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Addressing the limitations of standard economics:
insights from economic psychology.

**Improving decisions at the food, water, energy and
environment nexus: Values and valuation**

Friday 28 November 2014

Imprecision and measurement of economic values

Chris Starmer

jumping off points

- There is **good reason to measure values** that people assign to various (non-marketed) goods
 - E.g. environmental public goods
- Finding good **measurement tools** has proven **problematic**



One well-known issue

Procedure dependence of measured values

Consider evaluating some environmental damage:

WTA to accept
WTP to avoid

Should be 'similar', but typically very different

Some Possible Causes

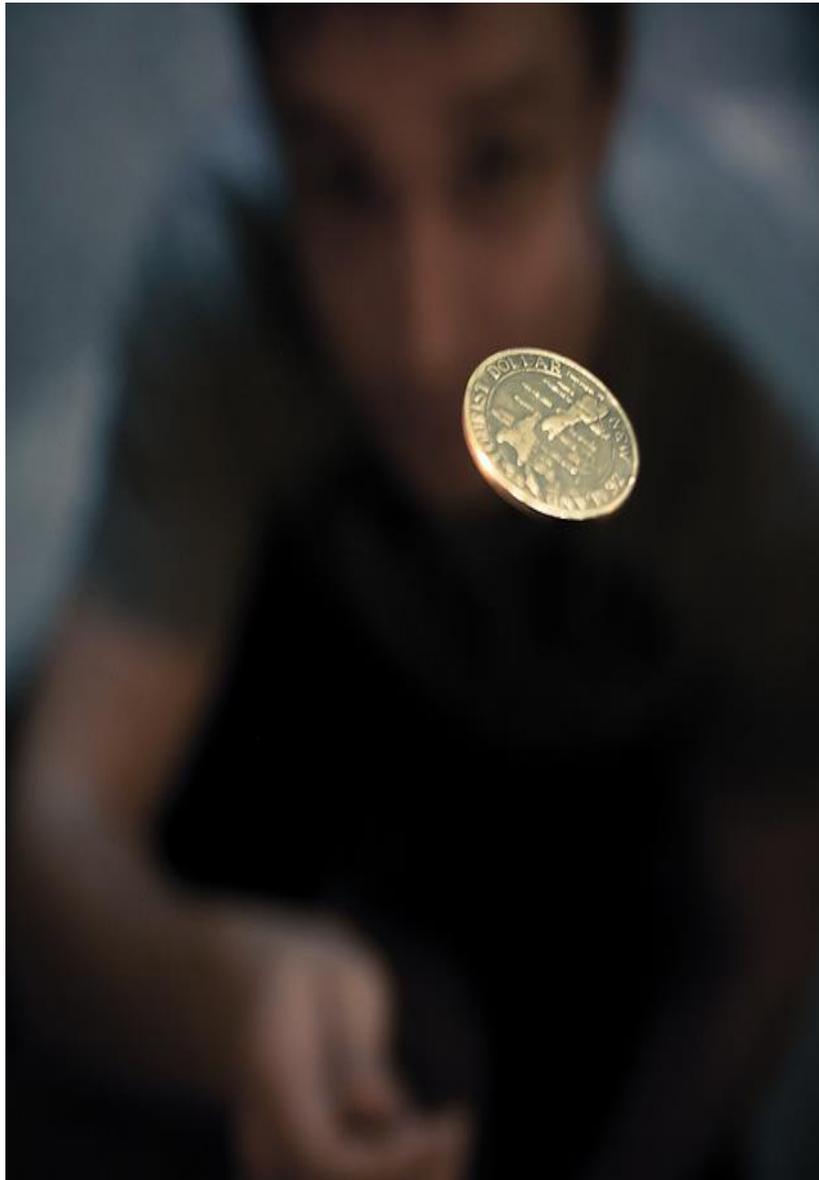
- **Measurement errors**
 - Limitations of measurement tools
- Measurement tools based on **wrong model of values**
 - Loss aversion
- Values **partially articulated**
 - Responses depend on both values and decision processes

Preference *IMPRECISION*

- Relatively new idea for economics
 - Evidence suggests **people do have**, vague or imperfectly articulated values/preferences
- Work underway by “NIBS” researchers:
 - Investigating **nature of imprecision**
 - Builds on earlier work (see refs at end)
- Early days, but concept may help:
 - **Diagnose** problems of measurement
 - **Improve** of measurement tools



Imprecise values - what do you mean?



A thought experiment.....

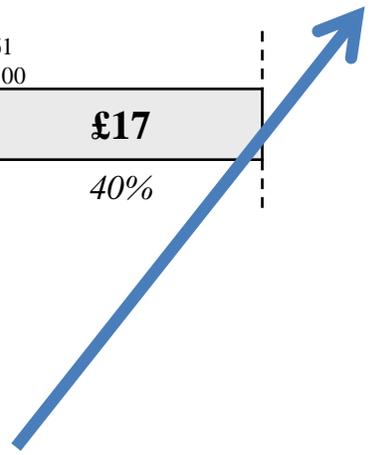
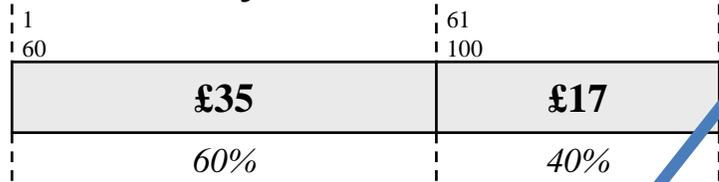
Consider a bet on a coin flip
that gives:

£1000 if heads; Nothing if
tails

**What would *you* pay to
play it?**

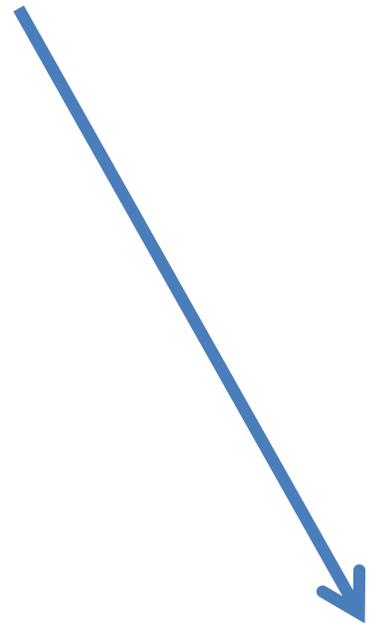
**A TOOL FOR
MEASURING
IMPRECISION**

Lottery:



Response table:

Lowest – highest, 50p increments



	<i>I'm sure I prefer the lottery</i>	<i>I'm not sure about my preference</i>	<i>I'm sure I prefer the certain amount</i>
For £17.00			
For £17.50			
For £18.00			
For £18.50			
For £19.00			
For £19.50			
For £20.00			
For £20.50			
For £21.00			
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For £32.50			
For £33.00			
For £33.50			
For £34.00			
For £34.50			
For £35.00			

	<i>I'm sure I prefer the lottery</i>	<i>I'm not sure about my preference</i>	<i>I'm sure I prefer the certain amount</i>
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For £26.50			
For £27.00			

Lottery:

1 60	61 100
£35	£17
60%	40%

1. Identify range where, 'sure' preference for lottery
2. Identify range where, 'sure' preference for money
3. Identify range where 'not sure'

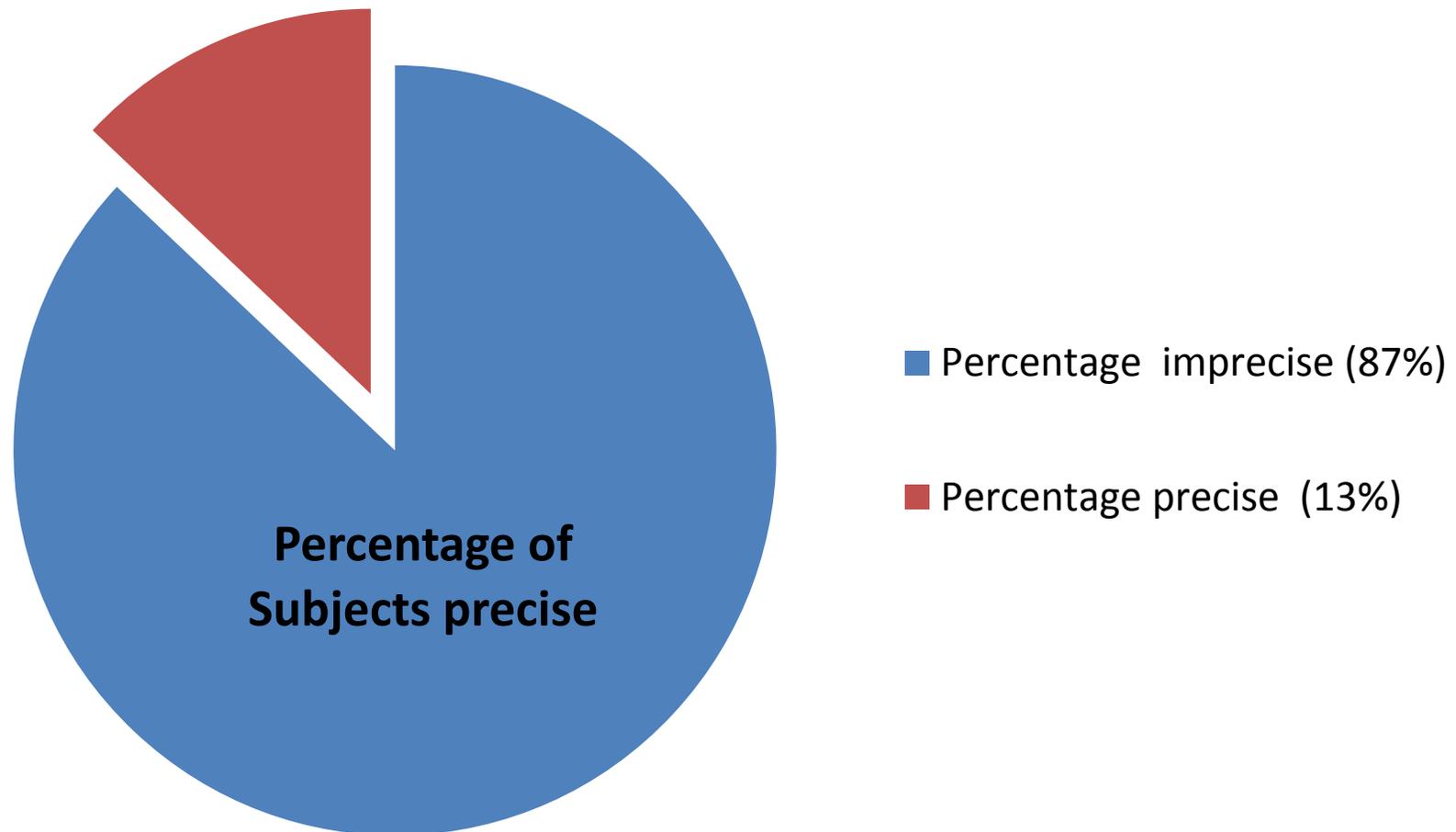
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For £35.00			

“Imprecision Interval”

**SOME THINGS
WE LEARNED
SO FAR.....**

Imprecision is **pervasive**

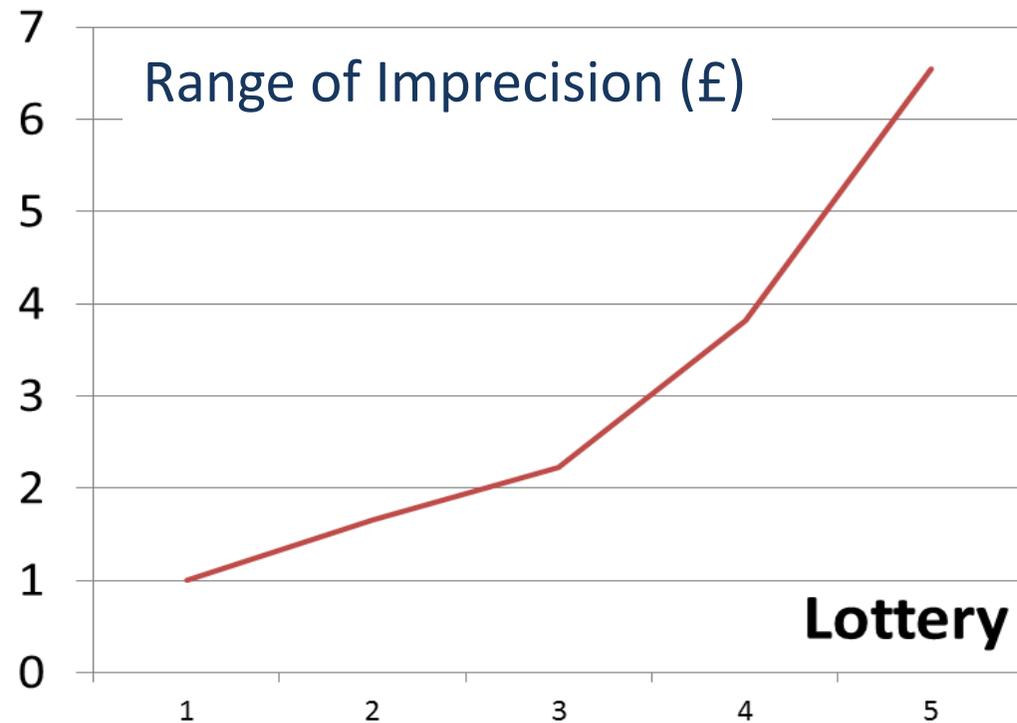
On average, 87% of subjects reveal some degree of imprecision (across range of tasks)



Imprecision behaves **coherently**

- e.g. wider imprecision interval for 'more risky' objects

Lottery	60%	40%
1	14	18.4
2	13	19.5
3	12	21
4	10	24
5	6	30

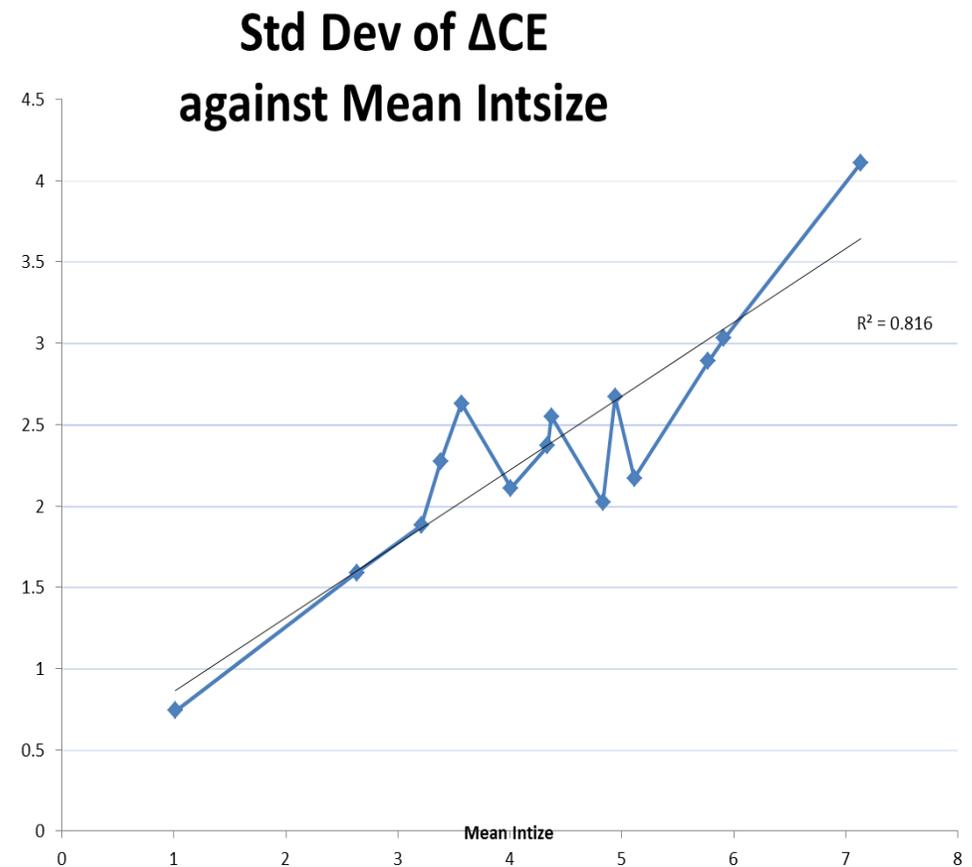


Imprecision **stable** on repeat measurement

- Test via **repeated measurement**:
 - Valuation of same risk
 - Same individual
 - 2 different occasions
 - 14 different lotteries
- At task level (averaged across individuals)
- Degree of **imprecision is stable**
 - That is, no tendency for imprecision intervals to shrink (or grow)

Imprecision and Noise

- For a given risk
- Average imprecision interval width highly correlated with **variability of point estimates of values**



Can imprecision analysis help develop better valuation tools?

Maybe – for example consider

Tools: *To what extent are known measurement anomalies **explained** by imprecision?*

Learning: *do **reflection or experience** reduce imprecision
If so, are changes systematic?*

Evaluation: *How much do people **care** about variation in decisions in range of imprecision?*

*Not sure and **{don't care much}** vs **{really want to get it right}***