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Individual differences in accessing personalized online pension information: Inertia and a digital hurdle

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Abstract

Online pension planning tools aim at assisting people in their preparations for retirement. We investigated individual differences in accessing an online pension planning tool for pension plan participants who received an invitation by email to do so. Their online activity was recorded administratively. In a survey, we elicited the intentions of participants to look into their pension situation, along with their socioeconomic and psychological characteristics. We found that participants aged 55-65, participants with a high need for pension-related cognition, and participants oriented at the short term were more likely to click on the weblink to the tool, conditional on having the positive intention to look into their pension situation. Ultimately, however, these groups of participants were not more likely to access the tool, which required taking the digital hurdle of using their personal digital identity code. These findings suggest an important role of digital hurdles for the use of online pension planning tools by participants. While pension providers can aim at reducing participants' inertia to act, reducing digital hurdles can be a more practical way to increase the use of online pension communication.

Samenvatting

Online-instrumenten voor pensioenplanning zijn bedoeld om deelnemers aan een pensioenregeling te helpen met de voorbereidingen op hun pensioen. We onderzochten individuele verschillen in het gebruik van een dergelijk instrument voor deelnemers aan een pensioenregeling die hiervoor per e-mail een uitnodiging ontvingen. Hun activiteiten met dit online-instrument werden administratief geregistreerd. In een enquête hebben we de deelnemers gevraagd naar hun intenties om naar hun pensioensituatie te kijken, evenals hun sociaaleconomische en psychologische kenmerken. Onze bevindingen laten zien dat deelnemers ouder dan 55, deelnemers met een grotere behoefte aan pensioen-gerelateerde cognitie, en deelnemers die vooral op de korte termijn gericht zijn, meer geneigd waren om op de weblink naar het instrument te klikken, gegeven dat ze een positieve intentie hadden om naar hun pensioensituatie te kijken. Uiteindelijk logden deze groepen deelnemers echter niet vaker in op het instrument, waarvoor ze hun persoonlijke digitale identiteitscode moesten gebruiken. De resultaten wijzen op de belangrijke rol van digitale barrières voor het gebruik van online-instrumenten voor pensioenplanning. Hoewel pensioenuitvoerders kunnen streven naar het motiveren van deelnemers tot actie, kan het verlagen van digitale barrières een meer praktische manier zijn om het gebruik van onlinepensioencommunicatie te stimuleren.

1. Introduction

Many individuals who are enrolled in a pension scheme do not look at their pension information, nor do they take pension decisions while they should. Blakstad et al. (2017), Eberhardt et al. (2020), and especially Thaler (2018) and Wood et al. (2012) point out that inertia can be an explanation for this observed behavior. Inert participants form a vulnerable group because they are potentially more at risk of inadequately preparing for retirement: they are less likely to inform themselves about their pension situation, e.g. by making use of online pension decision aids. In this paper, we investigate individual differences in inertia to access personalized online pension information and the role of digital hurdles in this context.

Wood et al. (2012) argue that the tendency to plan for retirement is inhibited by inertia: in general, people are positive towards pension planning, but still they do not take concrete action. Procrastination, for example, can cause such an action-versus-intention gap in financial decision-making (O'Donoghue & Rabin, 1999, 2001). Thaler and Benartzi (2013, 2004), therefore, suggest changing the choice architecture of pension plans in order to nudge individuals into becoming active pension planners and committing to future choices. McCrea et al. (2008) furthermore show that the presentation of a task as concrete and specific may help individuals to complete it. Similarly, Rogers et al. (2015) argue that inducing people to make concrete and specific plans increases the likelihood that individuals act on their intentions. They refer to a broad array of situations, including visiting the doctor, eating healthy, or getting people to vote (see also Sniehotta et al., 2005). Planning for retirement can be added to this list of application areas. Regarding such planning, studies have shown its relationship with household savings (Lusardi & Mitchell, 2007; van Rooij et al., 2012) and argue the importance of financial literacy in this relationship (van Rooij et al., 2011, 2012). Finally, the time horizon and use of expenditure control techniques (to stimulate self-control) are shown to relate to a realization of saving plans (Rabinovich & Webley, 2007).

Our contribution to the literature on pension planning is twofold. First, we provide insights into individual differences in inertia when it comes to pension planning. We measure inertia based on a comparison of intentions for pension planning (stated preferences or actions) with actual pension planning behavior in an online digital environment (revealed preferences or actions). Such a comparison, which has, to our knowledge, not been conducted yet in the literature on pension planning, is possible with the data that we have on the intentions of 899 pension plan participants to look into their pension situation, their actual pension planning behavior, and

their socioeconomic and psychological characteristics. In particular the inclusion of socio-psychological factors such as need for cognition, time preferences, and attitudes towards pension information have been argued to be important factors for the retirement planning process (Hershey et al. 2007).

Closely tied to our first contribution are the findings of Krijnen et al. (2018), which show that the importance and perceived difficulty of retirement preparation predict the intentions of people to prepare for retirement, plus that perceived difficulty is a strong predictor of their self-reported actions. Knoef et al. (2020) furthermore study, using a quasi-experimental setting involving social media platforms and framing of an invitation letter, how pension awareness and subsequent action can be increased. They find that a letter with fear appeal is almost twice as effective as a Facebook ad towards increasing pension awareness. In the discussion of their results, they stress the importance of using revealed rather than stated actions. We complement these latter two studies by analyzing the planning behavior of participants, i.e., the intention to look into their pension situation, and the revealed action of clicking on a weblink to an online pension tool. Our main findings are that the relatively older participants, participants with a relatively high need for pension-related cognition, and those who are relatively more focused at the short term, are less likely to be inert. In other words, these groups are more likely to click on the weblink, conditional on having a positive intention to look into their pension situation.

Our second contribution is that we provide insights into a possible digital hurdle that may inhibit pension participants to take a look at their pension situation even though their intentions are positive. As Ajzen (2015, p. 134) stated, a positive intention does not automatically lead to the desired behavior: "people must have the requisite resources, and potential barriers to behavioral performance must be removed." One important barrier in the context of online personalized pension information is the digital hurdle for participants to connect with the tools provided by pension providers. Because we measured pension planning behavior in an online environment, the digital skills of individuals (the ability to use digital means) can play a role in accessing personalized online pension information. For instance, participants might refrain from logging in to the online pension environment because it requires a personal digital identity code; this may be experienced as a 'digital hurdle' by those who do not frequently use it or feel uncomfortable using it. In order to shed light on this – also because we did not directly measure digital skills –, we analyzed the differences in login behavior. Our findings show that especially women and people aged 55-65 are less likely to log in to their pension environment. Moreover, even relatively less

inert participants do not log in more often. These findings suggest that this digital hurdle is a serious barrier for actively planning for retirement.

This paper is structured as follows: In Section 2 we provide a description of the relevant concepts and their operationalization, followed by some descriptive statistics. In Section 3 we present the results on which groups exhibit inertia, followed by an analysis of the digital hurdle. The last section states our conclusions and discusses the results.

2. The Data

We fielded a survey in the spring of 2016 among 3,300 employees of a large insurance company and, separately, collected administrative records of the employees' visits to an online pension planning tool. Participants received the survey about two weeks after they were invited to visit an online pension planning tool, for which access required logging in to their digital pension environment. The survey contains questions on financial literacy, the need for general and pension-related knowledge, attitudes related to pension information, and socioeconomic variables such as age and educational attainment. The variable descriptions and measurements are reported in Table A1, and Appendix B contains the exact wording of all survey questions. The administrative records consist of data on whether participants clicked on the link in the invitation letter, whether they subsequently logged in to their digital pension environment by using their personal digital identity code, and whether participants completed the Pension Check.

About 34% of the employees completed the survey, and the raw data contains information on 1,109 employees. When completing the survey, 982 respondents indicated that they agreed to having their survey responses linked with administrative data. The 127 respondents who did not agree to this were removed from the sample. After further removing 83 respondents who did not answer some of the questions, we ended up with the final estimation sample of 899 observations.[1] Survey nonresponse arguably causes endogenous sample selection and, along with the fact that all respondents were insurance company employees, warrants caution when generalizing our results.

2.1 Intentions and actions

2.1.1 Intentions

Behavioral intention was elicited with the statement, "I am planning to delve into my pension situation soon", to which the survey participant could respond on a 5-point scale ranging from *completely disagree* to *completely agree*. In case the respondent indicated to (completely) disagree, a follow-up question was asked about the reasons

1 Missing values are mainly on the question that elicited the intention to look into one's personal pension situation (77 observations).

for not intending to look into their pension situation.[2] We did not use the answers to this follow-up question because of the low number of observations. We then recoded the answers of the intention question into three categories (negative, neutral, and positive intentions) as the first and fifth categories had relatively few observations (3% and 15% of observations, respectively). This aggregation greatly improves the exposition of our results, without affecting the main findings of our study.

Figure 1 shows the percentage share for each of the five categories for the intention to look into one's pension information. From left to right, the intention categories range from having no intention at all to look into one's personal pension situation (completely disagree) to having the intention to delve into the personal pension situation (completely agree). We refer to these as negative and positive intentions, respectively. The share of participants with negative intentions is relatively low (3% and 12% for the lowest two categories). 32 percent indicated neutral intentions (neither agree nor disagree that they plan to look into their pension situation). The majority of our sample indicated the intention to look into their individual pension situation: 37% agreed and 15% completely agreed with the statement to look into the personal pension situation.

2.1.2 Actions

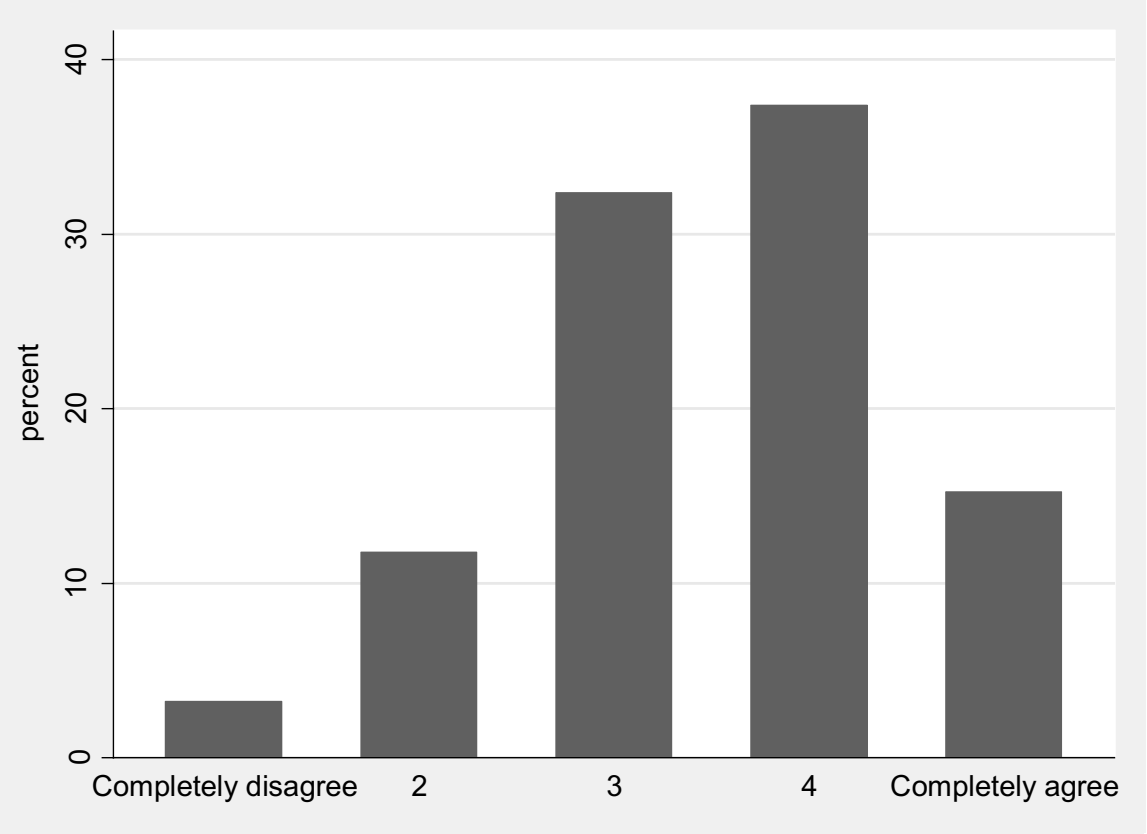
To investigate the relation between intentions and actions, all participants received an email inviting them to log in to their personal pension environment and to complete an online pension tool called the Pension Check. The Pension Check is an online tool that enables participants to check whether they have accumulated enough pension income for their retirement. When logging in to the Pension Check, participants had to use their personal digital identity code (DigiD), which is also used in communication with municipal and national government authorities. We refer to Dinkova et al. (2020) for more details on the Pension Check.

Administrative recording was done to identify whether participants clicked on the link in the invitation letter and whether they subsequently logged in to their digital pension environment. Such recording also took place of whether participants completed the Pension Check[3] and whether they committed themselves to checking their pension situation in the future once again by agreeing to receive a reminder to do the Pension Check a second time. We constructed a variable (action) that indicates

2 Possible answers are that the respondent has already delved into their pension situation (47 observations), is not interested in this topic (27 observations), or does not have the time (13 observations). Also there was a field allowing open text (48 observations).

3 On average, it took participants 13 minutes to complete the Pension Check.

Figure 1: Percentage shares of intention to look into pension information

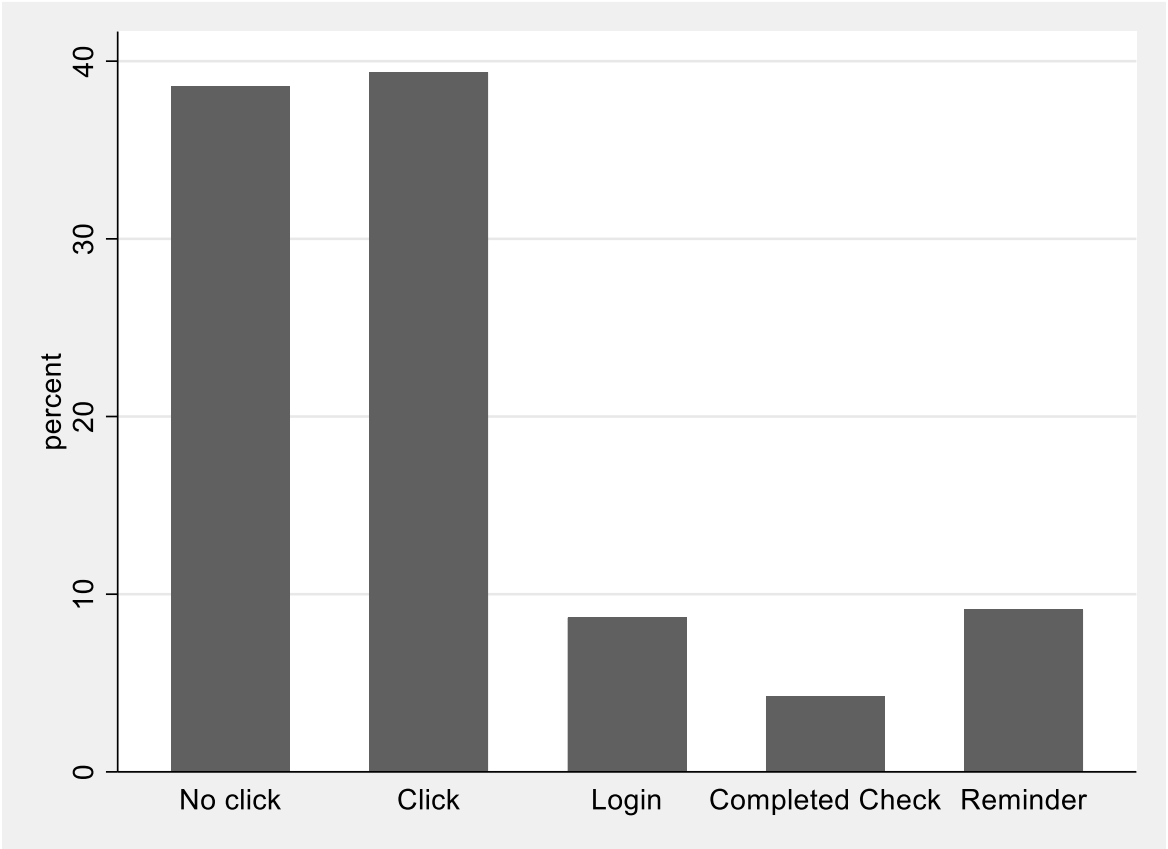


Notes: The underlying numbers for this Figure are in Table A2.

the action that participants took, with the following categories: 1) no action, 2) clicked on the link in the email invitation, 3) logged in to the online environment to do the Pension Check, 4) completed the Pension Check, and 5) indicated agreeing to be sent a reminder to do the Pension Check again in the future. For the empirical analysis, responses 3–5 are aggregated because only 82 participants completed the Pension Check, which is not enough for a meaningful statistical analysis on the individual differences between logging in and completing the Pension Check.

The percentage distribution of the participants' online behavior (referred to as actions from now on) is presented in Figure 2. This figure reveals that a relatively large share of the participants (almost 40%) does not take any action at all, meaning that they did not click through from the email invitation letter. Furthermore, there is a large difference in absolute percentage terms of participants who clicked on the link in the invitation letter (39%) and participants who logged in to the Pension Check (9%). If we consider conditional percentages, we find that, of the 61% of respondents who clicked on the invitation link, about one-third (22%) logged in to the Pension Check.

Figure 2: Percentage shares of different actions in online pension environment



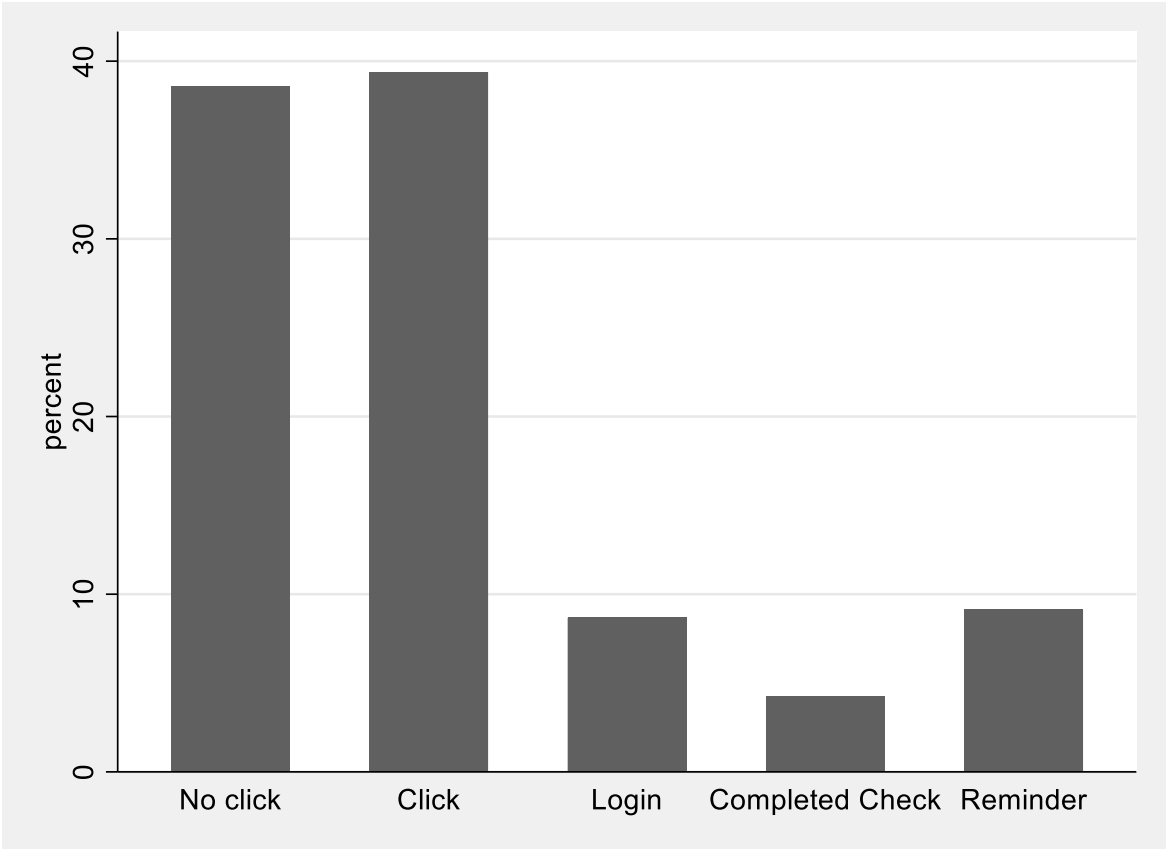
Notes: 'No click' refers to not having clicked on the invitation link, 'Click' to having clicked on the invitation link, 'Login' to having logged in to the Pension Check, 'Completed Check' to having completed the Pension Check, and 'Reminder' to having indicated (after having completed the Pension Check) to want to receive a reminder to do the Pension Check again in the future. The numbers for this figure are presented in Table A2.

2.1.3 Intentions versus actions

Figure 3 shows the percentage share distributions of actions conditional on each of the three intention categories. For this figure, and in line with the empirical analysis in the next section, the first two and last two categories of the intention variable (Figure 1) and the last three categories of the action variable (Figure 2) are combined because of the low number of observations.

The share of inactive participants, i.e. those who did not take any action, decreases with the level of intentions (Figure 3). For instance, compared to those with positive intentions, those with no intentions are 14 percentage points more likely not to click on the weblink (44% vs. 30%). Furthermore, the shares of participants who ultimately log in to the Pension Check are higher for those with positive intentions (10%) compared to those with no (7%) or neutral (7%) intentions.

Figure 3: Percentage shares of different actions, by intention category



Notes: The first two and the last two intention categories (see Figure 1) have been aggregated. The last three categories of the action variable (login to Pension Check, completed Pension Check, and indicating to want to do the Pension Check again in the future) have been aggregated in the category 'at least login'. The numbers for this figure are presented in Table A3 in the appendix.

2.2 Characteristics of participants and prima facie evidence on their relationships with intentions and actions

2.2.1 Measuring behavioral factors, financial skills, and background characteristics

Need for cognition (NFC) is a concept that is widely used in social psychology (see Cacioppo et al., 1986 and Pieters et al., 1987), that measures individual motivation to engage in cognitive demanding activities. Those cognitive demanding activities do not relate to a particular topic; hence we refer to them as general NFC. General NFC is measured by four questions on the extent to which the respondent enjoys being confronted with situations that require some cognitive effort. These items are based on Cacioppo et al. (1986) and Pieters et al. (1987).

'Thinking about things is not really my idea of having fun' and *'I like to think about new solutions to problems'* are two examples of how the questions are worded.

All items are measured on a 5-point Likert scale ranging from *completely disagree* to *completely agree*. An individual with low NFC does not derive pleasure from engaging in cognitive demanding activities, as opposed to a person with high NFC.

In order to elicit a person's motivation to think about pension-related issues, we developed a measure for NFC in the pension context. For this purpose, we developed three additional items (described in Dinkova, 2019) and included these in the survey to measure pension-related NFC. In particular, respondents were asked to indicate the extent to which they wished to be informed about their pension and how much they wished to look into it themselves. One item, for instance, was: '*I feel aversion when I need to deal with my pension*'.

We constructed the measure for general need for cognition by taking the average of the four questions. Cronbach's alpha is 0.66, suggesting a reasonable construct validity – a higher Cronbach's alpha (with a maximum of 1) suggests that all items consistently measure one concept. For the pension-related need for cognition measure we computed the average of the relevant three questions. Cronbach's alpha for this measure is 0.72.

As the goal of preparing for one's pension lies in the near or distant future, time preferences can be an important factor in explaining pension information behavior. We included three statements measuring time preferences based on Zimbardo (2015). Individuals had to answer questions on 1) the extent to which they are regularly occupied with issues that will have a result many years from now, 2) whether they would spend money on nice things today rather than saving for later, and 3) how important it is to take warnings seriously even they do not become relevant until a long time from now. All questions were measured on a 5-point Likert scale. To obtain one single measure on time preferences, we took the average of the answers to all three questions, resulting in a measure ranging from one to five. A score of 1 indicates an individual who focuses on the short term (preference for the present), while a score of 5 indicates one who looks far ahead (preference for the future). For this measure, Cronbach's alpha is 0.45[4].

Another factor that may explain actual or planned behavior is attitudes towards this particular behavior (see Ajzen, 1991; Eagly & Chaiken, 1993; Yzer, 2012). Respondents were asked to assess their attitudes regarding pension information, by ranking six separate characteristics on a 5-point Likert scale. In particular, respondents had to indicate the degree of importance of the information, how interesting

4 This is quite low. In alternative specifications, we included the questions on time preferences separately but found no changes in our results.

the information is, the level of difficulty, the reliability and clarity of the information, and how useful they consider the pension information. To avoid mechanical answers, the scales alternated from positive to negative and vice versa. Cronbach's alpha is 0.74, suggesting an acceptable construct validity.

Building upon studies by Nell (2017), Nell, Lentz and Pander Maat (2016), and Dinkova (2019), financial literacy was elicited with a multi-dimensional concept. It consists of numeracy and knowledge of financial concepts, topic knowledge (pension knowledge), self-assessed financial knowledge, and general literacy.

The classical approach in economic literature until now has focused on numeracy and basic knowledge of financial concepts, see Lusardi and Mitchell (2009, 2011) and Van Rooij et al. (2011). The following financial concepts are currently tested: interest compounding, inflation, risk diversification, and the relationship between bond prices and interest rate. See Lusardi and Mitchell (2011) for more details on these questions. To measure numeracy and knowledge of financial concepts, we constructed a score ranging from zero to four. Respondents received four questions to test their pension knowledge. The topics covered are occupational pensions (*aanvullend pensioen* in Dutch), basic state pension (*AOW*), life events that can impact one's pension, and the investment behavior of pension funds. Based on the answers, a score on pension knowledge ranging from zero to four was constructed.

To proxy literacy, we used a shortened version (nine questions) of the vocabulary test of Nell et al. (2016). Respondents were asked to identify the correct meaning of a complex word embedded in a specific context, in a multiple-choice setting. The words involved were general words that could be encountered in newspapers, books, or discussions. We computed a literacy score ranging from zero to nine. We also included a question on self-assessed financial knowledge, measured on a 7-point Likert scale.

Finally, we also included the following characteristics in our analyses: age, gender, education level, marital status, number of children, self-reported health, self-reported monthly net household income, and whether the participant is employed at the pension unit of the insurance company.

2.2.2 Intention and action levels by behavioral factors, financial skills, and background characteristics: prima facie evidence

For *prima facie* evidence on the relationships between characteristics and their intentions of participants and their actual behavior, Tables 1 to 3 provide sample means and raw correlations between 1) intentions or actions and 2) the behavioral variables, financial skills, and background characteristics. For easy reference, the first column in

Tables 1–3 gives the sample means of the covariates (independent of intention level or type of action).

A first observation is that age appears to be strongly correlated with intentions: a negative and significant correlation for participants aged 35–54 and a positive significant correlation for the oldest age group (Table 1).[5] This is confirmed by the sample means for each intention level: the percentages of participants aged 18–34 and 34–54 with negative intentions are substantially higher compared to those with positive intentions (21% vs. 13% and 69% vs. 51%, respectively).

As to the financial literacy measures, we find that self-assessed financial literacy is positively and significantly correlated with intentions. Regarding the behavioral factors, we find positive significant raw correlations between, on the one hand, intentions and, on the other hand, positive attitudes towards pension information, having a high need for cognition (pension-related) and being future-oriented.

There are no significant correlations between taking action and different age groups. Gender is positively correlated with taking action: see also the higher sample mean for the share of men who at least clicked on the invitation link to log in to the pension environment (Table 2). The correlation between self-assessed financial literacy and taking action is positive but somewhat weaker (higher p-value) than the correlation between intentions and self-assessed financial literacy. The positive correlations between actions and attitudes and pension-related need for cognition are significant but smaller (0.14 each) in magnitude compared to those correlations with intentions in Table 1 (0.30 for attitudes and 0.45 for pension-related need for cognition). Table 2 also shows a positive correlation between working at the pension unit of the insurance company and taking action.

Table 3 presents the sample means of 1) logging in versus not logging in, conditional on having clicked on the invitation link and 2) not having completed versus having completed the Pension Check, conditional on having logged in to the Pension Check. As the actions that participants could take in this study were all interdependent (one could only complete the Pension Check when also clicking on the invitation link and subsequently logging in to the Pension Check), Table 3 complements the statistics in Table 2.[6] Using the first three columns of Table 3, the groups of participants who are sensitive to digital barriers can be identified. The differences in sample

5 Reference to a correlation as being statistically significant relates to p-values of at most 1%.

6 For the sake of completeness, we included the sample means for having completed the Pension Check versus not having completed it, conditional on having logged in. As the sample proportions for those statistics are quite low (see bottom row of Table 3), we do not discuss those results in detail.

Table 1: Sample means by intention level and correlations

		Intention			
Variables	*Total*	*Negative*	*Neutral*	*Positive*	*Corr. Coeff.*
Male (0-1)	0.65	0.60	0.63	0.68	0.06
Aged 18-34 (0-1)	0.15	0.21	0.16	0.13	-0.08*
Aged 35-54 (0-1)	0.57	0.69	0.60	0.51	-0.13***
Aged 55-65 (0-1)	0.28	0.10	0.23	0.36	0.21***
Married (0-1)	0.82	0.81	0.82	0.82	0.00
Children in household (0-1)	0.57	0.64	0.64	0.51	-0.12***
Low household income (0-1)	0.24	0.27	0.26	0.22	-0.05
Middle household income (0-1)	0.39	0.38	0.39	0.40	0.02
High household income (0-1)	0.37	0.36	0.35	0.38	0.03
Poor health (0-1)	0.10	0.10	0.09	0.10	0.00
Medium health (0-1)	0.64	0.59	0.67	0.63	0.02
Excellent health (0-1)	0.26	0.31	0.24	0.26	-0.02
Low educated (0-1)	0.09	0.06	0.11	0.09	0.02
Medium educated (0-1)	0.30	0.26	0.33	0.29	0.01
High educated (0-1)	0.61	0.68	0.57	0.62	-0.02
Financial literacy (0-4)	3.29	3.33	3.16	3.35	0.05
Self-assessed financial literacy (1-7)	5.37	5.25	5.18	5.52	0.12***
Skills: pension knowledge (0-4)	2.54	2.59	2.48	2.56	0.01
Skills: reading vocabulary (0-9)	6.97	6.88	6.76	7.12	0.06
Attitudes pension info 1-5 (1=unimportant)	3.43	3.04	3.36	3.58	0.30***
Need for cognition, general (1-5)	3.67	3.54	3.63	3.74	0.13***
Decision-making, need for cognition, pensions (1-5)	3.48	2.79	3.32	3.77	0.45***
Decision-making, future time perspective (1-5)	3.46	3.11	3.36	3.62	0.32***
Works at pension unit (0-1)	0.14	0.16	0.12	0.14	0.00
Number of observations	899	135	291	473	
Sample proportion	1.00	0.15	0.32	0.53	

Notes: * p<0.05; ** p<0.01; *** p<0.005.(p-value of correlation coefficient).

means of logging in versus not logging in (conditional on having clicked) for men, different age, income and education levels suggest that women, older participants, those with lower income, and those with lower education level could be deterred by the digital barrier of logging in to look into their pension situation. Only the correlation between being male and logging in is statistically significant at the 1% level. Interestingly, we do not detect such differences in Table 3 for the behavioral and financial literacy variables.

Table 2: Sample means by action and correlations

	Action			
Variables	*Total*	*No click*	*Click*	*Corr. Coeff.*
Male (0-1)	0.65	0.63	0.67	0.10***
Aged 18-34 (0-1)	0.15	0.13	0.16	0.05
Aged 35-54 (0-1)	0.57	0.66	0.51	-0.06
Aged 55-65 (0-1)	0.28	0.21	0.33	0.03
Married (0-1)	0.82	0.80	0.83	0.00
Children in household (0-1)	0.57	0.60	0.55	-0.03
Low household income (0-1)	0.24	0.22	0.25	-0.01
Middle household income (0-1)	0.39	0.38	0.40	0.03
High household income (0-1)	0.37	0.39	0.35	-0.02
Poor health (0-1)	0.10	0.09	0.11	-0.01
Medium health (0-1)	0.64	0.64	0.64	-0.01
Excellent health (0-1)	0.26	0.27	0.26	0.01
Low educated (0-1)	0.09	0.07	0.10	-0.05
Medium educated (0-1)	0.30	0.30	0.29	-0.01
High educated (0-1)	0.61	0.62	0.61	0.04
Financial literacy (0-4)	3.29	3.28	3.29	0.07
Self-assessed financial literacy (1-7)	5.37	5.32	5.41	0.08*
Skills: pension knowledge (0-4)	2.54	2.53	2.55	0.07*
Skills: reading vocabulary (0-9)	6.97	6.97	6.97	0.01
Attitudes pension info 1-5 (1=unimportant)	3.43	3.32	3.49	0.14***
Need for cognition, general (1-5)	3.67	3.63	3.70	0.09**
Decision-making, need for cognition, pensions (1-5)	3.48	3.31	3.58	0.14***
Decision-making, future time perspective (1-5)	3.46	3.46	3.46	0.00
Works at pension unit (0-1)	0.14	0.12	0.15	0.10***
Number of observations	899	347	552	
Sample proportion	1.00	0.39	0.61	

Notes: * p<0.05; ** p<0.01; *** p<0.005.(p-value of correlation coefficient).

Table 3: Sample means by actions conditional on having clicked (or logged in)

Variables	Total	Conditional Action			
		No login|click	Login|-click	Not completed|Login	Completed|Login
Male (0-1)	0.65	0.62***	0.76***	0.77	0.76
Aged 18-34 (0-1)	0.15	0.15	0.19	0.17	0.20
Aged 35-54 (0-1)	0.57	0.50	0.54	0.49	0.57
Aged 55-65 (0-1)	0.28	0.35	0.28	0.35	0.23
Married (0-1)	0.82	0.82	0.83	0.92**	0.78**
Children in household (0-1)	0.57	0.55	0.55	0.53	0.57
Low household income (0-1)	0.24	0.27	0.22	0.22	0.22
Middle household income (0-1)	0.39	0.38	0.42	0.42	0.43
High household income (0-1)	0.37	0.34	0.36	0.36	0.36
Poor health (0-1)	0.10	0.12	0.09	0.10	0.08
Medium health (0-1)	0.64	0.63	0.64	0.65	0.63
Excellent health (0-1)	0.26	0.25	0.27	0.24	0.29
Low educated (0-1)	0.09	0.12*	0.07*	0.14***	0.02***
Medium educated (0-1)	0.30	0.30	0.28	0.31	0.27
High educated (0-1)	0.61	0.58	0.65	0.55*	0.72*
Financial literacy (0-4)	3.29	3.24*	3.39*	3.35	3.43
Self-assessed financial literacy (1-7)	5.37	5.37	5.48	5.26*	5.63*
Skills: pension knowledge (0-4)	2.54	2.49*	2.64*	2.59	2.68
Skills: reading vocabulary (0-9)	6.97	6.92	7.07	7.15	7.01
Attitudes pension info 1-5 (1=unimportant)	3.43	3.46	3.55	3.50	3.59
Need for cognition, general (1-5)	3.67	3.66	3.77	3.70	3.81
Decision-making, need for cognition, pensions (1-5)	3.48	3.56	3.61	3.61	3.61
Decision-making, future time perspective (1-5)	3.46	3.46	3.46	3.49	3.44
Works at pension unit (0-1)	0.14	0.12*	0.19*	0.10**	0.25**
Number of observations	899	354	198	78	120
Sample proportion	1.00	0.39	0.22	0.09	0.13

Notes: * p<0.05; ** p<0.01; *** p<0.005.(p-value of correlation coefficient).

3. Empirical analysis

Our empirical framework consists of three equations to model the intentions of participants to look into their pension situation and their revealed actions of clicking on the weblink and logging in to the Pension Check. We refrain from modeling further actions, such as having completed the Pension Check, because of a low number of observations (see, for example, Figure 2). Intentions are modeled with an ordered probit model, and each of the two actions is modeled with a probit model. These three models are simultaneously estimated by maximum likelihood.[7] A participant can only log in to the Pension Check after having clicked on the weblink, and all equations control for the same individual characteristics. Model identification is therefore achieved by assuming independence between the two actions of clicking and logging in. Correlations between the two actions and intentions are allowed for; these can, for example, account for individuals with unobserved stronger intentions to look into their pension information to be more (or less) likely to take actions.
The main aim of the empirical analysis is to identify groups of participants who experience a barrier in the form of a digital hurdle in realizing their intention to explore their financial pension situation (i.e., the action of logging in to the Pension Check after having clicked on the link). Given that we have observational data, we refrain from making causal inferences. Table 4 provides the full set of estimation results.

3.1 Intentions, the action of clicking, and Inertia

For the intention model (first column in Table 4), we find that individuals with a higher need for cognition (in the pension context) are more likely to intend to look into their pension situation. The same holds for individuals who focus on the longer term.

The estimated probabilities of taking action (at the highest action level) in the second column of Table 4 reveal interesting results as well. For instance, young (aged 18–34) and senior participants (aged 55–65) are more likely to take action than their middle-aged counterparts. Again, we find that participants with a higher need for cognition regarding pensions are more likely to take action (similar to the intention model).

Regarding time preferences, we find that the individuals with a focus on the longer term are *less* likely to take action. Regarding the third model, we find that men are more likely than women to log in to the Pension Check, conditional on having clicked on the invitation link.

7 We used the Stata module *cmp* written by Roodman (2009).

Table 4: Estimation results

Marginal effects	*P(Positive intentions)*	*P(Click link)*	*P(Login Pens. Check|Click link)*
Variables	*Coeff. (SE)*	*Coeff. (SE)*	*Coeff. (SE)*
Male	*-0.021*	*-0.002*	*0.158****
	(0.037)	*(0.038)*	*(0.049)*
Aged 18-34	*-0.03*	*0.161****	*0.085*
	(0.050)	*(0.054)*	*(0.066)*
Aged 55-65	*0.081*	*0.118***	*-0.095*
	(0.045)	*(0.045)*	*(0.056)*
Married (0-1)	*-0.021*	*0.095**	*-0.012*
	(0.051)	*(0.051)*	*(0.068)*
Children in household (0-1)	*-0.082**	*0.02*	*-0.037*
	(0.038)	*(0.038)*	*(0.047)*
Low household income	*-0.056*	*0.068*	*-0.055*
	(0.048)	*(0.050)*	*(0.062)*
High household income	*-0.013*	*-0.039*	*-0.019*
	(0.039)	*(0.040)*	*(0.050)*
Poor health	*0.004*	*0.041*	*-0.047*
	(0.057)	*(0.059)*	*(0.075)*
Excellent health	*-0.016*	*0.011*	*0.004*
	(0.039)	*(0.039)*	*(0.049)*
Low educated	*-0.032*	*0.052*	*-0.065*
	(0.064)	*(0.066)*	*(0.084)*
High educated	*-0.001*	*0.033*	*0.001*
	(0.040)	*(0.041)*	*(0.052)*
Financial literacy (0-4)	*0.021*	*0.001*	*0.026*
	(0.024)	*(0.025)*	*(0.032)*
Self-assessed financial literacy (1-7)	*-0.026*	*-0.01*	*-0.026*
	(0.018)	*(0.018)*	*(0.023)*
Skills: pension knowledge (0-4)	*-0.057**	*0.006*	*0.047*
	(0.024)	*(0.025)*	*(0.033)*
Skills: reading vocabulary (0-9)	*-0.006*	*-0.002*	*-0.005*
	(0.009)	*(0.009)*	*(0.011)*
Attitude pension info 1-5 (1=unimportant)	*0.068**	*0.061*	*0.057*
	(0.033)	*(0.034)*	*(0.041)*
Need for cognition, general (1-5)	*-0.033*	*0.027*	*0.023*
	(0.032)	*(0.032)*	*(0.041)*
Need for cognition, pensions (1-5)	*0.256****	*0.099****	*0.007*
	(0.029)	*(0.028)*	*(0.037)*
Time preferences (1-5, 1=short term)	*0.204****	*-0.077**	*-0.037*
	(0.033)	*(0.033)*	*(0.044)*
Employed at pension unit	*-0.073*	*0.039*	*0.091*
	(0.049)	*(0.050)*	*(0.061)*
Predicted probability for a reference person[a)]	*0.547*	*0.521*	*0.377*
	(0.043)	*(0.045)*	*(0.056)*

Notes: * p<0.05; ** p<0.01; *** p<0.005. Number of observations = 899. The estimated correlation coefficients: between intentions and clicking equal to 0.166 (p-value = 0.002), and between intentions and login (conditional on clicking) equal to -0.016 (p-value= 0.788). The correlation coefficient between clicking and login is set equal to zero. a) Reference person: female, aged 35-54, middle household income, good health, and medium education level. All skills and decision-making variables are expressed in deviations from their mean.

Table 5: Predicted probabilities of clicking, conditional on having the positive intention to look into the pension situation

	P(click| Positive intentions)		Difference with reference person	
	Coef.	(SE)	Coef.	(SE)
Reference person	0.569	(0.044)		
Gender				
• Female	0.569	(0.044)		
• Male	0.569	(0.058)	0.000	(0.039)
Age category				
• Young (18–34)	0.728	(0.054)	0.159***	(0.049)
• Medium (35–54)	0.569	(0.044)		
• Senior (55–65)	0.679	(0.045)	0.111*	(0.044)
Need for cognition, pensions				
• Low	0.493	(0.054)	−0.075*	(0.030)
• Medium	0.569	(0.044)		
• High	0.647	(0.050)	0.078***	(0.028)
Time preferences				
• Short term	0.668	(0.049)	0.100***	(0.032)
• Neutral	0.569	(0.044)		
• Long term	0.469	(0.059)	−0.100***	(0.034)

Notes: The findings for the selected group of participants in this table are based on the full set of results (Table 4). Reference person: female, medium age (35–54), education and income, medium need for cognition, and neutral time preferences, and the averages of other right-hand side variables. * p<0.05; ** p<0.01; *** p<0.005.

Based on those results, we zoom in on the following characteristics to further examine inertia: gender, different age groups, different levels of pension-related need for cognition, and time preferences. We selected these groups based on their (joint) significance level; it should be at least at the 0.5% level for the results to be plausibly replicable (Benjamin et al., 2018).[8]

Table 5 presents the predicted conditional probabilities of at least clicking on the link in the invitation mail, conditional on the positive intention to delve into pension information for men and women, different age groups, different levels of need for cognition (pensions), and different levels of time preferences. To put the results into perspective, we present in the first row the predictions for the reference person. This reference person is female, of middle age, with medium need for cognition, neutral time preferences, and average scores on health, income level, and skills. The last two columns show the differences for the different groups versus the reference person.

8 The test results are in line with what can be inferred from Table 5, based on individual levels of significance. These results are available upon request.

Table 6: Predicted probabilities to log in to the Pension Check, conditional on having the positive intention to look into pension information

	P (login| Positive intentions)		Difference with reference person	
	Coef.	(SE)	Coef.	(SE)
Reference person	0.372	(0.056)		
Gender				
• Female	0.372	(0.056)		
• Male	0.540	(0.075)	0.168***	(0.052)
Age category				
• Young (18–34)	0.460	(0.081)	0.089	(0.070)
• Medium (35–54)	0.372	(0.056)		
• Senior (55–65)	0.280	(0.054)	–0.091	(0.054)
Need for cognition, pensions				
• Low	0.326	(0.064)	–0.046	(0.033)
• Medium	0.372	(0.056)		
• High	0.419	(0.066)	0.048	(0.035)
Time preferences				
• Short term	0.407	(0.068)	0.036	(0.046)
• Neutral	0.372	(0.056)		
• Long term	0.337	(0.074)	–0.035	(0.043)

Notes: The findings for the selected group of participants in this table are based on the full set of results (Table 4). Reference person: female, medium age (35–54), education and income, medium need for cognition, and neutral time preferences, and the averages of other right-hand side variables. * p<0.05; ** p<0.01; *** p<0.005.

Relative to the reference person in the sample, the conditional probabilities of clicking are higher for individuals who belong to the young and senior age groups, individuals with a high need for cognition regarding pensions, and individuals with a short-term focus. In other words, respondents belonging to the senior age group, people with a high need for cognition related to pensions, and people with a focus on the short term are *less inert* if we consider the clicking behavior of people.

Summarizing, the empirical evidence is in support of participants aged over 55, participants with a high need for pension-related cognition, and participants with a short-term focus being more likely to click on the weblink to the tool, conditional on having the positive intention to look into their pension situation. These main findings are in line with the patterns observed in Tables 1–3.

3.2 A barrier: the digital hurdle

To obtain more information on their pension situation, respondents had to log in to the digital environment. Logging in is a task that, arguably, requires more digital skills than simply clicking on an invitation link in an email: participants need to log in with

their DigiD. Hence, they need to have their login name and password ready at hand or to have the DigiD application installed on their cell phone.

Table 6 presents the predicted probabilities to log in to the Pension Check using the DigiD, conditional on having clicked on the invitation link. It shows the results for men and women, for different age categories, different levels of need for cognition (pensions), and time preferences. For easy reference, we included the base level (reference group) in the first row. It shows that participants in this reference group have a roughly 37% probability to log in, conditional on having the positive intention to look into their pension situation.

As to the individual differences, the findings support the observation that men with positive intentions are more likely to log in than women with the same intentions. Furthermore, respondents belonging to the senior age group are 18 percentage points less likely to log in than their younger counterparts. This 18 percentage point difference is suggestive evidence with a p-value of 0.02 (not reported in the table). These findings are in line with those of Non and Dinkova (2021) on digital skills in The Netherlands, as they show that women, older people, and the lower educated have, on average, lower digital skills.

4. Conclusions and discussion

In this final section, we first summarize our conclusions. That is followed by a discussion of the results and our policy recommendations. We conclude this section with several avenues for future research.

4.1 Conclusions

We studied individual differences in inertia, and we provided insights into a specific barrier which inhibited less inert groups to explore their pension situation. Someone is inert if he or she did not take any action despite having indicated having the positive intention to engage in pension planning. The intention to look into one's pension situation was elicited in a survey, along with other characteristics; actual pension planning (action) was obtained by monitoring participants' clicking behavior in an online pension tool. Clicking behavior consisted of 1) clicking on the email invitation link to log in to the pension tool (the Pension Check), 2) logging in to the Pension Check using the DigiD, 3) completing the Pension Check, and 4) indicating to wish to receive a reminder to do the Pension Check in the future again.

We find that participants aged 55-65, with a high need for cognition about pensions, and with focus on the shorter term are less inert. In other words, they are more likely to take action (conditional on having positive intentions) than their younger counterparts with a lower need for cognition and focus on the longer term.
For our estimation sample, we did not find differences in pension planning behavior for people with different levels of financial and other knowledge or income, suggesting that pension planning competes – often unsuccessfully – with the daily routine of households rather than being driven by material or emotional reasons.

Additionally, we find that logging in to the Pension Check constitutes a substantial barrier for looking into pension information: of the 61% of respondents who clicked on the invitation link, only about one-third (22%) logged in to the Pension Check. This barrier was found to be relatively higher for women than for men. Moreover, this barrier is high enough for active (less inert) and motivated participants to stop exploring their pension situation, despite showing a positive intention to do so.

4.2 Discussion and policy recommendations

The results we present in this study cannot be generalized to the overall Dutch population since we analyzed a selective subsample of Dutch pension plan participants. This is due to the overlap with the survey responses and the characteristics of the

research population, namely employees of an insurance company who would have an affinity with finance.

Why would participants aged 55 or older be less inert? A possible explanation is that they recognize the urgency of looking into their pension situation because their retirement does not lie far ahead (Dinkova et al., 2020). Similarly, participants who have a preference for thinking about pensions and pension information (high need for cognition) are intrinsically more motivated and are thus more likely to take action (Cacioppo et al., 1986). Interestingly, individuals who focus on the longer term are more inert than those with a short-term focus. Krijnen et al. (2015) provide a possible explanation for this result. They find that people postpone taking action concerning important decisions (such as anything pertaining to pensions) rather than rushing it. But then again, the decision we focus on here is not the decision to retire but the decision to plan for retirement.

Online pension planning tools aim at facilitating a person's preparation for retirement by providing transparent and accessible information. Policymakers and pension plan providers should be aware of three challenges that could hinder participants to use personalized online pension information to plan their retirement adequately and on a timely basis.

The first challenge is to motivate pension participants who have no positive attitude towards pension information and no intention to explore their future financial situation. In our data we identified three such groups: younger participants, middle-aged participants, and women. It is likely that different communication strategies are needed for these groups in order to help them change their intentions.
The second challenge is to motivate the group of inert participants who do realize the importance of delving into their pension situation, but who, due to emotional or material reasons or simply their daily routine, do not take action. Conducting field experiments that involve different incentive schemes (tailoring information, lotteries, lump sum payments, or other non-monetary options) can provide valuable insights into what might work and what not. For instance, Dinkova et al. (2020) showed no effect of tailored information on pension planning behavior, but other tailoring strategies might be more successful.

The third challenge is to remove barriers for participants who are motivated to look into their pension situation but who do not do so because they experience a digital hurdle: they lack the skills to log in to their pension environment (and to subsequently upload their salary data). Two strategies might help: (1) lowering the hurdle when developing pension tools, and (2) empowerment through training of participants who need digital skills most in order to catch up with the ongoing

digitalization. Logging in with the DigiD has become increasingly common since 2016, especially since the start of online registration for testing and vaccination during the current COVID-19 pandemic.

4.3 Avenues for future research

To conclude, we offer several avenues for future research. Firstly, combining administrative login data with survey data appears to be a powerful means to understand why employees do not always act upon what pension communication tries to induce them to do. Combining these types of data can be very valuable and is worthwhile for future research, even though it is more costly in terms of management and privacy needs compared to purely administrative data. This study is a first effort. Ideally, researchers will collect data in close cooperation with an organization in the sector and thereby benefit from each other's expertise.

Secondly, it is essential that this type of research is conducted at a significantly greater scale. This would enable statistically sound analyses of subgroups and add more nuance to the analyses. This could be achieved, for instance, by using a large representative panel.

Thirdly, research on pension communication must include financial literacy, as that is an explanatory factor for differences in pension planning behavior. As our results show, there are two more variables which deserve more attention in future studies on pension planning behavior: the need for cognition and time preferences.
Fourthly, further research is needed on how to approach people who are inhibited in their pension planning because of digital barriers. People often log in at home with their DigiD to gain access to a pension tool with personal financial information. Alternative approaches, such as logging in at work without the need to identify oneself through a DigiD, in a specially designed pension booth, could be a way to bring pension planning closer to those for whom the digital barrier is the highest. A specific control question in a survey, to separate digitally savvy people from those who experience difficulties with digital tools, could be to ask whether people file their tax forms online personally.

Another interesting direction for future research is to follow people, for instance up to ten years after they have retired, and compare their preferences and needs before and after retirement. Would participants think in retrospective, 'I wish I had looked more closely at my pension situation'?

The topic of online pension communication, plus the factors that motivate or inhibit individuals to plan for their pension, remain very relevant and offer ample opportunities for further research in the field. As the data for this study were collected

in 2016, five years ago, it is important to map the developments since then. The digital barrier we discussed in this study has probably shrunk as new tools with easier access have been launched by pension plan providers since that time. Qualitative research investigating those trends would be of great added value.

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Appendix A. Data description

Table A1: Variable description

Variable	Description
Action	Categorical variable: 0 if not clicked through from the email invitation and no login; 1 if clicked through but no log in to the Pension Check; 2 if clicked through and logged in but did not spend time in the Pension Check; 3 if clicked through, logged in and actively spent time in the Pension Check; 4 if actively spent time in the Pension Check and indicated to wish to receive a reminder to go through the Pension Check again in the future.
Intention	Intention to look into pension situation; 5-point Likert scale: 1 = no intention, 5 = very determined to look into pension situation; truncated to 3-point scale for the analysis.
Age	Categorical variable: aged 18-34, aged 35-49 (reference category), and aged 50 or older.
Education	Categorical variable: low education (lower vocational training), medium education (higher vocational training or high school diploma, reference category), and high education (university of applied sciences or higher)
Married	Categorical variable: married or cohabiting (=1) and single (=0)
Kids	Categorical variable: has children (=1)
Subjective health	Self-reported health; categorical variable: poor health (=1), reasonable health (=2, reference category), excellent health (=3).
Income	Self-reported net monthly household income; categorical variable: €3,000 or less (=1), between €3,001 and €4,500 (=2, reference category), more than €4,501 (=3).
Works in pension unit	Categorical variable: works in pension unit of insurance company (=1).
Attitudes re pension info	Mean of six questions on attitudes re pension information (continuous, ranging from 1=negative attitude to 5=positive attitude).
Need for cognition (general)	Extent to which one chooses to think about things and be informed; mean of four questions (continuous, ranging from 1= low need for cognition to 5= high need for cognition).
Need for cognition (pensions)	Extent to which one chooses to think about pensions and be informed; mean of three questions (continuous, ranging from 1= low need for cognition to 5= high need for cognition).
Self-assessed financial literacy	7-point Likert scale: 1= very poor financial knowledge; 7= very good financial knowledge.
Time preferences	Extent to which one takes the future into account when making decisions; mean of three questions (continuous, ranging from 1=short-term focus to 5=long-term focus).
Pension knowledge	Score on pension knowledge test (0-4) based on four multiple choice questions.
Literacy	Score on vocabulary test (0-9) based on 9 multiple choice questions.
Financial literacy questions (big four)	Score on classic financial literacy questions (0-4) testing numeracy and knowledge of financial concepts (interest compounding, inflation, stocks, and bond prices)

Table A2: Distribution of intention, action, and socioeconomic variables

Variable	Level	% share	Obs.
Intention	Completely disagree	3.23	29
	Disagree	11.79	106
	Neither disagree nor agree	32.37	291
	Agree	37.37	336
	Completely agree	15.24	137
Action	No click	38.60	347
	Click	39.38	354
	Login on Pension Check	8.68	78
	Completed Pension Check	4.23	38
	Wishes reminder to do Pension Check again	9.12	82
Socioeconomic variables			
Gender	Female	34.71	312
	Male	65.29	587
Age	18–34 years	15.13	136
	35–54 years	56.73	510
	55–65 years	28.14	253
Married or cohabiting	Yes	81.65	734
	No	18.35	165
Children living at home	Yes	56.06	513
	No	42.94	386
Household income (net, monthly)	Low household income	24.03	216
	Medium household income	39.27	353
	High household income	36.71	330
Self-assessed health	Poor health	9.90	89
	Acceptable health	63.85	574
	Excellent health	26.25	236
Education level	Low education	9.01	81
	Medium education	29.70	267
	High education	61.29	551
Works in pensions unit	Yes	13.79	124
	No	86.21	775

Table A3: Cross-tabulation actions, by intention level (in percentage terms)

		Intention level		
		Negative	Neutral	Positive
Action	No click	47.41	47.08	30.87
	Click	29.63	36.08	44.19
	Login on Pension Check	7.41	6.87	10.15
	Completed Pension Check	5.19	3.78	4.23
	Reminder of Pension Check	10.37	6.19	10.57

Notes: The columns add up to 100%.

Appendix B. Relevant survey questions

All questions were in Dutch. The complete questionnaire in Dutch is available from the corresponding author upon request.

i. Intention
I am planning to delve into information regarding my retirement soon:
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

Follow-up question (If answered "completely disagree or disagree"):
You indicate that you are not planning to look into information regarding your pension anytime soon. What is your reason for this?
☐ I already looked into my pension situation
☐ I don't find pensions interesting
☐ I don't have time
☐ Other, namely ____(*Open text box*)

ii. Demographics
What is your date of birth? (DD/MM/YYYY)
What is your gender?
☐ Male
☐ Female

What is your household situation?
☐ single
☐ single with children living at home
☐ married or cohabiting, without children living at home
☐ married or cohabiting, with children living at home
☐ other, namely [...]

How many children do you have (living at home or elsewhere)?
[0–12]
What is your monthly total net household income?
☐ no income
☐ EUR 500 or less
☐ EUR 501 to EUR 1,000
☐ EUR 1,001 to EUR 1,500
☐ EUR 1,501 to EUR 2,000
☐ EUR 2,001 to EUR 2,500
☐ EUR 2,501 to EUR 3,000
☐ EUR 3,001 to EUR 3,500
☐ EUR 3,501 to EUR 4,000
☐ EUR 4,001 to EUR 4,500
☐ EUR 4,501 to EUR 5,000
☐ EUR 5,001 to EUR 7,500
☐ More than EUR 7,500
☐ I don't know
☐ I don't want to answer this

What is your highest obtained diploma (or educational level)?
☐ Elementary school
☐ Lower secondary vocational education, domestic sciences school [LBO, huishoudschool]
☐ Pre-vocational education (middle management-oriented learning path) [VMBO]
☐ Pre-vocational education (theoretical learning path) [VMBO-T or MAVO]
☐ Senior secondary vocational education and training level 1 [MBO niveau 1]
☐ Senior secondary vocational education and training level 2 [MBO niveau 2]
☐ Senior secondary vocational education and training level 3 [MBO niveau 3]
☐ Senior secondary vocational education and training level 4 [MBO niveau 4]
☐ Further extended primary education [MULO/MMS]
☐ Secondary modern school [HBS]
☐ Senior general secondary education [HAVO]
☐ University preparatory education [VWO]
☐ University of applied science (college) [HBO]
☐ University
☐ Other

If the respondent crossed "other", the following question appears:
You have indicated that your education falls under the category "other". Here you can provide more details about it: [text box]
The original Dutch abbreviations are in square brackets.

Subjective health
In general, how would you rate your health?
☐ Excellent ☐ Very good ☐ Good ☐ Acceptable ☐ Poor

iii. *Need for cognition*
People differ in the extent to which they like to delve into things. Below are several questions about how much you like to think about and learn about things.

To what extent do you agree with the following statements? [general NFC]
I like to be in a situation where I need to think a lot.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

Thinking about things is not really my idea of having fun.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

To consider something in a prolonged and precise way gives me satisfaction.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

I like to look into new solutions to problems.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

To what extent do you agree with the following statements? [pension-related NFC]
I want to be informed in detail about everything related to my pension.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

I like to delve into information regarding the amount of my pension entitlement.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

I feel aversion when I need to deal with my pension.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

iv. Time preferences
Below are several questions on how important you consider dealing with the future.

I am regularly occupied with issues that will have a result many years from now.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

I'd rather spend money on nice things today than saving money for later.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

I think that it is important to take warnings seriously, even though the issues involved do not become relevant until a long time from now.
☐ Completely disagree ☐ Disagree ☐ Don't disagree, don't agree ☐ Agree ☐ Completely agree

v. Attitudes regarding pension information
What is your attitude on information regarding your pension?
I find information regarding my pension: [horizontal 5-point scale]

Unimportant	☐ ☐ ☐ ☐ ☐	Important
Interesting	☐ ☐ ☐ ☐ ☐	Uninteresting
Difficult	☐ ☐ ☐ ☐ ☐	Easy
Reliable	☐ ☐ ☐ ☐ ☐	Unreliable
Unclear	☐ ☐ ☐ ☐ ☐	Clear
Useful	☐ ☐ ☐ ☐ ☐	Useless

vi. Financial literacy (vocabulary test, self-assessed financial literacy, classic financial literacy questions and pension knowledge)
[Note that the correct answers are marked in italics]

Vocabulary test
Pension information should be understandable for everyone, both for people who are used to reading a lot and for people with lower language skill. Which language use are you used to? Below you will find several questions about words that are more or instead less familiar. Don't think about the answers for too long, this is not a test. If you do not know the answer, then don't guess but fill in "I don't know" instead.

She is known to be a **philanthropist**.
What does this word mean?
☐ Someone who is very rich
☐ Someone who adjusts her opinion according to changing circumstances
☐ Someone who is a victim of fraud
☐ *Someone who gives a lot to the poor*
☐ I don't know

His contribution to this work is **marginal**.
What does this word mean?
☐ Large
☐ *Small*
☐ Positive
☐ Negative
☐ I don't know

He is a **demagogue**.
What does this word mean?
☐ Someone who does a lot for the common people
☐ Someone who lets the people co-decide
☐ Someone who represents the people in Parliament
☐ *Someone who misleads the people*
☐ I don't know

She has no **scruples**.
What does this word mean?
☐ Setbacks
☐ *Guilty conscience*
☐ Stress
☐ Responsibilities
☐ I don't know

His statements were **unambiguous**.
What does this word mean?
☐ *Clear*
☐ Unclear
☐ Friendly
☐ Unfriendly
☐ I don't know

It is **equitable** for him to pay back.
What does this word mean?
☐ Probable
☐ Necessary
☐ *Reasonable*
☐ Unjust
☐ I don't know

He is an **erudite** man.
What does this word mean?
☐ Attractive
☐ *Learned*
☐ Unreasonable
☐ Thick
☐ I don't know

The level of **segregation** in the Amsterdam suburb Bijlmer has increased.
What does this word mean?
☐ Crime
☐ Nuisance due to vandalism
☐ Cooperation between groups
☐ *Separated living of groups*
☐ I don't know

She is being **megalomaniac**.
What does this word mean?
☐ *Has delusions of grandeur*
☐ Is insecure
☐ Is somber
☐ Is hyperactive
☐ I don't know

Self-assessed financial literacy
How would you assess your knowledge about money issues?
Very poor ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very good

Financial literacy questions developed by Lusardi and Mitchell
Question on interest compounding (Q1)
Suppose you have 100 euros in a savings account and the interest rate is 2% per year.
How much do you think you will have in the savings account after five years, assuming that you leave all your money in this account?
☐ *More than 102 euros*
☐ Exactly 102 euros
☐ Less than 102 euros
☐ I don't know

Question on inflation (Q2)
Suppose that the interest rate on your savings is 1% per year and that inflation amounts to 2% per year. After 1 year, would you be able to buy more, exactly the same, or less than you could today with the money on that account?
☐ More than today
☐ Exactly the same as today
☐ *Less than today*
☐ I don't know

Question on risk diversification (Q3)
A share issued by a single company usually offers a more certain return than a fund that invests in shares issued by various companies.*
☐ True
☐ *Not true*
☐ I don't know

*We changed the wording of this question slightly compared to Lusardi and Mitchell (2011) in order to make the question less ambiguous.

Question on relation between bond prices and interest rate (Q4)
If the interest rate goes up, what would happen to bond prices?
☐ They would increase
☐ *They would decrease*
☐ They would stay the same
☐ None of the above
☐ I don't know

Pension knowledge
Which factors influence the pension that you receive through your employer? Mark the answer that you think has influence (several answers are possible):
☐ *The hourly wage that you earn*
☐ Whether or not you receive the state pension [AOW in Dutch]
☐ *The number of years you have worked until your retirement*
☐ None of the above

Does someone with a higher pension receive less state pension?
☐ *No, the amount of the state pension has no impact on the amount of the pension.*
☐ No, the state pension is a fixed percentage of the pension: someone with a high pension receives a higher state pension than someone with a lower pension.
☐ Yes, someone who has a pension above 100,000 euros per year receives less state pension as from the beginning of 2016.
☐ I don't know

Which life changes can impact your personal future pension? Mark the factors that you think have an impact (several answers are possible):
☐ *Your partner stops working*
☐ You get children
☐ *You receive a promotion*
☐ You become divorced
☐ *You start to work less*
☐ None of the above changes

Why do pension funds invest money in shares?
☐ *Pension funds invest in shares to obtain a higher return in the long run than when depositing the money in a savings account.*
☐ Pension funds invest in shares in order to be able to pay their employees and to cover other expenses.
☐ Pension funds invest in shares since they trust companies more than the government.
☐ I don't know

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