

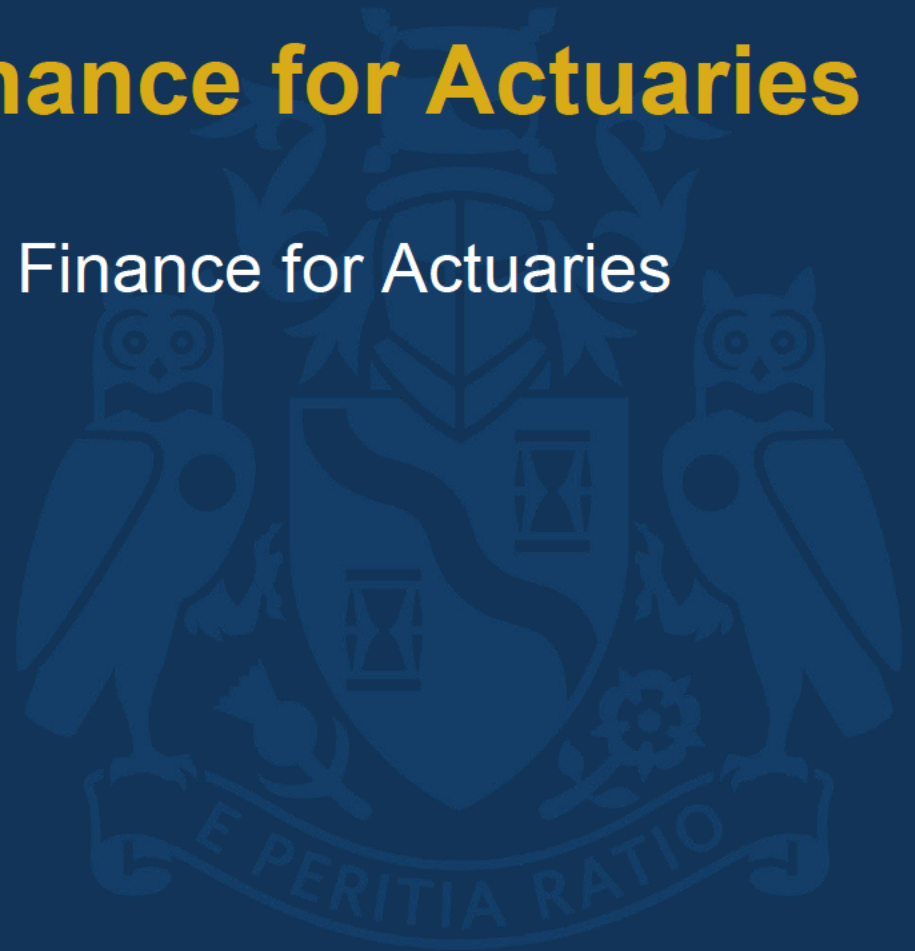


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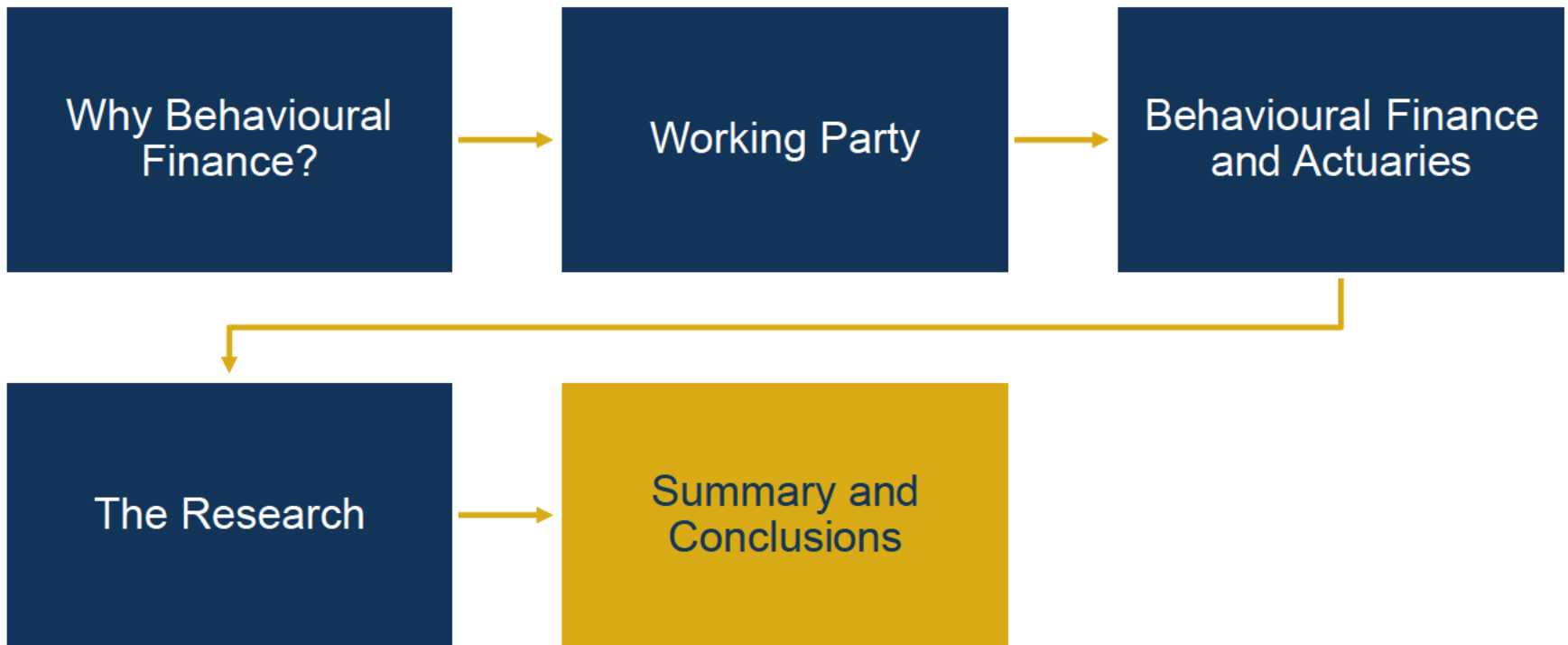
# E6: Behavioural Finance for Actuaries

Kathy Byrne and Paul Cook

Members of the Behavioural Finance for Actuaries  
Working Party



# Agenda



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# Why Behavioural Finance?

# Behavioural Finance is topical

Financial Conduct Authority



Occasional Paper No.1

## Applying behavioural economics at the Financial Conduct Authority

April 2013

Kristine Erta, Stefan Hunt, Zanna Iscenko, Will Brambley



## THE BEHAVIOURAL INSIGHTS TEAM

IN PARTNERSHIP WITH  Cabinet Office



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# What is Behavioural Finance

*A method of economic analysis that applies psychological insights into human behaviour to explain economic decision-making*

Oxford English Dictionary

*The field of behavioural finance looks at how a variety of mental biases and decision making errors affect financial decisions. It relates to the psychology that underlies and drives financial decision making behaviour.*

ST5 Examiners report Q3 October 2012



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# Behavioural Finance for Actuaries Working Party

26 September 2016

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ponsorship  
Thought leadership  
Progress  
Community  
Sessional Meetings  
Education  
Working parties  
Volunteering  
Research  
Shaping the future  
Networking  
Professional support  
Enterprise and risk  
Learned society  
Opportunity  
International profile  
Journals  
Support

# Working Party

- Kathy Byrne (Co-Chair)
- Iain Clacher (Co-Chair)
- Chandni Nakum
- Huw Withey
- Marcus Hurd
- Paul Cook
- Shai Harman
- Siddesh Ramasubramanian
- Simon Pearse



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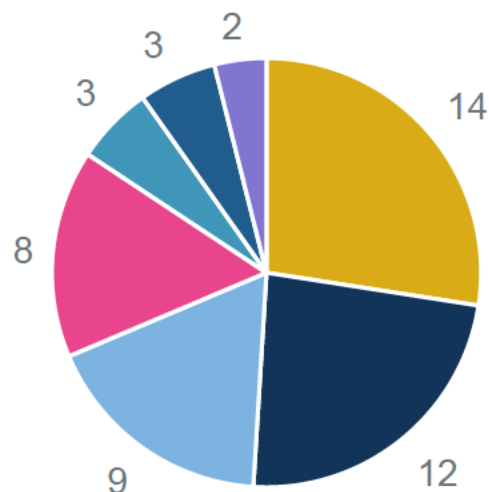
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# Behavioural Finance and Actuaries

26 September 2016



# IFoA Library Search



- Books
- Other Journals/Papers
- Conference Presentations
- The Actuary Articles
- Other Actuarial Journals
- SIAS Papers
- BAJ

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**Library catalogue search**

**Query form**

**Simple search**

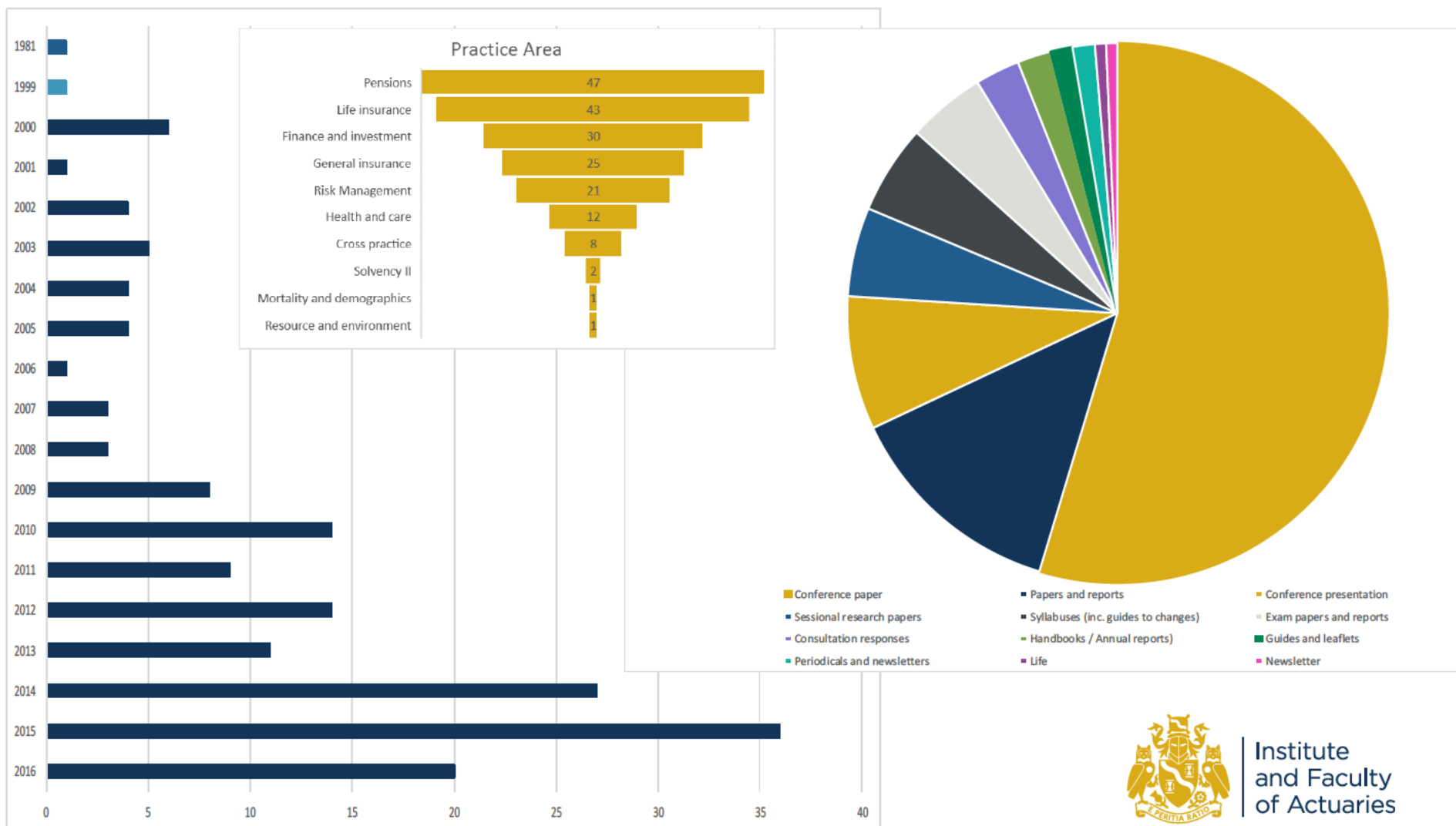
☐ Search electronic documents only  
☐ Search electronic documents on www.actuaries.org.uk only  
☐ Search journal articles only

Number of records per page:

**If you are looking for a specific title or author, or you want to combine terms, please use the advanced search**

Retrieval software: DB/Text WebPublisher, provided by **INMAGIC**  
 This site is designed for use with Internet Explorer

# Website Search



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# Key Actuarial Literature

making actuaries less human  
lessons from behavioural finance

presented to the Staple Inn Actuarial Society, 18 January 2000  
by Nigel Taylor



**The Actuarial Profession**  
making financial sense of the future

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**Transforming consumer information**  
A discussion paper

BY A. RITCHIE, J. CORRIGAN, S. GRAHAM,  
A. HAGUE, A. HIGHAM, J. HOLT, P. MOWBRAY  
AND H. ROBINSON

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Presented to the Institute and Faculty of Actuaries

23 April 2012 (London)



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# The Research

# Research Questions

- Do actuaries show the same biases as other people?
- Are actuaries more or less biased than other people?



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# Research Instrument

## Five minute survey

During the month of March, you will see this article in all the IFoA newsletters. Please can you spare five minutes in order to complete a survey and to help an IFoA working party with some research? No technical expertise is required but you do need to be a member of the IFoA. The aim is for you to answer the questions as quickly as possible. The results from the survey will form part of a series of research papers that the working party is writing. Their intention is then to present their findings at relevant conferences. No answers will be attributed to any individual.

Take part in the survey

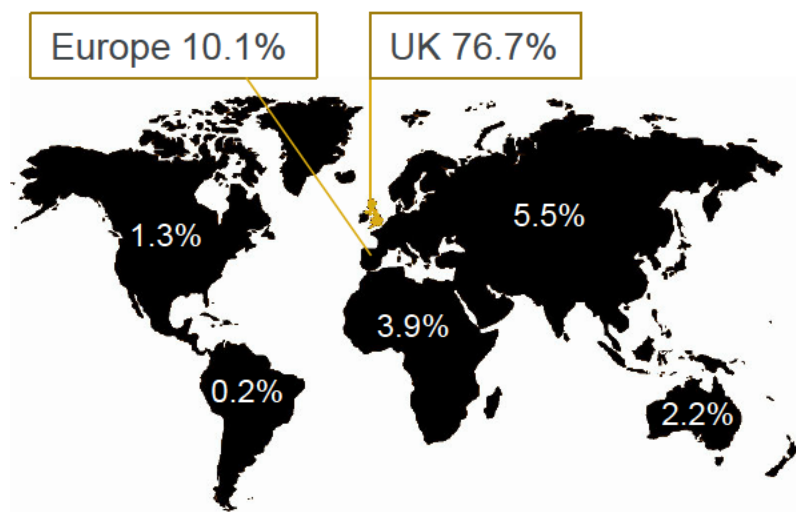
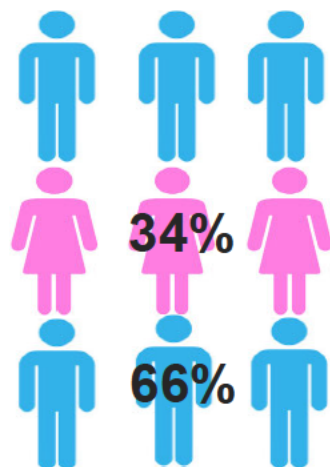
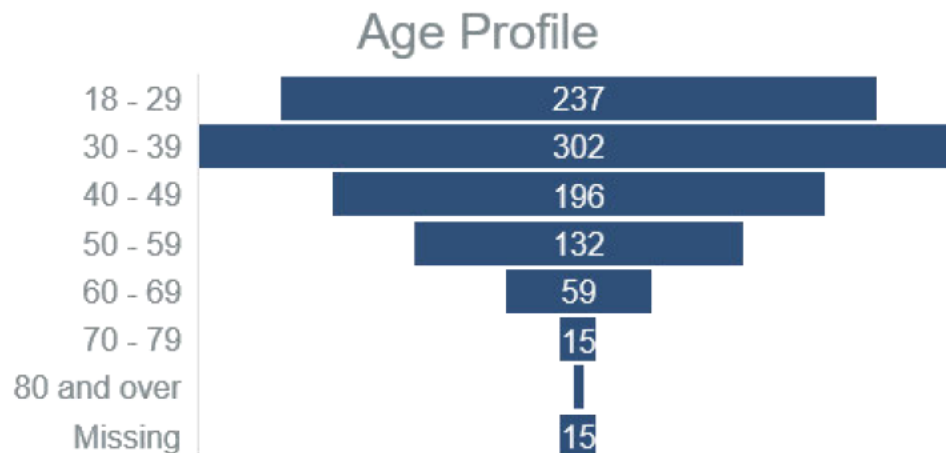
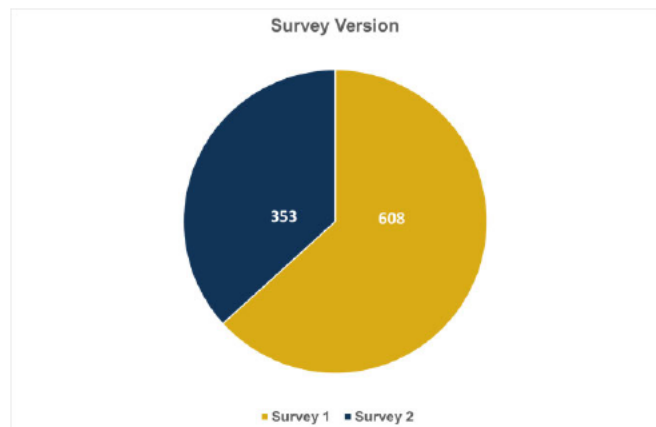


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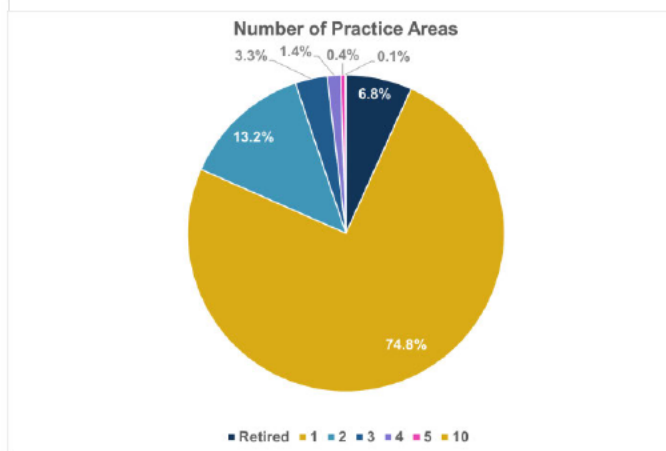
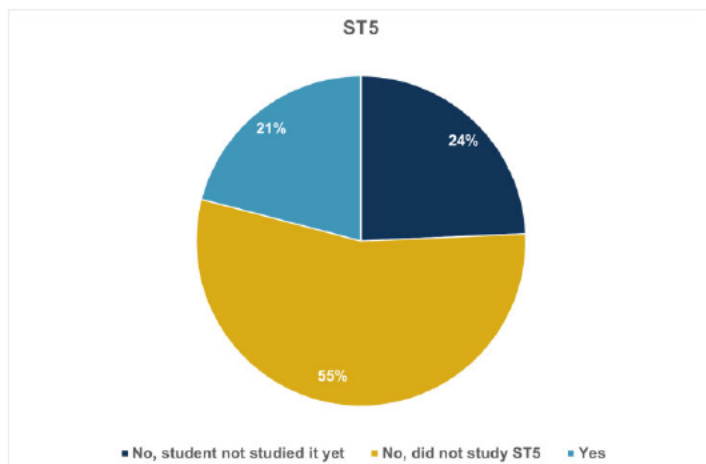
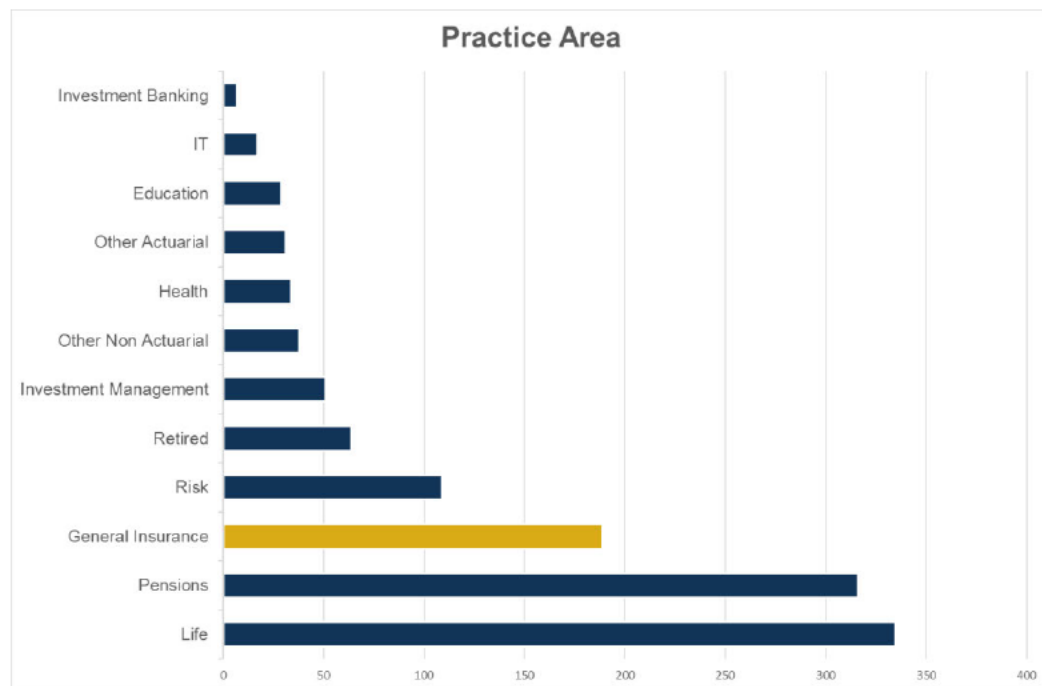
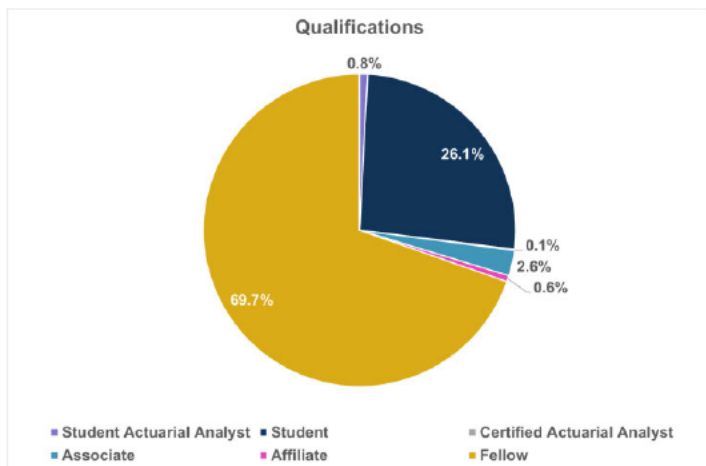
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# Research Sample



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# Research Sample



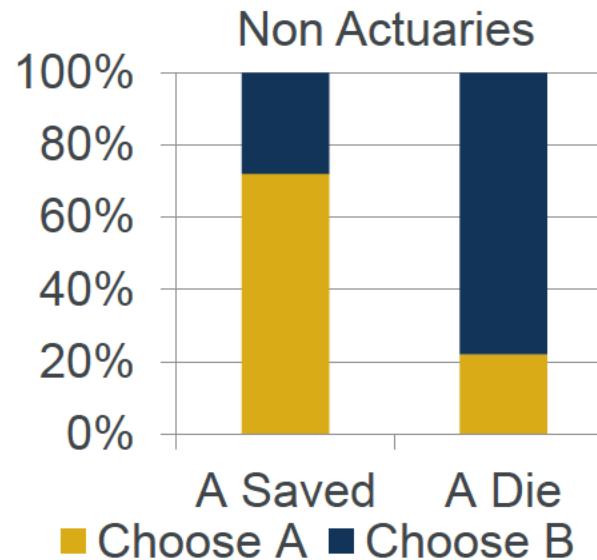
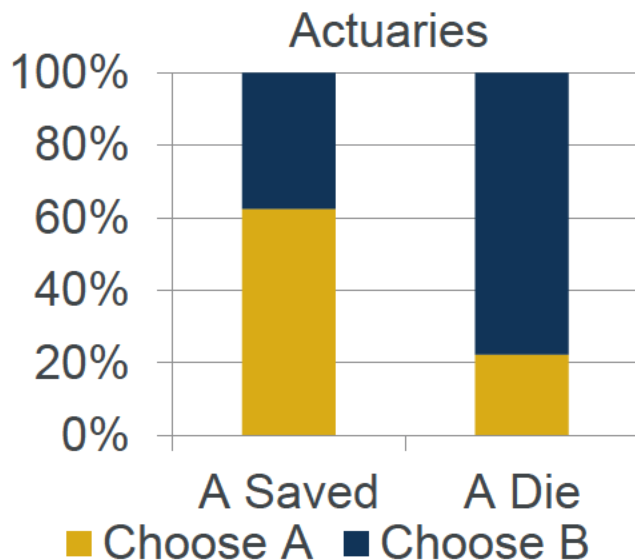
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# Framing - Avian Flu Programmes

The UK is preparing for an outbreak of avian flu which is expected to kill 600 people. Two alternative programmes to combat the disease have been proposed.

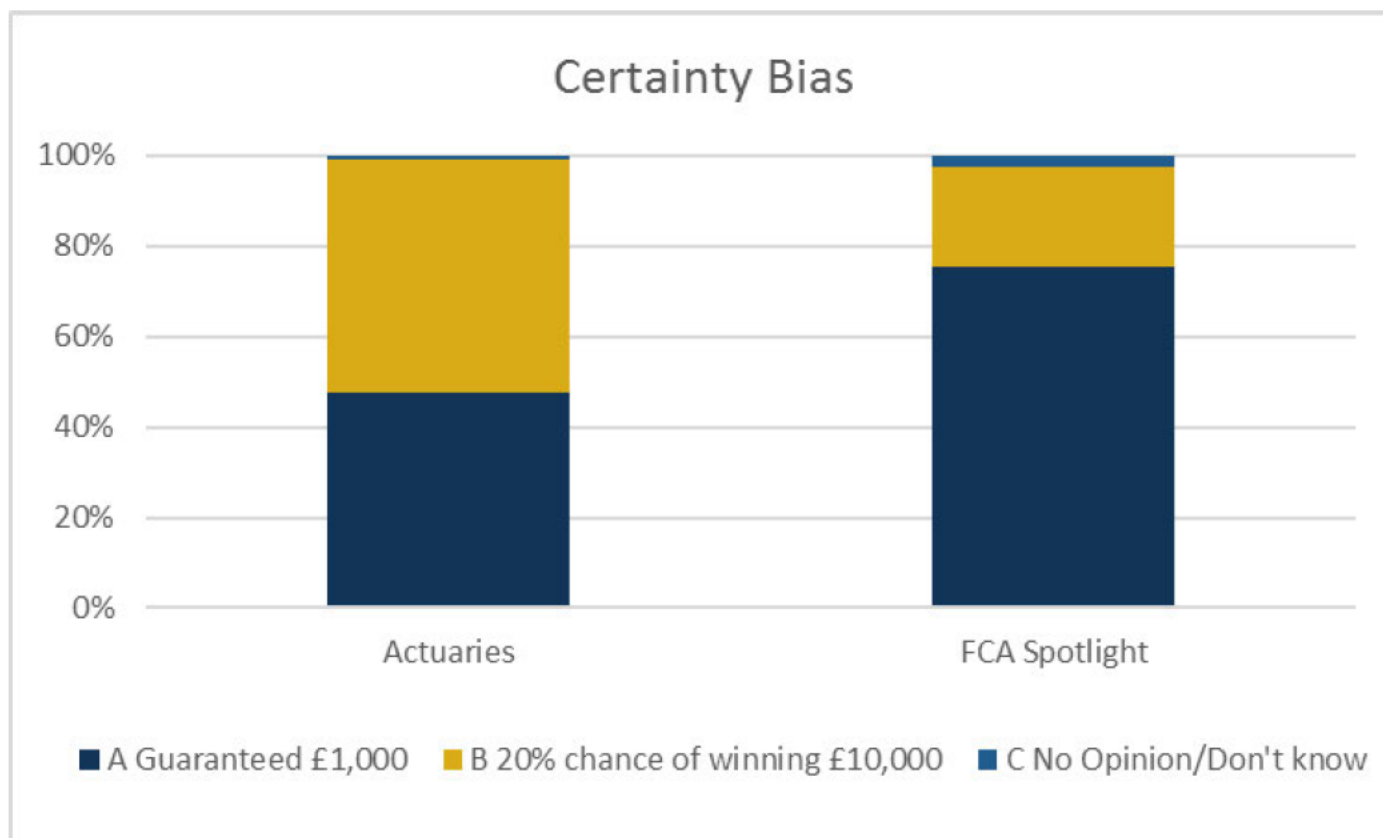
Survey 1	Survey 2
<b>Programme A:</b> 200 Saved	<b>Programme A:</b> 400 Die
<b>Programme B:</b> 1/3 probability that 600 people will be saved, 2/3 probability that no people will be saved	



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# Preference for Guarantees

If you had a choice between a guaranteed payment of £1,000 and a one in five chance of winning £10,000, which would you choose?

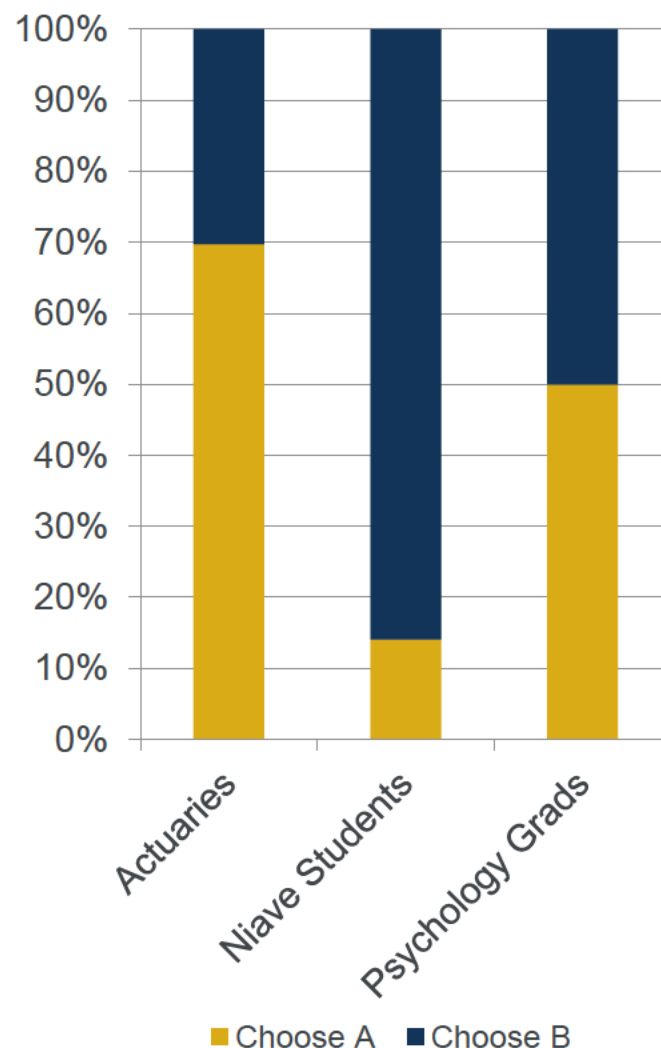
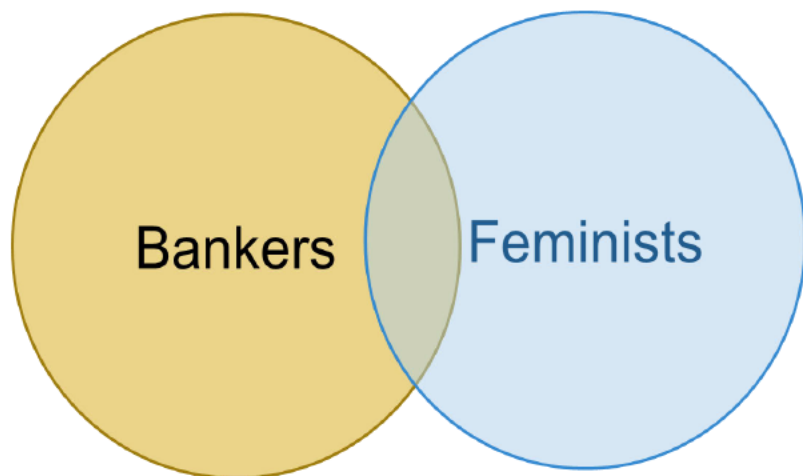


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# Representativeness

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which is more probable?

- A Linda works in a bank.
- B Linda works in a bank and is active in the feminist movement.



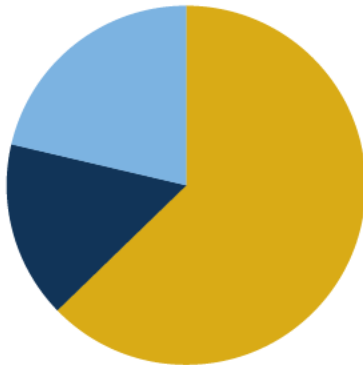
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# Availability

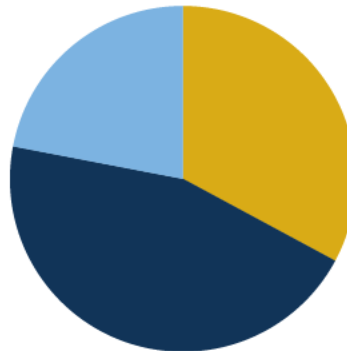
Which causes more deaths in the UK amongst women aged 20 to 29?

- A Accidents
- B Cancer
- C Self inflicted injuries

Actuaries



Actual causes of death 2010



- Accidents
- Cancer
- Self Inflicted



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# Anchoring

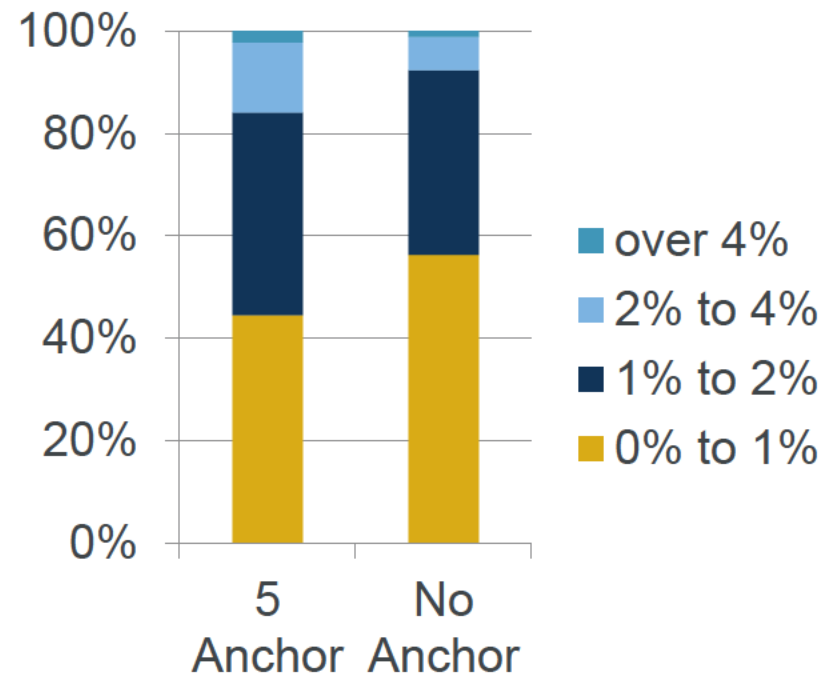
What do you think the rate you earn on your cash savings will be over the next year?

A Less than 1%

B 1% to 2%

C 2% to 4%

D over 4%



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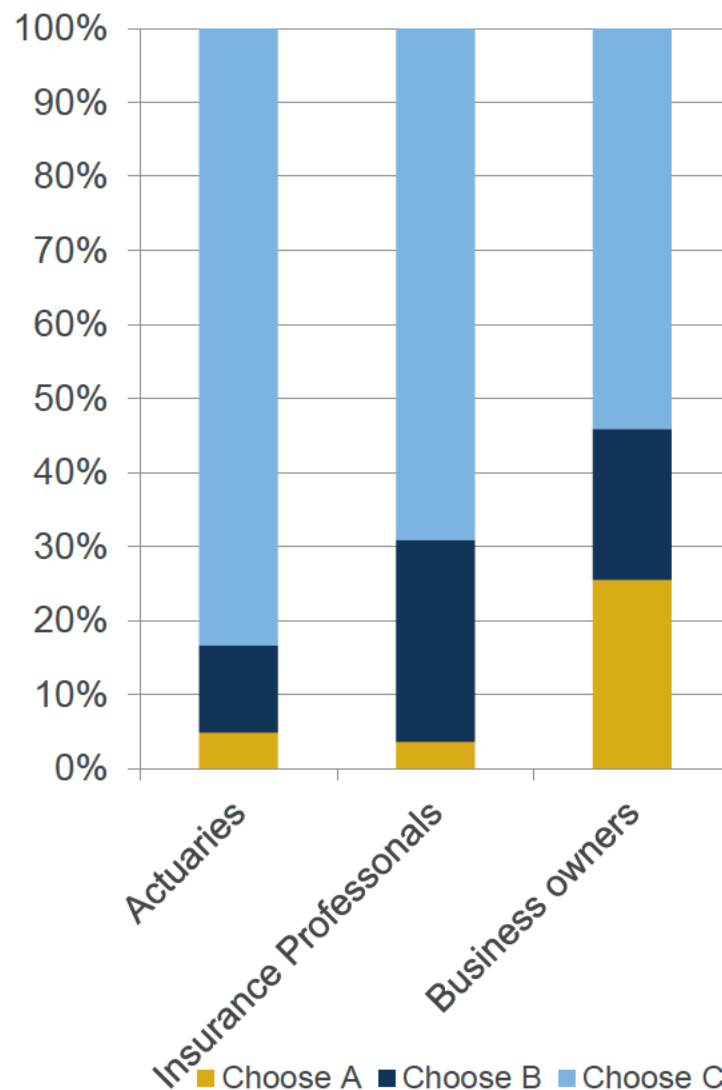
# Overconfidence

What is the capital of Kentucky State in the USA?

A Princeton

B Springfield

C Don't Know



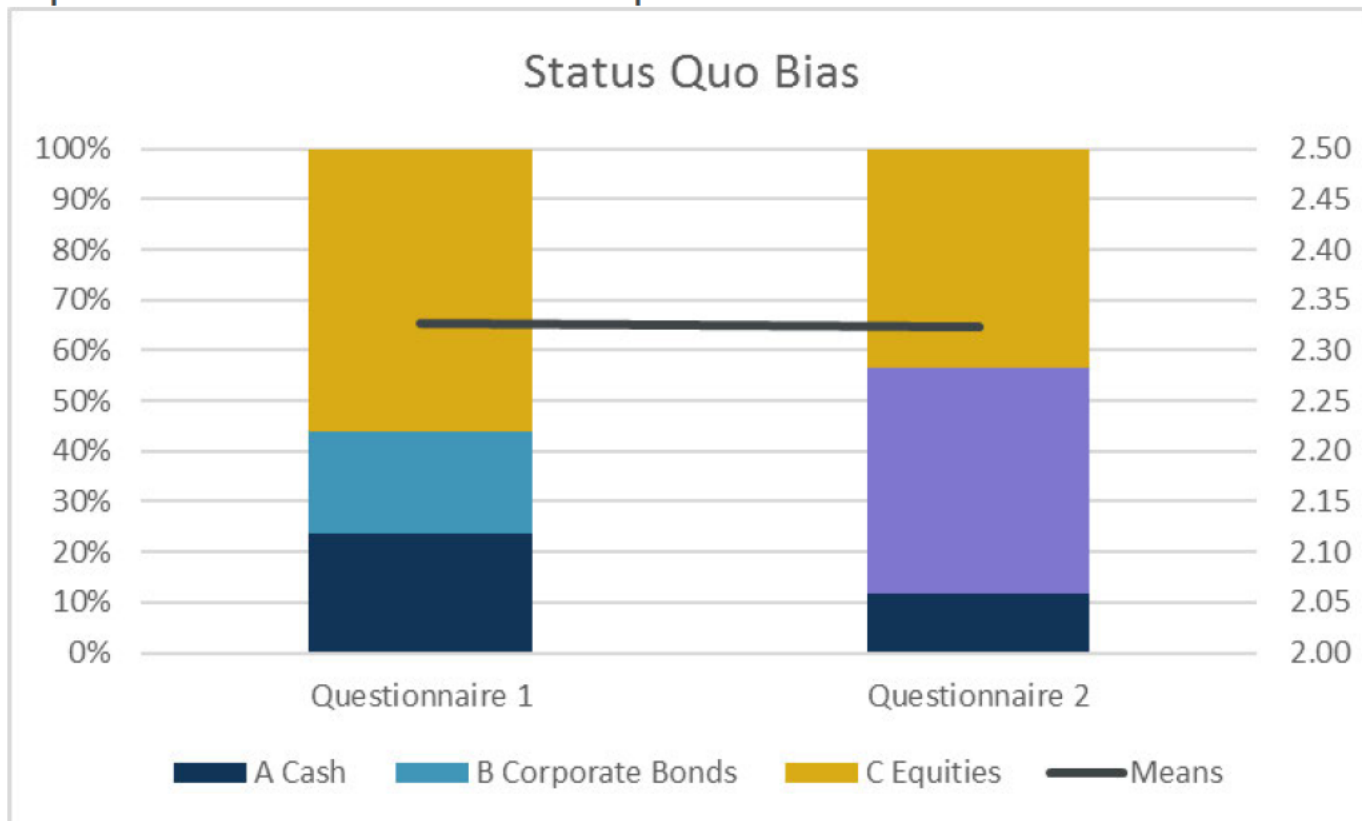
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# Status Quo Bias

A great aunt has bequeathed to you a large sum of money.

Questionnaire 1 simply offered a choice of 3 investment options.

Questionnaire 2 said the money was invested in corporate bonds and gave an option to switch to cash or equities.



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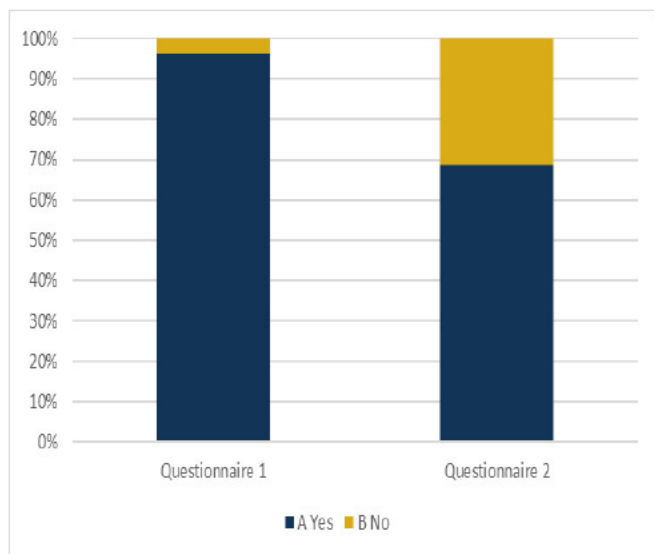
# Mental Accounting

Imagine that you have decided to see a play where admission is £20 per ticket.

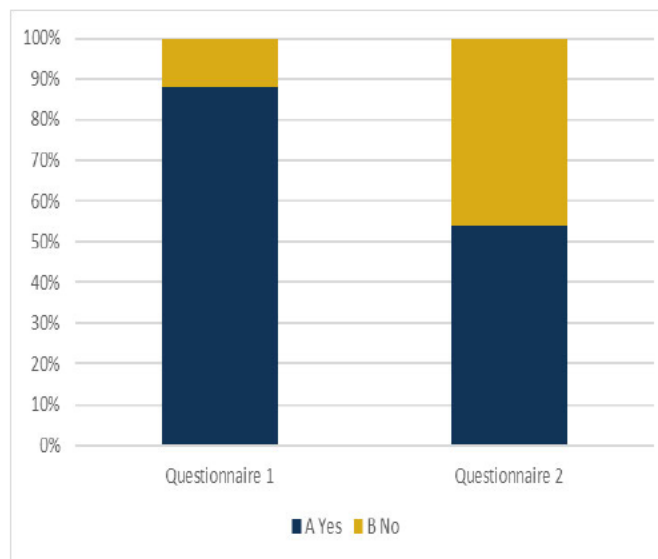
- As you enter the theatre you discover that you have lost a £20 note.
- As you enter the theatre you discover that you have lost the ticket.

Would you still pay £20 for a ticket to the play?

## Actuaries



## Non Actuaries

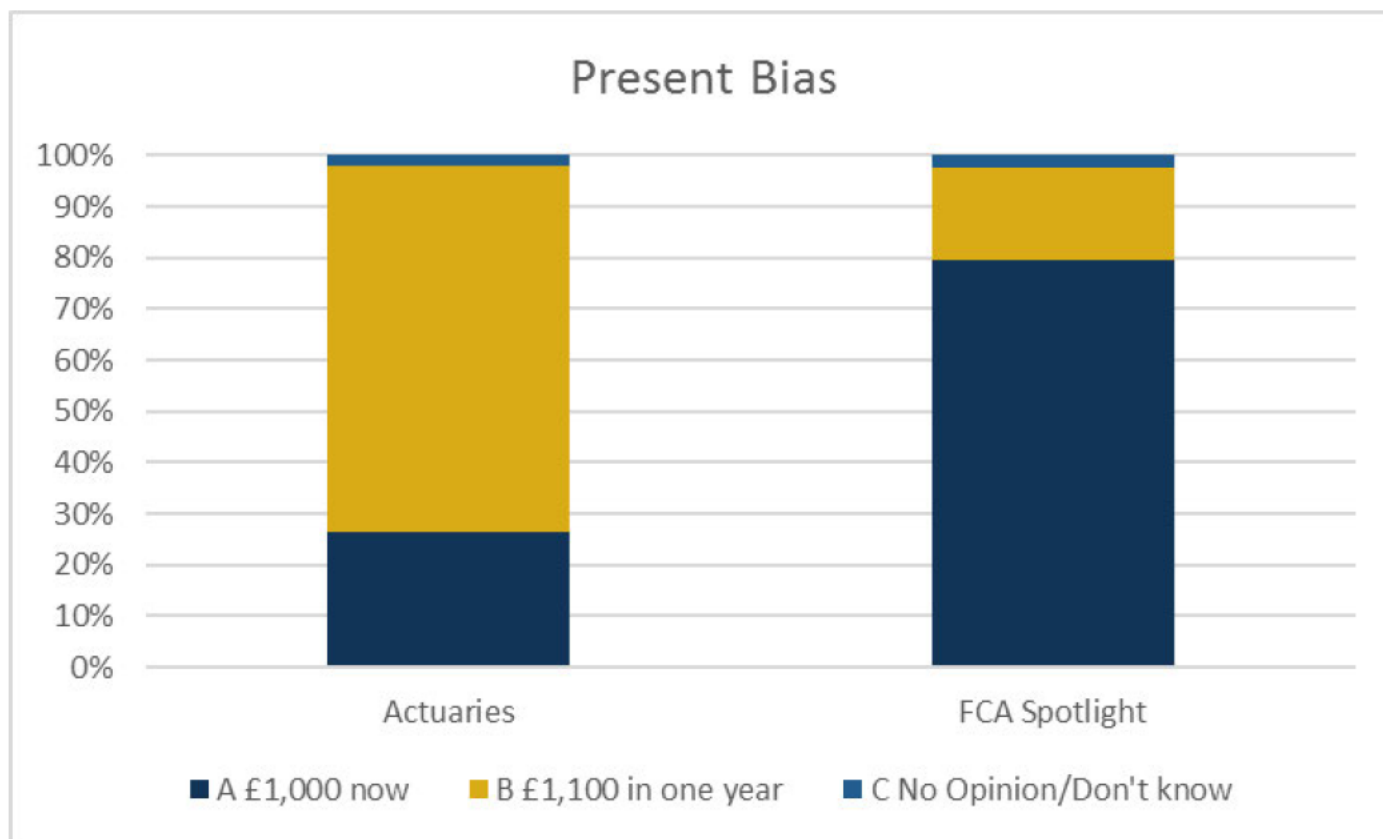


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# Present Bias

Which would you choose, receiving £1,000 today or £1,100 pounds in a year's time?



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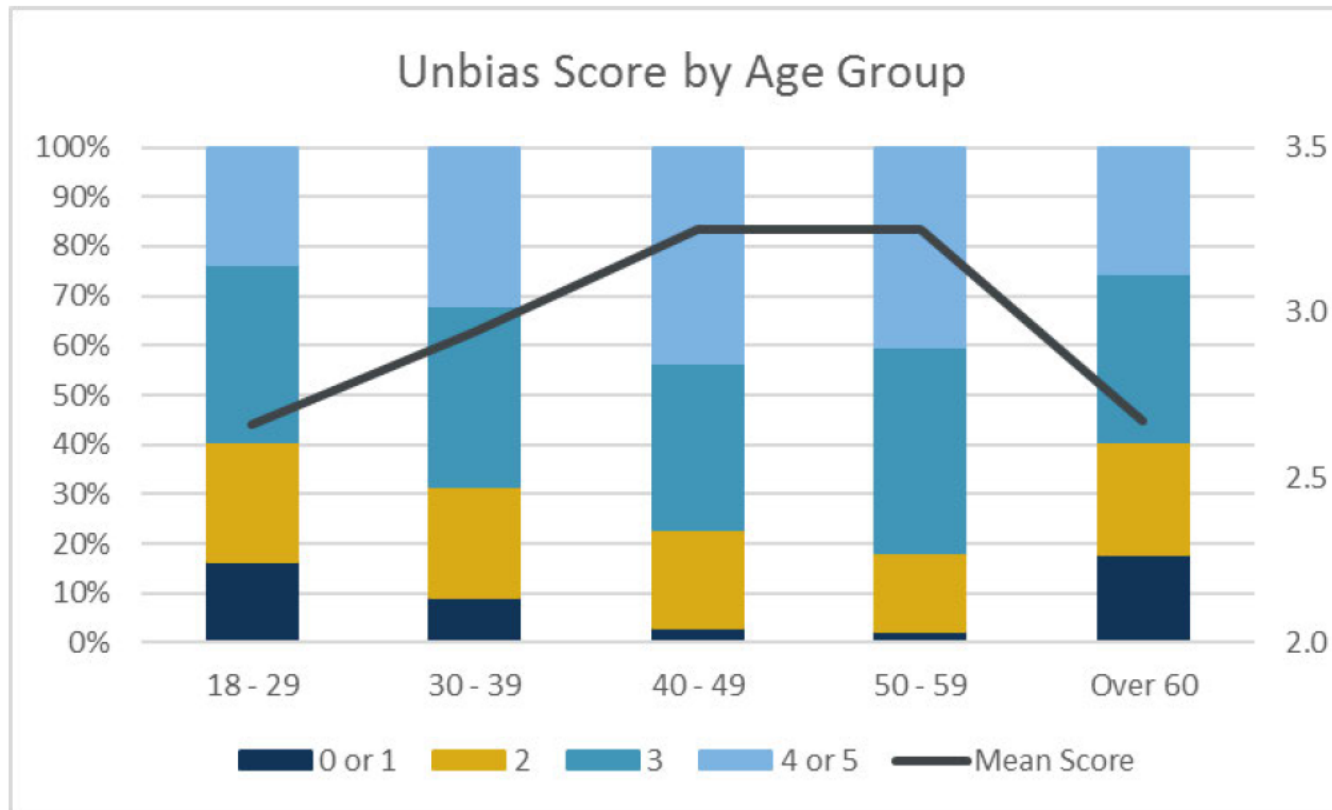
# Bias concept

## Unbiased score

- Certainty Bias (Utility)
- Representativeness (Probability)
- Causes of death (Probability)
- Overconfidence (Fact)
- Present Bias (Utility)

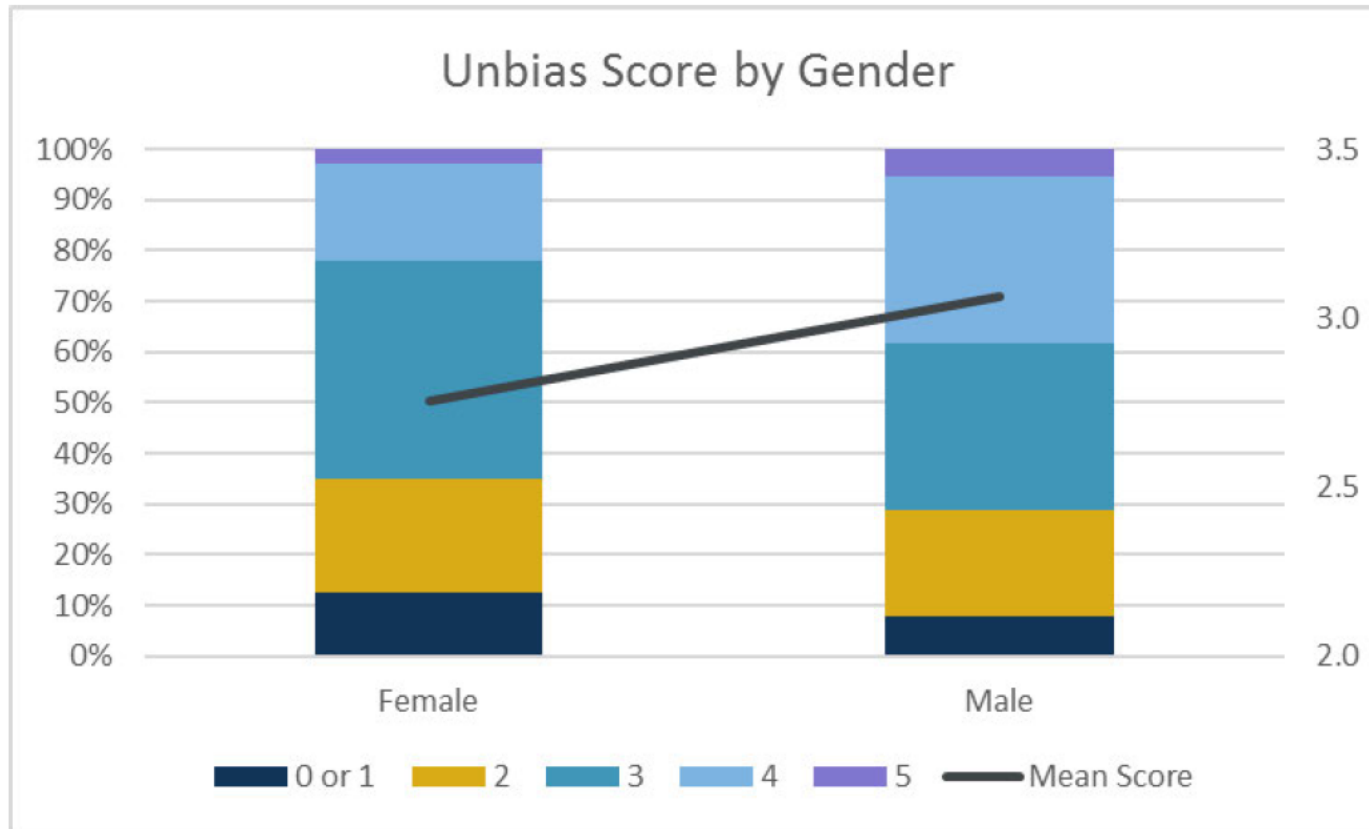


# Scores by Age



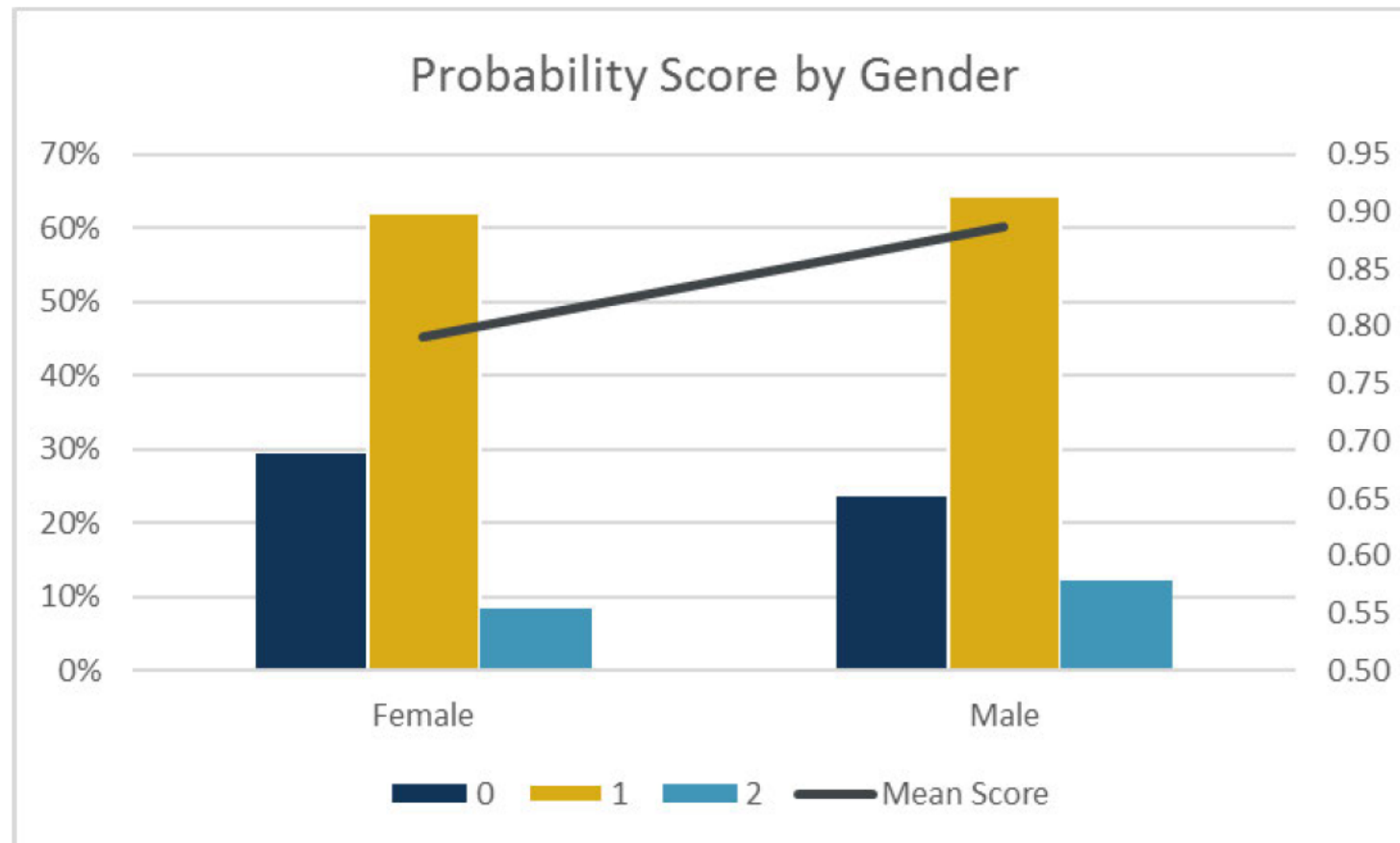
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# Scores by Gender



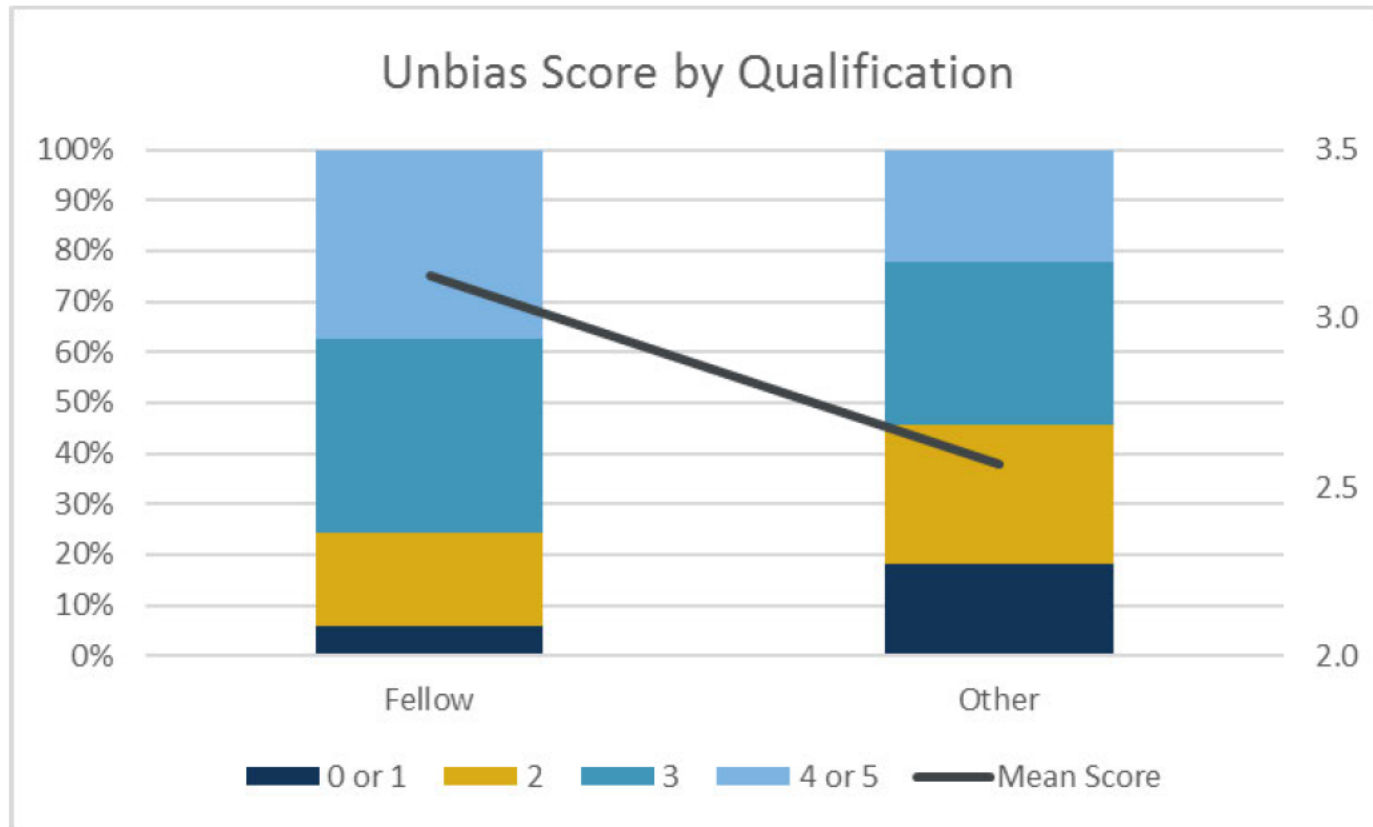
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# Scores by Gender



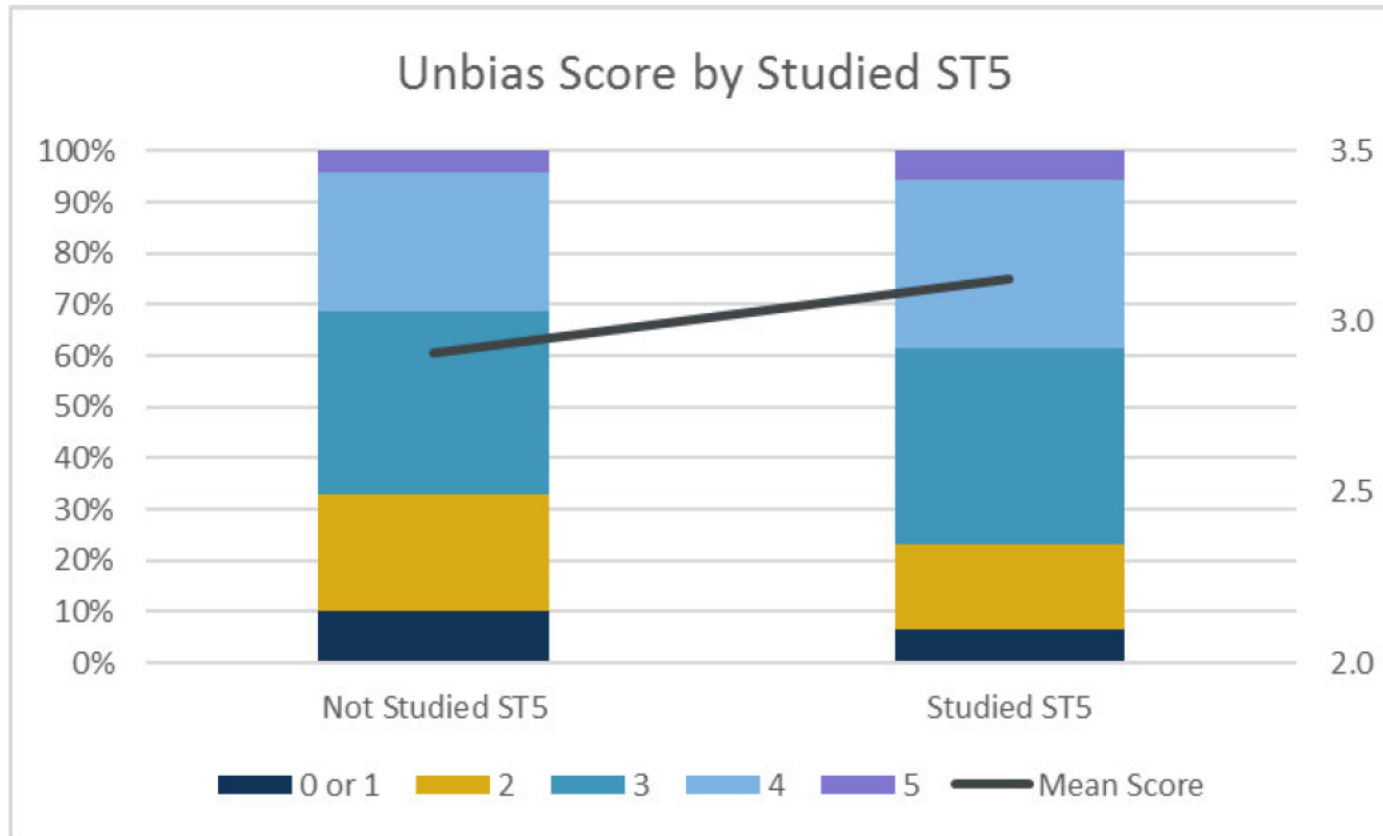
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# Scores by Qualification



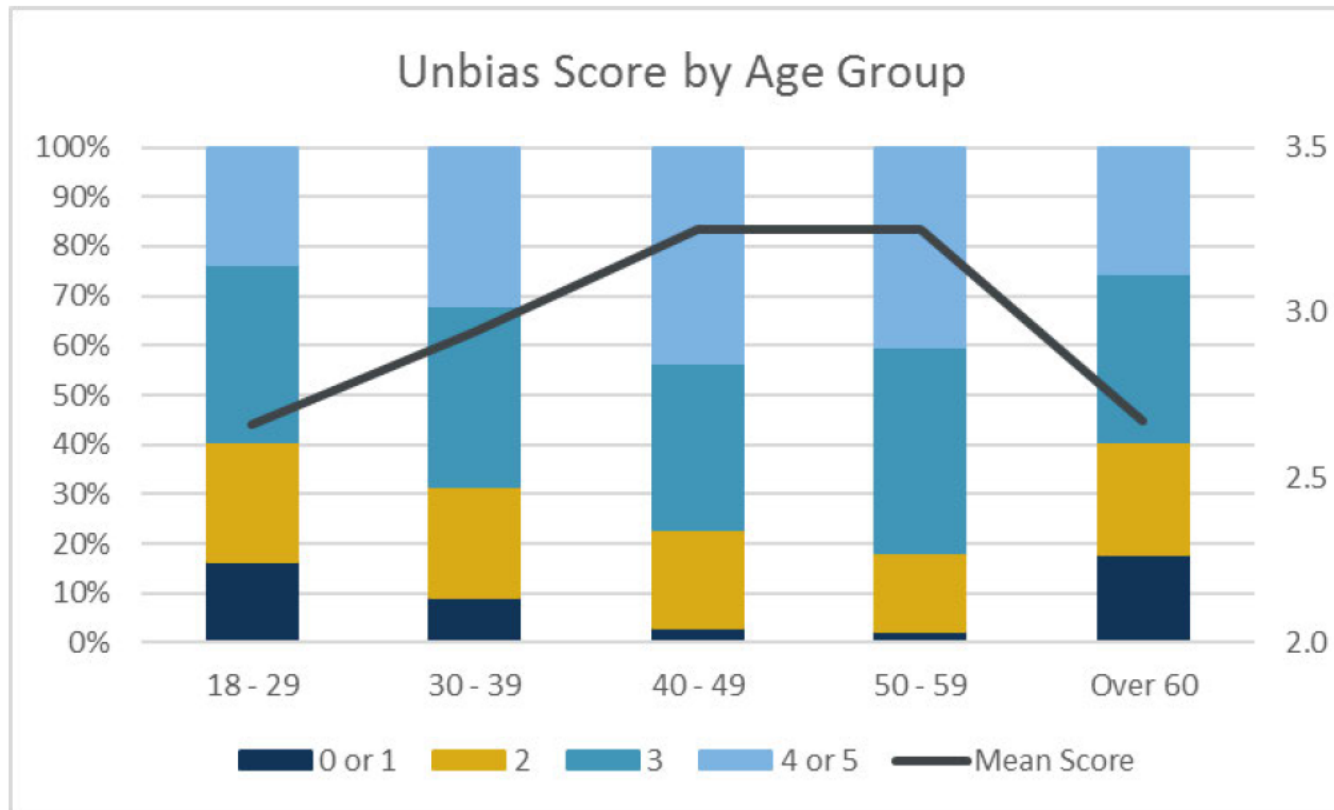
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# Scores by Studied ST5



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# Scores by Age



Studied ST5 26%

60%

11%



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# Actuarial Example: Cook's Paradox

You are one of two beneficiaries of a trust that has been established with capital of £1m.

Beneficiary 1 and their descendants receive the income from the trust for the next 100 years.

Beneficiary 2 and their descendants receive the capital in 100 years' time. The capital is invested in short dated gilts and cash with a guaranteed return of 3% p.a. The present value of a payment £1m in 100 years' time is about £50,000.

How much is each Beneficiary's share worth?



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# Actuarial Example: Survey Samples

Questionnaire 1: You and your descendants receive the capital in 100 years' time.

Questionnaire 2: You and your descendants receive the income from the trust for the next 100 years.

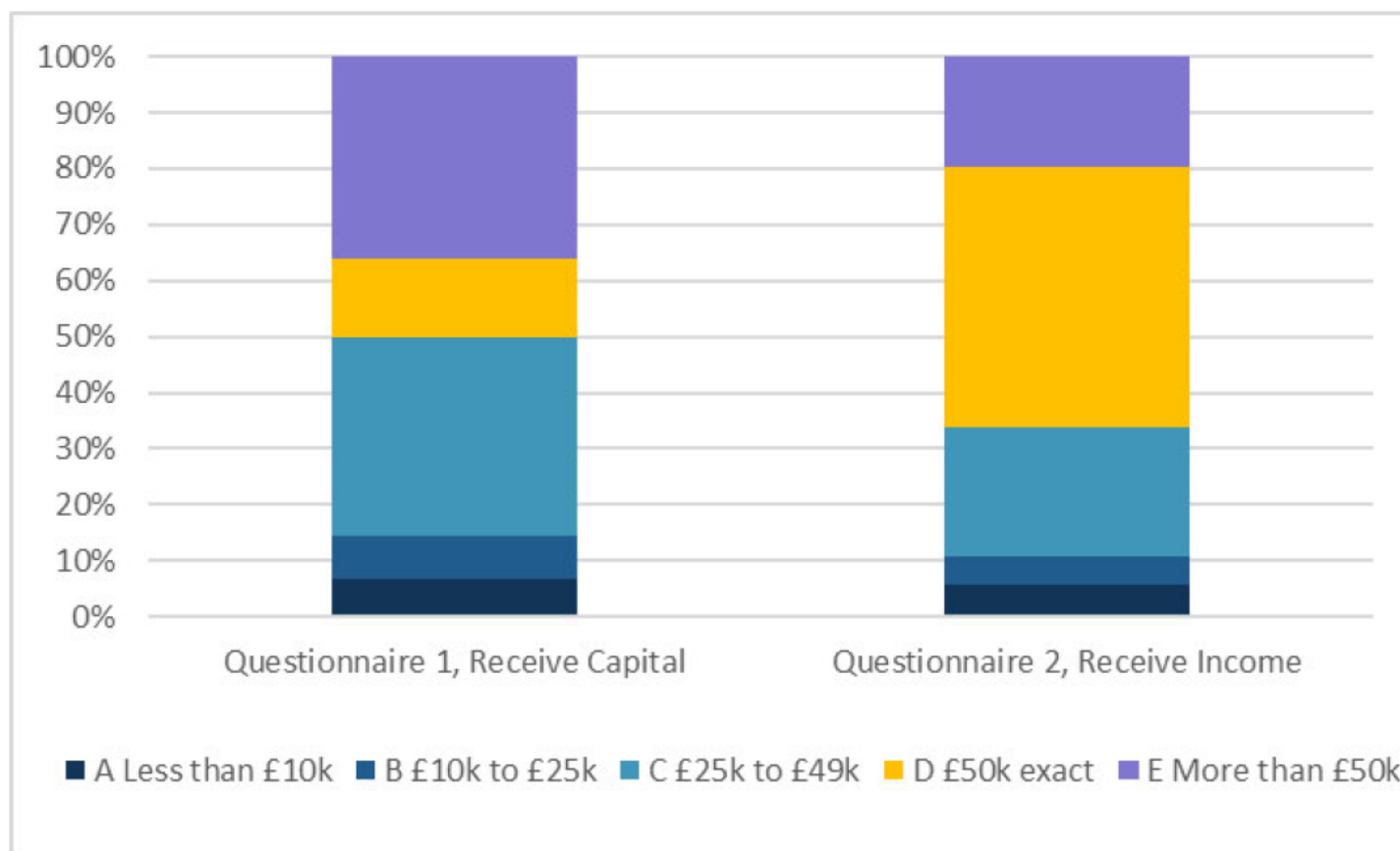
- Each asked to value their own share
- Each then asked to value the other beneficiary's share

	Capital Values	Income Values
A	Less than £10,000	Less than £600,000
B	£10,000 to £25,000	£600,000 to £750,000
C	£25,000 to £49,999	£750,000 to £949,999
D	£50,000 exactly	£950,000 exactly
E	More than £50,000	More than £950,000



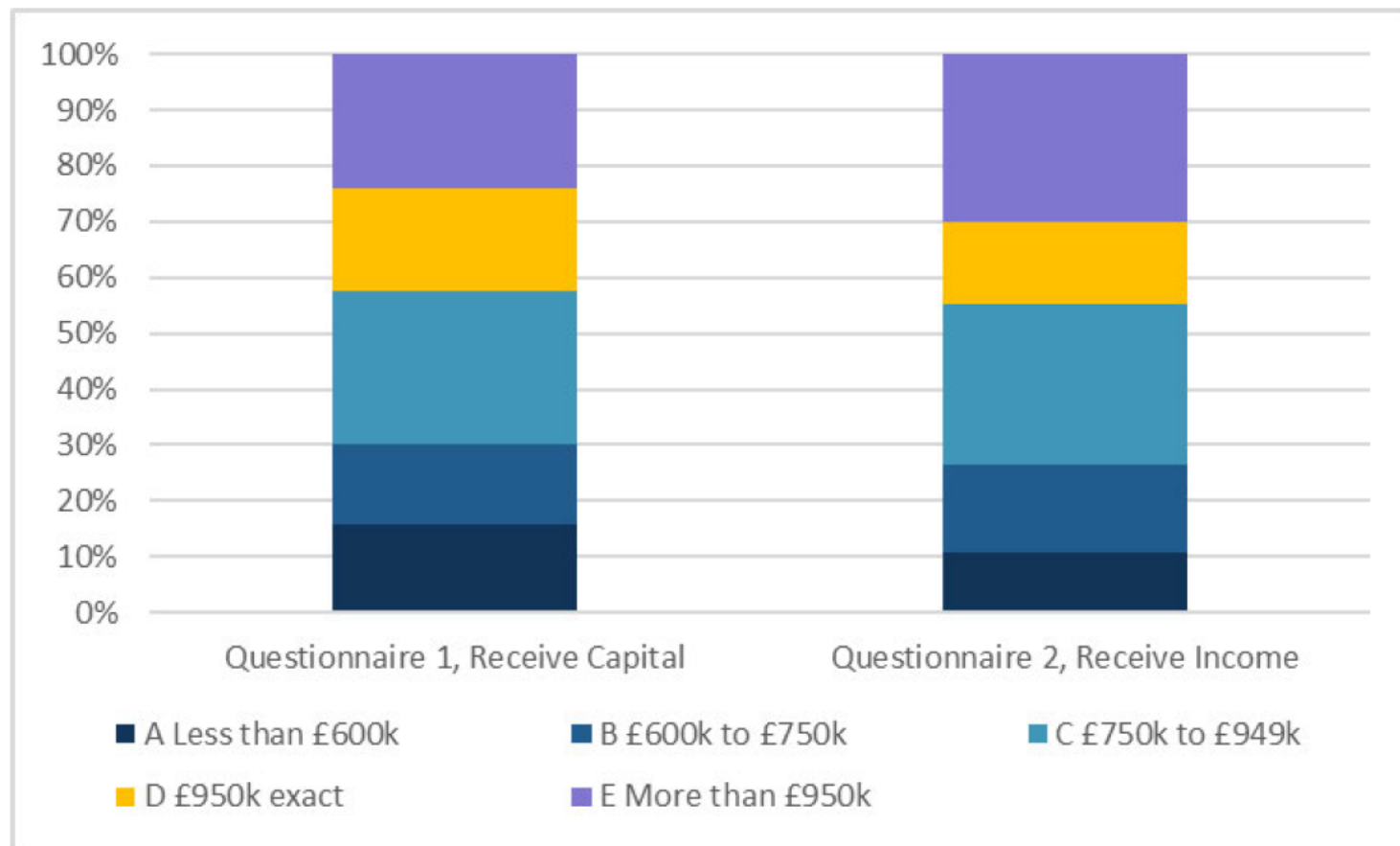
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# Actuarial Example: Capital Values



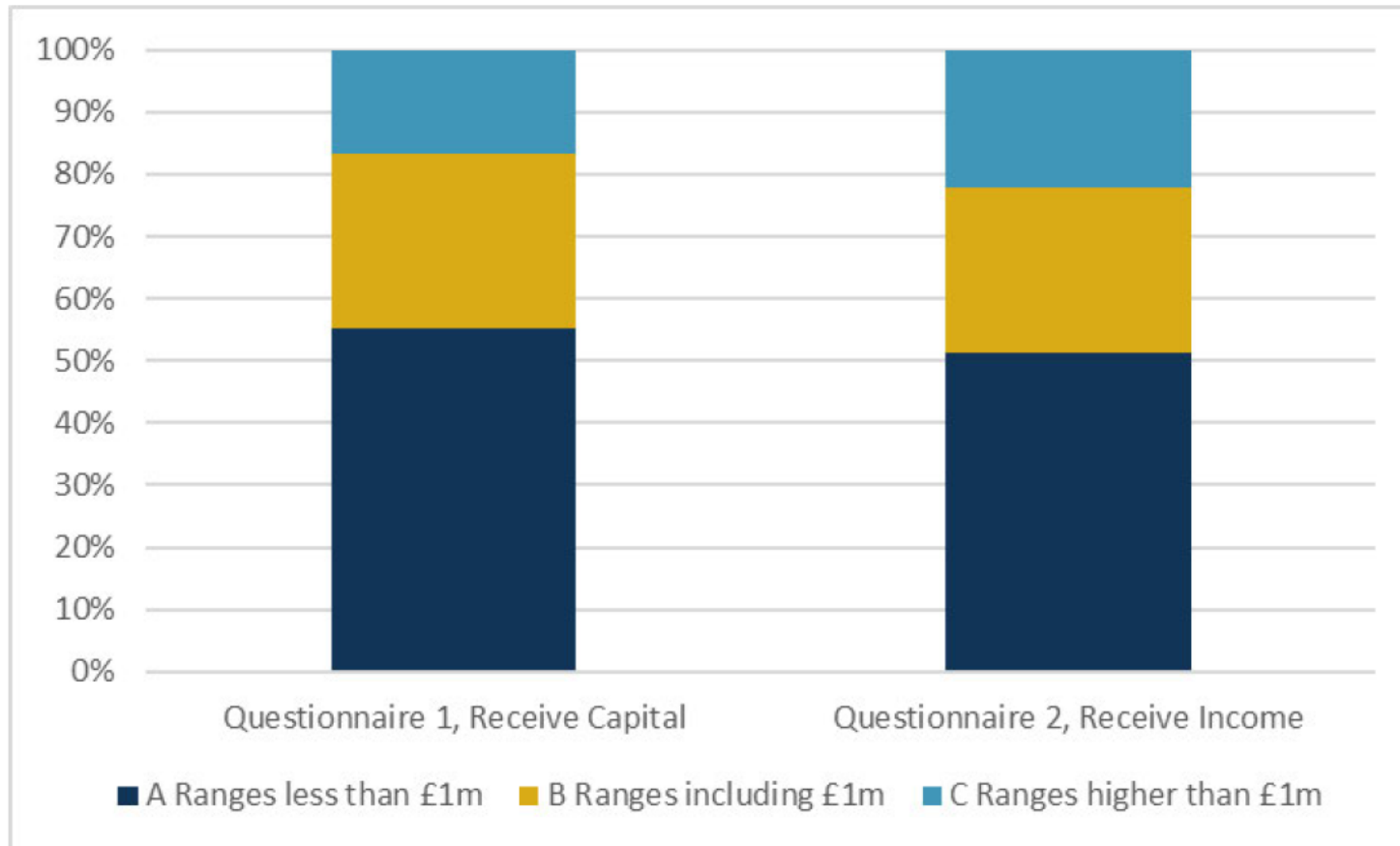
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# Actuarial Example: Income Values



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# Cooks Paradox: Total Values



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# Summary and Conclusions

# Conclusions

- Actuaries do show the same biases as other people
- In some areas actuaries show less bias than other people
  - Probability and statistics
  - Overconfidence
  - BUT bias in a real life actuarial example
- Age, education and experience appear to be key factors in reducing the impact of bias



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# E6: Behavioural Finance for Actuaries

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