

# THE AGEING POPULATION: AGEING MIND LITERATURE REVIEW REPORT



2017

# the big window

through the minds of your consumers



**2017**  
**the Big Window® Consulting Ltd**  
Mugup Barn | Towngate | Hepworth  
West Yorkshire | HD9 1TE

tel +44 (0)1484 690490  
mobile +44 07789 723801

[www.the-big-window.co.uk](http://www.the-big-window.co.uk)  
[info@the-big-window.co.uk](mailto:info@the-big-window.co.uk)

**the Big Window®** is very proud to have been commissioned by the Financial Conduct Authority ('FCA') to conduct this extensive review.

We are grateful to a number of individuals who supported us in writing it including the industry stakeholders and academics. In particular, we would like to thank everyone involved in the project at the FCA, Victoria McLoughlin, Vivienne Man, Isobel Yiannopoulos and Leslie Sopp.

**the Big Window®** is an award winning agency that works with clients across sectors and, in particular the financial services sector. We specialise in utilising psychology in the design, conduct and analysis of primary and secondary research to ensure the most challenging of truths are uncovered and translated into action.

This review was led by Lisa Edgar. The research team comprised Nicola Stenberg, Frances Green and Dr Emma Kirkby-Geddes.

#### Disclaimer:

The views expressed in this report are solely the responsibility of the authors and should not be interpreted as the views of the FCA. All errors or omissions are solely the responsibility of the authors.



---

# Contents

---

	<b>Introduction and Approach</b>	<b>page 5</b>
	<b>Executive Summary</b>	<b>page 9</b>
<b>1</b>	<b>The Landscape of the Ageing Mind</b>	<b>page 21</b>
<b>2</b>	<b>Financial Decision-Making and the Ageing Mind</b>	<b>page 39</b>
<b>3</b>	<b>Implications for Financial Services</b>	<b>page 52</b>
<b>4</b>	<b>Conclusion</b>	<b>page 81</b>
<b>5</b>	<b>Bibliography and Notes</b>	<b>page 84</b>

---

# Introduction and approach

## Background to the research

In recognition of the changing structure of the UK population, the Financial Conduct Authority ('FCA') is seeking to encourage **firms to reflect on what they can do to better meet the needs of older consumers and then adapt their practices accordingly.**

As a result, it embarked on the **Ageing Population Project**. This was launched in 2016 with a collaborative Discussion Paper. The paper features contributions from a range of experts, stakeholders and organisations on what older people need from financial services providers and some of the barriers that might get in the way.

The breadth of issues raised in this Discussion Paper highlight the wide range of issues relevant for older consumers. The FCA's Ageing Population Project meets the FCA's relevant strategic and operational objectives:

- **Strategic:** *"to ensure that the relevant markets function well".*
- **Operational:** *"to secure an appropriate degree of protection for consumers"; "to protect and enhance the integrity of the UK financial system"; and, "to promote effective competition in the interest of consumers in the markets for regulated financial services".*

This literature review has informed the Ageing Population project and is being published alongside the FCA's Ageing Population Occasional Paper. The FCA commissioned **the Big Window®** to conduct a comprehensive literature review to provide *an overview of the ageing mind in all its varying stages (i.e. what happens as we age) and the challenges faced by older consumers when interacting with financial services.* Whilst there are many age-related issues that may affect someone's engagement with the financial services market (such as mobility, dexterity, sight, hearing, caring responsibilities and ageism), the focus of this review is cognitive ageing.

The purpose of the literature review was:

*To provide a good working overview of the entire spectrum of cognitive factors that could affect the way in which older consumers engage with financial services.*

More specifically, the literature review was commissioned to provide:

- **An overview of the different processes that happen to the mind as people age.**
- **Information to help firms and FCA teams understand the challenges faced by older consumers in the financial services context.**
- **Clear recommendations that help financial services firms to adapt to meet the needs of older consumers.**

# Summary of the approach to the literature review

The review process was made up of three components.

## 1 The Landscape of the Ageing Mind

A literature review of age-related cognitive changes for both the:

- Cognitively healthy
- Cognitively impaired

## 2 Financial Decision-Making and the Ageing Mind

A literature review of age-related cognitive changes as they relate to:

- Decision-making
- Financial decisions and behaviours

## 3 Implications for Financial Services

A review of the implications for providers, organised into nine categories of tasks and activities related to financial services.

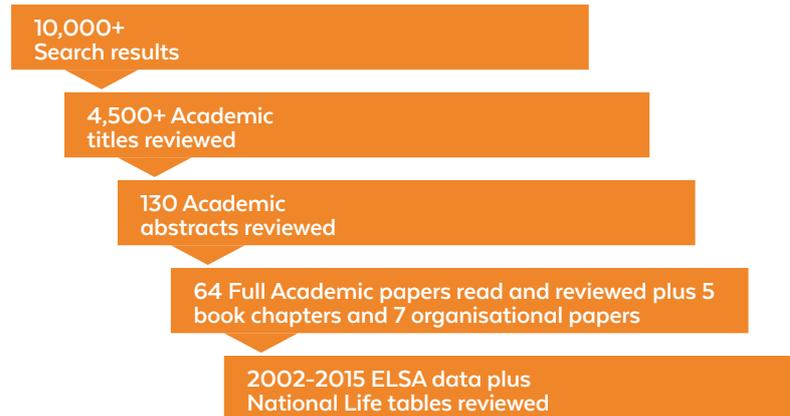
There are a number of approaches to undertaking literature reviews. At one end of the spectrum, there is a full and multi-arm systematic review, which typically takes between ten and eighteen months and involves selection of papers to include in the review based on very stringent criteria. At the other end, there is a shorter scoping review, which takes a matter of weeks and does not typically include critical assessment of materials, mapping of themes or evidence from other sources.

This review struck a balance between time, rigidity and robustness by using a ‘Rapid Evidence Assessment’. Taking four months to complete, it included:

- Input of key terms into several academic journal search engines, plus other search engines to identify published materials, typically from the last 10 years (2006-2016).
  - **Component 1** search terms included combinations of: *cognition, cognitive decline, meta analysis, ageing, systematic review and longitudinal.*
  - **Component 2** search terms included combinations of: *cognition, cognitive, decision-making, finance, financial, financial services, banking, older adults, older consumers, review, meta analysis and longitudinal.*
  - Data from the English Longitudinal Study of Ageing (‘ELSA’) was also used to support the review.
- Critical assessments of the evidence in the materials, i.e. assessment of ‘inputs’, such as design and sampling, in addition to ‘outputs’, such as findings, conclusions and recommendations.
- Input from external experts: interviews were conducted with six key industry and academic stakeholders. Their viewpoints were used to draw together key themes from the secondary evidence, in addition to drawing out implications and recommendations. The stakeholders were:
  - *Age UK, Jane Vass, Director of Policy and Research*
  - *Engage and Create, Rachel Mortimer, Founder*
  - *Edinburgh University and Lothian Project, Professor Ian Deary, Director, MRC Centre for Cognitive Ageing and Cognitive Epidemiology*
  - *Financial Services Consumer Panel, Professor Sharon Collard, Panel Member*
  - *The Pension Advisory Service, Michelle Cracknell, Chief Executive Officer*
  - *The Centre for Better Ageing, Anna Dixon, Chief Executive Officer*
- Search of additional sources of information (also known as ‘grey literature’) - for example, published work and policy documents from other age-related institutions such as Age UK and the Alzheimer’s Society.
- Mapping of evidence to build informed conclusions upon completion.

## Search outcomes

The search outcomes were extensive. A summary is provided below:



## A note on the report

The structure of the report is consistent with the approach to the review process:

- **The landscape of the ageing mind:** this chapter sets out the UK demographic landscape and associated age-related changes in the UK population. It explores what the literature suggests happens to the mind as it ages. The chapter concentrates on the effects of cognitive ageing, and thereby retains a focus on the implications, rather than the causes, of change. The chapter covers both normal cognitive ageing as well as age-related pathological conditions such as dementia.
- **Financial decision-making and the ageing mind:** this chapter focuses on the ageing mind as it relates to decision-making more generally and financial decision-making in particular. It explores the typical characteristics and common challenges associated with financial decision-making and ageing, as identified within the literature. Again, the chapter covers both normal cognitive ageing as well as age-related pathological conditions.
- **Implications and recommendations for financial services providers:** this chapter draws on the evidence set out in the previous two chapters, combined with insights from stakeholder interviews, to understand the implications for different financial situations and various financial tasks. Nine different financial tasks are considered, ranging from those that are relatively familiar to those that are unfamiliar and more complex.

# Executive summary

This review presents current academic thinking about cognitive ageing. It considers how age-related changes in cognitive abilities affect consumer interactions with financial products and services. The report discusses the implications of this for providers, by focusing on nine financial services-related tasks, ranging from relatively simple to relatively complex and from more familiar to less familiar. Recommendations for meeting the challenges associated with cognitive ageing are offered for each of the following nine categories of banking and financial tasks:

- 1 Paying by cash
- 2 Paying with a card
- 3 Using an Automated Teller Machine ('ATM')
- 4 Accessing services in a branch
- 5 Monitoring accounts
- 6 Making a telephone enquiry
- 7 Online banking and financial management
- 8 Changing product or provider
- 9 Longer-term financial tasks or decisions

This review contributes to the Financial Conduct Authority's ('FCA') Ageing Population Occasional Paper by assisting financial services firms to:

- Understand the varied needs and preferences of older consumers and how these may be affected by cognitive ageing.
- Identify potential challenges or barriers which may arise for consumers experiencing cognitive change.
- Identify opportunities for positive product or service innovation in the interests of these consumers.

The FCA aims to support financial services firms by providing educational material and practical examples to help them evaluate their current offerings and shape their products, services and distribution channels in a way that is accessible, age friendly and appropriate for all consumers.

Whilst there is considerable variation from individual to individual, there is strong evidence that as people age, they are likely to experience cognitive changes which may have implications for how they engage with the financial services industry. Some of the issues raised in this report are already being considered by the industry and there are examples of good age-friendly practice across the UK. As such, this report is designed to inform practice and foster continuous innovation, in favour of a positive outcome for all consumers as they age.

The report is structured in three parts. Chapter one presents the evidence about how cognitive abilities change as people age, distinguishing between normal maturation processes and pathological change, such as dementia. Chapter two considers how these age-related changes may impact on financial decision-making and chapter three discusses provider-focused implications and recommendations that arise from this review.

## The ageing population

### Key messages from the literature review

- People are living longer than ever before and this trend is expected to continue. This means that a growing proportion of the population is aged 65 and over.

People are living longer than ever before and this trend is expected to continue. In 2016 there were 11.8 million people aged 65 and over in the UK. By 2020 this will rise to 12.7 million and in less than 15 years, the number will reach 15.7 million. Forecasts suggest that population expansion will be most marked amongst the oldest old (people aged 85 and over), with the number doubling in the next 20 years (see page 50).

Whilst longevity is to be celebrated, population ageing and increased life-expectancy have major implications for all areas of life. Critically, improvements in overall life-expectancy are not being matched by improvements in healthy life-expectancy which means people over 65 years tend to spend more years in ill-health.

The implications of demographic ageing for financial services are far reaching. Age-related changes in physical capabilities, such as strength, stamina and speed, are accompanied by changes in the way that the brain processes information. To understand this better and how it might impact financial services firms or related consumer decisions, it is necessary to take a closer look at the ageing mind.

# How the ageing mind changes – normal cognitive ageing

## Key messages from the literature review

- Cognitive abilities tend to change as people age and these changes are shaped by many different factors. However, some people experience cognitive changes that are more marked than would be expected for a healthy person of their age.
- Normal cognitive ageing is associated with improvements in some cognitive abilities and decline in others.
- Although there is a general pattern of decline in fluid cognitive abilities from 30s onwards, cognitive changes vary considerably from individual to individual.

Normal cognitive ageing involves a natural process of maturation within the brain. It is associated with subtle and incremental changes in cognitive abilities, including memory and problem solving.

Whereas some cognitive abilities improve or remain stable with age, others decline. To understand these changes in cognition, it is helpful to distinguish between *crystallised* abilities and *fluid* abilities.

Crystallised abilities refer to the use of the skills, knowledge and experience that have accumulated through daily living. They are evident when writing a letter or when using general knowledge to answer quiz questions. Over time, as people age, these abilities tend to expand and become more stable.

Fluid abilities concern reasoning and problem-solving in novel situations. These skills are employed when navigating a city for the first time or when assembling a new piece of furniture. Fluid abilities tend to decline with age from the third decade of life. **This means that unfamiliar environments and new situations tend to challenge the more mature brain.**

# Normal cognitive ageing and everyday life

## Key messages from the literature review

- Normal cognitive ageing is unlikely to interfere with routine daily tasks but it should not be ignored.
- The decline in fluid cognitive abilities, which is associated with the normal ageing process, can be a greater obstacle when tasks are complex or unfamiliar.
- The steeper rate of cognitive decline, common amongst people in their 80s, can mean the oldest old are likely to be yet more challenged by novel or complex situations, with changes to environment or context (e.g. changes to website or process) potentially making a situation feel novel or complex.

Human beings are masters at adaption and, whether consciously or not, accommodate age-related changes. As a result, normal cognitive ageing is unlikely to interfere with routine daily tasks. However, declining fluid abilities can present challenges in certain situations or tasks.

The evidence points to a number of situations that are potentially challenging as people get older – those that are new or those that require complex reasoning. These types of situations are relatively common in financial services, due to changes in products or services and the environments or channels that consumers use to access them (e.g. pension freedom or online banking). These situations can also arise when a consumer's circumstances change (e.g. retirement) and there is a need to deal with new and/or more complex products or services. The acceleration in decline that is common amongst people in their 80s also means that the oldest old are likely to be more affected by cognitive ageing.

# Mild cognitive impairment and dementia

## Key messages from the literature review

- Up to 20% of the population aged over 65 may be affected by mild cognitive impairment (MCI).
- MCI does not cause a major impact on daily living in most situations but it does affect the ability to carry out complex everyday tasks.

People with mild cognitive impairment (MCI) or dementia experience cognitive changes that are more marked than would be expected for a healthy person of their age. This is known as pathological cognitive change and it is caused by factors such as disease or trauma to the brain.

Up to 20% of the population over 65 years may be experiencing slight impairments in memory or other cognitive abilities that are associated with MCI. Whilst these problems are likely to be noticeable, they do not cause a major impact on daily living. They may not, therefore, be formally diagnosed as MCI. In some people, MCI is a pre-dementia condition and approximately 10-15% of people with MCI go on to develop dementia. A recent review of the research about the impact of MCI revealed that it is associated with significant decline in performance of complex everyday tasks. This includes finance-related activities.

## Key messages from the literature review

- Whilst dementia symptoms vary greatly, they are likely to be severe enough to affect daily living and may involve changes in mood.

Around 7% of people in the UK aged over 65 are living with dementia. Amongst those aged over 80, the prevalence is much higher and current data suggests around one in six people in this age group are living with dementia. Importantly, everyone's experience of dementia is different and will depend on the type of dementia, how far it has progressed and the rate of progression. Life experiences, personality and social environment contribute to these differences. Nevertheless, common symptoms include memory-loss and difficulties with cognitive abilities and language, which have become severe enough to affect daily living. Mood changes are also likely.

# The ageing mind and financial decision-making capabilities

## Key messages from the literature review

- Financial decision-making capabilities are likely to change as people age.
- Financial decision-making tends to reach optimal performance in mid 50s and then declines over time.
- As consumers age, a decline in cognitive abilities may mean they face a number of challenges when making financial decisions.

There is substantial evidence that age-related cognitive changes impact upon financial decision-making. The research suggests financial decision-making tends to reach optimal performance in the mid 50s and then declines over time. This is concerning given that an older consumer is likely to be dealing with more complex financial products (e.g. equity release, investments, annuities etc.) and the amounts of money involved may be significant, as assets tend to increase over the course of a lifetime. The older consumer is also less likely to be able to address the consequences of any poor financial decisions at this life stage.

Four age-related impacts on financial decision-making are consistently highlighted in studies that have compared how older and younger people perform on specific tasks.

- **Divided attention:** older consumers find it harder to focus on multiple pieces of information at the same time. This is the case when the task or product is complex (e.g. task concerning pensions), or when the environment is complex or highly stimulated (e.g. noisy or busy branches).
- **Learning:** older adults perform less well than younger adults in tasks that require them to learn new skills or take on new information (e.g. setting up a new payee on an online account).
- **Choice and complexity:** older consumers are more likely to perform sub-optimally in high-complexity decisions (e.g. choosing between different mortgages) compared with younger consumers.
- **Prediction:** older adults' recall of the past and therefore predictions about the future, are 'blurry' and not always well defined. This could be a particular issue for products that involve inter-temporal purchase periods (e.g. annual renewal) or future promises (e.g. insurances or investments).

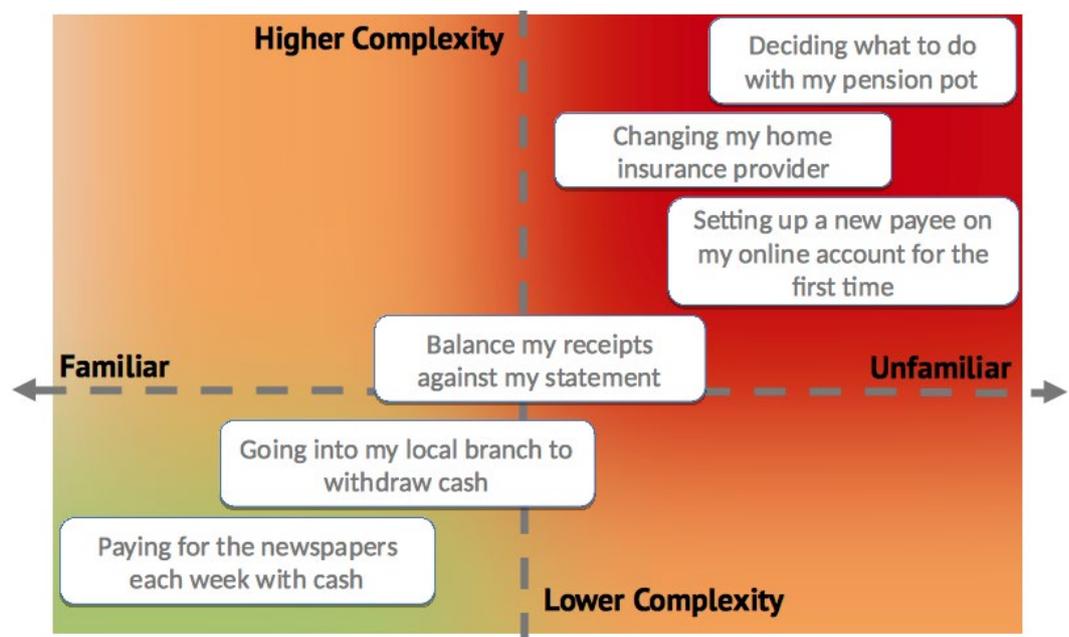
To compensate, older people tend to adopt decision-making strategies that enable them to draw on existing skills and knowledge rather than acquire new ones.

### Key messages from the literature review

- The complexity and unfamiliarity of financial services and products will influence how older consumers engage with them.

A key message emerging from analysis of the literature is that there are two dimensions critical to decision-making abilities and performance as people age: the complexity of the task/environment and the familiarity of the task/environment. Providers could use these dimensions to map different financial tasks. Tasks that are very complex and unfamiliar are likely to be more challenging to older customers. This is illustrated below and some examples are offered.

**Figure A: The Familiarity-Complexity Map**

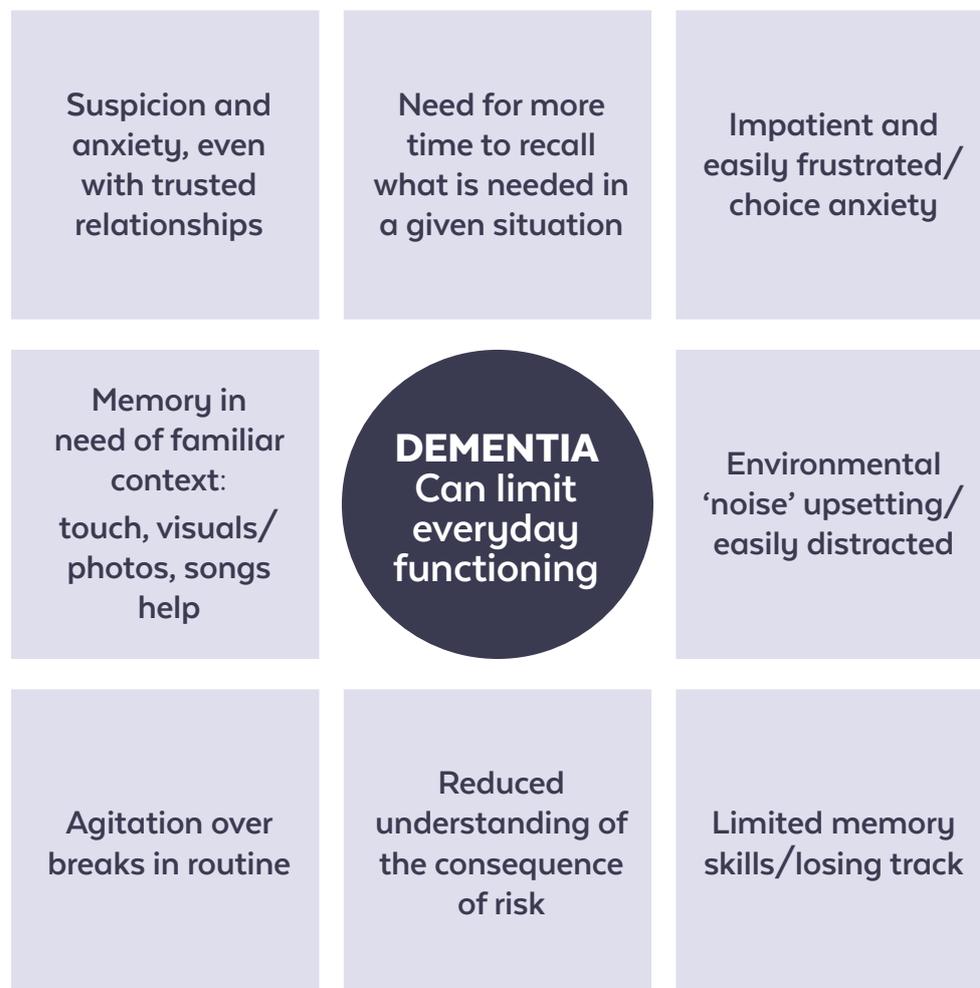


This map might also help providers consider the impact of introducing change to products and services: change to even the simplest of tasks can make them seem more complex. For example, for the oldest old or someone with a cognitive impairment, change in the local branch environment can make the experience of paying in a cheque feel new and, as a result, confusing and anxiety-ridden.

## Dementia and financial decision-making

For people with MCI or dementia, context that offers **structure, time and familiarity** is important for optimal financial decision-making. Qualitative research recently undertaken by **the Big Window**<sup>2</sup> has highlighted that people with dementia are likely to find financial tasks and decisions more difficult if they feel under pressure, if they are in a noisy environment, if the circumstances are unfamiliar, or if the decision/task is complex. In environments that do not offer the consumer time, predictability or comfort, dementia-related symptoms are more likely to come to the fore.

**Figure B: Dementia-related symptoms**<sup>3</sup>



# Ageing and financial decision-making: implications and recommendations

New information, new environments and complex decisions are more likely to challenge the ageing mind. This *is not a cohort issue*. We cannot assume that it is technology-related barriers that the current generation of older consumers are experiencing. What is new for today’s older generation will be a ‘different new’ for the next older generation. In turn, it leads us to advocate that all financial services providers *incorporate the needs and preferences of older consumers into their product/service development and governance processes or structures*.

Banking and financial tasks vary from relatively simple (e.g. making payments with cash) to those that are relatively complex (e.g. making decisions about pensions). The tasks also vary according to how often a typical person might do them, i.e. how familiar they are.

Categories of banking and financial tasks		
Task type	Complexity level	Frequency
1 Paying by cash	Low	Everyday
2 Paying with a card	Low	Most days
3 Using an ATM	Low	At least once per week
4 Accessing services in a branch	Low	Every week
5 Monitoring accounts	Low-Medium	Every month
6 Making a telephone enquiry	Medium	Infrequent
7 Online banking and financial management	Medium-High	Varies
8 Changing a product or provider	Medium-High	Infrequent
9 Longer-term financial tasks or decisions	High	Infrequent

There are wide-ranging implications of cognitive ageing for banking and financial tasks. To consider this, the review focuses on nine task areas and recommends responses to the challenges associated with cognitive ageing. It is strongly recommended providers read the full list of recommendations as set out in chapter three.

In summary, this review suggests providers adhere to the following principles to ensure a good customer outcome for their older customers:

### Please see full list of recommendations in Chapter 3

- **Branch environments** that are welcoming, familiar and well structured. A place that offers older customers an opportunity to conduct their business *without time, interpersonal or environmental pressures*; advising them about the optimal times to come to avoid the ‘crowds’ as well as offering in-branch areas which are quieter and/or private. A place that facilitates ‘*good customer thinking*’ irrespective of age by ensuring it is: *well signed* using familiar and recognisable visual stimuli; *well lit*, taking into account changing visual needs; and *well organised* with places to sit, plenty of clocks, and support materials to aid activities and decision-making (e.g. offer task templates such as ‘completing a direct debit form’).
- **Frontline staff** equipped and motivated to offer older customers the support they need in all of their banking and financial tasks. This could manifest itself as branch staff supporting older customers to *trial new behaviours* such as online banking or use of internal branch technologies such as new ATMs or video linked services. It could mean branch or telephone staff are trained to *recognise and support the needs of those who are experiencing cognitive changes or impairments* which mean they are struggling with banking and financial tasks.
- Providers to *collaborate and review* to provide older consumers with **cash and purchase equipment** such as automated teller machines (‘ATMs’), *point of sale (‘POS’) machines and payment (debit and credit) cards that are consistent with enabling positive transaction experiences* irrespective of age or ability. This might mean ensuring *greater consistency between ATMs and POS machines*, machines that are built around access as well as clarity and comfort of use. It might also mean developing suites of *debit and credit cards that are easy to handle and readily distinguishable* from each other.

- **Digital interfaces and technologies** should be developed with older consumers in mind. Rather than be designed in isolation, *human interfaces (and preferences for human interactions) and 'Fintech' advances must go hand-in-hand*. This might manifest itself in greater emphasis on connectivity with humans via the 'screen experience' (e.g. video banking). Firms should plan how frontline staff can support older customers to engage with new technology-based activities. Older people could be given opportunities to trial new behaviours in a safe and supportive environment, such as a branch. In turn, this might mean continuously reviewing and designing branches around the needs of older customers, to ensure they find the branches easy and supportive environments to be in. Technology and digital strategies should similarly be developed through the lens of the older consumer, by building their needs and expectations into the governance structure that surrounds the development of websites, web-based products and online customer journeys.
- **Channel strategies** need to be taken forward with older consumer preferences and changing cognitive abilities in mind. In particular, audio services, i.e. telephone-based services, might not facilitate ease of information processing for older consumers, particularly when significant cognitive changes occur or cognitive impairment is evident. This is particularly the case for automated telephone services which expect older people to recall passwords and process tasks whilst simultaneously communicating with the automated system and then, possibly, a staff member. Age-associated challenges can be ameliorated if providers give due consideration to what is expected of customers when they complete any particular task via multiple channels. Channel strategies should take into account the mental effort required to hear information rather than see or read it, the mental effort required to learn something new for oneself rather than be guided through it step by step, and the mental anxiety caused by feeling under pressure to get things right first time in a short time period.
- **Products and services** should be specifically designed and tested with older consumers in mind. This is true both for *the type of products/services offered* (e.g. insurances available for older age groups, long-term care funding, life-time access to loan equity) and *how products/services are communicated and delivered to consumers*. As one example, care must be taken to ensure that products are communicated such that the *terms associated with lead benefits* (e.g. interest rates) are given *as much priority as the benefits themselves*. Older customer archetypes should form a key part of all product development and marketing process. Key questions include: "*What does this look like from an older customer's perspective?*"; "*How might an older customer read this?*"; and "*How would an older customer make their decision to buy this?*" It is suggested that samples of older people are an integral part of customer needs research. Given the combination of demographic changes and socio-political changes (e.g. pensions freedom), older consumers will be expected to interact with more complex or even new product terms more frequently and later into their lives. As a result, providers should consider what is needed to guide and support those consumers. This includes what will make the communications and support surrounding longer-term products less complex and more familiar to consumers, thereby aiding their processing and decision-making.

- **Decision (or processing) aids** are *support mechanisms that help ameliorate the cognitive changes* that older consumers might experience. They help people recall and process what they have heard and facilitate better decisions. It is not always easy for people to recall conversations they have had with advisors, telephone staff or branch staff. Additionally, older consumers find it more difficult *remembering to remember* to do things such as pay bills. As a result, it is recommended that banks and other providers consider what they could offer older consumers to offset this. Given that we know recall is better when people have gone through the process of writing or typing, firms may wish to offer customers *structured note-taking sheets* with each new product or service. This could also include building in *feedback loops*, summaries of what has been agreed to, either implicitly or explicitly during interaction with providers. These summaries could be sent to consumers by email or in hard copy; or appear before consumers log off online accounts.

A full and detailed list of implications associated with ageing and accompanying recommendations is provided in **chapter three** of this literature review.

# 1 The Landscape of the Ageing Mind

In this chapter our focus on the ageing mind is placed in context. We describe the demographic trends that have transformed the structure of the UK population and we set out our rationale for focusing on the ageing mind.



# 1 The Landscape of the Ageing Mind

In this chapter our focus on the ageing mind is placed in context. We describe the demographic trends that have transformed the structure of the UK population and we set out our rationale for focusing on the ageing mind. There is an abundance of evidence about how the ageing process affects cognitive abilities. Increasingly more is known about how and when cognitive abilities change as people age and what factors affect these changes, and inevitably our understanding will develop further in the future. Our aim, in this chapter, is to draw attention to the key findings from the current literature about the ageing mind. We believe these findings provide a helpful starting point for exploring the relevance of cognitive ageing for consumers' interactions with financial services.

## 1.1 The ageing population

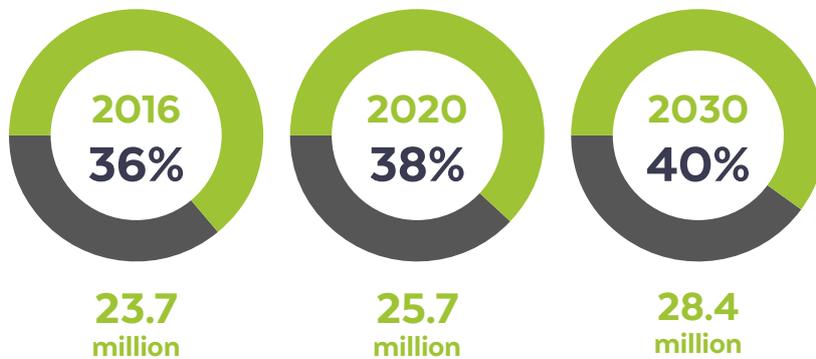
**Key message 1: People are living longer than ever before and this trend is expected to continue. This means that a growing proportion of the population is aged 65 and over.**

In the UK there has been a dramatic increase in life-expectancy amongst people aged 65 and over. Over the last three decades, this section of the population has increased by 40% for men and 22% for women. Falling mortality rates within age groups has been one of the main drivers of this life-expectancy increase. For instance, for those who are aged 85, life-expectancy has been increasing by around 30% for men and over 20% for women, so that those aged 85 and over are now the fastest growing segment of the population. Contributing to these changes are the improvements in mortality from diseases such as heart disease and strokes, which are themselves linked to behaviour changes (such as reductions in smoking) and medical and technological advances.<sup>4</sup>

Increases in life-expectancy are forecast to continue over the coming decades. Projecting forward, we can, therefore, expect the UK population pyramid to change in shape (see figure 1.1).<sup>5</sup>

**Figure 1.1:** What we can expect the UK population to look like in the future

Number of people aged 50+

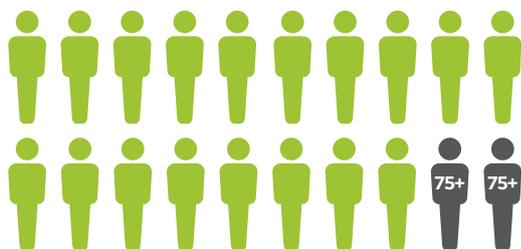


In 2016, there were **23.7 million** people aged 50 or over in the UK (36% of the population), by 2020 this will rise by to **25.7 million** and in less than 15 years' time (by 2030) to **28.4 million** people (over 40% of the population).

Number of people aged 65+



In 2016, there were **11.8 million** people aged 65 or over in the UK, by 2020 this will rise to **12.7 million** and in less than 15 years' time (by 2030) to **15.7 million**.

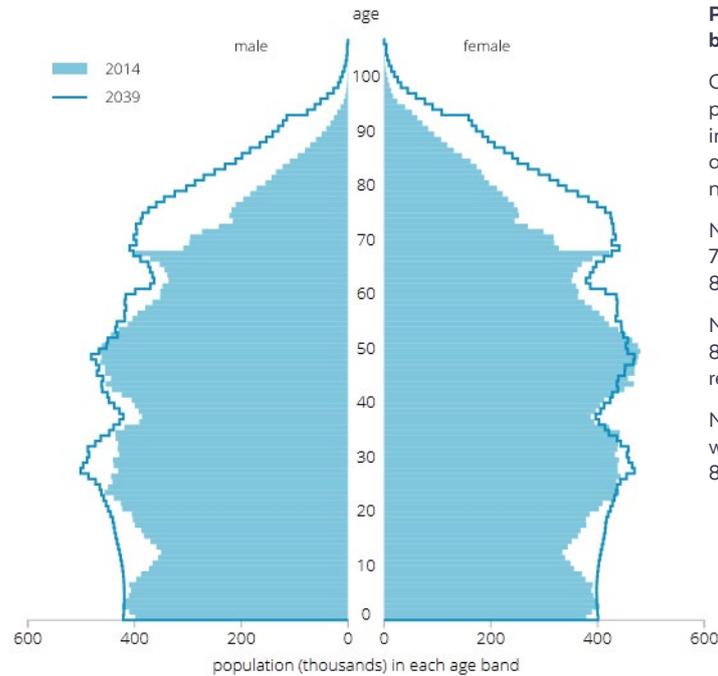


**In less than 10 years (by 2025) there will be over 7 million people aged over 75 years, 10% of the UK's projected population.**

**Figure 1.2:** What do the changes in life expectancy mean?

	65 Male life expectancy	65 Female life expectancy	
1981	78	82	In 1981 a man aged 65 could expect to live until 78; a woman until 82.
2012	83	86	In 2012 a man aged 65 could expect to live until 83; a woman until 86.
2025	86	88	By 2025 a man aged 65 will expect to live until 86; a woman until 88.

**Figure 1.3: Age structure of UK population, mid-2014 and mid-2039**



**Population projections between 2014 and 2039:**

Over 70% of UK population growth will be in the over 60 age group, an increase from 14.9 million to 21.9 million

Number of people aged 75 and over will rise by 89% to 9.9 million

Number of people aged 85 and over will double to reach 3.6 million

Number of centenarians will rise nearly six fold to 83,000

Source: ONS (2015)

Whilst longevity is to be celebrated, population ageing and increased life-expectancy have major implications for all aspects of life - from work, housing and education, through to health, social care and families.<sup>6</sup> Critically, improvements in life-expectancy are not being matched by improvements in *healthy* life-expectancy. This means that although the UK population is living longer, people aged 65 and over are likely to spend more time in ill-health. The most common age-related diseases amongst this age group are heart disease, strokes, cancer and dementia.<sup>7</sup> Having multiple conditions is very common – indeed most people over 65 years are likely to have more than one disease at the same time.<sup>8</sup>

The challenges associated with this trend are compounded by the fact that there are a lower proportion of people who are working, paying taxes and providing care in society. This is otherwise known as the ‘*old age support ratio*’.

**Box 1.1: What is the old age support ratio?**

The old age support ratio measures the proportion of people who are working for every person eligible for a state pension. In 2012 the ratio was 3.21 people of working age for every person of State Pension Age. Projected changes in state pension age mean that this ratio is expected to rise to 3.47 in 2020. However, by 2041, it is anticipated that the ratio will have fallen to 2.65.<sup>9</sup>

Whilst the focus of this report is on the 'ageing mind' and the associated impact on financial decisions, the old age support ratio is worthy of note. It highlights the changing nature of the UK population, with less people of working age to support the growing proportions of ageing and retired people.

The implications of demographic ageing for financial services are far-reaching and the case for new and different financial products and services, communicated and delivered in ways that meet the needs of the ageing population, is now compelling.<sup>10</sup> But how do we understand the characteristics and needs of a diverse older population? One approach is to use research to learn more about how people change as they age. This research tells us that as people get older, changes in physical capabilities, such as strength, stamina and speed, are accompanied by changes in the way the brain processes information. To understand this better, we need to look closer at *the ageing mind*.

## 1.2 How the ageing mind changes

**Key message 2: Cognitive abilities tend to change as people age and these changes are shaped by many different factors. For most people, cognitive changes are part of the normal maturation processes in the brain. However, some people experience cognitive changes that are more marked than would be expected for a healthy person of their age.**

It is important to take a long view of the ageing mind. Research reveals that cognitive abilities, such as memory and problem solving, change over a lifetime. They are also influenced by many different factors, including genes, education, family relationships, income levels and physical health.

From early adulthood, subtle and incremental changes occur in the way the brain handles information. This process is known as 'normal cognitive ageing'. This is not the same as pathological cognitive change, which involves the onset of **dementia**, such as Alzheimer's disease, usually after the age of 65.

Between normal cognitive ageing and age-related pathological change lies a condition that is known as 'mild cognitive impairment' ('MCI'). People with MCI have difficulties with their mental abilities that are more marked than would normally be expected for a healthy person of their age, yet the symptoms do not meet the criteria for dementia.<sup>11</sup> MCI is recognised as a risk factor for dementia although a large proportion of people with MCI do not go on to develop dementia.<sup>12</sup>

### Box 1.2: What is the difference between normal cognitive ageing and age-related pathological change?

Normal cognitive ageing refers to the natural maturation processes that happen within the brain.

Age-related pathological change is due to non-normative factors such as disease (e.g. Alzheimer's disease) or trauma to the brain.

Whilst it is helpful to make a distinction between dementia, MCI and normal cognitive ageing, it is also important to recognise that there is a degree of overlap between these groups. For instance, some of the symptoms of MCI are similar to those of mild dementia. Similarly, natural maturation processes within the brain mean that the oldest old (people aged 85 and over) may encounter cognitive difficulties that are similar to those with MCI or mild dementia.

It is also the case that, when researchers have examined how people experience normal cognitive ageing, they find there is much variation in their capabilities and their experiences. Similarly, people living with dementia report a range of symptoms as do those with MCI. To understand these experiences better, it is helpful to consider dementia, MCI and normal cognitive ageing in more detail.

## 1.2.1 Normal cognitive ageing

**Key message 3: Normal cognitive ageing is associated with improvements in some cognitive abilities and decline in others. Fluid cognitive abilities, which are important for problem solving and decision-making, tend to decline with age from the third decade of life (i.e. in the thirties).**

### Cognitive abilities – what they are and how they change with age

It is normal for cognitive abilities to change as people age. In order to understand these changes, it is helpful to make a distinction between our '*crystallised*' and '*fluid*' cognitive abilities.<sup>13</sup>

'Crystallised abilities' refers to the use of the skills, knowledge and experience that have accumulated through daily living. Crystallised abilities are evident when writing a letter (because this involves people using vocabulary they have built up over a number of years), or when using general knowledge to answer quiz questions. Over time, as people age, these abilities expand and become more stable.

‘Fluid abilities’, on the other hand, concern reasoning and problem-solving in novel situations. Fluid abilities are employed when navigating through a city for the first time or when assembling a new piece of furniture. Fluid abilities are employed in different ways in different situations, so they are flexible and adaptive. When learning a new task, it is fluid abilities that are most important.

Fluid and crystallised abilities change in different ways as people age. There is now a large body of scientific evidence which indicates that fluid abilities tend to peak when people are in their 20s whereas our crystallised abilities improve and then peak in late 50s to early 60s.<sup>14,15</sup> Understanding what is meant by ‘cognitive abilities’, and how these change with age, is therefore important.

Cognitive abilities can be divided into different domains. These include processing speed, attention, memory, language and executive functioning. Box 1.3 describes the function of these different domains and notes how they are affected by the normal ageing process. Although these domains are described separately, they are often closely related. Most tasks are likely to call upon more than one of these abilities at the same time.

Researchers have found that changes in one fluid cognitive ability are likely to be associated with changes in another.

**Box 1.3: ‘Cognitive abilities’ and how they change with age<sup>16</sup>**

<b>Cognitive domain</b>	<b>What this refers to</b>	<b>Normal age-related changes</b>
<b>Processing speed</b>	The speed with which people take in information, make sense of it and begin to respond. For example, processing speed affects how long it takes to do a calculation or how long it takes to respond to a set of instructions.	Processing speed slows down gradually from early adulthood. <sup>17</sup> Slower speed of information processing seems to have a ‘general’ effect on many other cognitive abilities. <sup>18</sup>
<b>Attention</b>	Selective attention is the ability to focus on what really matters whilst ignoring irrelevant information. For example, we use selective attention when tuning into a conversation with a friend at a party and ignore the other noises around us.	Selective attention does not tend to change as people age. <sup>19</sup>
	Divided attention is the ability to focus on multiple pieces of information at the same time. An example is holding a conversation whilst driving.	Divided attention has been associated with a significant age-related decline in performance, particularly when tasks are complex. <sup>20</sup>

<b>Memory</b>	<p>Short term memory is used when we hold information in our mind for a very short period of time, for example remembering a phone number long enough to be able to dial it. This information will be forgotten unless it is repeatedly used and reviewed. Then it will be committed to long term memory.</p> <p>Long term memory consists of semantic memory and episodic memory. Semantic memory is used to recall things that are common knowledge, such as the capitals of countries. Episodic memory is used to recall personal experiences and events, for example when recalling the events of a summer holiday or when describing the first day at a new job.</p> <p>Some memories are not conscious – they don't require any cognitive effort to recall them. These are known as implicit memories and examples include remembering the tune of a song or remembering how to ride a bike.</p>	<p>Short term memory tends to be less efficient as people get older.<sup>21</sup></p> <p>Episodic memory declines as people get older whereas semantic memory for frequently used information remains fairly robust as people age.<sup>22</sup></p> <p>Implicit memory does not tend to be affected by ageing.<sup>23</sup></p>
<b>Language</b>	<p>Language abilities refer to our knowledge of vocabulary and our ability to give a name to a common object.</p>	<p>Vocabulary improves and then remains stable until decline is likely from late 50s/early 60s.<sup>24</sup></p>
<b>Executive functioning</b>	<p>This includes a wide range of abilities such as the ability to plan, organise, reason and problem solve. For example, planning a holiday to somewhere unfamiliar uses executive functioning.</p>	<p>Generally, all these abilities decline with age from the 30s onwards, with an acceleration of decline likely when people are in their 80s.</p>

## Variability in normal cognitive ageing

**Key message 4:** Although there is a general pattern of decline in fluid cognitive abilities from 30s onwards, cognitive changes vary considerably from individual to individual.

Normal age-related cognitive changes vary considerably from individual to individual.<sup>25</sup> Studies have shown that there is variability *in the age* at which cognitive abilities peak; there is variability *in the level* at which they peak; and there is variability *in the pace of decline*.<sup>26</sup> What determines these differences is not yet fully understood, although there is persuasive evidence from longitudinal data that childhood intelligence plays an important role as explained in Box 1.4.

### Box 1.4: Variability in normal cognitive ageing: lessons from Scotland<sup>27</sup>

The Lothian Birth Cohorts are two groups of people, born in 1921 and 1936, who are helping researchers at the University of Edinburgh understand more about cognitive ageing.

At age 11, these people undertook a mental ability test at school, introduced by The Scottish Council for Research in Education, to inform education policy. Much later in their lives, when they were in their 60s, the same people were contacted by a team of researchers and recruited into two research samples, named the Lothian Birth Cohorts.

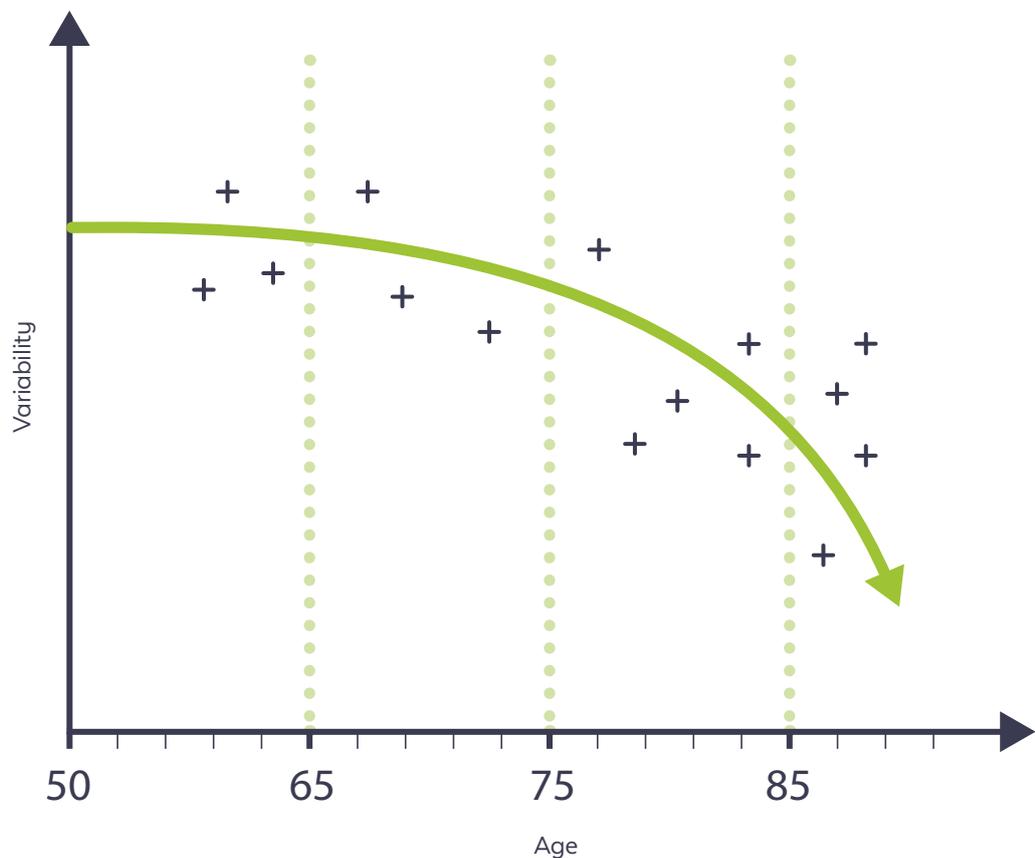
Over successive years, cohort members have participated in different tests about their cognitive abilities, lifestyle and medical health. This data has been analysed by a research group, who published many research papers about the different factors that contribute to cognitive changes as people age.

An important finding of the group has been that differences in mental ability, measured in childhood, are strongly associated with differences in cognitive ability in old age. The researchers found that childhood intelligence explains around 50% of the variance in cognitive ability across different people who were aged 80 and living without dementia.<sup>28</sup>

Along with childhood intelligence, there are many other factors that influence normal cognitive ageing. Genetic influences are likely, but there is also growing evidence that lifestyle factors, including diet, physical activity, smoking and sleep, contribute to cognitive ageing. Vascular disease and its risk factors, such as high blood pressure, have been linked with poorer cognitive functioning, whereas more years spent in formal education and higher social class have been linked with higher cognitive performance.<sup>29</sup>

This variability means that normal cognitive ageing affects people differently (see Figure 1.4). Nevertheless, the research reveals that most people are likely to experience changes in their cognitive abilities which can affect aspects of their lives.

**Figure 1.4: Variability in cognitive ageing**



## Normal cognitive ageing and everyday life

**Key message 5: Normal cognitive ageing is unlikely to interfere with routine daily tasks but it should not be ignored. The decline in fluid cognitive abilities, which is associated with the normal ageing process, can be a greater obstacle when tasks are complex or unfamiliar. The steeper rate of cognitive decline, common amongst people in their 80s, can mean the oldest old are likely to be yet more challenged by novel or complex situations, with changes to environment or context (e.g. changes to website or process) potentially making a situation feel novel or complex.**

A question commonly asked about normal cognitive ageing is, if this is a process that affects most of the population, why are these changes not more evident in everyday life? Researchers have offered a number of explanations.

First, few situations require us to perform at our optimum level. As people get older they become more and more experienced at handling situations at home or at work. Because of the knowledge and experience accumulated over the years, these situations are not mentally taxing and don't place much demand on fluid cognitive abilities, which means any decline in fluid abilities is not evident.

Second, people adapt to age-related changes either by avoiding situations that are taxing or by making use of the assistance of others or other aids. For example, rather than driving an unfamiliar route to a business meeting, someone might take a train or get a lift from someone else. Or, rather than trying to remember task-related information, someone may choose to use a reminder feature on their phone as a memory aid.

Lastly, it is not only cognitive abilities that influence every day encounters. Many other factors affect performance in everyday tasks. For example, motivation, commitment and personality characteristics are all relevant and are not necessarily related to age.

**Although normal age-related changes in cognitive abilities do not interfere with routine daily tasks, they should not be ignored.** This is because it is not always possible to adapt to and accommodate age-related changes. Inevitably, there will be times when a new decision or a new task cannot be avoided. Furthermore, longitudinal studies, that track a group of people over a number of years, show an acceleration of impairment from 80 years onwards (see page 50). This means that those who are described as the 'oldest old' are more likely to be challenged by new or complex situations, at a time when they are already at increased risk of having other illnesses or having less social support around them.<sup>30</sup>

### Box 1.5: Normal cognitive ageing from age 70+ lessons from abroad<sup>31</sup>

The Jerusalem Longitudinal Cohort Study followed a large group of Jerusalem residents from age 70 in 1990 up until the present time. Data about physical health, use of health services and levels of cognitive impairment was collected from the cohort participants when they were aged 70, 78 and 85.

The researchers note that this is a population ‘in transition’ from young healthy elderly at age 70 to the threshold of oldest old age. They describe the changes experienced by the cohort participants as ‘profound’, with many aspects of their health and functioning affected. Changes in cognitive abilities, like other aspects of physical health, were very marked. Whereas cognitive abilities were preserved in most people at age 70, they showed a steep rise in impairment by age 85.

Despite this, self-rated health was predominantly positive amongst the cohort even though they were encountering a high burden of disability and chronic disease.

Finally, there is evidence from research studies that people are not the best judge of their own capabilities. Significant differences have been found in self-reported decision-making abilities and actual performance on tasks.<sup>32</sup> This can be thought of as a ‘confidence-reality gap’.

### Box 1.6: Are changes in the ageing mind noticeable in everyday life: lessons from the USA<sup>33</sup>

A recent study in America collected data from older adults (average age 74) over five years to find out whether changes in their thinking abilities were also accompanied by changes in performance in everyday tasks, such as medication use, telephone use and financial management.

The study found that there was a strong association between thinking abilities and everyday task performance – as thinking abilities declined, so did performance in tasks. However, interestingly, the study found that the older adults were not aware of these changes in their performance of routine tasks, suggesting that they are not reliable judges of their own abilities.

In summary, whilst there is much evidence that cognitive abilities change as people age, it is important not to exaggerate the impact of these changes on everyday life. Human beings are masters at adaptation and, consciously or not, make changes that accommodate and limit the influence of any age-related changes in cognitive abilities. This does not mean that cognitive ageing should be ignored. It means that it is important to understand under what conditions it is likely to become an obstacle. The evidence points to a number of situations that are potentially challenging as people get older – those that involve new or very complex reasoning and decision-making and those that involve the oldest age groups.

## 1.2.2 Mild cognitive impairment

**Key message 6:** Up to 20% of the population over 65 years may be affected by mild cognitive impairment ('MCI'). In most situations, MCI does not cause a major impact on daily living but it does affect the ability to carry out complex everyday tasks.

Mild cognitive impairment is associated with slight impairment of memory or other cognitive abilities. These problems are noticeable, but in most situations they do not cause a major impact on daily living.<sup>34</sup> It is therefore likely that a significant number of people with MCI have not been diagnosed. In addition, they may not have talked about their symptoms with anyone else and may not have asked for help. This explains the sizeable variance in estimates of the number of people living with MCI. Latest data suggests that in the UK between 5% and 20% of people aged over 65 are affected.<sup>35</sup>

MCI is not associated with a specific disease and has a number of different causes. It can be caused by depression, anxiety, stress, or by a physical illness, such as poor eyesight, hearing, vitamin or thyroid deficiencies. MCI can also be a side effect of medication. MCI is recognised as a risk factor for dementia, and studies suggest that approximately one third of people with MCI go on to develop dementia.<sup>36</sup>

Experience of MCI will vary but it is likely that someone with MCI may:

- Have difficulty remembering things such as appointments.
- Lose the thread of a conversation or the plot of a film.
- Struggle to follow instructions.
- Take much longer than usual to find the right word for something.
- Repeat the same question.

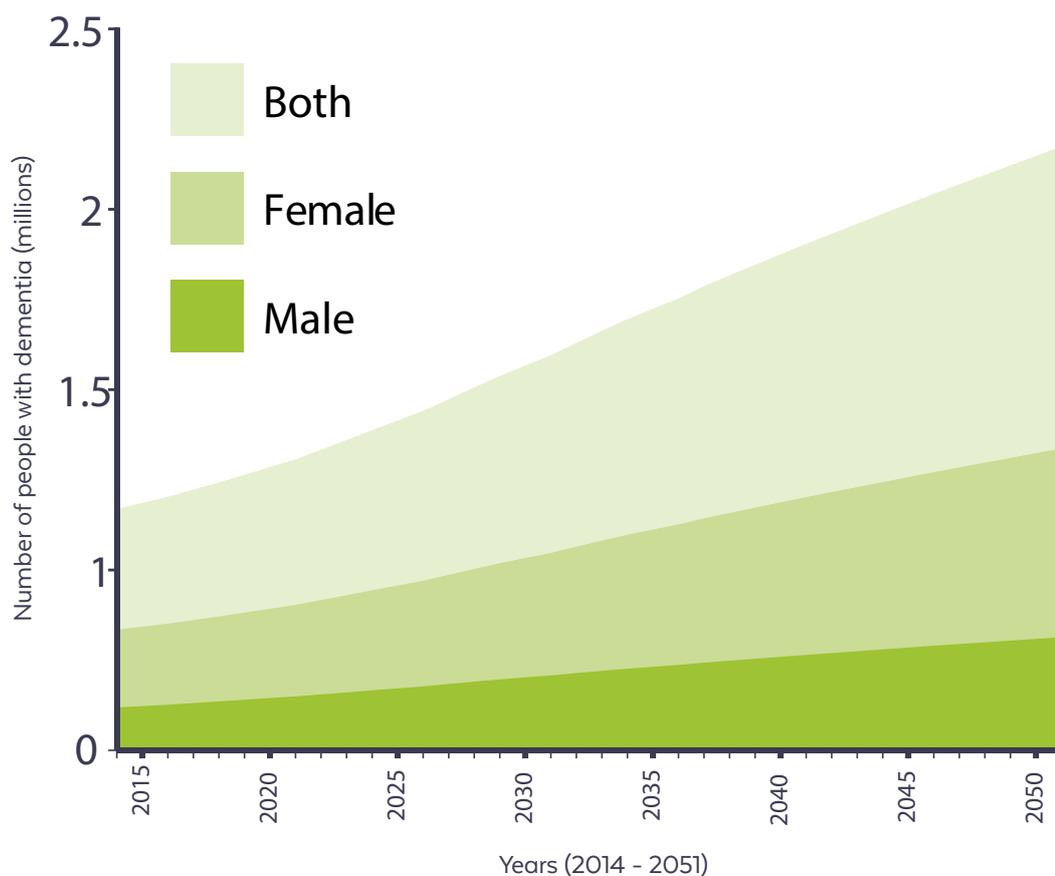
A recent review of the research about the impact of MCI on daily living revealed that it is associated with significant difference in performance of complex everyday tasks, which include finance-related activities.<sup>37</sup>

## 1.2.3 Dementia

**Key message 7: Whilst dementia symptoms vary greatly, they are likely to be severe enough to affect daily living and may involve changes in mood.**

Approximately 850,000 people in the UK were estimated to be living with dementia in 2014, of which 773,502 were aged over 65 years (around 7% of people aged over 65 years).<sup>38</sup> The prevalence of dementia is much higher amongst those aged over 80, and current data suggests that around 1 in 6 people in this age group are living with dementia. This is because the likelihood of developing dementia increases significantly with age.<sup>39</sup> Recent studies suggest there is a reduction in the number of people who develop dementia at any given age<sup>40</sup>. However, because of the ageing population trends, the total number of people with dementia in the UK is still set to grow (see figure 1.5).

**Figure 1.5: Projected increases in the number of people with dementia in the UK, by gender (2012-2051)**



Source: Prince et al. (2014)

Dementia occurs when the brain is damaged by diseases, such as Alzheimer's disease. Everyone's experience of dementia is different and will depend on the type of dementia, how far it has progressed and the rate of progression. Life experiences, personality and social environment also make a difference.

Nevertheless, common symptoms include memory-loss and difficulties with cognitive abilities and language. The difficulties will have become severe enough to affect daily living. There may also be mood changes.

Someone with mild dementia may:

- Have difficulty remembering recent events, forget messages and ask questions repeatedly.
- Struggle with activities that require organisation and planning.
- Become confused in unfamiliar environments.
- Have difficulty finding the right words.
- Struggle with numbers and/or handling money.
- Experience changes in mood and personality.
- Experience depression.

## Types of dementia

There are different types of dementia, which have different symptoms, especially in the early stages of the disease. The most common types of dementia are Alzheimer’s disease (affects 62% of people living with dementia), Vascular dementia (17% of dementia cases), Dementia with Lewy bodies (‘DLB’) and Frontotemporal dementia.

### Box 1.9: What are the symptoms of the different dementias?

<b>Alzheimer’s disease</b>	Early symptoms of Alzheimer’s disease, which affects 62% of people with dementia, include memory difficulties, apathy and depression.
<b>Vascular disease</b>	Early symptoms of Vascular Disease, which account for approximately 17% of dementia cases, are more likely to be impaired judgment or ability to make decisions, plan or organise.
<b>Dementia with Lewy bodies (‘DLB’)</b>	People with DLB often have memory-loss and thinking problems but are more likely than people with Alzheimer’s to have early symptoms of sleep disturbance, visual hallucinations and slowness.
<b>Frontotemporal dementia</b>	Symptoms of frontotemporal dementia include: apathy or an unwillingness to talk; changes in personality and mood; obsessive or repetitive behaviour, such as compulsively shaving or collecting items.

## Stages of dementia

The most common types of dementia are progressive which means the symptoms change over time. The severity of symptoms varies considerably across the different stages.

Dementia can be classified as mild, moderate or severe, depending on the stage of progression. It is estimated that in the UK, approximately 55% of people living with dementia are at the mild stage, 32% are at the moderate stage; and 13% are at the severe stages.<sup>41</sup>

The proportion of people with severe dementia increases with age, prevalence approximately doubles every five years after 65 years.

## Rate of progression

Although symptoms become more severe over time, the rate at which this happens varies from individual to individual. There are some differences between the different dementias. For example, on average, Alzheimer's disease has the slowest progression.

A wide range of other factors influence how quickly someone's dementia will progress. Genes and physical health play a role and advancement is also faster for those with poorly controlled heart conditions or diabetes. There is some evidence that remaining physically active can slow the rate of decline.

## 1.3 The landscape of the ageing mind overview

In this chapter we have considered how cognitive abilities change as people age. It has been noted that for most people, cognitive changes are part of the normal maturation processes in the brain, which are associated with improvements in crystallised abilities and decline in fluid cognition.

It has been argued that although normal cognitive ageing is unlikely to interfere with routine daily tasks, it should not be ignored. Declining fluid abilities can be an obstacle when tasks are complex or unfamiliar. Because cognitive changes tend to accelerate when people are in their 80s, the oldest old are particularly vulnerable in new situations or when making decisions.

The experiences of people with mild cognitive impairment and dementia have also been discussed in this chapter. Although symptoms vary considerably, the impact on daily living is such that the needs of this part of the population require particular attention, especially when tasks are complex.

# 2 Financial Decision-Making and the Ageing Mind

The previous chapter presented key findings from the literature about the ageing mind. This chapter considers how age-related cognitive changes impact financial decision-making.



# 2.1 The ageing mind and financial decision-making capabilities

**Key message 8:** Financial decision-making capabilities are likely to change as people age.

## 2.1.1 The evidence

There is substantial evidence to support the conclusion that financial decision-making capabilities change as people age. Box 2.1 outlines some of the key studies that have investigated this relationship.

### Box 2.1: Key cross-sectional studies and reviews of studies including meta-analyses showing the described relationship between age and financial decision-making

**Mata and Nunes (2010)**

The researchers analysed the results from 12 studies and concluded that, prior to making a decision, older people search for fewer pieces of information than younger people. Further investigations suggested that considering less information leads to small losses in decision quality.

**Mata et al. (2011)**

The researchers analysed the results from 29 studies and concluded age differences in decision-making capabilities are most notable in tasks that require learning in unfamiliar environments. In these tasks, older adults did not perform as well as younger adults.

**Lockenhoff et al. (2011)**

This review of the behavioural literature suggests that older adults are often more willing to wait over short-time delays for a larger amount of money compared to a smaller amount of money available immediately. It is suggested that this is because they draw on previous experiences of deriving benefits from waiting.

<b>Kornitos and Kumar (2011)</b>	The results of this study indicate that older investors' portfolio decisions reflect greater knowledge about investing in general but lower levels of investment skill, i.e. the cognitive skills required to process and make more complex decisions. The authors suggest that, overall, investment decisions deteriorate as a consequence of cognitive ageing, and this is particularly the case for people who are less educated and from lower income earners.
<b>Weierich et al. (2011)</b>	Presenting a comprehensive review of the literature, the authors suggest that the propensity to use affect (or emotion) to guide financial decision-making increases as people age. It is argued that older people are less able to draw on details from their past and, therefore, have a higher propensity to rely on momentary experiences when making decisions.
<b>Samanez-Larkin et al. (2014)</b>	The results of the authors' neuro-imaging studies demonstrated that when task difficulty increases, the learning impairment in older adults grows more pronounced. Therefore, older adults will perform sub-optimally in any decision task that involves an element of learning. However, the authors also found that given more time to learn, older adults can perform as well as younger adults even in a more difficult task.
<b>de Bruin et al. (2015)</b>	The authors conclude from their study that older adults perform worse than younger adults on measures of numeracy because they are less motivated to think hard about complex problems; the lower levels of motivation are linked to the cognitive effort involved in processing more complex problems.

Much of the research in this field uses cross-sectional study designs. This means that unlike the longitudinal research referred to in the previous chapter, the data has been collected from participants at one time point only. Typically, the studies compare how two or more groups of people perform on decision-making tasks. Because participants in one group are older than participants in the other group, researchers can make inferences about how age impacts on decision-making.

As with all types of research, cross-sectional studies have limitations. The findings are susceptible to what is known as 'cohort interference'. This is where the differences between one age group and another can be partly explained by the different experiences of the age cohorts rather than ageing. For instance, if a group of younger adults performed better than a group of older adults on a computer-based financial task, this may be because they have been exposed to computer technology from a young age.

Despite the potential for cohort interference, the evidence that ageing is associated with sub-optimal decision-making remains strong. This is, in part, due to the sheer volume of studies that report consistent results, but also because there is longitudinal evidence<sup>42</sup> that further corroborates the findings.

One such study is the Memory and Aging Project ('MAP'), which is described in Box 2.2 below. Academics have used this important study to explore age-related changes in financial ability. Boyle et al. (2015), for example, found that age-related changes in cognitive ability had a direct effect on financial literacy. Furthermore, it was noted that participants were unable to recognise this change. This is analogous to the 'confidence-reality gap' referred to in the previous chapter and suggests that older people may struggle to recognise declines in their financial capabilities.

### Box 2.2: The Memory and Aging Project<sup>43</sup>

Since 1997, the Memory & Aging Project ('MAP') has studied changes over time in the intellectual functioning of 1489 Illinois residents. Data from the MAP has generated more than 125 publications on many issues concerning ageing and Alzheimer's disease.

Since 2010, researchers have collected information from the MAP participants about three aspects of financial decision-making: financial literacy and decision-making, confidence in making financial decisions, and likelihood of getting help in relation to making financial decisions.

**“Even among older persons that most would consider cognitively healthy, the very subtle decline that occurs detrimentally affects decision-making and judgments.”**

(Boyle, Yu, Gamble and Buchman, 2012)<sup>44</sup>

## 2.1.2. The nature of the relationship between age and financial decision-making

**Key message 9: Financial decision-making tends to reach optimal performance in the mid 50s and then declines over time.**

Research suggests that there is a gradual improvement and then decline in financial decision-making performance over the course of a lifetime. The point at which performance peaks tends to be around the mid-50s. This trend is consistent with the age-related changes in crystallised and fluid cognitive abilities that were discussed in the previous chapter. As previously mentioned, crystallised cognitive abilities tend to plateau from the mid-50s onwards, whereas fluid abilities show a decline.

In a seminal piece of work using behavioural data on real financial accounts, Agarwal et al. (2009) demonstrated this. Their work is summarised in Box 2.3.

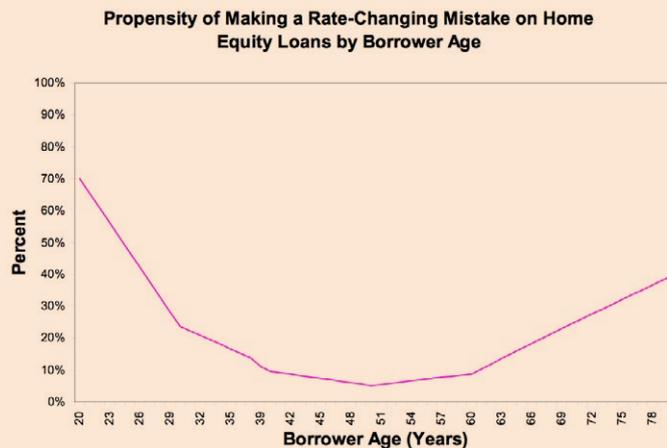
**Box 2.3: The relationship between age and outcomes of financial decisions: the work of Agarwal and colleagues using ‘real’ proprietary data<sup>45,46</sup>**

Whilst many consumers make poor choices including poor financial choices, Agarwal and his colleagues showed that older adults are particularly vulnerable to such errors.

They analysed financial mistakes using proprietary databases (e.g. from credit card companies) measuring ten different types of credit behaviour. In particular, they were interested in mistakes associated with:

- Suboptimal use of credit card balance transfer deals.
- Incorrect estimations of the value of one’s home.
- Payments of excess interest rate and fee payments.

The study compared three groups of prime borrowers and found that middle-aged adults made fewer financial mistakes than either younger or older adults. Agarwal et al. concluded that financial mistakes follow a U-shaped pattern, with optimum performance typically occurring around the age of 53.



Crucially, Agarwal et al’s study revealed that younger consumers are also prone to financial errors. Whilst this is an important issue, Agarwal and colleagues point out that financial errors amongst older people are of particular concern for a number of reasons:

- **Complexity of decisions:** older people are often dealing with more complex products e.g. equity release, investments, income drawdown, annuities.
- **Level of risk:** the amounts of money involved can be significant since assets increase over a lifespan.
- **Support needs:** whilst the deficits in younger consumers are due to a lack of knowledge and experience, which can be addressed with education and information, deficits in ageing consumers are due to a decline in fluid abilities. This is an area that needs more support than simply the dissemination of information.

## 2.1.3 Challenges associated with sub-optimal decision-making in later life

**Key message 10:** As consumers age, a decline in some cognitive abilities may mean they face a number of challenges when making financial decisions.

As detailed in the previous chapter, fluid abilities tend to decline with age. So, as we get older, it can become more difficult to perform novel, different or complex tasks that require reasoning and problem-solving skills.

Four impacts of declining fluid cognitive abilities are detailed in Box 2.4. It is important to note that not all older people will experience these changes, and the extent to which they impact on individuals over time will vary. Nevertheless, whilst the research into financial decision-making and ageing is relatively young, there is sufficient consistency to validate the following themes.

### Box 2.4: Summary of impacts of age-related changes on financial decision-making

Themes	Age-related impacts
<b>Divided attention</b>	Older consumers find it harder to divide their attention and focus on multiple pieces of information at the same time.
<b>Learning</b>	Older adults performed less well than younger adults in tasks that require them to learn new skills or new information.
<b>Choice and complexity</b>	Older consumers perform less well in more highly complex tasks.
<b>Prediction</b>	Older adults' predictions about the future are 'blurry' and not as well defined. This can lead to prediction errors and, perhaps, idealised future views.

## 2.1.4 Adaptive strategies associated with cognitive ageing

There is much evidence that older people adapt to these cognitive changes by adopting certain decision-making strategies. Typical adaptive behaviours, evidenced in research, are described in Box 2.5.

### Box 2.5: Decision-making behaviours associated with cognitive ageing

Theme	Behaviour (compared with younger consumers)	Example
<b>Motivation</b>	Older consumers are less motivated to think hard about complex problems or acquire new information or skills.	Older consumers may be less willing to try and learn how to use online banking.
<b>Avoiding choice/complexity</b>	Older consumers are more likely to avoid decisions that involve much choice and/or complexity.	Older adults might be more likely to repeatedly make the same choices over product and/or provider to avoid making a choice, particularly when the choice involves many and possibly complex component parts, such as choosing an insurance product or switching insurance provider.
<b>Emotional drivers</b>	Older consumers are more likely to prune out negative information and focus more closely on positive cues.	Older consumers can be more likely to tune out of the potential costs and tune into the benefits when, for example, being asked to upgrade their bank account.
<b>Acquiring new information</b>	Older consumers seek out less information before making a decision.	When faced with a decision about choosing a credit card, the older consumer may not pay much attention to details about interest charges.

<b>Willing to wait</b>	Older consumers are more willing to delay gratification, at least into the short to medium term.	Older consumers might be more willing to pay into short-term savings products (if the process is simple and clear).
<b>Seeking familiarity</b>	Decisions and tasks that are set in familiar contexts are more appealing to the older consumer. Older consumers are more likely to use visual and recognisable cues to aid decision-making.	Older consumers will be more comfortable with taking advice and support about new activities from known branch staff.

A feature of these adaptive strategies is they enable the older consumer to draw on existing skills, knowledge and abilities rather than acquire new ones. This does not necessarily result in erroneous decisions<sup>47</sup>, but it does suggest that older consumers are more likely to revert to approaches they feel familiar or comfortable with and require less effort. More specifically, studies suggest that older consumers seek to avoid effortful decisions or seek to approach them in a more effortless way, using short-cuts or what are often termed ‘heuristics’.<sup>48</sup> Examples of heuristics include educated guesses and rules of thumb.

## 2.1.5 Mapping banking and financial tasks and decisions

**Key message 11: The complexity and unfamiliarity of financial services and products will influence how older consumers engage with them.**

This review of the academic literature has highlighted the impacts of cognitive ageing on financial decision-making. Adaptive strategies adopted by older consumers have also been discussed. In considering the implications for financial service providers, it is helpful to consolidate key learnings suggested by the literature.

Two dimensions emerge as critical to decision-making abilities and performance:

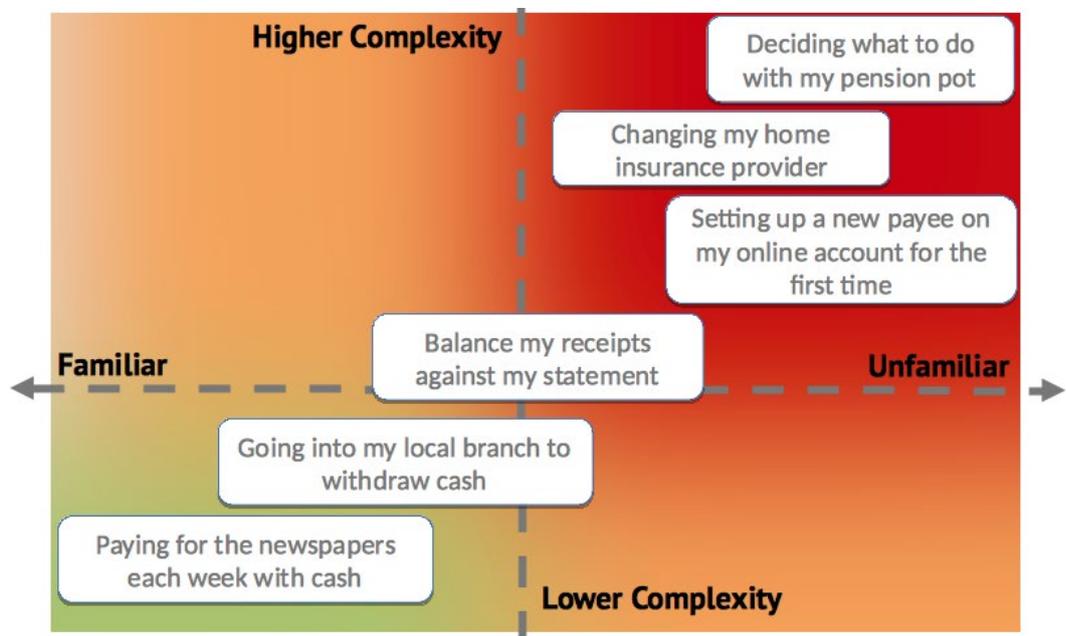
- **Complexity versus simplicity:** older adults avoid complexity and perform less well in tasks that involve much choice and multiple sources of information.
- **Familiarity versus unfamiliarity/newness:** older adults prefer familiar financial tasks and perform less well in uncertain or ambiguous situations that require them to learn something new.

## The ‘Complexity-Familiarity’ Matrix

Presented in the form of a matrix (set out in Figure 2.1), these two dimensions create a framework for understanding how the older consumer is likely to engage with financial products and services.

Figure 2.1 illustrates how different financial products and services can be mapped onto the matrix.

**Figure 2.1: Complexity-Familiarity Matrix**



A number of challenges for financial service providers emerge from this:

- 1 **What can providers do to reduce the complexity of financial decisions?  
What decision-making aids can they provide?**
- 2 **What can providers do to make decision tasks appear more familiar?**
- 3 **How can providers support older customers in their transition from an old way of doing something to a new way that will produce a better outcome?**

In the final chapter of this report, these questions will be addressed and suggestions posed to providers with regard to how they can help the older consumer perform optimally when encountering a decision-making task. First, the specific needs of consumers with dementia will be considered.

## 2.2 Dementia and financial decision-making

### 2.2.1 Financial decision-making challenges for people living with dementia

**Key message 12:** Those with dementia need predictable environments and can make more effective decisions if they feel familiar.

Figure 2.2 summarises the challenges that may be encountered by people living with dementia when they come into contact with financial services. These are based on the findings from a number of studies<sup>49,50,51</sup>.

**Figure 2.2: Categories of challenges which can be faced by people living with dementia.**<sup>52</sup>



Not all those living with dementia will encounter these challenges all of the time in all contexts. It is clear, however, that the financial decisions and actions of those living with dementia benefit from more time, space, familiarity and predictability.

People with dementia are likely to find financial tasks and decisions difficult if they feel under pressure, for example when they are in an ATM queue. They are more likely to struggle in a noisy environment, such as at peak times in a bank. Unfamiliar contexts, such as a new set of telephone instructions, can also be very challenging.

Contexts that offer structure, time and consistency are important for people living with dementia. As such, the Complexity-Familiarity Matrix introduced in Section 2.1.5 also has relevance for financial consumers living with dementia. The progression of dementia and its associated memory-loss means that many people find that those tasks or decisions that previously felt familiar, eventually become unfamiliar. Expressed another way, the quadrant on the matrix that represents familiar and simple tasks becomes smaller and the quadrant representing unfamiliar and more complex tasks becomes larger.

### “Patience is key. We need time to say what we want to say...”

Wendy Mitchell, *Living with and Blogging about Dementia*

**the Big Window**<sup>®</sup> completed qualitative research for the FCA on *The Ageing Population: coping mechanisms and third party* access to explore how older people and their carers use third party support to access banking services. This research has provided a number of case studies that illustrate the challenges faced by financial consumers (including but not exclusively among those with dementia), when they face unfamiliar or complex tasks. The case study given in Box 2.6 is from this study. The case study given in Box 2.7 is from an interview conducted by Lisa Edgar of **the Big Window**<sup>®</sup> as part of its on-going work with ageing consumers.

#### Box 2.6: Mary and her dad Brian<sup>53</sup>

Brian developed dementia following a head injury. Having previously held a very senior role in the civil service, managing all of his own accounts including more complex investment portfolios, Brian now gets very confused and, as a result, anxious about everyday financial management.

One day, Mary, Brian’s daughter, realised that Brian was no longer opening his mail, including finance-related mail. He had become confused between a credit and a debit card and had perceived his credit limit to be money available to spend rather than what he could borrow. Consequently, Brian generated considerable personal debt that he was unable to process or manage. What was previously more familiar and seemingly simple, was now the opposite on both counts. He avoided going into the branch as he found it noisy and disturbing.

Mary has since obtained lasting power of attorney for her dad to help him manage his money.

### Box 2.7: Wendy Mitchell<sup>54</sup>

Wendy is familiar with using her online banking services, which she set up and used prior to being diagnosed with dementia. Wendy reports to be very comfortable with websites in general and online banking in particular, **except when they change**. For Wendy, and many others living with dementia<sup>55</sup>, change can cause a lot of confusion, not least because it can lead to a lack of recognition of important parts of the website or even that the parts that have been moved never existed. This may result in accounts or important elements of the online services being missed.

**“When I hear the words “new and improved”,  
I just think “oh no!”**

Wendy Mitchell, Living with and Blogging about Dementia

## 2.2.2 Supporting the ‘oldest old’

The steepening nature of cognitive decline, experienced by the ‘oldest old’<sup>56</sup> (over 85 years), is another important consideration for financial services providers. Although there are individual variations in cognitive abilities within this age group, there is also a greater likelihood that people aged over 85 are challenged by tasks, decisions and environments that are unfamiliar or complex.

## 2.3 Age and decision-making in overview

This chapter explored the relationship between age and decision-making. Longitudinal and cross-sectional evidence has been presented on age-related changes in decision-making practices and outcomes for those experiencing normal cognitive ageing as well as for those who are living with a cognitive impairment.

There is a u-shaped relationship between age and financial decisions, with decision performance peaking around the mid-50s but declining thereafter.

We have also discussed specific changes in approaches to decisions. Whilst those experiencing normal age-related changes are unlikely to encounter challenges when conducting many banking and financial tasks, age is likely to be a factor as tasks become more complex and/or unfamiliar or new.

Finally, we set out the challenges that banking and financial services face by those living with a cognitive impairment and, in particular, dementia.

# 3 Implications for Financial Services

**This chapter considers the implications of age-related changes in decision-making for financial services. We consider a number of banking and financial services-related tasks and, for each, put forward recommendations for meeting challenges associated with cognitive ageing.**



**It is not our intention to offer financial service providers an exhaustive list of recommendations. Rather, it is intended to form a base for providers to work from and encourage them to develop products and employ practices that foster a good customer experience for people as they age.**

In essence, we hope the providers consider the specific needs, experiences and perspectives of the older consumer and ‘walk in their shoes’, perhaps by considering different older consumer ‘archetypes’, as part of their shorter and longer term strategies.

Where relevant, providers may wish to incorporate these recommendations into their product and proposition development processes, product and communication governance, training plans, and overall strategic planning and development.

## 3.1 Categorising banking and financial services tasks

Nine categories of banking and financial tasks that involve different variations of financial decisions are addressed in this chapter. As previously detailed, these categories are not exhaustive, neither are the tasks they cover. Furthermore, many of our recommendations will, by consequence, benefit customers of all ages.

The previous chapter discussed how complexity and familiarity are important moderators of the relationship between ageing and decision-making and decision outcomes. Therefore, consideration is given to how banking and financial service tasks vary in complexity and familiarity. Box 3.1 presents the nine categories of financial tasks that will be the focus of this chapter. These tasks are ordered from being relatively simple (e.g. making payments with cash), and progress towards tasks that are relatively complex (e.g. making decisions about pensions). The tasks also vary according to how often a typical person might do them, i.e. how familiar they are.

Whilst this review specifically addresses changes in cognitive function, it is worth noting there are other barriers that impact on how older consumers engage with financial services. Examples include: reduced mobility, hearing and visual impairments together with physical health difficulties. These additional challenges are referred to within some case studies in this chapter.

**Box 3.1: Categories of banking and financial tasks**

	<b>Task type</b>	<b>Complexity level</b>	<b>Frequency</b>
1	Paying by cash	Low	Everyday
2	Paying with a card	Low	Most days
3	Using an Automated Teller Machine ('ATM')	Low	At least once per week
4	Accessing services in a branch	Low	Every week
5	Monitoring accounts	Low-Medium	Every month
6	Making a telephone enquiry	Medium	Infrequent
7	Online banking and financial management	Medium-High	Varies
8	Changing a product or provider	Medium-High	Infrequent
9	Longer-term financial tasks or decisions	High	Infrequent

## 3.2 Implications by task category

In this section we discuss categories of banking and financial tasks and present the following:

- **A case scenario for someone experiencing normal cognitive ageing:** this scenario describes a typical experience in the task category for someone experiencing the non-pathological changes in cognitive function associated with ageing<sup>57</sup>. Chapters one and two describe how age-related changes in fluid cognitive skills have implications for reasoning and decision-making abilities. These changes are most likely to affect older consumers in complex or unfamiliar situations. A decline in cognitive abilities is also more likely to affect people aged over 80 when the process of normal cognitive ageing is accelerated.
- **A case scenario for a cognitively impaired person:** this scenario uses what has been learned from the literature about a typical experience in the task category for a cognitively impaired person. Research with older people in need of third party support<sup>58</sup> has influenced some of these case scenarios.
- **A summary of the implications** of cognitive ageing for decisions and actions associated with each task category.
- **Our recommendations** arising from the implications - what we believe providers could do to ensure a positive customer outcome.

## 3.2.1 Paying by cash

### Box 3.2.1: Paying by cash:

#### Sandra who is experiencing normal cognitive ageing

Sandra is a 74 year old volunteer with a local charity.

She is using cash increasingly less. She likes to keep some in her purse just in case she needs it but actually pays by her debit card whenever she can. For example, she pays her window cleaner and local trades by cash but most other payments are by card. Sandra has found that as she has got older, it has taken her a little longer to check her change. Otherwise, she is very comfortable paying by cash.

#### Simon who has dementia

Simon is a 77 year old retired engineer. He was diagnosed with dementia 2 years ago.

He can get confused when trying to relate how much something costs with what he has in his wallet. He is finding it harder to differentiate between different coins and has overpaid for some items as a result.

Nevertheless, Simon still prefers cash and worries if he doesn't have what he considers to be enough for 'just-in-case' purchases.

## Paying by Cash: Implications

Familiar numeracy is relatively stable with age. Many calculations, such as calculating how much change is due, are well-practised and, as such, are not likely to decline as people age. Furthermore, there is evidence that older consumers prefer the tangibility of cash and/or cheques.<sup>59</sup>

However, the acceleration of decline in processing speed and short term memory in late 70s and 80s means that older people may need a little more time to, for example, count change.

Those with a pathological cognitive impairment, such as dementia, can struggle with paying by cash. Problems that have been highlighted in recent qualitative research include: over-paying for goods or services; giving monies away; counting change; and distinguishing between different types of coins or notes.

**“The daily physical handling of money was described by people with dementia as difficult. Counting out cash when purchasing goods and services was cited as a problem. One focus group participant said he had to give lots of change to shop assistants and rely on them to take the right amount. Other problems included handling coins; some people carried large notes instead, which could put them more at risk of theft or could simply get lost.”<sup>60</sup>**

(Alzheimer’s Society, 2011)

In addition, **the Big Window**<sup>®</sup>’s work on *The Ageing Population: coping mechanisms and third party access*<sup>61</sup> found that those living with cognitive impairment can become anxious about having cash and being able to pay by cash when they need to.

### Paying by cash: Recommendations

**Banks and financial services providers cannot be expected to address all the challenges older people face in relation to cash. They could, however, consider the needs of older people in relation to:**



- **Access to cash:** banks need to consider the importance of cash and the need for older customers to easily access it when evaluating future strategies in branch closure and ATM provision



- **Time to check/count:** in-branch provision needs to be made for people to check and count monies in a private space, for example by offering separate booths for this purpose

## 3.2.2 Paying by card

Box 3.2.2: Paying by card:	
Colin who is experiencing normal cognitive ageing	Claire who is showing signs of cognitive impairment
<p>Colin is 80 years old. He belongs to a club and has a gardener. He pays for both by cheque.</p> <p>He tends to only use his debit card for large items or for a big supermarket shop.</p> <p>He is comfortable about point of sale ('POS') machines at his regular shop but feels under pressure when he goes anywhere new or when he has to use a different device. Colin is aware of his age but does not want anyone to think it is adversely affecting him – he can feel a little self-conscious as a result.</p> <p>Colin worries about card security because he has read stories in the press about fraudulent use of cards. Despite this, he keeps a record of his PIN and typically uses the same PIN for all his cards.</p>	<p>Claire is 83 years old and although she has not had a dementia diagnosis, she is showing some signs of cognitive impairment, for example, confusion and memory-loss.</p> <p>Claire's son is very worried about her use of cards as she has started to confuse her debit and credit cards. When she has paid by credit card she is confused over which card she has paid with and does not fully acknowledge any accumulation of debt as a result. Claire also feels under pressure when using POS machines to pay by card, making her more anxious and, in turn, further affecting her confidence and task performance.</p> <p>She finds it difficult to follow tasks that require her to use her card numbers and she becomes confused when reading them out over the telephone.</p> <p>Claire's son suspects that she has told a friend and neighbour her debit card PIN number and believes that she has authorised them to go shopping on her behalf.</p>

## Paying by card: Implications

Paying by card for many people is a frequent, familiar and typically simple process. As a result, it is expected that most older people who are experiencing normal cognitive ageing, are comfortable with paying by card for goods and services.

However, even those experiencing normal cognitive ageing can struggle to remember their PIN. This is consistent with studies showing a decline in some aspects of memory over the life-span, as discussed in chapter one. It also explains why older adults are increasingly using adaptive strategies to combat problems with number recall. For example, some people write their PIN numbers down, some use very ‘easy to guess’ numbers and others repeatedly use just one or two numbers.<sup>62</sup>

These problems are likely to be exacerbated for those living with mild cognitive impairment or with dementia. Increased difficulties can arise in recalling PINs, differentiating between credit and debit cards and using different types of POS machines.

**“The advent of chip and PIN and other electronic money management systems, and the decline of face-to-face banking, pose special problems for people with dementia. They may struggle to remember PINs.”**

(Alzheimer’s Society, 2011)<sup>63</sup>

### Paying by card: Recommendations

**Providers need to progress work on secure alternatives to chip and PIN cards. For example:**



- **Biometrics:** providers are already developing the use of fingerprints, iris, face or voice recognition. Providers should consider how this technology will work for older consumers and be mindful that not all older consumers will be adopters of technology.
- Make customers more aware of currently available alternatives, for example **chip and sign** or ‘X’ signing.



**In addition:**

- Card providers need to do more to **differentiate between card types**, for example with the use of colour, photos, texture.
- Point of sale providers should recognise the challenges that some older consumers face with new technology. Point of sale machines should be designed in an intuitive, user friendly and customer centric manner.

Further, whilst not the focus of this review, physical and access barriers are expected to present themselves more frequently as consumers move through older age groups. For example, older consumers might find reaching POS machines challenging or worsening eyesight problems might make differentiating numbers or instructions more difficult. There is evidence for various age-related eyesight challenges. These include difficulties in distinguishing between colour contrast and difficulties in discerning boundaries (i.e. where a card slot starts and finishes).

**“For people of all ages, it is harder to tell blues and greens from each other than it is to differentiate reds and yellows. This becomes even more pronounced with ageing. As your age increases, using lots of warm contrasting colours (yellow, orange, and red) in your home can improve your ability to tell where things are and makes it easier to perform daily activities.”<sup>64</sup>**

Salvi, S. M., Akhtar, S., & Currie, Z. (2006)

### 3.2.3 Using an ATM

Box 3.2.3: Using an ATM:	
Stan who is experiencing normal cognitive ageing	Maxine who has Alzheimer's disease
<p>Stan is 68 years old and is starting to have problem with his eyes.</p> <p>He uses an ATM to get cash out on a periodic basis. He typically has no problem with doing this. However, he does write down his PIN because he is worried about getting the number wrong and the machine confiscating his card (his number is in his wallet).</p> <p>Stan gets a little irritated that the ATM he uses most often is in direct sunlight. He needs to turn to the side to see the numbers properly and worries about his personal security as a result.</p>	<p>Maxine is 76 years old and has Alzheimer's disease.</p> <p>She feels exposed and under pressure when using an ATM machine. This is because she takes a long time to follow what it is asking her to do. Her dementia can cause moments of confusion and she can go 'blank' about what to do next. The stress of being in a queue can exacerbate this confusion and make her feel worse.</p> <p>Maxine has also been known to leave without taking her money with her.</p>

## Using an ATM: Implications

Normal cognitive ageing is unlikely to interfere with use of an ATM. However, because risk aversion *and perception* increases with age, older people may have more concerns about personal safety and security and therefore prefer internal ATM machines.

Those with a cognitive impairment may show greater anxiety, which could extend to anxiety about personal security and the perception of exposure to fraud. As with the use of payment cards, people with cognitive impairment can also find recall of PINs or even ATM processes difficult. Furthermore, anxiety can have a further adverse impact on memory<sup>65</sup>, which means we might expect a compound effect between anxiety and recall. This is illustrated in **the Big Window**<sup>9</sup>'s work on *The Ageing Population: coping mechanisms and third party access*, which highlighted incidences of older people living with dementia leaving money in ATMs.<sup>66</sup>

### Using an ATM: Recommendations



**We make similar recommendations for ATMs as for payments, i.e. the development of alternatives to PINs (for example, biometrics) to access ATM services.**

**In addition to this, we advocate that providers consider:**



- **Ease of access and use** of external ATMs, particularly those in exposed areas and/or direct sunlight.
- Making further provision for **internal ATM machines** to alleviate security concerns around taking out cash on the streets.



- **Time specific options** for older customers or those living with a cognitive impairment. Allow more time between prompts to avoid system time-outs.

## 3.2.4 Accessing services in a branch

Box 3.2.4: Using a branch:	
Sheila who is experiencing normal cognitive ageing	Chris who has dementia
<p>Sheila is 67 years old and is a retired teacher.</p> <p>She goes to a branch to pay in a cheque and withdraw some cash. Sometimes the queue for the bank teller is very long and she is redirected to the internal ATM by a staff member. The first couple of times that this happened she felt a little uncomfortable but, after receiving help from the banking assistant, she is now much more confident about using the ATM.</p> <p>On another visit to the branch, she would have liked to discuss her savings products with bank staff. Because she didn't make an appointment, she is advised to come back on a different day. She is irritated but not anxious or confused.</p>	<p>Chris is 88 years old and was diagnosed with early onset dementia 2 years ago. He recognises that his thinking skills have started to change.</p> <p>Chris goes into the bank branch at a particularly busy time. The noise and hectic environment disorients Chris and he feels anxious and stressed by the time he gets to the bank teller.</p> <p>The light is causing reflections from the Perspex screen and this, together with the crowded environment, leads him to be unsure about what he came in for. He asks for more money than he intended, and whilst the branch teller (who recognises him) is unsure about the request, she gives him what he asks for. Chris leaves the branch unsure whether or not to return.</p>

### Accessing services in a branch: Implications

Using a familiar bank branch for everyday tasks is unlikely to be a challenge for the older consumer. However, new tasks (e.g. using the internal ATM to pay in a cheque for the first time) or more complex tasks (e.g. making a foreign exchange payment) are likely to feel more challenging. The literature, as set out in chapter two, documents how tasks that require fluid cognitive abilities are likely to cause more difficulty. For example, older consumers find it harder to divide attention and focus on or process multiple sources of information simultaneously. They also perform less well in tasks that require them to learn new skills or make high-complexity decisions. Therefore, in older age, less than optimum performance on complex financial tasks is likely.

Those with a cognitive impairment may find elements of the branch environment stressful and potentially overwhelming. Examples given by industry experts and stakeholders include the following:

- Noisy environments, which can cause confusion and inhibit processing
- Reflective Perspex screen, which can be disturbing for those with dementia
- Unhelpful lighting, which causes reflections or stark light contrasts across the branch or between the branch and outside, which can be difficult for older people or those with a cognitive impairment to adjust to<sup>67</sup>
- A lack of clear direction about what to do and when, for example where to queue
- No private areas to check actions or talk things through
- Unfriendly or impatient bank staff (or fellow customers)
- Difficulty in remembering verbal instructions or conversations, particularly if they are not given face-to-face

**“One thing can just spiral you into decline and then into anxiety and difficulties with memory. We need to consider a clear pathway in to the bank branch, with dementia friendly lighting.”**

(Rachel Mortimer, Engage and Create)

## Accessing services in a branch: Recommendations

This review makes a number of recommendations for banks and other providers with retail branches:



### The environment and physical apparatus:

- Provide quiet areas for customer to complete tasks in their own time and have one-to-one discussions with branch staff.
- Review signage and colour schemes and consider how to make them more age-friendly, for example by using visual and more literal icons.
- Review lighting in branches and restrict the use of light reflective surfaces. Avoid, where possible, physical barriers between consumers and branch staff (e.g. review use of Perspex).



### Communication:

- Provide clear communication to consumers about the times of day when the branch is likely to be most and least busy or even offer 'over 60s' time recommendations (e.g. a traffic light system showing quieter versus busier bank times and when the bank could provide more support for older customers and potentially age-related expertise).
- Publicise the support provided for people who need help with tasks. Normalise discussions about the need for third party support using in-branch communications.
- Provide templates for all banking tasks that can be followed by customers (from completing a cheque to setting up a direct debit).
- Offer older people, who feel they need more support, a card signalling their needs. This could be given to the welcome desk so that an alternative route through branch services could be offered.



### Front-line staff:

- Provide training on communicating with the ageing customer for all staff (e.g. 'age-friendly' training that is similar to 'dementia-friendly').
- Encourage staff to 'go the extra mile' for older customers by checking their need for support and scrutinising the typicality of customer requests.
- Support older customers when completing first-time activities.
- Branch staff might also offer and set up telephone passwords for older customers, which would trigger a more personal, less automated telephone service.



### In-branch technology:

- Develop and use Fintech with older customers in mind. Interweave person-centred banking with Fintech to maximise the customer outcome. In particular, use initiatives including video-calls and telebanking with in-branch support to help older customers access specialist services, within the familiar environment of their own branch.

Overall, this review recommends that banks consider how their branch environments are working for older customers as part of their internal review and governance processes, and then seek to address the gaps.

Finally, we advocate that the profiles of local communities are considered when developing branch strategies.

## 3.2.5 Monitoring accounts

Box 3.2.5: Monitoring accounts:	
Graham who is experiencing normal cognitive ageing	Annie who has dementia
<p>Graham is 78 years old. He is a retired engineer and has always kept careful control of his money.</p> <p>Graham monitors his account balance and makes some payments using online banking but prefers to use paper statements to check through each of the account credit and debits. He tends to tick each entry off against his receipts which he keeps.</p> <p>Without realising he had done so, Graham agreed to no longer receive paper statements. He doesn't understand why he can only access account information online now and he is unhappy about this.</p>	<p>Annie has Alzheimer's disease and her daughter has a lasting power of attorney ('LPA') to manage her financial affairs.</p> <p>Annie is glad that her daughter is doing this for her but she still wants to retain a sense of control and likes to go through her account using a paper statement.</p> <p>In particular, Annie wants to feel sure that she has sufficient funds in her current account as she becomes anxious about running out of money for things she might need. She also worries about forgetting to pay bills.</p> <p>In addition, Annie's daughter wants her actions to be transparent in the statements, to both her mother and the rest of the family.</p>

### Monitoring accounts: Implications

Paper statements are still valued by many older customers because they offer a familiar and tangible way of monitoring account activity.

There is a risk that older consumers could opt for electronic statements without consciously choosing them. This could be because they inadvertently tick a box that opts out of paper-based statements or they do not tick the box to specifically request paper-based statements.

**“Even if they accessed their accounts online, many workshop participants expressed a preference for paper statements and particularly did not like what were seen as ‘sneaky’ ways of moving people to electronic statements such as having a hard-to-see tick box if they want to continue receiving paper statements.”<sup>68</sup>**

(Age Friendly Banking, Age UK, 2016)

In addition, the codes and acronyms that appear on statements might not be obvious to older people, particularly newer codes which are less familiar.

Additional information, for example about the benefits of other products, gives customers of all ages more to process. This could result in them finding it hard to focus on relevant transaction-based information. This review suggests that adaptive strategies, such as focusing on positive and/or affective messages, perhaps within additional marketing communications, might distract older people from processing the information they need to.<sup>69,70</sup>

### Monitoring accounts: Recommendations

The following changes will help older customers to monitor their accounts:



- **Feedback checks for requested actions:** ensure that the actions of older customers in particular are checked via a feedback loop: *“You asked us to XXX, is this what you intended?”*



- **Standardising formats:** providers could collaborate to create a standard statement format. This would support consumer familiarity.



- **Summary pages of actions:** consider using summaries of actions to help consumers to check transactions. This could prove particularly useful when there is third party access to the account, enabling the donor to see what actions have been taken by whom in separate summaries.



- **Reduction of associated marketing communications in statements:** review the amount of information sent with the statement, particularly information that is not directly related to the statement itself or associated product.

## 3.2.6 Making a telephone enquiry

### Box 3.2.6: Making a telephone enquiry:

#### Helen who is experiencing normal cognitive ageing

Helen is 84 years old. She is recently widowed and now finds herself dealing with areas of money management that she had previously left to her husband.

Helen telephoned her bank to discuss a query that she has on her statement. After dialling the number, she presses an option that she thinks applies but is unsure. She is asked for telephone security information but struggles to recall it and, because she feels she is wasting the call handler's time, she starts to get flustered.

The call feels scripted but Helen wants to double check the responses in a number of ways.

She leaves the call still feeling uncertain as to whether she has the correct information.

#### Penny who is living with dementia

Penny is 62 years old with young onset dementia. She lives on her own. Her children are able to help but do not live locally. She prefers to keep as independent as possible in all her dealings with other companies.

Penny's form of dementia means that she finds it particularly difficult to process verbal conversations. She finds it much easier to use a visual mode of communication, email or even live chat (though not for more complex queries).

Issues with memory means that Penny struggles to recall passwords and becomes stressed when her slowness of response leads the automated system to repeatedly prompt her to disclose parts of her password. As a result, she now avoids automated telephone systems completely.

However, whenever Penny tries to resolve an issue by email, she is redirected to a telephone number to call. This makes resolving queries very difficult and stressful.

## Making a telephone enquiry: Implications

Information that is transferred via a verbal conversation, as opposed to, for example, written/visual medium, can cause difficulties for ageing adults. This is not simply due to loss of hearing; rather it is also due to the slowing down of cognitive processes, particularly working memory<sup>71</sup>. Studies suggest that with age, cognitive resources are being prioritised towards word identification, which in turn draws them away from processing and storage.

Put simply, it is more difficult for older people to process and store information that they hear, rather than information they see, and this is exacerbated in a noisy environment and/or for complex subject matters.<sup>72</sup> This is even more the case for people living with dementia.

The implications for older customers dealing with call centres are clear. Older customers often prefer telephone contact over online management of an account, possibly because of their typically less proficient online knowledge, capabilities or confidence compared to younger people. However, banks and other financial service providers need to account for the auditory processing issues we have outlined. Specifically, providers need to consider how they might compensate for the amplified difficulties of verbal rather than written conversations, particularly if the conversation is non-standard or complex.

The evidence concerning cognitive changes suggest that some older customers might have difficulties using their working memory to process the instructions given and options presented at the beginning of a call. This means they may not be able to find their way to the right person. The literature on cognitive changes suggests that older customers might show difficulties in recalling the information necessary to pass telephone security checks.

Finally, problems with prospective memory as people age mean customers might not remember instructions they have been given. Studies suggest that encouraging people to write down what has been discussed can aid memory and decisions.<sup>73</sup>

Providers can expect these problems to be compounded for people living with dementia who experience sharper declines in short-term memory. This could be further hampered by stress and/or anxiety and lead those customers to avoid telephone contact altogether.

**“You always have to use the phone. I can’t use the phone anymore. I find the phone difficult because of the people at the other end – they can’t see you so they can’t see that you might be thinking of what to say. It takes longer to think of a sentence and so they get impatient and repeat the question. Because they think you have forgotten and that confuses you even more. And you either end up saying the wrong answers or not having the right conversation with them. So I don’t use the phone anymore.”**

Wendy Mitchell, Living with and Blogging about Dementia

### Making a telephone enquiry: Recommendations

**It is recommended that banks and other financial service providers review their telephone-based services so that they can be more confident of good outcomes for older customers. We suggest:**



- **Security checks:** review security checks and consider introduction of alternatives to the current approach to passwords. Passwords such as memorable dates, names or addresses can be very difficult for those with memory problems to recall without visual prompts (which are not possible over the telephone). Banks and other providers should consider the extent to which voice recognition can address the issues outlined. Where voice recognition falls short, alternatives should be considered.



- **Option menu review:** offer an alternative for customers who might struggle with processing options. Consider offering older customers a dedicated direct response number.



- **Staff training:** train staff on the challenges older customers might experience with telephone conversations, particularly with more complex products. Provide staff with:
  - Technical training to give them the ability to identify an issue associated with ageing and cognitive impairment.
  - Empathy-based training to deal with the case appropriately.



- **Feedback mechanisms:** ensure staff include feedback-checks at the end of telephone calls to ensure that important information has been processed (e.g. asking consumers to playback key elements of the conversation). Consider supplementing more complex calls with emails or letters reiterating the content of the call and what was agreed between the two parties.



- **Decision aids:** Encourage frontline and call centre customers to use decision aids, including writing down important elements of the conversation and agreed actions. Consider offering customers ‘notepads’ to record banking information, or as part of welcome packs (when opening accounts or buying new products).

## 3.2.7 Online banking

<b>Box 3.2.7: Online banking:</b>	
<b>Emma who is experiencing normal cognitive ageing</b>	<b>David who has mild cognitive impairment</b>
<p>Emma is 71 years old. She uses the internet to Skype her grandchildren, send emails and do some online shopping. Her son helped her register for and set up online banking but she still feels nervous about using it.</p> <p>She can now check her balance and account statement. She can also transfer money between accounts (she repays her son for doing some shopping for her).</p> <p>She is more uncomfortable with setting up new payees online and either avoids doing so or asks her son to help her.</p> <p>She searches for and compares prices of products such as general insurance online but prefers to make the purchase over the telephone.</p>	<p>David is 85 years old. His daughter believes that he is in the early stages of dementia but David is resistant to seeing his doctor for a diagnosis.</p> <p>David has started to struggle with managing his finances and his daughter has noticed demand letters for unpaid utility bills.</p> <p>David has allowed his daughter to set up an online account on his behalf. She tends to sit with him to go through the account and what has been paid.</p> <p>David would like to use the account on his own. He would ideally like to monitor his own account. However, he does not find it easy to navigate from one area of the online account to another, so he tends to avoid it.</p>

## Online banking: Implications

Given that it is a visual rather than auditory medium and can be accessed in the familiarity of one's own environment and at one's own pace, online banking could provide older customers with a more comfortable approach to managing their money and financial affairs.

The challenge appears to be facilitating some (not all) customers to try and work with online banking for the *first time* in addition to *triallying specific activities* within their online account, for example setting up a new payee.

This requires customers to feel comfortable with the security of what they are doing. Customers may also need to be supported through the process of setting up the account and then using it for the first time. Our literature review suggests this may in part be due to the heavy reliance on (less efficient) fluid abilities when undertaking unfamiliar activities. It is also likely to be linked to age-related changes in attitudes to and perceptions of risk.

Furthermore, changes to the layout and structure of websites can cause problems for those who are using them and have got used to the current format. This can cause discomfort as older customers need to re-learn the new layout and process. Testing of the new approach should take into account the needs of older people, such as the clarity of instructions, the amount of white space and the ease of enlarging elements.

It is expected that these implications would apply to all older people. However, these challenges might be more marked for those living with a cognitive impairment.

In addition, online banking provides a convenient option for those living with dementia who need secure but accessible, third party assistance. Further recommendations are made in **the Big Window**'s study on *The Ageing Population: coping mechanisms and third party access*.<sup>74</sup>

## Online banking: Recommendations

The recommendations for online banking focus on security and facilitating trial behaviour:



- **In-branch support:** enhance the support given to older customers as they begin their 'online journey' by helping them to set up and then use their online account for the first (or even first few) times. Ensure branch staff are available when a customer wants to try a new activity, (e.g. setting up a new payee). Consider an in-branch 'online training programme' for older consumers, organised at quiet times, with simple takeaway sheets using visuals and icons, including training of 'online champions'.



- **Entry-level banking:** consider providing easy entry-level online banking which gives customers fewer options (e.g. balances, payments and statements), with more visual prompts and larger fonts.



- **Online security:** provide more information to older customers about online security and how they can ensure security. There is an opportunity for providers to address common myths about internet security, 'what to be aware of' and 'what to be reassured by'.



- **Website changes:** give further consideration to older customers, particularly those with a cognitive impairment, when making website changes. The words "new and improved" might not be good news to this population as innovations can lead to confusion and disorientation. We advocate that the perspectives of older customers are integrated into internal product and website development processes and governance, such that internal stakeholders see these 'through the minds' of the older customer.



- **Third party access:** pay specific attention to the third party access both on the part of the donor and the carer. More details for this are provided in [the Big Window®](#) report for the Financial Conduct Authority ('FCA') on Third Party Access (published as part of the FCA's Ageing Population Occasional Paper).



- **Summary of actions and implications of actions:** provide a summary screen before logging off (prompted by customer clicking the 'logging off' button). The summary screen should show all actions taken, together with their key implications. (e.g. agreement to receive all statements online means no further statements will be sent through the post).

## 3.2.8 Changing product or provider

Box 3.2.8: Changing product or provider:	
Martin who is experiencing normal cognitive ageing	Rachel who has dementia
<p>Martin is 69 years old and enjoys a good social life. He still drives and likes to visit his children and grandchildren once a month though they do not live nearby. Martin also travels overseas at least twice per year.</p> <p>Martin has a packaged bank account that includes travel insurance. He buys his car and home insurance with a different provider but he has been with the same ones for over 20 years, believing a new company would not offer an equivalent service.</p> <p>Martin has been encouraged by his children to consider changing his insurance provider but he is unsure where to start.</p>	<p>Rachel is 74 years old and has mild cognitive impairment. She gets confused in some environments and more so at certain times (particularly in the afternoons). She is still able to do most things herself though she gets help from her two daughters when she struggles.</p> <p>Rachel has a credit card, which she opted for last year but has, on occasion, forgotten to pay the balance. Her daughters have noticed that she is paying a much higher than average interest for this card. She has also used this card thinking it was her debit card and has spent more than she has available. This has made budgeting more difficult.</p> <p>Her daughters have become a little more worried about her product choices.</p>

### Changing product or provider: Implications

There is considerable evidence across a number of studies that older people are more likely to make sub-optimal product or service purchase decisions as they get older. Box 2.3 in chapter two of this document outlines the findings of a large study showing these relationships.<sup>75</sup>

Increased reliance on crystallised knowledge and adaptive decision-making strategies can lead to decision biases and, as a result, sub-optimal decisions when changing product/service or provider. For instance, studies show greater emphasis on existing relationships with age.<sup>76</sup>

**“Findings confirm most of the findings in literature saying that age is negatively related to information gathering and processing, and positively related to the stability of purchase behaviour, i.e. brand loyalty.”**

Moschis, Marketing to Older Adults, 2003

The implication is that banks and other financial services providers need to intervene to maximise the chances of a good customer outcome. This might mean encouraging more effortful thinking at certain points in the purchase process.

Whilst this might be expected to be the case for all consumers, the evidence suggests that banks and financial services providers need to pay particular heed to older customers.

However, the value of emotional outcomes in the decision-making process might also need to be recognised. Older customers, in particular, might be looking to satisfy emotional goals such as feeling secure and comfortable with the person they are dealing with. This may take precedence over ‘rational’ goals, such as getting the best product for the best price.

### Changing product or provider: Recommendations

**Older consumers’ approaches to changing products and/or providers suggest that banks and other financial services providers need to do more to offset the biases that can determine decisions. However, as detailed in earlier chapters of this report, cognitive changes vary across individuals. This means that whilst providers might need to nudge consumers in the right direction, they must take care not to patronise or alienate them. The following recommendations are suggested:**



- **‘Walking in the shoes of the older customer’:** profiles of older customers should form a key part of all product development and marketing processes. Key questions are: “What does this look like from an older customer’s perspective?” “How might an older customer read this?” and “How would an older customer make their decision to buy this?” We also suggest that samples of older people are an integral part of customer needs-related research.



- **Decision and behavioural nudges:** be aware of the potential biases or adaptive strategies that older customers are using.

## 3.2.9 Longer term financial tasks or decisions

The primary objective of this review was to explore the relationships between ageing and everyday financial decisions, focusing on banking.

However, given the review's finding that decisions are more vulnerable when the subject area or required actions are more complex or less familiar, then older consumers and their decisions relating to longer-term financial products and services should be considered. We make some tentative recommendations in this section of the report about longer term financial tasks but further work in this area is required to offer a fuller picture.

### Box 3.2.9: Longer term financial tasks or decisions:

#### Normal cognitive ageing Bernadette

Bernadette, 75 years, has no children. She was formerly a senior manager in a large pharmaceutical company.

When Bernadette retired she took a tax-free lump sum from her defined contributions pension. She has also chosen to split the rest between an annuity and income drawdown set up for her by her financial advisor. He has since retired and she does not know his replacement.

Bernadette receives regular statements from her platform provider on the value of her drawdown and how different funds perform but she doesn't understand the statements and has never reviewed the funds so does not know if she could be getting a better return elsewhere or whether she now should consider using the funds to buy another annuity.

She worries about making a mistake with her financial decisions so chooses to make no decision at all and leave things where they are. This seems like an easier way forward for her. For the last few years, she has not paid attention to how her investments are working for her - she just wants to know that she isn't losing anything.

## Longer term financial tasks or decisions: Implications

Longer-term products are often those consumers manage on an infrequent basis making them both complex and unfamiliar. For these types of decisions, we would expect more fluid cognitive abilities to be involved. This suggests that older consumers' decision-making and outcomes are vulnerable in the domain of longer-term financial products and services.

There is study-based evidence of older consumers making poorer investment-related decisions.<sup>77</sup> Examples include opting for lower savings rates, favouring less risky but also less optimal decisions, or making no decision at all and leaving their investments where they are (though these findings are shown to vary in some studies; variability as a result of individual differences in memory and processing speed).<sup>78</sup>

This is of particular interest because, as a number of studies have referenced, consumers are typically making a number of complex and unfamiliar financial decisions from 50 years and onwards. From this age, people are more likely to be thinking more about their savings and investments, making plans for a lengthy retirement and making decisions about how and when to draw down on pensions. These areas in addition to others such as how to utilise equity in property or funding long-term care are decisions that are not only complex but are also unlikely to have been faced before and are, therefore, unfamiliar to the ageing consumer: both conditions which makes their decision-making more vulnerable and less optimised.

**“Older adults faced with many complex and consequential decisions at a time in their lives when, paradoxically, many of them begin to experience declines in cognitive abilities.”<sup>79</sup>**

(James, Boyle, Yu, Han and Bennett, 2015)

In addition, pensions freedom has added a further variable for older consumers to consider. Pensions freedom might not simply involve decisions at retirement, i.e. what to do with pension funds, whether to drawdown, take cash and so on. Pensions freedom might also involve consumers having to interact with the investments that are no longer tied into annuities later in life. Fintech also plays a part here with increased prevalence of online platforms, which might not suit older consumers who favour human interaction.

Finally, increasing longevity and changing welfare/social care provision could also involve older consumers in other financial decisions later into life. For example, we might see an increasing interest in products such as lifetime mortgages (also known as equity release) and long term care funding.

The need for older adults to have greater involvement in financial products later into life comes at a time when fluid abilities are diminished and crystallised abilities are starting to plateau. However, abilities and capabilities are not the sole focus: the need for older adults to be more engaged in long-term financial products also comes at a time when willingness and motivation to acquire new information starts to wane as people start to favour emotional goals over acquisition-based ones.

## Longer term financial tasks or decisions: Recommendations

There is still further review and research work to do in the longer-term financial services sectors. However, the findings of this review suggest the following changes:



- **Online ‘games’ and exercises to encourage older consumers to practise:** older consumers can show more risk aversion, concern about making mistakes and lack of willingness to trial investment-related activities. Providers might consider initiatives that encourage consumers to trial behaviour in a safe, no consequence environment. However, these trials should be positioned as educational and consumers need to be warned against over-confidence with investments.



- **Clear investment statements showing year-on-year differences:** investment communications can be complex and unclear. Firms should make it easier to see year-on-year changes at a glance.



- **Ready-made structured note-taking sheets to help processing:** consumers could be provided with packs alongside their investments that aid their processing, retention and decision-making. These could include note-taking sheets that give them a pathway through their investment decisions. These could be provided with customer policies or welcome packs.



- **Specialist support teams to help older customers:** we recommend the deployment of specialist teams to support older customers.



- **Recording of all contact:** provide customers with emails and/or letters summarising actions agreed or major issues covered. If using an online platform, show summary-screens before logging off.



- **Human technology interaction:** use of live video to support mobile or smaller branches in the delivery of specialist expertise.

## 3.3 The impact of change

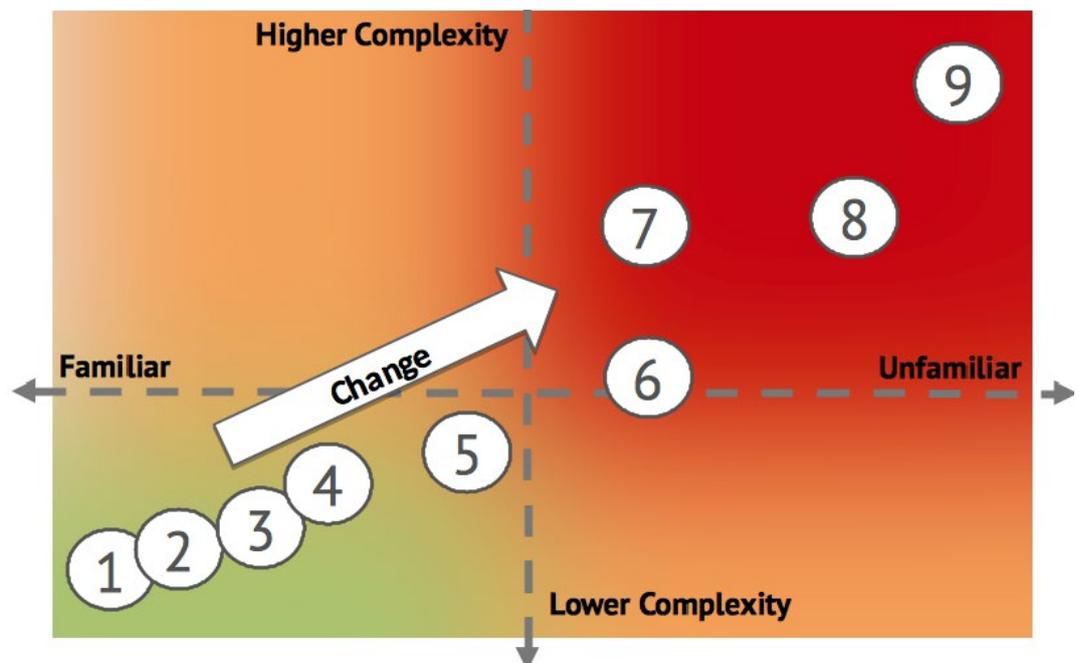
Chapter two mapped each of the banking or financial tasks against indicative Complexity and Familiarity dimensions (see Figure 1.5).

It is important to note that the familiarity and complexity of a financial task varies from task to task and from individual to individual.

The perceived familiarity of a particular task will be relative to how *stable* it is. In other words, change to any aspect of the task, i.e. the product features, the environment or channel in which it is sold or delivered (including website changes), its terms and conditions, can make a task that was previously familiar or simple seem less familiar and more complex.

The implication is that banks and financial services providers need to take care when making changes to products/services or the context within which they are accessed. Firms should be mindful that “changed” or “new and improved” is not always good news to older consumers and doesn’t always translate into a better consumer experience.

**Figure 3.3: Impact of change on the Complexity-Familiarity Map**



The numbers (above) refer to the categories of banking tasks as per Box 3.1 on page 54

## 3.4 Summary of implications and recommendations

We have reviewed nine categories of banking and financial activities and explored the implications of older consumers' decision-making. The recommendations set out for financial services firms are aimed at making it easier for older people to make financial decisions.

The nine tasks addressed in this report are predominantly associated with everyday banking activities; however it is important to note that there is application for these recommendations across other areas of financial services. The spectrum of recommendations set out in this report have been distilled into four broad categories, which may aid firms in developing their short and longer term strategy for managing older consumers:

- **Environment:** firms should be mindful of the physical environment in which they deliver their services and its potential impact on the ability of older consumers to make effective decisions. Consideration should be given to the importance of facilitating a comfortable and secure environment, in which older consumers can make considered financial decisions without time pressure.
- **Memory aids:** providing older consumers with records and reminders of actions will support older consumers' preferences for having a paper trail and the need for prompts. This may reduce confusion, improve understanding and facilitate ease of transaction.
- **Treatment of customers:** frontline staff should be well-trained, equipped and empowered to identify and respond to the specific or additional needs of older consumers. There is a need for empathy and understanding, across all points of consumer interaction and communication channels.
- **Future proofing:** Given the evidence of causality between age and the changes in financial decision-making, these changes cannot simply be attributed to generational or cohort differences. As such, firms may wish to consider long-term, sustainable strategies for developing and delivering products and services that are fit for purpose for the growing number of older customers. This will require firms to understand the needs of their customers and identify where they aren't being met.
- **Security:** consumers should be informed and reassured about how their monies and personal information can be kept safe.

### 3.4.1 Wider benefits of making changes in the interests of older customers

This review has highlighted the variability of the older population and emphasised that not all older people experience the same cognitive changes in the same way. However, firms could demonstrate a more customer-centric approach by introducing many of the changes outlined in this section. If firms are able to anticipate and meet the needs of their growing older customer base, it could have wider benefit for vulnerable consumers and others who simply don't like engaging with money matters, regardless of age and cognitive ability.

# 4 Conclusion



## 4 Conclusion

The *UK population is ageing* and older consumers, those over 50 years, 65 years, 75 years and 85 years will all be significant groups in our society and consequently represent large consumer groups for the financial services industry to consider.

Understanding and catering to the changes that occur as people age will facilitate the delivery of *good customer outcomes*, which is aligned with the Financial Conduct Authority's ('FCA') overarching objectives. There are also *sound commercial reasons* for providers to meet the needs of this consumer group, given each of the age groups listed above could be equivalent in size to what are currently considered significant segments in their target consumer population.

The ageing consumer population matters *because people change cognitively as they age*. On the one hand, people build on their knowledge, existing skills and experience ('crystallised abilities') as they age. On the other hand, cognitive changes over their lifespan mean they are simultaneously experiencing a decline in ability to process new or more complex information ('fluid abilities'). Ensuring good customer outcomes means providers must counter the net effects of these changes, both in products and services themselves as well as the ways in which these are offered and communicated.

This *change is not simply a cohort issue. It is an ageing issue*. We cannot assume it is solely about getting through the technology-related barriers that the current generation of older consumers might be experiencing. The challenges of processing and acting upon new information and new environments in addition to the difficulties with more complex decisions and/or decision contexts will be experienced by every ageing generation. What is new for today's older generation will be a 'different new' for the next older generation. In turn, it leads us to advocate that all financial services providers *incorporate the needs and preferences of older consumers into their product/service development and governance processes or structures*. Developments should be made with consideration to 'walking in the shoes' or 'in the minds' of older consumers.

By addressing the specific needs of older people as set out in this review document, providers can expect to also address the likely needs of consumers of all ages and abilities. To address these needs, it is recommended that banks and other financial services providers review the following:

- Branch environments
- Frontline staff-customer interactions
- Cash and purchase equipment
- Digital interfaces and technologies
- Channel strategies
- Product and services development and communication
- Provision of decision (or processing) aids

The very *specific needs of those living with a cognitive impairment* are also highlighted in this review. The findings of the review, together with **the Big Window**'s FCA commissioned work on *Coping Mechanisms and Third Party Access*, reveal that consumers and their carers can be empowered and supported in both a *secure and a more convenient way*. Specifically, environments and channels must be designed to extend, as far as possible, the independence of those with cognitive impairments, whilst also ensuring the pathways for carers to act on their behalf are easy to access, without compromising the security of the person they are acting for.

Finally, whilst the primary focus of this review was to explore how changes in cognition affect everyday financial tasks, it is important to recognise the significance of demographic and socio-political change. As a result of changes like pensions freedom, together with changing state retirement age, older people will be expected to interact with potentially new and more complex financial issues more frequently and longer into their older age. Consequently, the provision of long-term products, and the support that surrounds them, will merit increased focus. There is further work to be done by providers of long-term financial products, who will need to consider the implications of this changing landscape and how they address it to ensure good customer outcomes.

# 5 Bibliography & Notes



# 5 Bibliography

Agarwal, S., Driscoll, J. C., Gabaix, X., & Laibson, D. (2006). Financial mistakes over the life cycle. *Manuscript, Harvard University*

Agarwal, S., Driscoll, J. C., Gabaix, x., & Laibson, D. (2009). The age of reason: Financial decisions over the life cycle and implications for regulation. *Brookings Papers on Economic Activity*, 51-101.

Agarwal, S., & Mazumder, B. (2013). Cognitive abilities and household financial decision-making. *American Economic Journal: Applied Economics*, 5(1), 193-207.

Age UK. (2017). *About Dementia*. Retrieved from <http://www.ageuk.org.uk>.

Alzheimer's Society. (2015). *Dementia 2015: Aiming high to transform lives*. Alzheimer's Society.

Alzheimer's Society. (2014). *What is mild cognitive impairment?* Alzheimer's Society.

Baltes, P. B. (1993). The aging mind: potential and limits. *The Gerontologist*, 33(5), 580-594.

Banks, J. (2006). Economic capabilities, choices and outcomes at older ages. *Fiscal Studies*, 27(3), 281-311.

Bennett, D. A., Schneider, J. A., Buchman, A. S., Barnes, L. L., Boyle, P. A., & Wilson, R. S. (2012). Overview and findings from the Rush Memory and Aging Project. *Current Alzheimer Research*, 9(6), 646-663.

Best, R., & Charness, N. (2015). Age differences in the effect of framing on risky choice: A meta-analysis. *Psychology and Aging*, 30(3), 688.

Bonsang, E., & Dohmen, T. (2015). Risk attitude and cognitive aging. *Journal of Economic Behavior & Organization*, 112, 112-126.

Boyle, P. A., Yu, L., Wilson, R. S., Segawa, E., Buchman, A. S., & Bennett, D. A. (2013). Cognitive decline impairs financial and health literacy among community-based older persons without dementia. *Psychology and Aging*, 28(3), 614-624.

Carpenter, S. M., & Yoon, C. (2011). Aging and consumer decision-making. *Annals of the New York Academy of Sciences*, 1235(1).

Carstensen, L. L., Mikels, J. A., & Mather, M. (2006). Aging and the intersection of cognition, motivation and emotion. *Handbook of the psychology of aging*, 6, 343-362.

Cattell, R. B. (1971). *Abilities: Their structure, growth and action*. New York: Houghton Mifflin.

Chen, Y., Ma, X., & Pethtel, O. (2011). Age differences in trade-off decisions: Older adults prefer choice deferral. *Psychology and aging*, 26(2), 269.

- de Bruin, W. B., McNair, S. J., Taylor, A. L., Summers, B., & Strough, J. (2015). "Thinking about Numbers Is Not My Idea of Fun" Need for Cognition Mediates Age Differences in Numeracy Performance. *Medical Decision-making*, 35(1), 22-26.
- Cole, C., Laurent, G., Drolet, A., Ebert, J., Gutchess, A., Lambert-Pandraud, R., . . . Peters, E. (2008). Decision-making and brand choice by older consumers. *Marketing Letters*, 19(3), 355.
- Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E., ... & Starr, J. M. (2009). Age-associated cognitive decline. *British medical bulletin*, 92(1), 135-152.
- Earnst, K. S., Wadley, V. G., Aldridge, T. M., Steenwyk, A. B., Hammond, A. E., Harrell, L. E., & Marson, D. C. (2001). Loss of financial capacity in Alzheimer's disease: The role of working memory. *Aging, Neuropsychology, and Cognition*, 8(2), 109-119.
- Financial Conduct Authority. (2016). *Ageing population and financial services: discussion paper*
- Finke, M. S., Howe, J. S., & Huston, S. J. (2011). Old Age and the Decline in Financial Literacy.
- Gamble, K. J., Boyle, P. A., Yu, L., & Bennett, D. A. (2015). *How Does Aging Affect Financial Decision-making?*
- Gardner, R. C., Valcour, V., & Yaffe, K. (2013). Dementia in the oldest old: a multi-factorial and growing public health issue. *Alzheimer's research & therapy*, 5(4), 1.
- Garfein, A. J., & Herzog, A. R. (1995). Robust aging among the young-old, old-old, and oldest-old. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 50(2), S77-S87.
- Gerardi, K., Goette, L., & Meier, S. (2010). Financial literacy and subprime mortgage delinquency: Evidence from a survey matched to administrative data. *Federal Reserve Bank of Atlanta Working Paper Series*, (2010-10).
- Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision-making. *Annual review of psychology*, 62, 451-482.
- Government Office for Science. (2016). *Future of an ageing population*.
- Grundman, M., Petersen, R. C., Ferris, S. H., Thomas, R. G., Aisen, P. S., Bennett, D. A., ... & Kaye, J. (2004). Mild cognitive impairment can be distinguished from Alzheimer disease and normal ageing for clinical trials. *Archives of neurology*, 61(1), 59-66.
- Harada, C. N., Love, M. C. N., & Triebel, K. L. (2013). Normal cognitive aging. *Clinics in Geriatric Medicine*, 29(4), 737-752.
- Hartshorne, J and Germine, L. When Does Cognitive Functioning Peak? The Asynchronous Rise and Fall of Different Cognitive Abilities Across the Life Span. *Psychological Science*. 26(4), 433 – 443.
- Hedden, T., & Gabrieli, J. D. (2004). Insights into the ageing mind: a view from cognitive neuroscience. *Nature reviews neuroscience*, 5(2), 87-96.
- Henninger, D. E., Madden, D. J., & Huettel, S. A. (2010). Processing speed and memory mediate age-related differences in decision-making. *Psychology and Aging*, 25(2), 262.

- Henry, J. D., MacLeod, M. S., Phillips, L. H., & Crawford, J. R. (2004). A meta-analytic review of prospective memory and aging. *Psychology and aging, 19*(1), 27.
- Jacobs, J. M., Maaravi, Y., Cohen, A., Bursztyn, M., Ein-Mor, E., & Stessman, J. (2012). Changing profile of health and function from age 70 to 85 years. *Gerontology, 58*(4), 313-321.
- James, B. D., Boyle, P. A., Yu, L., Han, S. D., & Bennett, D. A. (2015). Cognitive decline is associated with risk aversion and temporal discounting in older adults without dementia. *PloS one, 10*(4).
- Korniotis, G. M., & Kumar, A. (2011). Do older investors make better investment decisions? *Review of Economics & Statistics, 93*(1), p. 244.
- Labouvie-Vief, G., Lumley, M. A., Jain, E., & Heinze, H. (2003). Age and gender differences in cardiac reactivity and subjective emotion responses to emotional autobiographical memories. *Emotion, 3*(2), 115.
- Langa, K. M., Larson, E. B., Crimmins, E. M., Faul, J. D., Levine, D. A., Kabeto, M. U., & Weir, D. R. (2017). A Comparison of the Prevalence of Dementia in the United States in 2000 and 2012. *JAMA Internal Medicine, 177*(1), 51-58.
- Li, Y., Baldassi, M., Johnson, E. J., & Weber, E. U. (2013). Complementary cognitive capabilities, economic decision-making, and aging. *Psychology and Aging, 28*(3), 595-613.
- Li, Y., Gao, J., Enkavi, A. Z., Zaval, L., Weber, E. U., & Johnson, E. J. (2015). Sound credit scores and financial decisions despite cognitive aging. *Proceedings of the National Academy of Sciences, 112*(1), 65-69.
- Lindbergh, C. A., Dishman, R. K., & Miller, L. S. (2016). Functional disability in mild cognitive impairment: a systematic review and meta-analysis. *Neuropsychology Review, 26*(2), 129-159.
- Lockenhoff, C. E., & Carstensen, L.L. (2009) Age, emotions and health related decision strategies: Motivational manipulations can reduce age differences. *Psychology and Aging, 22*, 134- 146.
- Löckenhoff, C. E., O'donoghue, T., & Dunning, D. (2011). Age differences in temporal discounting: the role of dispositional affect and anticipated emotions. *Psychology and aging, 26*(2), p. 274.
- Luo, Y., & Craik, F., (2008). Aging and Memory: A Cognitive Approach. *Canadian Journal of Psychology, 53*, 346-53.
- Lusardi, A. (2012). Financial literacy and financial decision-making in older adults. *Generations, 36*(2), 25.
- Lusardi, A. (2012). Numeracy, financial literacy, and financial decision-making. *Numeracy: Advancing Education in Quantitative Literacy, 5*(1), p.1.
- Lusardi, A. (2012). Numeracy, financial literacy, and financial decision-making. *NBER Working Papers*, p.1.

- Lusardi, A. (2015). Financial literacy: Do people know the ABCs of finance? *Public Understanding of Science*, 24(3), 260.
- Marmot M., Banks. J., Blundell R, Lessof, C., Nazroo J. (2002). *Health, wealth and lifestyles of the older population in England: The 2002 English longitudinal study of ageing*. London: Institute for Fiscal Studies; 2003.
- Marsiske, M., & Willis, S. L. (1995). Dimensionality of everyday problem solving in older adults. *Psychology and Aging*, 10(2), 269.
- Marson, D. C. (2001). Loss of financial competency in dementia: Conceptual and empirical approaches. *Aging, Neuropsychology, and Cognition*, 8(3), 164-181.
- Mata, R. (2007). Understanding the aging decision maker. *Human Development*, 50(6), 359.
- Mata, R., Josef, A. K., Samanez Larkin, G. R., & Hertwig, R. (2011). Age differences in risky choice: A meta analysis. *Annals of the New York Academy of Sciences*, 1235(1), 18-29.
- Mata, R., & Nunes, L. (2010). When less is enough: Cognitive aging, information search, and decision quality in consumer choice. *Psychology and Aging*, 25(2), 289-298.
- McEwen, B. S., & Sapolsky, R. M. (1995). Stress and cognitive function. *Current opinion in neurobiology*, 5(2), 205-216
- Melzer, D., Delgado, J. C., Winder, R., Masoli, J., Richards, S., & Ble, A. (2015). *The Age UK almanac of disease profiles in later life*.
- Meyer, B.J.F., Talbot, A.P., & Ranalli C. (2009). Why older adults make more immediate treatment decisions about cancer than younger adults. *Psychology and Ageing*, 22, 505-524.
- Mikels, J. A., Reed, A. E., & Simon, K. I. (2009). Older adults place lower value on choice relative to young adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 64(4), 443-446.
- Mitchell, D. B., & Schmitt, F. A. (2006). Short-and long-term implicit memory in aging and Alzheimer's disease. *Aging, Neuropsychology, and Cognition*, 13(3-4), 611-635
- Mohr, P. N., Li, S. C., & Heekeren, H. R. (2010). Neuroeconomics and aging: neuromodulation of economic decision-making in old age. *Neuroscience & Biobehavioral Reviews*, 34(5), 678-688.
- Moschis, G. P. (2003). Marketing to older adults: an updated overview of present knowledge and practice. *Journal of Consumer Marketing*, 20(6), 516-525.
- Office for National Statistics. (2016). *Population estimates for the UK, England and Wales, Scotland and Northern Ireland: mid 2015*. ONS.
- Office for National Statistics. (2015). *National population projections: 2014-based statistical bulletin*
- Office for National Statistics. (2015). *National Life Tables, UK: 2013-2015*. ONS.
- Office for National Statistics. (2014). *National Population Projections: 2014-based Statistical Bulletin*. ONS.

Office for National Statistics. (2014). Deaths registered in England and Wales - 2013. ONS.

Office for National Statistics. (2013). *What does the 2011 Census tell us about the 'oldest old' living in England and Wales.*

Peters, E., Finucane, M. L., MacGregor, D. G., & Slovic, P. (2000). The bearable lightness of aging: Judgment and decision processes in older adults. *The Aging Mind: Opportunities in Cognitive Research*, 144-165.

Petersen, R. C. (2004). Mild cognitive impairment as a diagnostic entity. *Journal of Internal Medicine*, 256(3), 183-194.

Pkhora-Fuller, M. K. (2003). Cognitive aging and auditory information processing. *International Journal of Audiology*, 42, 2S26-2S32.

Pichora-Fuller, M. K., & Souza, P. E. (2003). Effects of aging on auditory processing of speech. *International Journal of Audiology*, 42(sup2), 11-16

Pinsker, D. M., Pachana, N. A., Wilson, J., Tilse, C., & Byrne, G. J. (2010). Financial capacity in older adults: a review of clinical assessment approaches and considerations. *Clinical Gerontologist*, 33(4), 332-346.

Plassman, B. L., Langa, K. M., McCammon, R. J., Fisher, G. G., Potter, G. G., Burke, J. R., ... & Welsh Bohmer, K. A. (2011). Incidence of dementia and cognitive impairment, not dementia in the United States. *Annals of Neurology*, 70(3), 418-426.

Prince et al., (2014) Dementia UK: Second Edition – Overview. Alzheimer's Society, London

Salthouse, T. A. (2004). What and when of cognitive aging. *Current directions in Psychological Science*, 13(4), 140-144.

Salthouse, T. (2010). *Major issues in cognitive aging*. Oxford University Press.

Salthouse, T. A. (2016). Little relation of adult age with cognition after controlling general influences. *Developmental Psychology*, 52(10), 1545.

Samanez-Larkin, G. R. (2013). Financial decision-making and the aging brain. *APS observer*, 26(5), 30.

Samanez-Larkin, G. R., Worthy, D. A., Mata, R., McClure, S. M., & Knutson, B. (2014). Adult age differences in frontostriatal representation of prediction error but not reward outcome. *Cognitive, Affective, & Behavioral Neuroscience*, 14(2), 672-682.

Scheibe, S., & Carstensen, L. L. (2010). Emotional aging: Recent findings and future trends. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*.

Shivapour, S. K., Nguyen, C. M., Cole, C. A., & Denburg, N. L. (2012). Effects of age, sex, and neuropsychological performance on financial decision-making. *Frontiers in neuroscience*, 6, 82.

Salvi, S. M., Akhtar, S., & Currie, Z. (2006). Ageing changes in the eye. *Postgraduate Medical Journal*, 82(971), 581-587.

Stuart-Hamilton, I. (2012). *The psychology of ageing: An introduction*. Jessica Kingsley Publishers.

**the Big Window®**. (2017). *The ageing population: coping mechanisms and third party access*.

Thornton, W. J., & Dumke, H. A. (2005). Age differences in everyday problem-solving and decision-making effectiveness: a meta-analytic review. *Psychology and Aging, 20*(1), 85.

Triebel, K. L., Martin, R., Griffith, H. R., Marceaux, J., Okonkwo, O. C., Harrell, L., ... & Marson, D. C. (2009). Declining financial capacity in mild cognitive impairment A 1-year longitudinal study. *Neurology, 73*(12), 928-934

Torrington, J. M., & Tregenza, P. R. (2007). Lighting for people with dementia. *Lighting Research & Technology, 39*(1), 81-97.

Tucker-Drob, E. M. (2011). Neurocognitive functions and everyday functions change together in old age. *Neuropsychology, 25*(3), 368.

Verhaeghen, P., & Cerella, J. (2002). Aging, executive control, and attention: A review of meta-analyses. *Neuroscience & Biobehavioral Reviews, 26*(7), 849-857.

Ward A, Tardi S, Dye C, Arrighi HM. Rate of conversion from prodromal Alzheimer's disease to Alzheimer's dementia: A systematic review of the literature. *Dement Geriatr Cogn Disord Extra 2013,3:320-32*.

Weierich, M. R., Kensinger, E. A., Munnell, A. H., Sass, S. A., Dickerson, B. C., Wright, C. I., & Barrett, L. F. (2011). Older and wiser? An affective science perspective on age-related challenges in financial decision-making. *Social Cognitive & Affective Neuroscience, 6*(2), 195.

Willis, S. L. (1996). Everyday cognitive competence in elderly persons: Conceptual issues and empirical findings. *The Gerontologist, 36*(5), 595-601.

Woods, R. (2011) The psychology of atypical ageing. In I. Stuart-Hamilton (Ed.) *An introduction to gerontology*. Cambridge University Press.

Yoon, C., Cole, C. A., & Lee, M. P. (2009). Research dialogue: Consumer decision-making and aging: Current knowledge and future directions. *Journal of Consumer Psychology, 19*, 2-16.

# Notes

- 1 There is extensive academic work on cognition and ageing (or related terms). For this reason, **Component 1** focussed initially on scoping lead academics (those commonly cited or referenced in other institutional documents). It then sought to identify reviews, meta analyses and reviews of reviews so as to cover a broad base of journals in the time period. Conversely, work on ageing and financial services or banking-related decision and cognition is less profligate. For this reason, **Component 2** used key terms as inputs.
- 2 As part of the FCA's Ageing Population programme, **the Big Window®** conducted a qualitative study to explore coping mechanisms among those who, to varying degrees, needed third party support to conduct financial tasks
- 3 Age UK. (2017). *About Dementia*. Retrieved from <http://www.ageuk.org.uk>.
- 4 Office for National Statistics. (2015). *National population projections: 2014-based statistical bulletin*.
- 5 Office for National Statistics. (2015). *National population projections: 2014-based statistical bulletin*.
- 6 Government Office for Science. (2016). *Future of an ageing population*.
- 7 Office for National Statistics. (2014). Deaths registered in England and Wales -2013. ONS.
- 8 Melzer, D., Delgado, J. C., Winder, R., Masoli, J., Richards, S., & Ble, A. (2015). *The Age UK almanac of disease profiles in later life*.
- 9 Government Office for Science. (2016). *Future of an ageing population*.
- 10 Financial Conduct Authority. (2016). *Ageing population and financial services: discussion paper*.
- 11 Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E., ... & Starr, J. M. (2009). Age-associated cognitive decline. *British medical bulletin*, 92(1), 135-152.
- 12 Grundman, M., Petersen, R. C., Ferris, S. H., Thomas, R. G., Aisen, P. S., Bennett, D. A., ... & Kaye, J. (2004). Mild cognitive impairment can be distinguished from Alzheimer disease and normal ageing for clinical trials. *Archives of neurology*, 61(1), 59-66.
- 13 Cattell, R. B. (1971). *Abilities: Their structure, growth and action*. New York: Houghton Mifflin.
- 14 Salthouse, T. A. (2004). What and when of cognitive aging. *Current Directions in Psychological Science*, 13(4), 140-144.
- 15 Hartshorne, J. K., & Germine, L. T. (2014). When does cognitive functioning peak? The asynchronous rise and fall of different cognitive abilities across the life span. *Psychological Science*. 26(4), 433 – 443.

- 16 Harada, C. N., Love, M. C. N., & Triebel, K. L. (2013). Normal cognitive aging. *Clinics in Geriatric Medicine*, 29(4), 737-752.
- 17 Salthouse, T. A. (2004). What and when of cognitive aging. *Current directions in Psychological Science*, 13(4), 140-144.
- 18 Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E., ... & Starr, J. M. (2009). Age-associated cognitive decline. *British Medical Bulletin*, 92(1), 135-152.
- 19 Verhaeghen, P., & Cerella, J. (2002). Aging, executive control, and attention: A review of meta-analyses. *Neuroscience & Biobehavioral Reviews*, 26(7), 849-857.
- 20 Verhaeghen, P., & Cerella, J. (2002). Aging, executive control, and attention: A review of meta-analyses. *Neuroscience & Biobehavioral Reviews*, 26(7), 849-857.
- 21 Hartshorne, J. K., & Germine, L. T. (2015). When does cognitive functioning peak? The asynchronous rise and fall of different cognitive abilities across the life span. *Psychological Science*, 26(4), 433 – 443.
- 22 Luo, Y., & Craik, F. (2008) Aging and memory: a cognitive approach. *Canadian Journal of Psychology*, 53, 346-53.
- 23 Mitchell, D. B., & Schmitt, F. A. (2006). Short-and long-term implicit memory in aging and Alzheimer's disease. *Aging, Neuropsychology, and Cognition*, 13(3-4), 611-635.
- 24 Salthouse, T. A. (2004). What and when of cognitive aging. *Current directions in Psychological Science*, 13(4), 140-144.
- 25 Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E., ... & Starr, J. M. (2009). Age-associated cognitive decline. *British Medical Bulletin*, 92(1), 135-152.
- 26 Hartshorne, J. K., & Germine, L. T. (2015). When does cognitive functioning peak? The asynchronous rise and fall of different cognitive abilities across the life span. *Psychological science*, 26(4), 433 – 443.
- 27 More information about The Lothian Birth Cohort can be accessed at [www.ccace.ed.ac.uk/research/associated-projects/the-lothian-birth-cohort](http://www.ccace.ed.ac.uk/research/associated-projects/the-lothian-birth-cohort)
- 28 Deary, I.J., Whalley, L.J. & Starr, J.M. (2009). *A lifetime of intelligence: follow up studies of the Scottish mental surveys of 1932 and 1947*. Washington, DC: American Psychological Association.
- 29 Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E., ... & Starr, J. M. (2009). Age-associated cognitive decline. *British Medical Bulletin*, 92(1), 135-152.
- 30 Jacobs, J. M., Maaravi, Y., Cohen, A., Bursztyn, M., Ein-Mor, E., & Stessman, J. (2012). Changing profile of health and function from age 70 to 85 years. *Gerontology*, 58(4), 313-321.
- 31 Jacobs, J. M., Maaravi, Y., Cohen, A., Bursztyn, M., Ein-Mor, E., & Stessman, J. (2012). Changing profile of health and function from age 70 to 85 years. *Gerontology*, 58(4), 313-321.

- 32 Tucker-Drob, E. M. (2011). Neurocognitive functions and everyday functions change together in old age. *Neuropsychology*, 25(3), 368.
- 33 Tucker-Drob, E. M. (2011). Neurocognitive functions and everyday functions change together in old age. *Neuropsychology*, 25(3), 368.
- 34 Petersen, R. C. (2004). Mild cognitive impairment as a diagnostic entity. *Journal of Internal Medicine*, 256(3), 183-194.
- 35 Alzheimer's Society. (2014). *What is mild cognitive impairment?*
- 36 Ward A, Tardi S, Dye C, Arrighi HM. Rate of conversion from prodromal Alzheimer's disease to Alzheimer's dementia: A systematic review of the literature. *Dement Geriatr Cogn Disord Extra* 2013, 3:320-32.
- 37 Lindbergh, C. A., Dishman, R. K., & Miller, L. S. (2016). Functional disability in mild cognitive impairment: a systematic review and meta-analysis. *Neuropsychology Review*, 26(2), 129-159.
- 38 Prince et al., (2014). *Dementia UK: Second Edition – Overview*. Alzheimer's Society, London; Alzheimer's Society. (2014). *What is mild cognitive impairment?*
- 39 Prince et al., (2014). *Dementia UK: Second Edition – Overview*. Alzheimer's Society, London; Alzheimer's Society. (2014). *What is mild cognitive impairment?*
- 40 Langa, K. M., Larson, E. B., Crimmins, E. M., Faul, J. D., Levine, D. A., Kabeto, M. U., & Weir, D. R. (2017). A Comparison of the Prevalence of Dementia in the United States in 2000 and 2012. *JAMA Internal Medicine*, 177(1), 51-58.
- 41 Prince et al., (2014). *Dementia UK: Second Edition – Overview*. Alzheimer's Society, London.
- 42 There are pros and cons to cross-sectional and longitudinal studies. Whilst longitudinal studies offset the 'cohort effects', they can be influenced by practise effects among other biases. As a result, it is helpful to utilise data from both types of studies.
- 43 Bennett, D. A., Schneider, J. A., Buchman, A. S., Barnes, L. L., Boyle, P. A., & Wilson, R. S. (2012). Overview and findings from the Rush Memory and Aging Project. *Current Alzheimer Research*, 9(6), 646–663.
- 44 Boyle, P. A., Yu, L., Wilson, R. S., Gamble, K., Buchman, A. S., & Bennett, D. A. (2012). Poor decision-making is a consequence of cognitive decline among older persons without Alzheimer's disease or mild cognitive impairment. *PloS one*, 7(8).
- 45 Agarwal, S., Driscoll, J. C., Gabaix, X., & Laibson, D. (2009). The age of reason: financial decisions over the life cycle and implications for regulation. *Brookings Papers on Economic Activity*, 2, 51-117.
- 46 Agarwal, S., & Mazumder, B. (2013). Cognitive abilities and household financial decision-making. *American Economic Journal: Applied Economics*, 5(1), 193-207.
- 47 Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision-making. *Annual review of psychology*, 62, 451-482.

- 48 Peters, E., Finucane, M. L., MacGregor, D. G., & Slovic, P. (2000). The bearable lightness of aging: Judgment and decision processes in older adults. *The aging mind: Opportunities in cognitive research*, 144-165.
- 49 Boyle, P. A., Yu, L., Wilson, R. S., Segawa, E., Buchman, A. S., & Bennett, D. A. (2013). Cognitive decline impairs financial and health literacy among community-based older persons without dementia. *Psychology and aging*, 28(3), p. 614;
- 50 Marson, D. C. (2001). Loss of financial competency in dementia: conceptual and empirical approaches. *Aging, Neuropsychology, and Cognition*, 8(3), 164-181
- 51 Earnst, K. S., Wadley, V. G., Aldridge, T. M., Steenwyk, A. B., Hammond, A. E., Harrell, L. E., & Marson, D. C. (2001). Loss of financial capacity in Alzheimer's disease: The role of working memory. *Aging, Neuropsychology, and Cognition*, 8(2), 109-119.
- 52 'Age UK. (2017). *About Dementia*. Retrieved from <http://www.ageuk.org.uk>.
- 53 An interview conducted as part of **the Big Window**'s 2017 report on *The Ageing Population: coping mechanisms and third party access* commissioned by the FCA
- 54 An interview conducted by Lisa Edgar, founder of **the Big Window**, as part of its on-going and non-commissioned work with older consumers and the ageing population
- 55 Rachel Mortimer, Engage and Create, a stakeholder interviewed as part of this review
- 56 Willis, S. L. (1996). Everyday cognitive competence in elderly persons: conceptual issues and empirical findings. *The Gerontologist*, 36(5), 595-601.
- 57 The case studies are fictional characters and stories based on what the literature review has revealed about cognitive ageing and our discussions with industry and expert stakeholders
- 58 **the Big Window**. (2017). *The ageing population: coping mechanisms and third party access*.
- 59 Age UK. (2016). *Age friendly banking*.
- 60 Alzheimer's Society. (2011). *Short changed: protecting people with Dementia from financial abuse*
- 61 **the Big Window**. (2017). *The ageing population: coping mechanisms and third party access*.
- 62 Castel, A. D. (2007). The adaptive and strategic use of memory by older adults: evaluative processing and value-directed remembering. *Psychology of Learning and Motivation*, 48, 225-270.
- 63 'Alzheimer's Society. (2011). *Short changed: protecting people with dementia from financial abuse*.
- 64 Salvi, S. M., Akhtar, S., & Currie, Z. (2006). Ageing changes in the eye. *Postgraduate Medical Journal*, 82(971), 581-587.
- 65 McEwen, B. S., & Sapolsky, R. M. (1995). Stress and cognitive function. *Current opinion in neurobiology*, 5(2), 205-216.

- 66 **The Big Window®**. (2017). *The ageing population: coping mechanisms and third party access*.
- 67 Torrington, J. M., & Tregenza, P. R. (2007). Lighting for people with dementia. *Lighting Research & Technology*, 39(1), 81-97.
- 68 Age UK. (2016). *Age friendly banking*.
- 69 Weierich, M. R., Kensinger, E. A., Munnell, A. H., Sass, S. A., Dickerson, B. C., Wright, C. I., & Barrett, L. F. (2011). Older and wiser? An affective science perspective on age-related challenges in financial decision-making. *Social Cognitive and Affective Neuroscience*, 6(2), 195-206.
- 70 Cole, C., Laurent, G., Drolet, A., Ebert, J., Gutchess, A., Lambert-Pandraud, R., . . . Peters, E. (2008). Decision-making and brand choice by older consumers. *Marketing Letters*, 19(3), 355.
- 71 Pkhora-Fuller, M. K. (2003). Cognitive aging and auditory information processing. *International Journal of Audiology*, 42, 2S26-2S32.
- 72 Pichora-Fuller, M. K., & Souza, P. E. (2003). Effects of aging on auditory processing of speech. *International Journal of Audiology*, 42(sup2), 11-16.
- 73 Yoon, C., Cole, C. A., & Lee, M. P. (2009). Consumer decision-making and aging: Current knowledge and future directions. *Journal of Consumer Psychology*, 19(1), 2-16.
- 74 **The Big Window®**. (2017). *The ageing population: coping mechanisms and third party access*.
- 75 Agarwal, S., Driscoll, J. C., Gabaix, X., & Laibson, D. (2009). The age of reason: Financial decisions over the life cycle and implications for regulation. *Brookings Papers on Economic Activity*, 2009(2), 51-117.
- 76 Moschis, G. P. (2003). Marketing to older adults: an updated overview of present knowledge and practice. *Journal of Consumer Marketing*, 20(6), 516-525.
- 77 Korniotis, G. M., & Kumar, A. (2011). Do older investors make better investment decisions? *The Review of Economics and Statistics*, 93(1), 244-265.
- 78 Henninger, D. E., Madden, D. J., & Huettel, S. A. (2010). Processing speed and memory mediate age-related differences in decision-making. *Psychology and Aging*, 25(2), 262.
- 79 James, B. D., Boyle, P. A., Yu, L., Han, S. D., & Bennett, D. A. (2015). Cognitive decline is associated with risk aversion and temporal discounting in older adults without dementia. *PLoS one*, 10(4).