spouse/partner and I use his/her 401(k) plan to save for retirement.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	2%	9%
Disagree	31%	27%
Neither	10%	14%
Agree	43%	31%
Strongly Agree	6%	7%
Missing	8%	12%
Total	100%	100%
Mean	3.21	3.00
N	51	155

Question 2: You can't afford to save in your company's retirement savings plan.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	2%	8%
Disagree	31%	44%
Neither	16%	10%
Agree	35%	27%
Strongly Agree	16%	10%
Missing	0%	1%
Total	100%	100%
Mean	3.31	2.86
N	51	155

Question 3: You plan to join the retirement savings plan in the future.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	10%	2%
Disagree	10%	7%
Neither	6%	6%
Agree	49%	54%
Strongly Agree	25%	29%
Missing	0%	2%
Total	100%	100%
Mean	3.71	4.03
N	51	155

Question 4: You plan to join the retirement savings plan when you make more money.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	6%	3%
Disagree	24%	21%
Neither	4%	19%
Agree	43%	37%
Strongly Agree	22%	18%
Missing	2%	3%
Total	100%	100%
Mean	3.52	3.47
N	51	155

Table 10: Reasons for Not Participating (Cont.)

Question 5: You're to young to start saving for retirement.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	25%	37%
Disagree	65%	54%
Neither	4%	3%
Agree	4%	4%
Strongly Agree	2%	2%
Missing	0%	1%
Total	100%	100%
Mean	1.92	1.79
N	51	155

Question 6: Retirement is too far away to worry about saving for it now.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	25%	38%
Disagree	67%	48%
Neither	0%	5%
Agree	4%	8%
Strongly Agree	4%	1%
Missing	0%	0%
Total	100%	100%
Mean	1.94	1.86
N	51	155

Question 7: You're not in the retirement savings plan because most of your co-workers aren't in it either.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	49%	49%
Disagree	45%	36%
Neither	2%	5%
Agree	0%	6%
Strongly Agree	2%	3%
Missing	2%	1%
Total	100%	100%
Mean	2.00	1.75
N	51	155

Question 8: Social Security will be enough once you retire.

	Automatic Enrollment	Voluntary Enrollment
	Non-Participant	Non-Participant
Strongly Disagree	49%	49%
Disagree	45%	36%
Neither	2%	5%
Agree	0%	6%
Strongly Agree	2%	3%
Missing	0%	1%
Total	98%	100%
Mean	1.58	1.76
N	51	155

Figure 1: Financial Literacy vs. Education

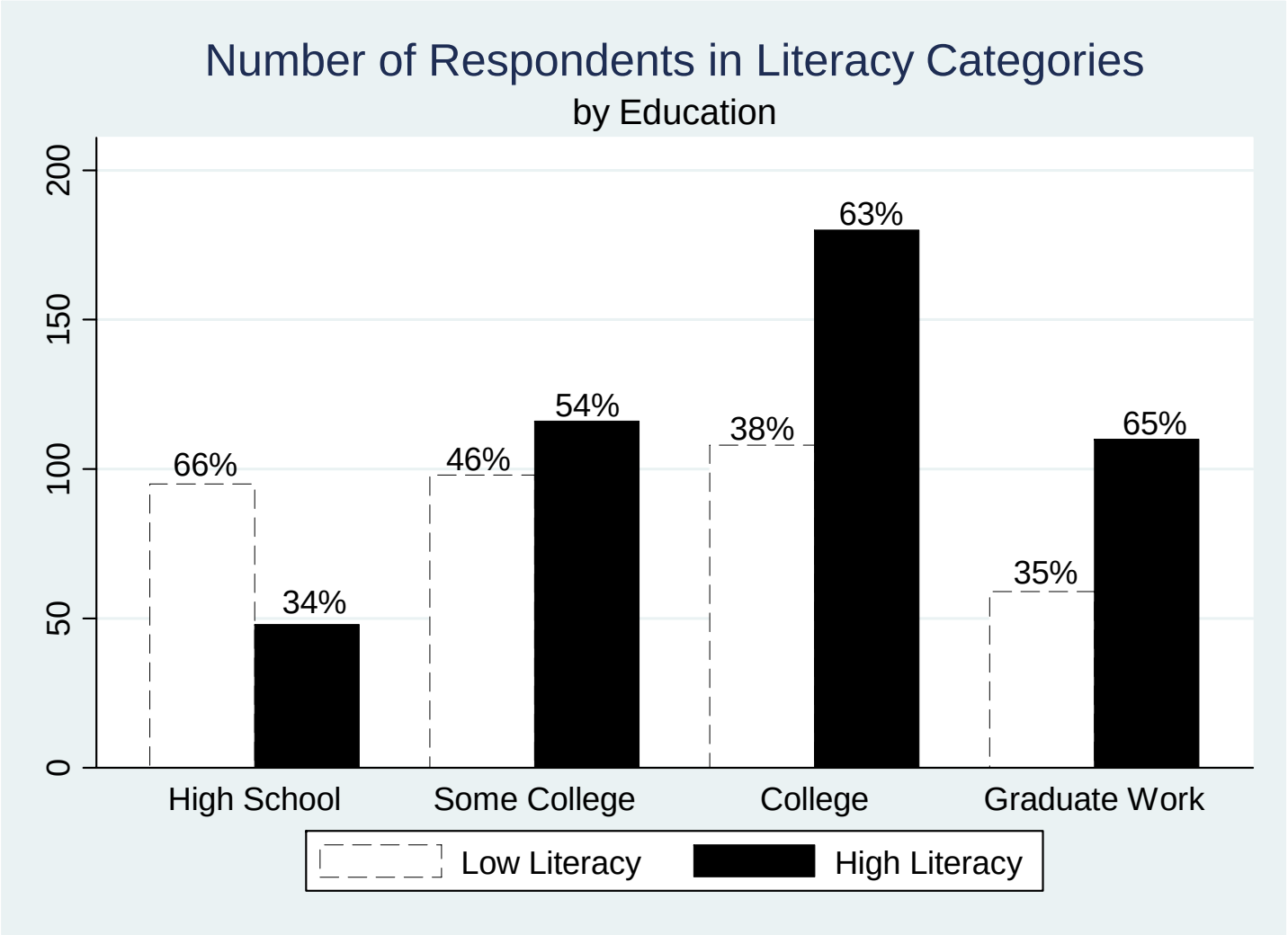


Figure 2: Financial Literacy vs. Salary

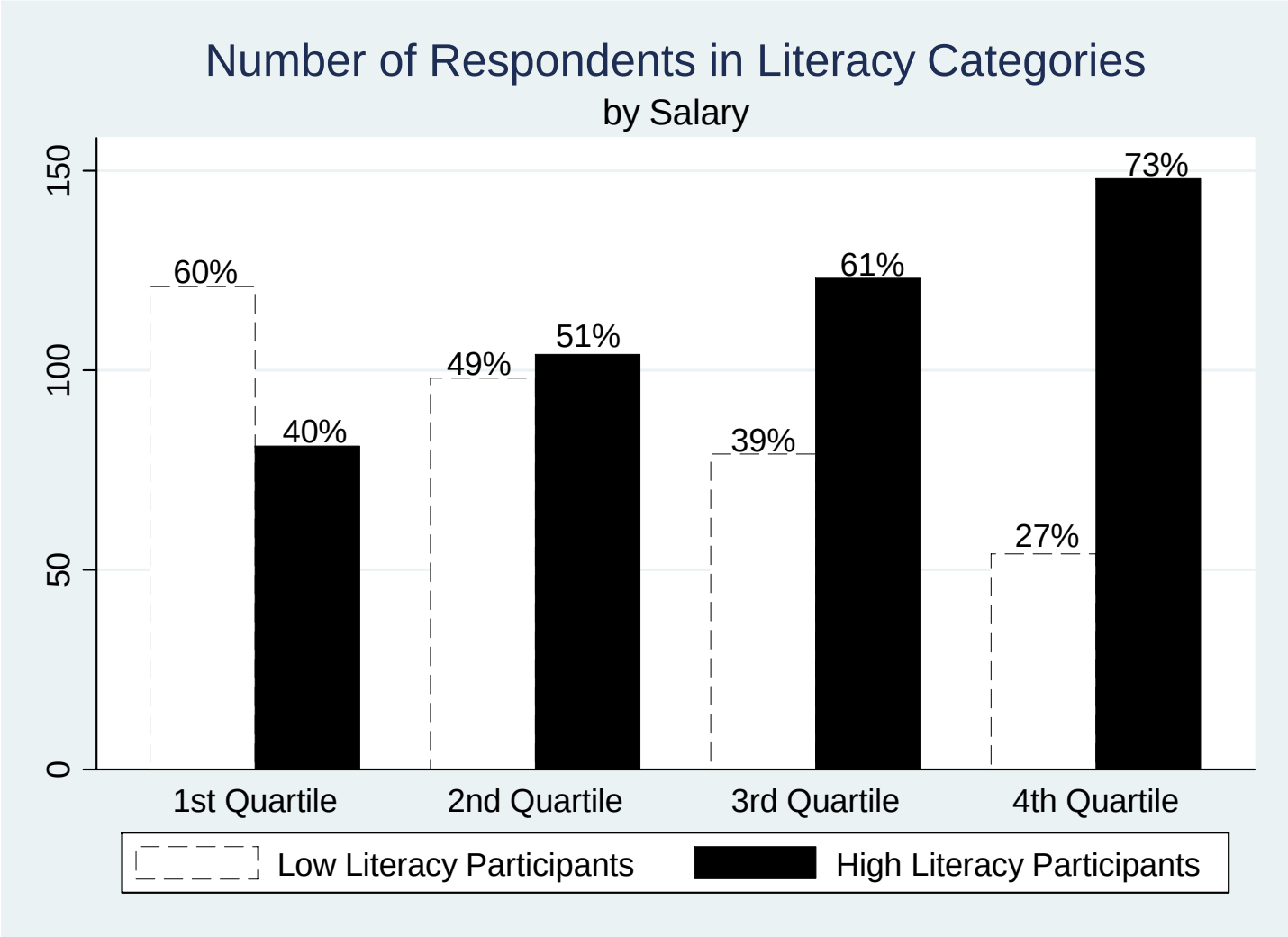


Figure 3. Financial Literacy vs. Plan Type and Participation Status

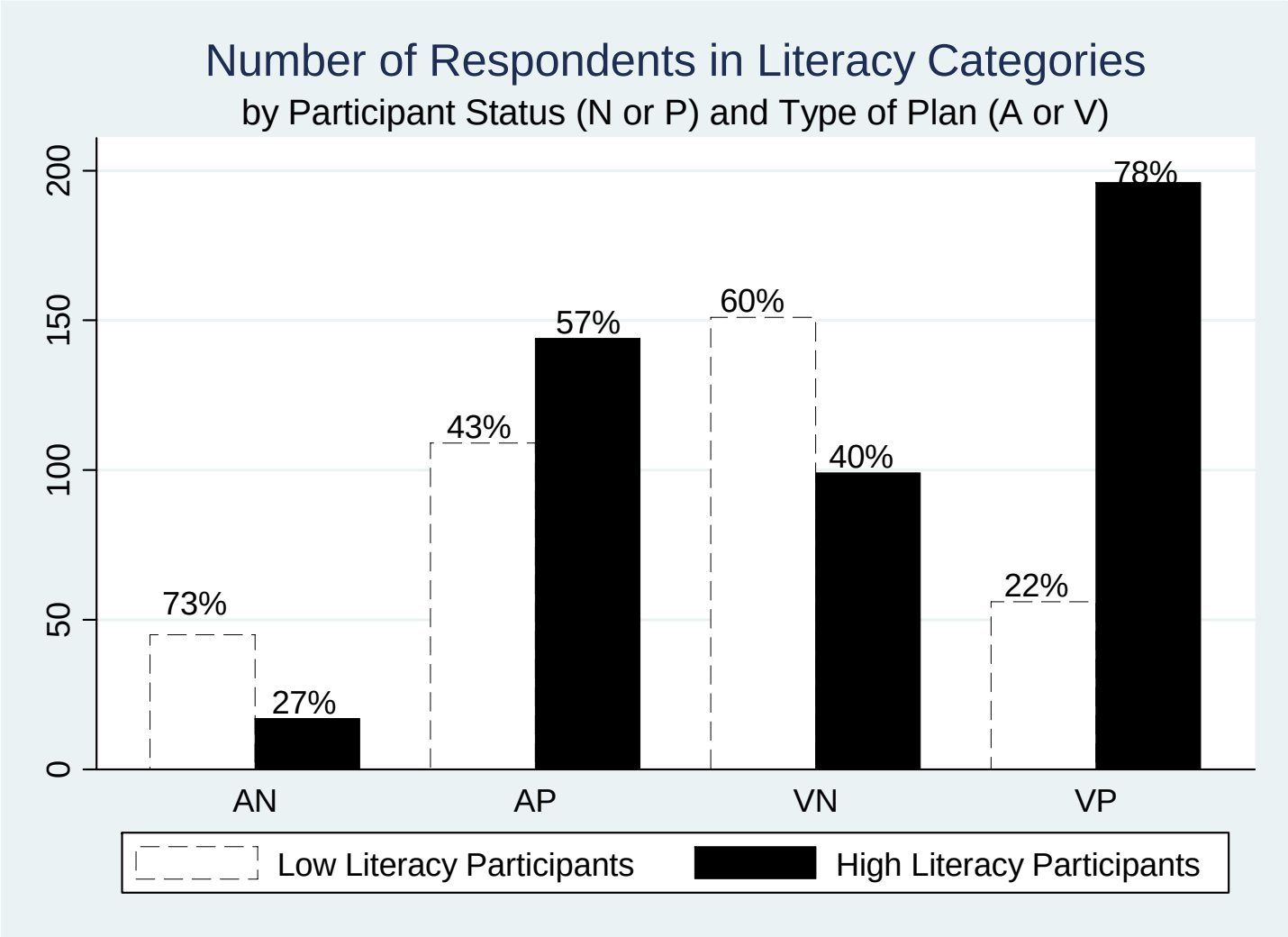


Figure 4: Financial Literacy vs Education by Plan Type/Participation Status

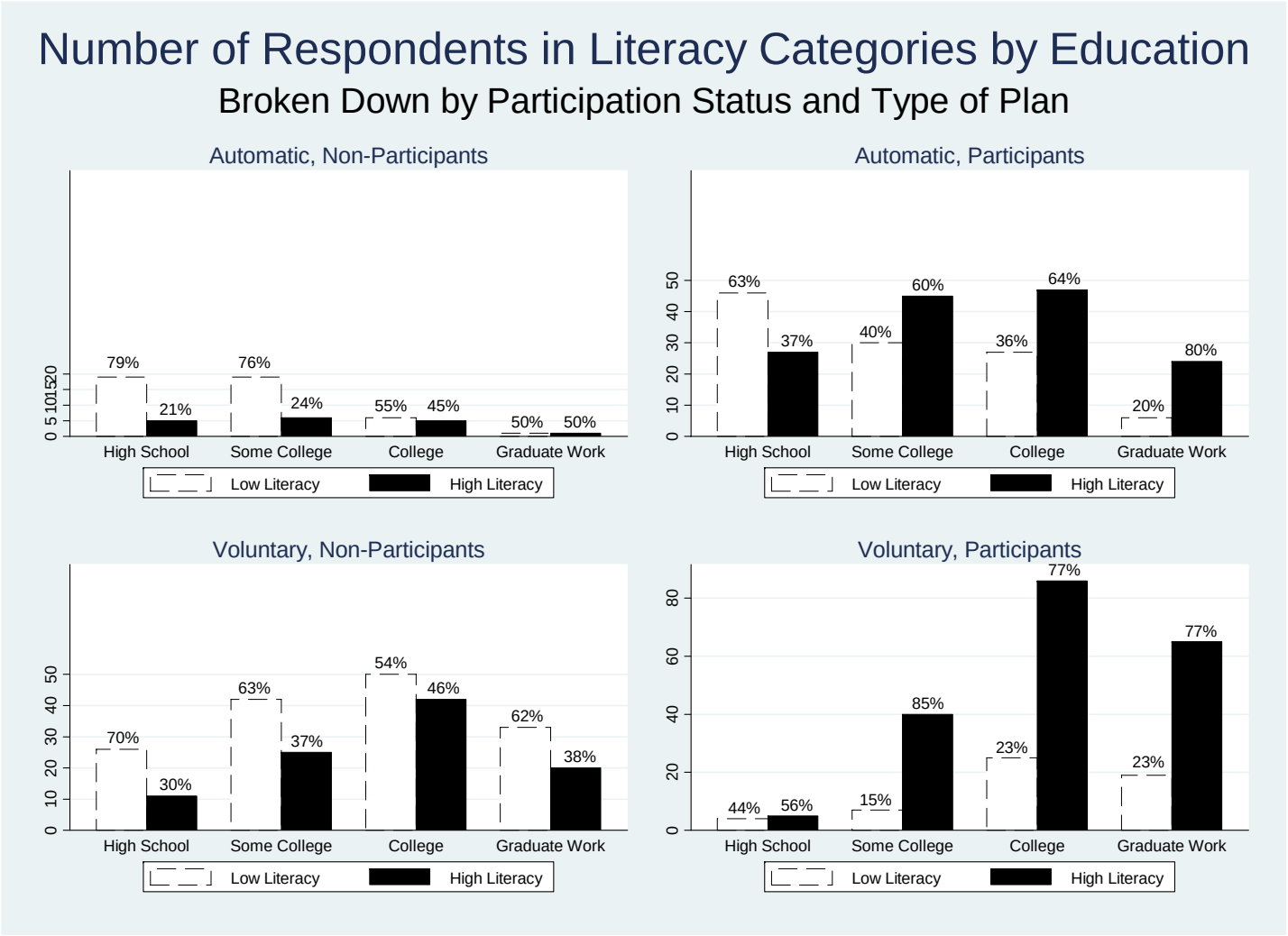


Figure 5: Plan Literacy vs. Salary by Plan Type/ Participation Status

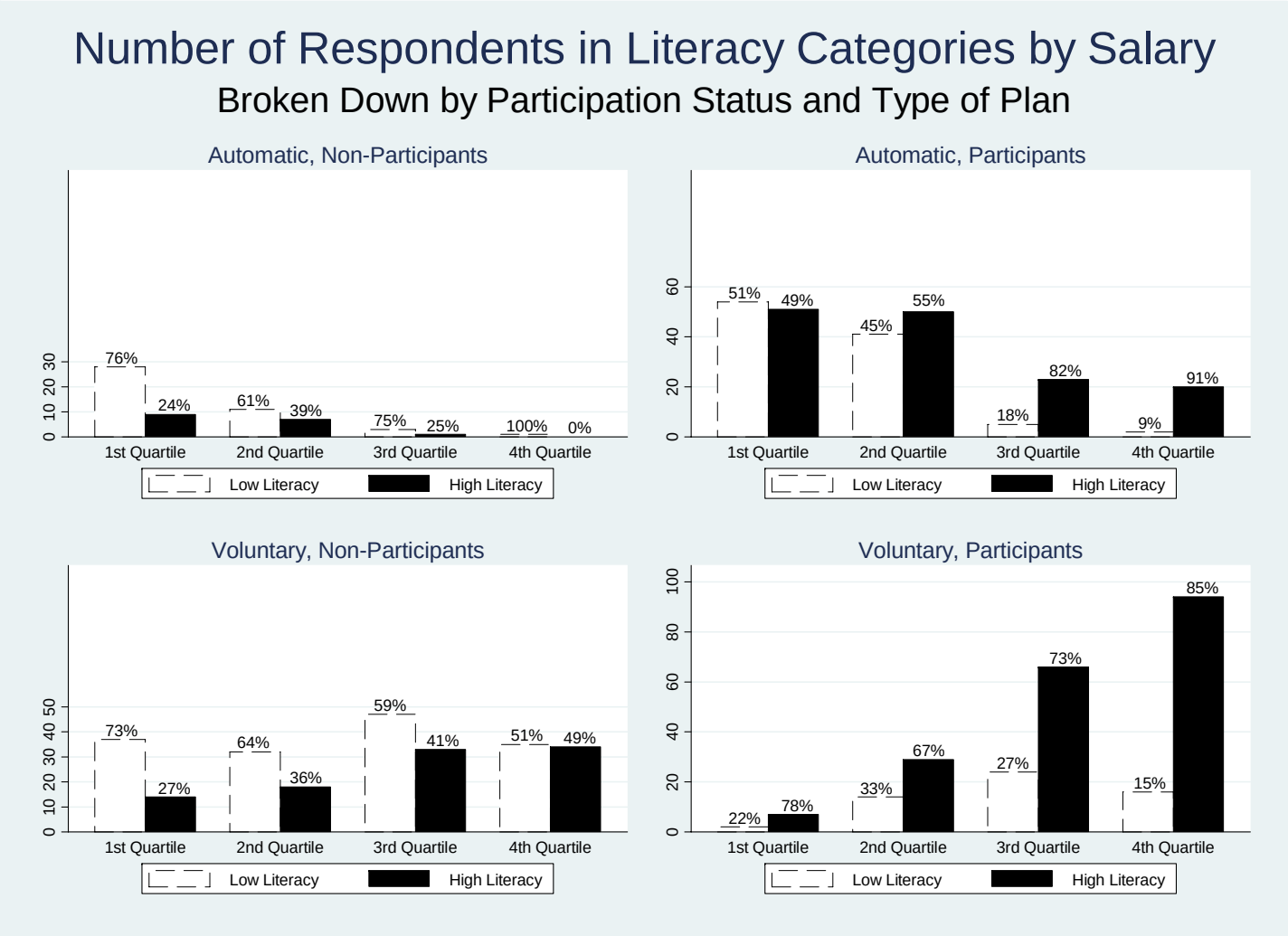


Figure 6: Trust vs. Education

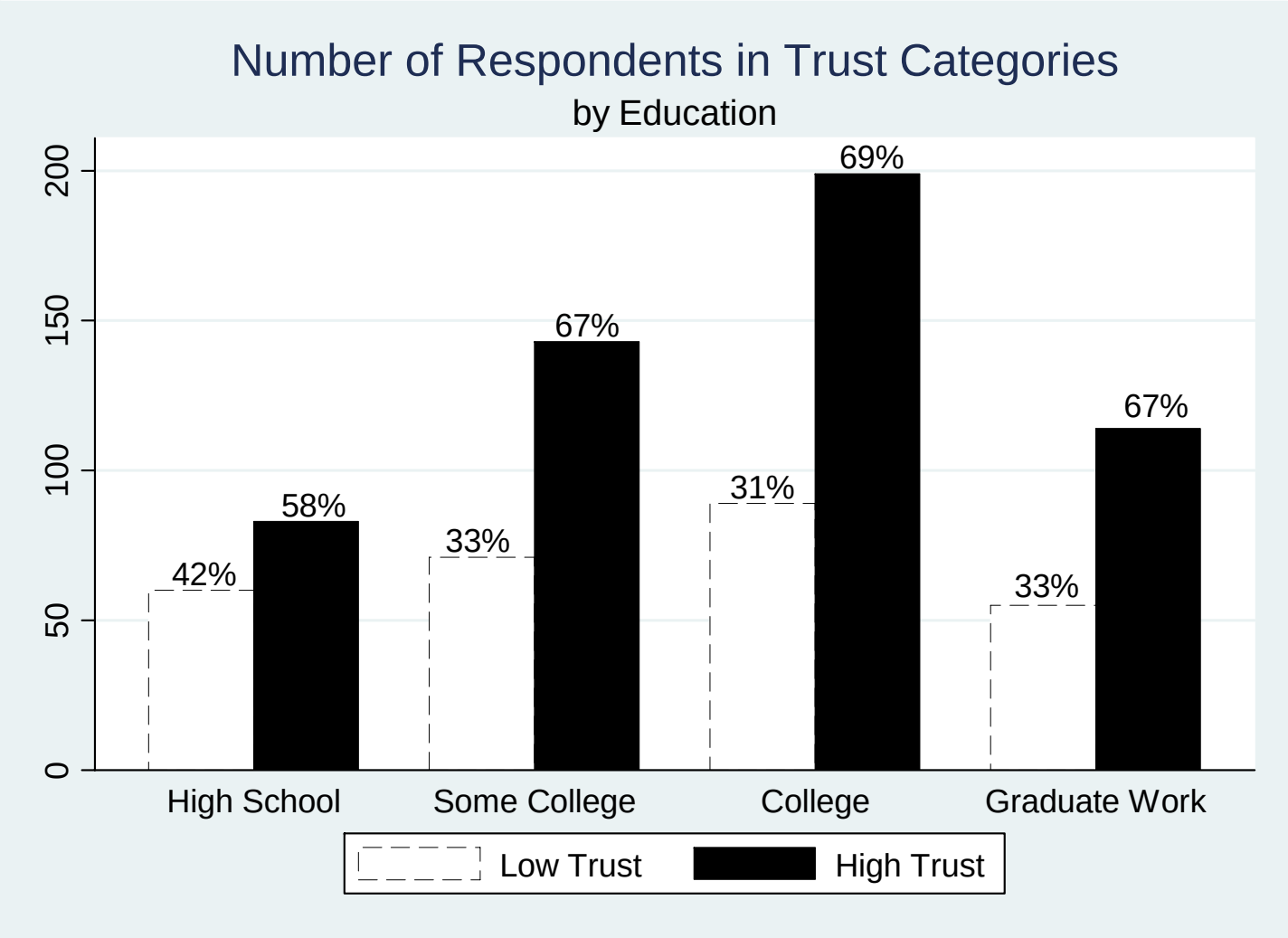


Figure 7: Trust vs. Salary

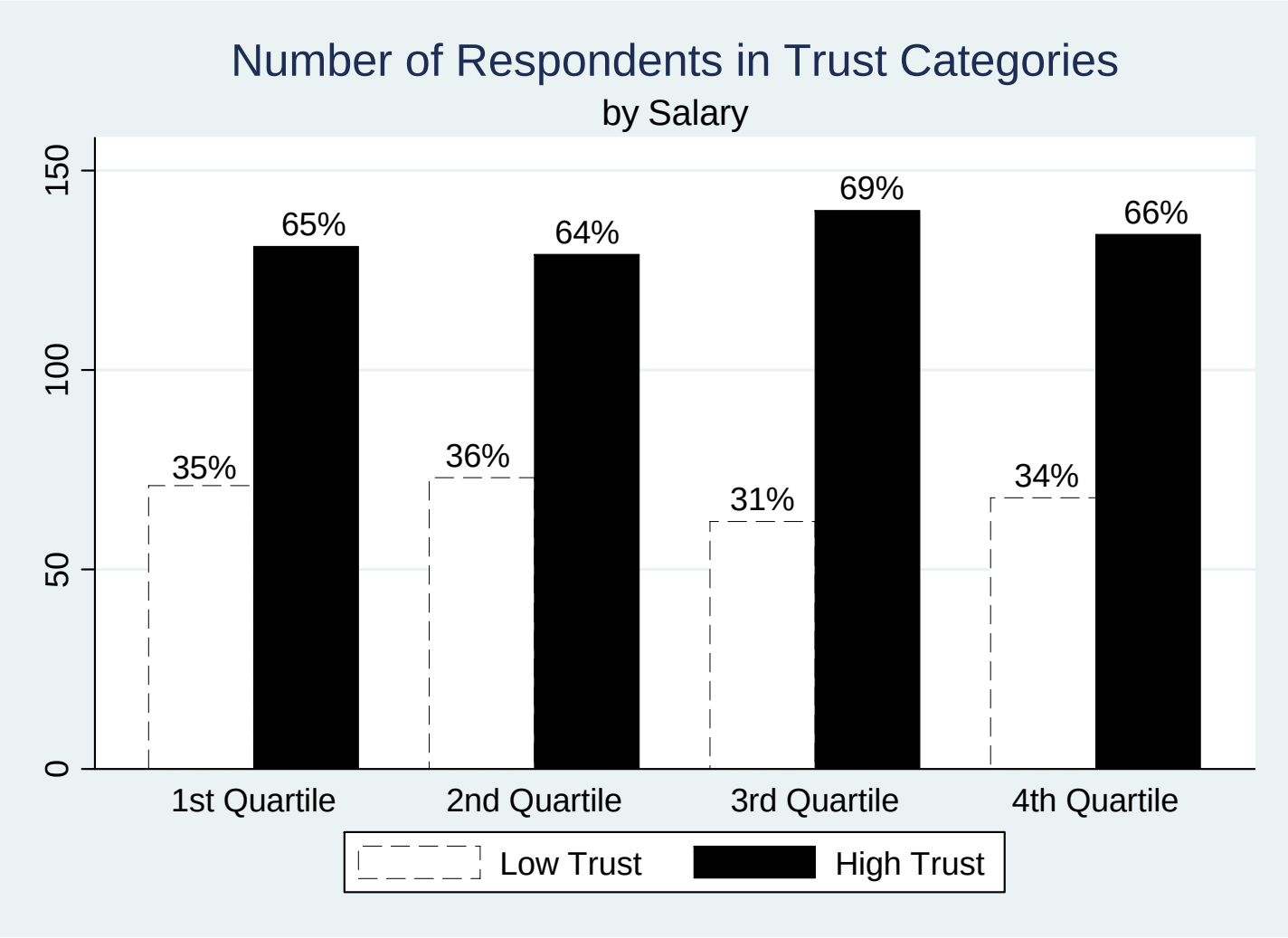


Figure 8: Trust by Plan Type and Participation Status

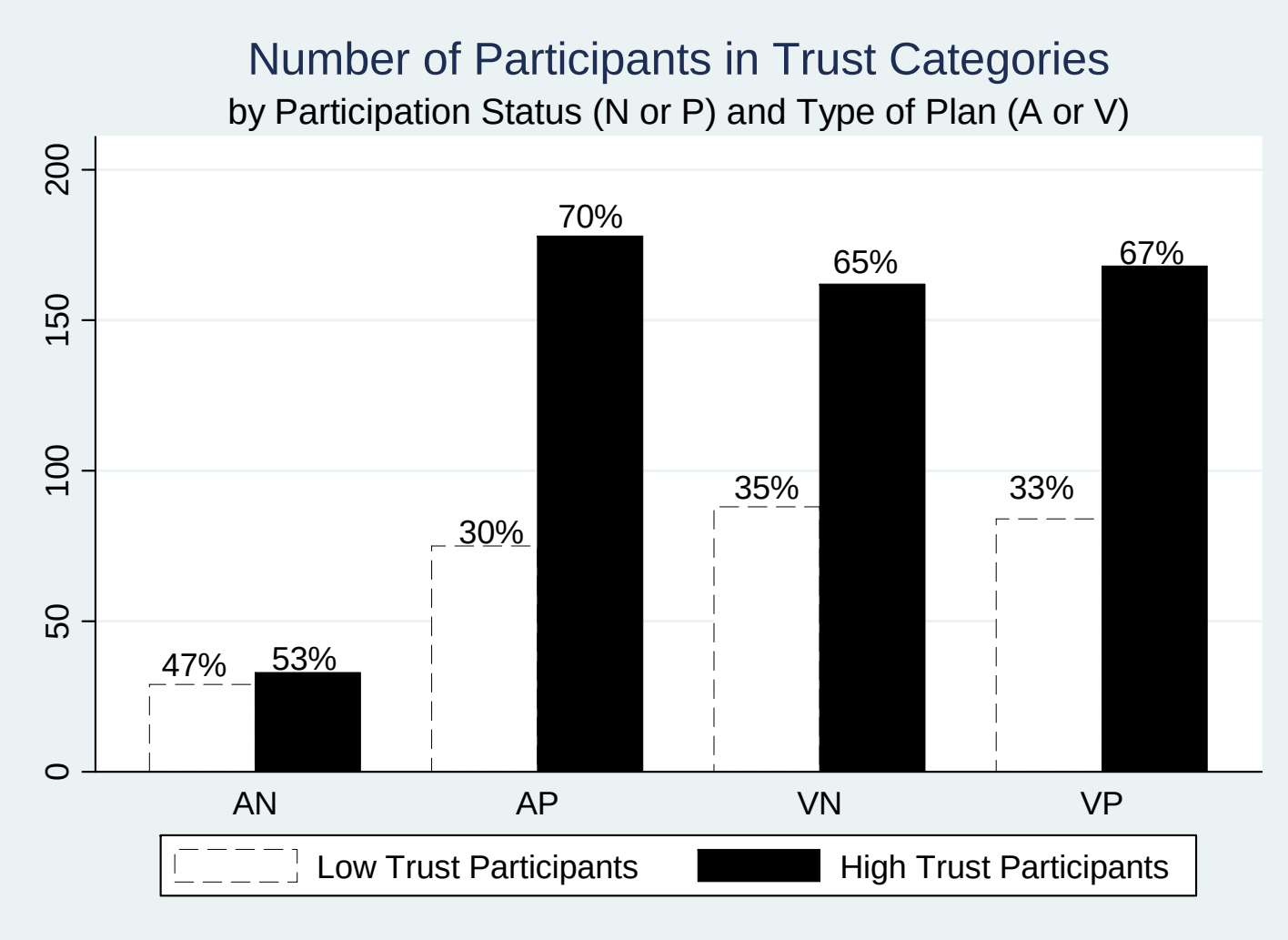


Figure 9: Trust vs. Education by Plan Type and Participation Status

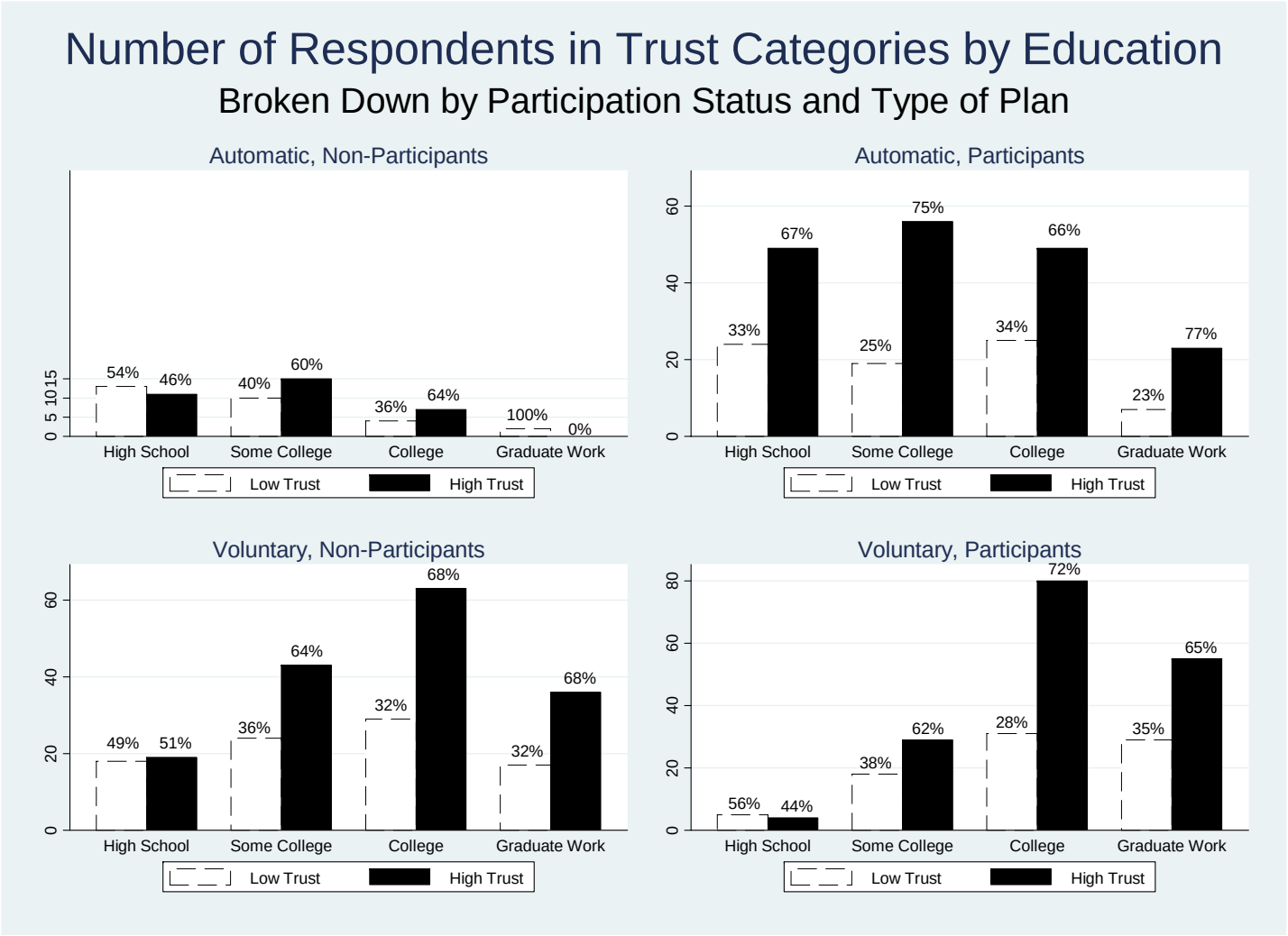
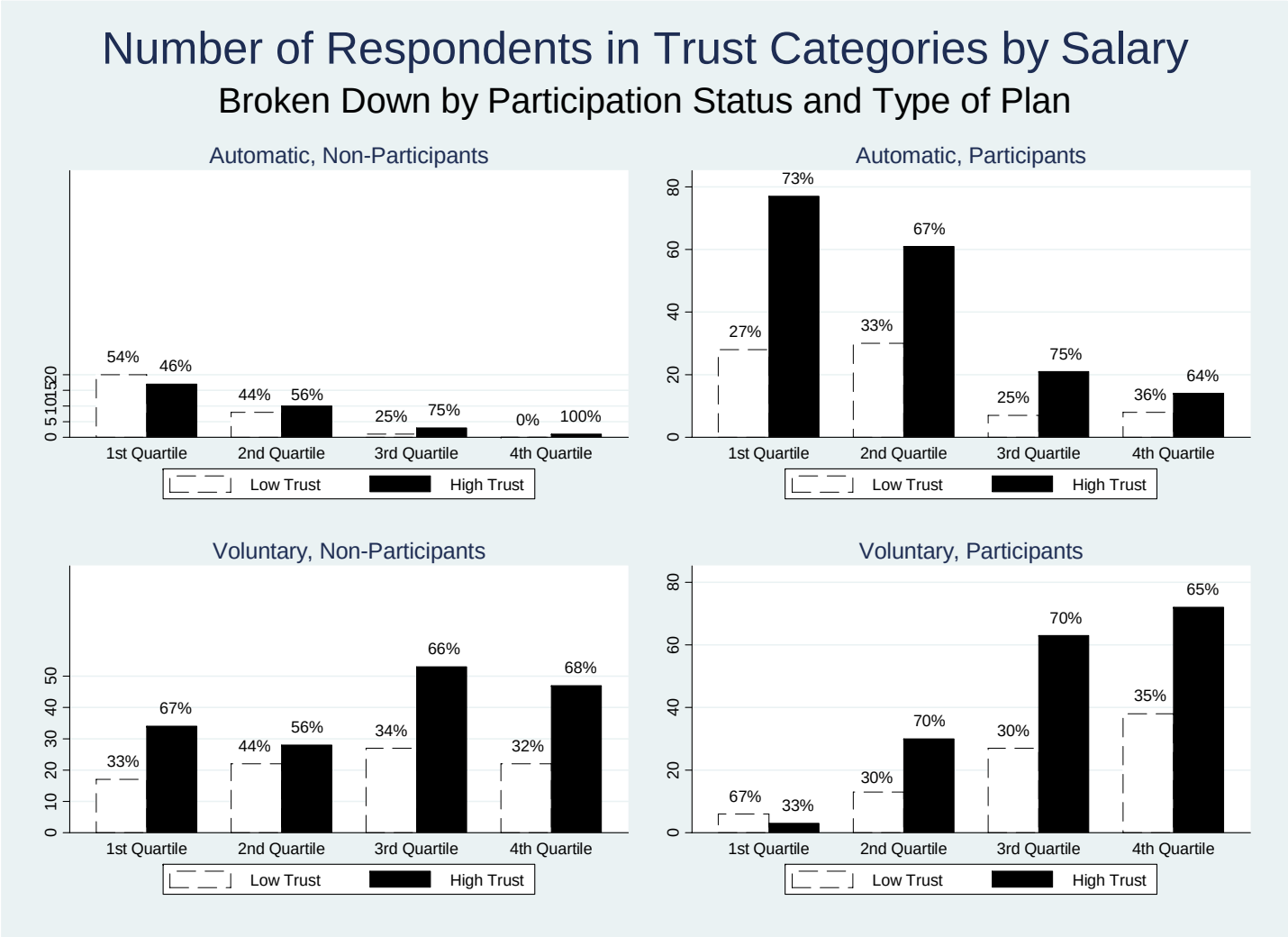


Figure 10: Trust vs. Salary by Plan Type and Participation Status



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