



# Numeracy and Financial Capability

Exploring the links

[moneyadviceservice.org.uk](http://moneyadviceservice.org.uk)

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# Foreword

## Foreword from David Haigh, Director of Financial Capability, Money Advice Service

Millions of people in the UK struggle to manage their money.

Nearly 17 million people – around 40% of the UK working-age population – have less than £100 in savings, making them highly vulnerable to the impact of a financial shock such as redundancy, long-term illness or even just a large unexpected bill.

Nearly a quarter routinely revolve a credit card balance, or use high-cost short-term credit to manage their day-to-day expenses.

And the latest figures suggest there are more than 8 million people who frequently have difficulty meeting their bills and credit commitments, or feel their debts are a heavy burden.

We need to do something about this.

It's clearly important, too, to tackle low levels of numeracy. Someone who struggles with numbers generally will also find other everyday tasks more difficult. This is a problem not just for the individuals concerned but for society as a whole.

The link between numeracy and financial capability is, on the face of it, an obvious one – and this research provides further confirmation that it is a strong one.

By examining this link in greater detail, we wanted to explore the potential for interventions that could help solve both these problems at the same time. Can we come up with ideas that help people develop their numeracy, while also enhancing their ability to manage their money? Or, by intervening directly to support them with money management, could we in the process help them develop their wider numeracy skills?

The issue is complicated by confusion over terminology: the term 'numeracy' is often used to refer to ability at maths. But while working hard at maths when you're at school certainly helps, it does not translate automatically to the practical numeracy people need in adult life, including the skills needed to manage your money effectively day to day, and plan for the future.

And it isn't just about skills. Mindset plays an important role – and in particular, whether people have confidence in their abilities. But this can cut both ways. Some people are at risk of making poor decisions because they doubt themselves, even though they have the skills they need. Equally, though, others will make questionable choices as a result of thinking they know more than they really do.

This report begins to clear away some of the confusion, and to paint a much more detailed picture of the interaction between people's numerical skills and their ability to manage their money in practice.

It suggests that alongside wider efforts to tackle low levels of numeracy, there needs to be specific work focused on overcoming issues related to confidence, and support based around real life scenarios.

The Money Advice Service will seek to take this work forward with partners and test different approaches to engaging people with numeracy issues.



David Haigh



## Foreword from Mike Ellicock, CEO National Numeracy

Many of the findings from this very thorough report seem common-sense and unremarkable. For example, if you struggle with a question such as

'You are paid £9 per hour and get a 5% pay increase. What is your new rate of pay?'

then you are unlikely to be financially capable.

However, what is remarkable is that the seemingly obvious fact of a strong link between good number sense and good money sense has not yet fed into financial capability and debt advice interventions in a systematic way. In addition, even though the Financial Conduct Authority identified numeracy as the largest single consumer vulnerability in their 2015 Occasional paper 8, numeracy does not yet feature within financial services firms' support for vulnerable customers (or their risk modelling) either. We hope that this report provides the impetus to start doing so in all these areas.

The scale of the challenge is huge – somewhere between a quarter and half the adult population would struggle with the question above. But there is good news:

- Initially it takes just five minutes to identify whether someone has an underlying issue with numbers. They can then be steered towards the right support if they do need help.

- We have evidence that adults can improve their numeracy skills, attitudes and confidence – and thereby financial capability – relatively quickly and without engaging with the formal education and skills system. National Numeracy offers the route to achieve this; enabling everyone to get the Essentials of Numeracy at [nnchallenge.org.uk](http://nnchallenge.org.uk)

This report finds that "improving one's numeracy – as well as confidence – would result in improved financial capability, all else being equal (Page 42)." Given the increased household debt burden and the current economic uncertainty, it is now more vital than ever that we work together with financial services businesses and the financial and debt advice sectors to address this underlying challenge – and through improving numeracy raise levels of financial competence in the UK.



Mike Ellicock



## Acknowledgements

The Money Advice Service would like to acknowledge and thank all the organisations and individuals that have contributed to the development of this report. Particular thanks go to Harris Interactive, Critical Research and Breaking Blue who worked on the quantitative and literature review elements of the work, Blake Woodham who conducted stakeholder interviews and Judith Staig who helped with the report drafting. We would also like to thank members of our own Insight and Evaluation and Policy teams who have worked on this report, in particular, Nick Watkins, Helen Pitman, Chris Phillips and Michael Royce.

Finally, we'd like to thank our survey respondents, and those stakeholders, including National Numeracy, who have been involved in the project throughout, taking part in interviews and sharing their knowledge of this subject with us.

# Executive summary

**It is well established that people who have more confidence and competence using numbers tend to be the same people who are better at managing their money and making financial decisions. But how this works – whether or not improving numeracy can lead to improved financial capability - is less well understood.**

**This report aims to explain the relationship between numeracy and financial capability, and to discuss the implications for stakeholders such as government, educators, employers, financial services providers and the third sector.**

## Numeracy



Having the confidence and competence to use numbers and data in everyday life to make good decisions, including financial ones



## Financial capability



A person's ability to manage money well, both day to day and through significant life events, and to handle periods of financial difficulty.

It is driven by personal skills, knowledge, attitudes and motivations, and made possible by an inclusive financial system and supportive social environment.

The report shows that numeracy is positively correlated with financial capability: throughout the research, respondents with higher numeracy were more likely to demonstrate financially capable behaviours than those with lower numeracy. Critically, these findings hold true even when we control for income, housing tenure and other demographics.

The strongest associations were with saving behaviour (amount and frequency). In particular, the research shows a strong positive correlation between numeracy level and savings amount (independent of other factors, such as income), and as one might expect, higher levels of numeracy are also linked to being able to better manage finances day-to-day.

One interesting facet of the research shows that to be financially capable it is more important to be able to perform every-day money calculations and financial concept calculations than to be able to read and interpret financial documents.

The report also shows that numeracy skills alone are not sufficient for financial capability. As per the definition of numeracy above that includes both competence and confidence, the report shows that confidence and positive attitudes have a bigger impact than numeracy skills alone on some elements of financial capability.

Delving into the relationship between confidence and skills, the report shows that people who are categorised as "Over-confident" (low numeracy, high confidence) typically have better financial outcomes than those who are "Overwhelmed" (low numeracy, low confidence), such as having more savings and being more likely to use financial information.

That said, there are some areas where being Over-confident is linked with poorer outcomes: Over-confident people are more likely to part-pay credit card balances, with one in five paying only the minimum each month, putting themselves at risk of building up unmanageable debts.

People aged 25-34 and those in the Money Advice Service Squeezed segment are most likely to be Over-confident – both groups are hard to engage with financial services and with interventions.

In addition, the results of the survey have highlighted:

(a) We can't assume that people with a formal maths qualification have high levels of numeracy: we found that 25% of people with Poor numeracy have maths GCSE or equivalent at grade C or above. We need to use a more appropriate measure of numeracy.

(b) Numeracy skills are generally better in the older age groups. However, men aged 18-24 have higher numeracy levels than those aged 25-34 which suggests that the younger group may be better at remembering the maths they learnt at school.

The implications of this research for different stakeholder groups are set out in Adult numeracy and financial capability<sup>1</sup> document published alongside this report.

<sup>1</sup> Money Advice Service Adult numeracy and financial capability.



# Introduction

**We all encounter numbers every day. We check our change, compare prices, look up train times and work out how to split bills. Some people - those who are highly numerate - do this easily and without deliberation. However, across the UK, around four in five adults have a low level of numeracy<sup>2</sup>. This analysis explores the links between numeracy and people's ability to manage money day-to-day, to plan for and respond to life events and to deal with financial difficulties.**

As the statutory body for financial capability the Money Advice Service has led work with financial services firms, the third sector, government and regulators to develop the Financial Capability Strategy for the UK. This 10-year strategy aims to improve financial capability, giving people the ability, motivation and opportunity to make the most of their money

Intuitively, we might expect there to be a relationship between numeracy and financial capability; people who have more confidence and competence in using numbers and data tend to be better at managing their money and at making financial decisions that are right for them. There is plenty of evidence that this relationship exists, but the details of how it works are less well understood<sup>3</sup>. It is not easy to establish whether financial capability results directly from numeracy, as there are so many other factors that can influence decision making. This report aims to explain the relationship between numeracy and financial capability.

The report is based on statistical analysis of data from a survey of more than 2,000 working-age adults in the UK, the Adult Numeracy and Financial Capability Survey 2017<sup>4</sup>. The interviews were carried out both online and face-to-face in March and April 2017. The study brings together a number of measures of numeracy and of financial capability, so that the relationship discussed above can be studied.

The analysis is supported by:

- interviews<sup>5</sup> and a roundtable<sup>6</sup> held with stakeholders and numeracy experts from a range of organisations (see appendix for further details);
- evidence from a comprehensive review and analysis of the available academic and commercial literature<sup>7</sup>, which was carried out to inform the development of the new questionnaire and
- a 'deep dive' secondary analysis of other existing data sources<sup>8</sup>.

The report comprises three sections:

1. Numeracy matters: This section looks at definitions of numeracy, explains how we measured numeracy in the research, and shows the results of the statistical modelling that we used to look at the relationship between numeracy and financial capability.
2. Mindset matters too: This section looks at how attitudes, especially confidence, affect the relationship between numeracy and financial capability.
3. Where is support most needed? This section looks at the groups of people who would benefit most from support to improve their numeracy and financial capability.

<sup>2</sup> <https://www.nationalnumeracy.org.uk/what-issue>.

<sup>3</sup> Money Advice Service Numeracy Literature Review.

<sup>4</sup> Adult Numeracy and Financial Capability Survey 2017.

<sup>5</sup> Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

<sup>6</sup> Stakeholder Research: Numeracy Roundtable.

<sup>7</sup> Numeracy Literature Review.

<sup>8</sup> Numeracy Deep Dive.

# 1.0 Numeracy matters

We know that numeracy is linked to financial capability. Two of the key pieces of research that provide evidence for the relationship are the 'Measuring financial capability – identifying the building blocks' analysis from the Money Advice Service<sup>9</sup>, and our analysis of the 1970 British Cohort Study (BCS70)<sup>10</sup>.

The Money Advice Service Building Blocks analysis looked at which aspects of financial capability are most important in improving financial wellbeing. The research shows that financial numeracy is an enabler of financial capability. It is particularly relevant to people's ability to build longer-term financial security, and there is a relationship with confidence which suggests that it is confidence in applying numeracy skills that is especially important.

Our analysis of the 1970 British Cohort Study shows that cognitive skills (maths and literacy) at the age of 10 are particularly important (statistically significant)<sup>11</sup> drivers of the relationship between childhood skills and adult financial outcomes (specifically saving, pension saving and financial self-assessment). This shows that maths skills in childhood do have an impact on financial capability in later life – however, the analysis does not show whether numeracy has more or less of an impact than literacy.

Whilst these reports show that there is a relationship, how the relationship works – whether a higher level of numeracy causes better financial capability – is yet to be understood, and is the topic of this report.



## A note on the Money Advice Service 'Building Blocks' research

This research is based on statistical analysis of the 2015 Adult Financial Capability Survey for the UK, and identifies the key factors or 'building blocks' which can improve people's ability to manage their money and build longer-term financial security.

The analysis shows that, whilst income is an important influence on financial resilience, improved financial capability has a substantial role to play to help people make the most of what they have.

The behaviours that help improve people's financial wellbeing are: effective use of credit, active saving, keeping track of money, building resilience and working towards goals. To influence these behaviours, the analysis finds that improving financial confidence, financial engagement and the application of financial numeracy are critical.

<sup>9</sup> Measuring financial capability – identifying the building blocks, Money Advice Service 2016.

<sup>10</sup> [https://masassets.blob.core.windows.net/cms/files/000/000/856/original/The\\_journey\\_from\\_childhood\\_skills\\_to\\_adult\\_financial\\_capability\\_%E2%80%93\\_analysis\\_of\\_BCS70.pdf](https://masassets.blob.core.windows.net/cms/files/000/000/856/original/The_journey_from_childhood_skills_to_adult_financial_capability_%E2%80%93_analysis_of_BCS70.pdf)

<sup>11</sup> In statistical terms, a significant difference between two research results is a difference that is large enough that it is highly likely it did not arise by chance.

# 1.1 What is numeracy?

Part of the difficulty in understanding the relationship between numeracy and financial capability lies in the difficulty of defining what we mean by numeracy. Mathematical skills and knowledge do not exist in isolation from other elements such as attitudes and motivations, lifestyle influences and demographic factors. There are also links with other skills such as literacy. This makes it hard to set out a specific, defined level of numeracy required to make financially capable decisions; it is likely that numeracy is a necessary but not sufficient pre-condition for financial capability, but that this varies depending on life stages and life events<sup>12</sup>.

Numeracy is not the same as having a formal maths qualification. In the 2011 Skills for Life survey only 24% of 16-24-year-olds demonstrated numeracy skills at the level deemed equivalent to a GCSE A\*-C pass in maths – despite two-thirds of teenagers actually passing maths GCSE at A\*-C<sup>13</sup>.

Compounding the problem, the literature around numeracy does not always use consistent terminology. For example, numeracy is typically taken to mean the extent to which someone can undertake mathematical calculations, outside of a financial context. However the term 'financial literacy' is sometimes used interchangeably with 'numeracy', whereas other sources use it to mean the ability to perform basic financial calculations and understand concepts such as compound interest, inflation and the time value of money.<sup>15</sup> Throughout this report, when citing other published research, we have quoted the author's chosen terminology, and have used inverted commas to signal that the term is taken directly from the research.



"I think you can only describe the benchmark for numeracy through real life experiences. Numeracy isn't simply a skills-based numeracy, it's also a critical thinking numeracy, it's also a numeracy that actually gives people confidence"

"There may be circumstances that affect someone personally which might mean that they were financially capable before because they had the right skills and confidence to manage their circumstances then, but when something changes, maybe they do not have what they need now to manage<sup>14</sup>"

In collaboration with National Numeracy, we have developed definitions of numeracy and financial capability, which we use consistently throughout our publications. The definitions are based on the 'Deep dive' analysis of existing research,<sup>16</sup> and are as follows:

## Numeracy

Having the confidence and competence to use numbers and data in everyday life to make good decisions, including financial ones.

## Financial Capability

A person's ability to manage money well, both day to day and through significant life events, and to handle periods of financial difficulty. It is driven by personal skills, knowledge, attitudes and motivations, and made possible by an inclusive financial system and supportive social environment.

<sup>12</sup> Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

<sup>13</sup> [www.nationalnumeracy.org.uk/sites/default/files/media/manifesto\\_for\\_a\\_numerate\\_uk.pdf](http://www.nationalnumeracy.org.uk/sites/default/files/media/manifesto_for_a_numerate_uk.pdf)

<sup>14</sup> Stakeholder Research: Numeracy and Financial Capability.

<sup>15</sup> Numeracy Literature Review.

<sup>16</sup> Money Advice Service Numeracy Deep Dive

# 1.2 How did we measure numeracy?

In the new Adult Numeracy and Financial Capability Survey research that forms the basis of this report, we have assigned each respondent to a level of numeracy according to their score out of ten for a set of maths questions of varying difficulty – see Figure 1 and Figure 2 for details. The questions included everyday money calculations, reading financial documents

and calculations that required knowledge of (relatively simple) financial concepts such as interest and inflation<sup>17</sup>. As such, the questions can be considered to cover our definition of numeracy and include the financially focused definition of financial literacy found in some literature.

**Figure 1: Numeracy questions in the Money Advice Service Adult Numeracy and Financial Capability Survey**

### Everyday money calculations

Susie is paid £9.00 an hour. She works four and a half hours each day.

How much does Susie earn each day?

Susie gets a 5% pay increase. What is her new pay per hour?

Susie buys a laptop costing €144 from a company in Germany, at an exchange rate of £1 = €1.20. What is the cost in pounds?

A mobile phone in Shop A is £140 and is currently reduced by 20%, whereas the same phone is £160 online, with a 30% reduction and no delivery cost. Which one is cheaper?

### Reading financial documents

Please look at this example bank statement:

How much money was in the account at the end of February?\*

Now please look at this payslip:

How much has Sally paid towards her retirement so far this year?\*\*\*

How much was Sally paid this month before any tax or deductions were taken?\*\*\*

### Financial concept calculations

Suppose you put £100 into a savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money.

How much would be in the account at the end of the first year, once the interest payment is made?\*

And how much would be in the account at the end of five years (remembering there are no fees or tax deductions). Would it be...?

If the inflation rate is 5% and the interest rate you get on your savings is 3%, will your savings have more, less or the same amount of buying power in a year's time?\*

**Figure 2: Documents for the 'Reading financial documents' numeracy question**

### Example bank statement

DATE	DETAILS	PAID OUT	PAID IN	BALANCE
01-Feb-05	BALANCE BROUGHT FORWARD			25.00
01-Feb-05	BACS TRANSFER-SALARY		1000.00	
01-Feb-05	DD ELECTRICITY BOARD	30.00		995.00
02-Feb-05	DD CAR INSURANCE	50.00		
02-Feb-05	ATM XXX BANK FOREST GLADE HIGH STREET	150.00		795.00
04-Feb-05	CHQ 100009	35.00		760.00
06-Feb-05	DD XXX MOBILE PHONE COMPANY	30.00		730.00
10-Feb-05	DD XXX MORTGAGE BANK	200.00		530.00
12-Feb-05	ATM XXX BANK FOREST GLADE HIGH STREET	120.00		410.00
15-Feb-05	SO NEW BUILDING SOCIETY	50.00		360.00
20-Feb-05	CHQ 100010	300.00		60.00
28-Feb-05	CR NET INTEREST		1.00	61.00
28-Feb-05	BALANCE CARRIED FORWARD			61.00

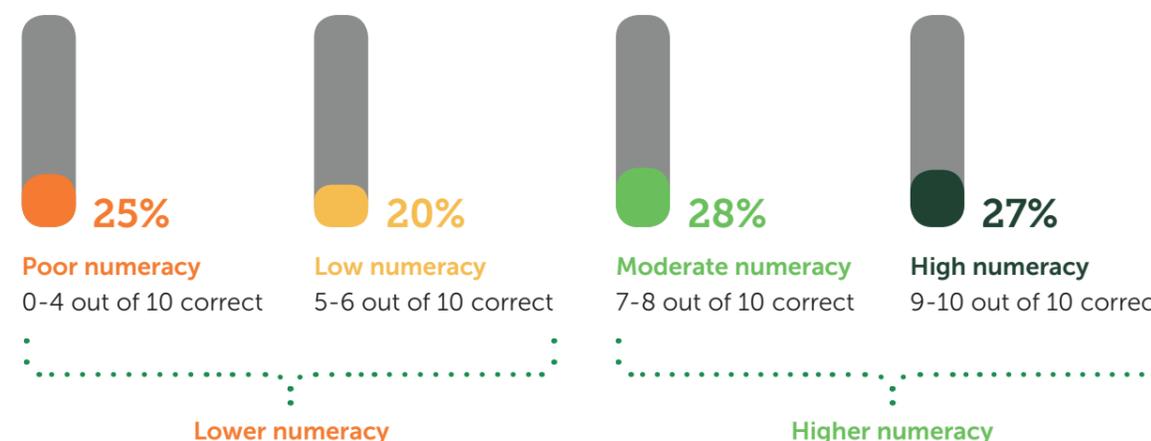
Throughout this report, we will use the terms Poor, Low, Moderate and High to refer to scores out of ten as shown in Figure 3. We shall also use the terms Higher and Lower numeracy to group together the High

### Example payslip

Employee No.	Employee Name	Process Date	National Insurance Number				
3	Sally James	28-10-15	SP739355C				
Payments		Units	Rate	Amount	Deductions		Amount
Salary	1.00	2000.00		2000.00	PAYE Tax		382.60
Bonus	1.00	500.00		500.00	National Insurance		246.52
Overtime	20.00	10.00		200.00	Pension		100.00
					Other		20.00
Sally James 788 Marlton Road Kings Heath Birmingham B14 3TL				This period		Year to date	
				Pay	2700.00	Pay	27000.00
				PAYE Tax	382.60	PAYE Tax	3826.00
				Nat Insurance	246.52	Nat Insurance	2465.20
				Pension	100.00	Pension	1000.00
				Other	20.00	Other	200.00
<b>Taylor and Butler Limited</b>				<b>Net Pay</b>		<b>1950.88</b>	
Tax Code: 94L				Payment Method: BACS		Dept: No Department	

and Moderate scorers and the Low and Poor scorers, respectively. Overall, the research shows that 27 percent of UK adults of working age have what we have defined as a High level of numeracy<sup>18</sup>.

**Figure 3: Levels of numeracy amongst UK working-age adults, in the Adult Numeracy and Financial Capability Survey 2017 and definitions used in this report.**



\*Question previously used in Adult Financial Capability Survey  
 \*\*Question previously used in Children and Young People Financial Capability Survey

17 Full details are given in Adult Numeracy and Financial Capability Survey 2017

18 This is not dissimilar to the National Numeracy estimate given above. Note that the Money Advice Service survey was of working-age adults only.



## 1.3 Does numeracy really drive financial capability?

Is the relationship between numeracy and financial capability really caused by numeracy or are there other factors at work? We know that demographic factors play a part in levels of financial wellbeing and therefore financial capability. For example, Money Advice Service Building Blocks research shows that people who are unemployed, live in rented accommodation and in low income households have lower scores for current and longer term financial wellbeing<sup>19</sup>. There is a body of research that argues that it is hard to identify causality between financial literacy and financial behaviour<sup>20</sup>. One paper suggests that the causality of the relationship is in doubt – it may be simply that ‘knowledge’ increases as wealth increases, or that other factors such as family experiences or economic background may affect both knowledge and behaviour<sup>21</sup>.

So before we look at the relationship between numeracy and the components of financial capability that we explored in the research, we need to ask the following question:

Are higher levels of financial capability really driven by higher numeracy or are they merely due to the demographic make-up, such as the age, income or educational attainment, of higher numeracy groups?

To answer this question, we conducted a numeracy modelling exercise, using regression analysis to control for the effects of other variables, and to understand whether financially capable behaviours were really driven by higher numeracy<sup>22</sup>.

We chose three variables as evidence for financially capable behaviour:

**Keeping up with bills:** How well are you keeping up with bills and credit commitments? This is an indicator of managing day-to-day.

**Savings frequency:** How often do you save money? This is a good predictor of managing day to day and also of building resilience for long term security.

**Savings amount:** Approximately how much, if anything, do you personally have in savings and investments? This measure is also a good predictor of long-term security.

In each case, our numeracy modelling analysis posed the following question:

*“Imagine that there are two people who have the same characteristics in everything but numeracy: the same age, gender, income, education level, housing tenure, attitudes and beliefs. Will the person with higher levels of numeracy also have a higher level of the financially capable behaviour that we are testing?”*

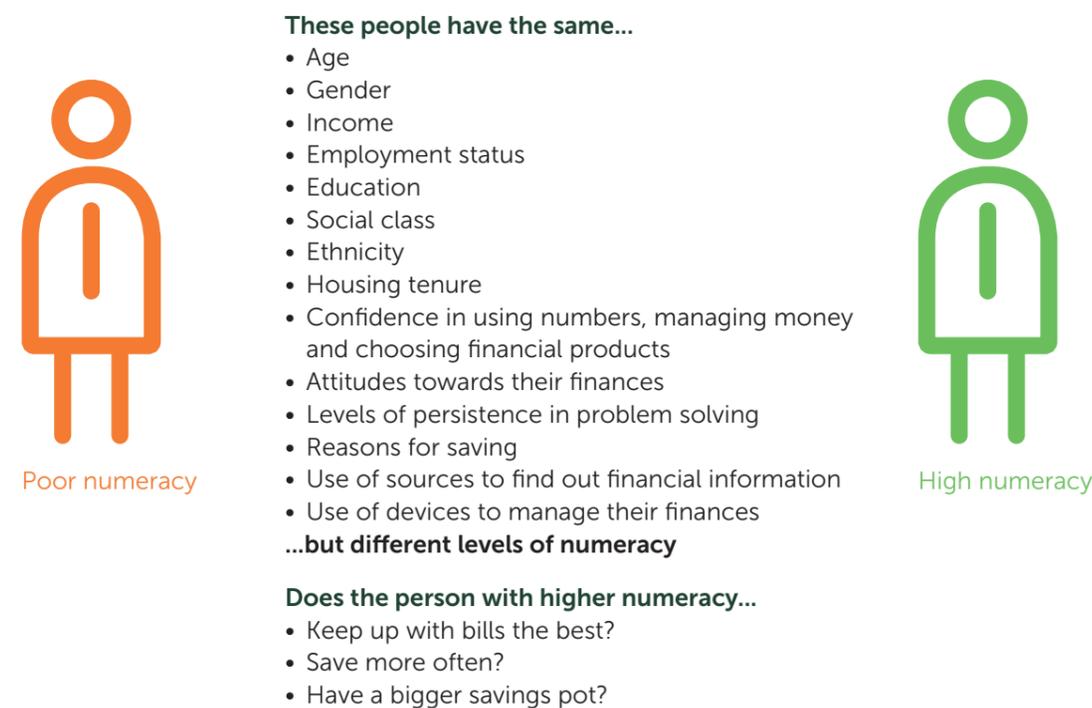
19 Measuring financial capability – identifying the building blocks, Money Advice Service 2016.

20 Cole and Fernando (2008) cited in Money Advice Service Numeracy Literature Review.

21 Hogarth and Hilgert (2003) cited in Money Advice Service Numeracy Literature Review.

22 See Adult Numeracy and Financial Capability Survey 2017 for further details of the analysis.

Figure 4: The numeracy modelling question



The results were as follows:

**Keeping up with bills:** Numeracy does drive keeping up with bills, even when we controlled for variables including age, gender, income, housing tenure, attitudes and sources of information or devices used to manage finances. People with higher numeracy are more likely to keep up with bills, and people with lower numeracy are less likely to do so.

When confidence was included in the model, the influence of numeracy was reduced<sup>23</sup>, which means that whilst numeracy is important in keeping up with bills, confidence plays an even bigger role. These findings are consistent with Money Advice Service Building Blocks and with other published research that shows that financial confidence is a better predictor than ‘financial knowledge’ when it comes to day-to-day money and debt management<sup>24</sup>. One possible explanation for this is that people feel more confident when they are numerate, in which case numeracy would also be having an indirect influence on keeping up with bills.

**Savings frequency:** Numeracy is a strong predictor of savings frequency, even when controlling for variables including age, gender, income and housing tenure. However, the effect of numeracy was less important than confidence AND attitudes. As above, a possible reason for this is that people are more confident and have more financially capable attitudes when they are numerate.

**Savings amount:** This was the strongest model. Numeracy is a strong predictor of how much savings and investments someone has amassed, regardless of their level of confidence or attitudes, or other characteristics such as age, gender, income and employment status.

23 The modelling used a composite measure of confidence in using numbers, managing money and choosing financial products. We discuss this in more detail in section 2.0.

24 Palameta, Nguyen, Shek-wai Hui, Gyarmati (2016) cited in Money Advice Service Numeracy Literature Review.



## 1.4 Which aspects of numeracy matter?

As discussed above, the overall numeracy score used throughout this report is derived from the number of correct answers to questions about three aspects of numeracy: everyday money calculations, reading financial documents, and calculations that involve understanding of financial concepts such as interest and inflation.

Figure 6 to Figure 8 show the relationship between these aspects of numeracy questions, and the key financial capability variables – that is, saving every month, having a bigger savings pot, or keeping up with bills with no difficulty.

Broadly speaking, the higher score for each aspect of numeracy, the better the financial capability result. However, the modelling work revealed that the aspects of numeracy do not all have the same impact on financial capability indicators.

Overall, the everyday money calculation questions and the financial concept calculations were stronger predictors of financial capability results than the

financial document questions. In particular, the financial concept questions had the greatest and most significant impact on both elements of savings behaviour, which suggests that numeracy for financial capability is more than simply the ability to work with numbers, and may include an understanding of financial concepts and/or an ability to apply numbers in real-life situations.

Additionally, the modelling showed that the everyday money calculations are a driver of amount in savings, when comparing those with the highest and lowest scores, when a range of variables are controlled for. This suggests that a basic level of numeracy is important for the savings amount element of financial capability. There is context for this in a published study that shows that understanding of compound interest, in particular, has an impact on financial planning – those who cannot do a given interest rate calculation are much less likely to plan for retirement. The author of this study argues that calculations about compound interest form part of most financial decisions<sup>25</sup>.

Overall, we can conclude that numeracy does drive financial capability, and especially level of savings and investments, but that confidence and attitudes also play a part, particularly in keeping up with bills and saving frequency.

Figure 5: The numeracy modelling question – answered

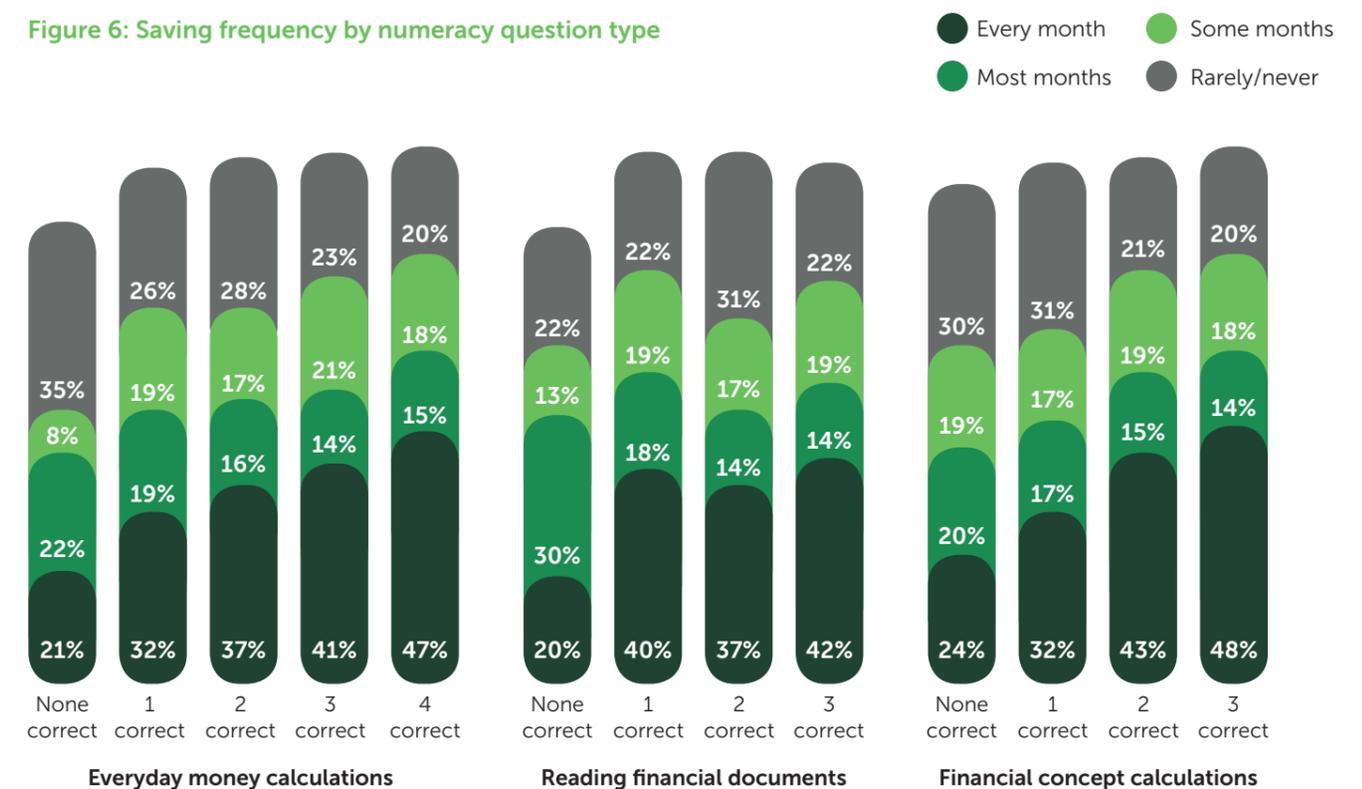
These people are the same in every other way, apart from level of numeracy.



### Does the person with high numeracy:

- Keep up with bills the best? **Yes** but confidence plays a bigger part than numeracy.
- Save more often? **Yes** but confidence and attitudes play a bigger part than numeracy.
- Have a bigger savings pot? **Yes** regardless of confidence, attitudes or other factors - **the strongest model.**

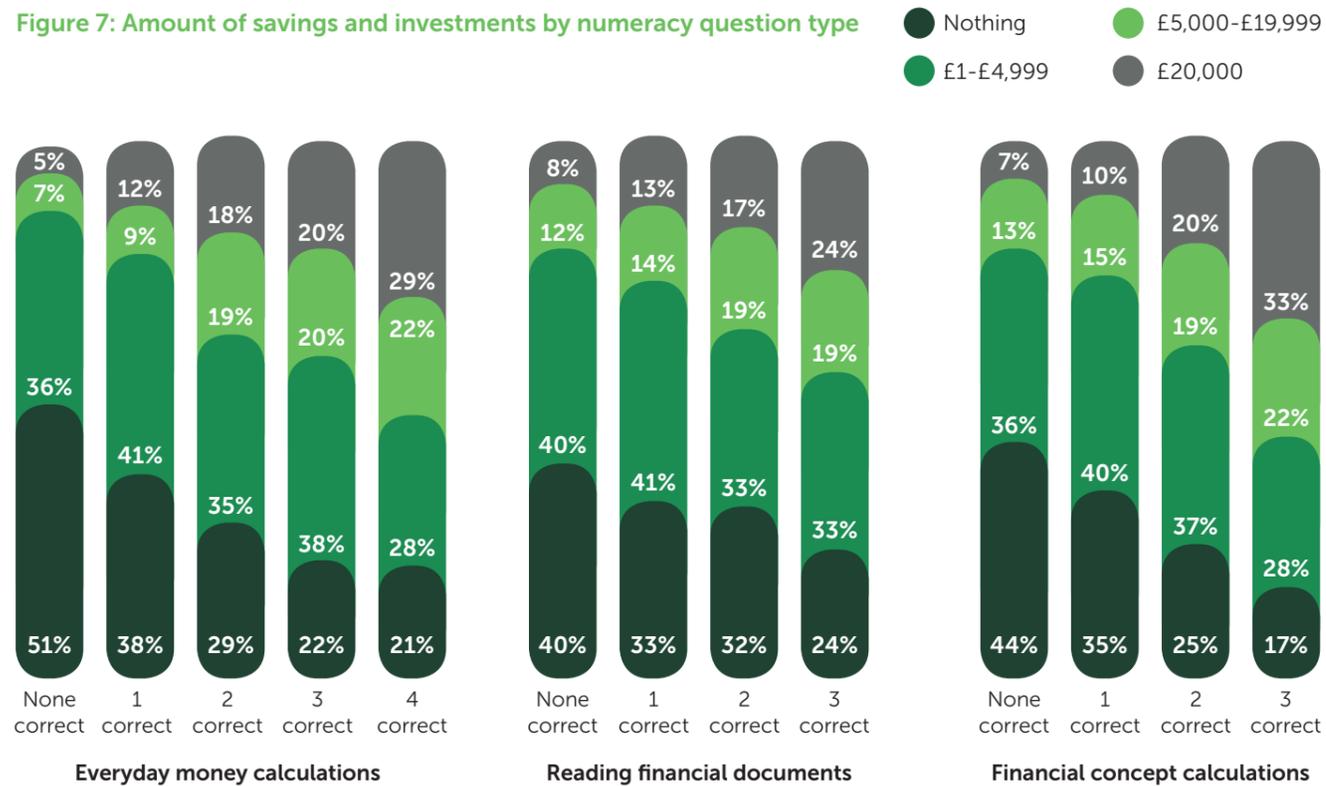
Figure 6: Saving frequency by numeracy question type



Source: MAS Adult Numeracy and Financial Capability Survey 2017. ME23. Which of these best describes how often you save money? Base: All UK respondents n=2086  
NB: DKs omitted so columns don't always add up to 100%

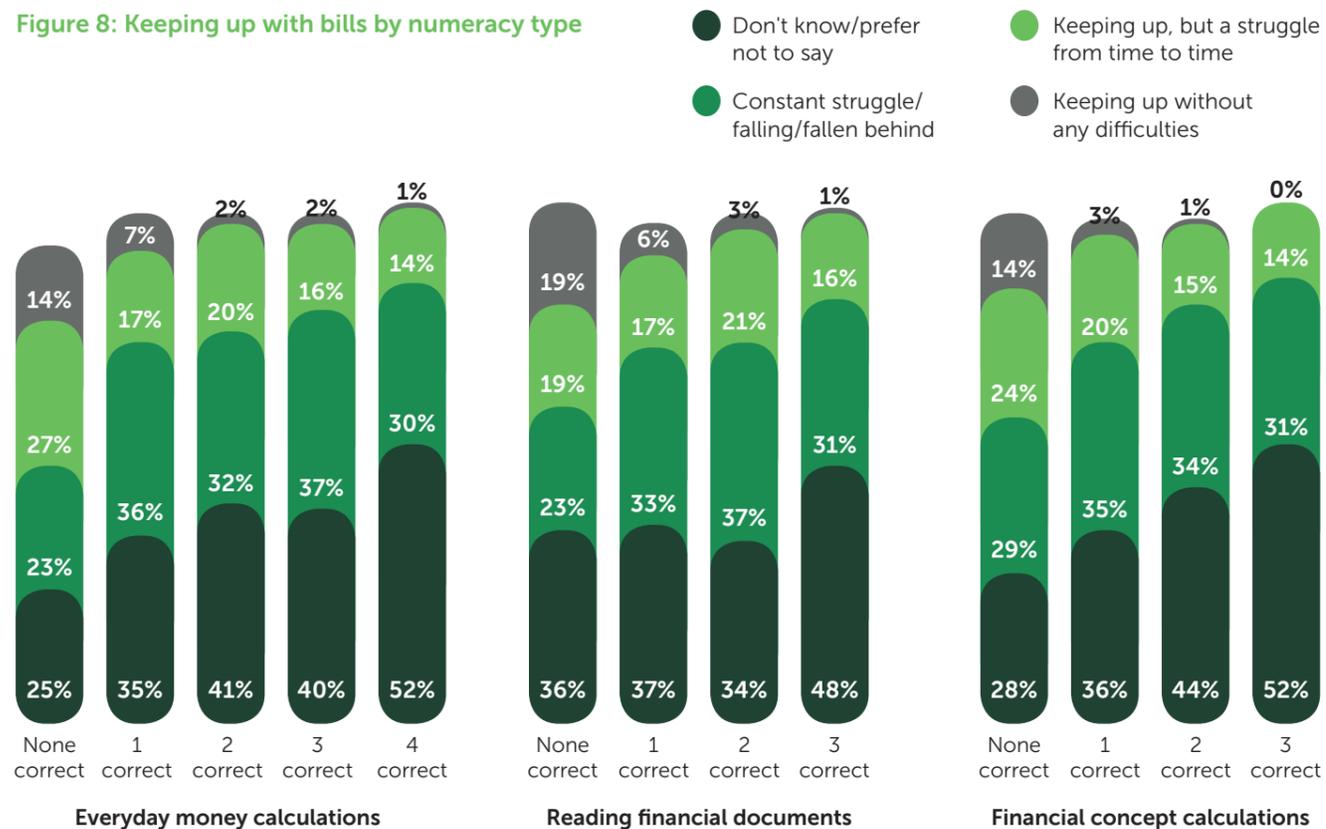
25 Lusardi (2011) cited in Money Advice Service Numeracy Literature Review.

Figure 7: Amount of savings and investments by numeracy question type



Source: MAS Adult Numeracy and Financial Capability Survey 2017. ME24/ME25 Imputed. Approximately how much, if anything, do you personally have in saving and investments? Base: All UK respondents n=2086

Figure 8: Keeping up with bills by numeracy type



Source: MAS Adult Numeracy and Financial Capability Survey 2017. MF29. Which one of the following statements best describes how well you are keeping up with your bills and credit commitments at the moment? Base: All UK respondents n=2086 NB: Don't have commitments is omitted so columns don't always add up to 100%

## 1.5 Summary

- It can be hard to pin down exactly what is meant by 'numeracy' as the literature around the topic can be confusing.
- We take numeracy to be broader than just the ability to use numbers, or the possession of a maths qualification.
- Numeracy is having the confidence and competence to use numbers and data in everyday life to make good decisions, including financial ones.
- Numeracy is linked to financial capability both indirectly and directly.
- The indirect link is through demographics such as income, education and housing tenure.
- More directly, our modelling work has shown that numeracy is a driver of a number of measures of financial capability, including 'keeping up with bills' and savings frequency. There is a particularly strong relationship with savings amount.
- However, numeracy alone is not sufficient for financial capability: confidence has a bigger impact than numeracy on 'keeping up with bills' and confidence AND attitudes have a bigger impact on saving frequency.
- This means that people who have a combination of numeracy, confidence and positive attitudes are the most likely to demonstrate financially capable behaviours.
- We measured three types of numeracy: everyday money calculations, reading financial documents, and financial concept calculations. Of these, our modelling work showed that reading financial documents has the least impact and financial concept calculations the most impact on financial capability.



## 2.0 Mindset matters too

Previous modelling work shows that mindset is a key enabler or inhibitor of financial capability<sup>26</sup>. Mindset includes financial confidence, attitudes towards money such as shopping around for deals or buying on impulse and persistence – the degree to which people can motivate themselves to keep going to solve difficult or intractable problems. Another key enabler or inhibitor is degree of financial engagement, which includes attitudes such as not just living for today, and belief in one's ability to manage money. This section considers the relationship between confidence, attitudes and beliefs and numeracy in influencing financial capability.

<sup>26</sup> Measuring financial capability – identifying the building blocks, Money Advice Service 2016

## 2.1 The role of confidence

“Lower numeracy is often linked to a fear of numbers – you don’t know how to add them up or subtract them or multiply them. Because, if you’re not confident with numbers, you’re not going to be confident with financial capability<sup>27</sup>”

Confidence has a very important role in financial capability. In the Money Advice Service Building Blocks work<sup>28</sup>, financial confidence was shown to be the most important component of current financial wellbeing. The ‘deep dive’ analysis of existing research found ‘promising (but not conclusive)’ evidence that lower numeracy skills are associated with lower confidence in managing money. There is also (limited) other published research that links confidence with numeracy. For example, one study shows that levels of confidence in saving money and resisting financial pressure are higher amongst people with higher ‘financial literacy’<sup>29</sup>.

We asked about three different types of confidence: confidence in using numbers every day, confidence

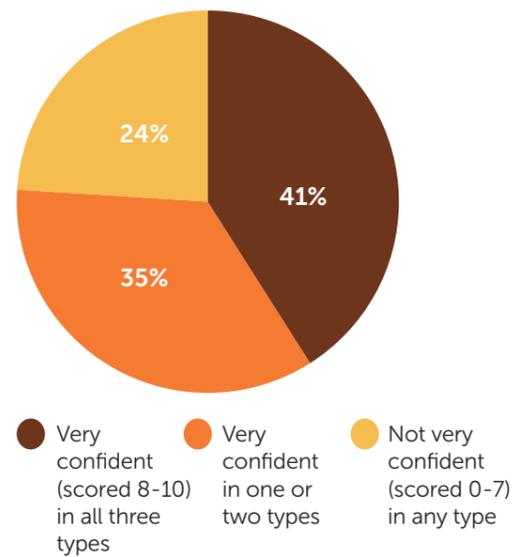
in managing money and confidence in making decisions about financial products and services (Figure 9). We wanted to understand how each of these types interacted and to compare measures that had previously been used in separate surveys<sup>30</sup>. Overall, fewest were ‘very’ confident in making decisions about financial products and services. Scores were generally high and only a small minority admit to a lack of confidence.

All three confidence types were highly correlated – that is, people typically gave similar scores for each of the types – around two thirds were either very confident in all types, or not very confident in any of the types. The overlap in types was driven by confidence in decisions about financial products or services: if you are confident about this, you are unlikely to say you are not very confident in either of the other types – this applied to only 2% of people. It appears that confidence in working with numbers and/or with managing money are a pre-requisite for confidence in making decisions about financial products.

Figure 9: Three measures of confidence



Overlap between confidence types

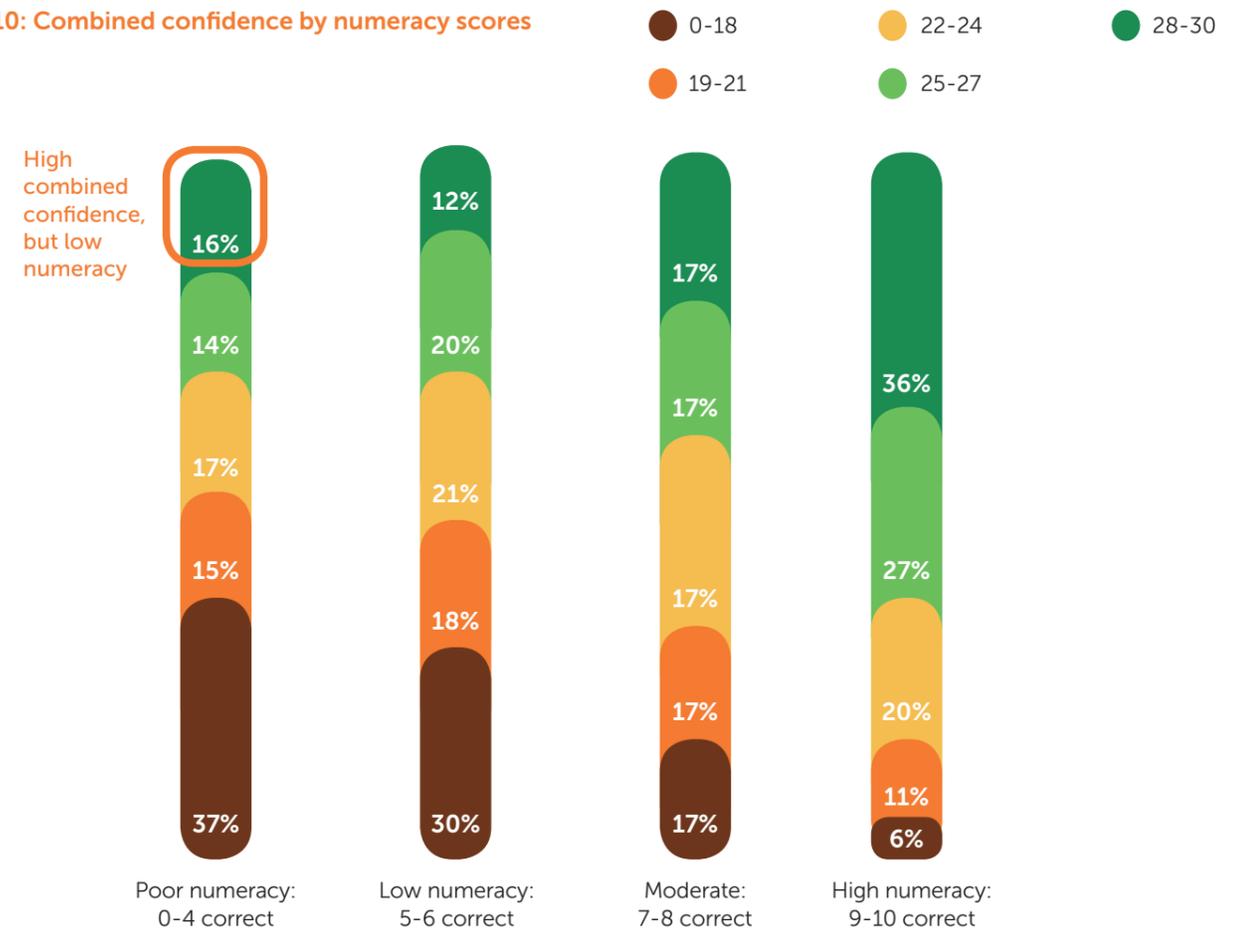


Source: MAS Adult Numeracy and Financial Capability Survey 2017. MA1/2/3. How confident do you feel working with numbers when you need to in everyday life/managing your money/making decisions about financial products and services? Very confident = 8-10, Medium = 4-7, Not confident = 0-3  
Base: All UK respondents n=2086

27 Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.  
28 Measuring financial capability – identifying the building blocks, Money Advice Service 2016  
29 Commonwealth Bank Foundation (2004) cited in Money Advice Service Numeracy Literature Review  
30 Confidence in using numbers every day was previously used in surveys by National Numeracy, and the other two confidence types were used in the Money Advice Service Adult Financial Capability Survey

Adding together each respondent’s score out of ten for each of the three questions gives a combined confidence score from 0-30 and this score was used for the numeracy modelling. Figure 10 shows that there is a relationship between overall confidence and numeracy: generally, more numerate people are more confident. However, not all highly numerate people are highly confident and vice versa – we wanted to understand the relationship in more detail.

Figure 10: Combined confidence by numeracy scores

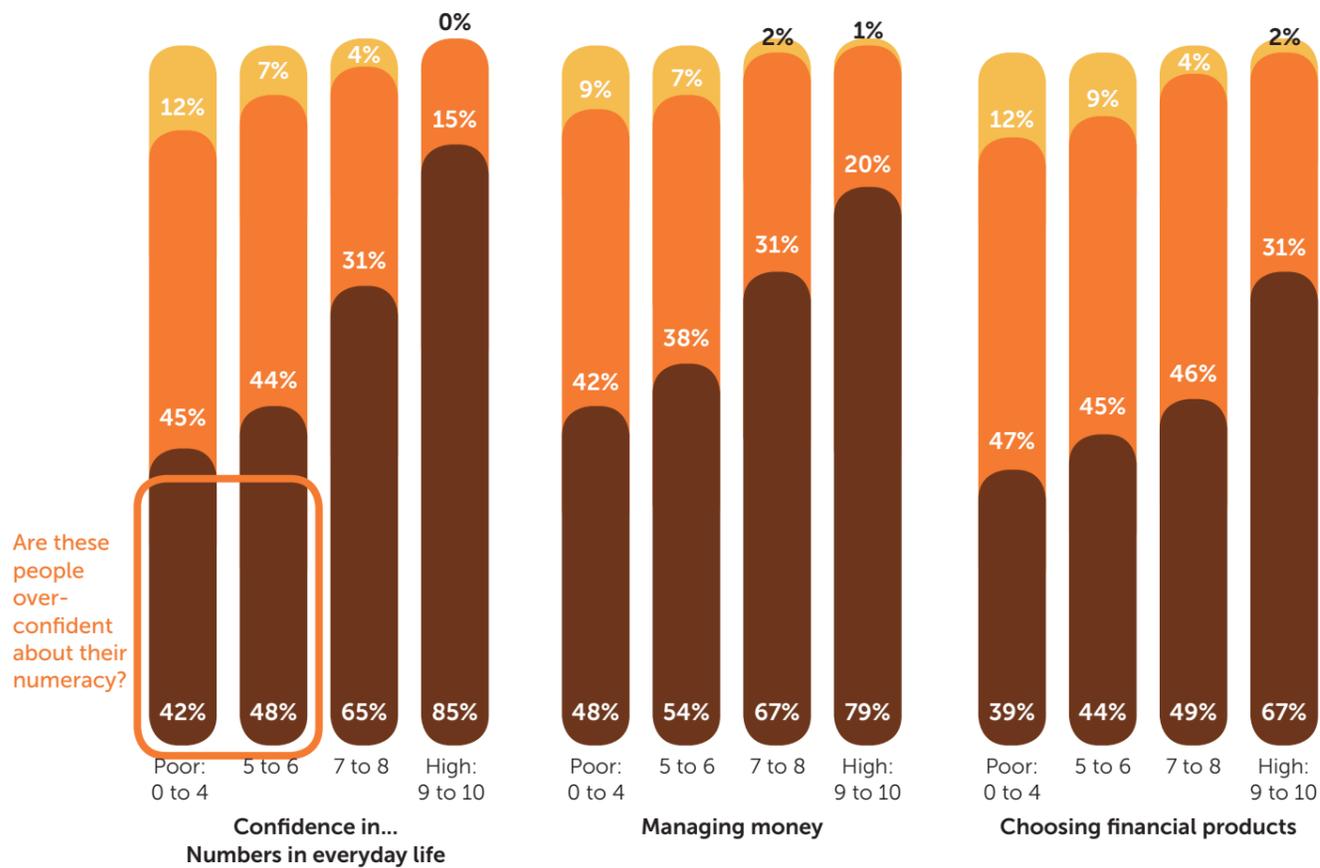


Source: MAS Adult Numeracy and Financial Capability Survey 2017. MA1/2/3. How confident do you feel working with numbers when you need to in everyday life/managing your money/making decisions about financial products and services? Base: All UK respondents n=2086

## 2.2 Can you be too confident?

In Figure 10 we can see that 16% of those who have the lowest numeracy scores also have the highest confidence scores. This unexpected combination is worthy of further investigation. Figure 11 shows that the pattern is similar across all types of confidence – there are a proportion of people who have lower numeracy scores who still rate themselves as having higher confidence levels. This suggests that there are some people who are over-confident about their level of basic numeracy.

**Figure 11: Three types of confidence by numeracy scores** ● Very confident ● Medium ● Not confident



Are these people over-confident about their numeracy?

Source: MAS Adult Numeracy and Financial Capability Survey 2017. MA1/2/3. How confident do you feel working with numbers when you need to in everyday life/managing your money/making decisions about financial products and services? Very confident = 8-10, Medium = 4-7, Not confident = 0-3. Base: All UK respondents n=2086

To investigate this further, we have created four numeracy/confidence quadrants as shown in Figure 12, and as follows:

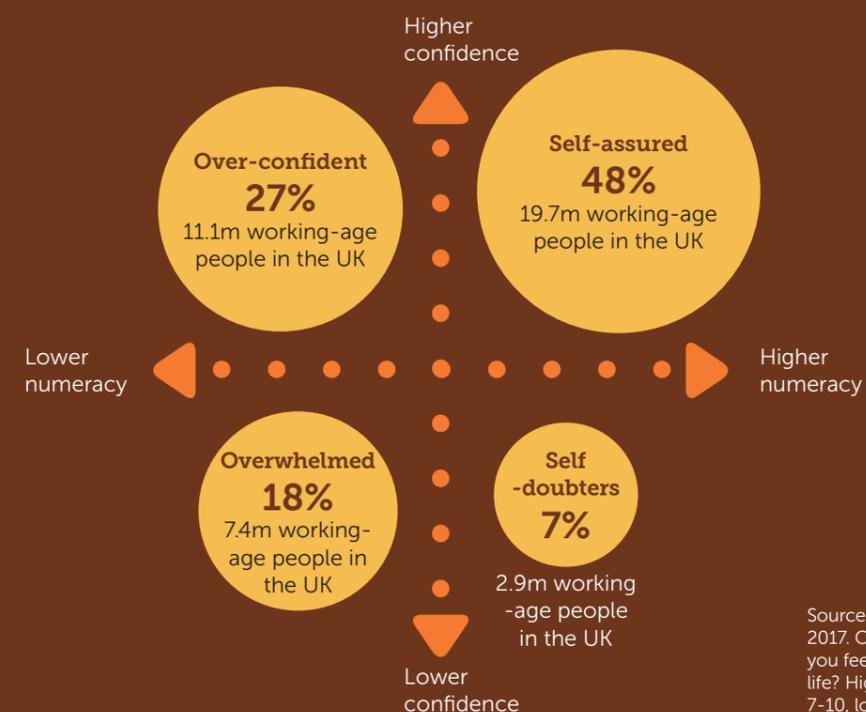
**Self-assured:** Higher confidence/higher numeracy. This quadrant comprises those scoring 7-10 for numeracy (Moderate and High numeracy) and 7-10 for confidence in using numbers. Nearly half of working-age adults in the UK (48%) fall into this category. They may still have some numeracy issues but they are doing the best of the four quadrants in terms of financial capability outcomes.

**Over-confident:** Higher confidence/lower numeracy. This quadrant comprises those scoring 0-6 for numeracy (Poor and Low numeracy) and 7-10 for confidence in using numbers. This represents more than a quarter of working-age adults in the UK. Whilst in general this group does better than those with similar numeracy but lower confidence, there are some areas where over-confidence may be putting them at risk of worse financial outcomes.

**Self-doubters:** Lower confidence/higher numeracy. This quadrant comprises those scoring 7-10 for numeracy (Moderate and High numeracy) and 0-6 for confidence in using numbers. This is the smallest quadrant – only representing 7% of working-age adults who, whilst they have the numeracy skills to have good financial outcomes, may need to have their confidence boosted, as they do not do as well as the Self-assured. The fact that this quadrant is the smallest confirms that UK working-age adults have more of a problem with numeracy than with confidence, and that people are more likely to over-estimate their skills than under-estimate.

**Overwhelmed:** Lower confidence/lower numeracy. This quadrant comprises those scoring 0-6 for numeracy (Poor and Low numeracy) and 0-6 for confidence in using numbers and represents around 1 in 5 of working-age adults in the UK. This is the group that struggles the most with financial capability, which, when compared with the Over-confident who also have lower levels of numeracy, confirms the positive effect that confidence can have.

**Figure 12: Confidence/numeracy quadrants**



Source: MAS Adult Numeracy and Financial Capability Survey 2017. Classification based on score at MA1 How confident do you feel working with numbers when you need to in everyday life? Higher = 7-10, lower = 0-6. Numeracy score higher = 7-10, lower = 0-6. Base: All UK respondents n=2086

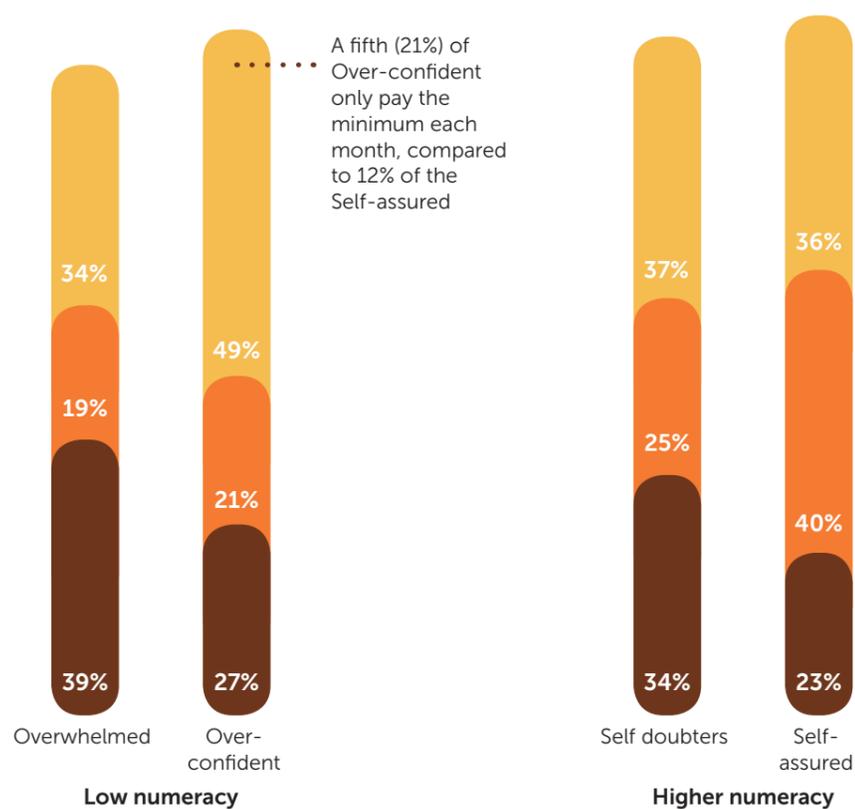
There is some evidence that over-confidence can have negative impacts. For example, one study demonstrates a mismatch between high levels of confidence in understanding financial issues and far lower levels of actual comprehension, which the authors conclude could result in failure to seek out professional advice, thus widening the knowledge gap<sup>31</sup>. In our research, over-confidence is linked with some risky financial

behaviours. The Money Advice Service Building Blocks research shows that managing credit is an important component of current financial wellbeing<sup>32</sup>. Figure 13 shows that over-confident people are most likely to part pay their credit and store card bills, with 21% only paying the minimum each month, putting themselves at risk of building up unmanageable debts.

**Figure 13: Credit use by confidence/numeracy quadrants**

● I don't have a store or credit card ● I always pay in full ● I pay in part

'Pay in part' includes those who generally pay the minimum (but pay more when they can), those who vary the amount they pay each month, and those who usually pay in full but sometimes let the balance roll over



Source: MAS Adult Numeracy and Financial Capability Survey 2017. ME27. How do you generally handle paying your bill each month for your credit card(s) or store card(s)? Base: All UK respondents n=2086

31 Lusardi and Mitchell (2007) cited in Money Advice Service Numeracy Literature Review  
 32 Measuring financial capability – identifying the building blocks, Money Advice Service 2016

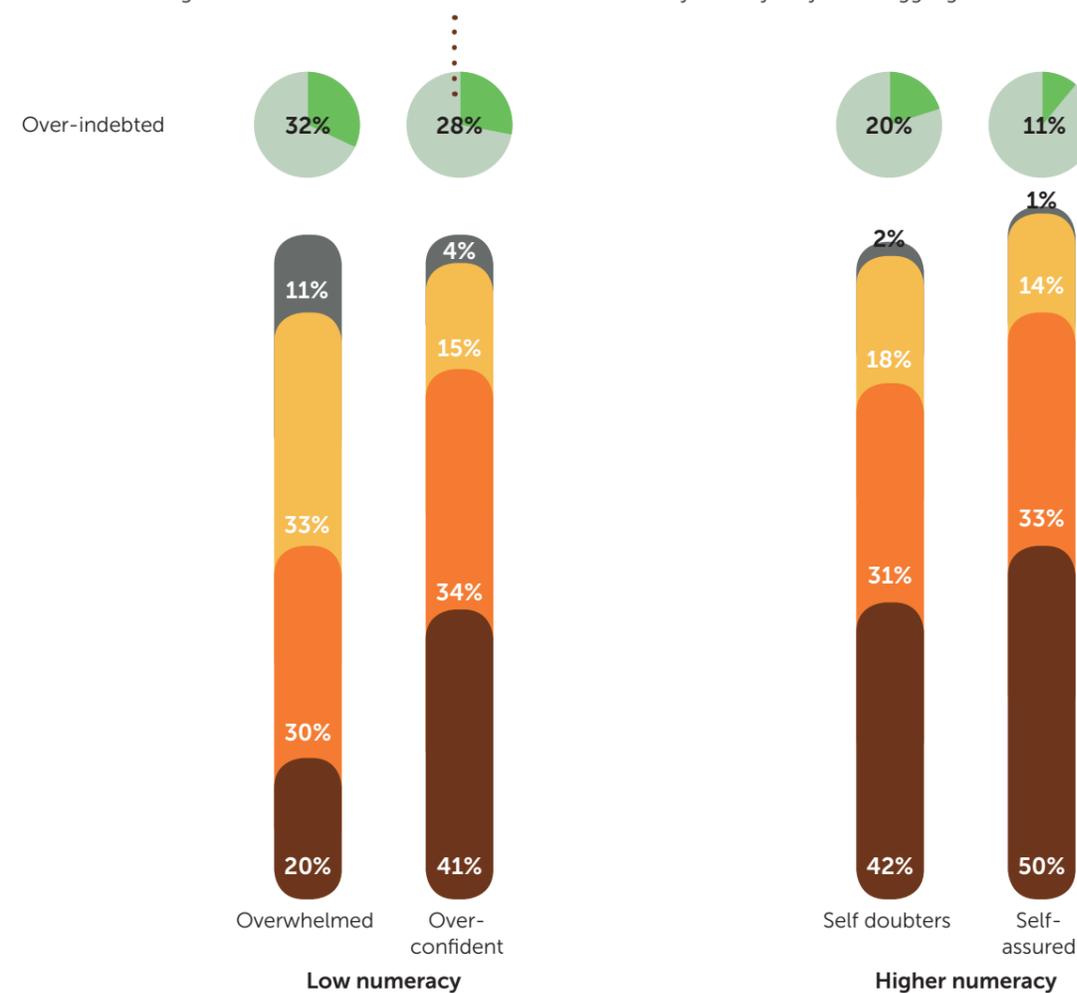
Over-confident people may also be unwilling to confront how they are managing their finances.

Figure 14 shows that in the other three quadrants, the proportion saying they are struggling is similar to the proportion who actually are over-indebted. However only 15% of the Over-confident quadrant say they are struggling, when nearly double that, 28%, are over-indebted.

**Figure 14: Keeping up with bills by confidence/numeracy quadrants**

● Keeping up without any difficulties ● Keeping up, but a struggle from time to time  
 ● Constant struggle/falling/fallen behind ● Don't know/prefer not to say

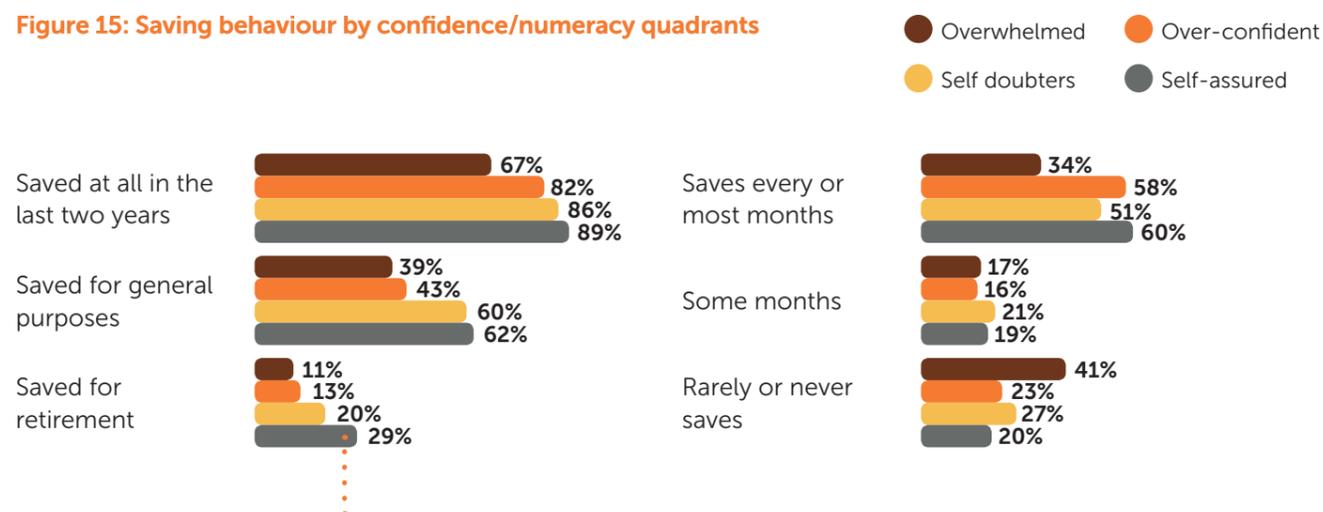
There is an overall correlation between those who are over-indebted and those saying constant struggle - however this is not borne out amongst the over-confident - 28% over-indebted but only 15% say they are struggling.



Source: MAS Adult Numeracy and Financial Capability Survey 2017. MF29. Which of the following statements best describes how well you are keeping up with your bills and credit commitments at the moment? Base: All UK respondents n=2086. Over-indebted = Finding bills and credit commitments a heavy burden at MF27 OR fallen behind on, or missed, any payments for credit commitments or domestic bills for any 3 or more months in the last 6 months at MF28.

On a more positive note, Figure 15 shows that Over-confident people are just as likely to save as Self-assured people. However they are significantly less likely to save for general purposes which, as discussed previously, is associated with financial resilience.

**Figure 15: Saving behaviour by confidence/numeracy quadrants**



There are no significant differences between the Over-confident and the Self-assured as to whether they save and how regularly, however the Over-confident are significantly less likely than the Self-assured to be saving for general purposes or for retirement.

Source: MAS Adult Numeracy and Financial Capability Survey 2017. ME21. People save money for different reasons. What are the main reasons why you have saved money in the last two years? ME23. Which of these best describes how often you save money? Base: All UK respondents n=2086

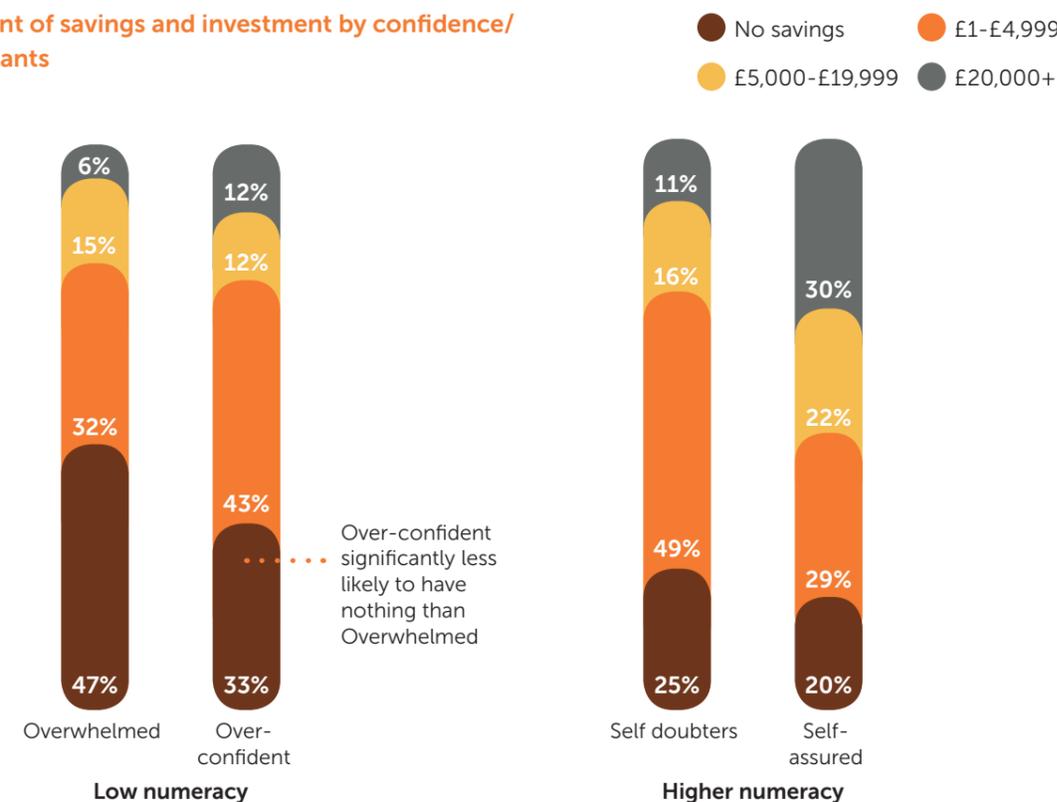
Having said that, Figure 16 shows that Over-confident people, are significantly more likely to have savings than the people in the Overwhelmed quadrant.

Figure 17 shows that Over-confident people are significantly more likely than Overwhelmed people to use at least one source of financial information, and also to use any online source. However, Figure 17 does also emphasise the disparity between higher and lower numeracy groups in terms of seeking out financial information and highlight the challenge of engaging with people with lower levels numeracy about their finances.

So, whilst there are risks in being Over-confident, this section shows that in some cases, such as savings behaviour and use of information, if you have lower numeracy you are likely to have better outcomes if your confidence is higher, rather than lower. This backs up the findings of the modelling work that showed that in some cases, confidence has more impact than numeracy on financial capability. This also supports the view of some of the numeracy stakeholders and experts we interviewed that it is possible to have low numeracy but still have some (limited) degree of financial capability if you have the right mindset and favourable circumstances, such as a modest savings buffer<sup>33</sup>. However the risks, such as making poor choices about credit, may still outweigh the benefits of the extra confidence.

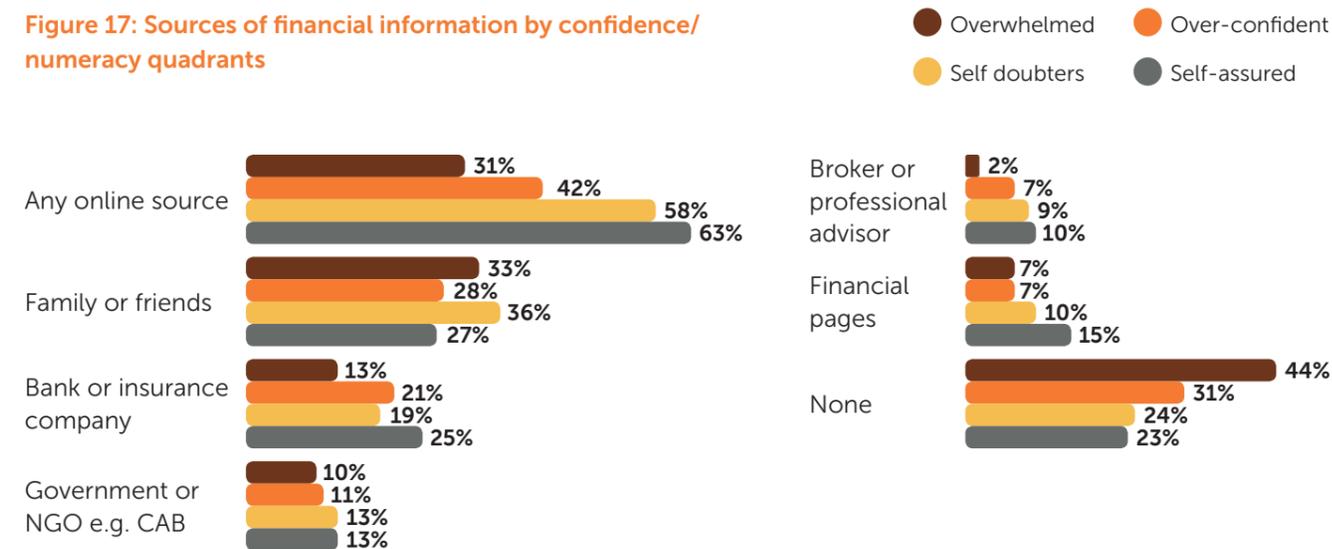
<sup>33</sup> Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

**Figure 16: Amount of savings and investment by confidence/numeracy quadrants**



Source: MAS Adult Numeracy and Financial Capability Survey, March 2017. ME24|IMPUT. Approximately how much, if anything, do you personally have in savings and investments? Base: All UK respondents (Imputed data) n=2086

**Figure 17: Sources of financial information by confidence/numeracy quadrants**



Source: MAS Adult Numeracy and Financial Capability Survey 2017. ME26. Which of the following sources of information have you used in the last year to find out about anything to do with money - whether that is how to budget or plan your finances, the best insurance, banking or credit products available, how to claim benefits or grants, or to get any help or advice, etc. Base: All UK respondents n=2086

## 2.3 The positive effect of positive attitudes and beliefs

The modelling work described in Section 1.3 showed that in some cases, attitudes as well as confidence affect financial outcomes. Overall, positive attitudes and beliefs about finances are linked to higher numeracy. The numeracy modelling work revealed that 'I prefer to live for today' and 'Nothing I do will make a difference' are the most significant attitudinal barriers to financial capability overall. This is in line with other research which indicates that less numerate people attach more importance to short term costs and benefits<sup>34</sup>. This also chimes with the views from the stakeholder research that numeracy may be a requirement for financial capability but that it cannot be used without the right attitudes.

"Without numeracy, you can't start... But numeracy itself doesn't lead to the habit of saving, or planning for the future"

"[We] need to convince people that if they take a grip on their finances then they can have a brighter future for themselves"

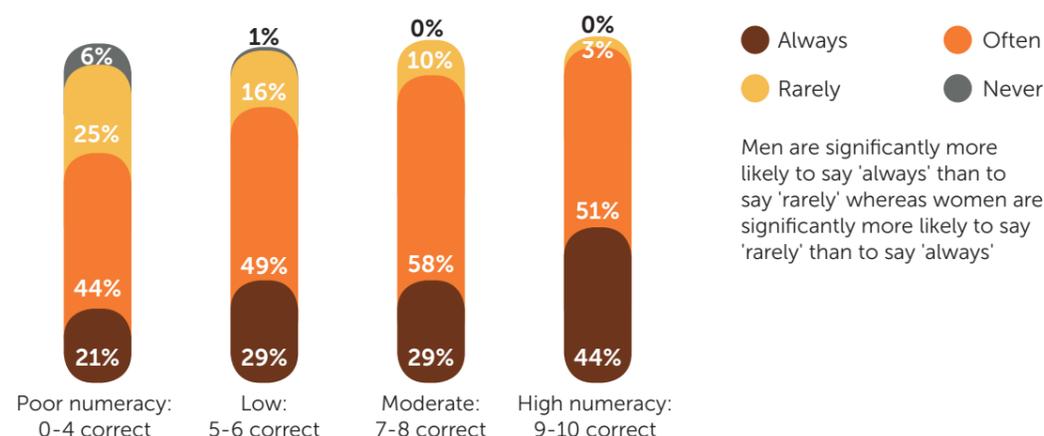
This raises the following question: did some of the Poor numeracy group score as they did due to lack of persistence rather than numeracy skills alone? There were a proportion who said 'don't know' to each question, rather than getting the wrong answer, as shown in the Appendix. In each case, people who said they were 'rarely' or 'never' able to think of ways to keep trying to solve a problem - were more likely to say 'don't know' to the numeracy questions than people who said they could 'always' or 'often' find ways to keep trying. However, people who said 'rarely' or 'never' were also more likely to get the answer wrong.

It seems that some people who have poor persistence either do not keep trying to answer this type of question, or just pick any answer without thinking it through. One of the stakeholders we interviewed talked about a necessary interplay of agency, confidence and self-regulation - the self-control to persist and the mental space to make decisions. This too highlights the importance of working not just to raise skills but also to address attitudes towards numeracy.

"I think just saying 'confidence' without thinking about the extent to which, particularly in terms of young people, we support their sense of self-efficacy, is a problem<sup>35</sup>"

We also asked about another element of mindset: persistence. We asked the question 'When you get stuck working something out, can you think of different ways to keep trying?' Figure 18 shows that there is a relationship between those who were 'always' or 'often' able to keep going and higher numeracy.

Figure 18: Persistence by numeracy scores



Source: MAS Adult Numeracy and Financial Capability Survey 2017. MA4. When you get stuck working something out, can you think of different ways to keep trying? Base: All UK respondents n=2086

34 Frederick (2005) cited in Money Advice Service Numeracy Literature Review

35 Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

## 2.4 Summary

- Numeracy is closely linked to three types of confidence: confidence in using numbers every day, confidence in managing money and confidence in making decisions about financial products and services.
- These types are highly correlated – if you are very confident in one type, you are likely to be very confident in the others – the converse is also true.
- Confidence in using numbers every day and confidence in managing money are pre-requisites for confidence in making decisions about financial products and services.
- Around a quarter of working-age adults – equivalent to around 11 million people in the UK are over-confident when it comes to numeracy – that is they have higher levels of confidence in using numbers but lower scores for the numeracy questions.
- This group of Over-confident people are linked with some poor financial outcomes – for example, they are the group most likely to part-pay for credit, which puts them at risk of incurring expensive repayments.
- However the Over-confident fare better in some ways than people with lower numeracy and lower confidence (18% or around 7 million people). For example, they are more likely to have savings and to access financial information.
- Attitudes and belief about finances are important too – those with High numeracy tend to have more positive financial attitudes and beliefs.
- In particular, persistence is associated with higher numeracy – those with low persistence are more likely to get numeracy questions wrong or to not even attempt them at all.



## 3.0 Where is support needed most?

### 3.1 Profiling High and Poor numeracy

It is important to understand which groups show particularly low levels of numeracy, so we can target improvement initiatives at those with most to gain. To understand how demographic factors relate to numeracy, it is helpful to profile the extremes, those in the survey with High and those with Poor numeracy. Figure 19 shows the characteristics that are significantly more likely to be found in each of these groups.

Figure 19: Profiles of UK working-age adults with Poor or High numeracy

	Poor numeracy (0 to 4 correct)	High numeracy (9 to 10 correct)
Gender	55% female	60% male
Age	Younger: 52% aged 18 to 34	Older: 76% aged 35 to 64
Region	London 21% in London	South: 27% in South of UK (excluding London)
Education	Less well educated: 15% have no formal qualifications, 52% have GCSE English, 25% have GCSE maths	Well educated: 42% have a degree, 83% have GCSE English, 70% have GCSE maths
Social grade	69% C2DE	63% ABC1
Employment	42% not working	71% employed
Life stage	44% single, 50% children in household	60% married or cohabiting, 74% no children in household
Management of household finances	16% managed entirely by spouse/partner	95% managed by self or jointly with spouse/partner
Income	Low: 69% in low income households	High: 17% in high income households
Tenure	Renters: 46% rent their home	Owners: 64% own their home
MAS segment	32% Struggling	51% Cushioned

#### A note on the Money Advice Service segmentation

The Money Advice Service segmentation groups UK consumers into discrete addressable segments, according to measure of financial resilience, which Money Advice Service defines in terms of five 'pillars' consisting of income, protection, savings, credit and demographics.

The segmentation comprises three macro-segments:

**Struggling:** 25% of the UK working-age adult population. Struggle to keep up with bills and payments and to build any form of savings buffer. Least financially resilient and most likely to be over-indebted.

**Squeezed:** 33% of the UK working-age adult population. Working-age consumers with significant financial commitments but relatively little provision for coping with income shocks. Digitally savvy, with high media consumption (although more for entertainment than financial information).

**Cushioned:** 37% of the UK working-age adult population. The most financially resilient group, with highest levels of savings and lowest proportion of over-indebted. Most highly engaged with their finances.

More information on the Money Advice Service segmentation is available on our website: [moneyadvice.org.uk/en/corporate/research](https://moneyadvice.org.uk/en/corporate/research).



Our research is in line with other research that shows that less 'financially knowledgeable' people tend to be single and have relatively lower levels of education and income<sup>36</sup>. The 'deep dive' analysis of existing data found solid evidence that lower numeracy is associated with lower levels of education, and evidence (albeit less solidly conclusive) that less educated people are associated with greater financial distress, and that women tend to have lower numeracy skills than men<sup>37</sup>. The stakeholder research also emphasised that even with good numeracy skills it may be harder to be financially capable if you have poor literacy, or English as a second language. They also noted that being on a low income exacerbates the effect of numeracy skills gaps as there is a need to manage money more tightly<sup>38</sup>. This, too, links with the findings of the British Cohort Study analysis that shows the importance of cognitive skills in children and the link with later adult financial capability<sup>39</sup>.

Poor numeracy alone does not cause lack of employment, low income and insecure housing tenure, but there is a link – and these factors are also associated with poor financial capability. It is worth noting that there were no significant differences in

numeracy between white and black and minority ethnic people as a whole in the survey but there may be differences to be found in ethnic groups at a more granular level.

It is also worth noting that a quarter of those with Poor numeracy actually have GCSE maths or equivalent at grade C or above. A number of explanations come to mind: that passing GCSE maths is not sufficient for the type of numeracy that will enable better financial outcomes; that it is possible to pass GCSE maths without being able to apply what you have learnt to practical problems; that maths skills are learnt at school but quickly forgotten. The stakeholders agreed that it was hard to set a benchmark for numeracy but felt that Level 2 – which is equivalent to an A\*–C grade at GCSE – was probably the minimum needed. There is an ongoing project known as 'Maths In Context' which aims to explore this issue further by looking at whether teaching teenagers 'real-world' maths – such as estimating the cost of a gas bill or calculating the interest on a savings account – can help improve not just their financial capability but also their Maths GCSE attainment<sup>40</sup>. The results of this programme, when available, will contribute to how to tackle this issue.

36 Lusardi and Mitchell (007) cited in Numeracy Literature Review.

37 Numeracy Deep Dive.

38 Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

39 [https://masassets.blob.core.windows.net/cms/files/000/000/856/original/The\\_journey\\_from\\_childhood\\_skills\\_to\\_adult\\_financial\\_capability\\_%E2%80%93\\_analysis\\_of\\_BCS70.pdf](https://masassets.blob.core.windows.net/cms/files/000/000/856/original/The_journey_from_childhood_skills_to_adult_financial_capability_%E2%80%93_analysis_of_BCS70.pdf)

40 [educationendowmentfoundation.org.uk/our-work/projects/maths-in-context/](http://educationendowmentfoundation.org.uk/our-work/projects/maths-in-context/)



**"If a person hasn't grasped the numeracy skills needed for a GCSE in maths, they are going to struggle"**

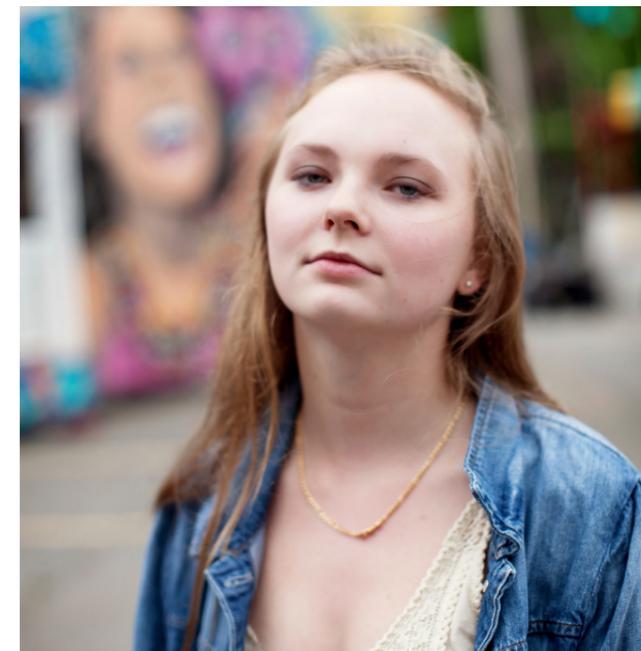
Even if you do hit those skill levels at 16, changes in experience of literacy or numeracy, or whether its changing requirements in the world, those skills aren't enough to keep you going, so you have to keep them topped up. Also, decreasing cognitive abilities, particularly after the age of 28 means that even if you had those skills when you were 16, you might not have them at 38"

Roughly two thirds of kids get A-C at GCSE but on the Skills for Life survey, the youngest cohort, the 16-24 year olds, less than a quarter of those who got A-C in their GCSE are still working at level 2 or the equivalent at every day maths questions. So there is something different going on and I think it comes down to simple maths in complex situations versus complex maths in simple situations. Mathematicians can do high-end maths but managing your finances is a different skill set and it emphasises that we need to build those skills through the education system<sup>41</sup>.

41 Stakeholder Research: Numeracy Roundtable.

42 Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

43 [www.oecd.org/finance/financial-education/oecd-infe-survey-adult-financial-literacy-competencies.htm](http://www.oecd.org/finance/financial-education/oecd-infe-survey-adult-financial-literacy-competencies.htm)



Half of those with Poor numeracy have children in the household; when parents do not have skills to pass on, and cannot act as role models, children may be more at risk of having lower levels of numeracy themselves. The stakeholder research discussed the issue of social context and the fact that children look to their families to learn about numbers and about money. They raised a concern that there appears to be a national culture of "I cannot do maths" which children pick up from their parents<sup>42</sup>. There is some evidence to support this concern in the OECD international comparisons that put the UK 15th out of 29 for overall 'financial literacy', and 24th out of 30 for 'financial knowledge'<sup>43</sup>.

### 3.2 The impact of age and gender

As we have already seen, numeracy is related to both age and gender: Overall, men score higher than women, and numeracy scores are generally better in older adults, especially over the age of 35.

The impact of age consists of both:

- Age effects – changes experienced as a result of growing older and having more life experiences. In the context of financial capability for working age people this could include the effects of starting work, moving into or buying a home or having children; and
- Cohort effects – the factors associated with being born at a particular time. For financial capability, this could include the effects of first entering the labour market during a recession or of being part of older cohorts where participation in higher education was lower.

In considering the impact of age we need to be conscious of both effects, and also be aware that they may be operating in the same or different directions. It is difficult to separate age and cohort effects.

There are several other published studies that demonstrate that men generally show higher level numeracy and financial literacy skills than women<sup>44</sup>. For example, the OECD international comparisons put UK men 18th out of 30 countries, and UK women 26th out of 30 for their financial knowledge<sup>45</sup>. Many academic sources agree that women are less engaged in financial markets as a result, for example, women are less likely to participate in the stock market<sup>46</sup>, or to plan for retirement<sup>47</sup>. However, some authors argue that

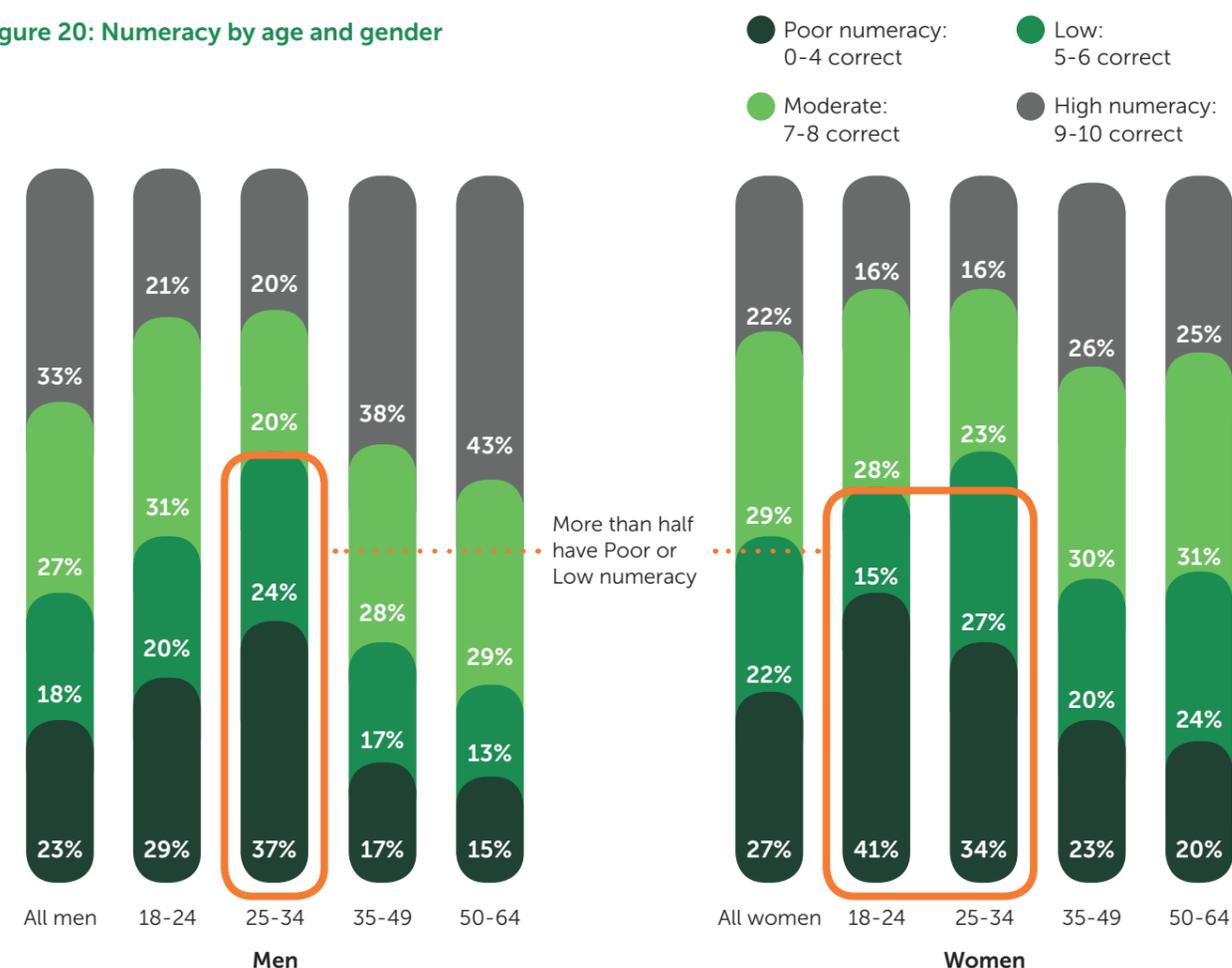
other factors, such as confidence and persistence may be at play, for example, women are more likely than men to say they do not know the answer to a financial literacy question<sup>48</sup>. This is consistent with our research where women were significantly more likely than men to answer 'don't know' to five out of the ten questions asked – this includes to all of the financial concept calculation questions. Women were also significantly more likely to say they 'rarely' persisted with working something out when stuck than 'always' persisted.

Regarding age, other studies have shown that less financially numerate people are more likely to be young, or old, and not middle aged<sup>49</sup>. This is broadly in line with our findings, which do not include people above the age of 65. Figure 20 shows that there is a bigger numeracy gap with increasing age amongst men than amongst women. The groups with the highest proportion of people with lower numeracy are women aged 18-34 and men aged 25-34. The stakeholders and numeracy experts suggested that numeracy skills may 'wash out' – decline with distance in time from formal education<sup>50</sup>, which may go some way to explain why 18-24 year old men in our study have better numeracy than those aged 25-34.

We cannot know why the older age groups in our study have better numeracy, nor why men have a bigger gap with age than women: as already discussed it may relate to cohort effects, historical approaches to numeracy at school or to the impact of life experience and practical opportunities to use numeracy throughout life – or any combination of these factors.



Figure 20: Numeracy by age and gender



Source: MAS Adult Numeracy Survey, March 2017 SQ1. Gender/HQ4. Age Base: All UK respondents n=2086

44 Numeracy Literature Review.

45 [www.oecd.org/finance/financial-education/oecd-infe-survey-adult-financial-literacy-competencies.htm](http://www.oecd.org/finance/financial-education/oecd-infe-survey-adult-financial-literacy-competencies.htm)

46 Almenberg and Dreber (2012) cited in Money Advice Service Numeracy Literature Review.

47 Lusardi and Mitchell (2009) cited in Money Advice Service Numeracy Literature Review.

48 Lusardi (2012) cited in Money Advice Service Numeracy Literature Review.

49 Lusardi and Mitchell (2007) cited in Money Advice Service Numeracy Literature Review.

50 Stakeholder Research: Numeracy and Financial Capability and Stakeholder Roundtable, please contact Money Advice Service for further details.

### 3.3 Which groups are most confident?

As confidence is so important, we have also looked at the relationship between confidence and age, gender, and other demographics. Other sources, including Money Advice Service Building Blocks, have also found that women, those in low income households and those with lower levels of educational attainment have lower financial confidence<sup>51</sup>. Another study of students found that college women were less confident, enthusiastic and willing to increase their 'knowledge of personal finance' than college men<sup>52</sup>. In our research, the combined confidence measure that was used for the numeracy modelling shows no significant differences between men and women.

Figure 21 shows that men are significantly more likely to be very confident at every day numbers and choosing financial products. Perhaps some women find it easier to admit to a lack of confidence in these areas than to divulge that they struggle to manage money. It is worth recalling here the earlier finding that confidence with numbers AND managing money seem to be pre-requisites for confidence in choosing financial products. Another study shows men are twice as likely as women to take financial risks – it is likely that risk taking is associated with confidence (regardless of whether the risk taking is shrewd or reckless or whether it is ultimately profitable)<sup>53</sup>.

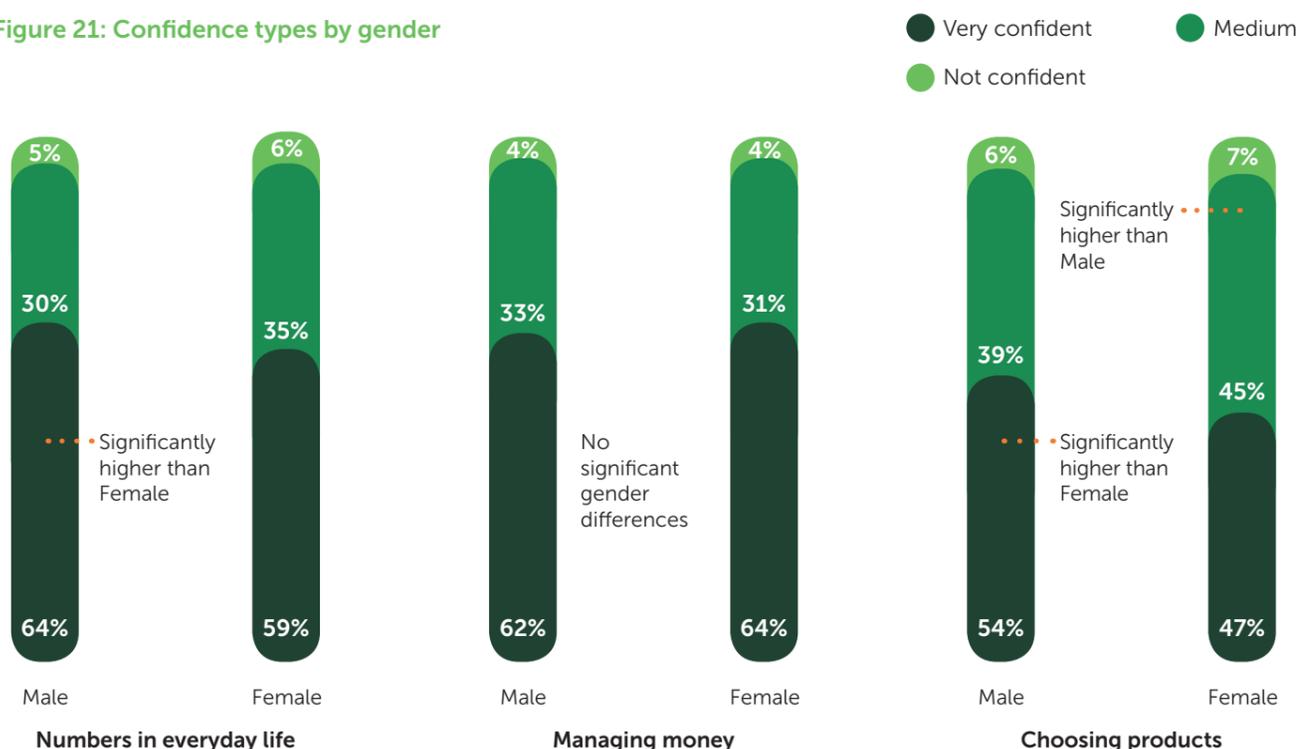
Overall, confidence - as well as numeracy - increases in the older age groups. Again, we cannot know why but it is likely that experience is playing a part, as well as cohort effects. Other research shows that, amongst young adults, confidence seems to come from experience and exposure to a wider range of situations, financial products and decisions rather than from age alone, and that both positive and negative experiences could have a beneficial impact on financial capability, especially on learning from mistakes<sup>54</sup>.

It is also interesting to note that there are no differences in age or gender between those who score the lowest on confidence in every day numeracy or in choosing products. This suggests that low confidence in these areas remains throughout life – a good reason to work on confidence with the young. However this is not true for confidence in managing money where the oldest age-group contains significantly fewer people who say they are not confident.

Looking at the confidence/numeracy quadrants by age and gender, in Figure 22, shows some interesting findings. The most Over-confident people are those aged 25-34 - both men and women. This over-confidence among 25-34 year olds may be driven by experience from having to deal with more complicated financial 'firsts' as responsibilities rise with age. Some numeracy inadequacies may be masked until this time, which may catch the over confident out. Men and women may be over confident for different reasons, which may require a more segmented response.

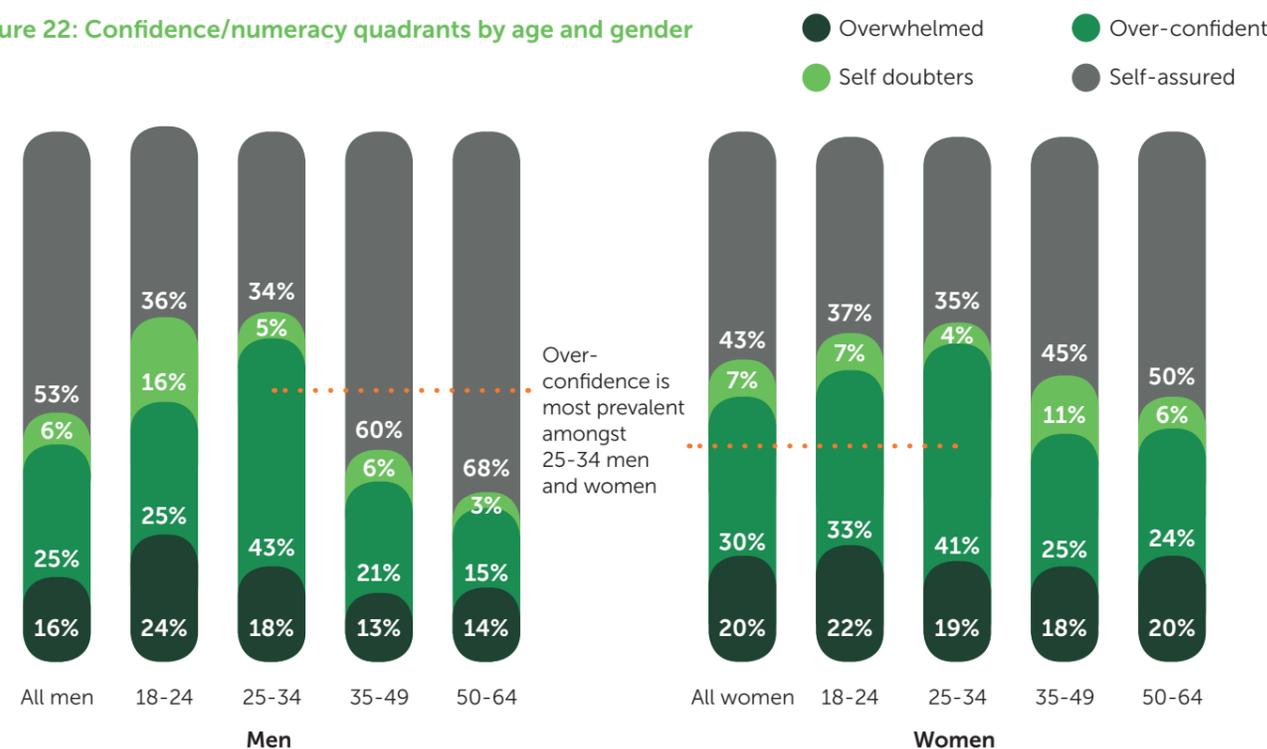
A higher proportion of men are Self-assured than women. The higher proportions of women in the Over-confident quadrant are driven by women's comparatively low numeracy, rather than by women being highly confident.

Figure 21: Confidence types by gender



Source: MAS Adult Numeracy and Financial Capability Survey 2017. SQ1: Gender. Base: All UK respondents n=2086

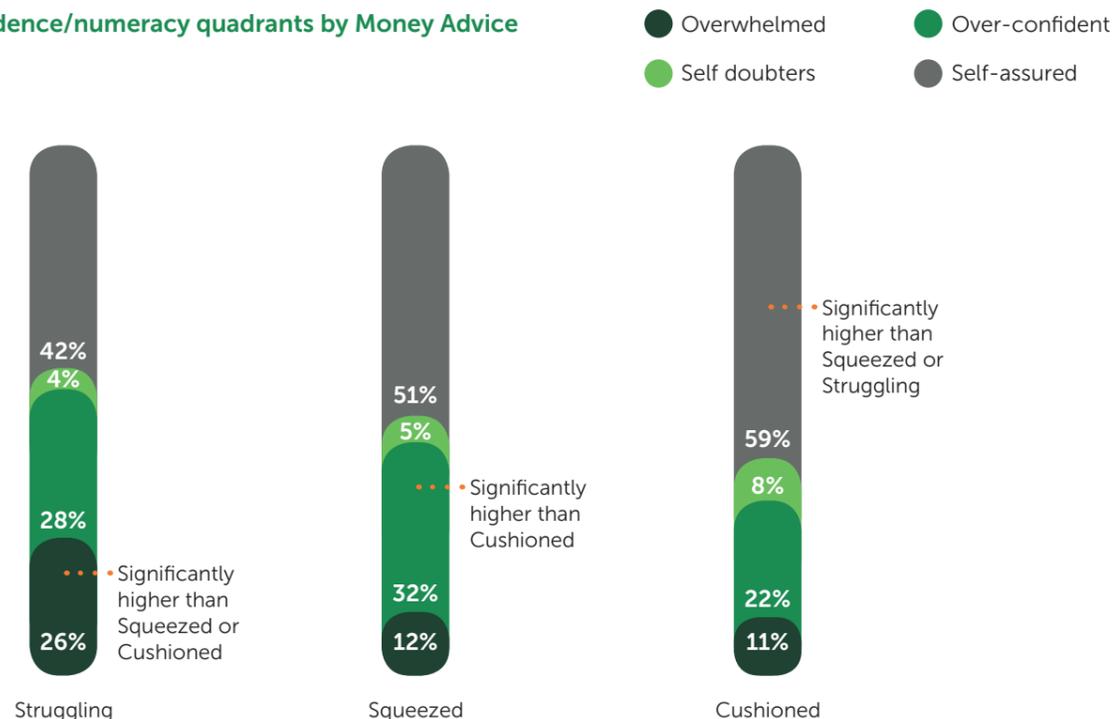
Figure 22: Confidence/numeracy quadrants by age and gender



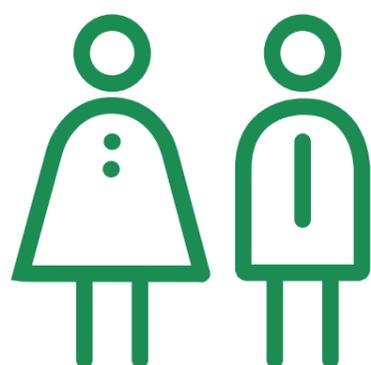
Source: MAS Adult Numeracy Survey, March 2017 SQ1. Gender/HQ4. Age Base: All UK respondents n=2086

51 Palameta, Nguyen, Shek-wai Hui, Gyarmati (2016) cited in Money Advice Service Numeracy Literature Review  
 52 Sole (2014) cited in Money Advice Service Numeracy Literature Review  
 53 FINRA Investor Education Foundation (2012) cited in Money Advice Service Numeracy Literature Review  
 54 <https://www.moneyadviceservice.org.uk/en/corporate/research>. Young Adults Deep Dive

**Figure 23: Confidence/numeracy quadrants by Money Advice Service segment**



Source: MAS Adult Numeracy and Financial Capability Survey 2017. Base: All UK respondents n=2086



Looking at the quadrants by segments in Figure 23 (also see box on page 33) shows, as to be expected, the 'Cushioned' segment has the highest proportion of Self-assured people and the 'Struggling' segment has the highest proportion of Overwhelmed. It is interesting to note that the highest proportion of Over-confident people are to be found in the Squeezed segment; we can speculate that their confidence may stem from their financial circumstances, which are better, relatively speaking, than those of the people with lower numeracy in the Struggling segment. It is also interesting to note that despite their relatively difficult circumstances, 42% of people in the Struggling segment are in the Self Assured quadrant; you can be struggling, but also confident and numerate.

## 3.4 Summary

- People with Poor numeracy are more likely to be female, younger, less well educated and live in lower income households than people with High numeracy.
- In many cases, people with lower levels of numeracy rely on partners to manage their finances.
- We found that 25% of people with Poor numeracy have maths GCSE or equivalent grade C or above which raises a number of issues: do people forget the maths they have learnt? Is GCSE maths the same thing as being numerate? Should children learn more applied financial numeracy skills in school?
- There are a number of studies that show that women have lower numeracy than men, and this is borne out in our research – we also found that women are somewhat less likely to persist when stuck working something out which indicates that self-efficacy and self-belief are particularly important for women.
- Numeracy scores generally increase in the older age groups - which may be due to experience, or cohort effects. Men aged 18-24 have higher numeracy than those aged 25-34 which suggests that the younger group may be better at remembering the maths they learnt at school.
- Women are generally less confident than men, but particularly less confident in using numbers every day and in choosing financial products and services.
- There are no differences in age or gender between those who score the lowest on confidence in every day numeracy or in choosing products. This suggests that low confidence in these areas remains throughout life, for both genders.
- People aged 25-34 are most likely to be Over-confident – these people may feel confident because of the life experiences they have had, without yet realising that their numeracy is letting them down – either way this group is hard to engage.
- Similarly, there are proportionately more over-confident people amongst the Money Advice Service Squeezed segment than any other – this segment is already hard to engage with financial services and interventions.



## 4.0 Conclusions and implications

Overall, this study has deepened our understanding of the links between numeracy and financial capability. The research findings and numeracy modelling analysis show clearly that numeracy is strongly linked to financial capability, together with confidence and some attitudes, regardless of other factors. This means that if two people have the same demographic profile, but different levels of numeracy, the one with higher numeracy will tend to have better financial outcomes. We know that a basic level of everyday numeracy is important for managing finances day-to-day and that an ability to perform calculations using financial concepts is important for future financial wellbeing. We also know that numeracy does not exist in isolation and needs to be coupled with financial confidence, self-belief and future thinking to be fully effective. This type of analysis still does not confirm causation. The act of keeping up with bills, or building a savings pot may be what develops numeracy skills, rather than

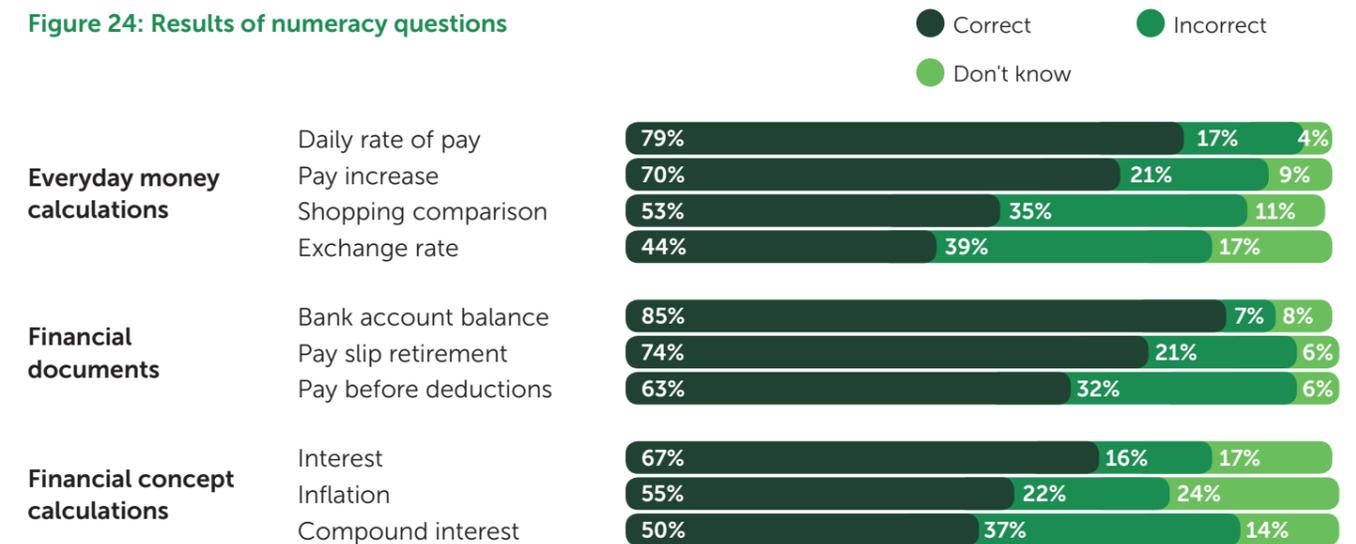
the other way around. However, the strength of the modelling outcomes, the plausibility of a causal explanation and the existence of a substantial body of other research that supports these findings all build towards a conclusion that improving one's numeracy – as well as confidence - would result in improved financial capability, all else being equal.

The relationship between these elements is complex and the types of intervention needed to improve financial capability through improved numeracy will need more research. However there is a sense that embedding numeracy in real-world situations and in other learning will be more effective than offering stand-alone 'help with maths' – this also needs testing. There will be challenges in attracting the right target groups, but this type of approach will help, as will being mindful of the need to confront the national culture of fear and inability that appears to exist around numbers.

## 5.0 Appendix

### 5.1 Results of numeracy questions

Figure 24: Results of numeracy questions



Source: MAS Adult Numeracy Survey, March 2017. Numeracy questions. Base: All UK respondents n=2086

## 5.2 Details of numeracy stakeholders and experts

The following stakeholders took part in the Numeracy Roundtable which took place in October 2016:

- Barry Sheerman, MP
- Anne-Marie Trevelyan, MP
- Wendy Jones, Trustee, National Numeracy
- James Hopkins, Director, Critical Research
- Rachel Malic, Communications Manager, National Numeracy
- Sian Whyte, Head of Impact and Evaluation, Citizens Advice
- Lucy Ryecroft-Smith, Research and Communications Officer, Cambridge Mathematics
- James Calder, Public Affairs Manager, ICAEW
- Helen McDaniel, Senior Policy Advisor, BEIS
- Caroline Rookes, CEO, Money Advice Service
- Mike Ellicock, CEO, National Numeracy
- Michael Royce, Proposition Manager, Money Advice Service
- Iris Kapelouzou, Policy Advisor, UK Finance
- Liz Booth, Senior Programmes and Services Manager, Young Enterprise
- Russell Butcher, Senior Manager, Education, Qualification and Skills, Starbucks
- David Banks, External Affairs Executive, Money Advice Service
- Chris Phillips, Insights Manager, Money Advice Service
- Amie Evans, Public Affairs Assistant, ICAEW
- Steve Hailstone HMI, Further Education and Skills, Ofsted

Expert interviews were conducted in February 2017 with the following stakeholders:

- Iris Kapelouzou, Policy Advisor, UK Finance
- Sian Whyte, Head of Impact and Evaluation, CAB
- Peter Pledger, CEO, National Skills Academy for Financial Services
- Michelle Highman, CEO, The Money Charity
- Jonathan Douglas, CEO, National Literacy
- David Haigh, UK Financial Capability Director, Money Advice Service
- Mike Ellicock, CEO, National Numeracy
- Rebecca Veitch, Senior Policy Adviser, Education
- Alex Stevenson, Head of English, Maths and ESOL, Learning and Work Institute
- Howard Gannoway, Learning and Work Institute
- Damon Gibbons, Learning and Work Institute

