

The effect of tailoring pension information on navigation behavior

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Abstract**The effect of tailoring pension information on navigation behavior**

In this study, we analyzed whether tailoring the general structure of pension information on the basis of age affects the navigation behavior of participants. We conducted a randomized control experiment (RCE) among 8,563 employees of several firms, who were enrolled in a new company pension scheme. Participants were sent a generic invitation email to log into the digital pension environment (DPE) and were subsequently randomly assigned tailored versions of digital pension information, based on their age. The effect of tailoring on the participants' navigation behavior was analyzed on the time spent in the DPE and clicking on relevant pension information. Tailoring of the DPE was based on selected goals that were relevant for the separate age groups. Five percent of the participants logged into the DPE. We found no tailoring effect for young participants regarding the goal of knowing how their pension is arranged. Concerning the goal of knowing whether one is on track, tailoring the structure of the pension document was effective in distracting young participants from clicking on information not relevant to them and in motivating senior participants to click on relevant information. As for the goal of awareness of the choices available, we found that tailoring worked for senior participants as they clicked more on relevant pension information.

Samenvatting

Het effect van maatwerk in pensioeninformatie op navigatiegedrag

Consumenten worden steeds vaker geconfronteerd met informatie over hun pensioen. Dit leidt tot een overvloed aan informatie, wat hinderlijk kan zijn bij het nemen van een optimale pensioenbeslissing. In een gerandomiseerd veldexperiment hebben wij getoetst of het aanpassen van de structuur van pensioeninformatie aan de leeftijd van deelnemers een effect heeft op hun navigatiegedrag. Dit experiment werd gevoerd onder 8563 nieuwe deelnemers aan een werknemerspensioenregeling bij een Nederlandse verzekeraar. Voor elk van drie leeftijdscategorieën definieerden wij in samenwerking met pensioenexperts doelen die de meeste aandacht bij het opstellen van pensioencommunicatie verdienen. Dit resulteerde in drie versies van pensioeninformatie op maat naast de generieke versie. Voor jonge deelnemers wordt het belangrijk geacht te weten hoe hun pensioen geregeld is. Oudere deelnemers en deelnemers van middelbare leeftijd willen geïnformeerd worden over de keuzes die zij hebben binnen hun pensioenregeling en of ze op koers liggen met sparen voor hun oude dag. Deelnemers ontvingen een generieke uitnodiging om in te loggen op hun digitale persoonlijke pensioenomgeving. Vervolgens werden zij willekeurig een digitaal pensioendocument op maat toegewezen. In deze studie bestudeerden wij het effect van maatwerk op navigatiegedrag door te kijken naar de tijd die in de digitale pensioenomgeving besteed werd door de deelnemers en door het klikgedrag op relevante pensioeninformatie per doel te meten. Wat betreft de tijd besteed in de digitale pensioenomgeving konden wij geen significante verschillen aantonen tussen de handelingen van deelnemers met generieke pensioeninformatie en die met informatie op maat. Maatwerk in de navigatiestructuur van pensioencommunicatie slaagt erin om jonge deelnemers af te leiden van (nog) niet relevante informatie maar slaagt er echter niet in om hen te motiveren om op relevante informatie te klikken. Hetzelfde resultaat geldt voor deelnemers van middelbare leeftijd. Voor oudere deelnemers had maatwerk het beoogde effect: zij klikten op relevante informatie en niet op niet-relevante informatie.

1. Introduction

During the past several decades, the ease of access to any type of information through computers, but also through tablets and mobile phones, has increased tremendously. Organizations that provide financial services face the challenge of providing accurate information to their customers and at the same time limiting the costs that arise with it. These organizations also need to comply with legal requirements regarding the transparency and intelligibility of the information transmitted to their customers. These obligations are set out in the Pension Communications Act (Wet pensioencommunicatie) that was enacted by the Dutch parliament in 2015. An unintended consequence of the disclosure that was mandated by this law is information overload, which hampers consumers in making optimal financial decisions (Iselin, 1988; Lee & Lee, 2004)¹. A side effect of being confronted with a large volume of information is that consumers feel swamped and less motivated to process all this pension information in their minds.

An additional problem caused by information overload is that of accumulation (Ben-Shahar & Schneider, 2011). In their rather extensive critique on mandated disclosure², Ben-Shahar and Schneider argue that “in disclosees’ lives, each disclosure competes for their time and attention with other disclosures [...] and with everything they do besides collecting information and making decisions” (p. 689). This causes disclosees to give up and not read (or not proficiently) all the disclosures. Consequently, the challenge for researchers and ultimately policymakers and pension organizations is to figure out how to rescue these drowning consumers and to motivate them to find their way through the ocean of pension information. In a review of the communication activities of pension organizations in a changed regulatory environment, Nell (2017) concludes that “the functions the [Dutch] government has established for pension communication are inaccurately formulated”, which in turn results in information overload by communication designers (chapter 6, p. 133). According to Nell (2017), communication designers generally prefer to “play it safe” (p. 168) and to provide more information than mandatory in order to ensure that they comply with the pension communication requirements of the Dutch government.

1 See Eppler and Mengis (2004) for an overview of the literature on information overload from various domains, including organization science, marketing, and accounting.

2 According to Ben-Shahar and Schneider (2010), mandated disclosure is a regulatory technique that requires “the discloser” to provide “the disclosee” with information, which the latter can use to make informed decisions.

Hence, the pension sector creates information overload, which makes it necessary to examine how pension communication can be made more effective.

In their study on comprehension of pension communication, Lentz, Nell, and Pander Maat (2017) found that pension organizations considered the obligations imposed by the Pension Communications Act an impediment to effective pension communication. In the second chapter of her dissertation on how organizations deal with communication regulations, Nell (2017) identified three strategies that pension organizations apply in response to the Pension Communications Act³. First, pension organizations comply with legislation without any additional actions. Second, they focus on optimizing the legally required media. Third, they optimize additional media. Such additional media include online pension information that can be accessed on the website of the pension provider, often in combination with audio and/or video elements. The majority of financial institutions and organizations find that mandatory information such as the Annual Pension Statement and the website Pensioen 1-2-3⁴ are not sufficient to inform their clients. Consequently, pension organizations look for alternative ways to convey information to them. This leads to the circulation of information through many different channels: physical mail, emails, website texts, and videos that can be accessed on any smart device. In this study, we tested the effectiveness of digital pension documents that fall in the category of additional media.

We sought answers to the following research question: what is the effect on navigation behavior of tailoring the structure of pension information? Together with an insurance company, we changed the structure of a digital pension document that introduces new pension plan participants to their employees' pension fund, one that belongs to the second pillar of the Dutch pension system. Being a new pension fund participant can mean of two things: either an individual has started in a new job and is automatically enrolled in the new pension fund, or an individual was already working at a company which has entered into a new agreement with a pension plan provider (i.e. the insurance company that collaborated with us for this study).

We differentiated consumers on the basis of their age and manipulated the general structure of the pension document accordingly. We defined goals that should receive the highest prominence per age group and then designed different versions of pension documents that reflect those goals, plus a generic version of the pension

3 For an overview of the Dutch pension system and especially the institutional context of pension information, we recommend the introductory chapter of Nell (2017).

4 Pensioen 1-2-3 is a website that provides layered information on the most important elements of a personal pension scheme.

document containing basic information. Within each age group, we randomly assigned a pension document with either a tailored or a generic structure. Hershey, Jacobs–Lawson, and Neukam (2002) found that there were age and gender differences in workers' goals for retirement. This is partially explained by differences in time preference, depending on which stage of the life-cycle people find themselves in. The propensity to plan is assumedly low for young people and increases with age. Eberhardt et al. (2016) integrated demographics such as age and gender into the conceptual model that they developed, in order to explain the participants' intention to learn more about their pension situation. Age as a key variable has been used before in research on tailoring information: see Lustria et al. (2009) for tailoring on the basis of health information needs or Etter (2005) and Cobb et al. (2005) on programs to stop smoking. To measure whether participants delved into the information that was relevant to them, we focused on who logged into the pension environment, how much time they spent going through the pension document, and, most importantly, whether participants clicked on content that was related to the age-specific goals.

The importance of effective pension communication has also been motivated from a behavioral economics perspective. Individuals appear to have time-inconsistent preferences when it comes to retirement planning (O'Donoghue & Rabin, 1999) as they are faced with costs now and benefits in the future. Consequently, they procrastinate and postpone saving for retirement. Offering them effective pension communication can act as a commitment device in order to motivate them to start or continue planning for retirement, regardless of the life phase that they are in.

To understand the path to effective digital pension communication, we distinguish three phases that are at the heart of providing pension information: the trigger phase, the navigation phase, and the content phase⁵.

This study is directed at the effect of manipulating pension information in the navigation phase, with particular focus on the general structure of pension information and on the design and presentation of choices. In a review article on financial

5 In the trigger phase, the pension plan provider contacts customers by mail or email, providing information about the different tools and websites available to become better informed about one's pension situation. Alternative triggers can be brochures, short videos, or even postcards. In a previous study (Dinkova, Elling, Kalwij, & Lentz, 2018a), we analyzed the effect of tailoring in the trigger phase on pension information behavior and found that a generic email invitation to be more effective than a tailored invitation. Another relevant study about pension communication in the trigger phase was conducted by Bauer, Eberhardt, and Smeets (2017). They investigated the impact of using social norms and financial incentives to trigger pension plan participants to seek information about their pension situation. The effect of tailoring pension information in the content phase has not been subjected to empirical research as yet.

literacy and preparing for retirement, Prast and Van Soest (2016) recognize that choice architecture plays a crucial role in improving the decision-making by consumers regarding their pension. Manipulation in the navigation phase may concern the restructuring of content in order to give prominence to particular topics by changing the order and rank (main or subordinate position within the information document) of the information provided.

With this study, we provide several contributions to research on the effectiveness of pension communication. First, we contribute to the scarce literature on tailoring of pension communication by designing and conducting an experiment that measures real behavior. Second, we provide a framework of three communication phases that we embedded our study in. Third, we combine methods adapted from communication science and linguistics to answer a question that is relevant for researchers from multiple disciplines – economists, psychologists, and communication scientists who are interested in investigating how people can be motivated to actively engage in financial planning.

This paper is organized as follows: in Section 2, we describe the experimental design. Sections 3 and 4 deal with the descriptive statistics and the estimation strategy respectively. Section 5 presents the estimation results. Section 6 contains the conclusion and a discussion of the results.

2. Experimental design

The experiment

The research population consisted of employees of companies that entered into a new employees' pension plan with an insurance company between January and May 2017. Employees who enrolled into this pension plan during this period received an email invitation to log into the online environment of the insurer and to explore pension information that provided them with useful information about their pension situation. Following Dinkova et al. (2018), we defined three age categories that differ in terms of urgency to save for retirement: young participants (18–34 years old), middle-aged participants (35–54 years), and senior participants (55 years and older). Employees belonging to the youngest age group are in the early phase of their working career and are typically concerned with other personal investments than their pension. The middle group has more working experience and has already accumulated savings to settle down and to start saving for retirement more actively. The senior age category is a heterogeneous group comprised of individuals who still have a number of working years left – and also opportunities to save for retirement – and individuals who are close to retirement.

We developed four different versions of the pension information document (three for each age category plus a generic version). Each version consisted of several pages. Each page contained dropdown menus with short titles on each page that, when clicked on, revealed more detailed information on selected subjects. For instance, the version for young participants included, for example, a page with the title *Pension in five minutes*, containing information on how their pension is arranged, when action must be taken, and which choices are available. On the other hand, the generic version included a page with the title *Good to know*, including the above information plus information on whether a participant is on track for retirement, which the pension plan provider communicates online. A more detailed overview of the structure of the pension documents is presented in the Appendix (boxes A1 and A2). We randomly assigned half of the employees to tailored pension information and the other half to the generic information.

Goals per age category

We identified different goals for each age category. We formulated the goals together with pension communication experts of the insurance company. See Table 1 for an overview of the goals per age group. The goals reflect what the insurer deemed most

Table 1: Goals per type of pension information document

Age category			
Young	Middle	Senior	Generic
Know how their pension is arranged	Be aware of their pension situation and to know whether they are on track (relative to people in a similar situation)	Know how much future pension income they (and possibly their partner) have accrued	Receive basic information on pension situation
Realize that pension plan membership is an important fringe benefit	Be aware of the possibilities to enrich their portfolio if needed	Be aware of the choices that can still be made and to be able to decide	To be informed about the possible choices and when action is required
	Know what to do considering different life events (e.g. divorce, working disability)	Convey the feeling of support by the insurer*	

Note that we did not specify goals for the generic version. The goal for the senior category marked * is an implicit goal that we did not explicitly measure.

important for each age group. We do not claim that these goals would apply to the entire pension sector. Note that there is not necessarily just one goal per age group.

Young participants should especially realize that their pension scheme is an important employee benefit and know how their pension is organized. The goals for the middle-age category are threefold: first, to be aware of their pension situation and especially to know whether they are on track relative to people of the same age; second, to be aware of the possibilities for enriching their portfolio if necessary; and third, to know what to do considering different life events such as divorce, occupational disability, or death. Senior participants, in turn, should know how much future pension income they have accrued. Furthermore, it is important for them to be aware of the choices that could still be made, especially with regard to the partner's pension and survivor's pension.

Operationalization of the goals

Having outlined the goals of pension information for each age group, we move on to creating a hierarchy for the goals across age groups. This hierarchy identifies which goals are measured and how and then helps in constructing measures to evaluate the effectiveness of tailoring the navigation structure of the pension documents. We limited the number of goals to three since not all goals could be applied when tailoring the structure of the pension documents. This left us with the following goals for pension plan participants: 1) knowing how their pension is structured, 2) knowing

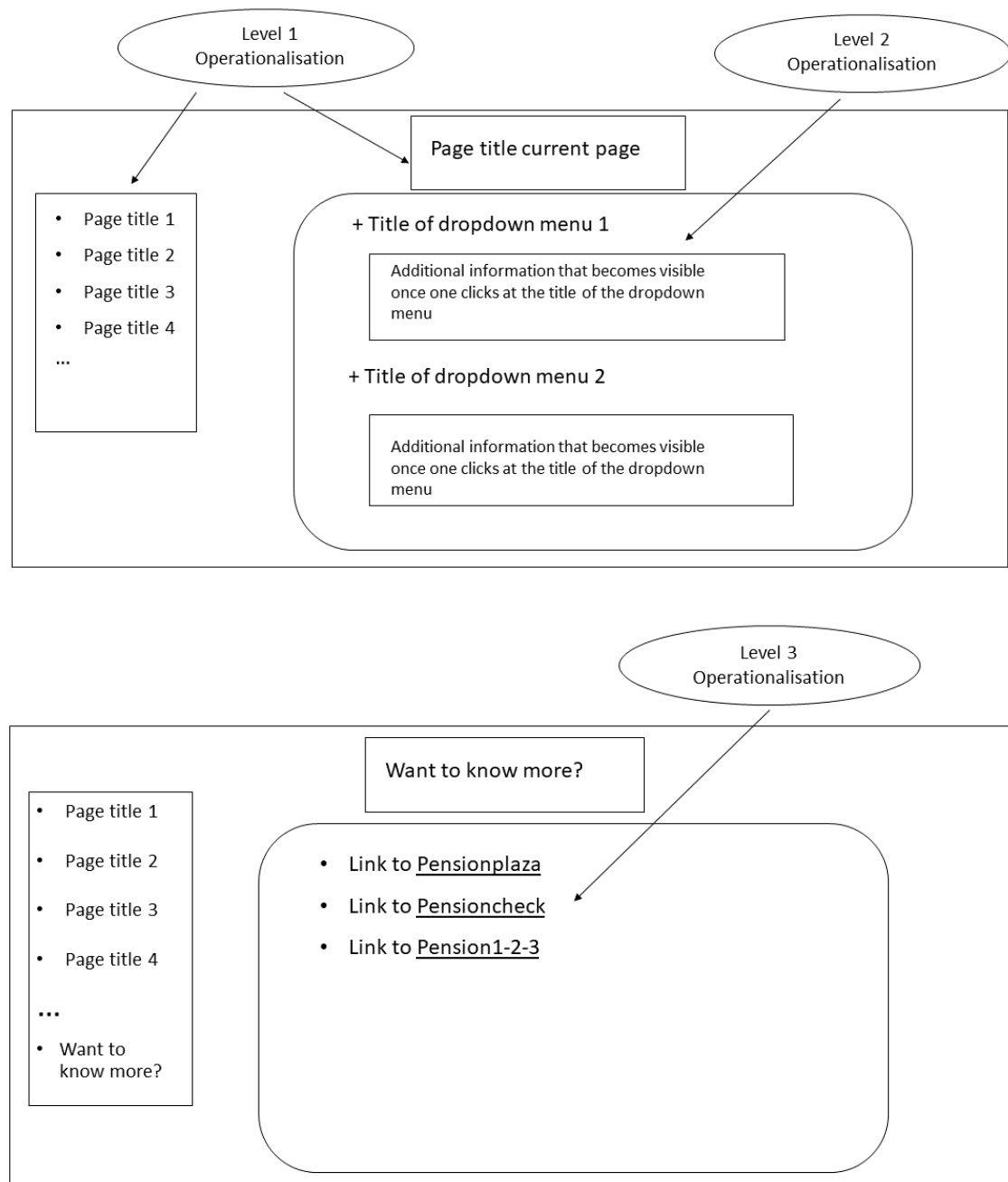
Table 2: Prominence of goals per type of pension information (scale: high, medium, low)

Goal	Prominence (by age category)			
	Young	Middle	Senior	Generic
Know how the pension is structured	high	low	low	medium
<i>Operationalization</i>	<i>Level 1</i>	<i>Level 3</i>	<i>Level 3</i>	<i>Level 2</i>
Know whether on track with saving for retirement	low	medium	high	medium
<i>Operationalization</i>	<i>Level 3</i>	<i>Level 2</i>	<i>Level 1</i>	<i>Level 2</i>
Be aware of the choices available within pension arrangement	medium	medium	high	medium
<i>Operationalization</i>	<i>Level 2</i>	<i>Level 2</i>	<i>Level 1</i>	<i>Level 2</i>

Notes: Level 1 refers to page title (visible all the time to participants), level 2 refers to title of dropdown menus (only visible if at respective page), and level 3 refers to the final page, where participants are redirected to content with more specific information and other pension tools.

whether they are on track with saving for retirement, and 3) their awareness of the choices available within their pension arrangement. Table 2 provides an overview of the three main goals per pension document and their operationalization in the related pension information document. The most prominent goal for the age group consisting of younger people is to know how their pension is arranged. For the middle age group the most prominent goal is knowing whether participants are on track with saving for retirement, plus the goal of being aware of the choices available within the pension arrangement. For the senior age group, the above goals are very important. For the middle age group, we changed the navigation structure in a more subtle way than for the senior age group regarding the goals of *being aware of the choices available* and whether *one is on track*. This results in different levels of prominence of the goals for the middle age group (*medium*) and the senior age group (*high*).

We tailored at three levels, with level 1 corresponding to a high prominence of the goals and level 3 to low prominence. Tailoring at level 1 implies that the goal is displayed as a page title, which stays visible during the entire time while the participant goes through the pension document. In this way, the goal received high prominence since the entire document page contains information that is dedicated to this goal. Tailoring at level 2 implies that the goal is addressed in the title of the dropdown menus on each page of the pension document. This information is only visible when the participant views the respective page of the pension document. Lastly, tailoring at level 3 implies that the goal receives relatively low prominence on the final page of the pension document. Here, participants are redirected to online content with more specific information or other pension tools such as Pensioncheck and Pensioen 1-2-3. The Pensioncheck is an online tool that enables participants to check whether

Figure 1: Schematic overview of the operationalization of the goals

Note: The bottom of the figure describes the operationalization at the third level on the very last page of the pension document, which carries the title "Want to know more?" in each version.

they have accrued enough pension income for their old age. As mentioned in the introduction, Pensioen 1-2-3 is a legally mandated document that includes layered pension information.

Consider, for instance, the group of young participants, whose most important goal is knowing how their pension is structured. The pension document has an entire page

dedicated to how their pension is arranged, with additional information at level 1. Consider now the tailored version for the middle and senior age groups. Information about how the pension is structured can be found on the final page of the pension document (level 3). For the generic version, knowing one's pension arrangement is of medium importance at level 2, by dedicating a part of a page (title and content of dropdown menu) to this goal. See Figure 1 for a schematic illustration of the operationalization of the various levels.

3. Data description

In total, 8,563 participants from 345 companies received an invitation to log into the digital environment of their pension plan provider and to explore the information about their pension situation. All of these participants were employees who were recently enrolled in the employees' pension plan of the insurer. We collected data on gender, age, marital status, and employer for every participant. About 5% (447 participants from 133 companies) logged into the digital pension environment (DPE). This is the group of participants whose navigation behavior we analyzed. In Table 3 the login behavior to the DPE is presented for each of the six segments. The distribution of participants who logged in is roughly the same across all segments. This does not come as a surprise as we did not tailor the invitation to log into the DPE. Furthermore, we observed that the middle segments are better represented in our sample relative to the young and senior segments. Comparing the subsamples of who logged in and who did not across other known key characteristics, such as gender and marital status, can give us more information on whether the individuals who logged in are a representative subsample.

Table 3: Behavior of login to the Digital Pension Environment (DPE) across segments (percentages in parentheses)

Segment	Obs.	Logged in to DPE
Young generic	1,068	48 (4.49)
Young tailored	1,118	60 (5.37)
Middle generic	2,420	127 (5.25)
Middle tailored	2,566	132 (5.14)
Old generic	682	43 (6.30)
Old tailored	709	37 (5.22)
Total	8,563	447 (5.22)

Demographics and time spent during the login

In Table 4, we present the means for the demographics (gender, age, marital status) and several indicators of overall activity in the DPE. The average age of participants was 43 years. Of the participants who had logged in to the DPE, 75% were male, while of individuals who did not log in, 72% were male. Typically, participants who logged in were married or lived with a registered partner (55%). Participants spent an average of 15 minutes in the DPE during their longest session.

The means for age and gender did not differ significantly between the participants who logged in and the participants who did not. Nevertheless, we should be careful

Table 4: Mean values of demographics and time spent for subsamples of participants who logged into the Digital Pension Environment and participants who did not log in

Variable	Logged in?		Pr(T > t) ^a
	Yes	No	
Male (%)	75.17	72.20	0.172
Age of participants (in years)	43.30	43.02	0.593
Singles (%)	36.91	44.44	0.002
Married/registered partners (%)	54.59	50.25	0.074
Cohabiting (%)	8.50	4.99	0.001
Unknown (%)	0.00	0.32	0.231
Total time (in minutes, all sessions)	24.45		
Time spent behind login (in minutes, longest session)	15.00		
Total number of actions in pension document	14.16		
Ratio number of actions per minute	1.59		
Number of observations	447	8,116	

Note: ^a Pr(|T| > |t|) returns the p-value of a two-sided t-test comparing means testing the zero hypothesis $H_0: \mu_{yes} = \mu_{no}$ where μ_{yes} and μ_{no} are the population means of the group that logged into the DPE and of the group that did not log in, respectively.

when interpreting the results from the experiment. As Table 4 shows, we do not have convincing evidence that the subsample of participants who logged into the DPE is representative of the entire research population since unobserved heterogeneity (the motivation that drove people to log in) cannot be accounted for.

We were able to track the total time spent (in seconds) each time that participants visited the pension information. This includes the time they spent going through the pension information, but also the time to follow the links to additional information and tools that were provided in the pension information document. To better understand the overall activity of participants during the experiment, we considered the longest session. The majority of participants who logged in had a maximum of four sessions (90%), with an average of two sessions. Note that even with multiple logins, participants were assigned the same version of the pension document. We can only speculate about the reasons for multiple logins: it might be that respondents were distracted during the first session and wanted to take their time looking at the pension information provided.

We furthermore tracked which pages the participants visited, and also which dropdown menus they clicked on. We have added up this information as the total number of actions. To create a proxy for the intensity of activity, we calculated the ratio of number of events per minute by dividing the total number of actions behind the login by the total time (in minutes) spent behind the login: the higher the ratio, the higher the intensity of activity while logged in.

4. Estimation procedure

Logging in

First, we looked at the determinants of logging into the online environment of the pension insurer using the personal DigiD code. With the DigiD, Dutch residents gain access to Dutch government websites. This enables them, for instance, to complete and file their income tax return, to apply for benefits and allowances, and to check their accrued pension on an online basis. Analysis of login behavior serves mainly as a check since we did not tailor the trigger (the invitation) but the pension document that could be accessed after being logged in. We used a linear probability model to estimate the probability of login – see equation (4.1), where $login_i$ is a binary dependent variable equal to 1 if an individual has logged into the digital environment and 0 if otherwise. Let $I(\cdot)$ be an indicator function equal to 1 if individual i belonged to group j and 0 if otherwise. We have three age categories, age $A \in \{young, middle, senior\}$, and two types of versions $T \in \{tailored, generic\}$ resulting in six groups.

$$login_i = \beta_0 + \sum_{j=1}^5 \beta_j I(AT_i = j) + \delta_i \mathbf{Z}' + \varepsilon_i \quad (4.1)$$

β_j is the difference in the probability of login between individuals i of a group j and those in the reference group (or base), which we set at middle-aged individuals who received a tailored pension document, once controlled for gender and marital status (included in \mathbf{Z}').

Explorative analysis and navigation behavior

The remainder of our empirical analysis focused on the subsample of participants who logged in. To measure online activity of the participants and their navigation behavior, we selected three dependent variables, namely the time spent in the digital pension environment (DPE), the intensity of the overall activity in the DPE (clicks per minute), and the clicking activity relating to navigation behavior, in other words, whether participants clicked at goal-related content. The models that we estimated are summarized by equation (4.2) with NB_i being a catch-all term for the above dependent variables. Table 5 provides a detailed overview of how the three dependent variables that measure navigation behavior are constructed.

Table 5: Construction of the variables that measure navigation behavior

Dependent variable*	Measures what?	Constructed how?
Arrangement	Whether participant clicked on content related to goal 1 from Table 1 (most relevant for young group)	Binary: = 1 if participant clicked on "How is your pension arranged" or on the link to Pensioen 1-2-3; = 0 if otherwise
On track	Whether participant clicked on content related to goal 3 from Table 1 (most relevant for middle and senior groups)	Binary: = 1 if participant clicked on "Are you on track for retirement?" or on the link to the Pensioncheck; = 0 if otherwise
Choices	Whether participant clicked on content related to goal 2 from Table 1 (most relevant for middle and senior groups)	Binary: = 1 if participant clicked on "Which choices do you have?" or "Choices to make when you retire" or "Which additional choices do you have?"; = 0 if otherwise

Note: * NB is a placeholder for all dependent variables in equation (4.2). The text between the quotation marks is clickable content (page headings and titles of dropdown menus) in the different versions of the pension documents. For more details, refer to boxes A1 and A2 in the Appendix.

$$NB_i = \beta_0 + \sum_{j=1}^5 \beta_j I(AT_i = j) + \delta_i \mathbf{Z}' + \varepsilon_i \quad (4.2)$$

For the first two specifications, β_j is the difference in the effect of tailoring on the time spent (or on activity) in the DPE relative to the reference group of middle-aged participants, who were assigned a tailored version of the pension document. For the three dependent variables referring to navigation behavior, β_j is the difference in the probability of clicking on goal-related content for individuals i of a group j and those in the reference group. \mathbf{Z}' includes gender and marital status.

5. Empirical results

5.1 Explorative analysis: navigation behavior

Table 6 provides an overview of navigation behavior measured by the three dependent variables, as described in the methodology section. The percentage of young participants who clicked on goal-related content about their pension arrangement is the highest of the three age groups. As expected, young participants were the most active group when it comes to learning more about their pension arrangement. However, we could not detect significant differences in clicking behavior between young participants regarding the generic and tailored versions. Additionally, we observed that on average, the percentage of middle-aged participants with a generic version of the pension document in clicking on content about their pension arrangement was higher than the percentage of these participants with a tailored version.

As to the second goal, that of being on track, we found significant differences in navigation behavior between participants with a generic version and those with a tailored version for the young and senior age groups. For the young group, the

Table 6: Navigation behavior: percentage clicking on goal-related content per goal by age category

Age category	Goals Version pension document	How arranged (%)	On track (%)	Choices (%)
<i>Young (18–34 years)</i>	generic	64.58	54.17	45.83
	tailored	66.67	20.00	35.00
	$H_0: \mu_G = \mu_T$ (p-values) ^b	0.823	0.000	0.257
<i>Middle (35–54 years)</i>	generic	59.06	52.76	33.86
	tailored	47.73	55.30	18.94
	$H_0: \mu_G = \mu_T$ (p-values)	0.068	0.682	0.006
<i>Senior (55+ years)</i>	generic	53.49	62.79	34.88
	tailored	45.95	91.89	89.19
	$H_0: \mu_G = \mu_T$ (p-values)	0.507	0.002	0.000
Total	generic	59.17	36.70	55.05
	tailored	52.40	34.50	51.97
	$H_0: \mu_G = \mu_T$ (p-values)	0.150	0.515	0.628

Note: G and T refer to generic and tailored versions of the pension document respectively.

^b The reported p-values correspond to testing this null hypothesis against a two-sided alternative, where μ_G and μ_T are the population means of the group with generic and tailored versions respectively. Statistically significant differences are in bold.

percentage of goal-related clicks was significantly higher for participants with a generic version. For the senior group, the percentage of goal-related clicks was significantly higher for participants with a tailored version. These observations are in line with our intentions for designing the pension documents.

For the third goal – being aware of the choices available – we detected differences in navigation behavior for the middle-aged and senior participants. Middle-aged participants with a generic version clicked more often at goal-related content than middle-aged participants with a tailored one – an activity we did not expect. As expected, the share of senior participants with a tailored version who clicked on goal-related content was significantly higher than the share of senior participants with a generic one.

5.2 Estimation results of login, intensity, and navigation behavior

Estimation results are reported in Table 7. The tailoring effects obtained in Table 7 are summarized in Table 8. Note that all results on time spent and navigation behavior in the DPE are conditional on having logged in. Essentially, the regression results confirm the correlation analysis conducted in Table 6 about navigation behavior.

Logging in

The first column of Table 7 presents the estimates of the probability of logging in; this is the only specification that takes the gross sample into account. We did not find differences in login behavior between participants of all age groups, no matter which pension document version they were assigned. This is as expected, for the invitation to log in to access the insurer's online environment was identical for all age groups. Married and cohabiting participants were more likely to log in than single participants.

Time spent and ratio events/time

Table 7 shows no evidence of a tailoring effect for the total time (in minutes) spent going through the assigned pension information. Married and cohabiting participants spent significantly more time (but less intensively) in the DPE than their single counterparts. Middle-aged participants with a tailored version were less active (0.45 events/minute) than middle-aged participants with a generic version. Being less active implies that the navigation structure was more efficient in the tailored version and that participants could go through the pension information with less effort.

Table 7: Estimation results for logging in and navigation behavior concerning goal-related content

	(1) Probability of logging in	(2) Log(time)	(3) Events per minute	(4) Probability of clicking on goal 1 information	(5) Probability of clicking on goal 2 information	(6) Probability of clicking on goal 3 information
Young generic	-0.002 (0.009)	0.069 (0.209)	0.065 (0.341)	0.076 (0.076)	0.027 (0.090)	0.119 (0.078)
Young tailored	0.006 (0.009)	-0.144 (0.229)	0.099 (0.339)	0.104 (0.084)	-0.322*** (0.071)	0.017 (0.071)
Middle tailored	-0.001 (0.005)	0.211 (0.164)	-0.452** (0.196)	-0.116* (0.062)	0.030 (0.066)	-0.142*** (0.046)
Senior generic	0.009 (0.012)	0.302 (0.190)	-0.395 (0.298)	-0.055 (0.086)	0.096 (0.095)	0.007 (0.077)
Senior tailored	-0.001 (0.010)	0.287 (0.245)	-0.351 (0.336)	-0.134 (0.091)	0.380*** (0.066)	0.558*** (0.064)
Share of men (%)	0.006 (0.006)	0.027 (0.131)	0.024 (0.190)	-0.011 (0.052)	0.025 (0.050)	-0.068 (0.047)
Married/registered partner (=1)	0.012* (0.006)	0.442*** (0.125)	-0.501*** (0.184)	0.087 (0.057)	0.015 (0.046)	0.025 (0.045)
Cohabiting (=1)	0.042** (0.019)	0.701*** (0.227)	-0.897*** (0.255)	0.111 (0.078)	-0.093 (0.077)	-0.009 (0.086)
Unknown marital status (=1)	-0.045*** (0.005)					
Observations	8,563	447	447	447	447	447
R-squared	0.003	0.059	0.054	0.030	0.117	0.149
Number of clusters	345	133	133	133	133	133
p-value F-test (married = cohabiting = unknown)	0.000	0.001	0.002	0.173	0.369	0.810
p-value F-test (young generic = young tailored)	0.327	0.382	0.930	0.744	0.000	0.226
p-value F-test (middle generic = middle tailored)	0.850	0.202	0.022	0.063	0.645	0.003
p-value F-test (senior generic = senior tailored)	0.435	0.956	0.877	0.473	0.003	0.000

Notes: Clustered standard errors in parentheses (at employer level). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Goals 1, 2, and 3 refer to Arrangement, On track, and Choices, respectively. Reference categories: middle age generic; single (marital status). The first F-test tests whether the marital status dummies are jointly significant. The next F-tests test for each age category whether the coefficients of the tailored version are equal to the coefficients of the generic version (thus whether there is a tailoring effect). Effects are in percentage points when multiplied by 100, except for columns (2) and (3), which are measured in percentages (times 100) and clicks/minute respectively. In an additional specification, we tested whether age (in years) could mediate the effect of tailoring on navigation behavior by interacting each segment with age. We did not find empirical evidence for such a mediating effect. A more flexible specification using age dummies instead of age in years leads to many empty cells, which is due to our sample size. Hence, we are not in the position to test whether the effects we found are sensitive around the margins of the age categories we defined. Results are available upon request from the corresponding author.

Navigation behavior

Table 8 shows that, as to the first goal of knowing how their pension is arranged, middle-aged participants with a generic version clicked more often on goal-related content than those with a tailored version. We estimated a negative coefficient of 12 percentage points. This result is in line with our expectations, as the pension document with the tailored structure was intended to induce young participants to focus on how their pension is arranged and to induce middle-aged and senior participants to explore the choices available and whether they were on track. Contrary to what we expected, we did not find significant differences in clicking on information about pension arrangements for young participants with a generic or tailored version. One explanation could be that young people do not realize the importance of having a pension and therefore do not examine how their pension is arranged.

For the second goal, that of knowing whether one is on track with saving for retirement, we estimated a negative coefficient of 35 percentage points for young participants. This was as intended by our design of the pension document, as we wanted to induce young participants to focus on how their pension was arranged rather than on whether they were on track. For senior participants, we found a positive coefficient, implying that they were 38 percentage points more likely to click on pension information about being on track when receiving the pension document with the tailored structure relative to the generic version. This result was also in line with our design intentions, as being on track was considered a primary goal for the senior group.

As for the third goal, being aware of choices regarding the pension plan, we found that middle-aged participants with a generic version clicked more often (14 percentage points) on goal-related content than those with a tailored version. This result is reason for concern (together with the results for the young participants) as tailoring did not have the desired effect on navigation behavior. For senior participants, we found a large positive and significant tailoring effect as intended: the difference of clicking on information on pension choices by seniors with a tailored version compared to seniors with a generic version was 50 percentage points.

In the light of Table 2, which presents the operationalization of the goals in the navigation structure, we can explain the results regarding the second and third goals (being on track and choices available) by comparing the prominence of the tailored and generic versions. For the second and third goals, tailoring did not achieve the desired effect for the middle-aged participants, as the prominence of information regarding knowing whether one is on track was *medium* for the tailored and the

Table 8: Tailoring effects per goal by age category

Age category	Goal: arrangement	According to expectations?	Goal: on track	According to expectations?	Goal: choices	According to expectations?
Young (18–34 years)	0.028 0.084	No	-0.350*** 0.086	Yes	-0.103 0.084	Yes
Middle (35–54 years)	-0.116* 0.062	Yes	0.03 0.066	No	-0.142*** 0.047	No
Senior (55+ years)	-0.078 0.109	Yes	0.284*** 0.092	Yes	0.551*** 0.086	Yes

Notes: Standard errors in parentheses. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Tailoring effects are computed by taking the difference between the estimated coefficients for the tailored and generic version for each age group using the *lincom* command with STATA. Effects are in percentage points when multiplied by 100. In the columns after the computed tailoring effects, we indicated whether the effects are in line with our expectations when designing the structure of the pension information.

generic versions⁶. For senior participants, we did achieve the desired tailoring effect, as the prominence differed between the generic version (*medium*) and the tailored version (*high*). This explanation does not appear to apply to the results regarding the first goal (knowing how one's pension is arranged).

Sample selection and representativeness

We conclude this section by discussing the issue of sample selection in our study. By randomly assigning a generic or a tailored version to participants, we did not eliminate the selection bias from logging into the DPE. We compared the distributions of the key variables between the subsample of the participants who logged in and the overall sample (Table 4). Regarding gender and age, we did not find significant differences between the subsample and the overall sample. At the bottom of Table 7, we presented an F-test on all coefficients of the marital status variables: we found significant differences between the subsample and the overall sample. Given those tests, we cannot establish with certainty whether the subsample of participants who logged into the DPE is representative of all participants in the experiment. Hence, it

6 The prominence of information regarding a specific goal being the same for the generic and tailored versions does not imply that the navigation structures for the two versions was identical. There are subtle differences within each operationalization level, for instance in the order or the number of the dropdown texts. Readers who are interested can obtain the screenshots of all versions of the original digital pension documents (in Dutch) by requesting these from the corresponding author.

is more accurate to interpret the effects as being causal *conditional* on having logged into the DPE, referring to the conditional independence assumption (CIA), which, according to Angrist and Pischke (2008), eliminates selection bias. A related issue is that only 5% of the research population participated in the experiment, which means that we estimate a treatment effect on the basis of a small select group of pension participants. We would thus advise caution as to the results applying to the entire research population.

6. Conclusions

We conducted an experiment among employees who enrolled recently in a new employees' pension scheme. We analyzed whether tailoring the general structure of pension information based on age affected the participants' navigation behavior through the digital pension setting. Participants were sent a generic invitation email to log into the digital pension environment of their pension provider and were subsequently randomly assigned tailored versions of the pension information document. To obtain the effect of tailoring on navigation behavior, we analyzed clicking behavior that involved selected goals that were relevant for different age groups. Participants should know 1) how their pension is arranged, 2) whether they are on track with saving for retirement, and 3) the choices available within the pension plan.

Concerning the first goal (knowing how one's pension is arranged), we found that tailoring distracted middle-aged participants away from the goal that was not deemed relevant for them. For young participants, however, tailoring was not effective in inducing them to click on goal-related pension information. For the second goal (being on track), tailoring the structure of the pension documents was effective in distracting young participants from clicking on information that was not relevant to them and in motivating senior participants to click on relevant information. These results were in line with our expectations: since being on track was not a prominent goal for the young age group, we did not expect young participants to be more active in the tailored version as we did not show information about being on track very prominently. Tailoring was effective for senior participants as they clicked on information that was considered relevant to them. The middle group however, contrary to our expectations, was not more active in the tailored pension document. We had expected participants from the middle-aged group to be triggered by the tailored navigation structure to click on information regarding whether they were on track with saving for their pension. The lack of evidence for a tailoring effect might suggest otherwise. As for the third goal (being aware of the choices available), we found that tailoring worked for senior participants as they clicked on relevant pension information. Similar to our findings about the second goal (being on track), we had to conclude that tailoring was more effective in the generic version in motivating the middle-aged group to click on relevant pension information.

The resistance of the middle group to tailoring pension information is in line with findings from tailoring in the trigger phase (Dinkova et al., 2018), where we found the generic invitation letter to be more effective than the tailored letter in inducing young and middle-aged participants to click through and log into a DPE. If a tailored

invitation letter did not trigger young and middle-aged participants to click through and log into the DPE (Dinkova et al., 2018), and if according to the present experiment, a tailored digital pension document did not succeed in motivating participants to click on relevant information, then what drove those participants and how can they be motivated to delve into their pension situation in the future?

From within a behavioral economics framework of individuals with time-inconsistent preferences about retirement planning (O'Donoghue & Rabin, 1999), we could argue that young and middle-aged participants have time-inconsistent preferences. They postpone their planning for retirement by not looking at relevant pension information which could provide them with more guidance on making informed pension decisions. Similarly, senior participants, for whom the horizon of future benefits is shorter, appear to realize that they cannot postpone planning for retirement any longer, as the urgency of what may be their final steps to prepare for retirement is apparent.

A less theoretical explanation concerning the results for the middle group is that this group is heterogeneous and that, depending on the life phase that middle-aged individuals are in, there could be an overlap in preferences across age groups. Although we tried to address this issue when estimating our results, we could not draw any conclusions about a possible overlap across age categories due to the small number of observations. Field experiments on effective pension communication in the navigation phase with a higher number of active participants (thus a more representative subsample of active participants) would enable researchers to estimate causal treatment effects and identify clearer interval borders of the age categories. Table 9 summarizes the lessons learned from our study by age category.

Table 9: Lessons learned by age category

Age category	Lessons learned
Young (18–34 years)	Tailoring succeeds in distracting young participants from clicking on information that is not (or not yet) relevant to them. Tailoring does not succeed in motivating young participants to click on relevant information.
Middle (35–54 years)	Similar as with young participants, tailoring works in distracting from irrelevant information but does not succeed in motivating middle-aged participants to click on relevant information.
Senior (55+ years)	Tailoring is successful in distracting senior participants from clicking on information that is not relevant to them and successful in motivating them to click on relevant information
General lesson	Young and middle-aged participants are still a tough nut to crack. More experimental evidence is needed to figure out how to motivate them to click on relevant information.

As already touched upon in previous sections, the results should be treated with caution since the tailoring effects we found are based on a subsample of assumedly intrinsically motivated people, who took the first hurdle of logging in (5% of our sample). The effects are causal but only if they are conditioned on having logged in. To gain a clearer view on who logged in in the first place and who clicked more actively on relevant information than others, it may be necessary to analyze personal characteristics that go beyond simple demographics. Empirical evidence about attitudes to pension information, the need for cognition (in general and related to the pension domain), financial literacy, and future time perspective (how individuals value present versus future benefits and present costs) can complete the picture of profiling individuals who typically are more likely to be actively interested in their pension situation. Directing future research at the role of future time perspective and financial literacy in improving the effectiveness of pension communication can be an example of how concepts that are rooted in economics can contribute to overcoming challenges of societal relevance jointly with insights from communication science, linguistics, and psychology.

From a policy perspective, there are two implications that come forward. First, especially young and middle-aged pension plan participants need to be aware of the importance of pensions and the choices available within their pension scheme. Our study shows that these age groups are more difficult to reach. Future reforms and policy measures will impact the future retirement income of these age groups. Therefore, it is crucial for policymakers to facilitate research and sharing of expertise on how to motivate people to delve into their pension situation. A second point, one that is related to the previous paragraph, pension plan providers should take the preferences of different age groups into account. Formulating goals per age group, similar to what we did in this study, could serve as a point of departure. We suggest that pension plan providers spend more effort to find out the needs and expectations of people of different age groups. Conducting informal interviews or polls via social media could help to calibrate the desired goals of informing pension plan participants of different ages effectively about their pension situation.

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Appendices

A. Overview of structure of each version of the pension information document

Box A1: Structure for each version of the pension information document. Arabic numbers refer to pages (higher level), bullets represent titles of the drop-down menus (lower level)

Generiek

0. Welkom scherm: plaatje met een groep relatief jonge mensen; Button: Ga verder
1. Welkom bij het Werknemers Pensioen
2. Goed om te weten
 - Hoe is je pensioen geregeld?
 - Lig je op koers met je pensioen?
 - Welke keuzes heb je?
 - Wanneer moet je in actie komen?
 - Wij communiceren digitaal
3. Meer weten? (Verwijs naar Pensioenplein, pensioen 1-2-3 en Pensioencheck en verwijs naar een adviseur en de helpdesk)

Jong

0. Welkom scherm: plaatje met relatief jonge groep; Button: Check het hier
1. Welkom bij het Werknemers Pensioen
2. Pensioen in vijf minuten
 - Hoe is je pensioen geregeld?
 - Wanneer moet je in actie komen?
 - Welke keuzes heb je?
3. Wil je meer weten? (Verwijs naar Pensioenplein, pensioen 1-2-3 en Pensioencheck en verwijs naar een adviseur en de helpdesk)

Midden

0. Welkom scherm: plaatje met een stel (middengroep) in de keuken; Button: Check het hier
1. Welkom bij het Werknemers Pensioen
 - Lig je op koers met je pensioen?
 - Wat kun je doen om extra pensioen op te bouwen?
 - Wanneer moet je in actie komen?
 - Welke keuzes heb je?
2. Meer weten? (Verwijs naar Pensioenplein, pensioen 1-2-3 en Pensioencheck en verwijs naar een adviseur en de helpdesk)

Senior

0. Welkom scherm: plaatje met een oudere man die aan het strand voetbalt; Button: Ga verder
1. Welkom bij het Werknemers Pensioen
2. Lig je op koers met je pensioen?
3. Keuzes als je met pensioen gaat
 - Wanneer wil je met pensioen?
 - Wil je eerst met deeltijdpensioen?
 - Wil je eerst een hoger pensioen en daarna een lager pensioen?
 - Wil je partnerpensioen ruilen voor extra ouderdompensioen?
4. Welke keuzes heb je nog meer?
5. Meer weten? (Verwijs naar Pensioenplein, pensioen 1-2-3 en Pensioencheck en verwijs naar een adviseur en de helpdesk)

Box A2: Structure for each version of the pension information document (English translation). Arabic numbers refer to pages (higher level) and bullets represent titles of the drop-down menus (lower level)

Generic

0. Homescreen: image of a group of relatively young people; Button: <Continue>
1. Welcome to the Employees' Pension
2. Good to know
 - How is your pension arranged?
 - Are you on track for retirement?
 - Which choices do you have?
 - When do you have to take action?
 - We communicate digitally
3. Know more? (Refer to Pension plaza, pensioen 1-2-3 and Pensioncheck and refer to an advisor and the helpdesk)

Young

0. Homescreen: image of a relatively young group; Button: <Check it here>
1. Welcome to the Employees' Pension
2. Pension in five minutes
 - How is your pension arranged?
 - When do you have to take action?
 - Which choices do you have?
3. Would you like to know more? (Refer to Pensionplaza, pensioen 1-2-3 and Pensioncheck and refer to an advisor and the helpdesk)

Middle

0. Homescreen: image of a middle-aged couple in the kitchen; Button: <Check it here>
1. Welcome to the Employees' Pension
 - Are you on track for retirement?
 - What can you do to accrue more pension?
 - When do you have to take action?
 - Which choices do you have?
2. Know more? (Refer to Pension plaza, pensioen 1-2-3 and Pensioncheck and refer to an advisor and the helpdesk)

Senior

0. Homescreen: image of a senior man playing football; Button: <Continue>
1. Welcome to the Employees' Pension
2. Are you on track for retirement?
3. Choices to make when you retire
 - When do you want to retire?
 - Do you first want to retire partially?
 - Do you first want to be paid out a higher pension amount and afterwards a lower pension amount?
 - Do you want to exchange partner's pension for additional retirement pension?
4. Which additional choices do you have?
5. Know more? (Refer to Pension plaza, Pensioen 1-2-3 and Pensioncheck and refer to an advisor and the helpdesk)

Additional notes:

Pensionplaza is a personal internet environment for customers of the insurer that allows access to pension information. Until the summer of 2017 it consisted of several documents that relate to pensions.

Pensioen 1-2-3 is a website, administered by the Federation of the Dutch Pension Funds (Nederlandse Pensioenfederatie) and the Dutch Association of Insurers (Verbond van Verzekeraars), that provides information on the most important elements of your pension plan. The information is organized in three layers. The first layer provides a quick overview of your pension scheme, the second layer builds on the information in the previous layer, and the third layer presents more detailed information and may include official documents about your specific pension scheme.

The Pensioncheck is an online tool that enables participants to check whether they have accrued enough pension income for their old age.

B. Screenshots of front pages of all four versions of the pension document

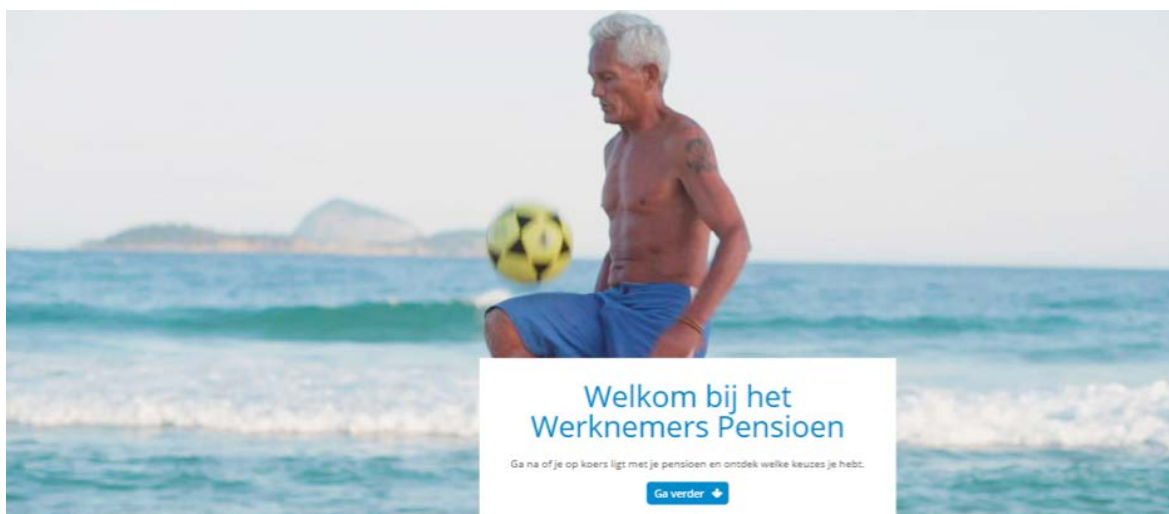
Version 1 (young)



Version 2 (middle group)



Version 3 (senior)



Version 4 (generic)



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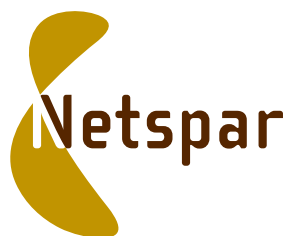
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