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# Question Design Matters:
## Response Options Influence the Length of Reported Financial Time Horizons

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## ABSTRACT

Time horizons are central to investment decisions and financial goals. Therefore, time horizons are assessed as part of giving investment advice and surveys of financial decision making. Financial professionals use widely varying response options with time horizon assessments, however, perhaps under the assumption that their clients will report the same time horizon regardless. For example, the shortest response option may vary from "immediately" to "0-5 years" and the longest response option vary from "10+ years" to "more than 20 years." Survey design research suggests that presented response options can affect people's responses, and that an open-ended question might better capture people's natural responses despite requiring more effort. Here, we tested the effects of varying response options on reported time horizons. We randomly assigned 5,801 participants from a nationally representative U.S. sample across four conditions in which the same time horizon question was presented with short-run, mid-run, or long-run response options, or an open-ended response mode. Reported time horizons were shortest in the short-run condition, longest in the long-run condition, with the mid-run and open-ended response modes falling in between. Moreover, time horizons in the mid-run condition were most similar to the open-ended condition. Perceptions of modal time horizons followed the same pattern of responses across conditions. The open-ended condition was rated as the hardest to answer and had the most missing responses. Thoughts about times horizons and evaluations of their own time horizon had, at most, small differences between conditions. The mid-run condition outperformed the other conditions when predicting other financial outcomes, including having an emergency fund and financial hardship. Based on these findings, we recommend standardizing the response options presented with time horizon assessments, and, where possible, using the mid-run options to improve financial advice and survey research that relies on reported time horizons.

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## 1. Introduction

A critical component of investment decisions is their "time horizon," defined as "the number of months, years, or decades [needed] to invest to achieve [a] financial goal" (investor.gov).[1] Researchers and financial professionals use time horizons to understand financial decisions and give advice. Researchers have correlated time horizons with financial decisions about 401(k) investments (Munnell et al., 2001), cryptocurrency (Bonaparte, 2022), household saving (Fisher & Montalto, 2010), and credit card use (Kim & DeVaney, 2001; Rutherford & DeVaney, 2009). Holding risk and time preferences constant, retirement time horizons affect recommendations in economic models about the percent of a portfolio to allocate to stocks, with consequences for future wealth (Bodie et al., 1992; Cocco et al., 2005; Gomes et al. 2008; Barberis, 2000).

Time horizons are also important for financial advice. According to regulatory interpretation by the Securities and Exchange Commission (SEC), time horizons are one factor for registered investment advisers to consider when recommending an investment strategy[2]. Similarly, broker-dealers are legally required to determine whether securities transactions or investment strategies are appropriate for investors.[3] For both types of financial professionals, information about time horizons can be gathered through a client's "investment profile," which typically consists of survey questions.[4] With the emergence of robo-advising services, that remove interactions between an investor and a financial professional, there are limited opportunities for professionals to clarify clients' reported time horizons. In these situations, the

[1] See, in particular: https://www.investor.gov/introduction-investing/investing-basics/glossary/time-horizon
[2] Securities and Exchange Commission, *Commission Interpretation Regarding Standard of Conduct for Investment Advisers*, Release No. IA-5248, File No. S7-07-18, 17 CFR Part 276, 84 Fed. Reg. 33699 (July 12, 2019)
[3] See Regulation Best Interest: The Broker Dealer Standard of Conduct, 84 Fed. Reg. 33,318, 17 CFR. §240 at n. 611 and accompanying text.
[4] See 17 CFR Part 276.

design of time horizon questions should interest both researchers and practitioners, as they provide information about question validity and investment advice.

**The potential role of response options in determining time horizon**

Despite the importance of time horizons, there is no validated, standard question for assessing time horizons. Many nationally representative surveys ask a variant of: "*In planning (your/your family's) saving and spending, which of the following time periods is most important to (you/your family)?*", including the Survey of Consumer Finances (US) (SCF); Survey of Consumer Expectations (US) (SCE); the English Longitudinal Survey of Ageing; the Household, Income and Labour Dynamics in Australia Survey (HILDA); and the Consumer Financial Protection Bureau's Financial Well-Being Survey (US).

Worryingly, the response options presented with these time horizon questions vary. The SCF uses "the next few months," "the next year," "the next few years," "the next 5 to 10 years," and "longer than 10 years." HILDA starts with "the next week" and ends with "more than 10 years ahead." Industry-designed investment profiles also show variation in response options. The shortest response option may range from "immediately" (Morgan Stanley, 2022) to "0-5 years" (CI Investments, 2022), while the longest may vary from "10+ years" (CI Investments, 2022) to "more than 20 years" (Northwestern Mutual Wealth Management, 2022).

Survey design research suggests that presented response options might change people's answers, undermining the validity of their responses. For example, in a classic study, participants were asked how often they watch TV (Schwarz et al., 1985). 38% of participants indicated watching more than 2.5 hours of TV when the response options were 'up to 2.5 hours'

to ‘more than 4.5 hours.’ Only 16% indicated watching more than 2.5 hours of TV when the response options were ‘up to 1/2 an hour’ to ‘more than 2.5 hours.’

One potential reason response options influence reported answers is they can change participants’ interpretation of the responses (Schwarz et al., 1985). In line with this reasoning, participants in the TV study reported that TV is less important for their leisure time when the scale had larger time bands (Schwarz et al., 1985).

To avoid effects of response options on participants’ responses, researchers recommend using open-ended response options (fill-in-the-blank), which allow respondents to think about their answer in a more natural way (Toepoel et al., 2009). Open-ended response options may be more difficult to answer than closed-ended ones, however, and more likely to result in missing responses (Griffith et al., 1999; Hurd et al., 1998). Additionally, responses to open-ended questions may be difficult to classify (Schuman and Presser, 1996). This difficulty can be addressed through a self-coding method, where participants provide an open-ended response and subsequently classify it into a close-ended category (Appelt et al., 2011; Glazier et al., 2021).

**The current study**

We aimed to evaluate the effects of varying response options on reported time horizons. To do so, we randomly assigned participants from a nationally representative U.S. sample to one of four conditions in which the same time horizon question was presented with short-run, mid-run, or long-run response options, or an open-ended response mode. Our research questions (RQs) were:

RQ1: Are participants’ reported time horizons affected by whether response options are short-run, mid-run, long-run, or open-ended?

RQ2: Are participants more likely to not indicate a time horizon and find the questions easier to answer when response options are short-run, mid-run, long-run, or open-ended?

RQ3: Are participants' thoughts about investing, evaluations of their reported time horizon, and their perception of the most common time horizon affected by whether response options are short-run, mid-run, long-run, or open-ended?

RQ4: Are reported financial planning horizons more valid, seen in stronger associations with financial outcomes, when response options are short-run, mid-run, long-run, or open-ended?

## Materials and Methods

### Sample

This study was approved by the Institutional Review Board at NORC (#23-08-1415). Participants were sampled from NORC's AmeriSpeak panel (https://amerispeak.norc.org/), a probability-based panel designed to be representative of the U.S. household population. AmeriSpeak has yielded coverage of approximately 97% of the U.S. household population (NORC 2022). The median response time was 7 minutes and participants were paid $3.

Overall, respondents reported an average age of 48.3 years, and 46.9% were male. Regarding race/ethnicity, the sample was 61.5% non-Hispanic white, 13.8% non-Hispanic black, 18.2% Hispanic, 3.2% Asian or Pacific Islander, and 3.2% selecting either multiple race/ethnicities or another race/ethnicity. The sample included 5.5% of respondents with less than a high school education, 19.6% with a high school diploma or equivalent, 42% with some college, 19.5% with a bachelor's degree, and 13.4% with a post graduate or professional degree. Median income was in the $60,000 to $74,999 range. For marital status, the breakdown was

48.6% married, 5% widowed, 12.6% divorced, 2.8% separated, 28.4% never married, with 0.3% not responding. A total of 15,000 panelists were invited to take the survey with 4,981 included in the main analysis (33.2%).

**Time Horizon Question: Four Conditions**

All participants saw the time horizon question "In deciding how much of their income to spend or save, people are likely to think about different financial planning periods. In planning your saving and spending, [which of the following **time periods**/what **time period]** is most important to you?" They were randomly assigned to one of four conditions, showing short-run, mid-run, or long-run response options, or an open-ended response (Table 1). The latter allowed participants to fill in a blank and then asked them to self-code their response using a set of 11 response options (the combined response options from the short-run and long-run conditions). For analysis, time horizons were coded as being a year or less (0) or greater than a year (1).

Table 1. Response Options across Experimental Conditions

| Response option | Short-run Condition | Mid-Run Condition | Long-Run Condition | Open-Ended Condition |
|---|---|---|---|---|
| 1 | Less than a week* | The next month* | The next year or less* | --- |
| 2 | The next week* | The next few months (longer than the next month but less than a year)* | The next 1-5 years | --- |
| 3 | The next month* | The next year* | The next 5-10 years | --- |
| 4 | The next few months (longer than the next month but less than a year)* | The next few years | The next 10-15 years | --- |
| 5 | The next year* | The next 5-10 years | The next 15-20 years | --- |
| 6 | Longer than the next year | Longer than 10 years | More than 20 years | --- |
| 7 | I don't do any financial planning | I don't do any financial planning | I don't do any financial planning | --- |

*Note*. The Open-Ended condition asked participants to classify their open-ended response, using one of the following categories: Less than a week*, The next week*, The next month*, The next few months (longer than the next month but less than a year)*, The next year*, Longer than the next year but less than the next 5 years, The next 5-10 years, The next 10-15 years, The next 15-20 years, Longer than 20 years, I don't do any financial planning.
* Response options coded as a time horizon of a year or less.

**Evaluation of ease of responding**

Participants were asked, "How hard or easy was it for you to answer [the time horizon question]?" Response options (and coding) were: Very hard (1), Somewhat hard (2), Somewhat Easy (3), Very easy (4).

**Interpretation of the Time Horizon Question**

Participants were asked, "When answering the question 'In planning your family's saving and spending, [which of the following time periods/what time period] is most important to you?' how much did you think about", followed by a list of twelve factors, displayed in a random order. The factors were: your **spending**? your **savings**? your **investments**? **saving for retirement?** your **expenses**? your **budget**? **emergencies you might have to pay for**? your **financial goals**? **the stock market**? **inflation**? your **age**? **when you expect to retire**? Response options (and coding) were "Very much" (4), "Somewhat" (3), "Not that much" (2), and "Not at all" (1). Based on an exploratory factor analysis using promax rotation, items loaded onto one of two factors, labelled long-run considerations and short-run considerations (Table B.1). For each of the two factors, we averaged the underlying items to calculate a consideration score.

**Evaluation of own time horizon**

Participants were asked, "What do you think about the time period you use for planning your saving and spending?" Response options (and coding) were: "I think it should be much longer" (2); "I think it should be longer" (1); "I think it is just right" (0); "I think it should be shorter" (-1); "I think it should be much shorter" (-2).

**Perception of most common time horizon**

Participants were asked, "What do you think **most people** will answer when they are asked [the time horizon question]?" Response options followed the original experimental assignment.

**Financial outcomes**

Participants were asked for four financial outcomes. First, to measure financial hardship, we asked, "Since January 2023, did any of the following happen to you because of a shortage of money?" followed by seven items (e.g., Could not pay electricity, gas, or telephone bills on time). An affirmative response to any of the items was considered a measure of hardship.

Second, we asked, "Have you set aside emergency or rainy day funds that would cover your expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies?" Possible response options were Yes, No, and Don't know.

Third, to assess financial planner use, we asked, "What sources of information do you use to make decisions about saving and investments?" Participants could choose from a list of: family member, friend, lawyer, accountant, banker, broker, financial planner. We coded those who selected "financial planner" as a 1, with non-selections coded as 0.

Fourth, to measure expected retirement age, we asked, "Do you expect to retire?" with response options of Yes and No. Those who answered affirmatively were then asked, "What age do you expect to retire?" (open text box). Participants who had already retired were not asked either of these questions.

**Demographics and other variables**

The survey included a marital status question. Demographic characteristics such as age, gender, and income came from AmeriSpeak. The survey contained additional items for exploratory purposes not analyzed here, including account ownership and financial decision-making within the household.

**Analysis Plan**

**RQ1: Are participants' reported time horizons affected by whether response options are short-run, mid-run, long-run, or open-ended?** We used a logistic regression to examine whether participants indicated a financial planning horizon of "the next year or less" vs. "longer than the next year." Predictor variables were indicator variables for mid-run, long-run and open-ended response conditions (all versus the short-run condition).

**RQ2: Are participants more likely to not indicate a time horizon and find the questions easier to answer when response options are short-run, mid-run, long-run, or open-ended?** We compared the rate of missing response for the low-, mid-, and long-run conditions against the open-ended using linear regression. We also ran a linear regression to measure perceptions of question difficulty, using indicator variables for each of the experimental conditions against the short-run condition.

**RQ3: Are participants' thoughts about investing, evaluations of their reported time horizon, and their perception of the most common time horizon affected by whether response options are short-run, mid-run, long-run, or open-ended?** For thoughts about investing and evaluations, we used linear regression to compare outcomes by experimental condition. Predictor variables were indicator variables for mid-run, long-run and open-ended response conditions (all versus the short-run condition). For estimates of the most common time horizon, we used a logistic regression of the same form.

**RQ4: Are reported financial planning horizons more valid, seen in stronger associations strongly associated with financial outcomes, when response options are short-run, mid-run, long-run, or open-ended?** For each outcome, we ran one regression per condition using responses to the time horizon question to predict the financial outcome. We then

calculated the model $R^2$ from each condition's regression as a measure of predictive ability. The distribution of $R^2$ was estimated by bootstrap sampling, where, within each condition, the observations were sampled with replacement and a model $R^2$ calculated.[5]

**Exclusions.** Of the 5,801 people who started the survey, three sets of individuals were excluded. First, 91 dropped out before the time horizon question. Second, 52 skipped the time horizon question and 302 selected "I don't do any financial planning." Third, 466 people who skipped at least one of the outcome questions. Ultimately, there were 4,981 participants for the majority of our analyses, with 2,354 providing an expected retirement age outcome for RQ4.

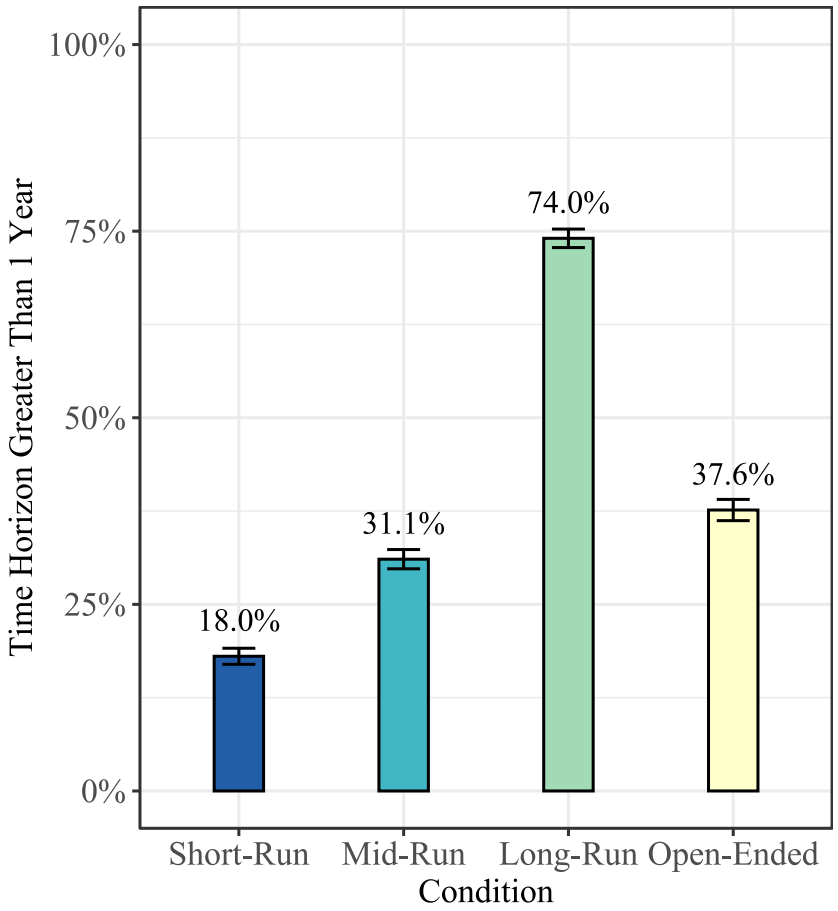
## Results

### Are participants' reported time horizons affected by whether response options are short-run, mid-run, long-run, or open-ended? (RQ1)

The proportion of respondents who reported time horizons over one year was the lowest in the short-run condition (Figure 1). In comparison to this condition, respondents in the long-run condition had about 13 the odds of giving time horizons over one year (OR = 13, z = 26.4, $p < 0.001$, 95% CI = [10.7, 15.7]), respondents in the mid-run condition had about 2 times the odds (OR = 2, z = 7.6, $p < 0.001$, 95% CI = [1.7, 2.5]) and those in the open-ended condition had 2.7 times the odds (OR = 2.7, z = 10.7, $p < 0.001$, 95% CI = [2.3, 3.3]). In an exploratory analysis comparing the closed-end response conditions, the mid-run is most like the open-ended responses. The difference in reported time horizons over a year for the mid-run versus open-ended is smaller than the difference between short-run and open-ended ($\chi^2$ (1) = 59, $p < 0.001$) or the difference between long-run and open-ended ($\chi^2$ (1) = 486, $p < 0.001$).

[5] The pre-registration specifies a likelihood ratio test to compare these values, but the assumptions of that test are not suitable for between-subjects data.

**Figure 1**. Percent of respondents reporting a time horizon over a year, by condition.

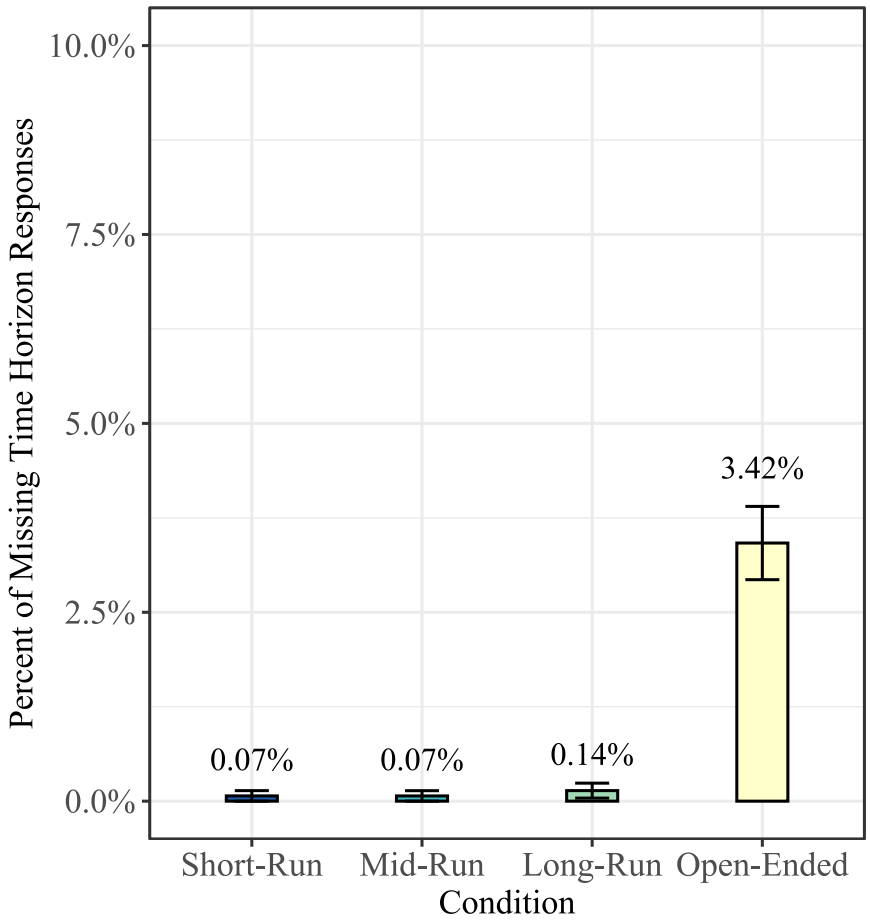



Errorbars represent 95% confidence intervals of condition means.

**Are participants more likely to not indicate a time horizon and find the questions harder to answer when response options are short-run, mid-run, long-run, or open-ended? (RQ2)**

**Missing Responses.** The proportion of participants skipping the time horizon question was the highest in the open-ended condition, at 3.4% (Figure 2). This missing rate was significantly higher than that in the three other conditions (open vs. short-run: $b = -0.033$, $t(5706) = -9.49$, $p < .001$; open vs. mid-run: $b = -0.03$, $t(5706) = -9.50$, $p < .001$; open vs. long-run: $b = -0.03$, $t(5706) = -9.29$, $p < .001$).

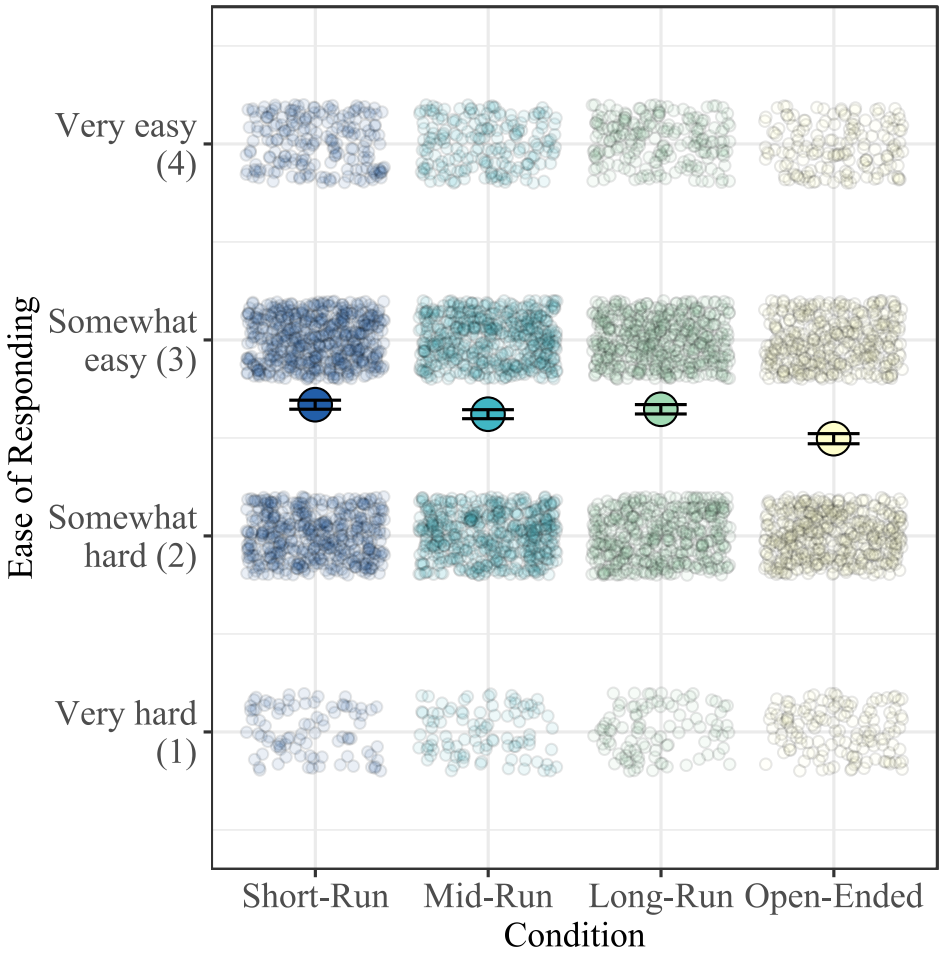
**Figure 2.** Percent of missing responses by condition.




Errorbars represent 95% confidence intervals of condition means.

**Ease of Responding**. Relative to the open-ended condition, participants in each of the other conditions rated the time horizon question as easier to answer (open vs. short-run: $b = 0.17$, $t(4977) = 5.07$, $p < .001$; open vs. mid-run: $b = 0.12$, $t(4977) = 3.66$, $p < .001$; open vs. long-run: $b = 0.15$, $t(4977) = 4.36$, $p < .001$; Figure 3). On average, perceptions of question ease were slightly above the middle of the scale ($M = 2.61$, $SD = 0.85$).

**Figure 3.** Ease of responding by experimental condition.



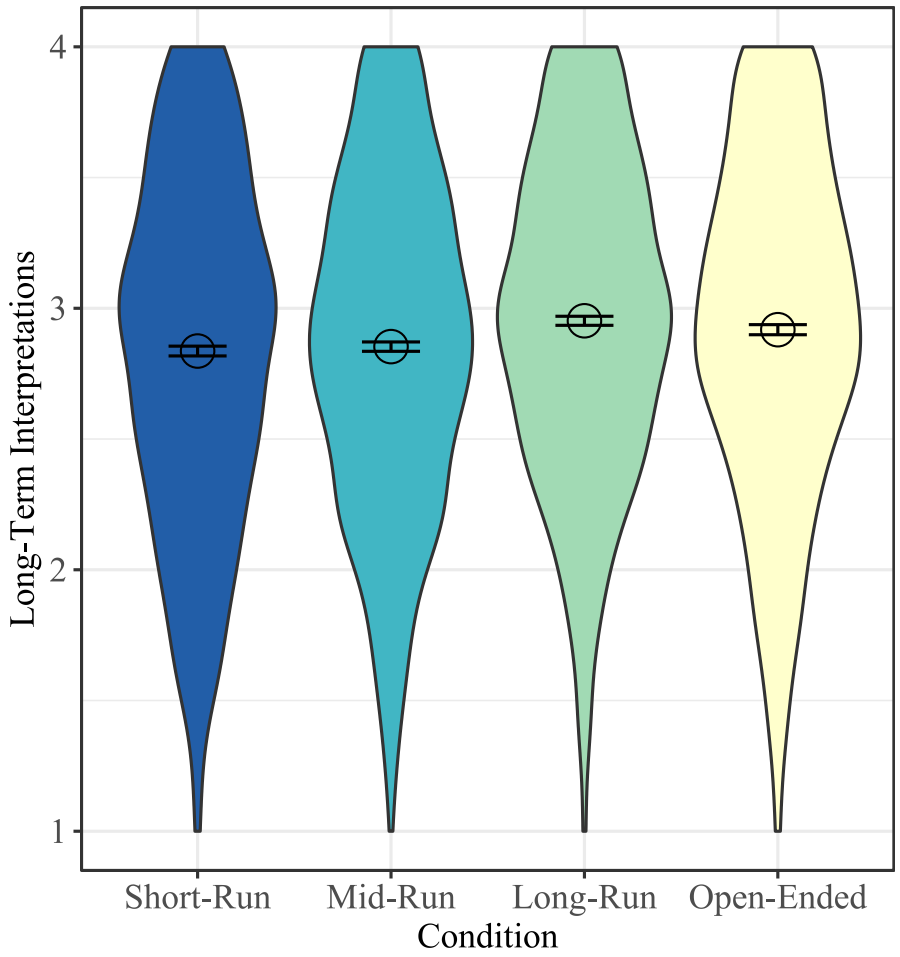

Errorbars represent 95% confidence intervals of condition means.

**Are participants' thoughts about investing, evaluations of their reported time horizon, and their perception of the most common time horizon affected by whether response options are short-run, mid-run, long-run, or open-ended? (RQ3)**

**Thoughts about investing**. The response option conditions did not substantially affect participants' considerations when reporting their time horizon. There were small differences between conditions for long-run considerations (short-run condition vs. mid-run: $b = 0.02$, $t(4977) = 0.66$, $p = 0.51$; short-run vs. long-run: $b = 0.12$, $t(4977) = 4.50$, $p < 0.001$; short-run vs.

open-ended: $b = 0.08$, $t(4977) = 3.11$, $p = 0.002$) and no differences between conditions on short-run considerations (all $ps > 0.48$; Figure B.1).

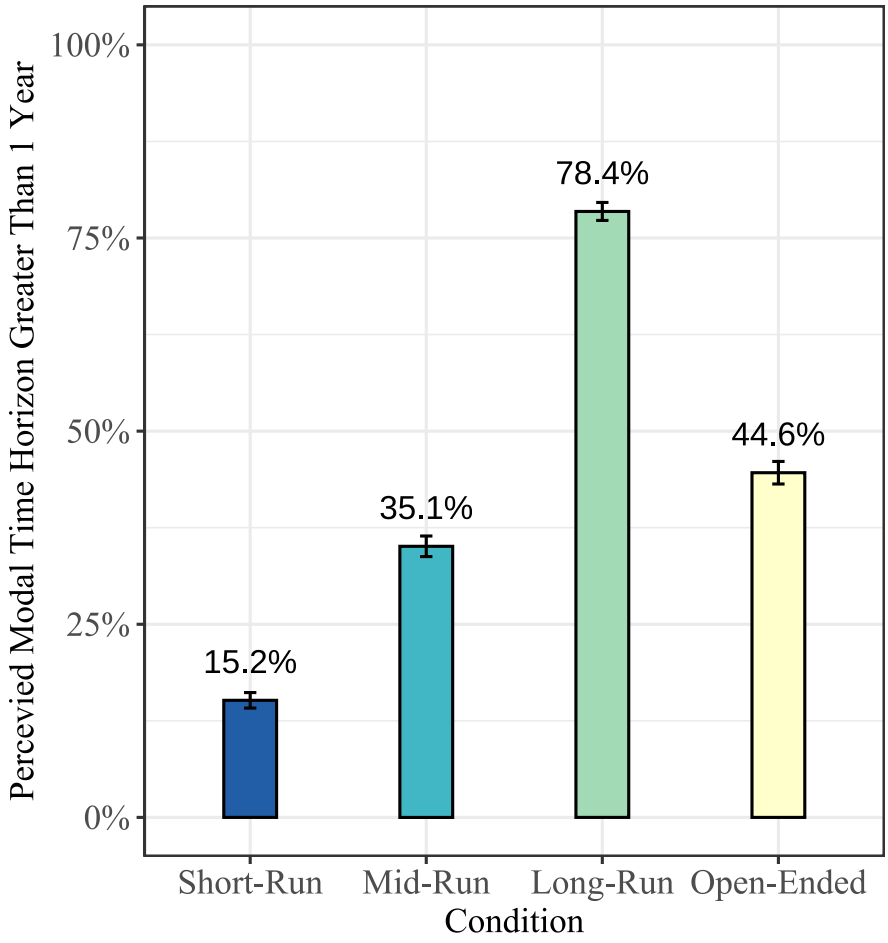
**Figure 4.** Distribution of long-term thoughts by condition




Errorbars represent 95% confidence intervals of condition means.

**Perceptions of Modal Time Horizon**. The proportion of respondents reporting a modal time horizon of greater than a year was lowest in the short-run condition (short-run vs. mid-run: $b = 3.0$, $z = 11.4$, $p < 0.001$; short-run vs. long-run: $b = 20.4$, $z = 29.0$, $p < 0.001$; short-run vs. open-ended: $b = 4.5$, $z = 15.4$, $p < 0.001$; Figure 5).

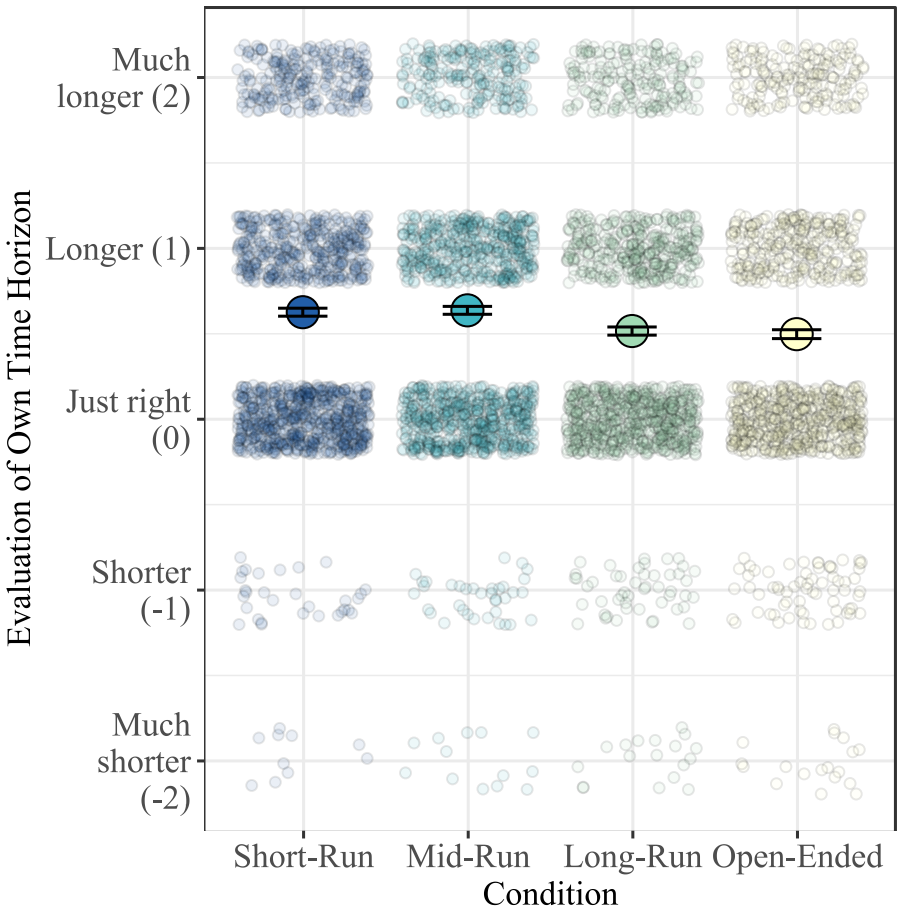
**Figure 5.** Percent of respondents perceiving modal time horizon over a year by condition.




Error bars represent 95% confidence intervals of condition means.

**Evaluations of own time horizon**. Across the sample, participants' indicated that they thought their time horizons should be longer ($M = 0.6$, $SD = 0.9$). The tendency to see one's time horizon as too short was slightly attenuated in the open-ended and long-run conditions relative to the short-run condition (short-run vs. open: $b = -0.13$, $t(4977) = -3.74$, $p < .001$; short-run vs. long-run: $b = -0.11$, $t(4977) = -3.27$, $p = .001$). Participants in the short-run and mid-run conditions did not differ in evaluations of their time horizon ($b = 0.01$, $t(4977) = 0.32$, $p = .75$).

**Figure 6.** Evaluation of one's own time horizon.




Errorbars represent 95% confidence intervals of condition means.

**Are reported financial planning horizons more strongly associated with financial behaviors when response options are short-run, mid-run, long-run, or open-ended? (RQ4)**

***Emergency Fund.*** The mid-run condition most strongly predicted whether participants had an emergency fund covering at least three months of expenses, performing better than the short-run condition (95% bootstrapped CI [1.6, 9.6]), the long-run condition (95% bootstrapped CI [3.9, 11.7]) and the open-ended condition (95% bootstrapped CI [4.6, 12.3]; Figure C.1).

***Financial Hardship.*** The mid-run condition best predicted financial hardship. It performed better than the short-run condition (95% bootstrapped CI [0, 9.1]), the long-run

condition (95% bootstrapped CI [1.1, 9.8]), and the open-ended condition (95% bootstrapped CI [3.3, 11.6]; Figure C.1).

***Expected Retirement Age.*** The mid-run condition did not differentially predict expected retirement age (mid-run vs. short-run: 95% bootstrapped CI [-3.4, 2.6]; mid-run vs. long-run: 95% bootstrapped CI [-2.1, 3.4], mid-run vs. open-ended: 95% bootstrapped CI [-3.1, 2.5]; Figure C.1).

***Having Financial Planner.*** The mid-run condition did not differentially predict whether respondents had a financial planner (mid-run vs. short-run: 95% bootstrapped CI [-2.4, 3.3]; mid-run vs. long-run: 95% bootstrapped CI [-3.6, 2.4]; mid-run vs. open: 95% bootstrapped CI [-1.9, 3.2]; Figure C.1).

## Discussion

Time horizons are essential for understanding and informing consumers' financial decisions. Time horizon questions appear on nationally representative financial surveys and investor profiles, but the response options presented with these time horizon questions vary widely. In this research, we examined the effects of presenting short-run, mid-run, long-run, or open-ended response options on reported time horizons, the perceived difficulty and rate of missing responses associated with reporting a time horizon, respondents' interpretation of time horizon questions, evaluations of their own time horizons, perceived modal time horizons, and the predictive ability of the responses with respect to financial outcomes. We report on four main findings.

First, response options substantially affected reported time horizons, with the percent of respondents giving a time horizon over a year deviating 56 percentage points across the closed-

ended conditions. Such variation is both statistically and economically significant, given that investment advice often partially depends on the time horizons clients report to financial professionals. On average, the mid-run set of response options appeared to most closely align with the open-ended response mode, which elicits people's more natural way of thinking (Toepoel, 2009).

Second, we found that the open-ended format was most burdensome, as measured by skipping the question and subjective ratings of difficulty. The closed-ended questions had similar rates of missing responses and difficulty ratings as each other. This pattern is consistent with research showing increased difficulty with open-ended questions (Griffith et al., 1999; Hurd et al., 1998).

Third, and perhaps surprisingly, there was limited evidence that respondents' interpretation of the question varied across conditions, with respondents generally thinking about long- and short-run considerations to the same extent. Rather than these considerations, however, perceptions of modal time horizons varied significantly across the experimental conditions, in a pattern that mimicked reported time horizons. This correspondence suggests that thoughts about modal time horizon may have driven differences in reported time horizons more than considerations about the question itself.

Lastly, we found that the set of mid-run response options performed the best, when assessed in terms of predictive ability on financial outcomes. The mid-run response options better predicted whether people have an emergency fund and whether they experienced financial hardship; the other response modes were not differentially predictive. At the same time, there were no differences between the response modes for the other two outcomes: having a financial planner and expected retirement age. This result suggests that the mid-run response options may

be particularly powerful for surveys dealing with topics like financial hardship and emergency funds.

**Implications for finance and investment advice**

Financial models suggest that both returns and variability in returns are partially derived from overall asset allocation (e.g., the overall split between stocks and bonds) (Ibbotson, 2010), a decision that is often partially determined by investor profiles. In particular, products like "target date" funds automatically adjust their asset allocation over time, as investors get closer to a given year. If investors do not appropriately pick their time horizon, these products will be inappropriate for their investment needs. Given the large differences in time horizons stemming from response options, our results suggest that response options need to be appropriately crafted for investors' goals. Yet, our research documents considerable variation in response options across investor profiles and existing surveys, raising questions about the quality of financial advice that investors receive.

In some cases, financial professionals' discussions with their clients may substitute for the information gathered through investment profiles. With the growth of automated "robo-advising," however, where a financial professional may not be directly involved with a client, time horizon questions on investment profiles become more important. If investors are not getting advice that is appropriate for them, that is important for advisors, policymakers, and investor advocates to know.

Taking our results in aggregate, we recommend that researchers and financial advisors use the set of mid-run response options when designing time horizon questions for their surveys or investor profiles, as these options provided lower rates of missing responses (relative to the

open-ended question), were the most predictive of financial outcomes, and appeared to most closely align to an open-ended response mode.

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## Appendix

### Time Horizon

Table A.1 Effects of Experimental Conditions on Reported Time Horizon

| | *Dependent variable:* | | | |
|---|---|---|---|---|
| | Time Horizon > 1 Year | | | |
| | *logistic* | *OLS* | *logistic* | *OLS* |
| | (1) | (2) | (3) | (4) |
| Long-run | 2.561*** | 0.560*** | 2.414*** | 0.538*** |
| | (0.097) | (0.018) | (0.138) | (0.027) |
| Mid-run | 0.716*** | 0.130*** | 0.874*** | 0.178*** |
| | (0.094) | (0.017) | (0.132) | (0.027) |
| Open-ended | 1.008*** | 0.196*** | 1.122*** | 0.238*** |
| | (0.095) | (0.018) | (0.131) | (0.027) |
| Constant | -1.513*** | 0.180*** | -1.347*** | 0.206*** |
| | (0.073) | (0.012) | (0.102) | (0.019) |
| Observations | 4,981 | 4,981 | 2,366 | 2,366 |
| $R^2$ | | 0.182 | | 0.152 |
| Adjusted $R^2$ | | 0.182 | | 0.151 |
| Log Likelihood | -2,888.092 | | -1,437.631 | |
| Akaike Inf. Crit. | 5,784.185 | | 2,883.261 | |
| Residual Std. Error | | 0.443 (df = 4977) | | 0.458 (df = 2362) |
| F Statistic | | 369.237*** (df = 3; 4977) | | 141.407*** (df = 3; 2362) |
| *Note:* | | | | * p < 0.05;** p < 0.01; *** p < 0.001 |

The reference condition is the short-run condition with variables are coded as indicator variables. Logistic regression coefficients are log odds.

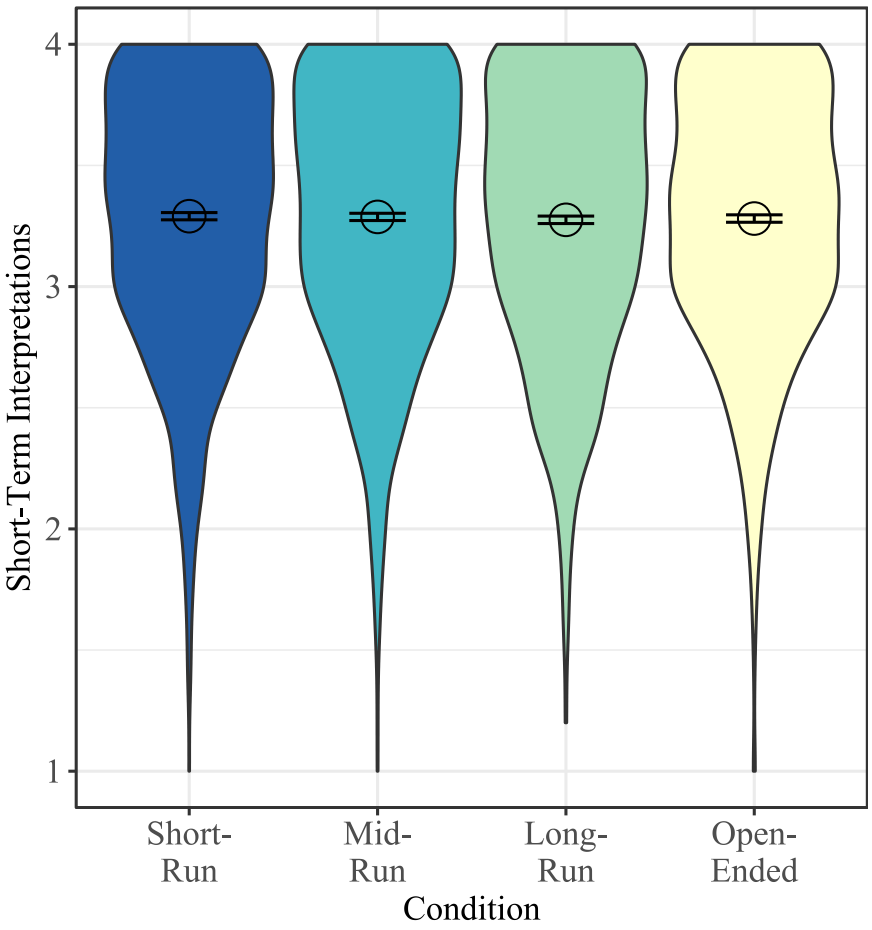
**Thoughts**

Table B.1 Exploratory factor analysis of thoughts when responding to the time horizon question

| Thought | Factor 1 (Long-Run) | Factor 2 (Short-Run) |
|---|---|---|
| your investments? | **0.85** | -0.2 |
| saving for retirement?* | 0.74 | 0 |
| the stock market? | **0.79** | -0.25 |
| when you expect to retire?* | 0.67 | 0 |
| your spending? | -0.16 | **0.69** |
| your expenses? | -0.19 | **0.81** |
| your budget? | -0.12 | **0.75** |
| emergencies you might have to pay for? | 0.13 | **0.51** |
| your savings? | **0.33** | 0.33 |
| your financial goals? | **0.46** | 0.29 |
| inflation? | 0.17 | **0.37** |
| your age? | **0.47** | 0.13 |

*: these statements only apply to people who have not yet retired and were excluded from the primary specification of the outcomes because they reduce the sample for analysis. Coefficient bolding indicates which statements were included in the factor averages.

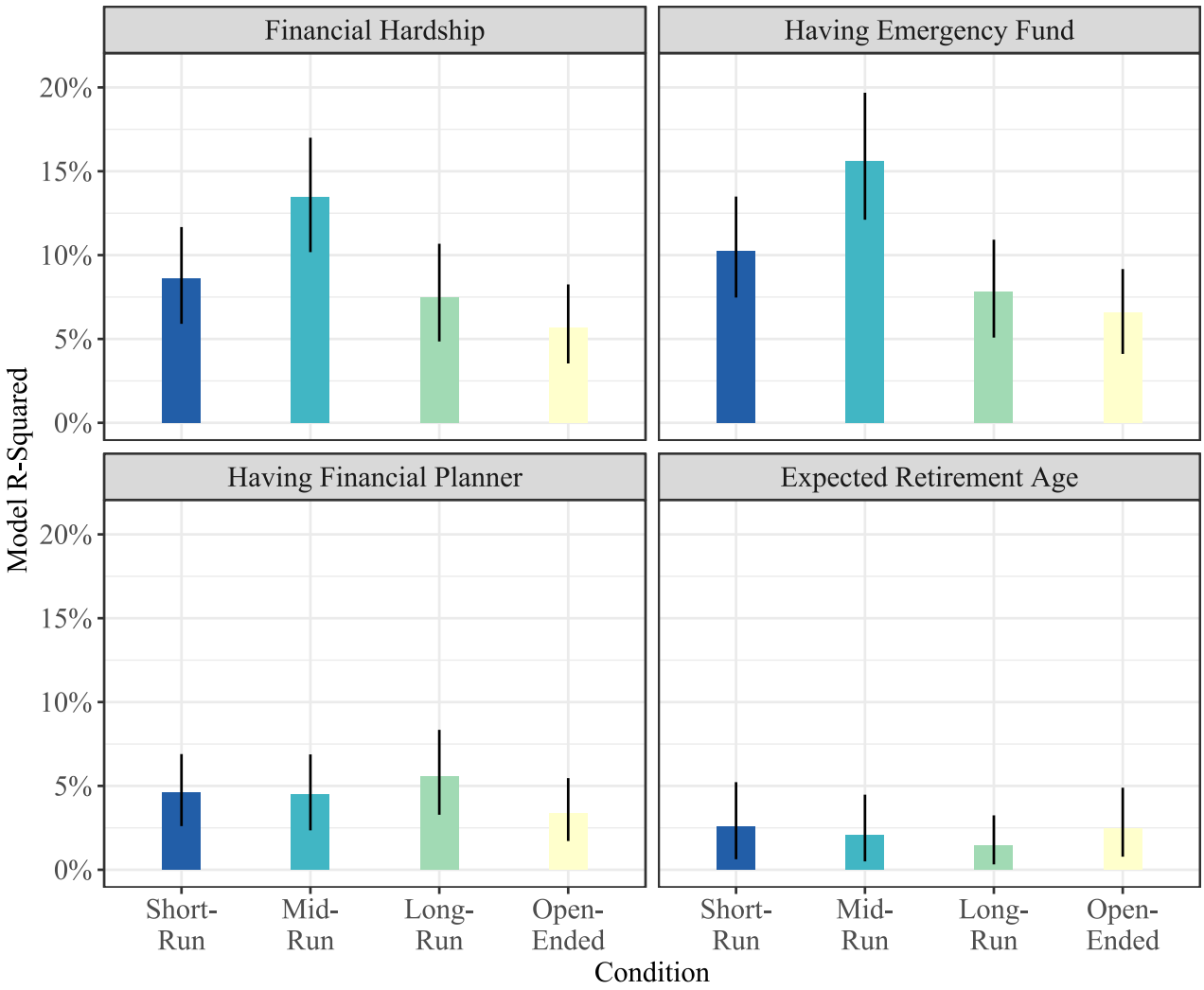
Figure B.1 Short-Term considerations by condition




Errorbars represent 95% confidence intervals of condition means

**Predictive Ability**

Figure C.1 Predictive Ability of Time Horizon Questions for Financial Outcomes




Errorbars represent 95% bootstrapped confidence intervals