

Dual processing theories of thought

System One/ X- system Intuitive	System Two C- System Reflective
Process Characteristics	
Automatic	Controlled
Effortless	Effortful
Associative	Deductive
Rapid, parallel	Slow, serial
Process opaque	Self aware
Skilled action	Rule application
Content on which processes act	
Affective	Neutral
Causal propensities	Statistics
Concrete, specific	Abstract
Prototypes	Sets

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Cognitive reflection task: How much does the ball cost?


(I) A bat and a ball cost \$1.10 in total. The bat costs a dollar more than the ball. How does the ball cost?

(II) If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

(III) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half the lake?

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Self deception or perception is reality

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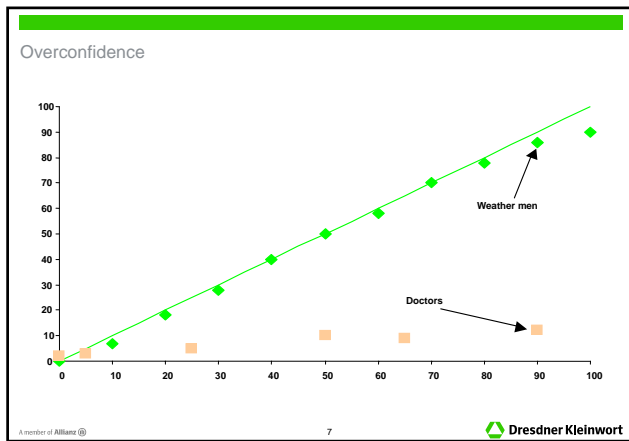
Self deception

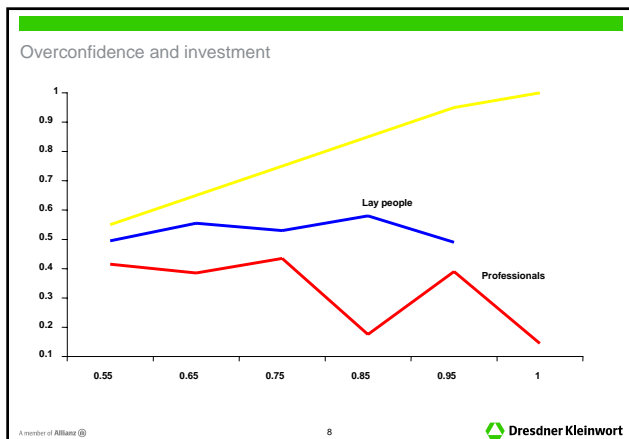
- Over-optimism
 - People tend to exaggerate their own abilities
 - Illusion of control
 - Illusion of knowledge
- Over-confidence
 - People are surprised more often than they expect. Not well calibrated.
 - Confidence intervals around a forecast which should yield 2% error, actually get a 30-40% error

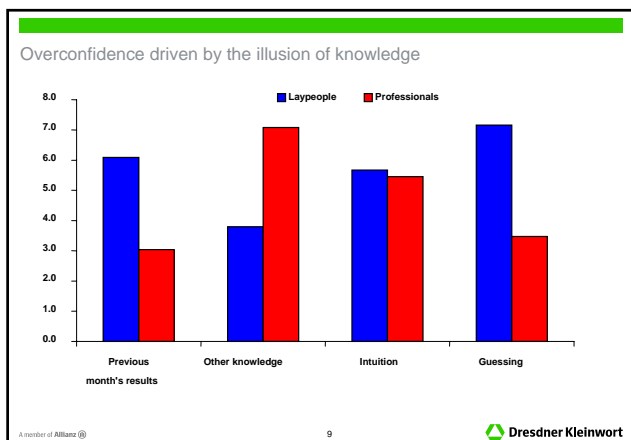
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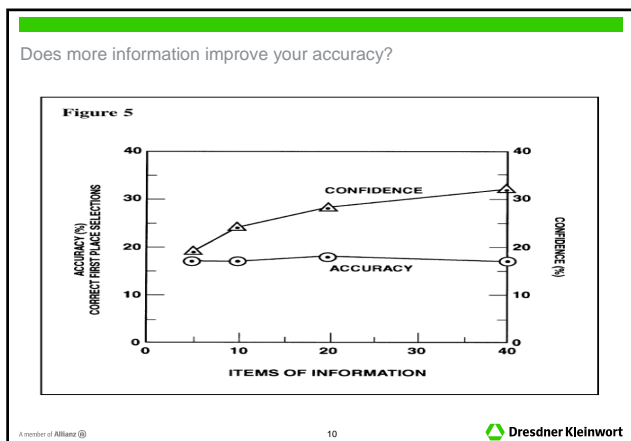
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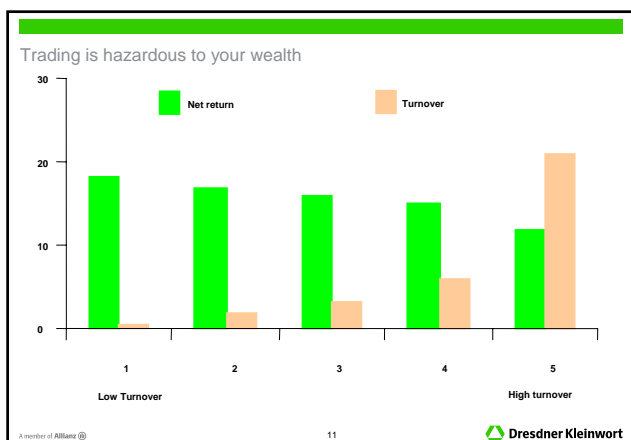
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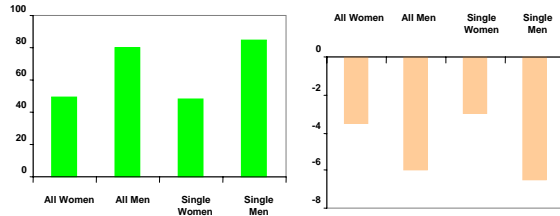








Should traders be women?



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Beauty contest

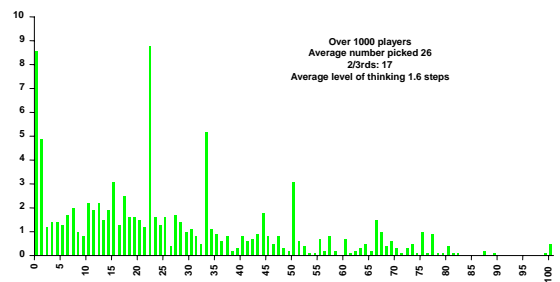
Professional investment may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the price being awarded to the competitor whose choice most nearly corresponds to the average preference of the competitors as a whole; so that each competitor has to pick, not those faces which he himself finds prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view. It is not a case of choosing those which, to the best of one's judgement, are really prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practise the fourth, faith and higher degrees. -JMK 1936

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Keynes's beauty contest and investment professionals



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Self deception

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Self attribution bias

- Good outcomes are a testament to your skill, bad outcomes are sheer bad luck.
- How often do you say that's just a blip?

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Hindsight bias

- It is a common observation that events in the past appear simple, comprehensible, and predictable in comparison to events in the future. Everyone has had the experience of believing that they knew all along the outcome of a football game, a political election or a business investment. The hindsight bias is the tendency for people with outcome knowledge to believe falsely that they would have predicted the reported outcome of an event. After learning of the occurrence of an event, people tend to exaggerate the extent to which they had foreseen the likelihood of its occurrence.

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Psychological Foundations

II. Heuristic Simplification

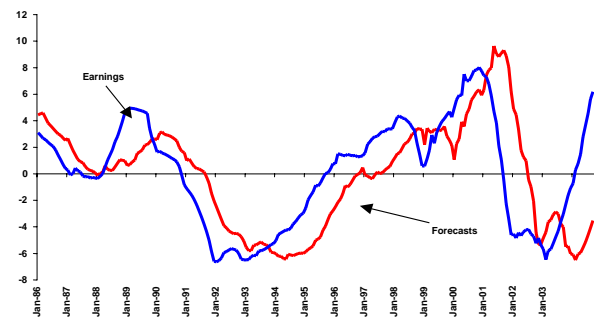
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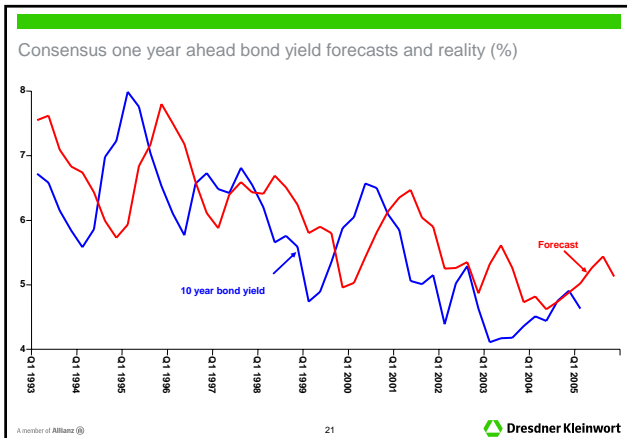
There is no such thing as context free decision making

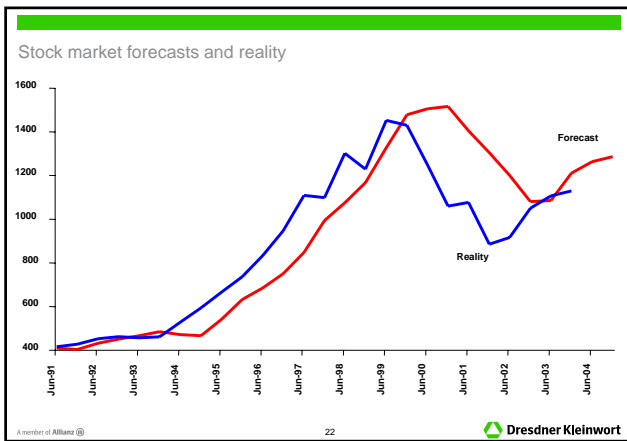
Heuristic Simplification

- Conservatism Bias
 - Hard to give up a view once it has formed. Leads to:
- Anchoring and slow adjustment
 - Depends upon saliency of the anchor
 - i.e. analysts will change their views from their forecasts slowly

Analysts lag reality







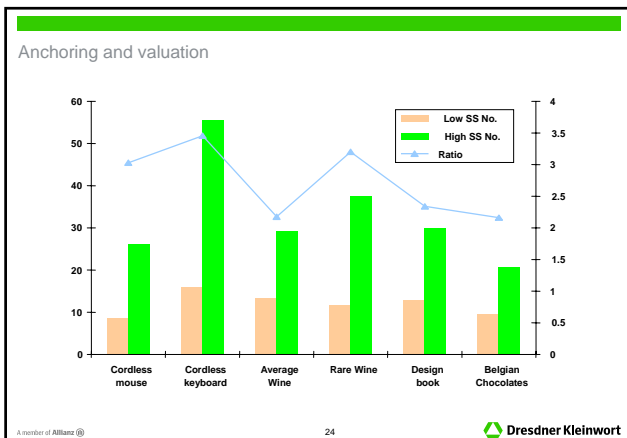
Simple maths leads to anchoring

- $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ = median answer 2250
- $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$ = median answer 512
- Actual answer = 40,320

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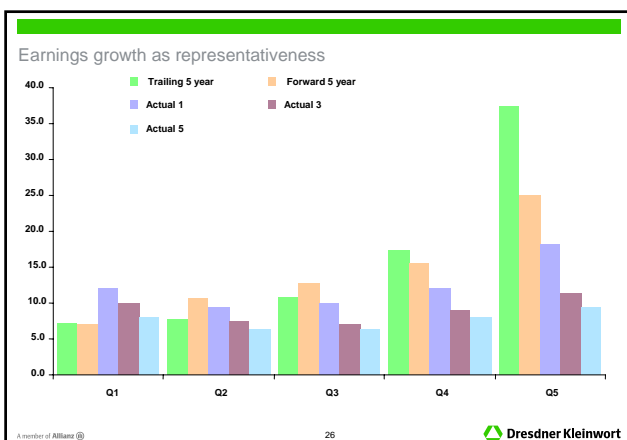
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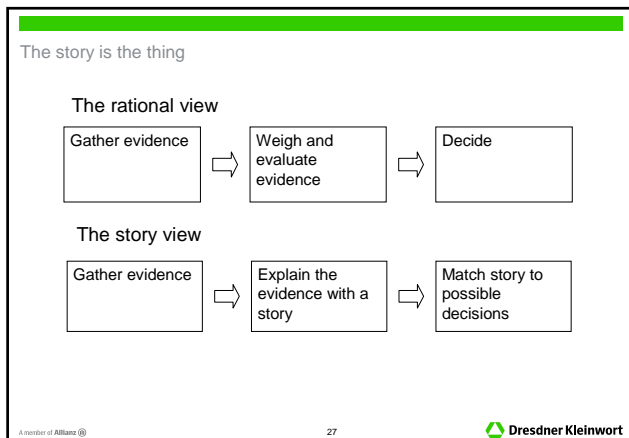


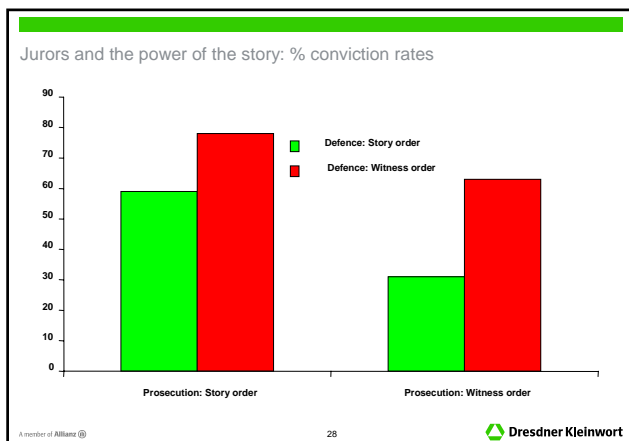
Psychological foundations

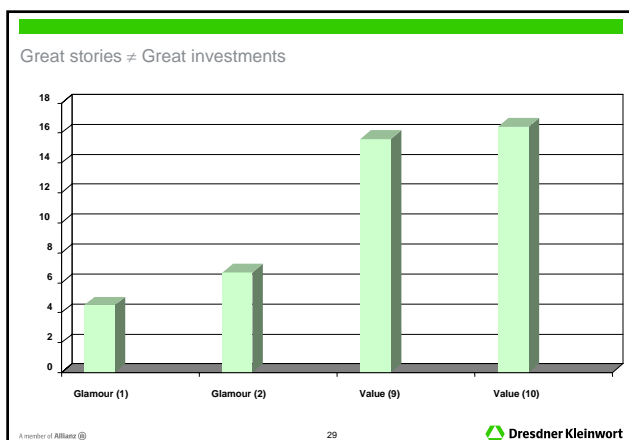
- Linda is 31, single, outspoken and very bright. She majored in philosophy. As a student she was deeply concerned with issues surrounding equality and discrimination.
- Is it more likely that Linda is
 - Works in a bank
 - Works in a bank and is active in the feminist movement

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Bias of Judgement

- Availability Bias
 - Which is a more likely cause of death in the US – being killed by a lightening strike or as a result of a shark attack?
 - Shark attacks receive more publicity, they are easier to imagine (thanks to Jaws). However, the chance of dying from a lightening strike are 30x greater than chances of being killed by a shark.

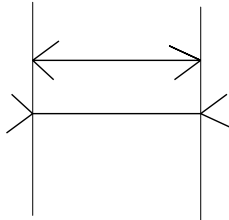
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Narrow Framing

- Context sensitivity. Aka frame dependence or mental accounting.
- We can't see through how things are actually framed.
- Separate funds for separate purposes – holiday money, house keeping



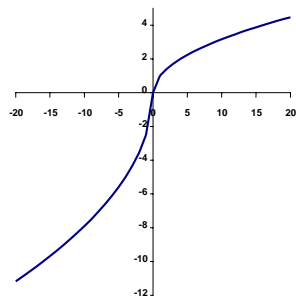
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Prospect Theory

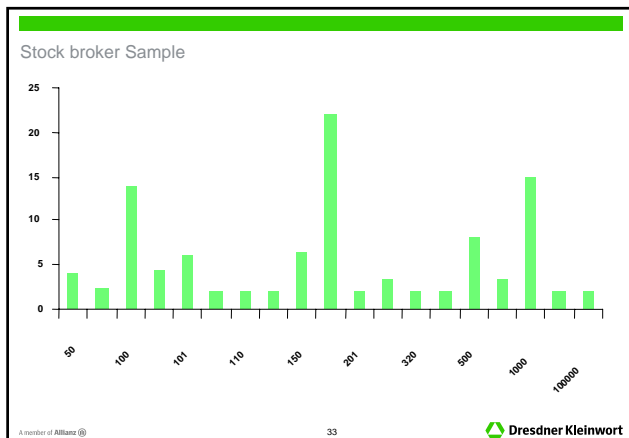
- People value changes not states. Rational man tries to maximise the utility of wealth.
- Real people worry far more about gains and losses than levels.



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Prospect theory

- Leads to
 - Endowment effect
 - Status quo bias
 - Disposition effect

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The Monty Hall Problem

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The Monty Hall problem

1 2 3

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The maths of the Monty Hall Problem

The a priori probability that the prize is behind door X, $P(X) = 1/3$

The probability that Monty Hall opens door B if the prize were behind A, $P(\text{Monty opens B} | A) = 1/2$

The probability that Monty Hall opens door B if the prize were behind B, $P(\text{Monty opens B} | B) = 0$

The probability that Monty Hall opens door B if the prize were behind C, $P(\text{Monty opens B} | C) = 1$

The probability that Monty Hall opens door B is then $p(\text{Monty opens B}) = p(A) * p(\text{M.o. B} | A) + p(B) * p(\text{M.o. B} | B) + p(C) * p(\text{M.o. B} | C) = 1/6 + 0 + 1/3 = 1/2$

Then, by Bayes' Theorem,

$P(A | \text{Monty opens B}) = p(A) * p(\text{Monty opens B} | A) / p(\text{Monty opens B}) = (1/6) / (1/2) = 1/3$
 and $P(C | \text{Monty opens B}) = p(C) * p(\text{Monty opens B} | C) / p(\text{Monty opens B}) = (1/3) / (1/2) = 2/3$

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Top tips for better decision making

- This applies to me, you and everyone else
- You know less than you think you do
- Be less certain in your views, aim for timid forecast and bold choices
- Don't get hung up on one technique tool, approach or view – flexibility and pragmatism are the order of the day
- Listen to those who don't agree with you

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Top tips for better decisions

- You didn't know it all along, you just think you did
- Forget relative valuation, forget market prices, work out what the stock is worth (Use reverse DCFs)
- Don't take information at face value, think carefully about how it was presented to you
- Don't confuse good firms with good investments, or good earnings growth with good returns

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Top tips for better decisions

- Vivid, easy to recall events are less likely than you think they are, subtle causes are underestimated
- Try to focus on facts, not stories
- Sell your losers and ride your winners

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