

CAN ONLINE DISCLOSURE DESIGN AFFECT INVESTOR UNDERSTANDING AND PERFORMANCE?

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INTRODUCTION

Financial prospectus documents provide information about investment products such as their objectives, fees and expenses, risk, performance, and fund management. Although the U.S. Securities and Exchange Commission has adopted a rule requiring that mutual fund summary prospectuses be written in plain English and has published guides on how to write disclosures, prospectus documents remain lengthy and complex. Many investors do not understand the presented information and pay insufficient attention to the information on risk and expenses. Prior work has suggested that overtaxed cognitive resources might contribute to investors' inability to calculate differences in fees.

Online investment platforms are met with new challenges. Prior research has found that screen-based reading behavior includes decreased sustained attention, and involves more time spent scanning, keyword spotting, and reading more selectively instead of in-depth. However, online platforms also permit flexibility in how information is presented, and careful presentation may improve investors' ability to gather and use information from prospectus documents.

In this study, we examine whether presenting online financial prospectus information using an accordion navigation design pattern can improve investor performance. As illustrated in Figure 1, an accordion navigation design arranges information into a vertically stacked list of headers that can be clicked to reveal or hide content. The use of this design allows for a lot of information to exist in a small space. It minimizes the need for users to scroll through and scan less relevant information—thereby reducing the cognitive load. Prior studies have found that similar designs improved speed and accuracy in finding information needed in health industry settings.

EXPERIMENTAL SETTING AND PROCEDURE

To investigate how the accordion navigation design can affect retirement investing decisions, we incorporated the presentation format into a retirement savings simulator designed to mimic the process of saving for retirement. We recruited 323 users from Amazon Mechanical Turk, a task crowdsourcing platform, to participate in our experiment. We limited participation to users that were U.S. based, over the age of 18, had a record of at least 100 tasks (on Amazon Mechanical Turk) at an approval rate above 99%, and had not participated in our similar studies. The average age in our sample was 42.7, and 57.3% of participants were female. Prior investment experience is a key characteristic in our experiment, as we hypothesized that accordion navigation design would be more beneficial for novices rather than experts. Novices are defined as participants who rated themselves as novice or having no investment experience, while experts are those who rated themselves

as intermediate or experts. Participants were distributed in the following manner: 130 (40.25%) novices in the control condition, 90 (27.86%) experts in the control condition, 62 (19.2%) novices in the accordion dynamic navigation condition, and 41 (12.69%) experts in the accordion dynamic navigation condition.

Participants took part in an online retirement saving exercise in which they were tasked with accumulating \$1.5M over the course of a simulated 35 years (periods) and were incentivized to attain performance as close to that goal as possible (through bonus payments that decrease with distance from the goal). Each simulation year, participants were given a hypothetical \$10,000 to invest in one or more funds, choosing from three stock funds, three bond funds, three lifecycle funds, and a money market fund (which represents a choice not to invest). The funds were modeled on real-world investments and ranged in historical performance, expense ratios, volatility, and fees.

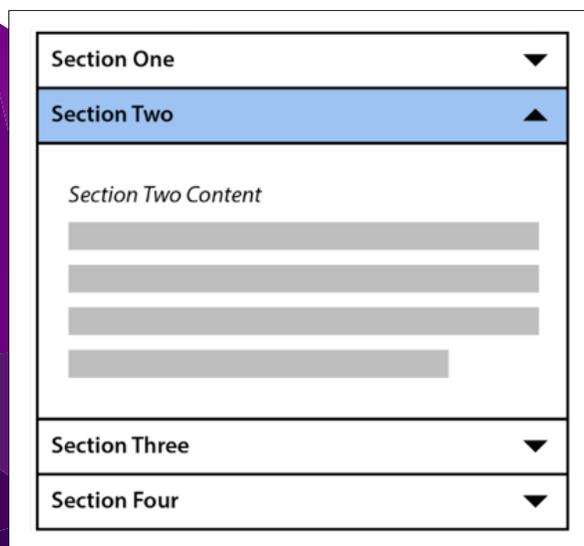


Figure 1: Accordion navigation design layout.

ACCORDION NAVIGATION DESIGN CONDITION

The simulator's homepage provided an account overview, including the total amount saved to date and a pie chart of the participant's current portfolio composition. From this screen, participants were prompted to set the current year's allocation, or to rebalance their entire portfolio. The following screen allowed them to choose their investments by displaying a list of the ten available funds. Participants were encouraged to learn more about the investments, and could do so by clicking on a fund's name, which directed the participant to the fund's disclosure page. The format of the disclosures varied across participants, and respondents were randomized into one of two groups: a treatment group which received the disclosure in the accordion navigation design, and a control group which received the disclosure in the traditional format. Once asset allocations were selected, users were directed to the next allocation year and shown the past performance of their portfolio and market behavior. Upon completion of the retirement savings simulation, participants were directed to a post-study questionnaire.

In the accordion navigation condition, users were able to decide what information was presented to them and in which order. The design includes a navigation panel with the main topics listed on the left and an accordion navigation layout containing subsections on the right. Examples of the topic headers include: Investment Objective & Fee Table and Principal Investment Strategies. Clicking on the "View" button in the header toggles the panels to expand and display the relevant information.

The control condition presented the same information available to subjects in the treatment condition, and differed only in formatting. In both conditions, participants were required to view the information for at least one fund option each round (simulated year). Participants in the control group viewed the prospectuses in the traditional layout used by commercial financial websites and hard copy documents. Per standard practice, control disclosures consisted of text and graph figures organized into sections with the inclusion of a table of contents at the top.

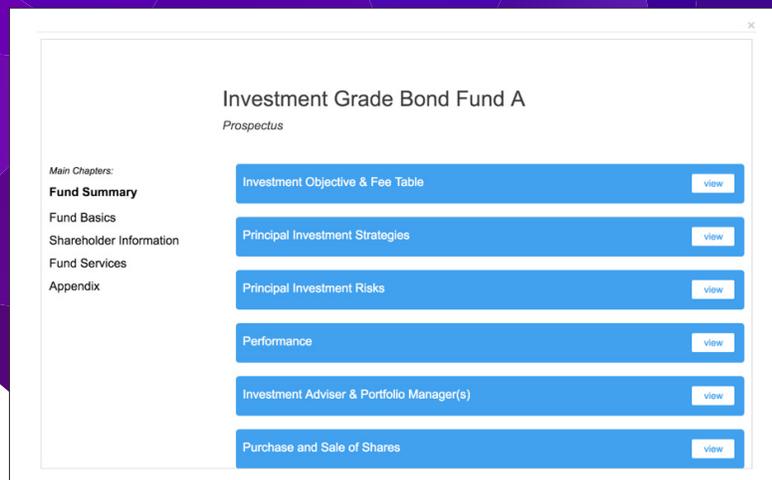


Figure 2: In an accordion navigation design, each panel contains a header and collapsible body.

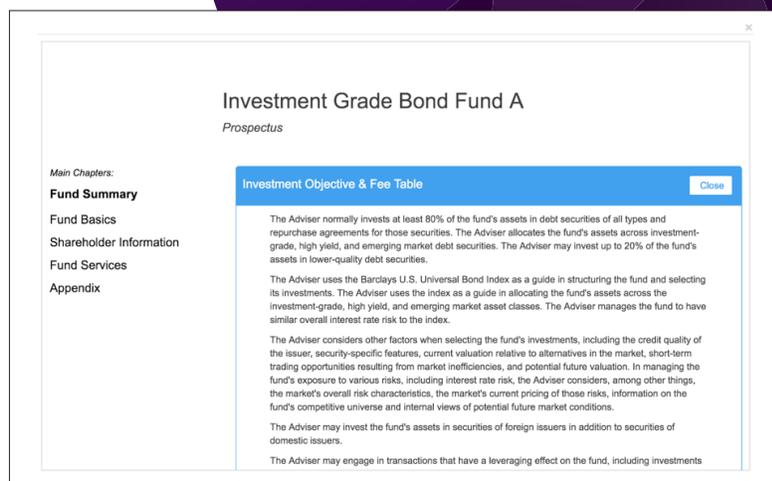


Figure 3: Panels are opened and collapsed upon the user click.

RESULTS

The study revealed that the mean gap between novices' accumulated savings and their goal in the accordion navigation condition, \$133,737, was significantly lower than the mean gap of \$186,733 ($p=0.005$) for novices in the control condition. Similarly, the likelihood that novices in the accordion condition performed poorly, not reaching within 20% of their goal, was 0.05, significantly lower than 0.2 for novices in the control condition ($p=0.023$) (Figure 4).

Somewhat surprisingly, experts in the accordion condition performed significantly worse than experts in the control group in three of our four

measures of performance. The mean gap between experts' savings and their goal in the accordion condition was \$203,961, significantly higher than a mean gap of \$123,894 ($p<0.001$) for experts in the control condition. Experts in the accordion condition had 31% of their portfolio allocated towards low fee funds, which is statistically lower ($p=0.035$) than the 41% allocated towards low fee funds by experts in control. In addition, the likelihood that experts in the accordion navigation condition performed superbly, missing the goal by 5% or less, was 0.07, significantly lower than the 0.39 for experts in the control condition ($p=0.001$) (Figure 5).

The mean gap between novices' savings and their goal in the accordion condition was \$133,737, significantly lower than a mean gap of \$203,961 ($p<0.001$) for experts in the accordion condition. The likelihood that novices in the accordion condition performed superbly was 0.39, significantly higher than the 0.07 for experts in the accordion condition ($p=0.002$).

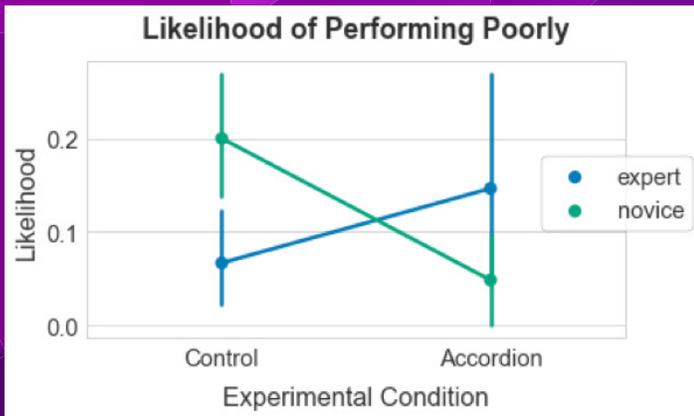


Figure 4: Likelihood of Performing Poorly (miss the goal by >20%). Novices exposed to the dynamic navigation outperformed their peers in the control group in terms of likelihood of missing their goal by >20%.

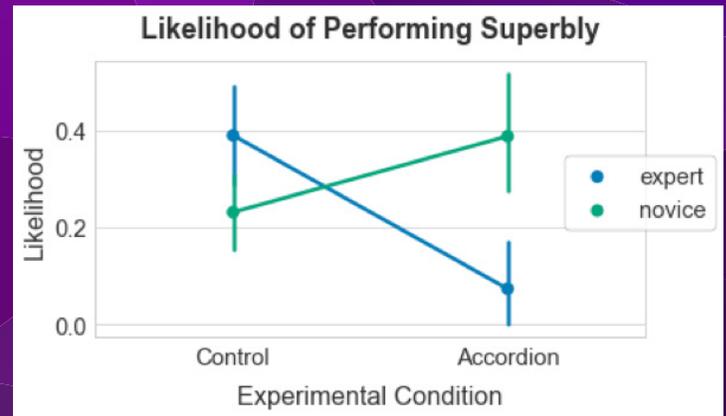


Figure 5: Likelihood of Performing Superbly (miss the goal by <5%). Experts exposed to the dynamic navigation underperformed their peers in the control group in terms of likelihood to miss goal by <5%.

INSIGHTS

Although novice investors in general have a steeper learning curve, novices randomly assigned to the accordion navigation condition showed better performance than their counterparts in the control group. They had a smaller average distance from the investment goal and were less likely to miss the goal by 20% or more. While novices in the accordion design condition performed better in these areas, there were no significant differences between treatment and control in how novices rated their understanding of the information presented or in their sense of making an informed decision.

Conversely, experts randomly assigned to the accordion condition performed worse than those in the control group. They had a higher mean gap from the goal, exhibited lower likelihood of missing the goal

by 5% or less, and invested less in low-fee funds. This adverse effect on performance for experts is also reflected in our previous study on the impact of social annotations on understanding disclosures.¹

Our results suggest that formatting a financial prospectus within an accordion navigation design can benefit novice users, yet it may have adverse effects on experienced investors. These findings might be explained by the usefulness of the new design for novices who don't have experience with conventional disclosures, and by experienced investors' difficulty in reconciling the new design with the traditional presentation of information to which they have become accustomed. Customizing the design of a prospectus for investors based on their experience may be beneficial, and due to the simplicity and

popularity of the accordion design pattern, the added development efforts should be minimal. Asking users for their level of investment experience, and targeting novice users with this design may reap positive results.

Further research is needed to explore why expert investors performed worse in the accordion navigation condition. While participants were required to view the disclosures page, it is not known how much or how in depth a user read the information. In addition, the measures for assessing the effects of the designs on the understanding of the information displayed is self-reported and may not give an accurate representation of the actual level of understanding. Future work would benefit from collecting additional data on these measures, possibly through the inclusion of a brief assessment.

¹ Burke, Jeremy, Oded Nov, and Junius Gunaratne. "Empowering Investors With Social Annotation When Saving For Retirement." *Proceedings of ACM CSCW*, 2018.

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