Decision-Making and Vulnerability in a Pyramid Scheme Fraud

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Abstract: Consumer financial fraud is costly to individuals and communities yet academic research on the subject is scarce, in part due to how difficult it is to find reliable data. Using a lab-in-the-field artefactual experiment, we study judgment and decision-making as well as the correlates of victimization in a prototypical pyramid scheme fraud. We record demographic, psychological, cognitive, and behavioral characteristics for 452 subjects at the 2017 Minnesota State Fair, and we estimate the impact of an information treatment—specifically, a reminder to pay attention to the odds of winning or losing—on our subjects' behavior in relation to pyramid scheme fraud. Our results indicate that this straightforward, simple treatment reduces fraud uptake, but only for subjects with a post-secondary education. Our findings show correlates of victimization beyond cognitive ability, including impulsivity, risk preferences, religiosity, and prior exposure to pyramid scheme fraud. Subject reliance on probabilities in decision-making and the accuracy of subjective expectations are the most statistically significant predictors of the decision to invest in a fraudulent pyramid scheme. Our results can help inform the targeting of consumer protection interventions as well as the potential content of those interventions.

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1. INTRODUCTION

Consumer financial fraud is costly, multifaceted, and difficult to stamp out. The direct, measurable costs of consumer financial fraud are estimated to be about $45 billion annually in the US (Deevy, Lucich and Beals 2012). Moreover, such fraud is underreported and its costs extend beyond the financial to include social, psychological, as well as forgone time and income, and enforcement as well as regulatory costs that typically go unaccounted for. This means the available cost estimates are a lower bound on the true costs of consumer financial fraud.

Fraud research is made difficult due to a dearth of reliable data and by the fact that there are several varieties of consumer fraud. Each type of consumer financial fraud has different characteristics, methods of persuasion, and target groups. While the stereotype of a typical fraud victim is that of an older consumer acting out of fear or greed, prior research suggests that there is no representative set of characteristics defining the likely consumer fraud victim (Knutson and Samanez-Larkin 2014, Pak and Shadel 2011); some individuals can be susceptible to one form of fraud while being immune to another.

This article focuses on pyramid schemes.[1] The Federal Trade Commission (FTC) estimates that about two million individuals in the US fall victim to pyramid schemes and related fraudulent

[1] Pyramid schemes are usually presented to consumers as chain letters, gifting schemes, or multilevel marketing business opportunities (MLMs). Chain letters are messages that encourage the recipient to send the message along to others, forming a chain of receivers and senders, so long as the receivers comply. When a chain letter is used to propagate a pyramid scheme, it asks the recipient to take an action, usually to send money, and then pass the message on to others who will do the same—pay and send on—with the promise of future returns. While these messages were historically sent as physical letters, they are now often communicated through email or in other digital forms. A gifting scheme is like a chain letter, but the pay-and-recruit offer is framed as giving a "gift" in order to receive a larger benefit in the future. The gift (i.e., the currency of the scheme) can be money or other purchased goods such as books or wine. When a pyramid scheme is disguised as an MLM, the recruit is told she can earn money from the sale of goods or services and

business opportunities each year (Anderson 2013). Of all victim groups monitored, victims of pyramid schemes are the least likely to report they have been defrauded (Anderson 2004), making prevention and enforcement even more important. Harm is compounded by the incentive structure of most pyramid schemes, as new recruits are trained and incentivized to bring friends and family into the scheme, leading to broader harm within social networks and communities. As with Ponzi schemes, trust and affinity often play a significant role in the diffusion of pyramid schemes (Carey and Webb 2017). In marginalized or vulnerable communities, the ramifications of pyramid scheme collapse can be dramatic and long-lasting (Fairfax 2003, Gunn 2015, Jarvis 1999). The FTC launched an initiative in 2016 to combat affinity-based consumer fraud,[2] especially within Latino and African-American communities (Federal Trade Commission 2016), and the Securities and Exchange Commission launched a Pyramid Scheme Task Force in 2014 in response to evidence of increasing pyramid scheme activity (Ceresney 2016). Recent pyramid schemes—some targeting teenagers and young adults—have promoted a fraud offer nearly identical to the scheme we utilize in this research (Belanger 2018, Fair 2016, Smith 2018).

We explore judgment about, decision-making processes surrounding, and the correlates of pyramid-scheme victimization using an artefactual field experiment. Past fraud research has often relied on complaint data or consumer survey methods. Complaint data is plagued with several forms of selection bias as victims must be able to recognize themselves as being defrauded, be willing to admit this to others, and proactively provide information to formal reporting agencies. While survey research does not require consumers to formally report fraud, it still suffers from underreporting (Deevy, Lucich, and Beals 2012). Analysis of self-reported data is also complicated

from the recruitment of additional sellers. The MLM acts as a pyramid scheme if earnings are dominated by recruitment rewards rather than commissions from retail sales (i.e., sales to those outside the organization; Vander Nat and Keep 2002).

[2] Affinity-based fraud is promoted person-to-person, capitalizing on pre-existing social connections and high levels of in-group trust (Perri and Brody 2012). As pyramid scheme participants are instructed and incentivized to sell the "opportunity" to others, affinity groups such as religious or immigrant communities or fraternal organizations make fertile ground for scheme diffusion (Bosley and Knorr 2018).

by variation in past exposure to consumer financial fraud, and a consumer's likelihood of being exposed to a type of fraud is not necessarily correlated with her susceptibility to that form of fraud (Schoepfer and Piquero 2009). To bypass self-reporting altogether, researchers have created survey-based fraud susceptibility measures but acknowledge that these measurements will deviate from lived experiences in nontrivial ways (James et al. 2014). The gold standard is data that directly confirms fraud victimization and allows for comparisons with non-victims.

Fraud research is also difficult because of the problem posed by accurately attributing consumer vulnerability to its possible sources. Past research has looked for demographic correlates of fraud vulnerability or associations between victimization and psychological or behavioral characteristics such as impulsivity, risk preferences, or financial literacy (Deevy, Lucich, and Beals 2012). While not directly exploring consumer fraud, a related strand of research has explored relationships between individual characteristics and decision-making processes (e.g., age and cognitive processes in Besedes et al. 2012), with an eye toward potential vulnerability in the marketplace. Very few studies have explored both decision-making processes and individual characteristics in the realm of consumer fraud. Exceptionally, Knutson and Samanez-Larkin (2014) studied investment fraud and noted the need for additional research in this vein, within different consumer fraud contexts, to identify "promising targets for intervention" and inform the nature of the interventions themselves.

Our lab-in-the-field experiment was designed to explore judgment and decision-making associated with pyramid scheme fraud as well as the correlates of victimization. The experiment was conducted over two days at the 2017 Minnesota State Fair with 452 subjects. Following Cubitt, Starmer, and Sugden (2001), we use a one-shot, single-task, individual-choice design to explore decision-making in this context. All participants were exposed to the same fraud offer; they could choose to either keep a certain amount of money or to invest that sum in a gamble (i.e., the

fraudulent pyramid scheme offer).[3] To test a potential policy intervention, our treatment group received a reminder to weigh the odds of winning or losing before making their choice. We collected data on demographic, behavioral, and psychological factors, and we asked questions that probed the individual's judgments (e.g., the perceived likelihood of "winning" within the fraudulent offer) and decision-making processes (e.g., reliance on probability in choice). We also collected information on prior exposure to pyramid scheme fraud, but only after a debrief, so as to not prime our subjects.

The contribution of this paper is fourfold. First, our experimental design allows for a comparison between victims and nonvictims that is untainted by differences in exposure to the pyramid-scheme fraud we study. As the subjects were given a specific and real-life choice with financial incentives, risk factors and decision-making processes can be identified that may be unique to this specific form of fraud and very difficult to capture through complaint data or pure surveys. Second, the data allow exploring systematic pitfalls in judgments as well as implications for behavior. Third, the experimental treatment allows evaluating the impact of a simple potential policy intervention. Lastly, this work identifies potential profiles of vulnerable individuals which can help better target pyramid scheme fraud prevention efforts.

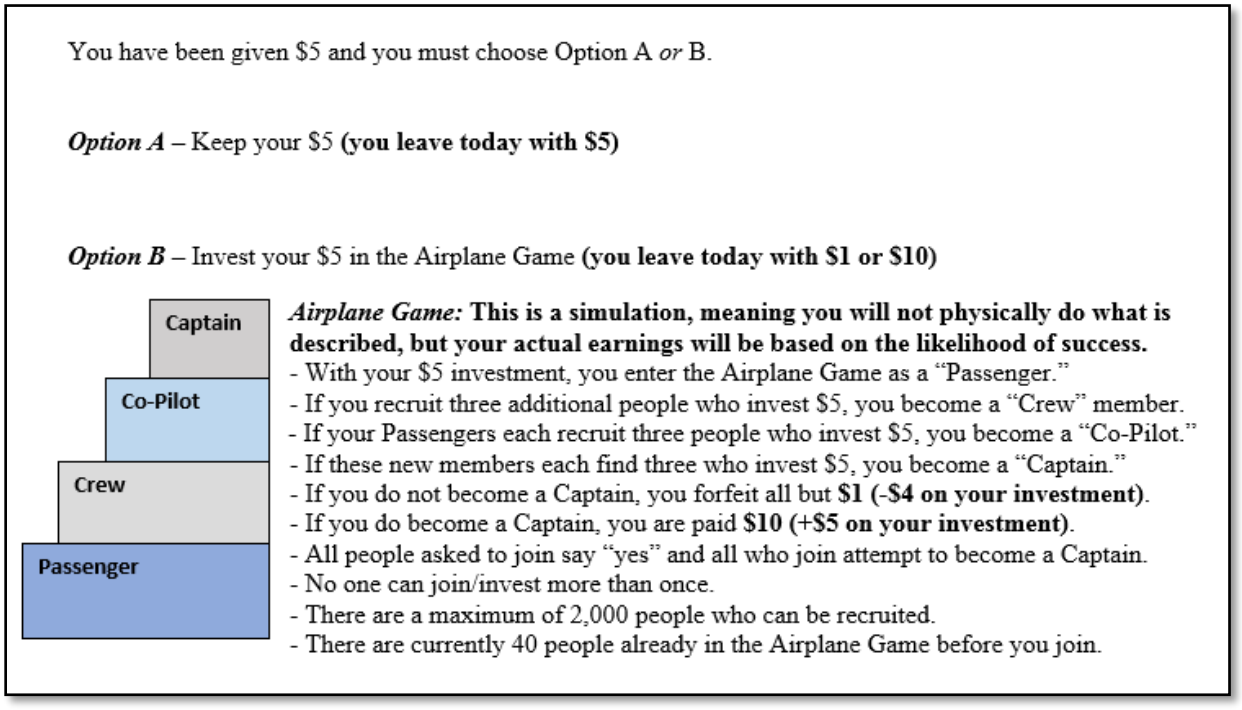
The remainder of this article is organized as follows. Section 2 describes the experimental framework in more detail. Section 3 presents the data generated by the experiment while Section 4 outlines our empirical framework and identification strategy. Section 5 provides results and compares findings to past fraud research. Section 6 concludes with policy implications and directions for future research.

[3] We discuss the ethics of our experiment and IRB approval in section 2.

2. EXPERIMENTAL FRAMEWORK

To study behavior in the context of pyramid scheme fraud, we designed a choice task with two mutually exclusive options. Immediately following the consent process, subjects were asked to select option A and keep the $5 given to them[4] or select option B and invest that $5 in the Airplane Game, a hypothetical game which we designed to reflect the features of an actual pyramid scheme (Neuffer 1987). Figure 1 provides a visual representation of the options as they were presented to subjects. Essentially, option B is a gamble with potential payoffs of $10 with probability 0.01 or $1 with probability 0.99, and it is a simulated pyramid scheme—no actual recruitment of others is required—whose likelihood of winning is based on the rules provided. To determine the likelihood of winning, subjects need to accurately process the rules of the game.

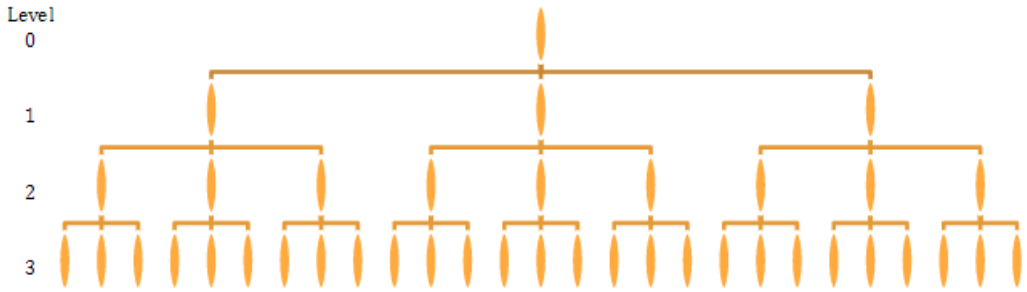
Figure 1. Choice Task



[4] We provided cash at the outset and told our subjects that it was theirs to mitigate a potential "house money" effect, wherein subjects are more inclined to take on more risk than they otherwise would because they mistakenly believe they are using the experimenter's money.

As a prototypical pyramid scheme, the Airplane Game has a pay-and-recruit structure that is inherently deceptive, and thus illegal outside of the laboratory. The exponential structure is designed to pass money from losers to winners (typically based on time of entry), with the vast majority in a loss position at every point in the life of the scheme (Vander Nat and Keep 2002). Two key factors define the pyramid structure: (i) the number of recruits needed for any single participant to "win," and (ii) the current number of levels. Figure 2 represents the pyramid described in our offer, with width and depth dictated by these two factors. In the context of our Airplane Game offer, a participant would need to have 39 recruits ($3^1 + 3^2 + 3^3$) to become a Captain and win the $10 payoff. But they are not alone: since there are already 40 individuals in the game, the new participant would be entering at the fourth level of the structure. Taking these facts and the additional simplifying assumptions into consideration, subjects should come to a determination that the probability of winning (i.e., becoming Captain) is effectively zero as the number of needed hypothetical recruits exceeds the eligible hypothetical population.[5] Subjects were told they could write on the choice task paper as desired and many ultimately drew pyramid structures and showed evidence of basic calculations.

Figure 2. Pyramid Scheme Structure



[5] As the number of participants at level n is 3^n (with recruitment factor of 3 for this pyramid scheme), the number of cumulative participants at level n can be represented as $\sum_{x=0}^{n} 3^x$. Entering the game at the fourth level, sufficient recruits are needed through the seventh level to become a Captain. At the seventh level, the cumulative number of participants required exceeds the finite population provided in the Airplane Game offer. Given that this is a hypothetical game, participants cannot adjust their recruitment speed to secure needed recruits before the population is exhausted and all participating subjects are assumed to have the same recruitment cost function, meaning that all participants recruit with equal speed, effort and success.

Subjects were randomly sorted into control and treatment groups based on odd or even subject identification numbers. The treatment group was shown a reminder of the odds salience at the top of the choice task handout, which stated: "Throughout this experiment, think carefully about your odds of winning each option before choosing"; the control group was not shown that reminder. The remainder of the experiment was identical for both the treatment and control groups.

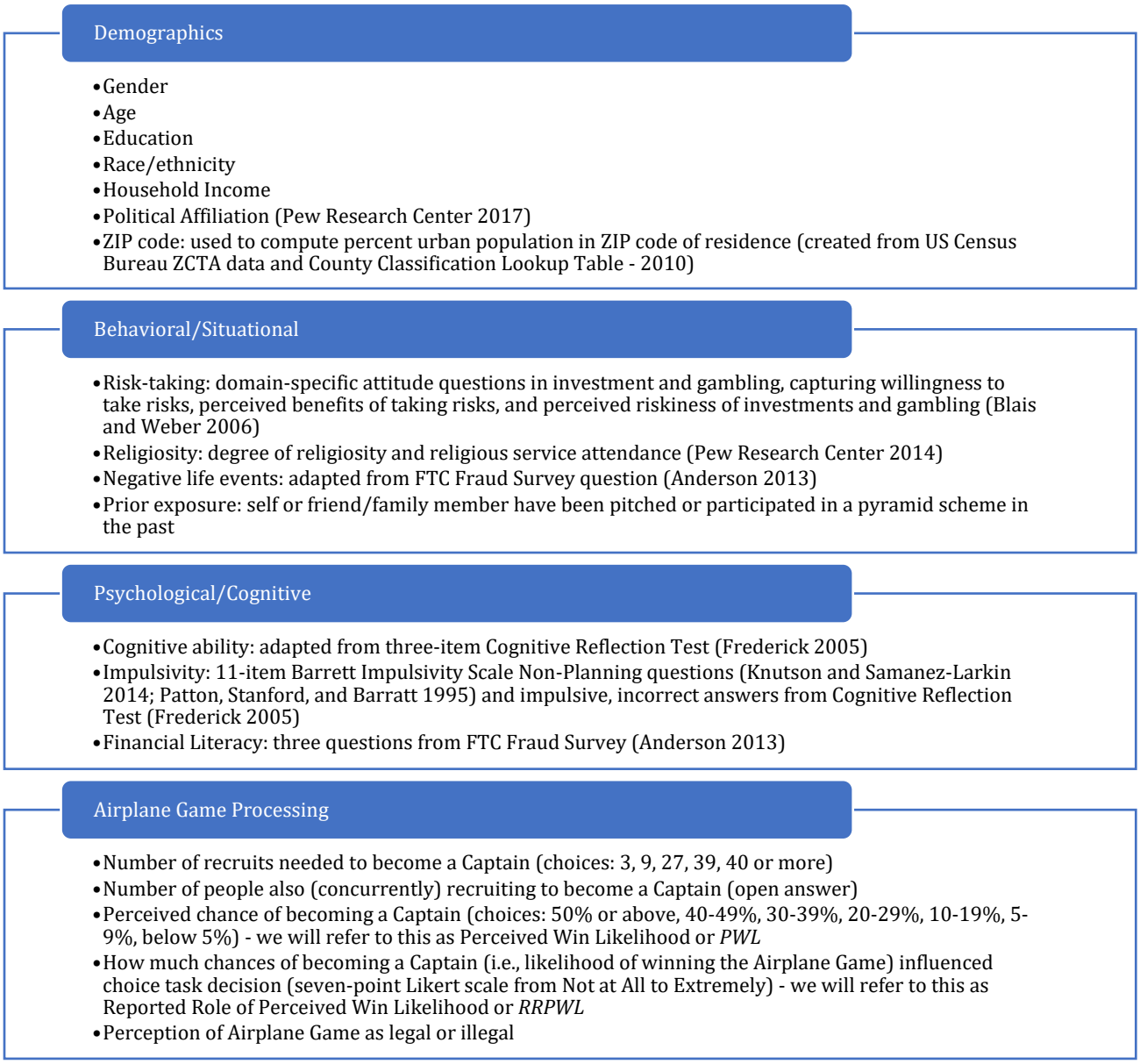
Following the one-shot, individual choice task, each subject responded to a series of survey questions. Subject dividers and instructions prevented communication with other subjects and with those outside the experiment. As described in Deevy, Lucich, and Beals (2012), fraud research typically explores demographic, behavioral, situational, psychological and cognitive correlates. Figure 3 outlines the survey questions[6] in our experiment and, where appropriate, relevant sources or the corresponding literature. Beyond basic demographic information, the household ZIP code allows us to identify whether the subject's place of residence is urban or rural. To measure risk preferences, we used the DOSPERT Scale (Blais and Weber 2006) which solicits risk attitudes within domains most relevant to the realm of inquiry—in this case, within the domains of financial investment and gambling. The DOSPERT Scale captures the subject's willingness to take risks, the perceived benefits of taking those risks, as well as perceptions of the level of risk in three types of investments (speculative stocks, business ventures, and moderate growth funds) and three types of gambling (sporting events, horse races, and casinos or poker).

Research indicates a potential role for religiosity and recent negative life events in fraud vulnerability (Bosley and Knorr 2018, Anderson 2013). We included two religiosity questions from the Pew Religious Landscape Study (Pew Research Center 2014), viz. degree of religiosity and

[6] See Appendix B for the full set of survey questions, the experiment protocol, and the choice task handout given to subjects.

frequency of service attendance, and the same negative life event question as in the FTC Fraud Survey (Anderson 2013).

Figure 3. Survey Components



To measure cognitive ability, we use a three-item cognitive reflection test (CRT; Frederick 2005). As this test has been widely used in research, we only made superficial modifications to the

three questions.[7] The CRT questions are designed to call to mind a quick, incorrect answer though the correct answer is not difficult to compute. The answers can therefore be used to compute a "number of correct answers" score and a "number of impulsive answers score," or iCRT score. In addition to the iCRT score, we follow Knutson and Samanez-Larkin (2014) and include the non-planning questions from the Barratt Impulsivity Scale, a commonly used instrument to measure impulsivity (Patton, Stanford, and Barratt 1995). Beyond general cognitive ability and self-control, we captured financial literacy using three questions from the FTC Fraud Survey (Anderson 2013). Two of the three questions are quite basic and capture basic numeracy, a requisite skill for financial literacy, while the third captures specific financial knowledge (compound interest).

Lastly, we ask questions specific to this fraudulent pyramid scheme offer. These questions are designed to explore the subject's judgment and decision-making processes in this unique context. Participants kept the choice task (i.e., option A or B) handout throughout the experiment and were encouraged to revisit it when answering these questions. Within this set of questions, we capture the subject's perceived likelihood of winning the Airplane Game, which we refer to as "Perceived Win Likelihood" (hereafter PWL). We also ask subjects to report the role that this perceived likelihood played in the choice task (i.e., uptake) decision, and to this as the "Reported Role of Perceived Win Likelihood" (hereafter RRPWL).

Two short debrief videos followed these survey questions. The first video discussed the Airplane Game as a form of fraud as well as the inherent deception and illegality of pyramid schemes. It also included a breakdown of the actual likelihood of winning and informed participants who chose option B (i.e., the Airplane Game) that they would be given a 1% chance of winning the $10 (drawing from 1 green marble and 99 red marbles) in our experiment. The second video discussed the multiple forms of pyramid schemes in the marketplace, including gifting schemes and

[7] For example, in one question "machines" and "widgets" are changed to "ovens" and "pizzas." Approximately 16% of experiment subjects indicated that they had seen similar questions at some time in the past.

fraudulent business opportunities, and provided warning signs of pyramid scheme fraud. After the debrief, subjects were asked about their prior exposure to pyramid schemes.

Finally, if the subject chose option A, she simply kept the $5. If the subject chose option B and invested in the Airplane Game, she returned the $5, drew a marble, and was paid accordingly ($10 for a green marble, $1 for red marble, with the probabilities being respectively 0.01 and 0.99). Each subject left with an educational brochure that included resources and warning signs of pyramid scheme fraud.

The experiment was conducted as part of the University of Minnesota Driven to Discover research initiative at the 2017 Minnesota State Fair. A designated facility housed multiple university-related research projects of various types, and fairgoers voluntarily entered to participate in one or more experiments of their choosing. In our case, fairgoers were eligible subjects if they were 18 or older and had basic English language proficiency. A total of 452 people ultimately participated in the experiment. The experiment was about 20 minutes in length.

Because of its nature, the project was reviewed extensively by the university's institutional review board. The fraudulent offer presented within the choice task was modeled after offers that appear in the daily lives of consumers and adult subjects were only allowed to participate if they demonstrated minimum English proficiency. The debrief videos and take-home resources were created to inform consumers on the illegality of the Airplane Game in particular and to illustrate the warning signs of pyramid scheme fraud more broadly. Many participants commented on the educational value of the experience and voluntarily related prior experiences they had with pyramid scheme fraud.

3. DATA

Summary Statistics

Table 1 provides subject characteristics along with uptake percentage, i.e., the share of subjects who chose to invest money in our stylized pyramid scheme. Nearly 91% of experiment participants were from Minnesota with another 3.6% from Wisconsin and the remainder from other states, so we compare subject characteristics to Minnesota data from the U.S. Census Bureau (2016). Our sample differs from the state's demographic profile most significantly in terms of gender, age, education, and in whether subjects live in rural or urban areas. As is common in voluntary survey research, women represent an outsized share of the subject pool (Sax, Gilmartin, and Bryant 2003). While about 18% of Minnesotan adults are aged 65 or older, this age cohort constitutes only 5% of our sample. In terms of education, about one third of Minnesotans 25 or older hold a Bachelor's degree or above while over two-thirds of our participants have attained this level of higher education. There are also differences in place of residence (i.e., rural or urban). Our participants live in ZIP codes that are 89% urban, on average, while 73% of Minnesota's population is classified as urban, which likely reflects the urban location of the Minnesota state fairgrounds. Approximately 56% identify or lean toward the Democratic party, which likely reflects the urban orientation of the subject pool.

Our subjects more closely reflect the income, race and ethnicity profile of the state. Median household income in Minnesota was just over $60,000 in 2015 and the median household income for our sample was $60,000-$80,000, though a large number of subjects fell within the highest income category. The share of Caucasian and Hispanic experimental subjects matched their respective shares in the state at large. We keep these differences and similarities in mind as we consider relevant sampling weights for external validity, even in the face of the self-selected (i.e.,

nonrandom) nature of our sample. In Section 5, we use population-based sampling weights based on the ZIP code of residence for Minnesota subjects and present associated results.

Overall, 44% of subjects chose to invest money in the pyramid scheme. While it is difficult to draw conclusions from differences in uptake without holding other observable confounders constant, a naïve comparison indicates a lower vulnerability to our pyramid scheme for older, male, graduate school educated, and rural residents. Those in the lowest and highest income categories are also least likely to invest in the scheme. These results, on their face, contradict the commonly held stereotype of fraud victims as uneducated, older consumers (Deevy, Lucich, and Beals 2012), especially given the relatively high uptake among participants with a Bachelor's degree.

Table 2 provides summary statistics for the remaining survey questions. The average subject reports a moderate preference for investment risk, a low desire to gamble, and identifies as somewhat religious. Nearly half of subjects experienced a significant negative life event in the past two years. In terms of prior experience, a little over half of our subjects have already been exposed to pyramid schemes through a friend or family member (i.e., the friend or family member was pitched or joined a scheme) while 30% have direct personal experience with a pyramid scheme. In terms of cognitive ability and literacy, the average respondent answered one of three CRT questions correctly, answered one of those CRT questions with the impulsive, incorrect answer, and answered two of the three financial literacy questions correctly. With a mean question score near two, the Barratt Impulsivity Scale responses indicate occasional impulsivity in non-planning domains (i.e., self-control and cognitive complexity) for the average subject (Patton, Stanford, and Barratt 1995).

Judgment and decision-making in this context could be affected by the perception of the offer as legal or illegal (Blaufus et al 2016). After all other survey questions and immediately before debrief, subjects were asked to judge the legality of the Airplane Game. Approximately half of subjects

indicated that the scheme was legal. Separate from the judgment pitfalls discussed below, this figure indicates that basic education on the warning signs of pyramid scheme fraud had not fully reached this relatively educated sample prior to the experiment.

Pitfalls in Judgment

When asked to process the rules of the Airplane Game, about half of subjects correctly identify the number of recruits needed to become Captain and a similar share identify the minimum number of concurrent recruiters, but only 31% answer both questions correctly. Subjects are also asked to estimate the likelihood of winning the Airplane Game assuming they were to invest in the game (whether they actually did so in the choice task or not).

Figures 4 to 6 provide additional information on the Perceived Win Likelihood (or *PWL*), the number of needed recruits, as well as the reported role of perceived win likelihood in the choice task (or *RRPWL*). Figure 4 reveals the degree to which subjects overestimate the likelihood of winning the Airplane Game. Recall that the objective probability of winning (i.e., becoming a Captain) is less than one percent. While about one in four correctly understood that there is a very low chance of winning (i.e., less than a 5%), a majority of subjects are much more optimistic. Those who reject the fraud offer tend toward pessimistic expectations and, of those who invest in the Airplane Game, the largest group estimates the chance of winning at 50% or more.

One potential source of error in judgment is the ability to process the operational rules of the pyramid scheme. Recall that 51% of subjects failed to recognize that at least 40 people would also be recruiting, though it was clearly stated that there were already 40 people in the Airplane Game, and all participants actively recruit. Nearly the same proportion (52%) did not understand that they would need at least 39 recruits to become Captain. Figure 5 shows the distribution of subject responses with respect to this question, where the possible options reflect the most likely numeric errors in this context (e.g., answering only three—counting direct recruits only—or $3 \times 3 \times 3$

rather than $3 + (3 \times 3) + (3 \times 3 \times 3)$. These findings point to common pitfalls in judgment that are unique to this specific form of fraud. If a consumer does not have the skills needed to understand the operational rules of the scheme, they are likely to significantly overestimate the likelihood of profit.

Figure 4. Perceived Win Likelihood (or *PWL*)

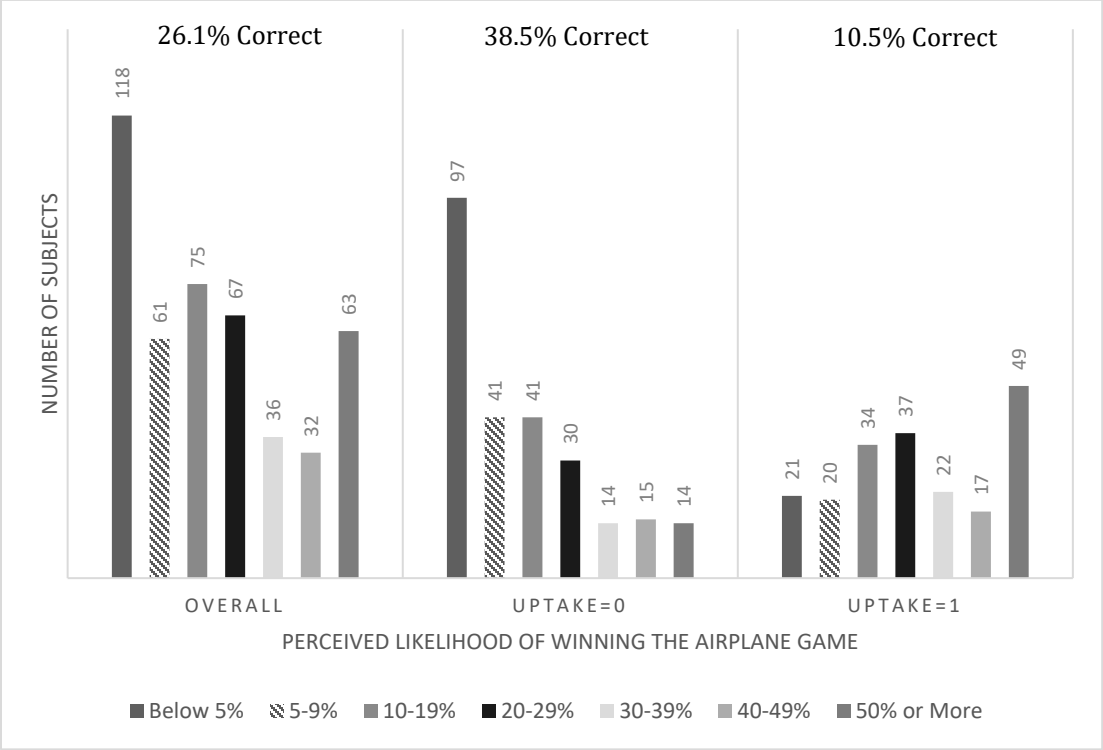
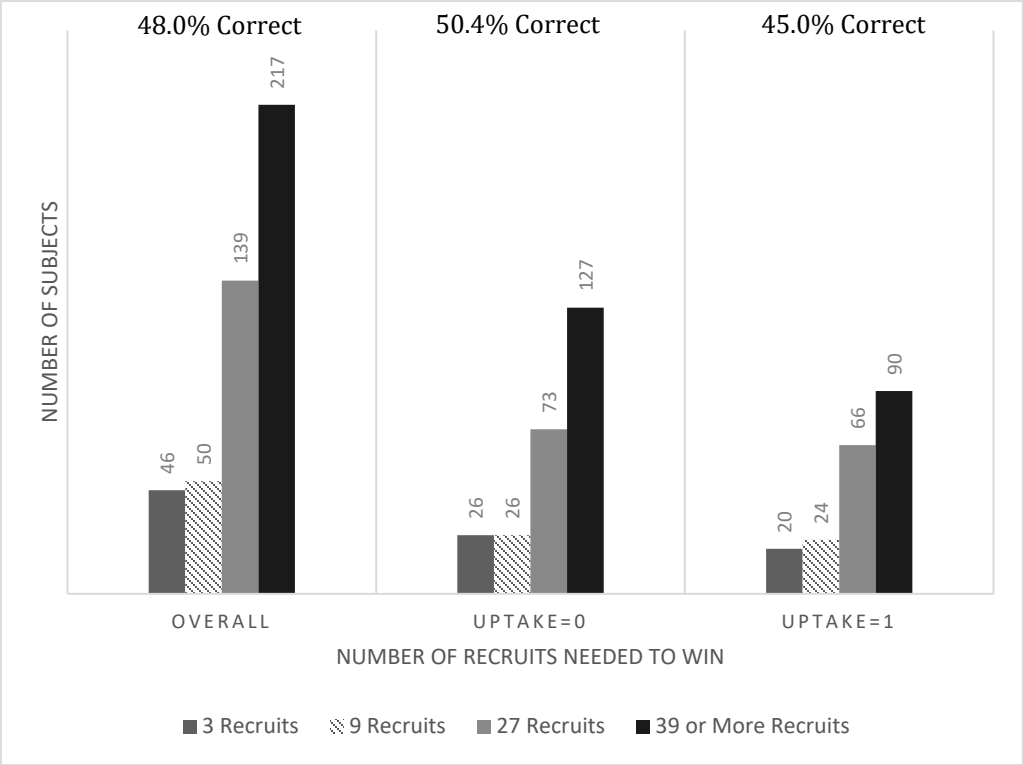
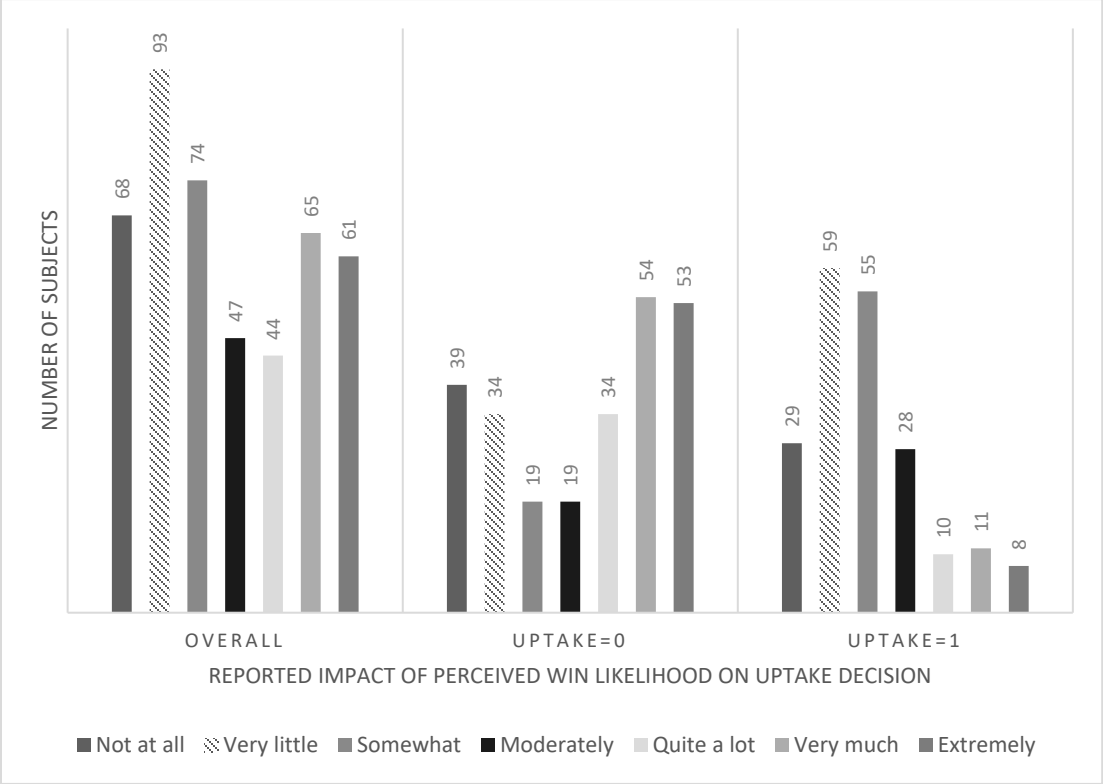


Figure 5. Reported Number of Recruits Needed to Win the Airplane Game



One might expect that those who consider the likelihood of winning or losing more heavily during the choice task would demonstrate better understanding of the Airplane Game and generate a more accurate assessment of the likelihood of winning. Figure 6 shows that 35% of subjects (161 of 452) indicate that the likelihood of winning has very little or no impact on their uptake decision while a similar share (i.e., 38%) report that that perceived win likelihood has quite a lot to an extremely high impact. Interestingly, the distribution for those who reject the fraud offer is somewhat bimodal, with 42% in the highest two categories (i.e., indicating that the likelihood of winning is very important to their uptake decision) while 29% are in the lowest two categories. Those who invest in the Airplane Game typically report that perceived win likelihood played a small role in their uptake decision. While this does not tell us precisely how much cognitive attention subjects devoted to probability estimation during the choice task, these responses give us some insight into the role of subjective probability in the decision-making process.

Figure 6. Reported Role of Perceived Win Likelihood (*RRPWL*)



4. EMPIRICAL FRAMEWORK

Our core equation of interest is:

$$Y_{1i} = \alpha_1 + \beta_1 x_i + \gamma_1 d_i + \eta_1 g_i + \varepsilon_{1i} \quad (1)$$

where y_i is a dummy variable equal to one if subject i chose to invest in Airplane Game and equal to zero otherwise, x_i is a vector of individual characteristics that include all elements reflected in Figure 3 (behavioral, situational, cognitive, and psychological),[8] d_i is a variable equal to one if the subject was in the (information) treatment group and equal to zero otherwise, g_i includes variables that capture the subject's knowledge and judgments about the Airplane Game including *PWL* (Perceived Win Likelihood) and *RRPWL* (Reported Role of Perceived Win Likelihood), and ε_i is an

[8] All survey elements are included with the exception of religious service attendance given the high correlation between service attendance and religiosity (ρ=0.79).

error term with mean zero. Since it is not necessarily the case that a subject exposed to the information treatment will use that information, the estimate of γ measures the intent to treat (ITT), and treatment heterogeneity is explored through interaction of treatment with controls. While x_i captures pre-treatment variables, knowledge and judgments about the Airplane Game are considered to be post-treatment variables so treatment effects are estimated with and without post-treatment variables.

Beyond the ITT and treatment heterogeneity across control variables, we consider the potential direct and indirect effects of treatment. In this experiment, it is possible that the treatment has a direct effect on uptake if a reminder to think about the likelihood of winning directly impacts uptake behavior. The treatment might also impact uptake indirectly through its effect on the decision-making variables, *PWL and RRPWL*, and the subsequent impact of those variables on the final uptake decision. Therefore, we follow Acharya, Blackwell and Sen (2016) and consider the possibility that *PWL* and *RRPWL* act as mediating variables and estimate the controlled direct effect, or CDE, of treatment on uptake. The authors define CDE as "the causal effect of a treatment when the mediator is fixed at a particular level." We follow Acharya, Blackwell and Sen's process for estimating CDE and present results in the following section.

In order to better understand decision-making regarding uptake, we further explore the mediating variables by estimating the following:

$$RRPWL_i = \alpha_2 + \beta_2 x_i + \gamma_2 d_i + \varepsilon_{2i} \quad (2)$$

$$PWL_i = \alpha_3 + \beta_3 x_i + \gamma_3 d_i + \lambda_3 h_i + \varepsilon_{3i} \quad (3)$$

where h_i includes all variables that capture the subject's knowledge and judgments about the Airplane Game including *RRPWL* (Reported Role of Perceived Win Likelihood) with the exception of *PWL* itself. For the analysis of uptake in equation (1), we use a linear probability model with and without bootstrapping, but we also compare these results to probit and logistic estimation results.

Similarly, we estimate equations (2) and (3) using OLS regression but compare results with ordered probit and ordered logit results. Lastly, we use sample weights based on the population of the subject's ZIP code of residence, using data for all subjects residing in Minnesota. The results section discusses the LPM and OLS results but each table identifies similarities and differences found using alternative estimation methods. Identification of the treatment's causal effect on uptake is achieved through the experimental design and the randomization of treatment assignment. Beyond analysis of treatment, we explore the correlates of the decision-making variables, *PWL* and *RRPWL*, as well as correlates of fraud uptake.

5. RESULTS

Treatment

We first examine treatment effects for a potential policy intervention aimed at highlighting the (usually low) odds of making money from a pyramid scheme. In our experiment, subjects were randomly assigned to control and treatment groups using odd and even subject identification numbers.[9] The treatment consisted of a reminder to pay attention to the likelihood of winning when making choices within the experiment and took the form of a single sentence, in bold font, at the top of the choice task handout (image of the treatment statement is available in Appendix B.3 in the experiment protocol). Table 3 provides characteristics of the control and treatment groups, with tests for differences in group means. There are no statistically significant differences in group demographic characteristics, with the exception of political party affiliation. With 14 variables in that table, it is no surprise that the means for one of them are significantly different, as we would expect this to randomly be the case for roughly one in 10 variables.

[9] Due to a temporary technical issue with our survey software, subject identification numbers were not captured for 82 subjects but this issue did not affect the randomization of group assignment.

Table 3 indicates that there are no significant differences in decision-making or judgment (i.e., *PWL* or *RRPWL*) or uptake behavior between the control and treatment groups. Table 4 presents regression results that examine the association between the treatment and uptake, controlling for other potential factors. Consistent with Table 3, results indicate that this straightforward treatment does not appear to influence behavior, though the ITT estimate of -0.066 is negative as expected in the first specification. While the treatment coefficient is lower in magnitude, the overall finding is unchanged in the second specification which removes any possible post-treatment variables.

As discussed in the previous section, it is possible that the treatment could affect the mediating variables, *PWL* and *RRPWL*, creating the potential for an indirect impact on uptake. With respect to *RRPWL*, it seems reasonable that the treatment would elevate the role that likelihood plays in the uptake decision-making process. Furthermore, the treatment could increase the cognitive attention given to likelihood estimation without affecting the subject's conscious assessment of *RRPWL*. If so, the treatment group could have more accurate assessments of the likelihood of winning the Airplane Game. To control for possible indirect effects of treatment operating through the mediating variables *PWL* and *RRPWL*, we follow Acharya, Blackwell and Sen's (2016) procedure to estimate the controlled direct effect (CDE) of treatment on the dependent variable. The resulting CDE estimate of treatment on uptake is -0.064 with a bootstrap standard error of 0.047, outside the range of statistical significance and very close to the ITT results presented in the first specification of Table 4. In this case, the estimate of treatment effect is effectively the same whether estimated using the CDE approach or as ITT, controlling for the mediating variables.

Table 5 explores treatment heterogeneity, interacting treatment with control variables. The consistent finding across the two specifications, with or without post-treatment variables, is the varied effect of treatment based on educational attainment. The impact of treatment appears to be significantly different for those with higher levels of education relative to subjects in excluded group (i.e., those with a high school degree or less) and the treatment-education interaction

coefficients are negative, suggesting that this simple reminder to think about the odds of winning before making decisions might reduce the likelihood of pyramid scheme participation but only among those with post-secondary education. We consider the policy implications of this finding further in Section 6.

Correlates of Uptake

Beyond treatment, we consider correlates of fraud uptake to identify potential individual risk factors. Table 6 presents multiple specifications of uptake analysis where the first specification includes the full set of regressors. The second and third are reduced specifications, demonstrating stability (or lack thereof) in statistical significance and direction. As expected, the probability of investing in the fraudulent offer is negatively associated with *RRPWL* (i.e., salience of likelihood in decision-making) and positively related to the *PWL*. For two identical subjects, the probability of fraud uptake is eight percentage points higher for the subject with a one-unit higher *PWL* (e.g., where the perceived chance of winning is 20-29% as opposed to 10-19%). The effect size is similar for *RRPWL*: there is a seven to eight percentage point increase in the likelihood of uptake for every one-unit reduction in *RRPWL* (e.g., when the reported role of likelihood falls from 3-somewhat to 2-very little). This result is stable across all specifications and estimation methodologies. Attention to likelihood and accurate assessment of relevant probabilities are associated with reduced personal vulnerability to pyramid-scheme fraud.

As in other studies of pyramid-scheme fraud (Bosley and Knorr 2018) and lottery fraud (Consumer Fraud Research Group 2006), religiosity appears to increase vulnerability in this experiment. On a four-point Likert scale, a one-unit increase in self-reported religiosity is associated with a five percentage point increase in the probability of fraud uptake. While this experiment cannot explain the mechanism whereby religiosity and fraud vulnerability are related, other research points to potential explanations. Bosley and Knorr find a connection between

county-level religiosity and pyramid-scheme victimization rates in the US and suggest that religious communities provide high-trust, clearly defined social networks for recruitment. Subjects with higher levels of religiosity might be better able to imagine recruitment within their own personal networks. It may also be that religiosity elevates trust and lessens personal scrutiny at an individual level, independent of connections to religious social networks or institutions. Table A1 in Appendix A includes both religious service attendance and religiosity, and only religiosity is statistically significant when the alternative measure is removed. This provides limited evidence that personal religiosity may be more relevant to fraud vulnerability than religious social networks, given that service attendance would presumably enhance ties to church networks more than religiosity itself. Again, this result is stable across specifications and methods of estimation.

Prior exposure to fraud is another potential risk factor for victimization. We measure prior exposure to pyramid scheme fraud only after the subject has gone through the debrief process, both (i) so that subjects understand the variety of ways pyramid schemes are presented to consumers and the warning signs of this fraud type as well as (ii) to avoid priming our subjects at any time during the experiment. While personal prior exposure to pyramid scheme fraud is not a significant predictor of uptake, exposure to a friend or family member who joined or was pitched a pyramid scheme is associated with an eight to ten percentage point increase in fraud, all else equal As noted in Section 1, fraud victims are often reluctant to pro-actively report their experience to authorities and unwilling to admit to having been scammed even when their victim status is independently verified (AARP 2003, Deevy, Lucich and Beals 2012). There can be a stigma to relating their experience, even to friends and family, due to embarrassment or confusion around the offer and outcome. Victims may feel that they were to blame for their own losses due to lack of effort or skill or feel guilty for bringing others into the scheme. This means that a subject may have been exposed to pyramid scheme fraud through a friend or family member but not know the outcome of that

experience. This exposure then could help to validate the fraud, rather than inoculate the individual against future victimization.

Controlling for all other regressors, subjects who report higher perceived benefits from risky financial investments are more likely to invest in the fraudulent offer. While past studies have identified potential connections between risk-taking and fraud victimization (Anderson 2013, Schoepfer and Piquero 2009), these studies have not generally identified the risk domain that is most predictive of fraud uptake which may vary by fraud type.[10] These results shed light on the relationship between fraud and risk by domain: first, the perceived benefits of risky financial behavior are more predictive than the self-reported willingness to take financial risks or the perceived riskiness of these financial decisions; second, attitudes toward the investment domain appear to be more closely connected to pyramid scheme uptake behavior than attitudes toward gambling. The remaining regressors, including gender, age, education, cognitive ability and impulsivity, are not statistically significant in the uptake analysis, but may be related to the subject's judgment and decision-making as captured in *PWL* and *RRPWL*.

Correlates of PWL and RRPWL

Given the desire to explore judgment and decision-making in the context of fraud, the importance of *PWL* and *RRPWL* in uptake behavior, and the central role of likelihood in an expected utility decision-making framework, we further explore correlates of these variables in Tables 7 and 8. Subject attention to likelihood in the uptake decision, self-reported in *RRPWL*, is higher for those with high cognitive ability and low impulsivity, as measured by the Cognitive Reflection Test and BIS-Nonplanning scale respectively. While past research has found that fraud victimization is

[10] As prior research has challenged the notion of risk preferences as situation-invariant, Blais and Weber (2006) provide a Domain-Specific Risk-Taking (DOSPERT) scale to capture risk attitudes within various situational contexts, or domains of life, such as health, recreation, or finance. Investments and gambling are the two subdomains with the finance domain of the DOSPERT scale.

associated with impulsivity and cognitive ability (Deevy, Lucich, and Beals 2012, Knutson and Samanez-Larkin 2014), our findings suggest that these factors impact behavior through their effects on decision-making processes and judgment. Cognitive ability and self-control may allow the subject to pay attention to relevant probabilities and their role in evaluating the gamble which, in turn, improves accuracy of probability estimates. Attention to likelihood is also higher for those residing in more urban ZIP codes, all else equal. Past research on the role of rural or urban residence in fraud vulnerability is mixed, and this finding points to the need for continued research on the relative vulnerability of urban and rural consumers to different forms of fraud. These findings hold across specifications as variables are removed.

In terms of the subjective probability of winning, captured by *PWL*, subjects were more pessimistic if they reported a larger role for likelihood in decision-making (i.e., higher *RRPWL*) and if they understood the correct number of recruits needed to win the Airplane Game. Higher expectations of winning were associated with higher perceived benefits from gambling and the perception that the Airplane Game was legal. Again, these findings are consistent across specifications. Gender and age were nearly statistically significant in the full model, with higher subjective probability estimates for women and older subjects. Past research has identified potential gender differences in decision-making under risk that may be relevant in this context. For example, Helga et. al. (2011) found that men were more likely to use an expected utility decision-making framework and have more stable subjective probability estimates. This suggests that women might me more vulnerable than men to pyramid fraud. Past findings on the role of gender and age in fraud vulnerability are mixed. and this research again suggests a need to replicate the experiment with an age and gender distribution that more closely reflects the overall population.

Population-based Sample Weights

As discussed in Section 3, our sample skewed urban, younger, and more educated than the state of Minnesota at large. To explore external validity, we adopted sample weights based on the population of the subject's home ZIP code, excluding all subjects who were not Minnesota residents (approximately nine percent of the subject pool). While the introduction of sample weights did not alter the findings on treatment effects, including the significance of treatment-education interaction terms, there were some changes in the correlates of *PWL, RRPWL* and uptake. When the sample weights are used to more closely reflect the profile of the state, subjects with who identify or lean toward the Democratic party have lower uptake, everything else equal. Prior exposure to pyramid scheme fraud through friends or family remains negatively associated with uptake but is no longer statistically significant. The role of religiosity, perceived benefits of risky financial choices, *PWL* and *RRPWL* in uptake remain the same as in prior results.

Probabilities continue to play a more significant role in the uptake decision for subjects with higher cognitive ability, lower impulsivity and more urban locations of residence. Beyond these factors, the subject's perceived benefit of gambling is now a significant positive correlate of *RRPWL*, meaning odds are more salient in the fraud uptake decision for those who anticipate higher benefits from gambling. Subjects who report higher religiosity also place more weight on likelihood in the uptake decision, all else equal. Note that this suggests a complex relationship between religiosity and pyramid scheme fraud, as religiosity is associated with increased attention to likelihood but also increased uptake.

As before, the estimated likelihood of winning the Airplane Game, *PWL*, is lower for those who report a higher role for likelihood in the uptake decision and those who know the correct number of recruits needed to win, but higher for those who think the offer is legal. There is now a positive and statistically significant relationship with subject age and a negative relationship with post-secondary education suggesting that older, less-educated subjects may be more optimistic about their chances for profit. As discussed in the following section, these results suggest that additional

work is needed to replicate this experiment with a more representative sample of consumers, given the non-random nature of the state fair experimental environment.

Taken together, these results indicate that cognitive ability, self-control, and urban residence are associated with an elevated role of likelihood in decision-making in this experiment. There is some indication that religiosity and perceived benefits from gambling may also be related to odds salience in the context of a pyramid scheme offer. *PWL* accuracy is, in turn, related to the reported role of likelihood in decision-making, comprehension of the fraud offer itself, perceptions of legality, and the perceived benefits from gambling. Perceived likelihood of winning may be inflated for women or those with less education. These inputs to decision-making, *PWL* and *RRPWL*, are important to the final uptake decision, as are religiosity, perceived benefits from risky investments, and prior exposure to pyramid scheme fraud through friends or family. The simple treatment—a reminder of odds salience—appears to reduce fraud uptake but only among those with post-secondary education.

6. POLICY IMPLICATIONS AND CONCLUSION

This research explores pyramid scheme fraud using an artefactual field experiment, conducted at the Minnesota State Fair. The ultimate goal is to inform consumer protection efforts by identifying potential intervention targets (i.e., most at-risk consumers) and by informing the nature and content of those interventions. As stated at the outset, this work cannot be generalized—research must be conducted within a specific fraud type as there is no reliable stereotype of the vulnerable financial fraud victim.

On the potential targets of intervention, this research suggests that those most vulnerable to pyramid scheme fraud include those with lower self-control and cognitive ability as these individuals may be less likely to consider odds of winning when making the decision to invest in a scheme. This may be true of more rural residents as well. Individuals who perceive the offer as

legal, who have a poor understanding of the offer itself, who find likelihood of winning to be less salient, or who perceive greater benefits from gambling tend to overestimate the likelihood of profit. Those who heavily considered likelihood in the uptake decision and who more accurately estimated the likelihood of winning were less likely to invest in the fraudulent offer. Beyond these factors, religiosity, higher perceived benefits from risky investments, and prior exposure are associated with heightened vulnerability.

These risk factors point to identifiable community-level education targets (e.g., religious or less educated communities) and to potential ingredients in a personal risk inventory, as suggested by Knutson and Samanez-Larkin (2014). Such an inventory could include the BIS-Nonplanning question set, the Cognitive Reflection Test, the DOSPERT scale questions on perceived benefits of risky gambling and investments, questions about a representative pyramid scheme offer and legality, as well as questions regarding religiosity and prior exposure.

Beyond identification and discussion of personal risk factors, consumer protection interventions could teach a multistep approach to offer deliberation. First, the recruit should scrutinize the offer for warning signs of fraud. As many of our subjects demonstrated (as seen in Figure 6), it is possible to quickly reject the offer without careful deliberation of odds or other elements of the offer if one or more warning signs are detected. Warning sign training should be highly specific to pyramid schemes, the varied forms in which they present themselves, and the reasons for illegality which are often misunderstood. Second, if no obvious warning sign is detected, the individual should carefully consider the likelihood of various outcomes with an expected value mindset, understanding that the recruiter will not necessarily provide reliable evidence of past earnings or the probability of those earnings. If a recruitment element is involved, special attention should be paid to the pitfalls in judgment that are unique to this form of fraud, discussed in Section 3.

Beyond tailored educational efforts, generalized improvement in educational attainment may reduce vulnerability, though there is evidence that post-secondary education does not provide sufficient inoculation in the absence of a treatment like the one implemented in this experiment. Table 9 depicts the differences in uptake by educational attainment and treatment status without controlling for other explanatory variables. There were high rates of uptake among college-educated subjects in the control group, the exception being those with a graduate degree. This speaks to the need for both educational attainment and continued reminders to deliberately think through offers in the marketplace. For subjects without post-secondary education, there is some indication that a reminder to consider the likelihood of winning backfires, as uptake was substantially higher in the treatment group. It could be the case that greater attention to likelihood is counterproductive if the decision-maker lacks the skills or knowledge needed to properly estimate subjective probabilities. This merits further attention with a larger sample size.

Beyond consumer protection efforts aimed at prevention, this research highlights the need for increased engagement with past victims. Efforts that increase awareness of past victimization and reduce the stigma of reporting, both formally and informally, will yield positive externalities for consumers-at-large. As formal complaints often trigger law enforcement action, silence can prevent detection and response. Informal complaints to friends and family can help to improve understanding of outcomes. Victim silence may not be neutral, but instead serve to validate the fraud and increase the risk of future victimization for others within their social networks.

Future research is needed to replicate this experiment, ideally with a nationally representative sample of consumers. Additional research is also needed on education efficacy, comparing multiple forms of consumer protection efforts that may include a personal risk inventory. While we suggest a targeted approach to education and prevention that is informed by the specific nature of pyramid scheme fraud, it is possible that more generalized consumer protection training would be effective in preventing pyramid scheme victimization. Lastly, attention should be given to research that

investigates and combats pyramid scheme victim silence. While this research indicates potential avenues for consumer protection, additional research is needed to validate this work and build on the understanding of pyramid scheme fraud and consumer vulnerability.

REFERENCES

AARP. (2003a). *Off the hook: reducing participation in telemarketing fraud*. AARP Foundation. Washington, DC. Retrieved January 30, 2018, from https://assets.aarp.org/rgcenter/consume/d17812_fraud.pdf.

Acharya, A., Blackwell, M. & Sen, M. (2016). Explaining Causal Findings Without Bias: Detecting and Assessing Direct Effects. American Political Science Review 110 (3): 512-529.

Anderson, K. B. (2004). Federal Trade Commission. Consumer fraud in the United States: An FTC survey. Retrieved January 30, 2018, from https://www.ftc.gov/sites/default/files/documents/reports/consumer-fraud-united-states-ftc-survey/040805confraudrpt.pdf.

Anderson, K. B. (2013). Federal Trade Commission. Consumer fraud in the United States, 2011: The third FTC survey. Retrieved January 30, 2018, from https://www.ftc.gov/sites/default/files/documents/reports/consumer-fraud-united-states-2011-third-ftc-survey/130419fraudsurvey_0.pdf.

Belanger, L. (2018, January 19). Pyramid Schemes are Targeting Snapchat's Mostly Teen Users. Entrepreneur. Retrieved January 30, 2018, from https://www.entrepreneur.com/article/307771.

Besedeš, T., Deck, C., Sarangi, S. & Shor, M. (2012). Decision-making strategies and performance among seniors. Journal of Economic Behavior & Organization 81 (2), 524-533.

Blais, A.R., & Weber, E. U. (2006). A Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. Judgment and Decision Making, 1, 33-47.

Blaufus, K., Hundsdoerfer, J., Jacob, M. and Sünwoldt, M. (2016). Does legality matter? The case of tax avoidance and evasion. Journal of Economic Behavior & Organization 127 (3), 182-206.

Bosley, S. & Knorr, M. (2018). Pyramids, Ponzis and fraud prevention: lessons from a case study. Journal of Financial Crime 25 (1), 81-94.

Carey, C. & Webb, J. (2017). Ponzi schemes and the roles of trust creation and maintenance. Journal of Financial Crime 24 (4), 589-600.

Ceresney, A. (2016, March 2). UIC-SEC Joint Symposium to Raise Public Awareness: Combating Pyramid Schemes and Affinity Frauds Opening Remarks. Securities and Exchange Commission Speech. Retrieved January 30, 2018, from https://www.sec.gov/news/speech/ceresney-remarks-joint-symposium-raise-public-awareness-03022016.html.

Consumer Fraud Research Group (2006). Investor Fraud Study: Final Report. Financial Fraud Research Center at the Stanford Center on Longevity. Retrieved January 30, 2018, from http://longevity.stanford.edu/2011/06/13/investor-fraud-study-final-report/.

Cubitt, R. P., Starmer, C. & Sugden, R. (2001) Discovered preferences and the experimental evidence of violations of expected utility theory. Journal of Economic Methodology 8 (3), 385–414.

Deevy, M., Lucich, S., & Beals, M. (2012). Scams, schemes, & swindles: A review of consumer financial fraud research. Financial Fraud Research Center at the Stanford Center on Longevity. Retrieved January 30, 2018, from http://longevity.stanford.edu/wp-content/uploads/2017/01/Scams-Schemes-Swindles-FINAL-On-Website.pdf.

Fair, L. (2016, December 15). Dismantling a pyramid: Lessons from the Vemma settlement. Federal Trade Commission Business Blog. Retrieved January 30, 2018, from https://www.ftc.gov/news-events/blogs/business-blog/2016/12/dismantling-pyramid-lessons-vemma-settlement.

Fairfax, L.M. (2003). The Thin Line between Love and Hate: Why Affinity-Based Securities and Investment Fraud Constitutes a Hate Crime. U C Davis Law Review. 36, p. 1073-1143; U of Maryland Legal Studies Research Paper No. 921045. Available at SSRN: https://ssrn.com/abstract=921045.

Federal Trade Commission (2016, June 15). Combatting Fraud in African-American and Latino Communities: The FTC's Comprehensive Strategic Plan. Report to Congress. Retrieved January 30, 2018, from https://www.ftc.gov/system/files/documents/reports/combating-fraud-african-american-latino-communities-ftcs-comprehensive-strategic-plan-federal-trade/160615fraudreport.pdf.

Frederick, S. (2005). Cognitive Reflection and Decision Making. Journal of Economic Perspectives 19 (4), 25–42.

Gunn, G. (2015). Broken People, Deep Scars, Fractured Communities, Fear and Distrust: Affinity Fraud and the Church of Jesus Christ of Latter-Day Saints, available at: http://ssrn.com/abstract=2562462 or http://dx.doi.org/10.2139/ssrn.2562462 (accessed January 30, 2018).

Helga F.D., Epper, T., Bruhin, A., & Schubert, R. (2011). Risk and rationality: The effects of mood and decision rules on probability weighting. Journal of Economic Behavior & Organization 78 (), 14-24.

James B. D., Boyle P.A. & Bennett D. A. (2014). Correlates of Susceptibility to Scams in Older Adults Without Dementia, Journal of Elder Abuse & Neglect 26 (2), 107-122.

Jarvis, C. (1999). The Rise and Fall of the Pyramid Schemes in Albania. International Monetary Fund Working Paper No. 99/98, available at: https://www.imf.org/en/Publications/WP/Issues/2016/12/30/The-Rise-and-Fall-of-the-Pyramid-Schemes-in-Albania-3161 (accessed January 30, 2018).

Knutson B. & Samenez-Larkin G. (2014). Individual Differences in Susceptibility to Investment Fraud. FINRA Investor Education Foundation. Retrieved January 30, 2018, from https://www.saveandinvest.org/sites/default/files/Individual-Differences-in-Susceptibility-to-Investment-Fraud.pdf.

Neuffer, E. (1987, April 7). 'Airplane': High-Stakes Chain Letter. The New York Times. Retrieved January 30, 2018, from http://www.nytimes.com/1987/04/07/nyregion/airplane-high-stakes-chain-letter.html.

Pak, K. & Shadel D. (2011). AARP Foundation National Fraud Victim Study. AARP Foundation. Retrieved January 30, 2018, from https://assets.aarp.org/rgcenter/econ/fraud-victims-11.pdf.

Patton, J.H., Stanford, M.S. & Barratt E.S. (1995). Factor structure of the Barratt impulsiveness scale. Journal of Clinical Psychology, 51, 768-774.

Perri, F.S. and Brody, R.G. (2012). The optics of fraud: affiliations that enhance offender credibility. Journal of Financial Crime 19 (4), 355-370.

Pew Research Center (2014, May 30). 2014 RELIGIOUS LANDSCAPE STUDY (RLS-II)

MAIN SURVEY OF NATIONALLY REPRESENTATIVE SAMPLE OF ADULTS FINAL QUESTIONNAIRE, Retrieved January 30, 2018, from http://assets.pewresearch.org/wp-content/uploads/sites/11/2016/10/25142557/RLS-II-Questionnaire-for-5th-release.pdf.

Pew Research Center (2017, May 17). Partisan Identification Is 'Sticky,' but About 10% Switched Parties Over the Past Year. Retrieved January 30, 2018, from http://www.people-press.org/2017/05/17/partisan-identification-is-sticky-but-about-10-switched-parties-over-the-past-year/.

Sax, L.J., Gilmartin, S.K. & Bryant, A.N. (2003). Assessing Response Rates and Nonresponse Bias in Web And Paper Surveys. Research in Higher Education 44 (4), 409-432.
Schoepfer, A., & Piquero, N. L. (2009). Studying the correlates of fraud victimization and reporting. Journal of Criminal Justice 37(2), 209–215.
Smith, M. (2018, January 8). Have you seen the 'Blessing Loom' on Facebook? Experts say it is a scam. WBTV.com. Retrieved January 30, 2018, from http://www.wbtv.com/story/37213059/have-you-seen-the-blessing-loom-on-facebook-experts-say-its-a-scam.
U.S. Census Bureau (2010). County Classification Lookup Table. Retrieved October 1, 2017, from https://www.census.gov/geo/reference/urban-rural.html.
U.S. Census Bureau (2010). 2010 Annual Population Estimates by ZCTA for Minnesota. Retrieved October 1, 2017, from https://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml.
U.S. Census Bureau (2016). Quick Facts - Minnesota. Retrieved October 10, 2017, from https://www.census.gov/quickfacts/MN.
Vander Nat, P. and Keep, W. (2002), Marketing fraud: an approach for differentiating multilevel marketing from pyramid schemes, Journal of Public Policy and Marketing 21 (1), 139-151.

Table 1. Demographic Characteristics and Fraud Uptake

		Number of Subjects	Percent of all Subjects[†]	Uptake Percentage
Total		452	100%	44.2%
Gender	Men	165	36.5	37.6
	Women	286	63.3	48.3
Age	Age 18-24	108	23.9	43.5
	Age 25-34	86	19.0	50.0
	Age 35-44	63	13.9	41.3
	Age 45-54	90	19.9	46.7
	Age 55-64	76	16.8	39.5
	Age 65 or older	23	5.1	34.8
Education	High School or Less	42	9.3	52.4
	Some College	105	23.2	42.9
	Bachelor's Degree	173	38.3	50.3
	Graduate Degree	132	29.2	34.8
Race/Ethnicity	Hispanic	22	4.9	50.0
	Non-Hispanic	430	95.1	44.0
	Caucasian	384	85.0	44.5
	Non-Caucasian	68	15.0	42.6
Household Income	Less than $20,000	27	6.0	40.7
	$20,000-$40,000	62	13.7	53.2
	$40,000-$60,000	68	15.0	45.6
	$60,000-$80,000	64	14.1	51.6
	$80,000-$100,000	68	15.0	47.1
	Over $100,000	143	31.6	38.5
Political Affiliation	Lean/Identify as Democrat	254	56.2	40.2
	Lean/Identify as Independent	50	11.1	50.0
	Lean/Identify as Republican	91	20.1	48.4
	None of the above	57	12.6	50.9
Percent Urban	Less than 25%	25	5.5	40.0
	25%-75%	41	9.1	48.8
	Over 75%	386	85.4	44.0

[†] The sum within a group may be less than 100% due to missing data.

Table 2. Descriptive Statistics for Non-Demographic Questions

	Variable Type	Mean	Std. Dev
Behavioral/Situational			
Willingness to Take Risk-Investment	Sum of three 7-point Likert questions	11.41	3.80
Willingness to Take Risk-Gambling	Sum of three 7-point Likert questions	4.47	2.88
Perceived Benefit-Investment	Sum of three 7-point Likert questions	13.55	3.67
Perceived Benefit-Gambling	Sum of three 7-point Likert questions	7.39	4.37
Perceived Risk-Investment	Sum of three 7-point Likert questions	13.13	3.09
Perceived Risk-Gambling	Sum of three 7-point Likert questions	18.44	3.76
Religiosity	4-point Likert	2.66	1.00
Religious Service Attendance	Ordinal, 1-9	4.63	2.40
Negative Life Event	Binary	0.45	0.50
Prior Exposure-Self	Binary	0.30	0.46
Prior Exposure-Other	Binary	0.51	0.50
Psychological/Cognitive			
Cognitive Ability-CRT	Number of correct answers (3 possible)	1.31	1.08
Impulsivity-iCRT	Number of intuitive, incorrect answers (3 possible)	1.37	1.01
Impulsivity-BIS NonPlanning	Sum of eleven 4-point Likert questions*	20.21	4.26
Financial Literacy	Number of correct answers (3 possible)	2.18	0.92
Airplane Game Processing			
Correct Number-Recruits Needed	Binary	0.48	0.50
Correct Number-Concurrent Recruiters	Binary	0.49	0.50
Perceived Win Likelihood *(PWL)*	Ordinal, 1-7	3.42	2.08
Reported Role of Perceived Win Likelihood *(RRPWL)*	7-point Likert	3.76	2.04
Legal	Binary	0.50	0.50

* Uses reverse scoring for certain questions as designated by BIS protocol

Table 3. Descriptive Statistics by Experimental Group

	Control (*n=183*)		Treatment (*n=187*)		Difference in Means
	Mean	Std. Error	Mean	Std. Error	
Age	39.58	1.169	40.62	1.182	
Male	0.385	0.036	0.390	0.036	
HS or Less	0.087	0.021	0.086	0.021	
Some College	0.240	0.032	0.203	0.030	
Bachelor's Degree	0.388	0.036	0.380	0.036	
Graduate Degree	0.284	0.452	0.332	0.472	
Hispanic	0.044	0.015	0.037	0.014	
Caucasian	0.836	0.027	0.856	0.026	
HH Income Category	4.099	0.131	4.240	0.120	
Democrat	0.492	0.037	0.604	0.036	**
Percent Urban	0.871	0.020	0.898	0.018	
Reported Role of Perceived Win Likelihood *(RRPWL)*	3.787	2.124	3.791	1.998	
Perceived Win Likelihood *(PWL)*	3.328	2.179	3.449	2.014	
Uptake	0.475	0.501	0.422	0.495	

Note: For each row, the last column presents the results of a t-test of the null hypothesis that the means are equal in both samples.

* Difference in means that is significant at the 10% level.

** Difference in means that is significant at the 5% level.

*** Difference in means that is significant at the 1% level.

Table 4. Estimation Results for Linear Probability Model Analysis of Fraud Uptake – Intent to Treat†

Variables Dependent variable: Uptake (binary)	OLS with post-treatment variables	OLS without post-treatment variables
Treatment	-0.066	-0.035
	(1.37)	(0.64)
Age	-0.001	-0.000
	(0.66)	(0.00)
Male	-0.024	-0.071
	(0.47)	(1.22)
Some College	-0.055	-0.080
	(0.57)	(0.69)
Bachelor's Degree	0.017	-0.006
	(0.18)	(0.06)
Graduate Degree	-0.054	-0.110
	(0.53)	(0.91)
Hispanic	-0.023	0.000
	(0.19)	(0.00)
Caucasian	-0.001	-0.020
	(0.02)	(0.25)
HH Income Category	-0.022	-0.023
	(1.30)	(1.28)
Democrat	-0.039	-0.075
	(0.73)	(1.24)
Percent Urban	0.029	-0.065
	(0.30)	(0.58)
Willingness to Take Risk-Investment	0.003	0.005
	(0.29)	(0.56)
Willingness to Take Risk-Gambling	0.010	0.010
	(1.13)	(0.97)
Perceived Risk-Investment	0.004	0.001
	(0.40)	(0.06)
Perceived Risk-Gambling	0.008	0.006
	(0.91)	(0.70)
Perceived Benefit-Investment	0.017	0.020
	(1.94)*	(2.00)**
Perceived Benefit-Gambling	-0.002	-0.002
	(0.22)	(0.28)
Religiosity	0.050	0.034
	(2.04)**	(1.20)
Negative Life Event	0.072	0.070
	(1.47)	(1.25)
Prior Exposure-Self	-0.059	-0.072
	(0.99)	(1.08)
Prior Exposure-Other	0.110	0.116

	(1.99)**	(1.88)*
Cognitive Ability-CRT	0.019	-0.009
	(0.44)	(0.18)
Impulsivity-iCRT	0.038	0.025
	(0.83)	(0.52)
Impulsivity-BIS Non-Planning	-0.008	-0.003
	(1.15)	(0.41)
Financial Literacy	-0.034	-0.042
	(1.09)	(1.22)
Perceived Win Likelihood *(PWL)*	0.081	
	(6.50)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.077	
	(6.49)***	
Correct Number-Recruits Needed	0.063	
	(1.26)	
Correct Number-Concurrent Recruiters	0.010	
	(0.19)	
Legal	-0.064	
	(1.35)	
Constant	0.138	0.265
	(0.41)	(0.71)
R^2	0.33	0.11
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

† Results regarding the Intent to Treat estimate are qualitatively unchanged when using bootstrap sampling within the linear probability model or when estimating as a probit or logistic model. When using sample weights by population for Minnesota ZIP Codes, the ITT estimate remains statistically insignificant in both specifications. These estimation results are provided in Appendix A, tables A2-A5.

Table 5. Estimation Results for Linear Probability Model Analysis of Fraud Uptake – Intent to Treat with Treatment Heterogeneity†

Variables Dependent variable: Uptake (binary)	OLS with post-treatment variables	OLS without post-treatment variables
Treatment	0.308	1.164
	(0.49)	(1.60)
Age	-0.003	-0.001
	(1.26)	(0.26)
Male	-0.052	-0.136
	(0.64)	(1.45)
Some College	0.220	0.179
	(1.77)*	(0.98)
Bachelor's Degree	0.298	0.260
	(2.44)**	(1.41)
Graduate Degree	0.218	0.163
	(1.63)	(0.84)
Hispanic	0.194	0.148
	(1.62)	(0.94)
Caucasian	0.127	0.036
	(1.47)	(0.35)
HH Income Category	-0.046	-0.040
	(2.14)**	(1.49)
Democrat	-0.071	-0.164
	(0.93)	(1.75)*
Percent Urban	0.131	0.089
	(0.94)	(0.53)
Willingness to Take Risk-Investment	0.009	0.018
	(0.71)	(1.33)
Willingness to Take Risk-Gambling	0.011	0.020
	(0.86)	(1.32)
Perceived Risk-Investment	-0.008	-0.002
	(0.56)	(0.16)
Perceived Risk-Gambling	0.020	0.017
	(1.80)*	(1.56)
Perceived Benefit-Investment	0.012	0.019
	(0.89)	(1.26)
Perceived Benefit-Gambling	-0.004	-0.008
	(0.49)	(0.74)
Religiosity	0.052	0.042
	(1.56)	(1.00)
Negative Life Event	0.142	0.134
	(1.99)**	(1.57)
Prior Exposure-Self	-0.059	-0.142
	(0.71)	(1.57)
Prior Exposure-Other	0.051	0.059

	(0.64)	(0.61)
Cognitive Ability-CRT	0.104	0.070
	(1.62)	(1.03)
Impulsivity-iCRT	0.046	0.033
	(0.75)	(0.52)
Impulsivity-BIS Non-Planning	-0.012	0.002
	(1.17)	(0.16)
Financial Literacy	-0.072	-0.065
	(1.77)*	(1.33)
Perceived Win Likelihood *(PWL)*	0.080	
	(6.39)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.078	
	(6.84)***	
Correct Number-Recruits Needed	0.035	
	(0.67)	
Correct Number-Concurrent Recruiters	0.006	
	(0.12)	
Legal	-0.081	
	(1.64)	
Treatment x Age	0.003	0.002
	(0.91)	(0.45)
Treatment x Male	0.060	0.126
	(0.53)	(1.01)
Treatment x Some College	-0.466	-0.458
	(2.46)**	(1.91)*
Treatment x Bachelor's Degree	-0.492	-0.503
	(2.80)***	(2.15)**
Treatment x Graduate Degree	-0.426	-0.473
	(2.25)**	(1.92)*
Treatment x Hispanic	-0.350	-0.216
	(1.59)	(0.89)
Treatment x Caucasian	-0.180	-0.059
	(1.28)	(0.40)
Treatment x HH Income	0.056	0.045
	(1.70)*	(1.21)
Treatment x Democrat	0.097	0.192
	(0.91)	(1.53)
Treatment x Percent Urban	-0.285	-0.394
	(1.47)	(1.77)*
Treatment x Willingness to take Risk-Investment	-0.014	-0.018
	(0.77)	(0.90)
Treatment x Willingness to take Risk-Gambling	-0.001	-0.017
	(0.03)	(0.79)
Treatment x Perceived Risk-Investment	0.020	0.010
	(1.01)	(0.46)
Treatment x Perceived Risk-Gambling	-0.027	-0.027

	(1.52)	(1.44)
Treatment x Perceived Benefit-Investment	0.011	-0.000
	(0.66)	(0.01)
Treatment x Perceived Benefit-Gambling	0.008	0.014
	(0.57)	(0.94)
Treatment x Religiosity	0.021	-0.004
	(0.41)	(0.06)
Treatment x Negative Life Event	-0.119	-0.132
	(1.17)	(1.13)
Treatment x Prior Exposure-Self	0.065	0.187
	(0.51)	(1.35)
Treatment x Prior Exposure-Other	0.105	0.079
	(0.91)	(0.59)
Treatment x CRT	-0.113	-0.106
	(1.23)	(1.05)
Treatment x iCRT	0.023	0.028
	(0.25)	(0.30)
Treatment x BIS Non-Planning	0.007	-0.010
	(0.54)	(0.64)
Treatment x Financial Literacy	0.059	0.021
	(0.98)	(0.28)
Constant	-0.110	-0.458
	(0.27)	(0.96)
R^2	0.39	0.18
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

[†] Results regarding treatment-education interactions are qualitatively unchanged when using bootstrap sampling within the linear probability model or when estimating as a probit or logistic model. In the second specification, the Democrat interaction is positive and statistically significant at the 10% level in the probit and logit estimations. In addition, the interaction between treatment and Perceived Risk of Gambling is negative and statistically significant at the 10% level in both probit specifications and in the first logit specification. When using sample weights by population for Minnesota ZIP Codes, the treatment-education interaction terms are just outside of statistical significance in the second specification but are statistically significant in the first specification. All results from alternative estimations are provided in Appendix A, Tables A6-A9.

Table 6. Estimation Results for Linear Probability Model Analysis of Fraud Uptake – Correlates of Uptake†

Variables Dependent variable: Uptake (binary)	OLS (1)	OLS (2)	OLS (3)
Treatment	-0.066 (1.37)	-0.054 (1.22)	
Age	-0.001 (0.66)		
Male	-0.024 (0.47)		
Some College	-0.055 (0.57)		
Bachelor's Degree	0.017 (0.18)		
Graduate Degree	-0.054 (0.53)		
Hispanic	-0.023 (0.19)		
Caucasian	-0.001 (0.02)		
HH Income Category	-0.022 (1.30)		
Democrat	-0.039 (0.73)		
Percent Urban	0.029 (0.30)		
Willingness to Take Risk-Investment	0.003 (0.29)		
Willingness to Take Risk-Gambling	0.010 (1.13)		
Perceived Risk-Investment	0.004 (0.40)		
Perceived Risk-Gambling	0.008 (0.91)		
Perceived Benefit-Investment	0.017 (1.94)*	0.017 (2.90)***	0.021 (3.79)***
Perceived Benefit-Gambling	-0.002 (0.22)		
Religiosity	0.050 (2.04)**	0.055 (2.54)**	0.046 (2.26)**
Negative Life Event	0.072 (1.47)		
Prior Exposure-Self	-0.059 (0.99)		
Prior Exposure-Other	0.110 (1.99)**	0.091 (2.06)**	0.079 (1.94)*

Cognitive Ability-CRT	0.019		
	(0.44)		
Impulsivity-iCRT	0.038		
	(0.83)		
Impulsivity-BIS Non-Planning	-0.008		
	(1.15)		
Financial Literacy	-0.034		
	(1.09)		
Perceived Win Likelihood *(PWL)*	0.081	0.084	0.079
	(6.50)***	(7.58)***	(7.76)***
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.077	-0.070	-0.069
	(6.49)***	(6.42)***	(7.03)***
Correct Number-Recruits Needed	0.063		
	(1.26)		
Correct Number-Concurrent Recruiters	0.010		
	(0.19)		
Legal	-0.064		
	(1.35)		
Constant	0.138	0.035	-0.008
	(0.41)	(0.29)	(0.07)
R^2	0.33	0.30	0.27
N	348	365	447

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

† Results regarding correlates are qualitatively unchanged when using bootstrap sampling within the linear probability model or when estimating as a probit or logistic model. When using sample weights by population for Minnesota ZIP Codes, Democrat (coef = -0.039) is statistically significant at the five percent level in all three specifications. Perceived benefits of investing, religiosity and prior exposure-others are just outside the range of statistical significance in the first specification and all but prior exposure become significant in the third specification. All maintain expected signs. All results from alternative estimations are provided in Appendix A, Tables A10-A13.

Table 7. Estimation Results for Linear Probability Model Analysis of Reported Role of Perceived Win Likelihood *(RRPWL)*[†]

Variables Dependent Variable: *RRPWL* (ordinal, seven-point scale)	OLS (1)	OLS (2)	OLS (3)
Treatment	-0.132 (0.58)	-0.036 (0.17)	
Age	-0.001 (0.08)		
Male	0.191 (0.77)		
Some College	-0.163 (0.36)		
Bachelor's Degree	-0.135 (0.31)		
Graduate Degree	0.022 (0.05)		
Hispanic	0.261 (0.43)		
Caucasian	-0.144 (0.42)		
HH Income Category	-0.051 (0.65)		
Democrat	0.384 (1.53)		
Percent Urban	0.802 (1.91)*	0.823 (2.07)**	0.709 (1.98)**
Willingness to Take Risk-Investment	0.009 (0.22)		
Willingness to Take Risk-Gambling	0.003 (0.07)		
Perceived Risk-Investment	0.019 (0.44)		
Perceived Risk-Gambling	0.022 (0.76)		
Perceived Benefit-Investment	-0.003 (0.08)		
Perceived Benefit-Gambling	0.050 (1.57)		
Religiosity	0.195 (1.58)		
Negative Life Event	0.159 (0.68)		
Prior Exposure-Self	0.076 (0.28)		
Prior Exposure-Other	-0.177 (0.70)		

Cognitive Ability-CRT	0.340 (1.99)**	0.235 (2.35)**	0.259 (2.92)***
Impulsivity-iCRT	0.138 (0.80)		
Impulsivity-BIS Non-Planning	-0.055 (1.77)*	-0.063 (2.54)**	-0.052 (2.38)**
Financial Literacy	-0.017 (0.12)		
Constant	2.129 (1.49)	4.021 (6.00)***	3.851 (6.58)***
R^2	0.09	0.05	0.05
N	348	368	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

† Results regarding Percent Urban as well as CRT and BIS scores are qualitatively unchanged when using bootstrap sampling within the linear probability model or when estimating as an ordered probit or ordered logit model. The same is true when using sample weights by population for Minnesota ZIP Codes. These alternative methods did identify religiosity as another statistically significant positive correlate of *RRPWL*. The estimation with sample weights also indicated that *RRPWL* is higher for those who perceive higher benefits from gambling, all else equal. All results from alternative estimations are provided in Appendix A, Tables A14-A17.

Table 8. Estimation Results for Linear Probability Model Analysis of Perceived Win Likelihood *(PWL)* †

Variables Dependent Variable: *PWL* (ordinal, seven-point scale)	OLS (1)	OLS (2)	OLS (3)
Treatment	0.213 (0.95)	0.203 (0.96)	
Age	0.014 (1.65)*	0.006 (0.92)	0.008 (1.26)
Male	-0.346 (1.45)	-0.295 (1.32)	-0.192 (0.94)
Some College	-0.418 (0.88)		
Bachelor's Degree	-0.377 (0.84)		
Graduate Degree	-0.623 (1.33)		
Hispanic	0.600 (0.87)		
Caucasian	-0.435 (1.29)		
HH Income Category	-0.068 (0.88)		
Democrat	-0.055 (0.21)		
Percent Urban	-0.263 (0.59)		
Willingness to Take Risk-Investment	0.046 (1.04)		
Willingness to Take Risk-Gambling	-0.003 (0.06)		
Perceived Risk-Investment	-0.020 (0.44)		
Perceived Risk-Gambling	0.002 (0.06)		
Perceived Benefit-Investment	0.039 (0.90)	0.057 (1.87)*	0.037 (1.29)
Perceived Benefit-Gambling	0.053 (1.66)*	0.050 (1.80)*	0.049 (1.90)*
Religiosity	0.014 (0.12)		
Negative Life Event	0.165 (0.72)		
Prior Exposure-Self	-0.120 (0.43)		
Prior Exposure-Other	-0.096 (0.38)		

Cognitive Ability-CRT	-0.006 (0.03)		
Impulsivity-iCRT	-0.008 (0.04)		
Impulsivity-BIS Non-Planning	-0.005 (0.18)		
Financial Literacy	-0.131 (0.87)		
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.156 (2.84)***	-0.142 (2.72)***	-0.137 (2.84)***
Correct Number-Recruits Needed	-0.413 (1.72)*	-0.581 (2.65)***	-0.379 (1.92)*
Correct Number-Concurrent Recruiters	-0.314 (1.23)	-0.351 (1.54)	-0.323 (1.58)
Legal	0.437 (1.89)*	0.476 (2.12)**	0.399 (1.99)**
Constant	4.148 (2.45)**	2.786 (4.95)***	2.966 (5.60)***
R^2	0.16	0.11	0.08
N	348	367	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

† Results regarding Perceived Benefits of Gambling and Investments, *RRPWL*, Correct Number of Recruits, and Legal are qualitatively unchanged when using bootstrap sampling within the linear probability model or when estimating as an ordered probit or ordered logit model. The same is true when using sample weights by population for Minnesota ZIP Codes. Alternative methods (ordered probit, ordered logit, and LPM with sampling weights) did identify age as another statistically significant positive correlate of *PWL*, with *PWL* rising with age. Both the ordered probit and ordered logit identified gender as a statistically significant correlate in the full model, with men estimating lower probabilities of winning on average, all else equal. The estimation with sample weights also indicated that *PWL* is lower for those who higher education, all else equal. All results from alternative estimations are provided in Appendix A, Tables A18-A21.

Table 9. Uptake Percentage by Education and Treatment Status

UPTAKE Percentage *(n)*	High School Or Less	Some College	Bachelor's Degree	Graduate Degree
Control	37.5% *(16)*	45.5% *(44)*	59.2% *(71)*	36.5% *(52)*
Treatment	62.5% *(16)*	42.1% *(38)*	46.5% *(71)*	32.3% *(62)*

Table A1. Estimation Results for Linear Probability Model Analysis of Fraud Uptake – Alternate Measures of Religion

Variables Dependent variable: Uptake (binary)	OLS with both religion variables	OLS with only Religiosity	OLS with only Service Attendance
Age	-0.002	-0.002	-0.002
	(0.96)	(0.99)	(1.03)
Male	-0.073	-0.073	-0.078
	(1.53)	(1.54)	(1.67)*
Some College	-0.082	-0.082	-0.090
	(1.01)	(1.01)	(1.08)
Bachelor's Degree	-0.033	-0.032	-0.023
	(0.43)	(0.43)	(0.29)
Graduate Degree	-0.093	-0.093	-0.082
	(1.08)	(1.07)	(0.93)
Hispanic	-0.026	-0.026	-0.014
	(0.24)	(0.24)	(0.13)
Caucasian	-0.000	-0.001	0.016
	(0.01)	(0.01)	(0.24)
HH Income Category	-0.018	-0.018	-0.018
	(1.18)	(1.18)	(1.24)
Democrat	-0.044	-0.044	-0.053
	(0.92)	(0.91)	(1.11)
Percent Urban	0.111	0.110	0.097
	(1.17)	(1.18)	(1.07)
Willingness to Take Risk-Investment	0.005	0.005	0.005
	(0.64)	(0.64)	(0.61)
Willingness to Take Risk-Gambling	0.007	0.007	0.007
	(0.78)	(0.80)	(0.81)
Perceived Risk-Investment	0.009	0.009	0.009
	(1.04)	(1.07)	(1.10)
Perceived Risk-Gambling	0.008	0.008	0.009
	(1.12)	(1.13)	(1.26)
Perceived Benefit-Investment	0.018	0.018	0.019
	(2.26)**	(2.31)**	(2.41)**
Perceived Benefit-Gambling	0.001	0.001	0.000
	(0.10)	(0.10)	(0.03)
Religiosity	0.048	0.045	
	(1.31)	(1.98)**	
Religious Service Attendance	-0.002		0.013
	(0.12)		(1.42)
Negative Life Event	0.043	0.044	0.043
	(0.99)	(1.00)	(0.98)
Prior Exposure-Self	-0.056	-0.056	-0.047

	(1.02)	(1.03)	(0.86)
Prior Exposure-Other	0.098	0.098	0.083
	(1.96)*	(1.96)*	(1.67)*
Cognitive Ability-CRT	0.019	0.020	0.016
	(0.47)	(0.48)	(0.39)
Impulsivity-iCRT	0.034	0.034	0.038
	(0.82)	(0.83)	(0.92)
Impulsivity-BIS Non-Planning	-0.003	-0.003	-0.000
	(0.48)	(0.46)	(0.07)
Financial Literacy	-0.008	-0.009	-0.006
	(0.30)	(0.30)	(0.22)
Perceived Win Likelihood *(PWL)*	0.080	0.080	0.079
	(7.14)***	(7.14)***	(7.06)***
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.079	-0.079	-0.078
	(7.47)***	(7.47)***	(7.47)***
Correct Number-Recruits Needed	0.034	0.034	0.029
	(0.76)	(0.76)	(0.64)
Correct Number-Concurrent Recruiters	0.053	0.054	0.056
	(1.13)	(1.14)	(1.20)
Legal	-0.050	-0.050	-0.048
	(1.14)	(1.14)	(1.10)
Constant	-0.171	-0.174	-0.187
	(0.58)	(0.59)	(0.64)
R^2	0.31	0.31	0.30
N	424	424	428

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A2. Estimation Results for Linear Probability Model Analysis of Fraud Uptake – Intent to Treat with Bootstrap Sampling

Variables Dependent variable: Uptake (binary)	OLS with post-treatment variables	OLS without post-treatment variables
Treatment	-0.066	-0.035
	(1.40)	(0.71)
Age	-0.001	-0.000
	(0.72)	(0.00)
Male	-0.024	-0.071
	(0.43)	(1.13)
Some College	-0.055	-0.080
	(0.57)	(0.69)
Bachelor's Degree	0.017	-0.006
	(0.17)	(0.05)
Graduate Degree	-0.054	-0.110
	(0.56)	(1.00)
Hispanic	-0.023	0.000
	(0.15)	(0.00)
Caucasian	-0.001	-0.020
	(0.02)	(0.27)
HH Income Category	-0.022	-0.023
	(1.34)	(1.29)
Democrat	-0.039	-0.075
	(0.78)	(1.32)
Percent Urban	0.029	-0.065
	(0.29)	(0.52)
Willingness to Take Risk-Investment	0.003	0.005
	(0.31)	(0.64)
Willingness to Take Risk-Gambling	0.010	0.010
	(1.00)	(0.86)
Perceived Risk-Investment	0.004	0.001
	(0.36)	(0.06)
Perceived Risk-Gambling	0.008	0.006
	(0.87)	(0.67)
Perceived Benefit-Investment	0.017	0.020
	(1.68)*	(1.70)*
Perceived Benefit-Gambling	-0.002	-0.002
	(0.22)	(0.28)
Religiosity	0.050	0.034
	(2.21)**	(1.24)
Negative Life Event	0.072	0.070
	(1.44)	(1.21)
Prior Exposure-Self	-0.059	-0.072
	(1.00)	(1.14)

Prior Exposure-Other	0.110 (1.67)*	0.116 (1.58)
Cognitive Ability-CRT	0.019 (0.38)	-0.009 (0.16)
Impulsivity-iCRT	0.038 (0.74)	0.025 (0.48)
Impulsivity-BIS Non-Planning	-0.008 (1.14)	-0.003 (0.39)
Financial Literacy	-0.034 (1.20)	-0.042 (1.31)
Perceived Win Likelihood *(PWL)*	0.081 (6.64)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.077 (6.89)***	
Correct Number-Recruits Needed	0.063 (1.24)	
Correct Number-Concurrent Recruiters	0.010 (0.18)	
Legal	-0.064 (1.30)	
Constant	0.138 (0.37)	0.265 (0.62)
R^2	0.33	0.11
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A3. Estimation Results for Logistic Analysis of Fraud Uptake – Intent to Treat

Variables Dependent variable: Uptake (binary)	Logistic with post-treatment variables	Logistic without post-treatment variables
Treatment	-0.363 (1.28)	-0.168 (0.70)
Age	-0.006 (0.55)	0.000 (0.04)
Male	-0.140 (0.46)	-0.330 (1.28)
Some College	-0.405 (0.78)	-0.337 (0.69)
Bachelor's Degree	-0.023 (0.05)	-0.027 (0.06)
Graduate Degree	-0.483 (0.91)	-0.500 (0.97)
Hispanic	-0.077 (0.12)	0.003 (0.00)
Caucasian	0.062 (0.15)	-0.077 (0.22)
HH Income Category	-0.157 (1.48)	-0.105 (1.30)
Democrat	-0.187 (0.61)	-0.318 (1.21)
Percent Urban	0.308 (0.56)	-0.261 (0.55)
Willingness to Take Risk-Investment	0.017 (0.35)	0.026 (0.61)
Willingness to Take Risk-Gambling	0.059 (0.91)	0.049 (1.03)
Perceived Risk-Investment	0.020 (0.38)	0.002 (0.05)
Perceived Risk-Gambling	0.034 (0.79)	0.030 (0.78)
Perceived Benefit-Investment	0.107 (2.13)**	0.089 (2.07)**
Perceived Benefit-Gambling	-0.002 (0.05)	-0.009 (0.26)
Religiosity	0.359 (2.38)**	0.161 (1.27)
Negative Life Event	0.381 (1.32)	0.315 (1.31)
Prior Exposure-Self	-0.424 (1.18)	-0.339 (1.15)
Prior Exposure-Other	0.789	0.530

	(2.37)**	(1.95)*
Cognitive Ability-CRT	0.074	-0.042
	(0.30)	(0.20)
Impulsivity-iCRT	0.209	0.105
	(0.81)	(0.52)
Impulsivity-BIS Non-Planning	-0.058	-0.015
	(1.48)	(0.47)
Financial Literacy	-0.187	-0.186
	(1.11)	(1.26)
Perceived Win Likelihood *(PWL)*	0.469	
	(5.83)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.472	
	(5.97)***	
Correct Number-Recruits Needed	0.391	
	(1.30)	
Correct Number-Concurrent Recruiters	0.083	
	(0.28)	
Legal	-0.456	
	(1.55)	
Constant	-1.909	-1.173
	(1.06)	(0.74)
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A4. Estimation Results of Probit Analysis of Fraud Uptake – Intent to Treat

Variables Dependent variable: Uptake (binary)	Probit with post-treatment variables	Probit without post-treatment variables
Treatment	-0.199 (1.24)	-0.102 (0.70)
Age	-0.003 (0.55)	0.000 (0.06)
Male	-0.105 (0.60)	-0.201 (1.29)
Some College	-0.238 (0.78)	-0.214 (0.71)
Bachelor's Degree	0.008 (0.03)	-0.017 (0.06)
Graduate Degree	-0.291 (0.92)	-0.310 (1.00)
Hispanic	-0.011 (0.03)	0.027 (0.08)
Caucasian	0.014 (0.06)	-0.037 (0.17)
HH Income Category	-0.089 (1.50)	-0.066 (1.34)
Democrat	-0.117 (0.66)	-0.204 (1.29)
Percent Urban	0.154 (0.48)	-0.159 (0.55)
Willingness to Take Risk-Investment	0.005 (0.18)	0.015 (0.60)
Willingness to Take Risk-Gambling	0.038 (1.07)	0.030 (1.04)
Perceived Risk-Investment	0.008 (0.26)	-0.000 (0.01)
Perceived Risk-Gambling	0.021 (0.88)	0.018 (0.78)
Perceived Benefit-Investment	0.066 (2.31)**	0.055 (2.13)**
Perceived Benefit-Gambling	-0.002 (0.09)	-0.005 (0.27)
Religiosity	0.200 (2.31)**	0.097 (1.27)
Negative Life Event	0.211 (1.28)	0.199 (1.36)
Prior Exposure-Self	-0.244 (1.19)	-0.209 (1.16)
Prior Exposure-Other	0.425	0.328

	(2.23)**	(1.98)**
Cognitive Ability-CRT	0.044	-0.024
	(0.32)	(0.19)
Impulsivity-iCRT	0.123	0.067
	(0.86)	(0.54)
Impulsivity-BIS Non-Planning	-0.032	-0.009
	(1.44)	(0.47)
Financial Literacy	-0.113	-0.116
	(1.14)	(1.26)
Perceived Win Likelihood *(PWL)*	0.270	
	(6.20)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.274	
	(6.36)***	
Correct Number-Recruits Needed	0.218	
	(1.26)	
Correct Number-Concurrent Recruiters	0.037	
	(0.21)	
Legal	-0.236	
	(1.43)	
Constant	-1.056	-0.694
	(0.99)	(0.71)
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A5. Estimation Results of Linear Probability Model Analysis of Fraud Uptake – Intent to Treat using Sample Weights (based on Minnesota ZIP Code Population)

Variables Dependent variable: Uptake (binary)	OLS with post-treatment variables	OLS without post-treatment variables
Treatment	-0.005 (0.09)	0.025 (0.39)
Age	-0.002 (0.91)	-0.001 (0.41)
Male	-0.032 (0.49)	-0.078 (1.13)
Some College	-0.053 (0.47)	-0.141 (1.13)
Bachelor's Degree	0.010 (0.10)	-0.064 (0.54)
Graduate Degree	0.009 (0.08)	-0.073 (0.58)
Hispanic	0.006 (0.04)	-0.023 (0.15)
Caucasian	-0.098 (1.18)	-0.107 (1.23)
HH Income Category	-0.028 (1.32)	-0.034 (1.60)
Democrat	-0.132 (2.09)**	-0.185 (2.69)***
Percent Urban	0.054 (0.26)	-0.116 (0.51)
Willingness to Take Risk-Investment	-0.005 (0.49)	-0.003 (0.27)
Willingness to Take Risk-Gambling	0.001 (0.09)	-0.007 (0.59)
Perceived Risk-Investment	0.005 (0.43)	0.001 (0.06)
Perceived Risk-Gambling	0.006 (0.55)	0.001 (0.06)
Perceived Benefit-Investment	0.018 (1.64)	0.020 (1.66)*
Perceived Benefit-Gambling	0.001 (0.08)	0.001 (0.11)
Religiosity	0.045 (1.50)	0.029 (0.85)
Negative Life Event	0.006 (0.09)	0.023 (0.35)
Prior Exposure-Self	-0.029	-0.039

	(0.43)	(0.51)
Prior Exposure-Other	0.097	0.104
	(1.50)	(1.51)
Cognitive Ability-CRT	-0.006	-0.035
	(0.12)	(0.66)
Impulsivity-iCRT	0.044	0.041
	(0.88)	(0.81)
Impulsivity-BIS Non-Planning	-0.004	0.000
	(0.46)	(0.01)
Financial Literacy	-0.021	-0.009
	(0.56)	(0.23)
Perceived Win Likelihood *(PWL)*	0.072	
	(4.59)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.072	
	(5.05)***	
Correct Number-Recruits Needed	0.042	
	(0.66)	
Correct Number-Concurrent Recruiters	0.023	
	(0.35)	
Legal	-0.034	
	(0.59)	
Constant	0.344	0.702
	(0.82)	(1.48)
R^2	0.33	0.14
N	318	318

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A6. Estimation Results of Linear Probability Model Analysis of Fraud Uptake – Intent to Treat with Treatment Heterogeneity and Bootstrap Sampling

Variables Dependent variable: Uptake (binary)	OLS with post-treatment variables	OLS with post-treatment variables
Treatment	0.308	1.164
	(0.37)	(1.27)
Age	-0.003	-0.001
	(1.32)	(0.26)
Male	-0.052	-0.136
	(0.58)	(1.37)
Some College	0.220	0.179
	(1.85)*	(0.98)
Bachelor's Degree	0.298	0.260
	(2.25)**	(1.30)
Graduate Degree	0.218	0.163
	(1.62)	(0.85)
Hispanic	0.194	0.148
	(1.11)	(0.77)
Caucasian	0.127	0.036
	(1.44)	(0.31)
HH Income Category	-0.046	-0.040
	(1.89)*	(1.41)
Democrat	-0.071	-0.164
	(0.82)	(1.70)*
Percent Urban	0.131	0.089
	(0.84)	(0.50)
Willingness to Take Risk-Investment	0.009	0.018
	(0.71)	(1.41)
Willingness to Take Risk-Gambling	0.011	0.020
	(0.73)	(1.17)
Perceived Risk-Investment	-0.008	-0.002
	(0.52)	(0.16)
Perceived Risk-Gambling	0.020	0.017
	(1.57)	(1.40)
Perceived Benefit-Investment	0.012	0.019
	(0.78)	(1.13)
Perceived Benefit-Gambling	-0.004	-0.008
	(0.41)	(0.70)
Religiosity	0.052	0.042
	(1.48)	(0.86)
Negative Life Event	0.142	0.134
	(1.98)**	(1.64)
Prior Exposure-Self	-0.059	-0.142
	(0.69)	(1.61)

Prior Exposure-Other	0.051	0.059
	(0.56)	(0.56)
Cognitive Ability-CRT	0.104	0.070
	(1.37)	(0.94)
Impulsivity-iCRT	0.046	0.033
	(0.65)	(0.48)
Impulsivity-BIS Non-Planning	-0.012	0.002
	(1.04)	(0.16)
Financial Literacy	-0.072	-0.065
	(1.92)*	(1.32)
Perceived Win Likelihood *(PWL)*	0.080	
	(6.23)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.078	
	(6.50)***	
Correct Number-Recruits Needed	0.035	
	(0.65)	
Correct Number-Concurrent Recruiters	0.006	
	(0.12)	
Legal	-0.081	
	(1.57)	
Treatment x Age	0.003	0.002
	(0.95)	(0.45)
Treatment x Male	0.060	0.126
	(0.47)	(0.91)
Treatment x Some College	-0.466	-0.458
	(2.19)**	(1.68)*
Treatment x Bachelor's Degree	-0.492	-0.503
	(2.45)**	(1.88)*
Treatment x Graduate Degree	-0.426	-0.473
	(1.89)*	(1.72)*
Treatment x Hispanic	-0.350	-0.216
	(1.31)	(0.74)
Treatment x Caucasian	-0.180	-0.059
	(1.17)	(0.36)
Treatment x HH Income	0.056	0.045
	(1.51)	(1.18)
Treatment x Democrat	0.097	0.192
	(0.79)	(1.40)
Treatment x Percent Urban	-0.285	-0.394
	(1.35)	(1.74)*
Treatment x Willingness to take Risk-Investment	-0.014	-0.018
	(0.73)	(0.89)
Treatment x Willingness to take Risk-Gambling	-0.001	-0.017
	(0.02)	(0.72)
Treatment x Perceived Risk-Investment	0.020	0.010
	(0.88)	(0.41)

Treatment x Perceived Risk-Gambling	-0.027	-0.027
	(1.41)	(1.34)
Treatment x Perceived Benefit-Investment	0.011	-0.000
	(0.61)	(0.01)
Treatment x Perceived Benefit-Gambling	0.008	0.014
	(0.58)	(0.98)
Treatment x Religiosity	0.021	-0.004
	(0.45)	(0.06)
Treatment x Negative Life Event	-0.119	-0.132
	(1.17)	(1.21)
Treatment x Prior Exposure-Self	0.065	0.187
	(0.53)	(1.44)
Treatment x Prior Exposure-Other	0.105	0.079
	(0.95)	(0.63)
Treatment x CRT	-0.113	-0.106
	(1.19)	(1.15)
Treatment x iCRT	0.023	0.028
	(0.23)	(0.28)
Treatment x BIS Non-Planning	0.007	-0.010
	(0.46)	(0.60)
Treatment x Financial Literacy	0.059	0.021
	(0.95)	(0.27)
Constant	-0.110	-0.458
	(0.20)	(0.77)
R^2	0.39	0.18
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A7. Estimation Results of Logistic Analysis of Fraud Uptake – Intent to Treat with Treatment Heterogeneity

Variables Dependent variable: Uptake (binary)	Logit with post-treatment variables	Logit with post-treatment variables
Treatment	1.640	5.914
	(0.40)	(1.72)*
Age	-0.023	-0.002
	(1.43)	(0.14)
Male	-0.575	-0.718
	(1.05)	(1.70)*
Some College	1.525	0.916
	(1.91)*	(1.11)
Bachelor's Degree	1.924	1.269
	(2.82)***	(1.53)
Graduate Degree	1.378	0.789
	(1.65)*	(0.92)
Hispanic	1.151	0.830
	(1.44)	(1.03)
Caucasian	0.947	0.200
	(1.63)	(0.39)
HH Income Category	-0.352	-0.197
	(2.27)**	(1.59)
Democrat	-0.303	-0.801
	(0.60)	(1.88)*
Percent Urban	0.806	0.444
	(0.89)	(0.58)
Willingness to Take Risk-Investment	0.074	0.089
	(1.08)	(1.37)
Willingness to Take Risk-Gambling	0.055	0.122
	(0.52)	(1.52)
Perceived Risk-Investment	-0.065	-0.008
	(0.80)	(0.12)
Perceived Risk-Gambling	0.121	0.093
	(1.90)*	(1.73)*
Perceived Benefit-Investment	0.080	0.097
	(0.95)	(1.38)
Perceived Benefit-Gambling	-0.020	-0.036
	(0.35)	(0.76)
Religiosity	0.435	0.228
	(1.88)*	(1.15)
Negative Life Event	1.060	0.689
	(2.32)**	(1.81)*
Prior Exposure-Self	-0.648	-0.756
	(1.10)	(1.74)*

Prior Exposure-Other	0.614	0.355
	(1.25)	(0.79)
Cognitive Ability-CRT	0.648	0.343
	(1.55)	(1.11)
Impulsivity-iCRT	0.248	0.147
	(0.57)	(0.49)
Impulsivity-BIS Non-Planning	-0.100	-0.001
	(1.55)	(0.03)
Financial Literacy	-0.488	-0.328
	(1.91)*	(1.48)
Perceived Win Likelihood *(PWL)*	0.515	
	(5.66)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.547	
	(5.80)***	
Correct Number-Recruits Needed	0.268	
	(0.77)	
Correct Number-Concurrent Recruiters	-0.009	
	(0.03)	
Legal	-0.630	
	(2.02)**	
Treatment x Age	0.028	0.008
	(1.26)	(0.41)
Treatment x Male	0.908	0.675
	(1.18)	(1.19)
Treatment x Some College	-3.318	-2.238
	(2.68)***	(2.01)**
Treatment x Bachelor's Degree	-3.217	-2.414
	(3.02)***	(2.24)**
Treatment x Graduate Degree	-2.854	-2.265
	(2.44)**	(2.01)**
Treatment x Hispanic	-2.081	-1.114
	(1.50)	(0.91)
Treatment x Caucasian	-1.026	-0.279
	(1.20)	(0.39)
Treatment x HH Income	0.366	0.213
	(1.71)*	(1.25)
Treatment x Democrat	0.492	0.986
	(0.75)	(1.72)*
Treatment x Percent Urban	-1.998	-1.960
	(1.50)	(1.84)*
Treatment x Willingness to take Risk-Investment	-0.125	-0.091
	(1.19)	(0.99)
Treatment x Willingness to take Risk-Gambling	0.021	-0.105
	(0.12)	(1.00)
Treatment x Perceived Risk-Investment	0.130	0.041
	(1.12)	(0.42)

Treatment x Perceived Risk-Gambling	-0.174 (1.67)*	-0.135 (1.58)
Treatment x Perceived Benefit-Investment	0.081 (0.72)	-0.001 (0.01)
Treatment x Perceived Benefit-Gambling	0.055 (0.67)	0.067 (0.99)
Treatment x Religiosity	0.119 (0.35)	-0.028 (0.10)
Treatment x Negative Life Event	-1.067 (1.56)	-0.701 (1.33)
Treatment x Prior Exposure-Self	0.674 (0.85)	0.947 (1.50)
Treatment x Prior Exposure-Other	0.537 (0.79)	0.327 (0.54)
Treatment x CRT	-0.794 (1.41)	-0.532 (1.18)
Treatment x iCRT	0.177 (0.30)	0.122 (0.29)
Treatment x BIS Non-Planning	0.059 (0.66)	-0.036 (0.52)
Treatment x Financial Literacy	0.436 (1.21)	0.131 (0.40)
Constant	-3.148 (1.15)	-4.983 (2.05)**
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A8. Estimation Results of Probit Analysis of Fraud Uptake – Intent to Treat with Treatment Heterogeneity

Variables Dependent variable: Uptake (binary)	Probit with post-treatment variables	Probit with post-treatment variables
Treatment	1.110 (0.50)	3.666 (1.78)*
Age	-0.013 (1.44)	-0.002 (0.18)
Male	-0.335 (1.13)	-0.451 (1.80)*
Some College	0.893 (1.97)**	0.546 (1.12)
Bachelor's Degree	1.153 (2.80)***	0.762 (1.56)
Graduate Degree	0.757 (1.59)	0.478 (0.93)
Hispanic	0.707 (1.51)	0.528 (1.07)
Caucasian	0.519 (1.51)	0.131 (0.42)
HH Income Category	-0.214 (2.46)**	-0.121 (1.64)
Democrat	-0.122 (0.44)	-0.489 (1.94)*
Percent Urban	0.411 (0.82)	0.274 (0.62)
Willingness to Take Risk-Investment	0.038 (0.95)	0.053 (1.38)
Willingness to Take Risk-Gambling	0.032 (0.51)	0.075 (1.55)
Perceived Risk-Investment	-0.041 (0.91)	-0.007 (0.16)
Perceived Risk-Gambling	0.074 (2.09)**	0.058 (1.80)*
Perceived Benefit-Investment	0.049 (1.07)	0.062 (1.48)
Perceived Benefit-Gambling	-0.010 (0.30)	-0.023 (0.80)
Religiosity	0.254 (1.99)**	0.136 (1.18)
Negative Life Event	0.576 (2.31)**	0.432 (1.91)*
Prior Exposure-Self	-0.397 (1.23)	-0.466 (1.77)*

Prior Exposure-Other	0.308	0.206
	(1.11)	(0.78)
Cognitive Ability-CRT	0.349	0.206
	(1.58)	(1.11)
Impulsivity-iCRT	0.128	0.089
	(0.56)	(0.49)
Impulsivity-BIS Non-Planning	-0.057	-0.000
	(1.63)	(0.01)
Financial Literacy	-0.272	-0.195
	(1.89)*	(1.47)
Perceived Win Likelihood *(PWL)*	0.291	
	(6.44)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.312	
	(6.86)***	
Correct Number-Recruits Needed	0.136	
	(0.70)	
Correct Number-Concurrent Recruiters	0.000	
	(0.00)	
Legal	-0.340	
	(1.96)**	
Treatment x Age	0.016	0.006
	(1.30)	(0.48)
Treatment x Male	0.460	0.436
	(1.14)	(1.29)
Treatment x Some College	-1.898	-1.371
	(2.80)***	(2.08)**
Treatment x Bachelor's Degree	-1.865	-1.465
	(3.10)***	(2.31)**
Treatment x Graduate Degree	-1.581	-1.391
	(2.40)**	(2.09)**
Treatment x Hispanic	-1.242	-0.682
	(1.56)	(0.94)
Treatment x Caucasian	-0.614	-0.177
	(1.23)	(0.41)
Treatment x HH Income	0.237	0.133
	(2.02)**	(1.29)
Treatment x Democrat	0.202	0.597
	(0.55)	(1.76)*
Treatment x Percent Urban	-1.123	-1.222
	(1.54)	(1.95)*
Treatment x Willingness to take Risk-Investment	-0.078	-0.057
	(1.32)	(1.06)
Treatment x Willingness to take Risk-Gambling	0.004	-0.064
	(0.05)	(1.02)
Treatment x Perceived Risk-Investment	0.074	0.026
	(1.16)	(0.45)

Treatment x Perceived Risk-Gambling	-0.108 (2.01)**	-0.086 (1.77)*
Treatment x Perceived Benefit-Investment	0.053 (0.86)	-0.001 (0.02)
Treatment x Perceived Benefit-Gambling	0.028 (0.61)	0.041 (1.01)
Treatment x Religiosity	0.036 (0.20)	-0.019 (0.12)
Treatment x Negative Life Event	-0.552 (1.56)	-0.426 (1.37)
Treatment x Prior Exposure-Self	0.441 (0.99)	0.581 (1.54)
Treatment x Prior Exposure-Other	0.316 (0.82)	0.218 (0.61)
Treatment x CRT	-0.433 (1.41)	-0.321 (1.20)
Treatment x iCRT	0.105 (0.34)	0.081 (0.31)
Treatment x BIS Non-Planning	0.037 (0.78)	-0.022 (0.54)
Treatment x Financial Literacy	0.220 (1.08)	0.073 (0.37)
Constant	-1.745 (1.11)	-3.038 (2.07)**
N	348	348

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A9. Estimation Results of Linear Probability Model Analysis of Fraud Uptake – Intent to Treat and Treatment Heterogeneity using Sample Weights (based on Minnesota ZIP Code Population)

Variables Dependent variable: Uptake (binary)	OLS with post-treatment variables	OLS with post-treatment variables
Treatment	-0.631 (0.85)	0.640 (0.72)
Age	-0.004 (1.46)	-0.000 (0.10)
Male	-0.109 (1.06)	-0.210 (1.87)*
Some College	0.239 (1.62)	0.068 (0.31)
Bachelor's Degree	0.315 (2.29)**	0.132 (0.61)
Graduate Degree	0.265 (1.75)*	0.120 (0.53)
Hispanic	0.106 (0.71)	0.000 (0.00)
Caucasian	-0.025 (0.23)	-0.137 (1.22)
HH Income Category	-0.047 (1.91)*	-0.041 (1.42)
Democrat	-0.111 (1.26)	-0.275 (2.68)***
Percent Urban	-0.019 (0.08)	-0.040 (0.13)
Willingness to Take Risk-Investment	-0.005 (0.36)	0.008 (0.48)
Willingness to Take Risk-Gambling	-0.002 (0.12)	0.002 (0.11)
Perceived Risk-Investment	-0.007 (0.51)	0.003 (0.16)
Perceived Risk-Gambling	0.020 (1.39)	0.015 (1.03)
Perceived Benefit-Investment	0.011 (0.70)	0.019 (1.07)
Perceived Benefit-Gambling	0.005 (0.45)	0.003 (0.26)
Religiosity	0.056 (1.33)	0.021 (0.39)
Negative Life Event	0.044 (0.51)	0.030 (0.30)
Prior Exposure-Self	-0.098	-0.184

	(1.00)	(1.68)*
Prior Exposure-Other	0.114	0.151
	(1.24)	(1.36)
Cognitive Ability-CRT	0.027	-0.025
	(0.41)	(0.37)
Impulsivity-iCRT	-0.014	-0.010
	(0.22)	(0.14)
Impulsivity-BIS Non-Planning	-0.013	-0.000
	(1.17)	(0.02)
Financial Literacy	-0.060	-0.003
	(1.23)	(0.04)
Perceived Win Likelihood *(PWL)*	0.076	
	(4.78)***	
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.079	
	(5.82)***	
Correct Number-Recruits Needed	0.041	
	(0.63)	
Correct Number-Concurrent Recruiters	0.018	
	(0.27)	
Legal	-0.080	
	(1.36)	
Treatment x Age	0.004	0.001
	(1.02)	(0.22)
Treatment x Male	0.118	0.173
	(0.86)	(1.16)
Treatment x Some College	-0.456	-0.387
	(2.08)**	(1.40)
Treatment x Bachelor's Degree	-0.494	-0.415
	(2.49)**	(1.57)
Treatment x Graduate Degree	-0.373	-0.363
	(1.80)*	(1.31)
Treatment x Hispanic	-0.119	-0.015
	(0.43)	(0.05)
Treatment x Caucasian	-0.105	0.072
	(0.66)	(0.43)
Treatment x HH Income	0.048	0.024
	(1.17)	(0.54)
Treatment x Democrat	0.042	0.203
	(0.34)	(1.40)
Treatment x Percent Urban	0.316	-0.073
	(0.70)	(0.15)
Treatment x Willingness to take Risk-Investment	-0.003	-0.013
	(0.17)	(0.56)
Treatment x Willingness to take Risk-Gambling	0.010	-0.012
	(0.46)	(0.51)
Treatment x Perceived Risk-Investment	0.027	0.010

	(1.26)	(0.40)
Treatment x Perceived Risk-Gambling	-0.034	-0.032
	(1.55)	(1.40)
Treatment x Perceived Benefit-Investment	0.014	0.000
	(0.65)	(0.02)
Treatment x Perceived Benefit-Gambling	-0.004	0.001
	(0.27)	(0.08)
Treatment x Religiosity	0.016	0.025
	(0.25)	(0.33)
Treatment x Negative Life Event	-0.108	-0.075
	(0.87)	(0.53)
Treatment x Prior Exposure-Self	0.210	0.326
	(1.41)	(2.02)**
Treatment x Prior Exposure-Other	-0.050	-0.134
	(0.38)	(0.90)
Treatment x CRT	-0.037	0.007
	(0.37)	(0.07)
Treatment x iCRT	0.121	0.116
	(1.24)	(1.12)
Treatment x BIS Non-Planning	0.013	-0.003
	(0.85)	(0.16)
Treatment x Financial Literacy	0.048	-0.037
	(0.68)	(0.42)
Constant	0.546	0.183
	(1.05)	(0.31)
R^2	0.39	0.20
N	318	318

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A10. Estimation Results of Linear Probability Model Analysis of Fraud Uptake – Correlates of Uptake with Bootstrap Sampling

Variables Dependent variable: Uptake (binary)	OLS (1)	OLS (2)	OLS (3)
Treatment	-0.066 (1.40)	-0.054 (1.44)	
Age	-0.001 (0.72)		
Male	-0.024 (0.43)		
Some College	-0.055 (0.57)		
Bachelor's Degree	0.017 (0.17)		
Graduate Degree	-0.054 (0.56)		
Hispanic	-0.023 (0.15)		
Caucasian	-0.001 (0.02)		
HH Income Category	-0.022 (1.34)		
Democrat	-0.039 (0.78)		
Percent Urban	0.029 (0.29)		
Willingness to Take Risk-Investment	0.003 (0.31)		
Willingness to Take Risk-Gambling	0.010 (1.00)		
Perceived Risk-Investment	0.004 (0.36)		
Perceived Risk-Gambling	0.008 (0.87)		
Perceived Benefit-Investment	0.017 (1.68)*	0.017 (3.27)***	0.021 (3.52)***
Perceived Benefit-Gambling	-0.002 (0.22)		
Religiosity	0.050 (2.21)**	0.055 (2.86)***	0.046 (2.12)**
Negative Life Event	0.072 (1.44)		
Prior Exposure-Self	-0.059 (1.00)		
Prior Exposure-Other	0.110 (1.67)*	0.091 (2.11)**	0.079 (1.75)*

Cognitive Ability-CRT	0.019 (0.38)		
Impulsivity-iCRT	0.038 (0.74)		
Impulsivity-BIS Non-Planning	-0.008 (1.14)		
Financial Literacy	-0.034 (1.20)		
Perceived Win Likelihood *(PWL)*	0.081 (6.64)***	0.084 (8.14)***	0.079 (7.23)***
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.077 (6.89)***	-0.070 (7.25)***	-0.069 (7.10)***
Correct Number-Recruits Needed	0.063 (1.24)		
Correct Number-Concurrent Recruiters	0.010 (0.18)		
Legal	-0.064 (1.30)		
Constant	0.138 (0.37)	0.035 (0.33)	-0.008 (0.07)
R^2	0.33	0.30	0.27
N	348	365	447

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A11. Estimation Results of Logistic Analysis of Fraud Uptake – Correlates of Uptake

Variables Dependent variable: Uptake (binary)	Logit (1)	Logit (1)	Logit (3)
Treatment	-0.363 (1.28)	-0.286 (1.12)	
Age	-0.006 (0.55)		
Male	-0.140 (0.46)		
Some College	-0.405 (0.78)		
Bachelor's Degree	-0.023 (0.05)		
Graduate Degree	-0.483 (0.91)		
Hispanic	-0.077 (0.12)		
Caucasian	0.062 (0.15)		
HH Income Category	-0.157 (1.48)		
Democrat	-0.187 (0.61)		
Percent Urban	0.308 (0.56)		
Willingness to Take Risk-Investment	0.017 (0.35)		
Willingness to Take Risk-Gambling	0.059 (0.91)		
Perceived Risk-Investment	0.020 (0.38)		
Perceived Risk-Gambling	0.034 (0.79)		
Perceived Benefit-Investment	0.107 (2.13)**	0.099 (2.84)***	0.118 (3.71)***
Perceived Benefit-Gambling	-0.002 (0.05)		
Religiosity	0.359 (2.38)**	0.345 (2.67)***	0.278 (2.37)**
Negative Life Event	0.381 (1.32)		
Prior Exposure-Self	-0.424 (1.18)		
Prior Exposure-Other	0.789 (2.37)**	0.547 (2.11)**	0.458 (2.00)**
Cognitive Ability-CRT	0.074		

	(0.30)		
Impulsivity-iCRT	0.209		
	(0.81)		
Impulsivity-BIS Non-Planning	-0.058		
	(1.48)		
Financial Literacy	-0.187		
	(1.11)		
Perceived Win Likelihood *(PWL)*	0.469	0.454	0.419
	(5.83)***	(6.45)***	(6.91)***
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.472	-0.397	-0.385
	(5.97)***	(6.12)***	(6.88)***
Correct Number-Recruits Needed	0.391		
	(1.30)		
Correct Number-Concurrent Recruiters	0.083		
	(0.28)		
Legal	-0.456		
	(1.55)		
Constant	-1.909	-2.725	-2.899
	(1.06)	(3.91)***	(4.49)***
N	348	365	447

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A12. Estimation Results of Probit Analysis of Fraud Uptake – Correlates of Uptake

Variables Dependent variable: Uptake (binary)	Probit (1)	Probit (1)	Probit (3)
Treatment	-0.199 (1.24)	-0.157 (1.05)	
Age	-0.003 (0.55)		
Male	-0.105 (0.60)		
Some College	-0.238 (0.78)		
Bachelor's Degree	0.008 (0.03)		
Graduate Degree	-0.291 (0.92)		
Hispanic	-0.011 (0.03)		
Caucasian	0.014 (0.06)		
HH Income Category	-0.089 (1.50)		
Democrat	-0.117 (0.66)		
Percent Urban	0.154 (0.48)		
Willingness to Take Risk-Investment	0.005 (0.18)		
Willingness to Take Risk-Gambling	0.038 (1.07)		
Perceived Risk-Investment	0.008 (0.26)		
Perceived Risk-Gambling	0.021 (0.88)		
Perceived Benefit-Investment	0.066 (2.31)**	0.061 (3.01)***	0.072 (3.88)***
Perceived Benefit-Gambling	-0.002 (0.09)		
Religiosity	0.200 (2.31)**	0.202 (2.65)***	0.166 (2.41)**
Negative Life Event	0.211 (1.28)		
Prior Exposure-Self	-0.244 (1.19)		
Prior Exposure-Other	0.425 (2.23)**	0.310 (2.04)**	0.268 (1.99)**
Cognitive Ability-CRT	0.044		

	(0.32)		
Impulsivity-iCRT	0.123		
	(0.86)		
Impulsivity-BIS Non-Planning	-0.032		
	(1.44)		
Financial Literacy	-0.113		
	(1.14)		
Perceived Win Likelihood *(PWL)*	0.270	0.265	0.249
	(6.20)***	(6.72)***	(7.22)***
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.274	-0.236	-0.234
	(6.36)***	(6.38)***	(7.18)***
Correct Number-Recruits Needed	0.218		
	(1.26)		
Correct Number-Concurrent Recruiters	0.037		
	(0.21)		
Legal	-0.236		
	(1.43)		
Constant	-1.056	-1.645	-1.749
	(0.99)	(4.07)***	(4.66)***
N	348	365	447

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A13. Estimation Results of Linear Probability Model Analysis of Fraud Uptake – Correlates of Uptake using Sample Weights (based on Minnesota ZIP Code Population)

Variables Dependent variable: Uptake (binary)	OLS (1)	OLS (2)	OLS (3)
Treatment	-0.005 (0.09)	-0.013 (0.24)	
Age	-0.002 (0.91)		
Male	-0.032 (0.49)		
Some College	-0.053 (0.47)		
Bachelor's Degree	0.010 (0.10)		
Graduate Degree	0.009 (0.08)		
Hispanic	0.006 (0.04)		
Caucasian	-0.098 (1.18)		
HH Income Category	-0.028 (1.32)		
Democrat	-0.132 (2.09)**		
Percent Urban	0.054 (0.26)		
Willingness to Take Risk-Investment	-0.005 (0.49)		
Willingness to Take Risk-Gambling	0.001 (0.09)		
Perceived Risk-Investment	0.005 (0.43)		
Perceived Risk-Gambling	0.006 (0.55)		
Perceived Benefit-Investment	0.018 (1.64)	0.013 (1.77)*	0.014 (2.04)**
Perceived Benefit-Gambling	0.001 (0.08)		
Religiosity	0.045 (1.50)	0.056 (2.14)**	0.054 (2.25)**
Negative Life Event	0.006 (0.09)		
Prior Exposure-Self	-0.029 (0.43)		
Prior Exposure-Other	0.097 (1.50)	0.087 (1.60)	0.072 (1.45)

Cognitive Ability-CRT	-0.006 (0.12)		
Impulsivity-iCRT	0.044 (0.88)		
Impulsivity-BIS Non-Planning	-0.004 (0.46)		
Financial Literacy	-0.021 (0.56)		
Perceived Win Likelihood *(PWL)*	0.072 (4.59)***	0.078 (5.46)***	0.078 (6.13)***
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.072 (5.05)***	-0.070 (5.22)***	-0.066 (5.46)***
Correct Number-Recruits Needed	0.042 (0.66)		
Correct Number-Concurrent Recruiters	0.023 (0.35)		
Legal	-0.034 (0.59)		
Constant	0.344 (0.82)	0.098 (0.68)	0.055 (0.41)
R^2	0.33	0.28	0.26
N	318	332	405

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A14. Estimation Results for Linear Probability Model Analysis of Reported Role of Perceived Win Likelihood *(RRPWL)* with Bootstrap Sampling

Variables	OLS	OLS	OLS
Dependent Variable: *RRPWL* (ordinal, 7-point scale)	(1)	(2)	(3)
Treatment	-0.132	-0.036	
	(0.61)	(0.15)	
Age	-0.001		
	(0.09)		
Male	0.191		
	(0.79)		
Some College	-0.163		
	(0.35)		
Bachelor's Degree	-0.135		
	(0.29)		
Graduate Degree	0.022		
	(0.04)		
Hispanic	0.261		
	(0.42)		
Caucasian	-0.144		
	(0.34)		
HH Income Category	-0.051		
	(0.68)		
Democrat	0.384		
	(1.80)*		
Percent Urban	0.802	0.823	0.709
	(1.97)**	(2.27)**	(1.87)*
Willingness to Take Risk-Investment	0.009		
	(0.22)		
Willingness to Take Risk-Gambling	0.003		
	(0.07)		
Perceived Risk-Investment	0.019		
	(0.42)		
Perceived Risk-Gambling	0.022		
	(0.85)		
Perceived Benefit-Investment	-0.003		
	(0.08)		
Perceived Benefit-Gambling	0.050		
	(1.63)		
Religiosity	0.195		
	(1.73)*		
Negative Life Event	0.159		
	(0.70)		
Prior Exposure-Self	0.076		
	(0.28)		
Prior Exposure-Other	-0.177		
	(0.69)		

Cognitive Ability-CRT	0.340	0.235	0.259
	(1.88)*	(2.25)**	(2.96)***
Impulsivity-iCRT	0.138		
	(0.81)		
Impulsivity-BIS Non-Planning	-0.055	-0.063	-0.052
	(1.89)*	(2.79)***	(2.30)**
Financial Literacy	-0.017		
	(0.12)		
Constant	2.129	4.021	3.851
	(1.67)*	(6.65)***	(6.41)***
R^2	0.09	0.05	0.05
N	348	368	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A15. Estimation Results for Ordered Logistic Analysis of Reported Role of Perceived Win Likelihood *(RRPWL*)

Variables Dependent Variable: *RRPWL* (ordinal, 7-point scale)	Logit (1)	Logit (2)	Logit (3)
Treatment	-0.083 (0.40)	-0.013 (0.07)	
Age	-0.002 (0.26)		
Male	0.190 (0.82)		
Some College	-0.158 (0.40)		
Bachelor's Degree	-0.166 (0.44)		
Graduate Degree	-0.016 (0.04)		
Hispanic	0.350 (0.62)		
Caucasian	-0.101 (0.33)		
HH Income Category	-0.072 (0.98)		
Democrat	0.343 (1.46)		
Percent Urban	0.768 (1.97)**	0.757 (2.00)**	0.614 (1.86)*
Willingness to Take Risk-Investment	0.002 (0.06)		
Willingness to Take Risk-Gambling	0.008 (0.17)		
Perceived Risk-Investment	0.003 (0.07)		
Perceived Risk-Gambling	0.016 (0.62)		
Perceived Benefit-Investment	-0.002 (0.05)		
Perceived Benefit-Gambling	0.043 (1.46)		
Religiosity	0.215 (1.83)*		
Negative Life Event	0.146 (0.69)		
Prior Exposure-Self	0.089 (0.36)		
Prior Exposure-Other	-0.091 (0.40)		

Cognitive Ability-CRT	0.287	0.187	0.217
	(1.96)**	(2.18)**	(2.85)***
Impulsivity-iCRT	0.091		
	(0.61)		
Impulsivity-BIS Non-Planning	-0.060	-0.057	-0.047
	(2.00)**	(2.57)**	(2.46)**
Financial Literacy	-0.034		
	(0.29)		
cut 1 Constant	-0.907	-1.982	-1.897
	(0.70)	(3.22)***	(3.62)***
cut 2 Constant	0.229	-0.863	-0.731
	(0.18)	(1.42)	(1.42)
cut 3 Constant	0.922	-0.165	-0.040
	(0.72)	(0.27)	(0.08)
cut 4 Constant	1.396	0.270	0.392
	(1.09)	(0.44)	(0.76)
cut 5 Constant	1.898	0.741	0.852
	(1.49)	(1.23)	(1.67)*
cut 6 Constant	2.788	1.616	1.782
	(2.19)**	(2.66)***	(3.45)***
N	348	368	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A16. Estimation Results for Ordered Probit Analysis of Reported Role of Perceived Win Likelihood *(RRPWL*)

Variables Dependent Variable: *RRPWL* (ordinal, 7-point scale)	Probit (1)	Probit (2)	Probit (3)
Treatment	-0.034 (0.29)	0.009 (0.08)	
Age	-0.001 (0.17)		
Male	0.099 (0.76)		
Some College	-0.132 (0.55)		
Bachelor's Degree	-0.160 (0.70)		
Graduate Degree	-0.043 (0.18)		
Hispanic	0.224 (0.69)		
Caucasian	-0.049 (0.28)		
HH Income Category	-0.036 (0.87)		
Democrat	0.196 (1.50)		
Percent Urban	0.454 (2.08)**	0.444 (2.07)**	0.375 (1.97)**
Willingness to Take Risk-Investment	0.002 (0.09)		
Willingness to Take Risk-Gambling	0.003 (0.10)		
Perceived Risk-Investment	0.008 (0.32)		
Perceived Risk-Gambling	0.011 (0.70)		
Perceived Benefit-Investment	0.001 (0.03)		
Perceived Benefit-Gambling	0.026 (1.56)		
Religiosity	0.125 (1.92)*		
Negative Life Event	0.068 (0.57)		
Prior Exposure-Self	0.049 (0.36)		
Prior Exposure-Other	-0.050 (0.39)		

Cognitive Ability-CRT	0.181 (2.09)**	0.116 (2.25)**	0.133 (2.89)***
Impulsivity-iCRT	0.066 (0.74)		
Impulsivity-BIS Non-Planning	-0.032 (1.94)*	-0.033 (2.50)**	-0.027 (2.30)**
Financial Literacy	-0.032 (0.46)		
cut 1 Constant	-0.345 (0.47)	-1.157 (3.19)***	-1.090 (3.48)***
cut 2 Constant	0.313 (0.43)	-0.506 (1.41)	-0.410 (1.32)
cut 3 Constant	0.738 (1.02)	-0.075 (0.21)	0.017 (0.06)
cut 4 Constant	1.029 (1.43)	0.195 (0.54)	0.286 (0.92)
cut 5 Constant	1.332 (1.85)*	0.482 (1.36)	0.565 (1.85)*
cut 6 Constant	1.842 (2.55)**	0.986 (2.75)***	1.097 (3.55)***
N	348	368	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A17. Estimation Results for Linear Probability Model Analysis of Reported Role of Perceived Win Likelihood *(RRPWL)* using Sample Weights (based on Minnesota ZIP Code Population)

Variables Dependent Variable: *RRPWL* (ordinal, 7-point scale)	OLS (1)	OLS (2)	OLS (3)
Treatment	-0.265 (0.98)	-0.165 (0.65)	
Age	0.005 (0.42)		
Male	0.401 (1.41)		
Some College	0.171 (0.32)		
Bachelor's Degree	0.032 (0.06)		
Graduate Degree	0.018 (0.03)		
Hispanic	0.527 (0.79)		
Caucasian	-0.230 (0.59)		
HH Income Category	-0.016 (0.18)		
Democrat	0.416 (1.42)		
Percent Urban	1.980 (2.08)**	1.587 (1.97)**	1.498 (2.00)**
Willingness to Take Risk-Investment	-0.002 (0.03)		
Willingness to Take Risk-Gambling	0.038 (0.73)		
Perceived Risk-Investment	0.016 (0.30)		
Perceived Risk-Gambling	0.034 (0.93)		
Perceived Benefit-Investment	-0.002 (0.05)		
Perceived Benefit-Gambling	0.066 (1.68)*		
Religiosity	0.283 (2.00)**		
Negative Life Event	-0.241 (0.85)		
Prior Exposure-Self	-0.045 (0.14)		
Prior Exposure-Other	-0.094		

	(0.33)		
Cognitive Ability-CRT	0.413	0.169	0.174
	(2.01)**	(1.43)	(1.66)*
Impulsivity-iCRT	0.226		
	(1.15)		
Impulsivity-BIS Non-Planning	-0.063	-0.055	-0.044
	(1.74)*	(1.89)*	(1.72)*
Financial Literacy	-0.108		
	(0.64)		
Constant	0.329	3.303	3.063
	(0.18)	(3.16)***	(3.31)***
R^2	0.11	0.04	0.03
N	318	337	410

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A18. Estimation Results for Linear Probability Model Analysis of Perceived Win Likelihood *(PWL)* with Bootstrap Sampling

Variables Dependent Variable: *PWL* (ordinal, 7-point scale)	OLS (1)	OLS (2)	OLS (3)
Treatment	0.204 (0.97)	0.203 (0.94)	
Age	0.017 (1.86)*	0.006 (0.92)	0.008 (1.34)
Male	-0.240 (1.09)	-0.295 (1.17)	-0.192 (0.93)
Some College	-0.376 (0.74)		
Bachelor's Degree	-0.378 (0.78)		
Graduate Degree	-0.630 (1.35)		
Hispanic	0.532 (0.71)		
Caucasian	-0.534 (1.48)		
HH Income Category	-0.082 (1.14)		
Democrat	-0.123 (0.49)		
Percent Urban	-0.274 (0.54)		
Willingness to Take Risk-Investment	0.048 (1.22)		
Willingness to Take Risk-Gambling	-0.005 (0.12)		
Perceived Risk-Investment	-0.025 (0.57)		
Perceived Risk-Gambling	-0.010 (0.26)		
Perceived Benefit-Investment	0.037 (0.86)	0.057 (2.00)**	0.037 (1.26)
Perceived Benefit-Gambling	0.068 (2.09)**	0.050 (1.68)*	0.049 (1.84)*
Religiosity	-0.007 (0.05)		
Negative Life Event	0.118 (0.41)		
Prior Exposure-Self	-0.136 (0.51)		
Prior Exposure-Other	-0.093 (0.35)		

Cognitive Ability-CRT	-0.076 (0.42)		
Impulsivity-iCRT	-0.020 (0.10)		
Impulsivity-BIS Non-Planning	-0.012 (0.35)		
Financial Literacy	-0.197 (1.58)		
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.187 (3.84)***	-0.142 (3.00)***	-0.137 (2.89)***
Correct Number-Recruits Needed		-0.581 (2.56)**	-0.379 (2.01)**
Correct Number-Concurrent Recruiters		-0.351 (1.47)	-0.323 (1.67)*
Legal		0.476 (2.26)**	0.399 (2.36)**
Constant	4.820 (2.69)***	2.786 (4.46)***	2.966 (5.71)***
R^2	0.13	0.11	0.08
N	348	367	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A19. Estimation Results for Ordered Logit Analysis of Perceived Win Likelihood *(PWL)*

Variables Dependent Variable: *PWL* (ordinal, 7-point scale)	Logit (1)	Logit (2)	Logit (3)
Treatment	0.281 (1.38)	0.317 (1.63)	
Age	0.014 (1.72)*	0.005 (0.83)	0.006 (1.07)
Male	-0.436 (1.92)*	-0.354 (1.74)*	-0.239 (1.30)
Some College	-0.514 (1.19)		
Bachelor's Degree	-0.520 (1.27)		
Graduate Degree	-0.631 (1.54)		
Hispanic	0.449 (0.68)		
Caucasian	-0.394 (1.35)		
HH Income Category	-0.095 (1.33)		
Democrat	-0.012 (0.05)		
Percent Urban	-0.158 (0.39)		
Willingness to Take Risk-Investment	0.039 (0.95)		
Willingness to Take Risk-Gambling	-0.008 (0.17)		
Perceived Risk-Investment	-0.026 (0.57)		
Perceived Risk-Gambling	0.003 (0.09)		
Perceived Benefit-Investment	0.035 (0.85)	0.045 (1.60)	0.029 (1.13)
Perceived Benefit-Gambling	0.051 (1.63)	0.041 (1.53)	0.043 (1.71)*
Religiosity	0.087 (0.73)		
Negative Life Event	0.073 (0.35)		
Prior Exposure-Self	-0.186 (0.75)		
Prior Exposure-Other	-0.018 (0.07)		

Cognitive Ability-CRT	-0.030 (0.17)		
Impulsivity-iCRT	-0.018 (0.09)		
Impulsivity-BIS Non-Planning	-0.002 (0.08)		
Financial Literacy	-0.116 (0.88)		
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.159 (3.11)***	-0.144 (3.00)***	-0.133 (3.02)***
Correct Number-Recruits Needed	-0.438 (1.96)**	-0.578 (2.87)***	-0.383 (2.18)**
Correct Number-Concurrent Recruiters	-0.260 (1.11)	-0.290 (1.41)	-0.253 (1.38)
Legal	0.460 (2.09)**	0.478 (2.32)**	0.375 (2.08)**
cut1 Constant	-1.905 (1.18)	-0.683 (1.31)	-0.863 (1.80)*
cut2 Constant	-1.222 (0.76)	-0.050 (0.10)	-0.211 (0.44)
cut3 Constant	-0.513 (0.32)	0.686 (1.34)	0.504 (1.06)
cut4 Constant	0.230 (0.14)	1.394 (2.72)***	1.193 (2.51)**
cut5 Constant	0.737 (0.46)	1.884 (3.64)***	1.644 (3.44)***
cut6 Constant	1.191 (0.74)	2.328 (4.47)***	2.164 (4.48)***
N	348	367	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A20. Estimation Results for Ordered Probit Analysis of Perceived Win Likelihood *(PWL)*

Variables Dependent Variable: *PWL* (ordinal, 7-point scale)	Probit (1)	Probit (2)	Probit (3)
Treatment	0.163 (1.37)	0.159 (1.39)	
Age	0.008 (1.74)*	0.004 (0.97)	0.004 (1.22)
Male	-0.217 (1.67)*	-0.183 (1.52)	-0.126 (1.16)
Some College	-0.232 (0.95)		
Bachelor's Degree	-0.227 (1.00)		
Graduate Degree	-0.338 (1.44)		
Hispanic	0.254 (0.72)		
Caucasian	-0.242 (1.37)		
HH Income Category	-0.047 (1.14)		
Democrat	-0.014 (0.10)		
Percent Urban	-0.134 (0.56)		
Willingness to Take Risk-Investment	0.024 (1.06)		
Willingness to Take Risk-Gambling	-0.002 (0.07)		
Perceived Risk-Investment	-0.018 (0.74)		
Perceived Risk-Gambling	0.001 (0.04)		
Perceived Benefit-Investment	0.017 (0.73)	0.028 (1.70)*	0.016 (1.09)
Perceived Benefit-Gambling	0.030 (1.67)*	0.026 (1.71)*	0.026 (1.82)*
Religiosity	0.035 (0.52)		
Negative Life Event	0.076 (0.62)		
Prior Exposure-Self	-0.116 (0.79)		
Prior Exposure-Other	0.008 (0.06)		

Cognitive Ability-CRT	-0.005 (0.05)		
Impulsivity-iCRT	-0.000 (0.00)		
Impulsivity-BIS Non-Planning	-0.000 (0.03)		
Financial Literacy	-0.059 (0.77)		
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.094 (3.14)***	-0.083 (2.90)***	-0.078 (2.98)***
Correct Number-Recruits Needed	-0.220 (1.70)*	-0.317 (2.66)***	-0.204 (1.95)*
Correct Number-Concurrent Recruiters	-0.146 (1.09)	-0.165 (1.36)	-0.146 (1.34)
Legal	0.238 (1.90)*	0.258 (2.14)**	0.210 (1.97)**
cut1 Constant	-1.096 (1.23)	-0.355 (1.14)	-0.495 (1.75)*
cut2 Constant	-0.691 (0.78)	0.024 (0.08)	-0.104 (0.37)
cut3 Constant	-0.264 (0.30)	0.472 (1.54)	0.335 (1.19)
cut4 Constant	0.182 (0.21)	0.898 (2.94)***	0.754 (2.67)***
cut5 Constant	0.477 (0.54)	1.184 (3.84)***	1.019 (3.60)***
cut6 Constant	0.731 (0.82)	1.431 (4.62)***	1.309 (4.58)***
N	348	367	449

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A21. Estimation Results for Linear Probability Model Analysis of Perceived Win Likelihood *(PWL)* using Sample Weights (based on Minnesota ZIPCode Population)

Variables Dependent Variable: *PWL* (ordinal, 7-point scale)	OLS (1)	OLS (2)	OLS (3)
Treatment	0.058 (0.22)	0.176 (0.72)	
Age	0.023 (2.19)**	0.013 (1.55)	0.016 (2.04)**
Male	0.034 (0.13)	-0.119 (0.46)	-0.025 (0.10)
Some College	-0.953 (1.78)*		
Bachelor's Degree	-0.975 (1.94)*		
Graduate Degree	-1.117 (2.13)**		
Hispanic	0.135 (0.18)		
Caucasian	-0.538 (1.61)		
HH Income Category	-0.121 (1.30)		
Democrat	-0.267 (0.92)		
Percent Urban	0.235 (0.22)		
Willingness to Take Risk-Investment	0.025 (0.49)		
Willingness to Take Risk-Gambling	-0.063 (1.33)		
Perceived Risk-Investment	-0.047 (0.90)		
Perceived Risk-Gambling	-0.038 (0.86)		
Perceived Benefit-Investment	0.011 (0.24)	0.035 (1.01)	0.020 (0.60)
Perceived Benefit-Gambling	0.103 (2.69)***	0.059 (1.93)*	0.075 (2.53)**
Religiosity	0.117 (0.86)		
Negative Life Event	-0.070 (0.28)		
Prior Exposure-Self	-0.212 (0.67)		
Prior Exposure-Other	0.014 (0.05)		

Cognitive Ability-CRT	0.065 (0.29)		
Impulsivity-iCRT	0.241 (1.06)		
Impulsivity-BIS Non-Planning	-0.038 (1.14)		
Financial Literacy	-0.068 (0.42)		
Reported Role of Perceived Win Likelihood *(RRPWL)*	-0.294 (4.62)***	-0.225 (3.60)***	-0.217 (3.78)***
Correct Number-Recruits Needed		-0.796 (2.99)***	-0.573 (2.42)**
Correct Number-Concurrent Recruiters		-0.256 (0.96)	-0.215 (0.88)
Legal		0.677 (2.60)***	0.435 (1.86)*
Constant	6.139 (2.95)***	3.004 (4.69)***	2.952 (4.81)***
R^2	0.19	0.17	0.13
N	318	334	407

Note: Robust standard errors appear in parentheses. Asterisks denote the following: * $p<0.1$; ** $p<0.05$; *** $p<0.01$

APPENDIX B

B.1 Survey Questionnaire

Note: Subjects answer these questions within a Google Form on an iPad.

Did you choose option A or B? (circle one) A or B

Please enter your age: _____

What is your gender? (circle one)

Male, Female, Other _____

What is your highest level of education? (circle one)

Some high school, High school diploma or GED, Associate's degree, Some college, no degree, Bachelor's degree, Graduate or professional degree, Other

What is your ethnicity? (circle one)

Hispanic or Latino, Not Hispanic or Latino

What is your racial background? (circle one)

American Indian or Alaska Native, Asian, Black or African American, Hawaiian or Other Pacific Islander, White, Multiracial, Other

Please enter your zip code: _____

For each of the following statements, please indicate the likelihood that you would engage in the described activity or behavior if you were to find yourself in that situation.

Provide a rating from *Extremely Unlikely* to *Extremely Likely*, using the following scale:

1	2	3	4	5	6	7
Extremely Unlikely	Moderately Unlikely	Somewhat Unlikely	Not Sure	Somewhat Likely	Moderately Likely	Extremely Likely

Betting a day's income at the horse races

1 2 3 4 5 6 7

Investing 10% of your annual income in a moderate growth diversified fund

1 2 3 4 5 6 7

Betting a day's income at a casino or high-stakes poker game

1 2 3 4 5 6 7

Investing 5% of your annual income in a very speculative stock

1 2 3 4 5 6 7

Betting a day's income on the outcome of a sporting event

1 2 3 4 5 6 7

Investing 10% of your annual income in a new business venture

1 2 3 4 5 6 7

For each of the following statements, please indicate **how risky you perceive** each situation.
Provide a rating from *Not at all Risky* to *Extremely Risky*, using the following scale:

1	2	3	4	5	6	7
Not at all Risky	Slightly Risky	Somewhat Risky	Moderately Risky	Risky	Very Risky	Extremely Risky

Betting a day's income at the horse races
1 2 3 4 5 6 7
Investing 10% of your annual income in a moderate growth diversified fund
1 2 3 4 5 6 7
Betting a day's income at a casino or high-stakes poker game
1 2 3 4 5 6 7
Investing 5% of your annual income in a very speculative stock
1 2 3 4 5 6 7
Betting a day's income on the outcome of a sporting event
1 2 3 4 5 6 7
Investing 10% of your annual income in a new business venture
1 2 3 4 5 6 7

For each of the following statements, please indicate **the benefits** you would obtain from each situation.
Provide a rating from **1 to 7**, using the following scale:

1	2	3	4	5	6	7
No benefits At all			Moderate Benefits			Great Benefits

Betting a day's income at the horse races
1 2 3 4 5 6 7
Investing 10% of your annual income in a moderate growth diversified fund
1 2 3 4 5 6 7
Betting a day's income at a casino or high-stakes poker game
1 2 3 4 5 6 7
Investing 5% of your annual income in a very speculative stock
1 2 3 4 5 6 7
Betting a day's income on the outcome of a sporting event
1 2 3 4 5 6 7
Investing 10% of your annual income in a new business venture
1 2 3 4 5 6 7

How religious do you consider yourself to be? (circle one)
Not at all religious, Not too religious, Somewhat religious, Very religious, I don't know

How often do you attend religious services? (circle one)
Never, Less than once a year, Once a year, Several times a year, Once a month, Two to three times a month, Nearly every week, Every week, More than once a week

Which statement most closely reflects your political affiliation? (circle one)
Identify as Democrat, Lean toward Democrat, Identify as Republican, Lean toward Republican, Identify as Independent/Third Party, Lean toward Independent/Third Party, None of the above

And for statistical purposes only, which of the following best describes your annual household income?

Less than $20,000, Between $20,000 - $40,000, Between $40,000 - $60,000, Between $60,000 - $80,000, Between $80,000 - $100,000, Over $100,000, Don't Know

Below are three items that vary in difficulty. Answer as many as you can.

(1) A desk and a chair cost $110 in total. The desk costs $100 more than the chair. How much does the chair cost? _____ dollars

(2) If it take 5 ovens 5 minutes to make 5 pizzas, how long would it take 100 ovens to make 100 pizzas? _____ minutes

(3) In a lake, there is algae. Every day, the algae doubles in size. If it takes 48 days for the algae to cover the entire lake, how long would it take for the algae to cover half of the lake? _____ days

Have you seen these three questions before? (circle one)

Yes, these exact questions, Yes, similar questions, No

In the past two years, have you experienced a serious negative life event, such as a divorce, the death of a family member or close friend, a serious injury or illness for you or a family member (physical or mental health), or the loss of a job?

Yes or No (circle one)

On these next questions, if you do not immediately know the answer, please try to figure it out.

If the chance of getting a disease is 10 percent, out of 1,000 people, how many would be expected to get the disease?

a. Less than 10 people
b. 10 people
c. More than 10 people
d. Don't know

A used car dealer is selling a car for $10,000. This is two-thirds of what the car cost new. How much did the car cost when it was new?

a. Less than $15,000
b. $15,000
c. More than $15,000
d. Don't know

Let's say you have $200 in a savings account. The account earns 10 percent interest per year. How much will you have in the account at the end of two years?

a. More than $240
b. Less than $240
c. $240
d. Don't know

No matter what option you chose today (A or B), we would like to ask you some questions regarding an option you were asked to consider, the Airplane Game (Option B). You may refer back to the paper descriptions of options A and B.

If you were to invest in the Airplane Game, what do you think your chances are of becoming a Captain and winning the $10?

a. above 50% chance of winning
b. 40-49%
c. 30-39%
d. 20-29%
e. 10-19%
f. 5-9%
g. below 5%

In order for you to become a Captain and win $10 in the Airplane Game, how many people would need to be recruited under you (by you or those under you)?

a. 3 people
b. 9 people
c. 27 people
d. 39 people
e. 40 or more people

If you were to invest in the Airplane Game, how many people (at a minimum) do you think would be recruiting to become a Captain at the same time as you? _____ people

When you were deciding whether to keep your $5 or enter the Airplane Game, how much did your chances of becoming a Captain (i.e., your odds of winning the Airplane Game) influence your decision?

1	2	3	4	5	6	7
Not at all	Very little	Somewhat	Moderately	Quite a lot	Very Much	Extremely

Do you think the Airplane Game is legal? Yes or No (circle one)

(After Debrief videos)
Now that we have discussed pyramid schemes and warning signs, please think about your past experiences.

Do you think that someone close to you (close family member or friend) has ever been recruited by or involved in a pyramid scheme? Yes or No (circle one)

Do you think that you have ever been recruited by or involved in a pyramid scheme? Yes or No (circle one)

B2. Experiment Protocol

- Potential subject expresses interest at experiment booth.
- Subject completes consent form and English language proficiency check.[11]
- When a space is available:
    - The subject is given $5 in cash and a "Choice Task" handout (provided below in *Appendix B.3*).
    - The subject is seated at a station equipped with an iPad, headphones, and a pen, with subject dividers in place.
    - The subject is instructed that she can write on the page as desired and that she will be entering her responses on the iPad and will only need the headphones near the end of the experiment.
- The subject then completes the following:
    - Enters a subject identification number, provided at the top of the choice task handout.
    - Reads the choice task handout and enters a decision, choosing Option A (keep the $5) or Option B (invest the money in the Airplane Game).
    - Answers the set of survey questions provided in *Appendix B.1*.
    - Watches two short debrief videos, approximately two minutes each.
    - Responds to two last questions regarding prior exposure to pyramid scheme fraud.
- At this point, the subject is instructed to raise her hand for assistance. A research assistant then completes the following tasks with the subject:
    - If the subject chose Option A, her hand is marked with a black marker, otherwise her hand is marked with a blue marker.

[11] A Spanish language version was also available but two potential subjects expressed interest and only one completed the full experiment so this data was not included in the experimental dataset.

- The subject is then directed to the payment table. The research assistant at the payment table notes the color marked on the subject's hand.
    - If black, he instructs the subject to keep her $5.
    - If blue, he reminds the subject that she has chosen to invest in the Airplane Game, collects the subject's $5, and reminds the subject of the chances of winning the Airplane Game described in the debrief video as 0.01 and 0.99 chances of winning and losing, respectively. He then asks the subject to draw from the bag of marbles, where a green marble pays $10 (winning the Airplane Game) and a red marble pays $1 (losing the Airplane Game). The subject is paid, in cash, according to the marble drawn.
- The subject is then asked to record the payment received ($10, $5, or $1) on a receipt log and the subject receives an educational brochure and a Principle Investigator's business card. If the subject has any questions or comments, she is directed to the Principle Investigator.

B3. Choice Task Handout

Note that the image below is the Choice Task handout for the treatment group. The control group received an identical handout except the bold first line regarding odds was absent.

Subject ID: _____

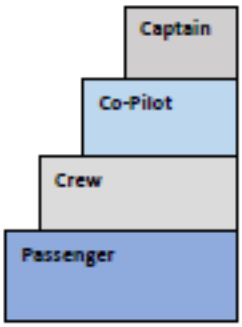
Throughout this experiment, think carefully about your odds of winning each option before choosing.

You have been given $5 and you must make a choice with your money. After you make your choice and complete the experiment you will be paid, in cash, based on the option you selected. If you choose Option B, you will draw from a bag of marbles to determine your payout. A green marble = higher payout. A red marble = lower payout.

You have been given $5 and you must choose Option A *or* B.

Option A – Keep your $5 **(you leave today with $5)**

Option B – Invest your $5 in the Airplane Game **(you leave today with $1 or $10)**



Airplane Game: **This is a simulation, meaning you will not physically do what is described, but your actual earnings will be based on the likelihood of success.**
- With your $5 investment, you enter the Airplane Game as a "Passenger."
- If you recruit three additional people who invest $5, you become a "Crew" member.
- If your Passengers each recruit three people who invest $5, you become a "Co-Pilot."
- If these new members each find three who invest $5, you become a "Captain."
- If you do not become a Captain, you forfeit all but **$1 (-$4 on your investment)**.
- If you do become a Captain, you are paid **$10 (+$5 on your investment)**.
- All people asked to join say "yes" and all who join attempt to become a Captain.
- No one can join/invest more than once.
- There are a maximum of 2,000 people who can be recruited.
- There are currently 40 people already in the Airplane Game before you join.

Would you like to choose Option A or B?

(No matter what you choose, we will discuss these options again later in the experiment.)

Please enter your decision on the iPad.