Knowledge, Fear and Beliefs: Understanding Household Demand for Green Investments*

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Abstract

We explore whether households understand the tradeoffs that they face when they invest in funds that purport to be environmentally responsible. We conduct a large scale survey of Swedish households to measure how much they understand about the science behind environmental impact, their financial literacy, as well as their understanding of their own knowledge of these matters. We find only moderate correlation in knowledge between environmental and financial knowledge, but find the correlation of overestimation across domains to be sizeable. Overestimation of environmental knowledge crowds out actual knowledge when explaining fears of climate change and reported recycling behavior, and is also strongly associated with beliefs that environmentally sustainable firms generate higher returns and with the willingness to pay higher fees for sustainable mutual funds.

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1 Introduction

Global warming is a hot topic, especially in the colder parts of the world. Indeed, throughout the world households are being asked increasingly to make investment decisions based not only on risk and return, but also environmental impact. Corporations routinely publish environmental impact reports to go along with their financial reports, and increasing numbers of mutual funds offer products screened on social or environmental impact. These developments illustrate the fact that investors who want both to do good in addition to doing well with their portfolio choices must possess not only financial sophistication but also a knowledge of the relevant environmental tradeoffs. Yet financial literacy across the world appears to be in short supply (see Lusardi and Mitchell (2011))—adding environmental considerations to the savings/investment problem faced by households raises basic questions about household *environmental* as well as financial sophistication.

Financial and environmental decision-making is related in important ways that make them both susceptible to framing. Like retirement planning decisions, the consequences of environmental change play out slowly over time. The effect of one's own personal action on the environment is difficult to measure, and consequently, feedback is noisy. And like long-term financial planning decisions, we have limited potential to correct past mistakes or change a course of action in a manner that will produce sudden improvement. Therefore many of the behavioral biases and issues that attend to long-term financial decisions are likely also at play in the context of making environmentally responsible investment choices.

How much do most households understand about the environment? How well do they understand the environmental impact of their own actions? Do households that possess environmental literacy also possess financial literacy? Are households who possess broader understanding of environmental issues more sensitive to the potential for impending environmental calamities to negatively affect life, and therefore willing to make different tradeoffs to achieve environmental aims? How are knowledge and fear related? Answers to these questions are critical inputs to a better understanding of how financial sophistication extends to a world in which households are being encouraged to invest with environmental responsibility.

In this paper we address these questions. To do this, we develop a five-question test of environmental literacy that captures understanding of basic environmental and biological phenomena connected to climate change. We embed this test in a larger survey that includes measures of financial literacy as well as beliefs about financial tradeoffs, environmental outcomes, and household actions. Then we administer the survey to a large sample of Swedish households.

The main punchline of our analysis is simple: most households score poorly on a test of the environmental processes connected to climate change. The correlation between financial and environmental literacy is low, but the correlation in self perceptions is much higher. Beliefs about one's own knowledge are generally more important indicators of attitudes about the environment and financial tradeoffs than actual knowledge. Individuals who think they score well on our environmental test believe they recycle more than their neighbors, and on average they tend to attach high probability to future environmental calamities. These factors in turn are associated with a willingness to pay higher fees for environmentally sound investments, and with the belief that environmentally sound investments outperform in the long run. In sharp contrast, *knowing* more about finance and the environment is very weakly connected to positive views on green investments. Our results suggest that views on sustainable investment are not easily changed by increasing amounts of environmental knowledge, but rather with information targeted at changing the beliefs about future environmental calamities.

Our results add to a growing literature on socially responsible investing in general. Previous research has focused on understanding whether, on the supply side, social responsibility is associated with systematic mispricing or it carries additional risk premia. Hong and Kacperczyk (2009) argue that sin stocks earn higher returns because investors bid down prices as they steer away from these stocks, while Edmans (2011) finds that markets consistently underprice the cash flows from high-CSR firms. Hong, Li, and Xu (2017) find evidence that food stocks are mispriced with respect to draught risk inherent in their supply chains. Also using a survey instrument, but on a sample of institutional investors, Krueger, Sautner, and Starks (2018) find that managers believing in climate change tilt their portfolios more aggressively towards green investments. More generally, Barber, Morse, and Yasuda (2018) argue that there is excess demand for socially responsible in-

vestments. Our findings provide behavioral foundations for the consumer demand side behind these results.[1]

Our paper is especially connected to a recent paper by Riedl and Smeets (2017), who show that socially responsible expect to pay higher fees and expect to earn lower returns on socially responsible funds. Our analysis indicates that some investors internalize environmental returns, which can account for a willingness to earn lower financial returns. On a more general level, our paper is the first to explore the role of confidence in explaining demand for green investments.

The remainder of the paper is structured as follows. First we describe the demographics of our study population and present basic summary statistics for the questions in our survey. This is presented in Section 2. In Section 3 we explain the environmental and financial literacy scores with demographic information. Then in Section 4 we relate actual and perceived environmental literacy to beliefs about one's own environmental stewardship and the salience of adverse future environmental outcomes. Section 5 connects the beliefs and knowledge that we have measured to views about the willingness to pay higher fees to be invested in environmentally responsible funds, and about their expected performance. Section 6 concludes.

2 Measuring Environmental and Financial Literacy

To measure environmental literacy and see how it squares with perceived literacy and a general understanding of financial matters, we invited 20,000 Swedish households to participate in an online financial and environmental literacy survey. The first survey was sent out on February 7, 2018, and after two reminders sent out on February 22 and March 5, the survey was closed on April 5. A total of 4,257 respondents completed the survey, for a response rate of just over 21%. After deleting incomplete survey responses and matching the data to the characteristics leaves us with at total of 3,993 observations. Table I provides a demographic breakdown of the respondents along with average test scores.

Table I here

[1] See also Hartzmark and Sussman (2018).

Having Statistics Sweden conduct the survey for us makes it possible to relate our sample to the 6,097,316 people in the overall Swedish population in the sampled cohort. We have an over-representation of older, wealthier, better-educated respondents in our sample. 57% of our respondents are 45 or older, while only 42% of the Swedish working age population is in this age range. We received 15% of the responses from the lowest income bracket, while 25% of the population belong to this group. Also, women are slightly over-represented in our study. Statistics Sweden offers sampling weights that allow us to adjust our regressions for these sampling differences, so that our results can be taken as though they are drawn from a stratified random sample of the population.

Our survey includes four basic types of questions: financial literacy questions, environmental literacy questions, questions on household behavior, and questions that gauge one's own perceptions of financial literacy and environmental matters. We postpone the discussion of household behaviors until Section 4. A complete survey instrument is presented in Appendix A.

2.1 Financial Literacy Questions

We use a version of the standard financial literacy test developed by Lusardi and Mitchell (2007) adapted to the Swedish retirements savings context by Anderson and Robinson (2018). On average, respondents got 3.12 questions correct, which is in line with many other studies using these survey questions. When we apply survey weights to correct for underrepresentation of younger, lower income respondents, this number drops to 2.91. Average scores by demographic category are presented in Table I. Univariate comparisons indicate that men score higher than women, and that younger, less affluent and less educated households have lower scores.

We follow Moore and Healy (2008) and Anderson, Baker, and Robinson (2017) to incorporate a measure of self-perceptions of financial literacy by asking respondents to provide a distribution of possible test outcomes (all five correct, four questions correct, etc.) and then using this distribution to compute a subjective expected score. On average, respondents in our study were well calibrated on financial literacy. The patterns we observe in this study closely match those discussed in Anderson and Robinson (2018). Respondents tend to be more certain of their scores in the extreme outcomes (zero or all five),

but there is considerable uncertainty in the intermediate score categories, a result that is usually attributed to meta-cognition (see Kruger and Dunning (1999)).

2.2 Environmental Literacy Questions

To measure environmental literacy in a similar manner, we develop a five-question test intended to capture knowledge of household-related matters that connect to the environment. The test is designed to offer some simple questions that most individuals would be expected to know, but to also offer some more challenging questions that require a more subtle understanding of environmental processes. As Table I shows, the average score on this test was 2.26, while the average subjective score was a little over 3.0, for an average miscalibration of 0.87.

Two questions focus on energy, three focus on biological and environmental phenomena. Table II summarizes the test. Correct answers are underlined, and response tallies are provided in parentheses. The first question gauges knowledge about the tradeoffs surrounding the use of regular versus low energy consumption lightbulbs, "A low energy lightbulb costs more than a regular lightbulb but uses less energy. About how long does one last?" Compact-fluorescent bulbs last about 10-times longer than standard incandescent bulbs, whereas led light bulbs last as much as 25 times longer. Most respondents get the correct answer (42.5%) but almost as many respondents (41.6%) think that low energy bulbs last 100 times longer. (This answer is especially puzzling in light of Allcott and Taubinsky (2015).)

To test for basic knowledge around one of the key culprits behind global warming, we asked respondents about the purpose of the ozone layer: "The ozone layer filters what harmful substance?" Almost all respondents (86%) replied with the correct answer ("UV radiation"), but almost 7% claimed to not know the answer.

Table II here

The third question measures knowledge about food loss and food waste in the global food supply chain: "According to the UN, around 30% of the world's food production is wasted each year. When does this waste occur?" The data behind this question come from the United Nations Food and Agriculture Organization (FAO). Over 62% of respondents

incorrectly believe that most waste occurs at home, after food is purchased from the grocery store. Although the amount of food wasted in the developed world in this manner is large relative to the supply of food in the developing world, much more food is wasted earlier in the supply chain. In the developing world, the majority of food waste occurs because of inefficiencies in harvesting, storage and transportation, whereas in the developed world, transportation systems are more efficient but large amounts of food waste occurs because cosmetically unappealing, but otherwise perfectly healthy, produce is discarded before it reaches the supermarket. Based on calculations presented in Gustavsson, Cederberg, and Sonesson (2011), the correct answer is "Most food is wasted before it reaches the supermarket," but only 11% of respondents answer accordingly. Around 18% report that it occurs at the grocery store before the produce is sold and over 62% incorrectly thinks that most food is wasted at home. In fact, food loss and waste at the consumer level is much lower compared to earlier stages in the supply chain even in the developed world.

An inter-connected question relates to global expenditures on heating and cooling: "Does the world spend more energy on heating homes or cooling them?" In Sweden, as in much of Northern Europe, home air-conditioning systems are relatively uncommon, whereas heating is ubiquitous. The correct answer reflects two forces in tension. On the one hand, many more people in the world live in warmer places than in cooler places, which militates toward cooling being a larger energy sink than heating. But on the other hand, air-conditioning is not widely available in these parts of the world. According to the U.S. Energy Information Administration (IEA), more energy is spent on heating than cooling, but this relation is expected to change going forward where demand for cooling to grow 33-fold to 10,000 terawatt hours (TWh) by year 2100—equivalent to roughly half of the total electricity generated worldwide in 2010.[2] Most respondents answered that heating was a bigger use of energy (39.9%), while only around 28% respond correctly.

One consequence of global warming that has received attention in the media is the displacement of arctic animals like polar bears from their natural habitats. Our final question is intended to capture a basic awareness of this process: "Why don't polar bears eat penguins?" Penguins are native to the Southern Hemisphere, while polar bears are native to

[2]This phenomenon is also reported in an article published in the Guardian "World set to use more energy for cooling than heating", October 26, 2015. See Labriet et. al. (2015) for examples of assumptions and projections. .

the Arctic region, which makes "None of the above" the correct answer. More than half (58%) of respondents answer correctly, but a quarter report that they do not know. Over ten percent of respondents indicate that polar bears do not eat penguins because they have both been driven from their natural habitats.

3 Understanding Environmental Literacy

The next step in our analysis is to explain environmental scores with demographic variables. This is presented in Table III. The first five columns report Probit regressions modelling the correct response as a function of observable demographic characteristics. Columns (1) through (3) focus on the financial literacy score while Columns (4) through (8) present the results of the environmental literacy test. We present the results of running the same regressions question by question for each of the two tests in the Appendix.

Table III here

Higher income respondents are more likely to get the question about the ozone layer (Q2) correct. Women score lower on this question, as do married respondents. University-educated respondents in Green Party dominated municipalities also score higher, but when we look in more detail at a person's subject of study, we see that the effect of education is strongest in those with environmental science or biology backgrounds. In fact, respondents with this background scored significantly higher on each of the three biology/environment-focused questions.

The question capturing the understanding the food supply chain (Q3) loads differently on demographic variables. There is no relationship with household income, but age is highly negatively correlated with the correct answer. Essentially, older households are much more likely to believe that most waste occurs at home after the food has been purchased. Younger respondents are more likely to understand how waste occurs across the food supply chain. University educated individuals are also much more likely to get this answer wrong, but when we specifically examine the effect of environmental science or biology background, we see that these individuals are more likely to understand the food supply chain.

When we turn to the question about the habitats of polar bears and penguins (Q5) we find that women are much less likely to get this question correct than men. Married individuals and those who live outside major cities are also less likely to get this question correct, but university educated, and especially those with environmental science or biology backgrounds, are more likely to understand this question. Those who studied economics, finance or business are less likely to get this question correct. Individuals who live in areas in which the Green party received a lot of votes in the previous election are more likely to get this answer correct.

The explanatory power of demographics for the remaining two questions of the environmental literacy test are much lower. None of the demographic variables are important for explaining answers to the question about the length of a light bulb. Essentially, this is a function of the fact that the respondents were roughly evenly split between thinking light bulbs last ten times longer and one hundred times longer, and this split is uncorrelated with demographics. This fact in turn suggests that most respondents are largely unaware of the cost-benefit tradeoff associated with using low energy light bulbs.

The final question concerns the relative magnitude of global heating and cooling costs (Q4). Here, higher income respondents and respondents with environmental science backgrounds are more likely to believe that more money is spent on cooling, failing to account for the fact that while much more of the world lives there, fewer of them correctly account for the fact that many fewer households in these regions possess air-conditioning units.

Column (6) collapses questions 2, 3, and 5 into a single measure of biology-oriented environmental literacy. When we collapse the three questions into a single measure, we see more clearly how demographic variation correlates with this component of environmental knowledge. Higher income, urban-dwelling, science-educated respondents are much more likely to score higher. Female respondents and married respondents are more likely to score lower on this portion of the test.

In Column (7) we examine the sum of all five questions. The loadings on demographics are similar to the loadings for the biology-oriented questions, but slightly weaker from incorporating the two energy-related questions. Column (8) focuses on explaining overconfidence, the difference between the subjective estimate of the test score and the actual

score. In line with a large body of prior work, women are associated with lower overconfidence scores than men (see Barber and Odean (2001)), but in general overconfidence is not well explained by demographic variation. Importantly, having an educational background in environmental science is highly predictive of overconfidence. This result is essentially a familiarity bias. Indeed, in Column (9) when we model the number of times a respondent answered "Don't Know" to the question, we see that environmental science students are much less likely to answer that they do not know. For comparison purposes, the Appendix contains a similar analysis focused on the financial literacy test.

Table IV here

Table IV compares the total scores from the environmental and financial literacy tests with the same demographic control variables. Column (1) and (2) of Table IV puts the analysis of the two tests side-by-side. (Column (2) repeats Column (7) from the previous table.) As have been shown in many other papers, financial literacy is increasing with income and education.[3] We also find that living in an urban area or owning a house — both most likely associated with higher wealth — is increasing in financial literacy, and as discussed in Lusardi and Mitchell (2008), women score lower than men. The characteristics in Column (2) explain less of the variation in the environmental compared to the financial scores in Column (1). Perhaps it is natural that financial literacy scores are much better explained by demographics, because an individual's economic status and their engagement with financial matters is generally positively correlated, whereas environmental issues affect most households irrespective of their economic status. Many of the loadings of the characteristics are similar, indicating that they share a common component of general knowledge that spans both domains. In Column (3) we introduce financial literacy among the explanatory variables for environmental literacy and find that it is strongly significant and explains a great deal of the variation as measured by the increase in R-squared. The coefficient for financial literacy can be viewed as a conditional correlation between financial and environmental score, which is around 18% — similar to the raw correlation of 21%.[4] Controlling for financial knowledge, we also find that most other characteristics lose statistical power, except for topic related education.

[3]See for instance Hastings, Madrian, and Skimmyhorn (2013).

[4]We include a complete correlation matrix of perceived and actual scores in the Appendix Table A.6.

Columns (4) through (6) of Table IV offers the same analysis for overestimation as the dependent variable. In both knowledge domains, higher income individuals score better, but display lower overestimation. Older people do not score better, but think they do. Women score lower on both tests, but also assess lower scores to themselves, and those having studied environmental science score better, but report on average higher self-assessed scores on both tests. Most of the significant characteristics explaining environmental overestimation survive when we include financial overestimation among the explanatory variables, although they become weaker. Respondents with ecology/biology backgrounds think they score better, even though Columns (1) through (3) only provide weak evidence that they do.

Perhaps the most striking result of Column (6) is the size of the coefficient for overestimation stemming from financial literacy of 33.8%. The correlation between overestimation between knowledge domains is therefore half again as high as the corresponding measures for actual scores. This shows that self-perceptions of one's skills spill over across domains to a greater degree than do the skills themselves.

Figure 1 here

Figure 1B and 1D summarize the results for the environmental literacy test. Comparing them to the financial literacy test, average perceived literacy is much higher across scores (as indicated by a flatter solid line compared to the dotted 45-degree line). This in turn is attributed to a flatter beliefs distribution across all scores. In other words, people are more uncertain about their score of the test given their responses. This can be due to the nature of the test: the answers to the environmental questions can maybe more easily be retrieved by own experience. It could also be that people feel more comfortable in guessing the right answer in the environmental domain, as can be seen by the lower number of average "Don't know" responses by comparing the dashed lines in Figure 1B to Figure 1A. The most important feature of the test is that we obtain cross-sectional variation, and this is what we use in order to see how test-scores across the two domains of financial and environmental knowledge correlate with attitudes towards green behavior and investments in the next section.

4 Climate Fears and Recycling Behavior

In order to capture the link between financial and environmental literacy and concern about future environmental calamities, our survey includes questions which measure how likely are a range of future environmental scenarios to occur and about everyday recycling behavior. In this section, we link the actual and self-assesed test scores to these questions in order to explore the correlation between beliefs and self-reported actions in an environmental context.

4.1 Climate Fears

We focus on three specific scenarios where we intentionally ask for predictions over a relatively short time-horizon compared to the estimates provided by scientists. We ask "How likely do you the following globals scenarios are in the next twenty years." The scenarios are (proportion strongly agreeing within parenthesis):

- "The average temperature on earth rises by more than one Centigrade" (39%)
- "Shortage of food will increase" (25%)
- "The seawater level will increase by over one meter" (13%)

These outcomes are obviously difficult to predict, but over a twenty year horizon, they should be low or moderate probability outcomes even if the consequences of them are severe. Based on current scientific consensus, it is unlikely that the average temperature would rise by one degree centigrade in twenty years, since the current temperature increase is measured to be around a rate of 0.17 Centigrades per decade. Likewise, a sea-level increase of one meter in a twenty year period far exceeds most consensus estimates for sea level increases.[5] Global hunger and undernourishment has been decreasing during the last decades, with the exception of an increase in recent years. According to FAO, IFAD and WFP (2015), food shortage in many regions of the world can be closely tied to conflicts and natural disasters, but generally diminishes with economic growth. We

[5]The Intergovernmental Panel of Climate Change (IPCC) report in their worst cace scenarios that there is a 95% probability that sea level rise will be less than one meter by 2100. Likewise, the same report estimates global warming to increase by more than one centigrade in twenty years only in their most negative scenarios.

therefore argue that a belief in increased food shortage also can be associated with a more pessimistic outlook.

To measure beliefs about these catastrophes, we code dummy variables equaling one if respondents think these scenarios are very likely and zero otherwise. Table V explores Probit regressions of these statements with demographics, financial and environmental literacy as independent variables.

Tabel V here

In Columns (1) and (2) we examine beliefs about rising temperatures. Column (1) includes environmental and financial literacy along with demographic controls. Respondents with high financial or environmental literacy are much more likely to believe that extreme temperature outcomes are likely. However in Column (2) when we include the subjective scores, we see that perceived environmental literacy drives out the actual literacy. Perceived financial literacy and actual financial literacy are both insignificant in this specification, but Column (2) echos a result from Anderson, Baker and Robinson (2017), which is that what someone thinks they know about the domain in question is more important for predicting their behavior and beliefs than what they actually know.

We see the same pattern in Columns (3) and (4) when we turn from rising temperatures to beliefs about food shortages. High actual environmental literacy scores are associated with a higher likelihood of food shortages, but this relation disappears when we introduce perceived environmental literacy: respondents self-perceptions are correlated with environmental fears, but there actual knowledge about the underlying science is not.

In Columns (5) and (6) we see that both measures of literacy, whether actual or perceived, are unrelated to beliefs about rising sea levels. Finally, Column (7) and (8) defines an indicator variable Calamities by bundling the previous three questions into one if the any of the responses were "Very likely", which essentially makes the measured effects stronger. Actual and perceived financial literacy have no explanatory power for climate calamities — it is only the perceived environmental knowledge that survive when controlling for self-perceptions.

Across each of the specifications, we find that women are much more likely to believe that these calamities are likely. We also find that older respondents think these calamities are much less likely. In general, however, this table illustrates that there is relatively

low correlation between environmental literacy and beliefs about future environmental calamities, but what correlation there is exists largely in the domain of beliefs, not actual literacy. The results are therefore related to those found in the psychology literature on attention and weighting of probabilities (as in Tversky and Kahneman's (1992) Cumulative Prospect Theory), where people tend to attach a greater weight to extreme outcomes. It is those who believe to have scored better than they actually did on the environmental test that are more prone to hold these beliefs.

4.2 Self-Reported Recycling Behavior

The next step in our analysis is draw a link between environmental knowledge and fears and beliefs about current actions. To do this we include questions that gauge a respondent's environmental behaviors. This allows us not only to assess how much environmental conservation households think they are engaging in, but also how the tendency to be green at home correlates with green investment. Specifically, we ask"Which sentence best describes how much you recycle?" Potential answers are as follows:

- "A great deal more than my neighbors" (n=612, 15%)
- "Somewhat more than my neighbors," (n=1,174, 29%)
- "About the same as my neighbors," (n=1,941, 48%)
- "My neighbors recycle somewhat more than I do," (n=238, 6%)
- "My neighbors recycle a great deal more than I do," (n=60, 1%).

Only 7% of respondents believe that they recycle less than their neighbors. To study how this better-than-average effect along the lines of Svenson (1981) relates to knowledge and beliefs, we code a dummy variable to equal one if a respondent thinks they recycle more or a great deal more than their neighbors. This is presented in Table VI.

Table VI here

Column (1) regresses better-than-average recycling on demographics only. Women and those having studied environmental science report that they are 2.9% and 14.5%

more likely to recycle a great deal more than their neighbors, which of course may be in line with actual behavior. When we include financial and environmental literacy among the explanatory variables in Column (2), better environmental knowledge seems to explain better than average recycling behavior, but this effect is again dominated by self-perceptions when comparing the results to Column (3). In other words, it is not those who have, but those who think they have higher environmental literacy scores that are more inclined to report above average recycling behavior.

Column (4) adds the measure of climate fears displayed in Table V, the dummy variable from the analysis in Table V for whether the respondent thought any of the calamities were very likely. These individuals are much more likely to believe that they recycle more than their neighbors. Introducing this measure of fear does little to attenuate the loadings on self-perceptions.

5 From Environmental Beliefs to Investment Beliefs

The final step of our analysis is to link the knowledge, beliefs and fear measured above to respondents' beliefs about the cost/benefit tradeoffs associated with investing in environmentally responsible funds. To be able to compare results we first ask respondents about behavior in the general product market before we hone in on finance. We examine the link between a respondents' environmental stance and the willingness to pay for environmentally friendly products by asking to which extent the respondent agrees to the statement "I am willing to pay more for environmentally friendly products" (Higher Price). 28% of the surveyed sample strongly agrees to this statement and 41% agree. Then we ask a more specific question about investments by asking for attitudes towards the statement "Environmentally sustainable investments generate higher returns in the long run" (Higher Return). Here, only about half or 14% strongly agree to the statement compared to the product question while 30% agree.

Finally, we ask a question about fees: "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments" (Higher Fee), where only 9% strongly agree to this statement, and 32% agree. As in the previous analysis, we code a dummy variable taking the value of one if strongly agreeing, and zero otherwise.

The results are presented in Table VII. Columns (1) and (2) show how characteristics vary with the propensity to pay higher prices for green products. Younger and more financially and environmentally literate female respondents living in Green Party areas with a background in environmental science are more willing to pay a premium for consuming environmentally friendly products. Introuducing self-perceptions shows again that the environmental literacy effect crowds out that of actual score, but does not effect the estimate for financial literacy. This again is evidence that it is the domain-specific perceptions that relates to behavior. In Columns (3) and (4) we replace the dependent variable with the agreement to the statement if green investments outperform and find qualitatively similar results, but in which higher income individuals tend to be less in agreement. Financial literacy does not matter in any specification, but environmental literacy shows a strong positive correlation. This correlation vanishes when introducing perceived environmental literacy.

Table VII here

Finally, the last three columns of Table VII show the analysis of strongly agreeing to the question "It is worth paying higher fees for a fund that only makes sustainable investments". As seen in the question about green returns, we find this to be more common among young, lower income females. Self-perceptions of environmental score is strongly significant, leaving the other measures of financial and environmental knowledge redundant. People who think that green investments should outperform would presumably also be willing to be higher fees for such investments. Indeed, when we include a control for this in Column (7), we find that to be the case and strongly significant. 26% of those thinking that green investments outperform are willing to pay higher fees, but still 6% strongly agree to the statement even though they do not share this view. Including a control for green return beliefs does crowd out some of the effect from other characteristics, but importantly, the strong influence of self-perceived environmental knowledge prevails as an important determinant of the willingness to pay higher fees.

In sum, the message from Table VII is that the belief that environmentally sustainable investments generate higher returns and willingness to pay higher fees is highly correlated with beliefs about one's own environmental literacy, but not one's actual literacy.

Actual knowledge about the environment or about financial matters is uncorrelated with this view.

6 Conclusion

Households are increasingly being asked to make investment choices based not only on risk and return, but also on environmental impact or other social factors. Understanding what factors and decision processes are responsible for driving the willingness to make environmentally friendly investments is key for understanding how this important element of consumer financial decision-making will evolve.

What drives household demand for environmentally responsible investment? This paper essentially pits two opposing hypotheses against one another. One posits that increased knowledge of environmental and biological processes heightens an investors willingness to tilt their investment portfolios towards such investments. This effect may work through the belief that environmentally sound investments will have higher returns in the long run, or it may work through a heightened awareness of the costs of environmental damage. To test this hypothesis, we develop a five-question environmental literacy test designed to gauge respondents' understanding of scientific and biological processes behind climate change. The test is inspired by the Big-5 financial literacy test pioneered by Lusardi and Mitchell (2007), but an important limitation of our test relative to theirs is that finance is built from a central, unified framework, whereas the knowledge required to understand a household's impact on climate change is far more disparate.

The alternative is that fears about unlikely future calamities and mistaken beliefs about one's own behaviors and actions affect the way people construe financial tradeoffs. To test this hypothesis, we ask respondents to predict how many questions they got right on the environmental and financial literacy tests described above. We also ask them to rate themselves relative to their neighbors in terms of their recycling ability, and we ask them to rate the likelihood of future environmental calamities that lie well outside the scientific consensus.

We find little evidence to support the idea that more environmentally informed households approached environmental/financial tradeoffs differently than other households.

Respondents who *think* they are well informed also indicate that they would pay more for environmentally sustainable products, that they would pay higher fees for environmentally sound investments, and that these investments would perform, but there is little relation between *actual* environmental literacy and these outcomes. Likewise, those who think they are environmentally literate are more likely to believe that future environmental calamities are more likely, whereas there is no correlation between actual knowledge and these fears once we control for self-perceptions. In other words, what you *think* you know about the environment is more important than what you *actually* know.

As decision processes, saving for retirement and planning for a future affected by climate change share many common features. Both require forming expectations over outcomes that are in the distant future. Feedback is noisy in both cases, and in both cases small decisions accumulate slowly over time in ways that are difficult to reverse. In a horserace between knowledge, fear and beliefs, fear wins out in terms of its ability to predict whether an individual would pay higher fees for environmentally sustainable investments, or whether these funds are likely to outperform in the long run. This conclusion is especially noteworthy given the fact that scenes of environmental devastation are becoming increasingly commonplace in print, television and social media. Our findings suggest that these images may have outsized influence on investor attitudes, which in turn raises questions about the efficacy of a variety of standard tools for increasing investor sophistication in an increasingly complicated financial marketplace. Understanding how beliefs about unlikely, but devastating future calamities interact with knowledge and self-awareness is likely to be an increasingly important question going forward.

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Table I: Sample Characteristics

This table reports summary statistics, average test scores and sample proportions of the key survey questions. Column (1) shows the sample proportions and Column (2) the corresponding population average for Sweden. Columns (3) and (5) present the present the average score from the financial and environmental tests, where the maximum score is 5. Columns (4) and (6) present the average overestimation, calculated as the difference between actual score and average self-assessed score on each test. The last three columns shows the proportions of respondents strongly agreeing to a set of green beliefs. Calamities takes the value of one if strongly agreeing to: "How likely do you the following globals scenarios are in the next twenty year", followed by the following three statements "The average temperature on earth rises by more than one degree Celsius", "Shortage of food will increase" and "The seawater level will increase by over one meter" and zero otherwise. Returns takes the value of one if agreeing to the statement: "In the long run, environmentally sustainable investments generate higher returns" and zero otherwise. Fees takes the value of one if strongly agreeing to: "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments", zero otherwise. The sample is compared across gender, age, income and education where information about the underlying population is provided by Statistics Sweden. In addition, there are indicators whether the subject having studied Economics/Business or Biology/Geography/Environmental science at any level since high school and a dummy variable for Urban residence if the respondent lived in a municipality with a population over 100,000 and with a population density over 100 people per square kilometer (corresponding to 12 main cities in Sweden). There are 3,933 individuals in the sample.

	Sample	Pop.	Finance		Environment		Green Beliefs		
	Prop.	Prop.	Score	Overest.	Score	Overest	Calamities	Returns	Fees
Overall	100.00	100.00	3.14	-0.03	2.27	0.86	0.48	0.14	0.09
Pop. Wtd.	.	.	2.93	-0.02	2.23	0.80	0.50	0.16	0.09
Gender									
Men	49.09	51.10	3.44	0.04	2.32	1.04	0.46	0.13	0.08
Women	50.91	48.90	2.85	-0.10	2.22	0.68	0.49	0.15	0.10
Age									
18-24	9.57	15.50	2.69	-0.28	2.32	0.26	0.56	0.13	0.08
25-34	14.95	22.90	3.03	-0.28	2.30	0.53	0.60	0.17	0.13
35-44	18.33	20.80	3.28	-0.07	2.35	0.84	0.51	0.16	0.11
45-54	25.17	22.00	3.26	-0.02	2.26	0.98	0.42	0.12	0.09
55-65	31.98	18.90	3.15	0.18	2.21	1.11	0.42	0.12	0.07
Income									
0-111	14.85	25.00	2.72	-0.11	2.31	0.50	0.56	0.17	0.10
111-287	32.16	24.90	2.83	-0.01	2.25	0.76	0.48	0.15	0.09
287-399	28.75	25.20	3.18	-0.02	2.21	0.99	0.45	0.13	0.09
399+	23.67	25.00	3.79	0.00	2.35	1.07	0.45	0.10	0.08
Education									
Some school	9.47	17.40	2.59	-0.02	2.21	0.66	0.50	0.17	0.08
High school	37.32	44.00	2.84	0.04	2.17	0.91	0.46	0.12	0.05
College	52.04	38.60	3.48	-0.09	2.37	0.86	0.48	0.14	0.12
Studied Env/Bio	1.78	.	3.62	0.16	2.65	1.03	0.58	0.18	0.17
Studied Econ/Bus	9.74	.	3.52	-0.05	2.16	0.84	0.42	0.14	0.09
Location									
Urban	34.18	.	3.32	-0.06	2.34	0.80	0.52	0.15	0.12
Rural	65.82	.	3.05	-0.01	2.24	0.89	0.45	0.13	0.07

Table II: Measuring Environmental Literacy

- A low-energy (CFL or LED) lightbulb costs more than a regular lightbulb but uses less energy. About how long does one last?
  - About the same as a regular lightbulb (78, 1.9%)
  - About 10 times as long as a regular lightbulb (1,773, 42.5%)
  - About 100 times as long as a regular lightbulb (1,737, 41.6%)
  - Don't know/Prefer not to say (586, 14%)
- The ozone layer filters what harmful substance?
  - Acid rain (28, 1.0%)
  - UV radiation (3,599, 86.0%)
  - Sewage (63, 1.5%)
  - The Greenhouse Effect (202, 4.8%)
  - Don't know/Prefer not to say (282, 6.8%)
- According to the UN, around 30% of the world's food is wasted each year. When does this occur?
  - Most food is wasted before it reaches the supermarket (462, 11.1%)
  - Most food is discarded at the supermarket before it is sold (754, 18.1%)
  - Most food is wasted after it is purchased from the supermarket (2,593, 62.1%)
  - Don't know/Prefer not to say (365, 8.7%)
- Does the world spend more energy on heating homes or cooling them?
  - More energy on heating (1,164, 27.9%)
  - More energy on cooling (1,665, 39.9%)
  - About the same amount on both (589, 14.1%)
  - Don't know / Prefer not to say (756, 18.1%)
- Why don't polar bears eat penguins?
  - They have both been driven out of their natural environment (474, 11.4%)
  - Polar bears do not eat meat (92, 2.2%)
  - Penguins are only active when polar bears hibernate (145, 3.5%)
  - None of the above (2,421, 58.0%)
  - Don't know/Prefer not to say (1,042, 24.9%)

Table III: Environmental Knowledge and Self-Perceptions

This table provides an analysis of the scores from the environmental literacy tests. The first five columns report Probit regressions where the dependent variable takes the value of one if correct and zero otherwise. The columns are grouped such that the first three columns display the biology related questions (Q2, Q3 and Q5) and the last two the energy questions (Q1 and Q4). Column (7) presents an OLS regression where the dependent variable is the sum of correct answers to the first three questions (Bio 3) and Column (7) summing scores over all five questions. Column (8) uses the count of the number of "Don't Know" responses as the dependent variable (DK), and Column (9) Overestimation (OE) defined as the difference between the average self-reported score on the test (Perceived score) and actual outcome of the test. Independent variables Urban and Green measures the population density and share of green party votes within the municipality of the respondent. Female, Married, Children and House are indicator variables for marital or household status. Income is log of disposable income, Age is divided by ten measured at the end of 2017. University, ECON and ECO student are education indicator variables for subjects having a university degree or having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. Sampling weights are used.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Q2	Q3	Q5	Q1	Q4	Bio 3	Score	DK	OE
Log Income	0.016***	-0.002	0.002	0.017**	0.006	0.022*	0.043***	-0.040**	-0.022
	(0.005)	(0.004)	(0.007)	(0.007)	(0.006)	(0.013)	(0.015)	(0.016)	(0.014)
Age	-0.001	-0.015***	0.007	0.000	-0.004	-0.009	-0.014	-0.023	0.151***
	(0.007)	(0.005)	(0.009)	(0.009)	(0.008)	(0.014)	(0.019)	(0.019)	(0.018)
Female	-0.025*	0.017	-0.076***	-0.015	0.020	-0.081***	-0.076*	0.198***	-0.400***
	(0.015)	(0.012)	(0.018)	(0.018)	(0.017)	(0.029)	(0.040)	(0.042)	(0.039)
Married	-0.063***	-0.008	-0.079***	-0.005	0.026	-0.149***	-0.127***	0.027	0.072
	(0.019)	(0.014)	(0.023)	(0.023)	(0.021)	(0.036)	(0.048)	(0.049)	(0.046)
Children	-0.007	0.045***	0.003	-0.033	-0.050**	0.033	-0.049	-0.016	0.106**
	(0.017)	(0.014)	(0.022)	(0.021)	(0.020)	(0.035)	(0.046)	(0.047)	(0.044)
House	0.102***	-0.028**	0.055**	-0.026	-0.071***	0.131***	0.036	-0.118**	0.056
	(0.017)	(0.014)	(0.023)	(0.022)	(0.021)	(0.036)	(0.048)	(0.051)	(0.048)
Urban	0.001	0.006	-0.006	-0.011	-0.000	0.001	-0.010	0.011	-0.002
	(0.006)	(0.005)	(0.007)	(0.007)	(0.007)	(0.012)	(0.016)	(0.017)	(0.015)
Green	0.005*	-0.001	0.009***	0.003	-0.002	0.013**	0.014*	-0.011	0.006
	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)	(0.008)	(0.008)	(0.007)
University	0.142***	-0.056*	0.184***	0.034	-0.044	0.239***	0.233*	-0.191	0.109
	(0.021)	(0.033)	(0.066)	(0.071)	(0.067)	(0.068)	(0.136)	(0.130)	(0.139)
ECO student	0.104**	0.063	0.222***	-0.033	-0.109*	0.378***	0.235	-0.327**	0.470***
	(0.044)	(0.051)	(0.069)	(0.068)	(0.061)	(0.117)	(0.145)	(0.144)	(0.116)
ECON student	0.015	-0.031*	-0.025	-0.007	-0.026	-0.040	-0.072	0.063	-0.150**
	(0.024)	(0.017)	(0.031)	(0.030)	(0.028)	(0.048)	(0.063)	(0.073)	(0.071)
Constant						1.222***	1.806***	1.350***	1.479***
						(0.179)	(0.220)	(0.215)	(0.236)
Observations	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993
R-squared						0.027	0.015	0.022	0.366
Score controls	No	No	No	No	No	No	No	No	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table IV: Financial and Environmental Knowledge

This table provides an analysis of the financial and environmental literacy tests. The first three columns report OLS regressions where the dependent variable is the score of the Financial literacy test, the number of "Don't Know" responses (Fin. DK) and Overestimation (Fin. OE). Columns (4) through (8) repeats the analysis for the Environmental literacy test. Column (5) includes Financial literacy score and Column (8) Financial Overestimation among the explanatory variables. Independent variables Urban and Green measures the population density and share of green party votes within the municipality of the respondent. Female, Married, Children and House are indicator variables for marital or household status. Income is log of disposable income, Age is divided by ten measured at the end of 2017. University, ECON and ECO student are education indicator variables for subjects having a university degree or having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. Sampling weights are used.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Fin. Lit.	Env. Lit.	Env. Lit.	Fin. OE	Env. OE	Env. OE
Fin. Lit.			0.208***			
			(0.017)			
Overest. Fin. Lit.						0.338***
						(0.016)
Log Income	0.034**	0.043***	0.036**	-0.031**	-0.022	-0.007
	(0.017)	(0.015)	(0.014)	(0.015)	(0.014)	(0.013)
Age	-0.018	-0.014	-0.010	0.125***	0.151***	0.106***
	(0.021)	(0.019)	(0.018)	(0.019)	(0.018)	(0.017)
Female	-0.589***	-0.076*	0.046	-0.391***	-0.400***	-0.355***
	(0.045)	(0.040)	(0.040)	(0.042)	(0.039)	(0.036)
Married	-0.043	-0.127***	-0.118**	0.084*	0.072	0.042
	(0.055)	(0.048)	(0.047)	(0.048)	(0.046)	(0.043)
Children	0.053	-0.049	-0.060	0.028	0.106**	0.104**
	(0.052)	(0.046)	(0.044)	(0.046)	(0.044)	(0.041)
House	0.431***	0.036	-0.054	0.078	0.056	0.085*
	(0.054)	(0.048)	(0.047)	(0.050)	(0.048)	(0.044)
Urban	0.028	-0.010	-0.015	0.017	-0.002	-0.003
	(0.018)	(0.016)	(0.016)	(0.016)	(0.015)	(0.014)
Green	0.032***	0.014*	0.007	0.010	0.006	0.006
	(0.009)	(0.008)	(0.007)	(0.008)	(0.007)	(0.006)
University	0.862***	0.233*	0.053	0.477***	0.109	0.076
	(0.125)	(0.136)	(0.136)	(0.127)	(0.139)	(0.138)
ECO student	0.322*	0.235	0.168	0.404***	0.470***	0.372***
	(0.176)	(0.145)	(0.131)	(0.135)	(0.116)	(0.116)
ECON student	0.385***	-0.072	-0.152**	0.151**	-0.150**	-0.144**
	(0.072)	(0.063)	(0.061)	(0.066)	(0.071)	(0.066)
Constant	2.329***	1.806***	1.322***	0.657***	1.479***	1.372***
	(0.232)	(0.220)	(0.211)	(0.246)	(0.236)	(0.206)
Observations	3,993	3,993	3,993	3,993	3,993	3,993
R-squared	0.117	0.015	0.070	0.205	0.366	0.458
Score controls	No	No	No	Yes	Yes	Yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table V: Climate Calamaties

This table reports the results of Probit regressions where the dependent variable takes the value of one if the response is "Very likely" to the following statements beginning with "How likely do you think the following globals scenarios are in the next twenty years", followed by "The average temperature on earth rises by more than one Centigrade" (High temp); "Food shortage will increase" (Food short); and "The sea level rises by more than one meter" (Sea rise), and zero otherwise. The indicator variable Calamities takes the value of one if the respondent had marked any of the three statements to be very likely and zero otherwise. Independent variables Urban and Green measures the population density and share of green party votes within the municipality of the respondent. Female, Married, Children and House are indicator variables for marital or household status. Income is log of disposable income, Age is divided by ten measured at the end of 2017. University, ECON and ECO student are education indicator variables for subjects having a university degree or having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. Sampling weights are used.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	High temp	High temp	Food short	Food short	Sea rise	Sea rise	Calamities	Calamities
Perceived Env. Lit.		0.029***		0.037***		0.011		0.040***
		(0.011)		(0.009)		(0.008)		(0.011)
Perceived Fin. Lit.		0.001		-0.010		-0.003		0.001
		(0.010)		(0.009)		(0.007)		(0.010)
Env. Lit.	0.026***	0.018*	0.020**	0.011	-0.002	-0.005	0.028***	0.016
	(0.009)	(0.010)	(0.008)	(0.008)	(0.006)	(0.007)	(0.009)	(0.010)
Fin. Lit.	0.021***	0.015	0.015**	0.014*	-0.010*	-0.011	0.029***	0.021**
	(0.008)	(0.010)	(0.007)	(0.008)	(0.006)	(0.007)	(0.008)	(0.010)
Log Income	-0.006	-0.005	-0.017***	-0.017***	0.002	0.003	-0.023***	-0.022***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.008)	(0.008)
Age	-0.041***	-0.046***	-0.016**	-0.020***	-0.017***	-0.018***	-0.040***	-0.047***
	(0.009)	(0.009)	(0.008)	(0.008)	(0.006)	(0.006)	(0.009)	(0.009)
Female	0.043**	0.052***	0.050***	0.057***	0.062***	0.064***	0.068***	0.080***
	(0.019)	(0.019)	(0.017)	(0.017)	(0.013)	(0.013)	(0.019)	(0.020)
Married	0.018	0.016	-0.013	-0.014	-0.013	-0.014	0.014	0.011
	(0.023)	(0.023)	(0.020)	(0.020)	(0.016)	(0.016)	(0.024)	(0.024)
Children	-0.006	-0.009	0.003	-0.001	-0.002	-0.003	-0.002	-0.005
	(0.021)	(0.021)	(0.019)	(0.018)	(0.015)	(0.015)	(0.022)	(0.022)
House	-0.010	-0.010	0.005	0.006	-0.042***	-0.041***	-0.028	-0.028
	(0.023)	(0.023)	(0.020)	(0.020)	(0.015)	(0.015)	(0.023)	(0.023)
Urban	0.006	0.006	0.008	0.009	0.003	0.004	0.010	0.010
	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.007)	(0.007)
Green	0.002	0.002	0.001	0.001	-0.001	-0.001	0.001	0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
University	0.058	0.059	-0.081*	-0.077	0.025	0.028	-0.004	-0.003
	(0.069)	(0.070)	(0.048)	(0.049)	(0.056)	(0.057)	(0.069)	(0.070)
ECO student	-0.034	-0.046	0.064	0.051	-0.008	-0.012	0.019	0.003
	(0.067)	(0.066)	(0.066)	(0.064)	(0.048)	(0.047)	(0.073)	(0.072)
ECON student	-0.038	-0.033	-0.021	-0.012	-0.011	-0.009	-0.061**	-0.053*
	(0.030)	(0.030)	(0.026)	(0.027)	(0.022)	(0.022)	(0.031)	(0.031)
Observations	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table VI: Better-than-Average Environmental Stewardship

This table studies the survey question,"Which sentence best describes how much you recycle?" Potential answers are "A great deal more than my neighbors" (581, 15%), "Somewhat more than my neighbors," (1,144, 29%), "About the same as my neighbors," (1,865, 47%), "My neighbors recycle somewhat more than I do," (223, 6%), "My neighbors recycle a great deal more than I do," (54, 1%) and "Don't know," (126, 3%). The dependent variable in the regression is a dummy equaling one if the respondent thinks they recycle more or a great deal more than their neighbors. Independent variables follow those in Table V. Sampling weights are used.

	(1)	(2)	(3)	(4)
VARIABLES	Recycling	Recycling	Recycling	Recycling
Calamities				0.061***
				(0.013)
Perceived Env. Lit.			0.035***	0.033***
			(0.007)	(0.007)
Perceived Fin. Lit.			-0.013*	-0.013*
			(0.008)	(0.008)
Env. Lit.		0.018***	0.010	0.009
		(0.006)	(0.007)	(0.007)
Fin. Lit.		-0.004	-0.003	-0.004
		(0.006)	(0.007)	(0.007)
Log Income	0.004	0.003	0.003	0.004
	(0.005)	(0.005)	(0.005)	(0.005)
Age	0.001	0.001	-0.003	0.000
	(0.006)	(0.006)	(0.006)	(0.006)
Female	0.029**	0.028**	0.033**	0.029**
	(0.013)	(0.013)	(0.013)	(0.013)
Married	-0.017	-0.015	-0.016	-0.016
	(0.016)	(0.016)	(0.016)	(0.016)
Children	0.004	0.005	0.003	0.003
	(0.015)	(0.015)	(0.015)	(0.015)
House	0.031*	0.032**	0.032**	0.034**
	(0.016)	(0.016)	(0.016)	(0.016)
Urban	-0.002	-0.002	-0.001	-0.002
	(0.005)	(0.005)	(0.005)	(0.005)
Green	-0.004*	-0.004*	-0.004*	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)
University	0.023	0.021	0.029	0.030
	(0.051)	(0.050)	(0.052)	(0.052)
ECO student	0.145**	0.139**	0.125**	0.123**
	(0.064)	(0.063)	(0.061)	(0.060)
ECON student	0.038	0.041*	0.052**	0.055**
	(0.023)	(0.023)	(0.024)	(0.024)
Observations	3,993	3,993	3,993	3,993

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table VII: Knowledge, Beliefs and Preferences for Green Investments

This table reports the results of Probit regressions where the dependent variable takes the value of one if the response Strongly Agree to the statements: "I am willing to pay more for environmentally friendly products" (Higher Price); "Environmental sustainable investments generate higher returns in the long run." (Higher Return); and "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments" (Higher Fee), and zero otherwise. Independent variables follow those in Table V and VI. Sampling weights are used.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Higher Price	Higher Price	Higher Return	Higher Return	Higher Fee	Higher Fee	Higher Fee
Higher Return							0.156***
							(0.020)
Perceived Env. Lit.		0.029***		0.023***		0.014**	0.010*
		(0.009)		(0.008)		(0.006)	(0.006)
Perceived Fin. Lit.		0.004		0.009		0.001	-0.000
		(0.009)		(0.008)		(0.006)	(0.005)
Env. Lit.	0.029***	0.020**	0.014**	0.007	0.010**	0.006	0.005
	(0.008)	(0.008)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
Fin. Lit.	0.033***	0.026***	-0.000	-0.009	0.004	0.002	0.004
	(0.008)	(0.009)	(0.006)	(0.007)	(0.005)	(0.006)	(0.005)
Log Income	-0.003	-0.002	-0.016***	-0.015***	-0.007**	-0.007**	-0.004
	(0.006)	(0.006)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)
Urban	0.005	0.005	0.004	0.004	0.003	0.003	0.002
	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Green	0.008***	0.008***	0.001	0.001	0.004**	0.004**	0.004**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Age	-0.022***	-0.027***	-0.012*	-0.017**	-0.011**	-0.013**	-0.010**
	(0.008)	(0.008)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)
Female	0.075***	0.085***	0.023	0.033**	0.001	0.005	0.003
	(0.017)	(0.017)	(0.014)	(0.014)	(0.011)	(0.011)	(0.010)
Married	0.017	0.014	0.038**	0.035**	0.016	0.015	0.008
	(0.021)	(0.021)	(0.018)	(0.017)	(0.014)	(0.014)	(0.013)
Children	0.004	0.002	0.002	-0.001	-0.001	-0.002	-0.002
	(0.019)	(0.019)	(0.016)	(0.016)	(0.011)	(0.011)	(0.010)
House	0.024	0.024	-0.019	-0.019	0.013	0.014	0.016
	(0.020)	(0.020)	(0.017)	(0.016)	(0.013)	(0.013)	(0.012)
University	0.077	0.076	0.043	0.041	0.065	0.065	0.056
	(0.064)	(0.063)	(0.059)	(0.058)	(0.053)	(0.054)	(0.047)
ECO student	0.236***	0.219***	0.040	0.024	0.045	0.036	0.029
	(0.071)	(0.071)	(0.058)	(0.055)	(0.044)	(0.041)	(0.037)
ECON student	-0.003	0.003	0.003	0.006	0.003	0.005	0.001
	(0.028)	(0.029)	(0.023)	(0.024)	(0.017)	(0.017)	(0.015)
Observations	3,993	3,993	3,993	3,993	3,993	3,993	3,993

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 1: Actual vs. Perceived Financial and Environmental Literacy

These figures summarize the environmental land financial literacy test scores. The bars in Figures 1A and 1B show the proportion of respondents being certain of their score ("Proportion sure", right scale) by putting all probability mass at one outcome, separately for those being correct and incorrect with respect to the actual test score (horizontal axis). The solid line traces out the average estimated correct score, labeled "Perceived score" (left scale). The dotted 45-degree line indicates a perfect match between Actual and Perceived scores. Figures 1C and 1D show the average self-assessed probability distributions across actual test scores.

Figure 1A

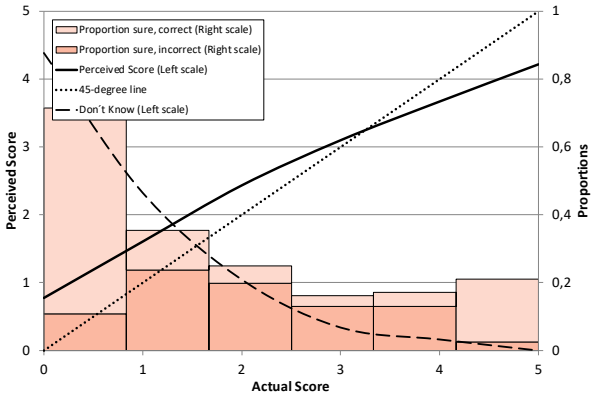


Figure 1B

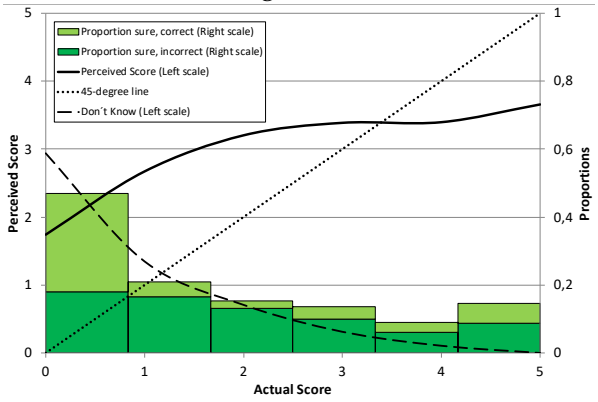


Figure 1C

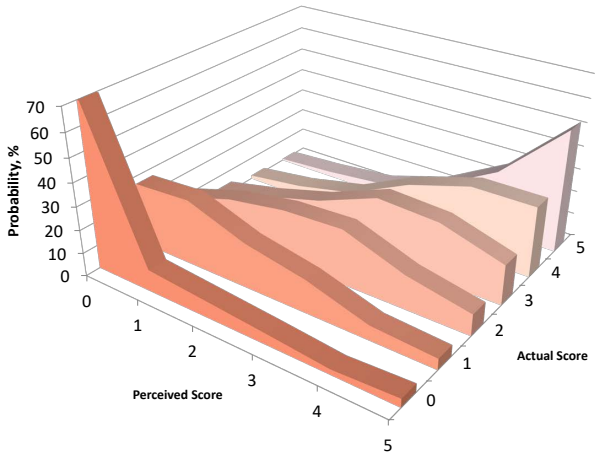
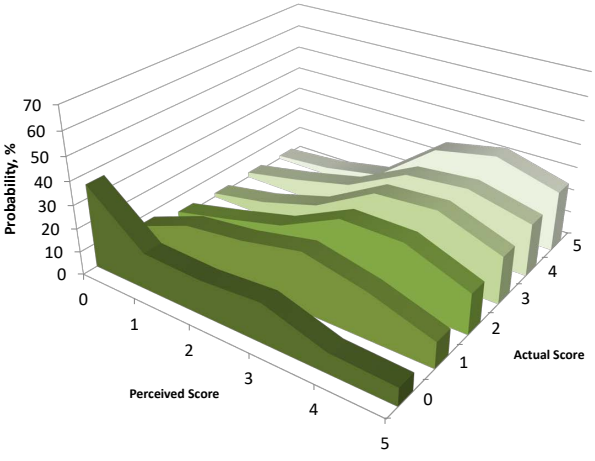


Figure 1D



A Online Appendix

This Appendix contains the distribution of answers to the questions in our financial literacy survey, environmental and financial attitudes and beliefs, and the question about environmental risks. We include a regression analysis of responses to the financial literacy test (similar to that for environmental test scores in the main text), and a correlation matrix of environmental and financial subjective and objective scores.

Table A.1: Five Modified Financial Literacy Questions

Below are the five ("Big 5") financial literacy questions used in the study and corresponding frequency responses on each item. Correct answers are highlighted in boldface. The questions have been translated from Swedish into English.

1. *Compounding*. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? Please select one.
   - **More than $102 (3,633, 91.0%)**
   - Exactly $102 (68, 1.7%)
   - Less than $102 (109, 2.7%)
   - Don't know (136, 3.4%)
   - Prefer not to say (47, 1.2%)
2. *Inflation*. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? Please select one.
   - More than today (199, 5.0%)
   - **Less than today (3,065, 76.8%)**
   - Exactly the same as today (146, 3.7%)
   - Don't know (516, 12.9%)
   - Prefer not to say (67, 1.7%)
3. *Diversification*. Buying a single company's stock usually provides a safer return than a stock mutual fund. Please select one.
   - True (225, 5.6%)
   - **False (3,261, 81.7%)**
   - Don't know (458, 11.5%)
   - Prefer not to say (49, 1.2%)
4. *Saving*. Suppose you were given 10,000 as a gift and wanted to double the amount by saving the money ten years without having to touch it. What interest rate would you require to achieve this goal? Please select one.
   - About 15% annual interest rate (254, 6.4%)
   - About 10% annual interest rate (1,552, 38.9%)
   - **About 7% annual interest rate (1,764, 44.2%)**
   - Don't know (353, 8.8%)
   - Prefer not to say (70, 1.8%)
5. *Bond Pricing*. If interest rates fall, what should happen to bond prices? Please select one.
   - **They will rise (676, 16.9%)**
   - They will fall (818, 20.5%)
   - They will stay the same (1,680, 42.1%)
   - Don't know (752, 18.8%)
   - Prefer not to say (67, 1.7%)

Table A.2: Question about environmental attitudes and beliefs
This table tabulates responses to which extent respondents agree or disagree to statements related to the environment. The questions have been translated from Swedish into English.

1. *Interest*. "I find environmental issues interesting."
    - Strongly agree (1,406, 35.2%)
    - Agree (1,684, 42.2%)
    - Neither Agree or Disagree (610, 15.3%)
    - Disagree (162, 4.1%)
    - Strongly disagree (57, 1.4%)
    - Don't know (74, 1.8%)
2. *Green products*. "I am willing to pay more for environmentally friendly products."
    - Strongly agree (1,138, 28.5%)
    - Agree (1,623, 40.6%)
    - Neither Agree or Disagree (723, 18.1%)
    - Disagree (276, 6.9%)
    - Strongly disagree (161, 4.0%)
    - Don't know (72, 1.8%)
3. *High returns*. "Environmentally sustainable investments generate higher returns in the long run."
    - Strongly agree (551, 13.8%)
    - Agree (1,198, 30.0%)
    - Neither Agree or Disagree (1,490, 37.3%)
    - Disagree (312, 7.8%)
    - Strongly disagree (196, 4.9%)
    - Don't know (246, 6.2%)
4. *Clean planet*. "A clean planet is more important for me than economic welfare."
    - Strongly agree (1,015, 25.4%)
    - Agree (1,561, 39.1%)
    - Neither Agree or Disagree (1,016, 25.4%)
    - Disagree (203, 5.1%)
    - Strongly disagree (96, 2.4%)
    - Don't know (102, 2.6%)

Table A.3: Question about financial attitudes and beliefs
This table tabulates responses to which extent respondents agree or disagree to statements related to the financial decisions. The questions have been translated from Swedish into English.

1. *Interest*. "I find personal financial matters interesting."
    - Strongly agree (859, 21.6%)
    - Agree (1,507, 37.8%)
    - Neither Agree or Disagree (897, 22.5%)
    - Disagree (434, 10.9%)
    - Strongly disagree (196, 4.9%)
    - Don't know (89, 2.2%)
2. *Past returns*. "When selecting a mutual fund, past performance is more important than fees."
    - Strongly agree (136, 3.4%)
    - Agree (844, 21.2%)
    - Neither Agree or Disagree (1,437, 36.2%)
    - Disagree (676, 17.0%)
    - Strongly disagree (339, 8.5%)
    - Don't know (540, 13.6%)
3. *Aid*. "I am willing to pay higher taxes in order to increase Sweden's aid to poor countries."
    - Strongly agree (334, 8.4%)
    - Agree (837, 21.1%)
    - Neither Agree or Disagree (1,056, 26.6%)
    - Disagree (746, 18.8%)
    - Strongly disagree (813, 20.5%)
    - Don't know (180, 4.5%)
4. *Green fees*. "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments."
    - Strongly agree (361, 9.1%)
    - Agree (1,249, 31.6%)
    - Neither Agree or Disagree (1,232, 31.2%)
    - Disagree (447, 11.3%)
    - Strongly disagree (320, 8.1%)
    - Don't know (342, 8.7%)

Table A.4: Question about environmental risks
This table tabulates responses to which extent respondents rank the following global scenarios on a five point Likert scale ranging from Very likely to Very unlikely. The statements have been translated from Swedish into English. The question begins with "How likely do you think the following globals scenarios are in the next twenty years", followed by:

1. *Temperature rise*. "The average temperature on earth increases by more than 1 Centigrade."
    - Very likely (1,560, 39.1%)
    - Likely (1,634, 40.9%)
    - Neither Likely or Unlikely (428, 10.7%)
    - Unlikely (174, 4.4%)
    - Very unlikely (85, 2.1%)
    - Don't know (112, 2.8%)
2. *Food shortage*. "Food shortage will increase."
    - Very likely (986, 24.7%)
    - Likely (1,591, 39.8%)
    - Neither Likely or Unlikely (781, 19.6%)
    - Unlikely (427, 10.7%)
    - Very unlikely (119, 3.0%)
    - Don't know (89, 2.2%)
3. *Sealevel rise*. "The sea level rises by more than one meter."
    - Very likely (531, 13.3%)
    - Likely (1,371, 34.3%)
    - Neither Likely or Unlikely (813, 20.4%)
    - Unlikely (698, 17.5%)
    - Very unlikely (449, 11.2%)
    - Don't know (131, 3.3%)

Table A.5: The Demographics of Financial Literacy Scores

This table provides an analysis of the scores from the financial literacy tests. The first five columns report Probit regressions where the dependent variable takes the value of one if correct and zero otherwise. Column (7) presents an OLS regression where the dependent variable is the sum of correct answers to the first three questions (Big 3) and Column (7) summing scores over all five questions. Column (8) uses the count of the number of "Don't Know" responses as the dependent variable (DK), and Column (9) Overestimation (OE) defined as the difference between the average self-reported score on the test (Perceived score) and actual outcome of the test. Independent variables Urban and Green measures the population density and share of green party votes within the municipality of the respondent. Female, Married, Children and House are indicator variables for marital or household status. Income is log of disposable income, Age is divided by ten measured at the end of 2017. University, ECON and ECO student are education indicator variables for subjects having a university degree or having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. The variable ECO student is dropped in Column (1) due to perfect collinearity with the dependent variable. Sampling weights are used.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Q1	Q2	Q3	Q4	Q5	Big 3	Score	DK	OE
Log Income	0.002	0.001	0.010*	0.009	0.015*	0.015	0.034**	-0.028	-0.031**
	(0.004)	(0.006)	(0.005)	(0.008)	(0.008)	(0.013)	(0.017)	(0.021)	(0.015)
Age	-0.006	0.035***	0.001	-0.037***	-0.015**	0.030*	-0.018	-0.035	0.125***
	(0.005)	(0.008)	(0.008)	(0.009)	(0.006)	(0.015)	(0.021)	(0.022)	(0.019)
Female	-0.044***	-0.156***	-0.094***	-0.199***	-0.105***	-0.289***	-0.589***	0.452***	-0.391***
	(0.012)	(0.017)	(0.016)	(0.018)	(0.013)	(0.033)	(0.045)	(0.048)	(0.042)
Married	-0.001	-0.005	-0.054**	0.001	0.020	-0.063	-0.043	0.026	0.084*
	(0.015)	(0.022)	(0.021)	(0.023)	(0.017)	(0.040)	(0.055)	(0.057)	(0.048)
Children	0.016	0.001	0.031*	-0.013	0.017	0.044	0.053	-0.020	0.028
	(0.014)	(0.020)	(0.019)	(0.021)	(0.016)	(0.038)	(0.052)	(0.056)	(0.046)
House	0.077***	0.083***	0.118***	0.127***	0.032*	0.280***	0.431***	-0.399***	0.078
	(0.014)	(0.021)	(0.019)	(0.023)	(0.017)	(0.040)	(0.054)	(0.059)	(0.050)
Urban	-0.001	0.004	-0.005	0.020***	0.011**	-0.001	0.028	0.008	0.017
	(0.005)	(0.007)	(0.006)	(0.007)	(0.005)	(0.013)	(0.018)	(0.019)	(0.016)
Green	0.007***	0.013***	0.006**	0.001	0.005**	0.024***	0.032***	-0.034***	0.010
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.006)	(0.009)	(0.009)	(0.008)
University	0.105***	0.267***	0.135***	0.314***	0.126**	0.430***	0.862***	-0.433***	0.477***
	(0.008)	(0.012)	(0.039)	(0.064)	(0.062)	(0.058)	(0.125)	(0.092)	(0.127)
ECO student		0.126*	0.026	0.104	-0.007	0.237**	0.322*	-0.192	0.404***
		(0.067)	(0.066)	(0.079)	(0.054)	(0.106)	(0.176)	(0.168)	(0.135)
ECON student	0.053***	0.073***	0.063**	0.118***	0.088***	0.184***	0.385***	-0.215***	0.151**
	(0.017)	(0.027)	(0.026)	(0.030)	(0.025)	(0.050)	(0.072)	(0.075)	(0.066)
Constant						1.937***	2.329***	1.403***	0.657***
						(0.180)	(0.232)	(0.280)	(0.246)
Observations	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993
R-squared						0.081	0.117	0.078	0.205
Score controls	No	No	No	No	No	No	No	No	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.6: Correlations in Financial and Environmental Literacy

This table presents the correlations between environmental and financial literacy, both in terms of the actual scores recorded as well as the average score computed over the subjective distributions of outcomes as reported by the respondents.

Literacy Score:	(1)	(2)	(3)	(4)
(1) Environmental Literacy (actual)	1.00	0.30	0.21	0.18
(2) Environmental Literacy (subjective)	-	1.00	0.31	0.59
(3) Financial Literacy (actual)	-	-	1.00	0.61
(4) Financial Literacy (subjective)	-	-	-	1.00