

# Measuring (In)Attention to Mutual Fund Fees: Evidence from Experiments

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## Abstract

We estimate investors' attention level to mutual fund fees based on a parsimonious asset allocation model with limited attention in an experimental setting. We find that, on average, investors allocate 62.5% of their full attention to mutual fund fees. We also find that cognitive ability is an important factor in determining investors' attention to the fees. The estimated attention level implies investors in the U.S. mutual funds market pay \$16 billion more in fees per year than the level they recognize. We evaluate policy options to increase attention to fees and find that the policy effectiveness may depend on one's cognitive ability.

*JEL*: G41, G11, G23

*Keywords*: mutual fund fees, limited attention, price complexity, cognitive ability

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## 1. Introduction

An important question in the retail financial market is how much attention they allocate to the cost of financial services. There is a growing body of literature that recognizes the limited attention of investors to costs of delegated investment, such as mutual funds. Prior studies in this literature find that investors are not fully allocating their attention to mutual fund fees, paying higher prices than they are aware (for example, Choi, Laibson, and Madrian (2010), Anagol and Kim (2012)). So far, however, there has been little analysis quantifying the attention level to the mutual fund fees and identifying the determinants of the attention level. In this paper, we measure the degree of attention which investors allocate to mutual fund fees and investigate its determinants based on a parsimonious model of asset allocation with limited attention in an experimental setting.

Investor attention plays a critical role in financial markets. The limited attention of investors affects market underreaction to earnings surprise (Hirshleifer, Lim, and Teoh (2009)), momentum of stock returns (Hong and Stein (1999)), and firms' strategic disclosure of news (DellaVigna and Pollet (2009)). Importantly, investor inattention shapes the design of pricing for retail financial services. When investors' attention to the price of financial services is limited, the price is not converging to the marginal cost due to strategic pricing decisions of firms (Carlin (2009)), and its structure becomes even more complex with add-on features (Gabaix and Laibson (2006)).

Although prior studies showing that investors' attention is limited provides a useful starting point for policy discussions, quantifying the attention level is necessary to evaluate various policy options and to improve investors' choice of costly financial services (Gabaix (2017)). Measuring the attention level also helps us to build more general structural models incorporating the limited attention of investors and conduct many counterfactual policy experiments. Additionally, understanding the determinants of attention level will guide us through fine-tuning policy options to improve investor welfare.

In this paper, based on a parsimonious model of portfolio choice with limited attention, we estimate the attention level of investors to mutual fund fees in an experimental setting. In experiments, we ask questions to participants in two stages. In the first stage, we ask questions about subjects' cognitive ability

(Frederick (2005)), financial literacy (Lusardi and Mitchell (2014)), demographic characteristics and economic background. Subsequently, participants are presented two investment options: risky S&P500 index fund and risk-free bank checking account. We provide information about expected returns and risk level of those two investment options. Subjects are then asked to report their desired portfolio allocation between the two options.

In the second stage, experiment participants are randomly assigned to a control group or one of two treatment groups. In the control group, the mutual fund fees are described without any distracting information. In the Treatment 1 group, we present the same fee structure with a graphical illustration showing the impact of fees on total investment returns during the 5- and 10-year periods. This is to enable investors to find it easy to pay attention to the detrimental impact of fees on fund performance. The Treatment 1 design is similar to a series of policy changes about mutual fund fee disclosures to enhance investors' awareness of mutual fund fees (Securities and Exchange Commission (2004, 2009)). In the Treatment 2 group, we present the mutual fund fee with distracting information. Many complex fee options, which are not applicable to retail investors, are provided in parallel with the baseline fee option.

By measuring changes in the portfolio allocation to mutual funds with fees (the second stage) compared to the no-load mutual funds (the first stage), we can recover the attention level investors allocate to the mutual fund fees. We assume investors are mean-variance utility maximizers, which enables us to recover their attention level to the mutual fund fees based on a parsimonious asset allocation model. Exploiting the difference in asset allocation in two stages for a same person reduces biases from participants' unobserved differing characteristics (e.g., ability of quantitative analysis, probability weighting).

We recruit subjects from the Amazon Mturk who live in the U.S. and implement the experiments in the Qualtrics platform. We also ask a set of validation questions to minimize potential biases from noisy answers from unheeding experiment subjects. The final sample includes 1,190 participants in the experiments conducted during February 22, 2018– March 2, 2018.

To preview our results, we find that average attention level to mutual fund fee is only 62.5%. This result implies that investors are on average allocating only 62.5% of their full attention to the mutual fund fees and potentially paying fees to mutual funds more than they recognize. Put in a different perspective,

the mutual fund industry could charge 37.5% more fees because of investors inattention, equivalent to total additional fee revenue of \$16 billion a year based on the total asset under management (\$2,053 billion) and average fee level (0.8%) in the mutual fund industry. If we restrict our attention to equity mutual funds, investors in the U.S. pay \$6.16 billion more fees per year than the level they are aware of to purchase shares of equity mutual funds.

There is also considerable heterogeneity of attention level across subjects. The 10<sup>th</sup> and 90<sup>th</sup> percentile values for the attention level is 0.00 and 1.807. Importantly, we find that the attention level is positively correlated with the cognitive ability of experiment participants controlling for the demographic and economic background. A one-standard-deviation increase in the cognitive ability leads to an increase in the attention level to mutual fund fees by 12 percent of its average.

Surprisingly, the average attention level in the Treatment 1 (with more salient fee information) and Treatment 2 (with more distracting fee information) are not statistically different from the attention level found in the control group (with standard fee information). The average attention levels are 0.652, 0.641 and 0.583 in the control, Treatment 1 and Treatment 2, respectively. This finding is in line with Beshears et al. (2011)'s experiment which finds that simplified mutual fund prospectus does not improve the quality of investment choices in 401(k) plans. However, we find that the impact of disclosure clarity on investor attention depends on investors' cognitive ability. In the Treatment 1 (with more salient fee information), subjects with high cognitive ability pay more attention to fees. Similarly, in the Treatment 2 (with more distracting fee information), subjects with high cognitive ability are less affected by shrouded fee information.

Our findings also suggest that disclosure transparency of fees may not improve investors attention with a large margin on average, and would have adverse distributional effect based on investors' cognitive ability. Policy options have been focusing on more simple and transparent disclosure of prices. If the effectiveness of such policies is not existent for investors with low cognitive ability, more engaged policies such as 'nudging' investors to less pricey investment options (Thaler and Sunstein (2008)) or lowering barriers to unbiased financial advisors would be needed (Kim, Maurer, and Mitchell (2016)).

Our paper contributes to the literature on pricing strategies of retail financial products. Prior studies in this literature (e.g., Carlin (2009)) posit that naïve investors are prone to limited attention to the complex pricing of financial products. We are directly testing this assumption in an experimental setting by estimating the level of attention to mutual fund fees.<sup>1</sup> We find evidence that naïve investors (measured by low cognitive ability score) are less attentive to fees, giving fund companies a strategic chance to increase their fees above the marginal cost. To the extent that the cognitive ability is an important determinant of attention level to fund fees, it is likely that naïve investors are misguided by the pricing complexity and the high competition in the fund industry would not lower mutual fund fees to a marginal cost level. In a similar vein, the result also implies that naïve investors would cross-subsidize more sophisticated investors' participation in the mutual fund industry.

This paper is also related to the behavioral industrial organization literature studying the interaction between consumers with behavioral biases and firms with rational and profit-maximizing goals. DellaVigna and Malmendier (2004) study how the self-control problems of consumers influence pricing strategy of firms. Gabaix and Laibson (2006) show firms make their pricing schemes more complex by adding shrouded features when consumers are boundedly rational. Because firms have no incentive to debias naïve consumers, competition does not make the price level converge to the marginal cost.

The remainder of the paper is organized as follows. Section 2 discusses our experiment design and procedures to estimate the attention level to mutual fund fees. Section 3 presents analysis results. Section 4 concludes. The online appendix contains questionnaires used in the experiments.

## **2. Experiment design and procedures**

In this section, we describe a theoretical ground for the impact of attention on investors' choice of mutual fund investment and present our main hypotheses.

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<sup>1</sup> In a quantitative analysis of a life-cycle portfolio choice model, Kim, Maurer, and Mitchell (2016) estimate the attention cost to financial management in the form of forgone opportunity to accumulate job-specific human capital.

## 2.1. Estimating attention level to mutual fund fees based on portfolio allocation decisions

We develop hypotheses about the impact of mutual fund price complexity on investors' attention to fees and design experiments based on the theory of limited attention.

We denote  $\theta(s, N)$  as the attention level of investors to mutual fund fees, where  $s$  is a salience level of mutual fund fee and  $N$  is the number of distracting information (e.g., number of share classes). Prior studies in psychology and behavioral economics (e.g., Bordalo, Gennaioli, and Shleifer (2012)) show that more salient information receives more attention (i.e.,  $\partial\theta/\partial s > 0$ ). Similarly, as posited in Hirshleifer, Lim, and Teoh (2009), distracting information may inhibit investors from paying full attention ( $\partial\theta/\partial N < 0$ ).

Investors are given two investment options: risky and risk-free options. The risky investment option is an S&P index fund, and the risk-free option is a checking account. S&P index fund will earn expected return of  $E[r]$  with standard deviation of  $\sigma$ . Checking account will earn  $r_f$  without any risk. S&P index fund charges a fee of  $\phi$ , so the expected net-of-fee return is  $E[r] - \phi$ . For inattentive investors, the perceived fee level is  $\theta\phi$  and the expected return will be  $E[r] - \theta\phi$ . As the attention level ( $\theta$ ) increases, investors perceive the fund as more expensive (i.e., lower net-of-fee returns) investment option. For a fully attentive investor ( $\theta = 1$ ), the fee is fully recognized.

We assume investors have mean-variance utility with limited attention to the mutual fund fee. With the mutual funds' expected return ( $E[r]$ ) and standard deviation ( $\sigma$ ), an investor chooses an optimal weight ( $w$ ) to the mutual fund maximizing his utility given as follows:

$$w(E[r] - \theta\phi) + (1 - w)r_f - \frac{1}{2}\gamma w^2\sigma^2 \quad (1)$$

where  $\gamma$  denotes an investors' risk aversion level and  $w$  denotes the chosen portfolio weight to the mutual fund. The first order condition implies that the optimal allocation to the mutual fund is given as:

$$w^*(\theta) = \frac{E[r] - r_f - \theta\phi}{\gamma\sigma^2} \quad (2)$$

where  $\gamma$  represents risk-aversion and  $\theta$  denotes the attention level of investors to mutual fund fees. By comparing investors' portfolio allocation decision with vs. without fees, we can estimate investors' attention to fees ( $\theta$ ). When a mutual fund is not charging any fees, the optimal allocation would be as follows:

$$w^0 = \frac{E[r] - r_f}{\gamma\sigma^2} \quad (3)$$

By observing portfolio decisions ( $w^0, w^*(\theta)$ ) of participants, we can estimate their attention level ( $\theta$ ) to mutual fund fees. After some algebraic reordering, the attention level to fees ( $\theta$ ) can be reformulated as follows:

$$\theta = \left[ \frac{w^0 - w^*(\theta)}{w^0} \right] / \left[ \frac{\phi}{E[r] - r_f} \right] \quad (4)$$

An inattentive investor ( $\theta < 1$ ) would reduce the allocation to the costly fund ( $(w^0 - w^*(\theta))/w^0$ ) less in magnitude than charged fees per expected performance of the fund ( $\phi/(E[r] - r_f)$ ). With a short-sale constraint, the range of the attention level ( $\theta$ ) would be as follows:

$$0 \leq \theta \leq \left[ \frac{E[r] - r_f}{\phi} \right] \quad (5)$$

When an investor reduces his allocation to mutual funds in response to fees by a large margin ( $w^0 > w^*(\theta)$ ), this implies that his attention level to fees could be potentially greater than one, overreacting to the costs of funds. Additionally, compared to a fully attentive investor ( $\theta = 1$ ), inattentive investors ( $\theta = 0$ ) allocate more wealth to mutual funds by  $\frac{\theta\phi}{\gamma\sigma^2}$ .

Based on the above discussion, we formulate the following hypothesis regarding the level of attention to mutual fund fees.

***Hypothesis 1 (Inattention to fees):*** Estimated attention level to mutual fund fees is less than one ( $\theta < 1$ ).

Moreover, the salient information theory (Bordalo, Gennaioli, and Shleifer (2012)) suggests that an increase in the salience of mutual fund fees would lead to an increase in investors' attention to the fees. A similar argument also suggests that more distracting information would divert investors' attention from the fees (Hirshleifer, Lim, and Teoh (2009)). Based on this discussion, we can formulate two additional hypotheses as follows:

**Hypothesis 2 (Price salience):** As the salience level of mutual fund fee increases, investors allocate more attention to mutual funds fees.

**Hypothesis 3 (Price complexity):** As the distracting information about fees increases, investors allocate less attention to mutual funds fees.

In experiments, we manipulate the salience level of fees by showing a graph of projected returns over time. We manipulate the distracting information about fees by presenting a long list of (unnecessary) fund share classes. We describe the experimental design in the next section.

## **2.2. Experiment design**

In experiments, we ask questions to subjects in two stages. In the first stage, they answer questions about their cognitive ability, financial literacy, demographic characteristics and economic background. We design a list of cognitive reflection test (CRT) questions based on Frederick (2005). We modify the CRT questions to minimize biases from subjects' prior experience in answering same questions with same wordings (Thomson and Oppenheimer (2016)). CRT test is considered a commonly accepted test of individual cognitive ability in the experimental economics literature. For example, Frederick (2005) and Oechssler, Roider, and Schmitz (2009) find that CRT score is related to individual's intelligence and the degree of behavioral biases. Individuals with higher CRT scores are less likely to suffer from conjunction fallacy and conservatism. Corgnet et al. (2015) find that CRT can predict the individual subject's profits in the classic SSW (Smith, Suchanek, and Williams (1988)) bubble experimental setting. To measure subjects' financial literacy level, we ask a set of financial literacy questions developed by Lusardi and Mitchell (Lusardi and Mitchell (2014)). We complement these questions with a set of questionnaires eliciting information about the subject's time preference, demographic characteristics, and economic background. In the final set of questions, subjects are presented two investment options (risky S&P500 index fund without fees and risk-free bank account) and asked to set their portfolio allocation to the two options. We present expected returns and risk level of those two investment options.

In the second stage, subjects are randomly assigned to a control group or one of two treatment groups. In the control group, the mutual fund fees are plainly described without any distracting information.

In the Treatment 1 group, the same fee structure is presented but we provide a graphical illustration of the impact of fees on total investment returns in the future. This design of fee disclosure is in line with recent policies (Securities and Exchange Commission (2004, 2009)) to enhance investors' awareness of mutual fund fees. In the Treatment 2 group, we shroud the fee level with distracting information. We present many different fee options in parallel with the baseline fee level, which are not applicable to retail investors. All information related to the applicable fee options (such as minimum required investment) is presented in a small footnote of the fee tables. All questions including those for the control and the two treatment groups are in the online Appendix.

### **2.3. Implementation procedure of the experiment**

The experiment questions are designed in the Qualtrics platform. Subjects are recruited in the Amazon MTurk and are redirected to the Qualtrics questionnaires to participate in the experiment. We set a list of requirements for subjects to participate in the experiment. To minimize biases from subjects who cannot represent the population of investors in the U.S. mutual fund market, we require that their annual salary should be more than the poverty level (\$24,600, family of four) and they should reside in the U.S. In the first stage, all subjects answer the same set of questions regarding their cognitive ability, financial literacy, and demographic information. In the second stage, subjects are randomly assigned to a control group or one of the two treatment groups. To ensure subjects pay proper attention to survey questions, we present a validation question at the end of the questionnaire (Oppenheimer, Meyvis, and Davidenko (2009) and Hauser and Schwarz (2016)). We exclude subjects who did not pay attention to the instruction based on the validation question. An experiment session lasts about 10 minutes on average. 1,247 subjects participated in the experiment and 57 were dropped from analysis due to their suspected inattention to the experiment instruction. The final sample includes 1,190 participants. Each subject earned around \$1 for participating in the experiment.

### **3. Empirical analysis and results**

In this section, we present our key findings from the experiments.

### 3.1. Descriptive statistics

We present summary statistics for the variables in Table 1. An important finding is that the average *Attention* is 62.5%, implying that investors are not fully attentive to the impact of mutual fund fees when deciding portfolio allocations.<sup>2</sup> There is also huge heterogeneity of attention level across investors. The standard deviation of *Attention* is 0.703, and the 10<sup>th</sup> and 90<sup>th</sup> values are 0.000 and 1.807, respectively. Some participants are overreacting to the fees with *Attention* greater than one.

When the fee information is presented in a salient graph showing the impact of fees (Treatment 1: Saliency group), the attention level is not much different from the baseline case. The attention level slightly decreases when the fee information is presented in a complex way (Treatment 2: Complexity group). The average *Attention* is 0.652, 0.641, and 0.583 for the control group, Treatment 1 and Treatment 2, respectively.

About 68% of our subjects were able to answer all three financial literacy questions correctly, 17% answer 2 out of 3 correctly, 10% answer 1 out of 3 correctly, and 4% fail all three questions. These numbers are higher than those reported in the prior studies.<sup>3</sup> The summary statistics show that the inattention to fees is not mainly due to lack of knowledge in finance. For those with perfect scores in financial literacy questions (*Finlit score* = 3), the average attention level is 0.627. Other participants scoring 1 or 2 in financial literacy questions also have average attention level less than one.

Regarding demographic information about the participants, about half (48.7%) of them are female. Average (median) age is 38 (35) years old with 10<sup>th</sup> and 90<sup>th</sup> percentile values at 26 and 56 years old, respectively. The largest racial group is Caucasian (41.3%) followed by Asian (28.4%) and African American (24.6%). Latino group is 13.8%. Participants are most college-educated (61.7%). 19.5% of participants have high school or less degree as their final education. 18.8% have post-graduate degrees. Median annual income is \$40,000 - \$60,000 range. About nine of ten participants earn less than \$100,000 dollars. Participants are well experienced in investment. Only 12.4% of participants report they have no

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<sup>2</sup> There are some participants increasing their allocation to mutual funds after being charged fees, resulting in negative *Attention* variable. We replace the negative attention values with zero, which is the theoretical lower bound.

<sup>3</sup> Lusardi and Mitchell (2014) find that only 34% of subjects are able to answer all three questions correctly.

investment experience and 81.7% report they have limited or some investment experience. 5.8% participants report they have extensive experience in investment.

Table 2 presents correlation matrix between *Attention* to fees and participant's characteristics. *Attention* level is highly correlated with the *Cognitive score*. Moreover, *Female* participants have higher attention level compared to male participants. Interestingly, attention level is not correlated with financial literacy score, age, time preference or risk aversion. In the next section, we investigate the determinants of the *Attention* to mutual fund fees in a regression setting.

### 3.2. Cognitive ability and attention level to mutual fund fees

To better understand how the attention to fees is affected by participants' utility preference and demographic or economic characteristics, we run a regression in the following form:

$$Attention_i = \beta Cognitive\ score_i + \delta' X_i + \epsilon_i, \quad (6)$$

where  $X_i$  represents a vector of participants' characteristics including financial literacy scores, age, sex, time preference, risk aversion, education, race, income and investment experience.

Table 3 presents coefficient estimates from the above regressions. In a univariate regression (column 1), the coefficient on the *Cognitive score* is positive and statistically significant at the 1% level (coeff.= 0.044,  $t$ -statistic=3.06). After controlling for other characteristics of participants (column 3), the coefficient on *Cognitive ability* continues to be positive and statistically significant at the 1% level. To put the economic magnitude of the coefficient on the *Cognitive score*, a one-standard-deviation increase in the *Cognitive score* leads to an increase in the *Attention* by 12 percent of its average.

Interestingly, financial literacy score is not significantly related to attention. Without cognitive ability score as a control variable, financial literacy is positively correlated with attention level (column 4), but this effect is absorbed by the *Cognitive score* (column 5).

The analysis results also show that female participants are more attentive to mutual fund fees in all specifications. The economic significance is also sizable. Female investors pay more attention than male investors by 12% - 14% more of the average attention level (0.625).

Another noteworthy result is that experience of investment is negatively related to the *Attention* level. This result suggests that more experienced investors are less likely to pay attention to the cost of financial services, which is consistent with overconfidence among retail investors (Barber and Odean (2001)).

### **3.3. Price complexity and attention level to mutual fund fees**

In this section, we investigate how the design of fee disclosures is related to the attention level. As discussed above, we randomly assign participants into three groups. The control group is presented simple fee information. The Treatment group 1 is presented the same fee information but additionally given a graph showing the detrimental impact of fees over 5- and 10-year period. The Treatment 2 group is presented a fee table containing the same fee schedule of the control group but also other complex fee schedules not applicable retail investors. The Treatment 1 is comparable to policy interventions by U.S. Securities and Exchange Commissions to improve the clarity of mutual fund fees (Securities and Exchange Commission (2004, 2009)). The Treatment 2 is comparable to strategic pricing practices of firms to increase the complexity of product cost structures with the aim of exploiting naïve consumers.

Column 1 of Table 4 presents coefficient estimates from regressions of *Attention* on the binary variables for Treatment 1 and Treatment 2 and participants characteristics. Surprisingly, the estimated coefficients on Treatment 1 and Treatment 2 are statistically indifferent from zero. This result implies that the attention level in the Treatment 1 and Treatment 2 are not statistically different from the control group. Investors with more clear or complex fee information did not increase or decrease their attention level to the mutual fund fees in our experiments on average.

To evaluate the potential heterogeneous effect of the treatment on the attention level, we include an interaction term between binary variables for the treatment groups and other key variables affecting the *Attention* level such as *Cognitive ability*, *Finlit score*, and *Female*.

Column 2 of Table 4 presents coefficient estimates from a regression of the *Attention* on the interaction term between Treatment groups and *Cognitive ability* along with other controls. The coefficient on the interaction term between the Treatment 2 and the *Cognitive score* is positive and statistically

significant at 10% level. This result implies that participants with high *Cognitive score* were less affected by distracting information in the fee disclosure. The coefficient on Treatment 1 and the *Cognitive score* is also positive but with weak statistical significance. Financial literacy (column 3) and *Female* (column 4) are not affecting how much the fee disclosure design increase or decrease the *Attention* level to mutual fund fees.

Overall, the analysis result shows that policy to improve the clarity of fee disclosure may not have first-order importance in improving investors' attention to the fees. However, the impact depends on investors' cognitive ability. Policy options to increase the clarity of fee disclosure are likely to affect investors with relatively high cognitive ability. Moreover, strategic pricing to increase the complexity of fees is more likely to affect investors with low cognitive ability, which can potentially result in cross-subsidization from naïve investors to sophisticated investors in purchasing financial services.

### **3.4. Robustness check**

In this section, we perform robustness checks of our main findings by including experiment group fixed effects and clustering the standard errors at the group level. Our experiment sessions were conducted on the Amazon Mturk Platform with five experiment groups from Feb 26, 2018 to March 02, 2018. It is possible that some unobservable heterogeneity across experiment groups in different timing could affect our results (Casey et al. (2017)). For example, the subjects who participated in the experiment during the early weekdays could perform differently from the subjects who participated in the late weekdays. The experiment group fixed effects alleviates concerns about potential bias from the timing of experiments. Moreover, clustering the standard errors at the experiment group level can adjust for arbitrary correlations of error terms in the regression model (6) at the experiment group level.

Table 5 reports the results that replicate the analysis of Table 3 by including experiment group fixed effects and clustering standard errors at the experiment group level. The results remain largely the same. The estimated coefficients on the *Cognitive score* are all positive and statistically significant with a similar magnitude of Table 3. The estimated coefficients on other variables are also similar in economic and statistical significance. Noticeably, the *t*-statistics increase for the *Cognitive score*, possibly due to a small

number of clusters. Thus we suggest the readers to rely on our main analysis for a more conservative inference of statistical significance.

Similarly, Table 6 reports the robustness checks for the treatment effect of varying salience level of fees by repeating the analysis in Table 4 with experiment group fixed effects and clustered standard errors. Most of the results remain unchanged. It is noteworthy that the interaction term between treatment 1 and cognitive score become statistically significant while the economic magnitude remains at the almost same level (column (2)). This result implies that once the correlation within the experiment group is taken into account, participants with higher *Cognitive score* tend to be more responsive to the salient information about mutual fund fees, paying more attention to the fees. The overall implication is same: the cognitive ability is an important factor in determining the impact of the fee disclosure clarity on investors' attention.

#### **4. Conclusion**

The goal of this study is to quantify the level of investors' attention to mutual fund fees and investigate its determinants. Especially, we focus on the relation between cognitive ability and attention level. Based on a parsimonious model of portfolio choice with limited attention, we estimate the attention level of investors to mutual fund fees in an experimental setting. Our analysis shows that average attention level to mutual fund fee is only 62.5%. This result implies that investors are potentially paying more fees than they recognize. Investors in the U.S. pay \$16 billion more mutual fund fees per year than they are aware. For equity mutual fund, the additional fee level is \$4.85 billion every year than the level they recognize.

There is also substantial heterogeneity of attention level across subjects. The attention level is positively correlated with the cognitive ability of subjects. A one-standard-deviation increase in the cognitive ability leads to an increase in the attention to mutual fund fees by 12 percent of its average. The estimated attention levels are similar across different experimental designs with a clearer or complicated fee disclosure.

## Appendix: Variable descriptions

Variable	Description
<b>Key variables</b>	
<i>Attention</i>	A measure of attention to mutual fund fees derived from investors' choice of portfolio allocation between mutual funds charging fees and savings account.
<i>Cognitive score</i>	A measure of cognitive ability defined as the total number of correct answers to a modified version of Cognitive Reflection Test (Frederick (2005))
<i>Finlit score</i>	A measure of financial literacy defined as the total number of correct answers to financial literacy tests (Lusardi and Mitchell (2014))
<b>Demographic variables</b>	
<i>Female</i>	A binary variable equal to one if a subject's gender is female and zero otherwise.
<i>Age</i>	Age of participants in the experiment
<i>Risk aversion</i>	A measure of risk aversion derived from investors' choice of portfolio allocation between load-free mutual funds and savings account.
<i>Time preference</i>	A measure of time-discounting based on experiment participants' intertemporal choices.
<i>Race (African American)</i>	A binary variable equal to one if a participant's self-identified race is African American and zero otherwise.
<i>Race (Asian)</i>	A binary variable equal to one if a participant's self-identified race is Asian and zero otherwise.
<i>Race (Caucasian)</i>	A binary variable equal to one if a participant's self-identified race is Caucasian and zero otherwise.
<i>Race (Latino)</i>	A binary variable equal to one if a participant's self-identified race is Latino and zero otherwise.
<i>Race (Other)</i>	A binary variable equal to one if a participant's self-identified race is other than African American, Asian, Caucasian and Latino and zero otherwise.
<i>Edu. (high school or below)</i>	A binary variable equal to one if a participant's reported education level is high school or lower
<i>Edu. (college)</i>	A binary variable equal to one if a participant's reported education level is Bachelor's degree or Associate degree
<i>Edu. (post graduate)</i>	A binary variable equal to one if a participant's reported education level is Master's degree or Doctoral degree
<i>Income below \$40,000</i>	A binary variable equal to one if a participant's reported annual income is below \$40,000 (US dollars)

<i>Income \$40,000 - \$60,000</i>	A binary variable equal to one if a participant's reported annual income is between \$40,000 and \$60,000 (US dollars)
<i>Income \$60,000-\$100,000</i>	A binary variable equal to one if a participant's reported annual income is between \$60,000 and \$100,000 (US dollars)
<i>Income above \$100,000</i>	A binary variable equal to one if a participant's reported annual income is above \$100,000 (US dollars)
<i>Exp. of investment: None</i>	A binary variable equal to one if a participant's reported no investment experience
<i>Exp. of investment: Limited</i>	A binary variable equal to one if a participant's reported limited investment experience
<i>Exp. of investment: Some</i>	A binary variable equal to one if a participant's reported some investment experience
<i>Exp. of investment: Extensive</i>	A binary variable equal to one if a participant's reported extensive investment experience

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**Table 1: Descriptive statistics for the sample**

This table reports summary statistics for variables used in the analysis. The sample includes 1,190 participants in the experiments conducted during February 26, 2018– March 2, 2018. *Treatment 1* represents the treatment where we add more salient information about fund fees to highlight the cost of mutual fund fees. *Treatment 2* represents the treatment where we add unnecessary and complex information about the mutual fund fee to increase the complexity of the fee structure.

	N	Mean	StDev	10th Percentile	Median	90% Percentile
<i>Attention</i>	1190	0.625	0.703	0.000	0.395	1.807
<i>Attention (Control)</i>	397	0.652	0.701	0.000	0.434	1.807
<i>Attention (Treatment 1)</i>	392	0.641	0.741	0.000	0.325	1.955
<i>Attention (Treatment 2)</i>	401	0.583	0.665	0.000	0.391	1.561
<i>Cognitive score</i>	1190	2.395	1.388	0.000	3.000	4.000
<i>Finlit score</i>	1190	2.512	0.823	1.000	3.000	3.000
<i>Attention (Finlit score = 3)</i>	818	0.627	0.698	0.000	0.409	1.807
<i>Attention (Finlit score = 2)</i>	208	0.665	0.720	0.000	0.527	1.858
<i>Attention (Finlit score = 1)</i>	119	0.637	0.748	0.000	0.361	1.955
<i>Attention (Finlit score = 0)</i>	45	0.364	0.524	0.000	0.000	1.301
<i>Female</i>	1190	0.487	0.500	0.000	0.000	1.000
<i>Age</i>	1154	38.635	11.857	26.000	35.000	56.000
<i>Time preference</i>	1190	0.941	0.033	0.900	0.940	0.980
<i>Risk aversion</i>	1190	0.089	0.175	0.025	0.049	0.165
<i>Race (Caucasian)</i>	0.782	0.413	0.000	1.000	1.000	0.782
<i>Race (African American)</i>	0.065	0.246	0.000	0.000	0.000	0.065
<i>Race (Asian)</i>	0.088	0.284	0.000	0.000	0.000	0.088
<i>Race (Latino)</i>	0.046	0.210	0.000	0.000	0.000	0.046
<i>Race (Other)</i>	0.019	0.138	0.000	0.000	0.000	0.019
<i>Edu. (high school or below)</i>	0.195	0.396	0.000	0.000	1.000	0.195
<i>Edu. (college)</i>	0.617	0.486	0.000	1.000	1.000	0.617
<i>Edu. (post graduate)</i>	0.188	0.391	0.000	0.000	1.000	0.188
<i>Income below \$40,000</i>	0.339	0.473	0.000	0.000	1.000	0.339
<i>Income \$40,000 - \$60,000</i>	0.256	0.437	0.000	0.000	1.000	0.256
<i>Income \$60,000 - \$100,000</i>	0.313	0.464	0.000	0.000	1.000	0.313
<i>Income above \$100,000</i>	0.092	0.289	0.000	0.000	0.000	0.092
<i>Exp. of investment: None</i>	0.124	0.330	0.000	0.000	1.000	0.124
<i>Exp. of investment: Limited</i>	0.356	0.479	0.000	0.000	1.000	0.356
<i>Exp. of investment: Some</i>	0.461	0.499	0.000	0.000	1.000	0.461
<i>Exp. of investment: Extensive</i>	0.058	0.234	0.000	0.000	0.000	0.058

**Table 2: Correlation matrix**

This table reports a correlation matrix among variables. The sample includes 1,190 participants in the experiments conducted during February 26, 2018 – March 2, 2018. Statistical significance at the 10%, 5%, and 1% levels is denoted by \*, \*\*, and \*\*\*, respectively.

	<i>Attention</i>	<i>Cognitive score</i>	<i>Finlit score</i>	<i>Female</i>	<i>Age</i>	<i>Time preference</i>	<i>Risk aversion</i>
<i>Attention</i>	<b>1.000</b>						
<i>Cognitive score</i>	<b>0.086***</b>	1.000					
<i>Finlit score</i>	<b>0.035</b>	0.455***	1.000				
<i>Female</i>	<b>0.149***</b>	-0.207***	-0.166***	1.000			
<i>Age</i>	<b>0.003</b>	-0.026	0.188***	0.047	1.000		
<i>Time preference</i>	<b>-0.008</b>	0.048*	0.075**	0.040	0.011	1.000	
<i>Risk aversion</i>	<b>0.037</b>	-0.128***	-0.096***	0.092***	-0.007	0.025	1.000

**Table 3: Determinants of attention level to mutual fund fees**

This table presents estimated coefficients from regressions of attention level to fees (*Attention*) on characteristics of investors. The sample includes 1,190 participants in the experiments conducted during February 26, 2018– March 2, 2018. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity. Statistical significance at the 10%, 5%, and 1% levels is denoted by \*, \*\*, and \*\*\*, respectively.

Dep. Variable = <i>Attention</i>					
	(1)	(2)	(3)	(4)	(5)
<b><i>Cognitive score</i></b>	<b>0.044***</b>		<b>0.061***</b>		<b>0.056***</b>
	<b>(3.06)</b>		<b>(3.99)</b>		<b>(3.36)</b>
<i>Finlit score</i>		0.030		0.062**	0.019
		(1.26)		(2.34)	(0.66)
<i>Log(Age)</i>			0.035	-0.003	0.027
			(0.48)	(-0.04)	(0.35)
<i>Female</i>			0.218***	0.197***	0.220***
			(5.08)	(4.62)	(5.11)
<i>Time preference</i>			-0.372	-0.340	-0.394
			(-0.60)	(-0.54)	(-0.63)
<i>Risk aversion</i>			0.057	0.018	0.058
			(0.36)	(0.11)	(0.36)
<b>Education baseline:</b>					
<b>High school or below</b>					
<i>Edu. (college)</i>			0.040	0.042	0.038
			(0.72)	(0.74)	(0.67)
<i>Edu. (post graduate)</i>			-0.000	0.009	-0.004
			(-0.01)	(0.12)	(-0.06)
<b>Race Baseline:</b>					
<b>Caucasian</b>					
<i>Race (African American)</i>			-0.242***	-0.250***	-0.235***
			(-3.49)	(-3.63)	(-3.38)
<i>Race (Asian)</i>			-0.005	-0.012	-0.004
			(-0.07)	(-0.16)	(-0.05)
<i>Race (Latino)</i>			-0.015	-0.030	-0.016
			(-0.15)	(-0.29)	(-0.16)
<i>Race (Other)</i>			-0.093	-0.106	-0.083
			(-0.61)	(-0.67)	(-0.55)
<b>Income baseline:</b>					
<b>Below \$40,000</b>					
<i>Income \$40,000 - \$60,000</i>			0.069	0.065	0.069
			(1.23)	(1.17)	(1.24)
<i>Income \$60,000 - \$100,000</i>			-0.098*	-0.101*	-0.098*
			(-1.87)	(-1.91)	(-1.87)
<i>Income above \$100,000</i>			-0.070	-0.069	-0.070
			(-0.90)	(-0.86)	(-0.90)
<b>Experience baseline:</b>					
<i>Exp. of investment: None</i>					

<i>Exp. of investment: Limited</i>			-0.138*	-0.161**	-0.144*
			(-1.79)	(-2.07)	(-1.84)
<i>Exp. of investment: Some</i>			-0.248***	-0.279***	-0.255***
			(-3.29)	(-3.69)	(-3.36)
<i>Exp. of investment: Extensive</i>			-0.233**	-0.287**	-0.242**
			(-2.10)	(-2.55)	(-2.15)
Constant	0.520***	0.550***	0.781	0.920	0.803
	(13.48)	(8.80)	(1.21)	(1.41)	(1.23)
Observations	0.007	0.000	0.056	0.047	0.055
Adjusted R-squared	1190	1190	1154	1154	1154

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**Table 4: Does clarity of fee disclosure affect investors' attention to mutual fund fees?**

This table presents coefficient estimates from regressions of *Attention* on dummy variables for treatment groups and investor characteristics. The sample includes 1,190 participants in the experiments conducted during February 26, 2018 – March 2, 2018. Coefficients on constant terms are omitted. *t*-statistics are reported in parentheses and are based on standard errors robust to heteroskedasticity. Statistical significance at the 10%, 5%, and 1% levels is denoted by \*, \*\*, and \*\*\*, respectively.

	Dep. Variable = <i>Attention</i>			
	(1)	(2)	(3)	(4)
<b><i>Treatment group 1</i></b>	<b>-0.017</b>	<b>-0.128</b>	<b>-0.082</b>	<b>0.001</b>
	(-0.33)	(-1.32)	(-0.52)	(0.02)
<b><i>Treatment group 2</i></b>	<b>-0.064</b>	<b>-0.205**</b>	<b>-0.260*</b>	<b>0.001</b>
	(-1.33)	(-2.27)	(-1.71)	(0.01)
<i>Cognitive score</i>		<b>0.046</b>		
× <i>Treatment group 1</i>		(1.29)		
<i>Cognitive score</i>		<b>0.059*</b>		
× <i>Treatment group 2</i>		(1.72)		
<i>Finlit score</i>			0.026	
× <i>Treatment group 1</i>			(0.44)	
<i>Finlit score</i>			0.077	
× <i>Treatment group 2</i>			(1.34)	
<i>Female</i>				-0.036
× <i>Treatment group 1</i>				(-0.35)
<i>Female</i>				-0.134
× <i>Treatment group 2</i>				(-1.37)
<i>Cognitive score</i>	0.056***	0.019	0.057***	0.057***
	(3.33)	(0.73)	(3.37)	(3.39)
<i>Finlit score</i>	0.021	0.023	-0.014	0.021
	(0.72)	(0.79)	(-0.30)	(0.73)
<i>Female</i>	0.219***	0.214***	0.216***	0.276***
	(5.07)	(4.95)	(5.01)	(3.79)
<i>Other controls</i>	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.055	0.056	0.055	0.055
<i>N</i>	1154	1154	1154	1154

**Table 5: Robustness Check: Determinants of attention level to mutual fund fees**

This table replicates Table 3 by adding experiment group fixed effects and clustering standard errors at the group level in all specifications. The sample includes 1,190 participants in the experiments conducted during February 26, 2018–March 2, 2018. *t*-statistics are reported in parentheses and are based on clustered standard errors at the batch level. Statistical significance at the 10%, 5%, and 1% levels is denoted by \*, \*\*, and \*\*\*, respectively.

	Dep. Variable = <i>Attention</i>				
	(1)	(2)	(3)	(4)	(5)
<b><i>Cognitive score</i></b>	<b>0.043***</b>		<b>0.060***</b>		<b>0.055***</b>
	<b>(17.98)</b>		<b>(16.44)</b>		<b>(8.34)</b>
<i>Finlit score</i>		0.027		0.061*	0.020
		(1.23)		(2.53)	(0.71)
<i>Log(Age)</i>			0.037	-0.002	0.028
			(0.29)	(-0.01)	(0.25)
<i>Female</i>			0.212**	0.191*	0.213**
			(3.29)	(3.01)	(3.31)
<i>Time preference</i>			-0.366	-0.329	-0.389
			(-0.65)	(-0.62)	(-0.70)
<i>Risk aversion</i>			0.057	0.018	0.057
			(0.37)	(0.12)	(0.38)
<b>Education baseline:</b>					
<b>High school or below</b>					
<i>Edu. (college)</i>			0.041	0.042	0.038
			(1.67)	(1.53)	(1.45)
<i>Edu. (post graduate)</i>			-0.005	0.004	-0.009
			(-0.09)	(0.06)	(-0.16)
<b>Race Baseline:</b>					
<b>Caucasian</b>					
<i>Race (African American)</i>			-0.243**	-0.251**	-0.236**
			(-4.09)	(-3.51)	(-3.73)
<i>Race (Asian)</i>			-0.007	-0.014	-0.005
			(-0.05)	(-0.10)	(-0.04)
<i>Race (Latino)</i>			-0.020	-0.036	-0.021
			(-0.15)	(-0.26)	(-0.16)
<i>Race (Other)</i>			-0.075	-0.086	-0.065
			(-0.36)	(-0.39)	(-0.31)
<b>Income baseline:</b>					
<b>Below \$40,000</b>					
<i>Income \$40,000 - \$60,000</i>			0.069	0.067	0.070
			(0.93)	(0.83)	(0.94)
<i>Income \$60,000 - \$100,000</i>			-0.095	-0.098	-0.096
			(-1.95)	(-2.19)	(-1.97)
<i>Income above \$100,000</i>			-0.073	-0.071	-0.073
			(-0.97)	(-0.90)	(-0.97)
<b>Experience baseline:</b>					
<b>Exp. of investment: None</b>					
<i>Exp. of investment: Limited</i>			-0.143**	-0.165**	-0.149**

			(-3.42)	(-3.64)	(-3.68)
<i>Exp. of investment: Some</i>			-0.254**	-0.284**	-0.261**
			(-5.06)	(-4.49)	(-4.33)
<i>Exp. of investment: Extensive</i>			-0.240	-0.292	-0.249
			(-1.63)	(-1.77)	(-1.54)
Constant	0.523***	0.557***	0.780	0.913	0.803
	(91.93)	(10.00)	(1.12)	(1.42)	(1.21)
Observations	1190	1190	1154	1154	1154
Adjusted R-squared	0.010	0.003	0.058	0.049	0.057

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**Table 6: Robustness Check: Does clarity of fee disclosure affect investors' attention to mutual fund fees?**

This table replicates Table 4 by adding experiment group fixed effects and clustering standard errors at the group level in all specifications. The sample includes 1,190 participants in the experiments conducted during February 26, 2018–March 2, 2018. *t*-statistics are reported in parentheses and are based on standard errors clustered at the batch level. Statistical significance at the 10%, 5%, and 1% levels is denoted by \*, \*\*, and \*\*\*, respectively.

	Dep. Variable = <i>Attention</i>			
	(1)	(2)	(3)	(4)
<i>Treatment group 1</i>	<b>-0.024</b> (-0.34)	<b>-0.136</b> (-1.56)	<b>-0.084</b> (-0.49)	<b>0.000</b> (0.00)
<i>Treatment group 2</i>	<b>-0.070</b> (-1.56)	<b>-0.210*</b> (-2.50)	<b>-0.270</b> (-1.54)	<b>-0.006</b> (-0.06)
<i>Cognitive score</i>		<b>0.047***</b>		
× <i>Treatment group 1</i>		<b>(6.21)</b>		
<i>Cognitive score</i>		<b>0.058*</b>		
× <i>Treatment group 2</i>		<b>(2.64)</b>		
<i>Finlit score</i>			0.024	
× <i>Treatment group 1</i>			(0.49)	
<i>Finlit score</i>			0.079	
× <i>Treatment group 2</i>			(1.34)	
<i>Female</i>				-0.047
× <i>Treatment group 1</i>				(-0.52)
<i>Female</i>				-0.130
× <i>Treatment group 2</i>				(-1.07)
<i>Cognitive score</i>	0.055*** (8.16)	0.018* (2.62)	0.056*** (8.24)	0.056*** (7.85)
<i>Finlit score</i>	0.021 (0.74)	0.023 (0.78)	-0.013 (-0.36)	0.022 (0.78)
<i>Female</i>	0.212** (3.24)	0.207* (3.12)	0.209** (3.22)	0.272 (2.10)
<i>Other controls</i>	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.057	0.058	0.057	0.057
<i>N</i>	1154	1154	1154	1154

## **Online appendix: Survey questions**

You are being asked to participate in this study because you showed interest in answering questions related to improving our understanding of mutual fund investors behavior.

The principal investigator (PI) of this research is Dr. Hugh Kim at the University of South Carolina. The survey is conducted by the PI. The survey is voluntary and anonymous. Responses will not be identified by individual. All responses will be compiled and analyzed together. A completed survey is automatically submitted to the system (Amazon MTurk), and the data is stored safely in the system or password-protected computer system on the PI side. Payment is transferred to participants' MTurk accounts who complete the survey. The survey is expected to take about 30 min.

If you have any questions or concerns, please contact Dr. Hugh Kim at [hugh.kim@moore.sc.edu](mailto:hugh.kim@moore.sc.edu) or Dr. Wenhao Yang at [wenhao.yang@moore.sc.edu](mailto:wenhao.yang@moore.sc.edu).

We would appreciate your time for completing the following questionnaire.

## Section 0: Sample selection

Subjects will belong to following groups:

1. Ages more than 18 years old
2. US residents (to rule out cultural confounding effects)
3. Annual income more than \$24,600 (poverty level for a family of 4)

## Section 1: Demographic information

**Question 1:** What is your birth year? [      ] (e.g., 1987)

**Question 2:** What is your sex?

- A. Male
- B. Female
- C. Prefer not to disclose

**Question 3:** What is your final academic degree?

- A. Elementary school
- B. Middle school
- C. High school
- D. Associate degree
- E. Bachelor's degree
- F. Master's degree
- G. Doctoral degree
- H. None of the above

**Question 4:** What is your identified race?

- A. Asian
- B. Black
- C. White
- D. Latino
- E. Native American
- F. Native Hawaiian or other pacific islander
- G. None of the above

**Question:** What's your experience on investing in financial assets (e.g. stocks, mutual funds, bonds, pension funds etc.)?

- A. I have extensive experience in investing
- B. I have some experience
- C. I have limited experience
- D. I have no experience at all

**Question:** What is your annual income? Answer: [      ] US dollars

- A. Below \$40,000
- B. \$40,000 --- \$60,000
- C. \$60,000 --- \$80,000
- D. \$80,000 --- \$100,000
- E. \$100,000 --- \$150,000
- F. \$150,000 --- \$200,000
- G. Above \$200,000

## Section 2: Discounting rate, financial literacy, risk aversion

**Question:** Suppose the U.S. government just issued you a check of \$100 but you can cash it out only one year later. But you can sell this check to a third-party. What is the minimum price you are willing to receive by selling this check to the third party now? (There is no renegotiation. The price is either accepted or rejected)

- A. \$90
- B. \$92
- C. \$94
- D. \$96
- E. \$98

**Question:** Tomorrow's weather will be rainy with 50% probability or sunny with 50% probability. You can choose one of two options.

- Option 1 gives you \$10 regardless of the weather tomorrow.
- Option 2 gives you \$1 if it rains and gives you \$X if it is sunny tomorrow.

How much money (\$X) for the sunny weather in the Option 2 makes you indifferent between the Option 1 and Option 2?

- A. \$15
- B. \$18
- C. \$21
- D. \$24
- E. \$27

**Question:** Suppose you had \$100 in a savings account and the interest rate was 2 percent per year. After 5 years, how much do you think you would have in the account if you left the money to grow:

- A. more than \$102
- B. exactly \$102
- C. less than \$102
- D. do not know
- E. refuse to answer

**Question:** Imagine that the interest rate on your savings account was 1 percent per year and inflation was 2 percent per year. After 1 year, would you be able to buy:

- A. more than today with the money in this account
- B. exactly the same as today with the money in this account
- C. less than today with the money in this account
- D. do not know
- E. refuse to answer

**Question:** Do you think that the following statement is true or false? “Buying a single company stock usually provides a safer return than a stock mutual fund.”

- A. true
- B. false
- C. do not know
- D. refuse to answer

### Section 3: Cognitive reflection test

**Question:** A cat and a dog weigh 110 pounds in total. The dog weighs 100 pounds more than the cat. How much does the cat weigh? \_\_\_\_ pounds

**Question:** If it takes 10 builders and 10 months to build 10 houses, how long would it take 100 builders to build 100 houses?

**Question:** A bamboo shoot is just sprouting. It doubles in length every day. If it will be 10 inches after 10 days, how long will it be after 9 days? \_\_\_\_\_ inches

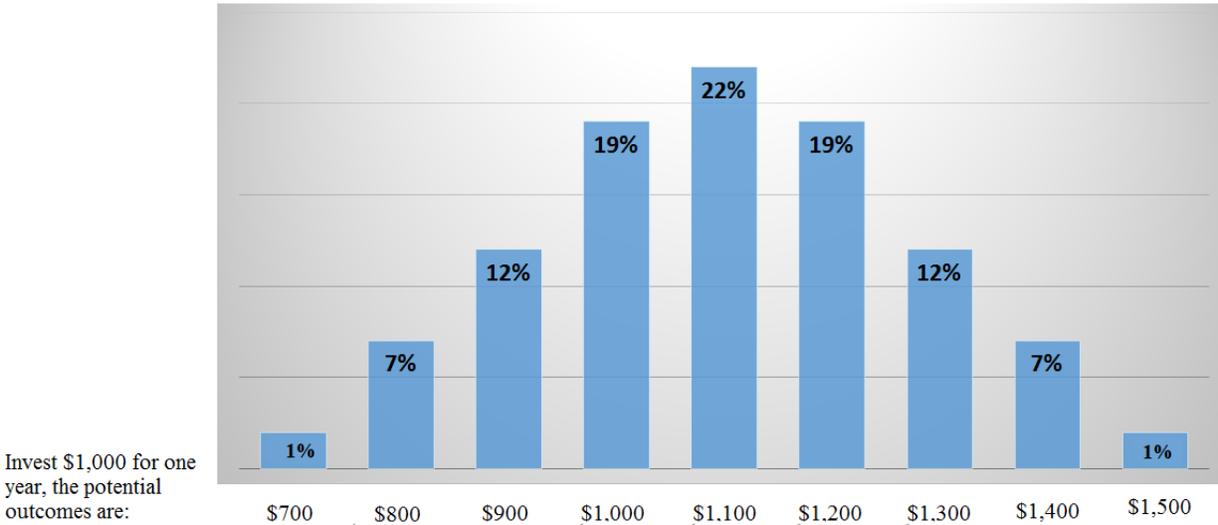
**Question:** If you're running a race and you pass the person in the 2nd place, what place are you in?

**Question:** A farmer had 15 sheep and all but 8 died. How many are left?

**Question:** Emily's father has three daughters. The first two are named April and May. What is the third daughter's name?

## Section 4: Mutual fund fee complexity and limited attention

**Instruction:** You have \$1,000 cash. You have two investment options: S&P500 index fund and checking account. S&P index fund is a risky investment option with expected return of 10%, which is not certain. The following graph describes the possible payoffs with the corresponding probability. For example, a \$1,000 investment after 1 year can become \$700 with 2% of chance. Notice the number on each bar stands for the probability for that potential payoff while the number at the bottom of the graph shows the potential payoff. On the other hand, the checking account is a safe investment with a promised return of 2%.



**Question:** There is no fee for investing in the mutual fund or checking account. What fraction of your money are you going to invest in the S&P 500 index fund? **Answer:** [    ]%

**Question:** In reality, investing in S&P 500 index fund is not free. Given the following fee schedule, what fraction of your money are you going to invest in the S&P 500 index fund? All terms are explained in the footnote of the table.

**(Experiment A): Complexity (Salience of cost)**

**A: Control group:**

<b>One-time expense</b>	<b>Cost</b>
Maximum Sales charge <sup>1</sup>	2.5%
Maximum Deferred sales charge <sup>2</sup>	0.5%
Redemption fee	None
<b>Total one-time expense</b>	<b>3%</b>
<b>Annual operating expense</b>	
Management Fees	0.15%
Distribution (12b-1) Fees <sup>3</sup>	0.01%
Other Expense	0.53%
Shareholder Servicing fee	0.25%
Other	0.28%
<b>Total Annual Operating Expenses</b>	<b>0.68%</b>
<b>Total maximum expenses in the first year</b>	<b>3.69%</b>

*1 A one sales charge upfront.*

*2 This contingent deferred sales charge applies only to purchases of \$1,000,000 or more of the fund if the shares are redeemed within 12 months of the date of purchase.*

*3 The Fund may reimburse expenses incurred by Fund Distributor up to a maximum of 0.10% under the Fund's distribution plan. The Board of Trustees (the "Board") has approved a contractual commitment whereby such reimbursements will be no more than the Distribution (12b-1) Fees stated in the table above for the Fund. This commitment continues through December 31, 2019, at which time the Board will determine whether to renew, revise, or discontinue it, except that it may be terminated by the Board at any time.*

**A: Treatment group:**

<b>One-time expense</b>	<b>Cost</b>
Maximum Sales charge <sup>1</sup>	2.5%
Maximum Deferred sales charge <sup>2</sup>	0.5%
Redemption fee	None
<b>Total one-time expense</b>	<b>3%</b>
<b>Annual operating expense</b>	
Management Fees	0.15%
Distribution (12b-1) Fees <sup>3</sup>	0.00%
Other Expense	0.53%
Shareholder Servicing fee	0.25%
Other	0.28%
<b>Total Annual Operating Expenses</b>	<b>0.68%</b>
<b>Total maximum expenses in the first year</b>	<b>3.68%</b>

*1 A one sales charge upfront.*

*2 This contingent deferred sales charge applies only to purchases of \$1,000,000 or more of the fund if the shares are redeemed within 12 months of the date of purchase.*

*3 The Fund may reimburse expenses incurred by Fund Distributor up to a maximum of 0.10% under the Fund's distribution plan. The Board of Trustees (the "Board") has approved a contractual commitment whereby such reimbursements will be no more than the Distribution (12b-1) Fees stated in the table above for the Fund. This commitment continues through December 31, 2019, at which time the Board will determine whether to renew, revise, or discontinue it, except that it may be terminated by the Board at any time.*

To illustrate the effect of expense on your wealth over the long run, the following table list out your terminal wealth after investing in the S&P 500 Index Fund for certain years, assuming the fund can deliver 10% of return before fee every year. The graph below plots the how your wealth will change over the years with \$10,000 initial investment.



Number of Years after initial investment	Terminal Wealth With No Fee	Terminal Wealth With 3.69% Fee	Difference of Wealth
After 10 years	\$23,579	\$17,344	\$6,235
After 15 years	\$37,975	\$23,553	\$14,442
After 20 years	\$61,159	\$31,982	\$29,177
After 25 years	\$98,497	\$43,429	\$35,068

**(Experiment B): Complexity (Distracting information)**

**B: Control group:**

<b>One-time expense</b>	<b>Cost</b>
Maximum Sales charge <sup>1</sup>	2.5%
Maximum Deferred sales charge <sup>2</sup>	0.5%
Redemption fee	None
<b>Total one-time expense</b>	<b>3%</b>
<b>Annual operating expense</b>	
Management Fees	0.15%
Distribution (12b-1) Fees <sup>3</sup>	0.01%
Other Expense	0.53%
Shareholder Servicing fee	0.25%
Other	0.28%
<b>Total Annual Operating Expenses</b>	<b>0.68%</b>
<b>Total maximum expenses in the first year</b>	<b>3.69%</b>

*1 A one sales charge upfront.*

*2 This contingent deferred sales charge applies only to purchases of \$1,000,000 or more of the fund if the shares are redeemed within 12 months of the date of purchase.*

*3 The Fund may reimburse expenses incurred by Fund Distributor up to a maximum of 0.10% under the Fund's distribution plan. The Board of Trustees (the "Board") has approved a contractual commitment whereby such reimbursements will be no more than the Distribution (12b-1) Fees stated in the table above for the Fund. This commitment continues through December 31, 2019, at which time the Board will determine whether to renew, revise, or discontinue it, except that it may be terminated by the Board at any time.*

**B: Treatment group:**

	<b>Class A</b>	<b>Class B<sup>1</sup></b>	<b>Class C<sup>1</sup></b>
<b>One-time expense</b>			
Maximum Sales charge <sup>2</sup>	2.5%	None	None
Maximum Deferred sales charge <sup>3</sup>	0.5%	None	1%
Redemption fee	None	2.0%	1%
Total one-time expense	3%	2%	2%
<b>Annual operating expense</b>			
Management Fees	0.15%	0.15%	0.15%
Distribution (12b-1) Fees <sup>4</sup>	0.01%	0.75%	0.75%
Other Expense	0.53%	0.28%	0.28%
Shareholder Servicing fee	0.25%	None	None
Other	0.28%	0.28%	0.28%
Total Annual Operating Expenses	0.68%	1.18%	1.18%
<b>Total maximum expenses in the first year</b>	<b>3.69%</b>	<b>3.18%</b>	<b>3.18%</b>

<sup>1</sup> Class B and Class C are available to investors with initial investment in the amount of \$1,000,000 or more.

<sup>2</sup> A sales charge is not charged on purchases of Class B or Class C Shares in the amount of \$1,000,000 or more.

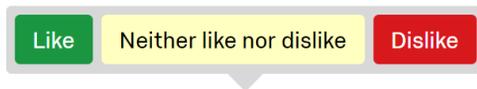
<sup>3</sup> This contingent deferred sales charge applies only to purchases of \$1,000,000 or more of Class A or Class C Shares if the shares are redeemed within 12 months of the date of purchase.

<sup>4</sup> The Fund may reimburse expenses incurred by Fund Distributor up to a maximum of 0.10% under the Fund's distribution plan for Class B and Class C Shares. The Board of Trustees (the "Board") has approved a contractual commitment whereby such reimbursements will be no more than the Distribution (12b-1) Fees stated in the table above for the Fund. This commitment continues through December 31, 2019, at which time the Board will determine whether to renew, revise, or discontinue it, except that it may be terminated by the Board at any time.

## Section 5: Attention Check

Most modern theories of decision making recognize the fact that decisions do not take place in a vacuum. Individual preferences and knowledge, along with situational variables can greatly impact the decision process. In order to facilitate our research on decision making, we are interested in knowing certain factors about you, the decision maker. Specifically, we are interested in whether you actually take the time to read the directions; if not, then some of our manipulations that rely on changes in the instructions will be ineffective. So, in order to demonstrate that you have read the instructions, please ignore the question asked below (regarding the sports activities), and simply click the arrow at the bottom-right corner to proceed to the next screen. Thank you very much! Thank you very much!

Please click the activities below and highlight each item with tag "like", "dislike", and "neither like nor dislike"?



skiing score snowboarding running hockey football swimming tennis  
basketball cycling