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think

The Brain Game:
How can actuaries leverage
behavioural economics?

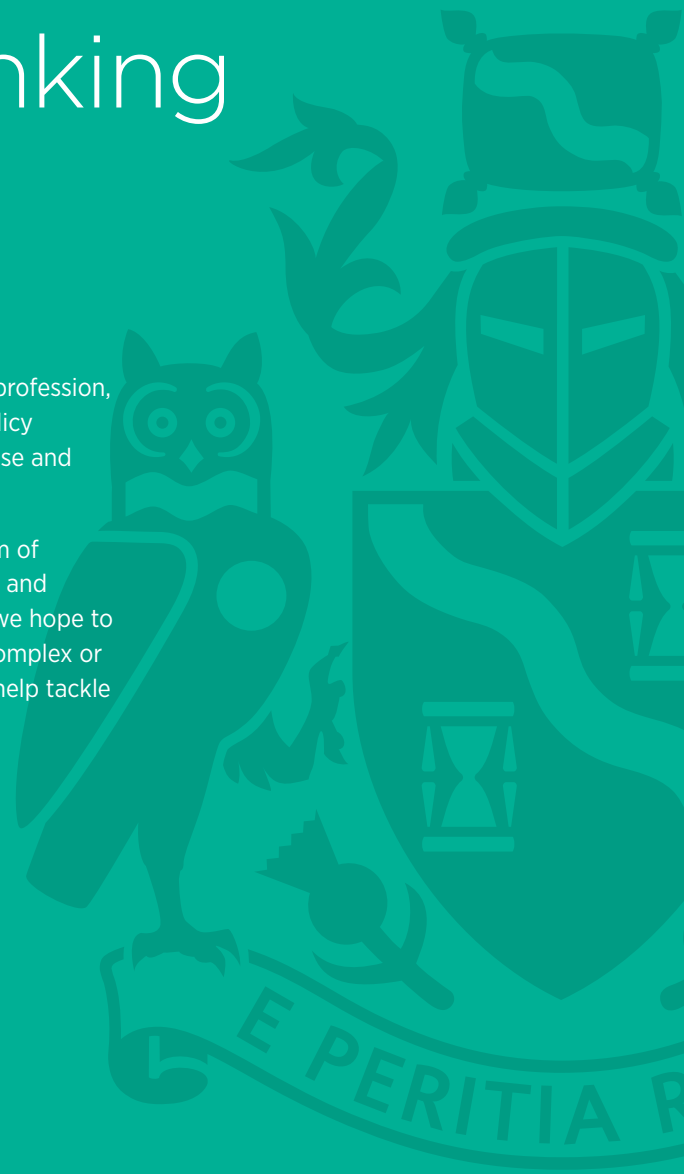
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Independent thinking from the IFoA

Part of the IFoA's purpose is to promote debate within and beyond the profession, and to position our members as leading voices on the biggest public policy challenges of our time. We aim to showcase the diverse range of expertise and critical thinking both within and outside the profession.

Our 'think' series seeks to promote debate on topics across the spectrum of actuarial work, providing a platform for members and stakeholders alike and sharing views that may differ from the IFoA's house view. In doing this, we hope to challenge the status quo, question the orthodoxy, and shine a light on complex or under-examined issues, thereby stimulating discussion and dialogue to help tackle issues in a different way.



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Introduction

We live in times of abundance – of material goods, services as well as choices. The last half century has seen massive industrialisation and automation that has led to increases in production. The current period we are in is widely being called the Fourth Industrial Revolution and technology is changing our lives in profound ways, one of them being the myriad choices and opportunities it is presenting to us. In earlier periods geography, distance, and time imposed significant restrictions in the sharing of information and trading goods and services, but this is no longer a barrier for us. The flip side is that we have to deal with a lot more uncertainty than our predecessors had to. When presented with uncertainty, we need to be able to make a choice about a possible future outcome and the decisions we come to are not always rational.

The human brain is the biggest guzzler of energy and runs on a near constant 20% of our metabolic energy output. In order to optimise its functioning and reduce decision making time, the brain looks for patterns that repeat and creates shortcuts. The one challenge in this process is that sometimes, we can connect the dots incorrectly or connect irrelevant dots and arrive at sub-optimal decisions. There is a strong influence of our personality, emotions, and past experience that may lead us to make a sub-optimal pick.

Financial decisions for most people are more complicated, less intuitive and can have consequences that are long term and possibly even irreversible.

This is what we refer to as biases and heuristics and it is not getting easier with technology. With targeted marketing, our phones and emails are buzzing with advertisements based on our recent browsing history. Online shopping apps help us purchase not just what is locally available. We get to compare these items with similar ones being sold millions of miles away. Add to this a number of reviews from other consumers on all online shopping apps and we have a huge amount of information to sort through and finally make a choice. When deciding on groceries or clothes, the cost of a wrong decision may not be much. After all grocery has a short shelf life, and the sheer number of clothes we buy in our lifetimes, makes one wrong choice insignificant.

Financial decisions for most people are more complicated, less intuitive and can have consequences that are long term and possibly even irreversible. This makes it harder to reach a decision especially when having to deal with so much information about investment choices, market behaviour, expert opinions and also the opinions of almost anyone who can post online. It's not so uncommon to see people making irrational choices based on their limited awareness or confidence, biases, and past experience. As actuaries in our roles working for financial services providers, it helps to understand what drives people to make decisions and to build into our products and models this understanding for better outcomes for people, companies, and society.

Why should actuaries care about 'behaviour'?

Understanding consumer choices is not just useful for advertising or marketing products and services in a way that increases take-up rates. It can also be a powerful tool to understand and influence behaviours that can help improve key indicators for the welfare of society at large. Although actuaries are making inroads into a number of hitherto off-limit industries and roles, a majority of us still are employed in insurance, employee benefits and investments. Often our tasks extend beyond just modelling.

Along with pricing, in-product and scheme design, we would benefit greatly from increased knowledge on the behaviours and biases of the end users of the products we design. For example, we can exploit the understanding of biases and heuristics to 'nudge' people towards choices that are good for them such as a pension plan, the right kind or amount of insurance, and more responsible behaviours that mitigate health risks or improve their carbon footprint.

Often our tasks extend beyond just modelling.

How do we get influenced?

Online shopping for insurance has become normal with company websites, aggregators and many other platforms. In addition to these choices, the inherent nature of the insurance business and products make it less intuitive and hence more difficult to decide what to buy. Insurance contracts are promises to compensate losses of policyholders in exchange for a premium that in monetary terms is significantly less than the likely claim payout. Policyholders are often not well acquainted with how insurers come up with premiums. The probabilistic nature of these calculations and occurrence of many mishap free years creates confusion in performing a straightforward cost benefit analysis of premiums vis-à-vis insurance protection they can buy. The decisions made in respect of insurance are also complicated by the significant non-monetary value attached to what is insured (for example lives, health, homes, vehicles, and other possessions). Finally, there is also an element of trust involved in choosing an insurance company. Insights on behaviour can therefore be very useful in influencing consumer choices with respect to insurance.

We put more weight on avoiding a bad decision than we put on making a good decision.

Apart from the influence we may exert and impact we may create with our work, we are human too and are equally affected by the very same biases that we study, and so are others we collaborate with at work. Biases are universal and occur across all ages, professions and irrespective of the level of financial literacy. Anchoring is one of the most common behavioural biases and refers to our tendency to rely unduly on the first bit of information we receive. This then serves as the starting point for all future information to be processed. A paper by Ünveren and Baycar (2019) found evidence as early as 1875 where surveyors who assessed property values in Istanbul demonstrated a **strong anchoring bias**¹. The study found that surveyors were strongly swayed by door numbers, a very irrelevant data point in assessing property values.

The recency or availability bias refers to the tendency we have to base our decisions on information that was presented to us most recently or the most easily available information. The simplest example of this is when insurance sales increase post event such as the surge in demand for life and medical policies during the pandemic. We judge the likelihood of an event to be higher soon after we have heard of it or experienced it, for instance a theft in the neighbourhood makes us feel that thefts are more common than they actually are.

Regret aversion is another common, self explanatory phenomenon which refers to our tendency to act mostly in a way to avoid feelings of regret. We put more weight on avoiding a bad decision than we put on making a good decision. Although this is a good survival or coping mechanism from a psychological point of view, it is one that could lead to some sub-optimal financial decisions. Directly related to this bias is the sale of extended warranty insurance as an add-on to a purchase of consumer durables. Though this is not an example that shows the insurance industry in a good light, it is a good example of how consumer behaviour is studied and used to do business. Some studies argue that risk aversion through purchase of insurance makes sense for large losses that can change the marginal utility of wealth. Legal experts in the US argue that the manufacturer provides a warranty that is sufficient based on the quality they provide and that no rational consumers would be genuinely worried about a loss so small in amount compared to other insurance they **normally buy**.²

How can we positively influence consumer behaviour?

It's not just about selling!

Studying behaviour is not just about finding ways of selling your products to customers by exploiting biases. There are a number of positive influences that we can exert with the knowledge and insights on how people respond to being presented with choices. For example, it is hard to get honest responses to questions about how much people exercise, how much people weigh or how many cigarettes they smoke in a day. But this is key information in underwriting. Posing these sensitive questions in a way to promote more honest responses could go a long way in collecting necessary information on proposal forms.

Another anomaly that has been studied is that policyholders prefer lower deductibles which make the premiums costlier. Pure rationality would dictate that we prefer a policy with a large deductible for which we pay less. Given that the likelihood that event we are insuring will occur is very small, the amount we pay for additional coverage is large compared to the expected value of the benefits. It is important for actuaries to understand such policyholder tendency while building in assumptions in pricing and **reserving models**.³

Insurance product design

Just like any other sector designing or marketing its offerings to influence consumer choices, insurance products may also be designed to produce certain outcomes based on consumer choice, rationality and behaviours in decision making. This is not a new concept or an idea, and it has been leveraged in a number of ways without being named as such. For a long time, insurance products have been designed with measures to limit or discourage moral hazard with deductibles, co-pays, limits, and exclusions. All these have been put in place to induce consumers to behave responsibly and not act in a way to exacerbate the risk that they are covered for by insurance. The bonus-malus system in motor insurance has been in practice since the 1960s. Offering premium discounts for good driving and penalties for rash driving or accidents, has been proven to promote good driving.

Introduction of telematics devices that record driving parameters such as average or maximum speed, acceleration, and braking, also act as deterrents and promote safe driving. In health insurance, the Fitbit and smart devices that track the number of steps we walk, how much we exercise, and other vital indicators of health encourage adoption of healthy lifestyle habits, a desirable behaviour among policyholders while incentivising them with reduced premiums.

...insurance products may be designed to produce certain outcomes based on consumer choice...

In recent years, the introduction of usage-based car insurance has produced many impacts on the way people drive as well as the way people perceive and buy insurance. Since there is a reward in the form of reduced premiums, people would be encouraged to drive less and only when absolutely necessary. This has a number of larger impacts on society such as greater reliance on public transport which could eventually lead to governments improving this key bit of infrastructure. Also driving less, reduces the demand for petrol and diesel and could further the **sustainability cause**.⁴

Even the decision of participation in a pensions scheme is highly dependent on financial awareness and the individual's biases.

Retirement outcomes

In a number of countries, state funded pay-as-you-go pension schemes are being replaced by private pension plans. Also, world over, there has been a shift from the more easily understandable defined benefit plans to the defined contribution plans. In addition to these changes, low financial literacy results in people making irrational choices when it comes to providing for their retirement. Apart from details about the plan, a general awareness of macroeconomic variables that can affect your retirement income and make it insufficient is not something people readily understand. One of the most common behavioural issues that impacts retirement planning is the power that instant gratification holds over the mind versus putting in money that one will receive many years into the future. Overconfidence by relying too much on the 'present' and underestimating the risks and uncertainties of old age is also common.

Studies in the UK and US indicate that people often do not estimate their retirement readiness **correctly**.⁵ Even the decision of participation in a pensions scheme is highly dependent on financial awareness and the individual's biases.

In our roles in employee benefits, actuaries can help influence choices that will ultimately result in better outcomes for people in retirement, thereby reducing the burden on the state and their families. Designing schemes that present simple choices for example automatic or compulsory enrolment, drawdown facilities and incentives such as guarantees that ensure people get back at least the amount they contributed could go a long way in boosting **take up**.⁶

Richard Thaler, who's widely acknowledged as the founder of the field of behavioural economics, and Shlomo Benartzi designed a scheme that linked future salary increases to increases in future savings rates. 78% of people stuck with this scheme for 3 years and in that period, the savings rate went up from **3% to 14%**.⁷ A study in Germany between **1997-2004**⁸ showed that changes in the scheme could affect retirement age, specifically, inducing people to delay retirement. Lower birth rates and a higher proportion of retirees compared to the working age population prompted the adjustment in the state funded PAYG plan that made people take the decision to delay retirement. This adjustment worked well partly because at that time in Germany, early retirement was highly valued and considered an achievement in **society**.⁹

The future

As of now, with a majority of actuaries working in insurance, investments and pensions, understanding the behaviour and aspirations of end users including policyholders, investors, insurers and other stakeholders helps us in delivering better outcomes through better designed products and services and more relevant advice. Discussing the future of any field today is incomplete without considering the role of AI, more so for the topic of behaviour biases. Immensely scaled up technology now means we are sitting on a wealth of data available to analyse trends and behaviours.

But another important aspect to consider is how human behaviour is being altered by interaction with machines. Human-human interactions have been characterised by warmth and emotion, but with an increase in human-computer interactions, there is not much room for either. Will this mean we will act more rationally and conform with classical textbook economics or will this mean we will evolve newer behaviours and biases that invalidates the write up above. We will have to wait and see.

Discussing the future of any field today is incomplete without considering the role of AI, more so for the topic of behaviour biases.



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