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Testing a Behaviourally Informed Product Comparison Tool for Private Health Insurance

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Abstract

The market of private health insurance is characterised by high level of consumer inertia. Low consumer activity is probably linked to product complexity, abundance of choice options and low consumer understanding. These factors may overwhelm consumers and reduce willingness to engage with the process of choosing private health insurance. To address this issue, we designed a behaviourally informed health insurance plan comparison tool that splits the decision into sequential stages, aiming to make the process of choice easier and less frustrating. In a pre-registered online experimental study, we tested this tool against one that closely mimicked the market regulator's existing online comparison tool. Our results revealed higher satisfaction with and clear preference for the behaviourally informed comparison tool, across different sociodemographic groups. We also found a small but significant positive effect of the sequential tool on satisfaction with the chosen health insurance plan. Consumers using the sequential tool opted, on average, for lower premiums. Overall, our findings attest to the usefulness of decision aids based on the principles of sequential decision making, both for consumer satisfaction and choice outcomes.

Keywords: private health insurance, choice overload, sequential decision-making, decision aids

1. Introduction

Choosing a health insurance plan can be a source of confusion and some distress (Bhargava & Loewenstein, 2015). As a consequence, the health insurance market is characterized by high levels of consumer inertia, with consumers sticking with the default health insurance plan despite increases in premiums and changes in health plans offerings (Drake et al., 2022; Kautish et al., 2021). Ireland's health insurance market is not an exception: 86% of consumers without private health insurance have never had it, and only 19% of consumers with private health insurance have ever switched (Health Insurance Authority, 2020).

Sources of consumer inertia include inattention (e.g., Drake et al., 2022; Heiss et al., 2021), lack of basic health insurance knowledge and understanding how this complicated market works (e.g., Ericson & Sydnor, 2017). Another likely candidate is the abundance of options one has when choosing private health insurance; there are many plans on the market that vary on many different attributes. Abundance of choice can often lead consumers to feel overwhelmed and to avoid deciding (Howard, 2019).

Behavioural economists have proposed that the problem of inertia caused by choice complexity can be tackled by simplifying health insurance for consumers (Bhargava & Loewenstein, 2015). One potential way of simplification is to design decision aids that guide consumers through the choice of a health insurance plan. In the present study, we designed and experimentally evaluated the performance of one such decision aid.

We tested whether a new behaviourally informed product comparison tool helps consumers to make better choices and improves their satisfaction with the process of choosing health insurance. The behaviourally informed tool divides the decision into a personalised sequence of steps, with each step representing a trade-off between a different coverage area and the premium, in order to reduce cognitive load. The order of the steps is informed by the individual consumer's stated preferences for coverage areas, starting with the area that matters most to them. The aim is for the final set of available products to be selected according to the consumer's needs and willingness to pay. The tool proceeds via the following steps: (1) coverage ranking task, (2) sequential attribute choice tasks, and (3) final plan choice. We compare the performance of the behaviourally informed comparison tool to the performance of a tool that closely mimics the one currently available on the website of the Health Insurance Authority of Ireland (HIA). Prior to turning to the results of our test, we briefly describe the literature on choice overload and sequential decision-making that motivated the study.

1.1. The problem of choice overload and sequential decision-making as means to overcome it

Having a lot of choice can be both beneficial and have negative consequences for decisions (Chernev et al., 2016). On the one hand, large assortments mean that consumers have an opportunity to find a closer match to their goals and accommodate their future need for variety. On the other hand, abundance of choice often results in higher expectations (Diehl & Poynor, 2010), decreased motivation to choose and choice paralysis (Howard, 2019), dissatisfaction with both the process and the result of choice (Haynes, 2009), regret (Feiler & Müller-Trede, 2022) and broader dissatisfaction, feelings of uncertainty and lower well-being (Markus & Schwartz, 2010).

Choice overload has been documented in contexts of decisions about candy, essay topics (Iyengar & Lepper, 2000), retirement plans (Liersch, 2009; Sethi-Iyengar et al., 2005), holiday destination (Park & Jang, 2013; Thai & Yuksel, 2017), and even potential romantic partners (D'Angelo & Toma, 2016). Choice overload is greater when there are higher levels of decision task difficulty, greater choice set

complexity and higher preference uncertainty (Chernev et al., 2016). Where alternatives are differentiated on many attributes and where people do not understand the benefits of the choice options and cannot prioritise these benefits when trading off the pros and cons of these options, having many alternatives can be negatively associated with choice satisfaction (Greifeneder et al., 2010).

These conditions apply when choosing private health insurance. First, consumers choose from a very large set of alternative plans that vary on many attributes. Second, people have low health insurance literacy (O'Connor & Kabadayi, 2019), which likely leads to the lack of articulated preferences and increased difficulty to make sense of the complex information describing health insurance plans.

In order to improve decisions and make the experience of choice less frustrating, it is necessary to help consumers to deal with the complexity they face when choosing from a very large set of alternatives. One possible way to do this is to split a large decision into an ordered series of smaller ones. With such an approach, the number of options can be reduced sequentially, one decision at a time. This helps to counter choice overload without reducing the number of options (Besedes et al., 2014) and is thought to be a useful application in areas such as career choice (Gati, 1986; Gati & Kulcsár, 2021; Gati & Levin, 2014) and patient counselling (Van Achterberg et al., 2011). Despite its promise, we are not aware of studies that applied this approach to complex consumer choices.

2. Current study

The Irish private health insurance market is characterised by a high number of choice alternatives (at the time of writing there are 324 private health insurance plans). Moreover, each alternative needs to be evaluated on (at least) seven different cover areas, each of which has a number of attributes. The large number of plans, cover areas and attributes make all possible combinations overwhelmingly large. This market complexity combined with low levels of health insurance comprehension mean that it is impossible for ordinary consumers to do a systematic review and evaluation of each plan; they would feel overwhelmed with the choice and frustrated with the process.

To address these feelings and to simplify the process of choice, we designed a plan comparison tool that splits the decision into sequential stages. To test the tool's performance, we compared it to a tool that closely mimics the one currently provided online by the HIA. We aimed to answer the following research questions:

RQ1. Does using a behaviourally informed health insurance comparison tool make consumers more likely to choose a plan that they prefer?

RQ2. Do consumers perceive the comparison and choice process more positively if they use a behaviourally informed comparison tool?

RQ3. Do the choices of plans and perceptions of tools differ based on consumers' sociodemographic characteristics or experience with private health insurance?

RQ1 and RQ2 are directional hypotheses: our prediction, based on reduced cognitive load, is that the behaviourally informed tool will make a positive impact on choice and perception. Our hypotheses and study design were pre-registered: <https://archive.org/details/osf-registrations-3mezq-v1>.

3. Method

3.1. Behaviourally informed ("sequential") comparison tool

The basic logic of our behaviourally informed comparison tool was to elicit the areas of coverage that the consumer thought were most important, then get them to decide whether they were willing to pay more for higher cover, area by area, starting with their most important one. The tool therefore comprised consecutive tasks to match this logic: (1) a coverage ranking task, (2) a sequence of attribute choice tasks, and (3) a final plan choice. First, participants ranked seven coverage areas (inpatient care, maternity benefits, outpatient cover, outpatient radiology, overseas benefits, psychiatry cover and fertility benefits) that are used to describe private health insurance plans in Ireland in the order of personal importance to them. After obtaining the participant's ranking of coverage areas, the tool asked them to choose between different levels of cover one area at a time. The central idea of this stage was to present consumers with a series of trade-offs between the premium and the different attributes of available plans, starting with the area of coverage that they had ranked as most important in the first stage and proceeding in the order of their ranking.

To isolate and describe these trade-offs, we analysed real market data containing information on the 37 most popular private health insurance plans on the Irish market. First, we used regression models to explore the relationships between different attributes within each coverage area and the premium. This exercise allowed us to understand which attributes mattered and thus could be used to describe a particular coverage area and to categorise the plans within this area. For instance, inpatient cover has many attributes, among which access to private hospitals, access to private rooms, excess, and availability of certain procedures. Based on the relationships between these attributes and the premium, we defined two or three levels of cover for each coverage area in order to describe the plans. For example, inpatient care coverage area had three levels: (1) plans covering stays in public hospitals only, (2) plans covering stays in private hospitals with high excess, (3) plans covering stays in private hospitals with low or no excess.

For each area of coverage in sequence, to help people choose between different levels of cover, we showed participants information on how much the plans at each level typically cost (on average) and the benefits they include. We also indicated the range of premiums available at each level, by displaying the average price plus/minus one standard deviation, thus capturing the range of prices for the majority of plans at the relevant level.

Responses to the sequential attribute choice task were used to eliminate plans until four or fewer plans – those that matched people's preferences the most – remained in the choice set. At this stage, participants were invited to read detailed descriptions of the remaining plans and to make a final choice. If they were not happy with the final plans on offer, they could go back and start the process again.

3.2. "Control" tool

The tool that we used as a comparison (i.e., the "control" tool) closely mimicked the existing plan comparison tool available on the website of the Health Insurance Authority: <https://www.hia.ie/comparison-tool/#/>. The tool displayed all plans on the same page (their name and premium) and people could click on each of them to read detailed descriptions and view the full list of benefits. They could use filters (for the premium, amount of excess and coverage of certain procedures) on the left-hand side to narrow the number of plans down. Finally, they could choose up to four plans to compare in detail.

3.3. Experimental conditions

Participants were randomly assigned to two conditions. Half used the sequential tool first and control tool second, and half used the two tools in the opposite order. Hence the design was a within-subject comparison. The detailed procedure can be found in Appendix A.

3.4. Sample

To answer our research questions, we recruited 800¹ people from an online panel of a market research agency. We used a quota-based sampling approach to generate a sample that was approximately representative of the working Irish population aged 18-65 years. Half of the participants had private health insurance, half did not. All participants gave informed consent and indicated that their data could be used in the analysis.

3.5. Dependent variables

Our dependent variables for assessing the outcomes of the choice processes were as follows:

- 1) Preference of the plan chosen using the sequential versus the control tool. After using the two different tools to make choices, in cases where the chosen plans were not the same, participants were presented with both chosen plans and asked to make a final binary choice between them.²
- 2) Preference of the tool chosen using the sequential versus the control tool. After having used both tools, the participants were asked to make a final binary choice between them.
- 3) Satisfaction with the plan chosen using sequential tool and satisfaction with the plan chosen using control tool. These were combined scores of the responses to the two following questions, as we found strong correlations between them: "How happy are you with the plan that you chose?" and "How much do you trust it's the best plan for you?" (The responses were given on a 7-point rating scale).
- 4) Satisfaction with the tool/process. This was a combined score of the responses to the following four questions, as we found strong correlations between all items: "How much did you enjoy using the tool?", "How easy was it to use?", "How likely would you be to use it in the future?", "How likely would you be to recommend it to your friends/family?" (The responses were given on a 7-point rating scale).

3.6. Analyses

3.6.1. Descriptive analyses

Both tools contained features that allowed us to assess what consumers consider important when choosing private health insurance. We assessed the shares of people who filtered plans by different criteria when using the control tool. Similarly, we checked the rankings of different coverage areas that the participants produced via the behaviorally informed comparison tool.

3.6.2. Hypotheses testing

¹ As one of our research questions focused on interactions, we aimed to collect a sufficient number of observations to be able to reliably test those (200 per cell). With this sample size, we aim to reduce the standard errors while keeping the costs of the project feasible.

² A computer error resulted in 135 missing observations in this final binary choice task. The missing data occurred at random, so while somewhat reducing our sample size, they did not affect hypothesis testing.

Prior to conducting the main analyses, we checked the distributions of our dependent variables assessing satisfaction with the plan and the tool/process. The responses on these variables were non-normally distributed (left-skewed), so we opted for non-parametric analyses using Wilcoxon's signed rank test and ordered logistic regression analysis. When modelling satisfaction with the plan and the tool, we transformed the variables assessing satisfaction by grouping the responses into three categories: (1) more satisfied with the sequential tool, (2) equally satisfied with the sequential and control tool, (3) more satisfied with the control tool, and used ordered logistic regression. To assess the plan and tool preference, we conducted tests of proportions, and we modelled the plan and tool choice using binary logistic regression.

In addition to the pre-registered research questions, we also tested whether the plans chosen using sequential and control tools differed by annual premium.

4. Results

4.1. What is important to consumers when choosing health insurance?

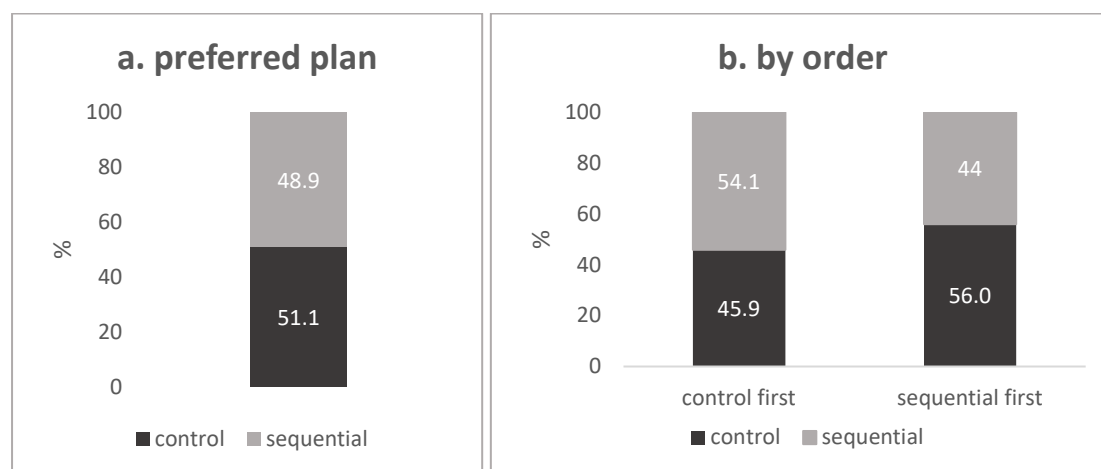
The most used filters when using the control tool to choose a plan were ophthalmology cover (used by 31.5% of participants) and fertility benefits (31.3%), followed by annual premium (25.6%). The shares were slightly higher among those participants who already had private health insurance (details in Appendix B). The filters used the least were orthopaedics cover (used by 4% of participants) and hospital type (not used by anyone).

When using the sequential tool, half of the participants ranked inpatient cover as the most important coverage area. It was followed by outpatient benefits – nearly one-third of all participants ranked it as the most important.

4.2. Preference and satisfaction with the plan

Final plan preferences were evenly split, with approximately half of the participants ultimately opting for the plan chosen when using the control tool, and half preferring the plan chosen using the sequential tool ($\chi^2 = 0.29$, $df = 1$, $p = .488$) (Figure 1a). However, any effect of the tool may have been masked by the order effect. Participants tended to prefer the plan suggested by the tool they used last, indicating a recency effect (Figure 1b, Table 1a). Neither current private health insurance status, nor participants' sociodemographic background influenced plan preference (Table 1a).

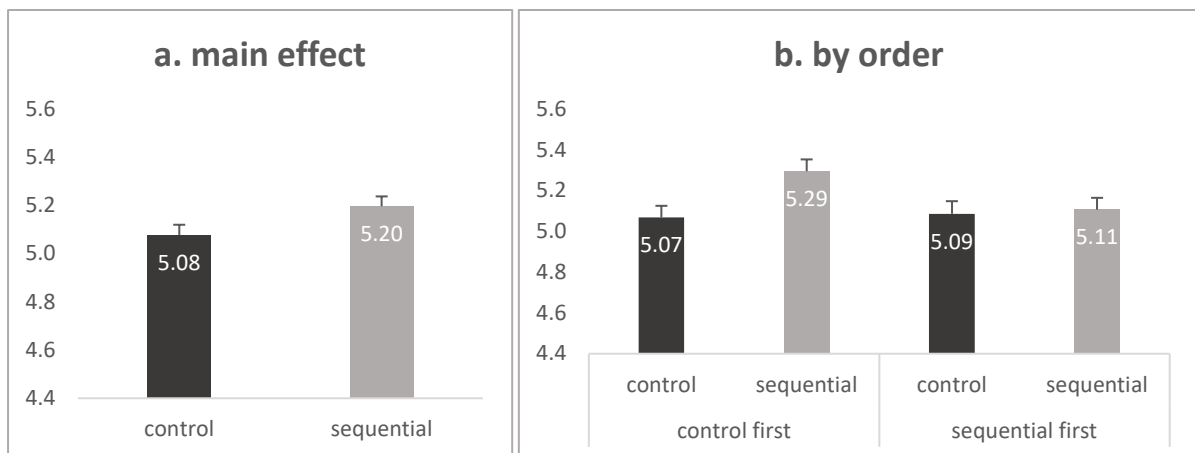
Figure 1. Plan preference



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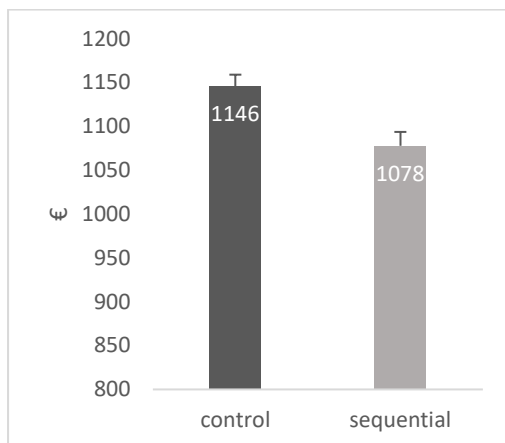
Mean levels of satisfaction with both plans were above the midpoint of the scale. There was a small (0.1 of a standard deviation) but significant ($V = 56074$, $p = .001$) improvement in levels of satisfaction with plans chosen using the sequential rather than the control tool (Figure 2a). This difference was driven by the “control first” condition (Figure 2a). Furthermore, plans chosen using the sequential tool were, on average, almost €70 cheaper (Figure 3). This difference was significant ($V = 142429$, $p < .001$). The effect of the tool on plan satisfaction was unimpacted by sociodemographic variables and current private health insurance status (Table 1b).

Figure 2. Plan satisfaction



Note. Error bars are standard errors

Figure 3. Annual premium



Note. Error bars are standard errors

Table 1. Binary (a) and ordered (b) logistic regression models for plan preference and satisfaction

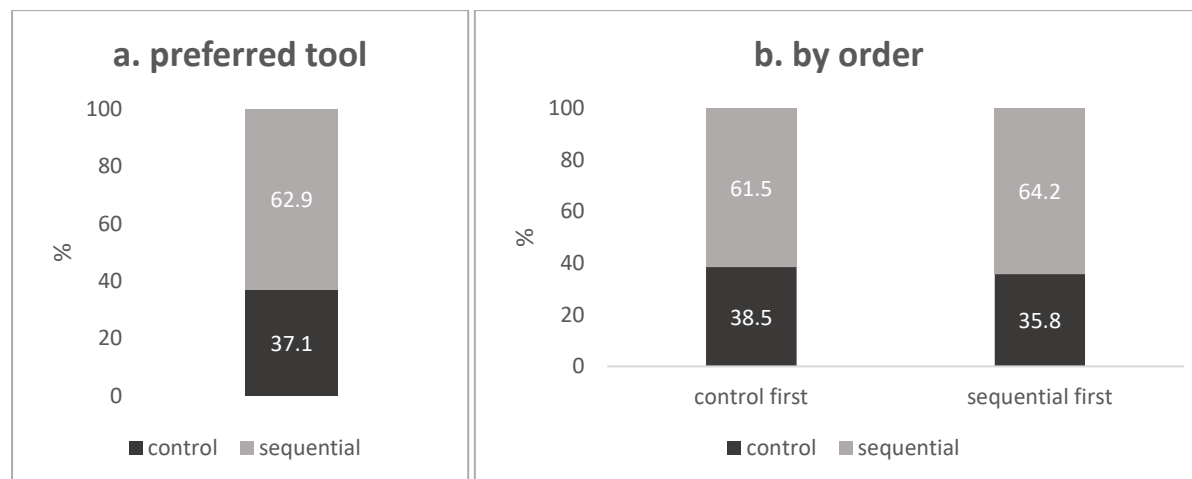
	a. Preference of the plan suggested by the sequential tool	b. Satisfaction with the plan
Order: sequential tool first	-.397* (.168)	-.502** (.132)
Having private health insurance	-.173 (.174)	.071 (.166)
Male	.028 (.174)	.102 (.136)
Age (ref. "below 30")		
30-39 yo	.052 (.260)	.134 (.204)
40-49 yo	.110 (.264)	.041 (.208)
50-59 yo	.235 (.298)	-.061 (.234)
60-65 yo	-.883* (.402)	-.014 (.288)
C2DE	-.048 (.184)	-.053 (.141)
Log likelihood	-396.703	-863.831
N	583	801

Note. *** $p < .001$; ** $p < .01$; * $p < .05$

4.3. Preference and satisfaction with the comparison tool

The participants strongly preferred the sequential tool ($\chi^2 = 52.98$, $df = 1$, $p < .001$): 62.9% liked using it more than the control one (Figure 4a). Preference for the sequential tool was not related to order (Figure 4b, Table 2a) and the effects of current private health insurance status and participants' demographic and social background were insignificant as well (Table 2a), suggesting the universality of this effect.

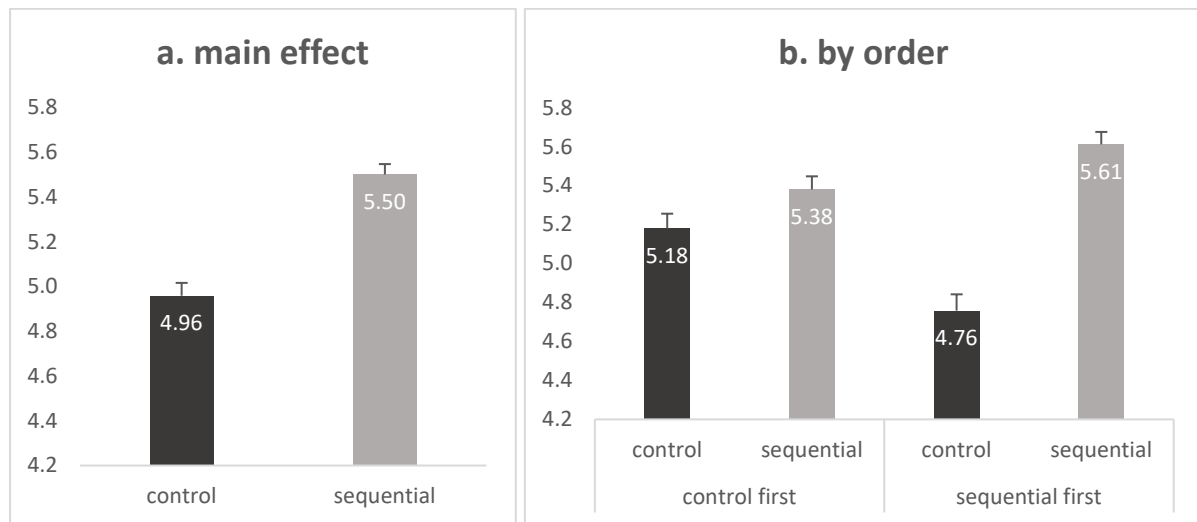
Figure 4. Tool preference



Note. Error bars are standard errors

The participants also gave higher satisfaction ratings to the sequential tool than to the control one (Figure 5). This effect ($V = .53661$, $p < .001$) was moderately large: more than one-third of a standard deviation. Although the effect was greater for those who used the sequential tool first, we did not register a significant order effect (Figure 4b, Table 2b). As in previous analysis, satisfaction with the tool was unimpacted by sociodemographic variables.

Figure 5. Tool satisfaction



Note. Error bars are standard errors.

Table 2. Binary (a) and ordered (b) logistic regression models for tool preference and satisfaction.

	a. Preference of the sequential tool	b. Satisfaction with the tool
Order: sequential tool first	.129 (.147)	.221 (.135)
Having private health insurance	.076 (.152)	.072 (.139)
Male	-.013 (.153)	.006 (.139)
Age (ref. "below 30")		
30-39 yo	-.460 (.235)	-.122 (.208)
40-49 yo	-.395 (.241)	-.046 (.213)
50-59 yo	-.352 (.269)	-.016 (.240)
60-65 yo	-.227 (.335)	.129 (.296)
C2DE	.045 (.158)	-.004 (.143)
Log likelihood	-525.078	-828.8978
N	586	801

Note. *** $p < .001$; ** $p < .01$; * $p < .05$

5. Discussion

The health insurance market is traditionally characterized by high levels of consumer inertia (Kautish et al., 2021; Drake et al., 2022). Product complexity, low levels of consumer literacy and choice overload may lead to frustration and lack of willingness to engage with the decision-making process (Howard, 2019). In the current study, we aimed to address these issues by designing and testing a behaviourally informed plan comparison tool that splits the decision into sequential stages, simplifying the process and reducing cognitive load. We hypothesized that the behaviourally informed tool would make a positive impact both on choice and on users' perceptions of the process.

Our hypothesis about the positive impact of the sequential tool on plan choice and satisfaction received some support. While we found no preference for the plan suggested by the sequential tool versus the control tool in a final binary choice, there was a small but significant effect on satisfaction with the chosen plan. Exploratory analysis showed that people also chose cheaper plans when using the sequential tool.

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The hypothesis about the positive impact of sequential tool on the perceptions of the process of choosing private health insurance was supported. Participants preferred the sequential tool over the control one and expressed higher levels of satisfaction with it. Importantly, the preference for and satisfaction with the sequential tool was universal – it did not vary by gender, age and socioeconomic status of the user, or according to whether they had private health insurance.

Our study provides empirical evidence in support of decision aids designed using a sequential elimination approach as useful tools to improve people's satisfaction with the process of choice when faced with complex decisions and a large number of options. We demonstrate the potential of such behaviourally informed product comparison tools to improve consumers' satisfaction with the process of choosing health insurance.

Our study has limitations. First, for reasons of practicality in conducting an online experiment, we used 37 plans in the study (based on the most popular choices of health insurance in Ireland), rather than the full 324 plans on Ireland's private health insurance market. Using 37 plans meant that in this hypothetical experiment people got to make their final choice relatively quickly; it would have taken longer with 324 plans. However, since we believe that the key factor in improved satisfaction was sequential elimination that simplified the process and reduced cognitive load, an even more complex decision might have benefitted from the intervention even more.

Given the usefulness of the sequential elimination approach to private health insurance choices, a similar approach might be useful to improve satisfaction with the process of decision-making in other domains. Private health insurance is not the only market characterised by high consumer inertia, low consumer literacy, product complexity and a large number of choice alternatives. People find it difficult to choose between different cell phone or internet plans. Consumers often fail to switch energy suppliers or financial services providers even if switching would allow them to save (Gray et al., 2017; Hortaçsu et al., 2017; Weiergräber, 2014). Providing them with an easy-to-use decision-making tool that simplifies choice would likely result in higher willingness to engage with the process and higher satisfaction.

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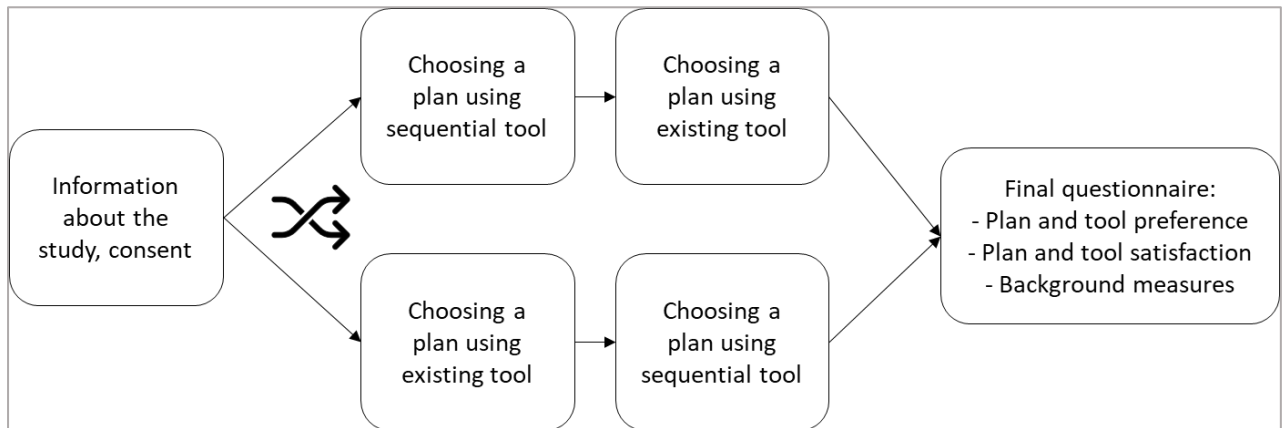
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SEQUENTIAL DECISION-MAKING FOR HEALTH INSURANCE

APPENDIX A

Experimental procedure



SEQUENTIAL DECISION-MAKING FOR HEALTH INSURANCE

APPENDIX B

Share of participants who chose different filters when using control tool.

	% total	% with PHI
Ophthalmology cover	31.5	36.2
Fertility benefits	31.3	40.9
Premium	25.6	30.7
Cardiac cover	19.2	21.9
Special procedures cover	15.9	11
Room type	15.5	19.5
Inpatient excess	13.7	14.3
Day-to-day benefits	12.6	15.7
Orthopaedics cover	4	3.8
Hospital type	0	0