

# Applying Psychology to Enhance Project Management

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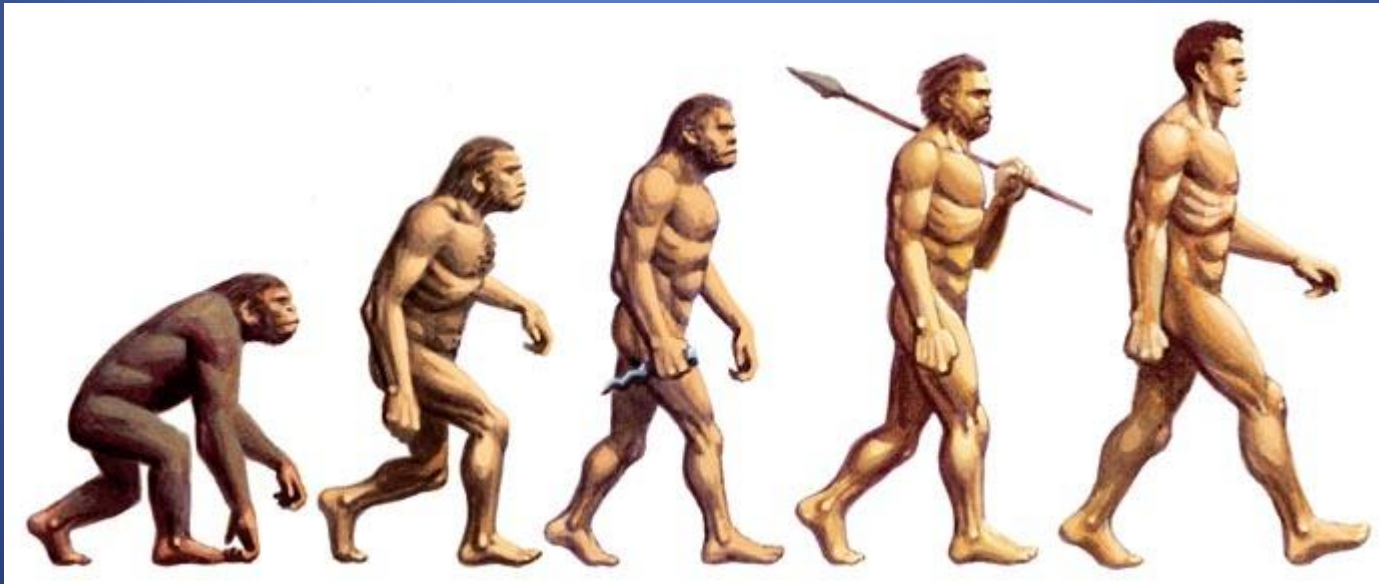
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# Some Areas Psychology Affects Projects

- Selecting people for the project
- Motivation
- Leadership
- Group Dynamics
- Influence
- Problem Solving
- Decision Making (e.g. Estimation)

# What does evidence-based mean?

Personal opinion   Anecdotal evidence   Surveys   Experiments   Randomised control trials   Meta-analysis   Large-scale widely replicated studies



*(Meta-analysis combines the results of tens to hundreds of individual studies (which may differ in their findings), over thousands of people, in order to draw more robust, large-scale conclusions.)*

# Evidence

- Ideally we need a good quality, robust, well replicated, large-scale body of evidence upon which to base practice.
- We are still a long way from that.
- As things stand now, in order to apply psychology to project management you should really use interventions which are backed by good quality evidence.
- You need to *critically* assess models, products and consultancy offered to you. You may need help for this.
- You should evaluate the *outcomes* of any interventions to *measure* their effectiveness.

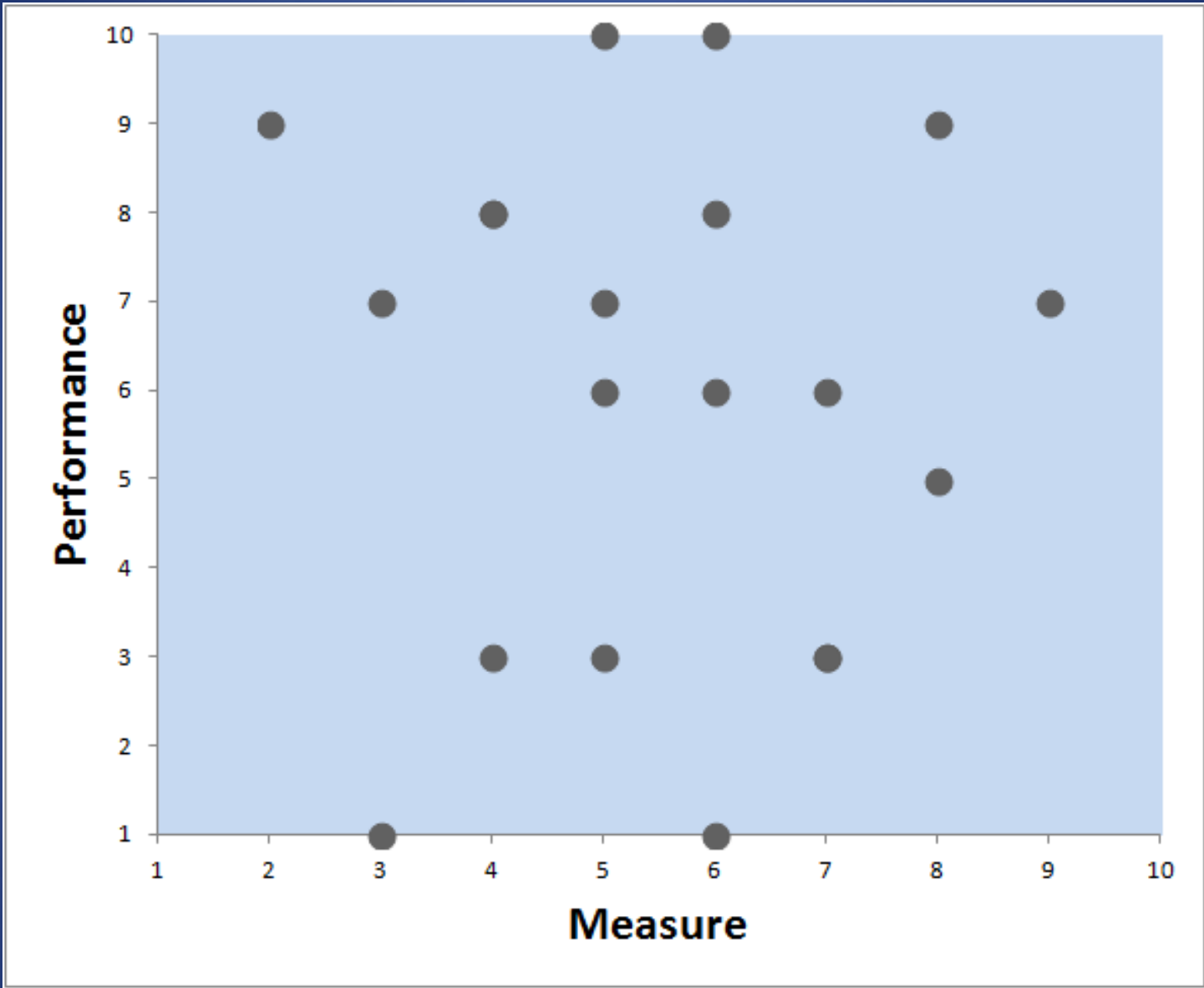
# Personnel Selection

*Getting the right people on the bus...*



# Personnel Selection: Validity

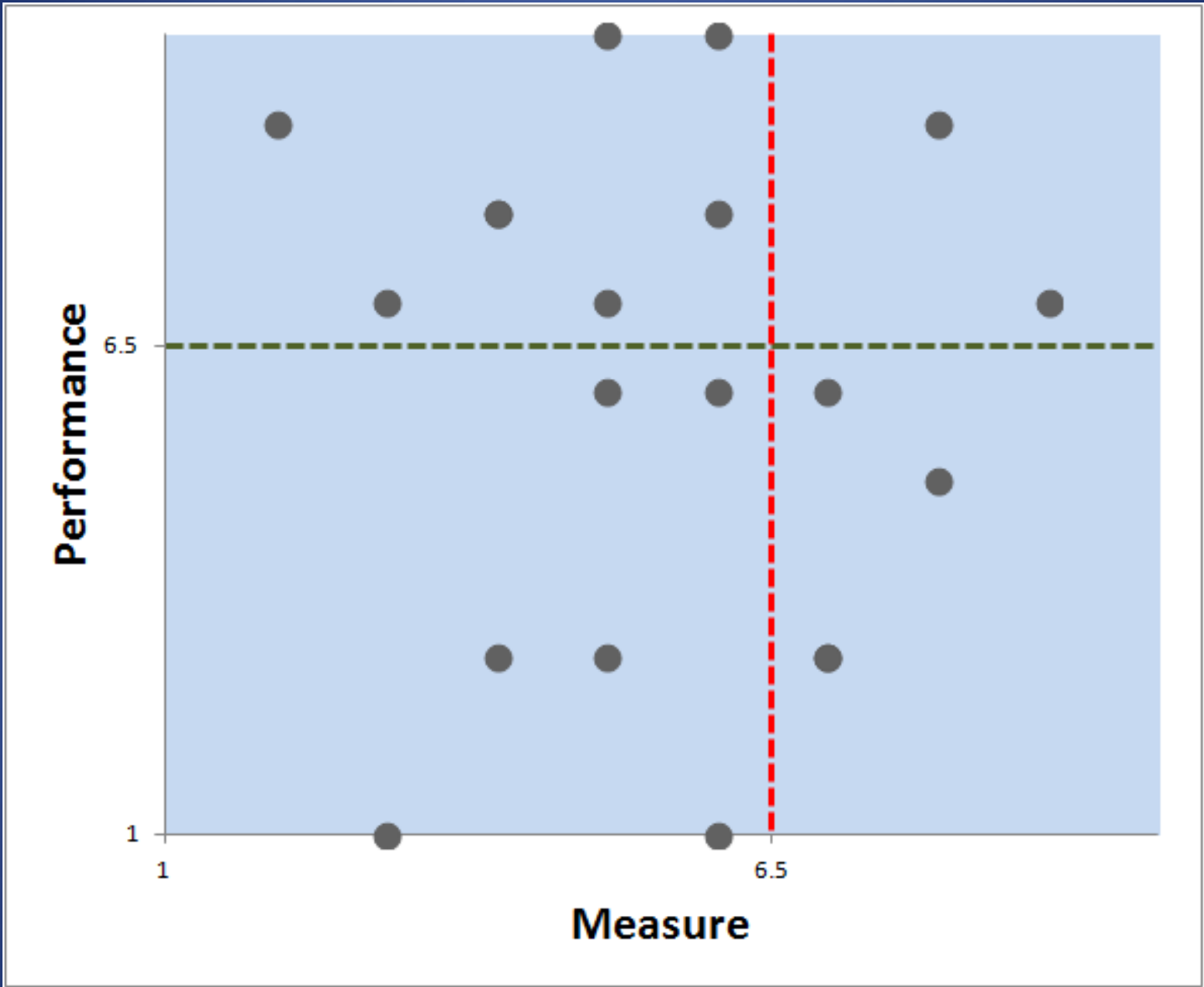
- A key idea is predictive validity. Does your assessment method predict performance?
- Imagine you give 18 people a test or scored interview which, for each person, results in a measure on a 1-10 scale; then hire all 18; and then get manager performance ratings for them, 6 months later, on a 1-10 scale.
- You could get a result like this:



# Personnel Selection : Validity

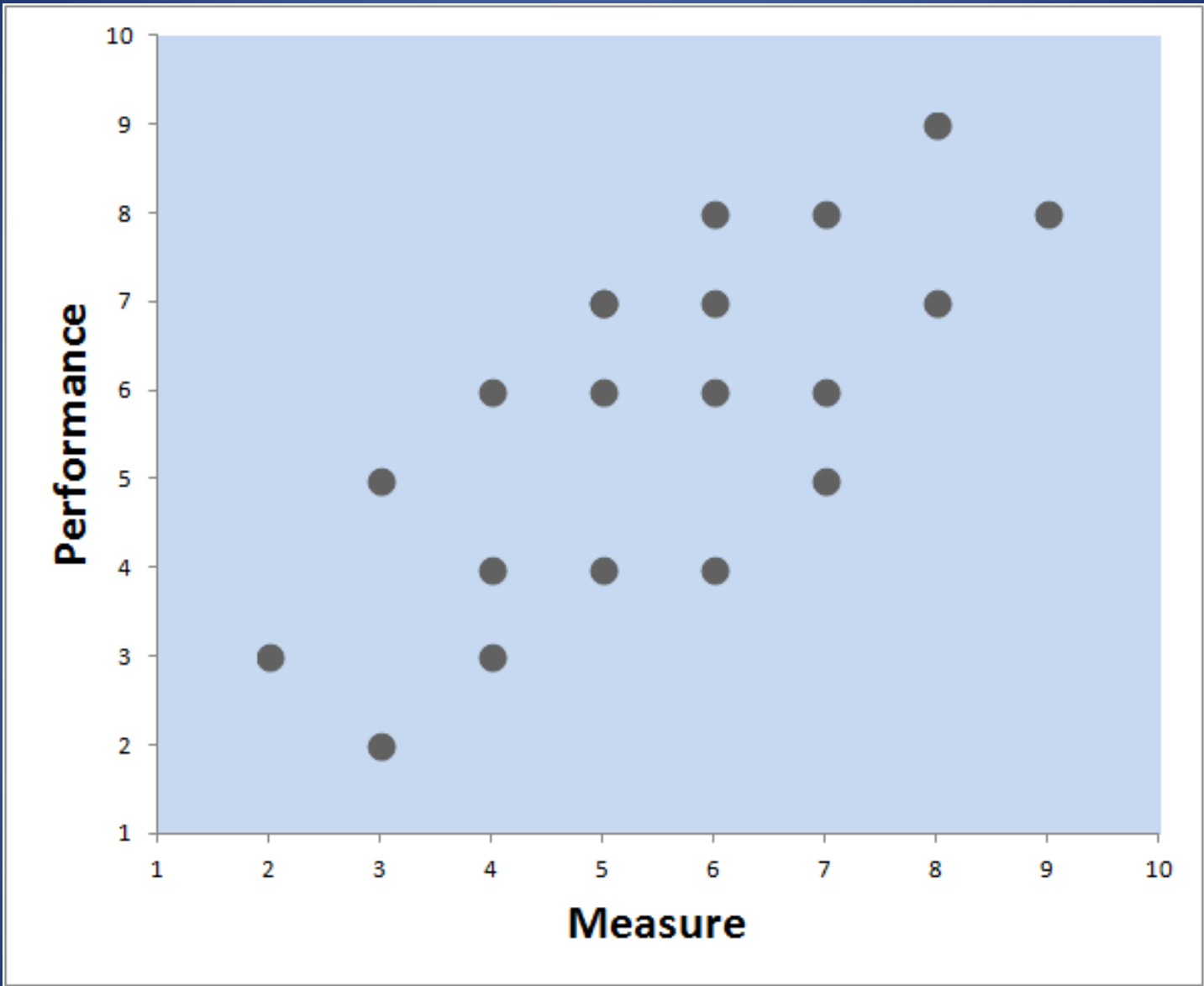
- This shows a validity of 0 i.e. A correlation between measure and performance of 0.
- If, instead of hiring the 18, you had used the assessment to decide who to hire, had decided to hire people scoring above 6 on the assessment and defined good performance as scoring above 6, you would have hired more poor performers than good (i.e. hits versus false alarms) and rejected 7 good performers (i.e. misses or the ones that got away).





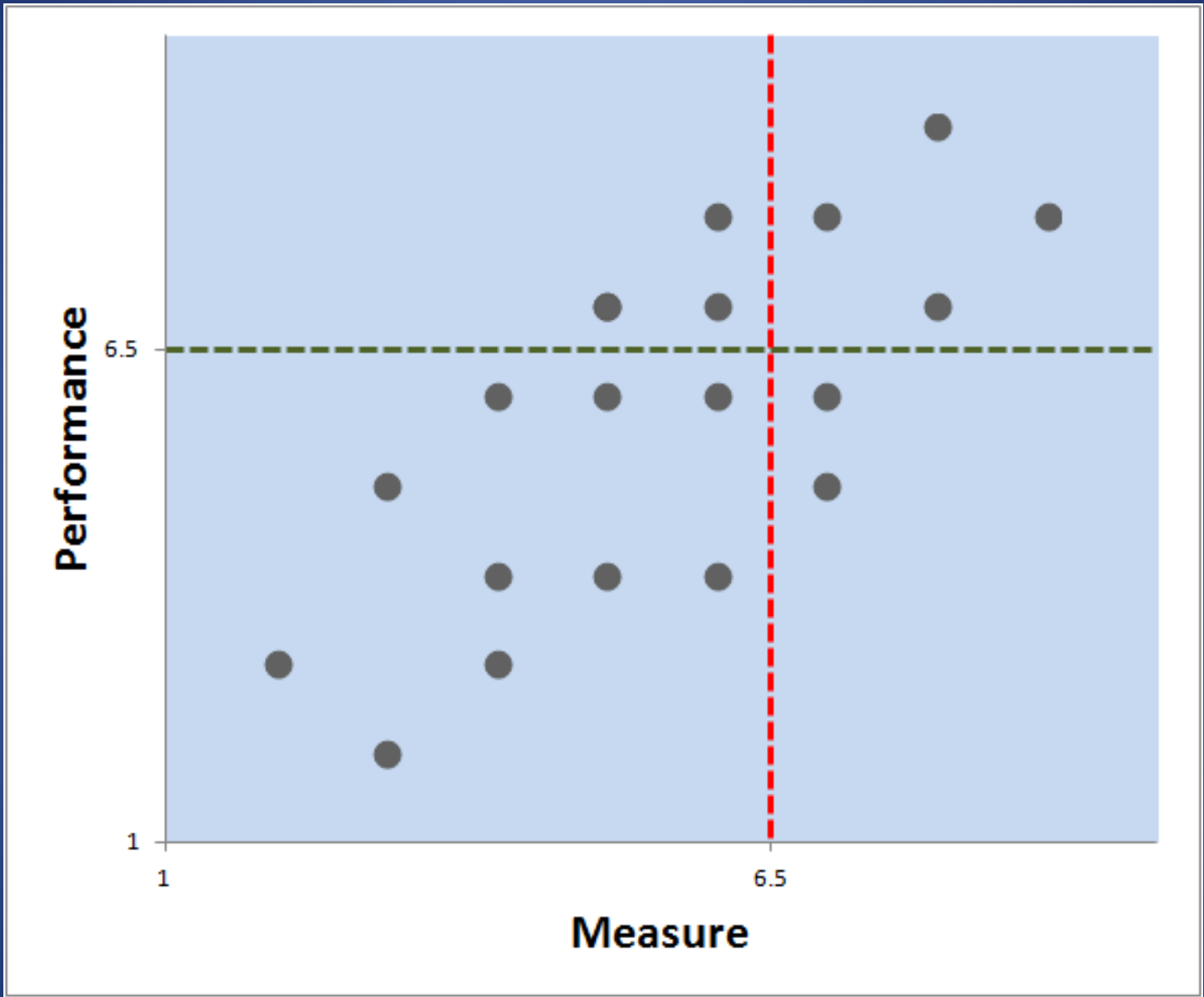
# Personnel Selection : Validity

- The next slide shows what could happen if you re-ran the exercise using an assessment method that produces a predictive validity of 0.7. (A correlation of 1 means a perfect straight line relationship between measure and performance).



# Personnel Selection: Validity

- Using the method with higher validity and the same threshold values means you would have hired relatively more high performers and rejected fewer good performers.



# Personnel Selection: Personality

- So let's look at Personality as an assessment measure.
- The 'industry standard' model is the 5 factor model. It is based on looking at the results of millions of questionnaires, applying a statistical technique called factor analysis which produces a top level grouping of characteristics. This categorisation is broadly robust across the world.

# 5 Factor Model of Personality

Extraversion

Emotional  
Stability

Conscientiousness

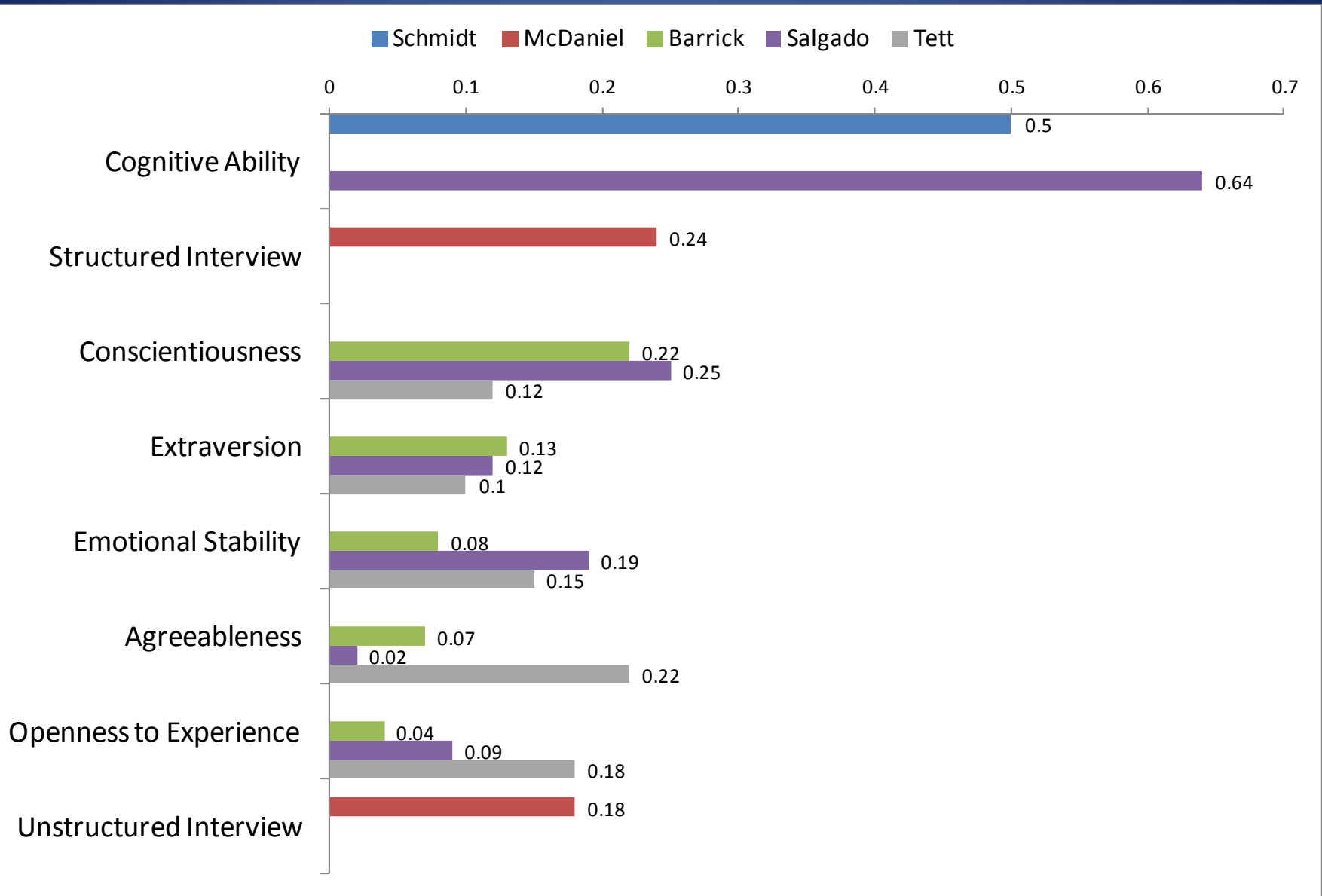
Agreeableness

Openness to  
Experience

# Personnel Selection: Personality

- So how well does Personality predict job performance?
- Over the years, many meta-analysis studies have been carried out. The next slide shows the results of 3 which aggregate the results of hundreds of individual studies and comparisons carried out on tens of thousands of people.





# Personnel Selection: Personality

- Validity for personality ranges from around 0 to 0.25.
- 0.25 is low-moderate.
- Over the three meta-analyses, the personality factor most predictive of performance (in general, over a wide range of jobs) seems to be conscientiousness. (Which is quite project management related e.g. Achievement oriented, detail oriented, dutiful, self-disciplined, organised, ordered, deliberate, planful).
- 0.25 is not a high level of validity but if you used it over a large number of people you would, on average, hire better performers than you would if you selected at random.

# Personnel Selection: Interviews

- McDaniel carried out a meta-analysis of over 400 individual studies of the relationship between interviews and performance, including results from over 86,000 people.
- The correlations are in a similar range as personality.
- Structured interviews are somewhat better than unstructured.
- Psychologists don't recommend unstructured interviews as they are prone to bias.

# Personnel Selection: Cognitive Ability

- Schmidt and Hunter, in several meta-analyses, examined hundreds of individual studies comparing cognitive ability (intelligence) with performance and obtained an overall validity around 0.5. It is lower for manual work and higher, up to 0.7, for more technically demanding work.
- So a half hour numerical, verbal or abstract reasoning test buys you much more predictive validity than an interview or a personality questionnaire. It is even more predictive than a half or full day assessment centre (validities are around .3 to .4).
- You have to take into account 'adverse impact' though. Ethnic groups differ in their average scores so you don't want to discriminate against any group.
- By combining cognitive ability with other assessments you can gain 'incremental validity' – i.e. slightly higher validity than cognitive ability alone.

# Personnel Selection: Competencies

- Another approach widely used for selection is competencies. They are not without problems.
- There is no single widely accepted competency framework. Most organisations use their own idiosyncratic framework. Dave Bartram at SHL compiled a large number, and aggregated them to create The Great 8 (next slide). He shows how they relate to personality, motivation and intelligence. But his model is proprietary and not universally accepted.

# Personnel Selection: Competencies

SHL Great 8 “Universal” Competencies	Big 5 Personality Factors		Motivations
Leading and Deciding			Need for Power
Supporting and Co-operating	Agreeableness		
Interacting and Presenting	Extraversion		Need for Affiliation
Analysing and Interpreting		Cognitive Ability	
Creating and Conceptualising	Openness to Experience		
Organising and Executing	Conscientiousness		
Adapting and Coping	Emotional Stability		
Enterprising and Performing			Need for Achievement

# Competencies: How do you measure them?

- Competencies are used throughout the talent management flow from recruitment to performance management and leadership development. For in-role employees, 360-degree feedback effectively measures perceptions of competencies.
- For recruitment, we use structured, competency-based interviews where candidates' narratives of examples of competency behaviour have to be mapped onto a rating. This is not always straightforward or done consistently between interviewers or across candidates.
- For young candidates, people from different backgrounds have different opportunities to build up competency narratives. More affluent young people have more opportunities e.g. internships, even though they may not be any more capable than less privileged candidates.

# Competencies: What are they anyway?

- “an underlying characteristic of a person which results in effective and/or superior performance in a job” (Klemp, 1980)
- “an underlying characteristic of a person ... may be a motive, trait, skill, aspect of one’s self-image or a social role or a body of knowledge which he or she uses” (Boyatzis, 1982)
- In other words – competencies are just about anything!
- My personal recommendation is, in hiring, measure the underlying components i.e. motivation, personality traits and skills.



# And what do you mean by performance?

- One other complicating factor in considering validity is what do you mean by performance?
- A manager appraisal rating may not fully capture the range and multi-dimensional nature of performance. A 1-5 scale does not differentiate the good from the great. There is job performance and contextual performance (being a team player, helping colleagues etc). There are also objective measures, and performance can change over time.
- And do you want to be hiring people just to do a job now or are you looking for candidates who have the potential to be leaders in the future?

# Recruitment Selection: Summary

- Be clear what outcome(s) you are looking for.
- Put a premium on:
  - Can do: Cognitive ability and conscientiousness are great but are they enough?
  - Will do: Drive, motivation
  - Socially rewarding: co-operative, team player who you will enjoy working with.
- Minimum assessment: Cognitive ability test + personality questionnaire
- Optionally a skills test + interview by a skilled interviewer (Google don't let line managers interview)
- Set up feedback loops to measure the links between your assessment process and key outcomes in order to track and improve its predictive validity.

# Motivation



# Motivation

- This is another massive subject but three perspectives are:
  - Content / Direction
  - Effort
  - Goal setting

# Motivation: Content

- There is intrinsic versus extrinsic motivation. The idea being that people are more willing to put extra effort into something they are genuinely interested in (intrinsic) than an externally imposed activity to gain a reward or avoid a punishment (extrinsic).
- There is an overlap in meaning between motivation, drive, needs and values.
- Maslow's hierarchy of needs is often mentioned but he never collected any evidence to support his ideas (e.g. are any of the needs he came up with wrong? did he miss any? Do they form a hierarchy?).
- David McClelland interviewed managers using 'projective' techniques and came up with the needs for Power, Affiliation and Achievement (see the competencies slide).
- Steven Reiss gave 4000 people a long list of motivations and analysed the answers statistically with factor analysis and came up with a list of 16 primary needs (or motivations, next slide). Tapping into an individual's preferences should provide intrinsic motivation.

Motivation	Description
Acceptance	the need to be appreciated
Curiosity	the need to gain knowledge
Eating	the need for food
Family	the need to take care of one's offspring
Honour	the need to be faithful to the customary values of an individual's ethnic group or family
Idealism	the need for social justice
Independence	the need to be distinct and self-reliant
Order	the need for an established and conventional environment
Physical activity	the need for work out of the body
Power	the need for control of will
Romance	the need for mating or sex
Saving	the need to accumulate something
Social contact	the need for relationship with others
Social status	the need for social significance
Tranquility	the need to be secure and protected
Vengeance	the need to strike back against another person

# Motivation: Degree of Effort



(This is based on Vroom's expectancy theory).

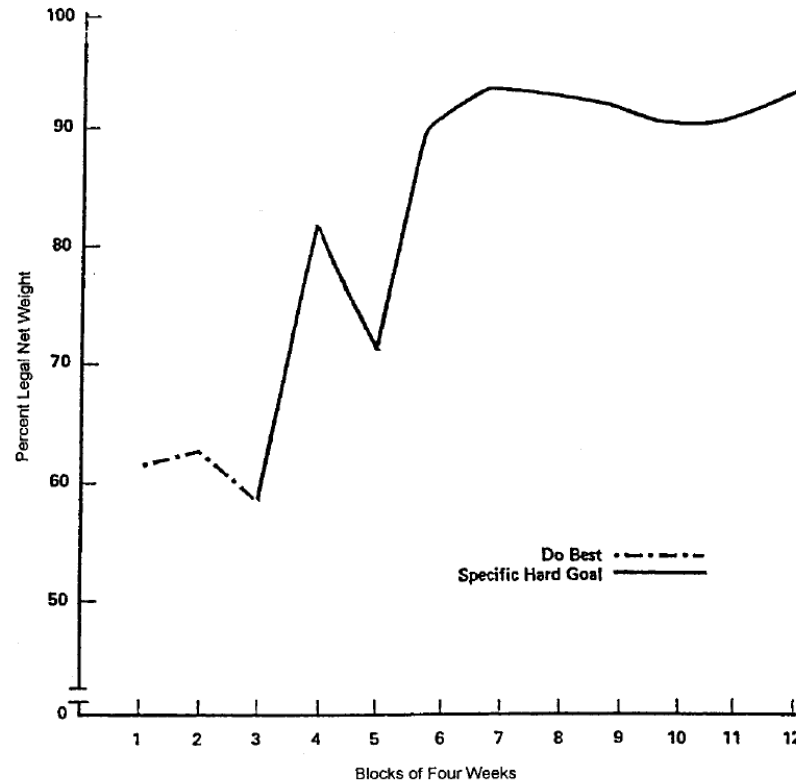
# Motivation: Goal Setting

- Based on a large number of studies over several decades Locke & Latham found that just asking people to 'do their best' is not enough. You need to:
- Set clear and specific goals
- Set challenging goals (not too easy, not impossible. See chart on next slide.)
- Ensure goal commitment
- Provide feedback
- For more complex tasks, split into more manageable chunks.
- If there is uncertainty of outcome, use learning (rather than performance goals)



# Motivation: Goal Setting

Effect of Goal Setting on Percentage of Legal Net Weight Achieved by Logging Truck Drivers



Note. From "The 'Practical Significance' of Locke's Theory of Goal Setting," by G. P. Latham and J. Baldes, 1975, *Journal of Applied Psychology*, 60, p. 123. Copyright 1975 by the American Psychological Association.

American logging teams produce substantially more output after being set more challenging targets.

# Motivation: Summary

- Tap into peoples' individual intrinsic motivation – what works for them? (in addition to transactional rewards)
- Use goal setting
- Where appropriate, use the idea of learning goals
- In the end though, it comes down to leadership

# Leadership



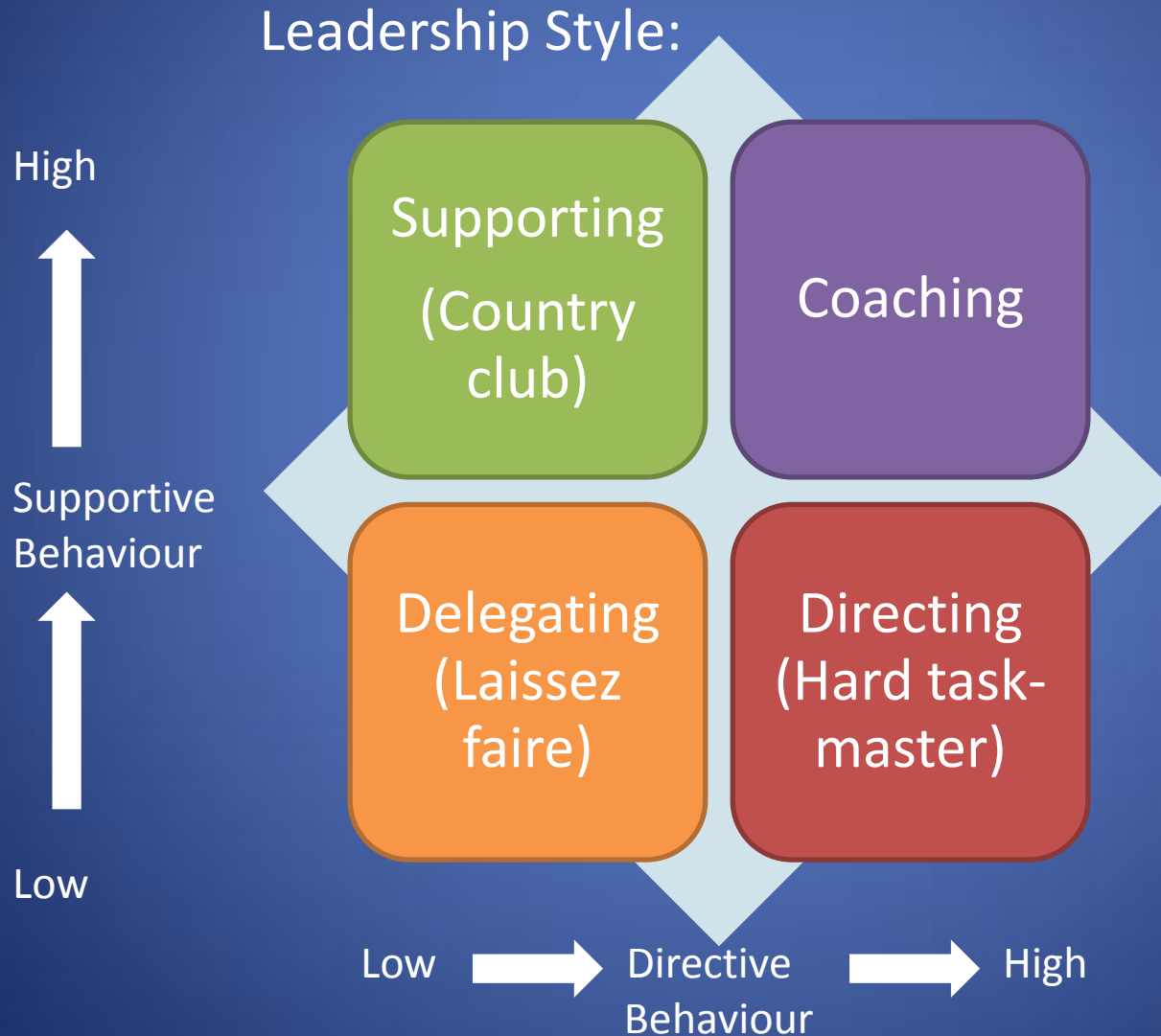
# Leadership

- A huge amount has been written about leadership. Surprisingly little provides good quality evidence. By far the majority is personal opinion. However there are two large bodies of research:
- Contingency Theory or Situational Leadership
- Transformational Leadership and Transactional Leadership

# Leadership: Contingent / Situational

- Based on independent research programmes at Ohio State University and the University of Michigan in the 1950s and 1960s.
- The Leader needs to find the right balance between people orientation and support, and task orientation and direction.
- There is no “right” answer, it depends on the team, the context and the goals.
- Hence it is difficult to find evidence to support this idea. Most studies find employee satisfaction is higher for more supportive leaders but that does not necessarily mean they perform more effectively.

# Leadership: Contingent / Situational



# Leadership:

## Transformational and Transactional

- Transactional: Directive, motivate by reward or punishment
- Transformational: Supportive, motivate by taking people with you
- Not either/or. Augment Transactional with Transformational
- The 4 I's of Transformational Leadership:
  - Idealised Influence -> charisma
  - Inspirational Motivation -> charisma
  - Individualised Consideration
  - Intellectual Stimulation

# Leadership:

## Transformational and Transactional

- Judge & Piccolo carried out a meta-analysis averaging over 87 individual studies and about 10,000 managers.
- They found leaders who adopt Transformational practices are better regarded by their followers (correlation of .71) and demonstrate better leader effectiveness (.64) than those who adopt Transactional practices (.55 and .55 respectively).
- But leaders who adopt Transactional practices attain higher job satisfaction among followers (.64) and are rated as achieving higher performance (.45) versus those who adopt Transformational practices (.58 and .27 respectively)
- The correlation with group performance, though is .26 for Transformational leadership and .16 for Transactional.
- There is a UK version of Transformational leadership (Engaging leadership) which was trialled with 740 managers in the NHS over a 3 year period and attained significant improvement in performance well-being and morale. The UK version does not refer to charisma.



# Leadership: Project Management Competencies

Intellectual	Managerial	Emotional
* Critical analysis and judgment	Resource Management	Self-awareness
Vision and imagination	Engaging Communication	Emotional Resilience
Strategic perspective	Empowering	Intuitiveness
	Achieving	Interpersonal Sensitivity
		* Influence
		* Motivation
		* Conscientiousness

- Muller & Turner collected questionnaires from 400 project managers who were members of international professional project management institutions.
- Competencies marked with asterisks were the most predictive of project management success.
- Note that two of the competencies are 'critical analysis and judgment', which is close to the idea of cognitive ability, and conscientiousness.

# Leadership: Summary

- As a leader you need to balance a people focus with a task focus and adapt your style to the people and context.
- As a leader you need to identify your strong and weak competencies (at the level of skills and behaviour), and build on them or address them, respectively, in particular the Muller & Turner competencies.

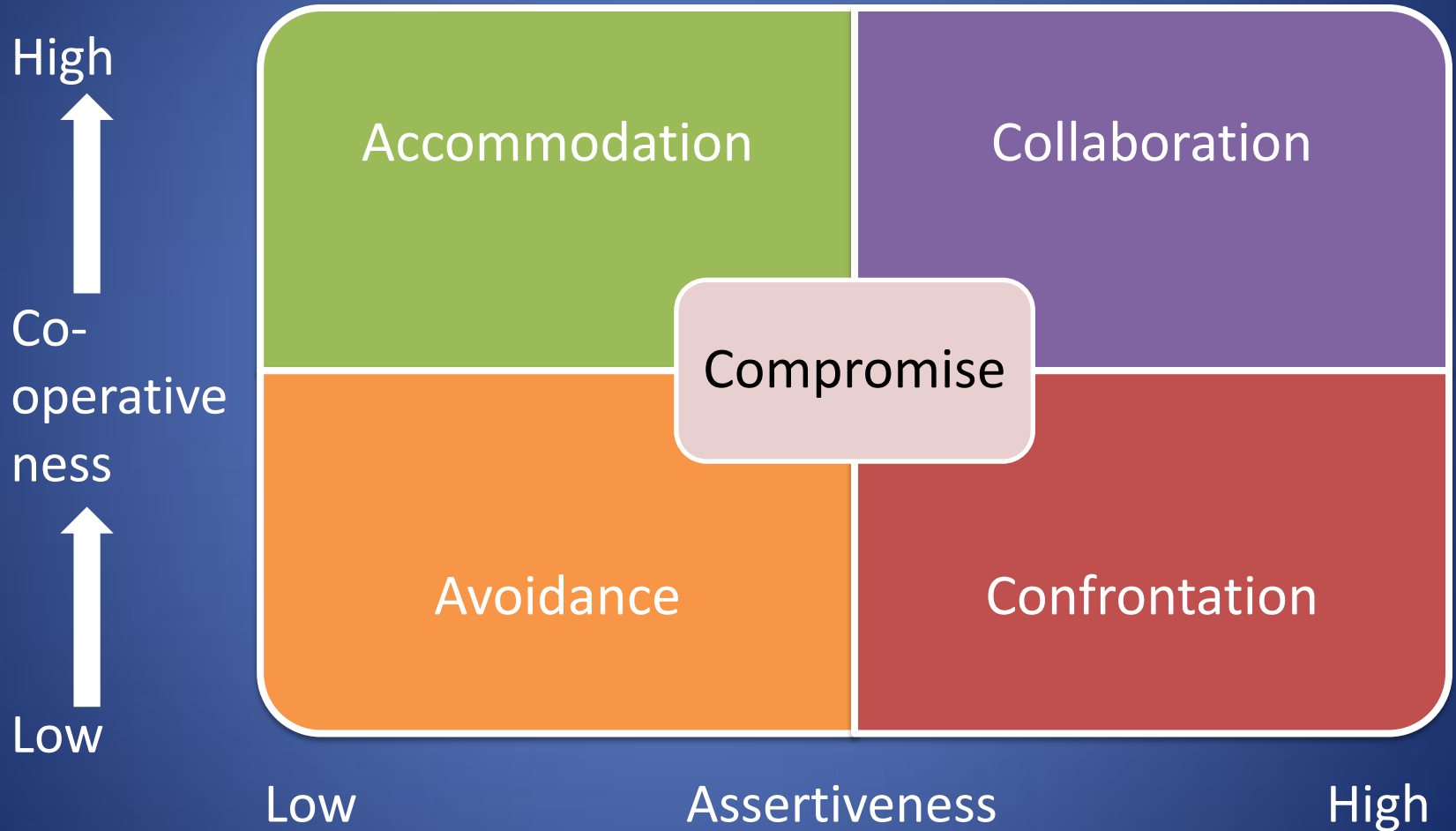
# Group Dynamics



# Group Dynamics

- Conflict within groups is inevitable. Areas include:
  - Differences in opinion in solving problem solving or achieving goals
  - Differences in how to distribute work or rewards
  - How to deal with social loafing
- The key is not to avoid conflict but to manage it well so that it is not destructive and all parties come out feeling positive.
- There is not a huge amount of research findings in this field. One of the most widely accepted models is the 'dual concern' theory (next slide).
- Robust, well-intentioned collaboration is the favoured approach.

# Group Dynamics



*(This also corresponds to the PMBOK guidance for conflict resolution).*

# Group Dynamics: Summary

- Both cooperativeness and assertiveness should be encouraged. The team should be encouraged to express opinions in a non-confrontational way, and not withdraw. The team leader's role is to model co-operative problem solving.
- Clear terms of engagement for conflict resolution are useful e.g. A Team Charter.
- Encourage active participation, trust, feedback.
- Co-operation is enhanced by developing a strong sense of team identity.

# Influence



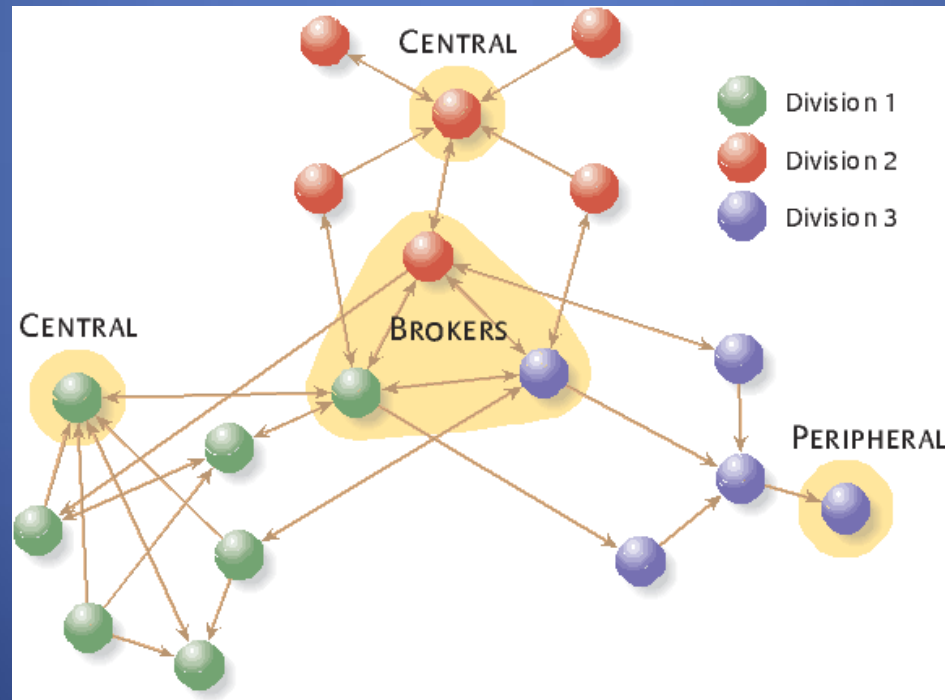
# Influence: 6 Principles of Persuasion

- There isn't a huge amount of good evidence in this area. There is also a great deal of misinformation. The field of consumer behaviour provides some related, data driven evidence.
- People are notoriously intransigent in their beliefs, and will find many ways to discount counter-evidence.
- One "framework" is the "6 Principles of Persuasion":
  - Reciprocation (people feel obliged to repay your generosity)
  - Social pressure (keeping up with the Joneses)
  - Liking (people are more favourable to people they like)
  - Authority (e.g. celebrity endorsements)
  - Scarcity (this offer ends at midnight)
  - Commitment (if you get someone to change their behaviour, in certain circumstances, they will adjust their beliefs to maintain consistency)



# Influence: Social Capital

- Its not what you know...
- Its not the number of people in your network that counts, but the quality and type of your relationships, and the influence and position of your contacts.



# Influence: Summary

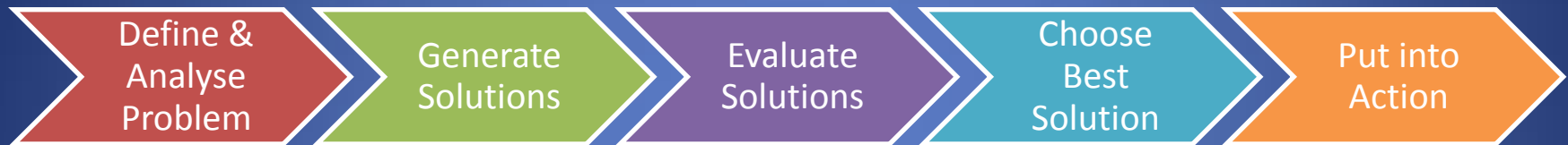
- Important factors:
  - Regular face-to-face contact to build trust
  - Seek first to understand
  - Don't only rely only on facts and logic
  - Effective networking
  - Personal impact (body language, presentational style)
  - Use of language

# Problem Solving



# Problem Solving

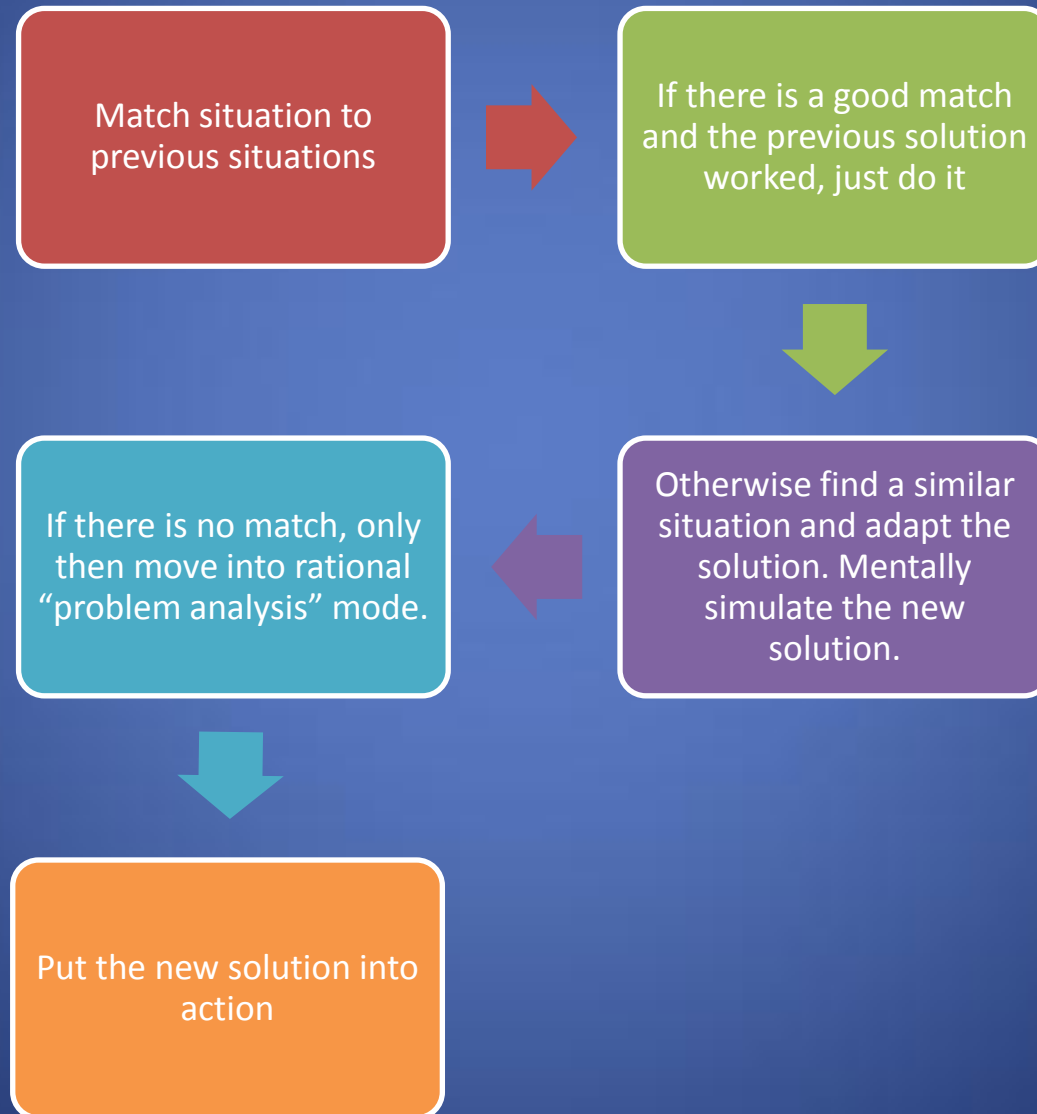
A typical, rational and logical approach to problem solving :



In the real world, with time constraints (e.g. fire-fighters) it is not so much careful step-by-step analysis, but often more of a pattern-matching process: you see the problem and see the solution *at the same time*. The theory to describe this is Recognition Primed Decision Making.

Supposedly, it captures expert intuition, based on the problem solver's experience of a large number of real-world cases.

# Problem Solving: Recognition Primed Decision Making



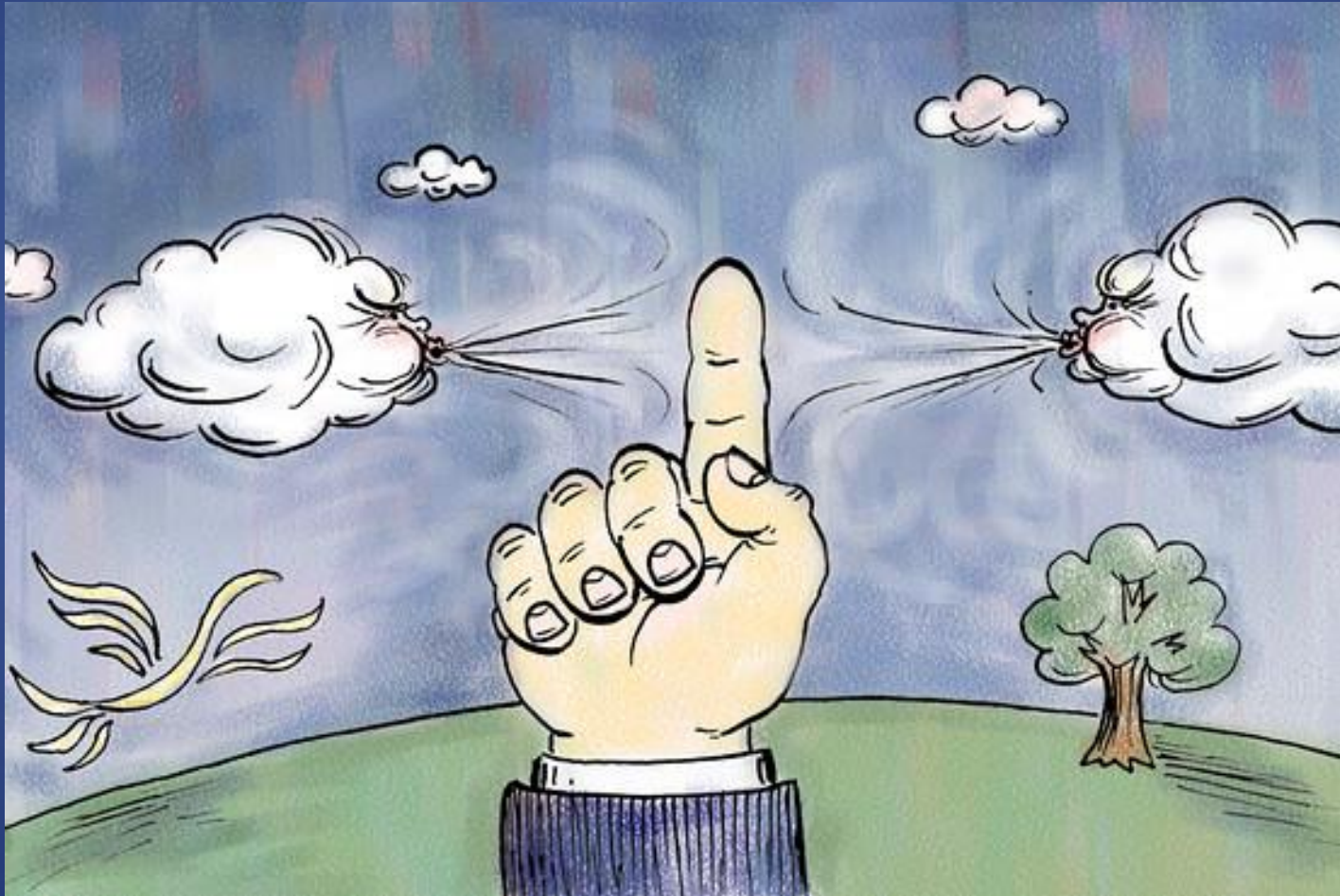
# Problem Solving

- The somatic marker hypothesis proposes that it is not just the features and attributes of the situation which are stored, but the problem solver's physiological reaction e.g. that sinking feeling in the pit of the stomach is re-felt when a previous situation is matched to the new one. This *could* explain 'gut feel'.
- A useful risk assessment technique is 'pre-mortem'. Before the project starts, get stake-holders to think about why it ended in abject disaster, and work backwards to solutions to avoid the causes. This technique makes the risks more tangible, and critical thinking more acceptable.

# Problem Solving: Summary

- When problem solving, be aware of assuming a solution that worked before will be appropriate for the current situation.
- Simulation training that exposes you to a wide set of situations may build intuitive expertise. Pilots use flight simulators for training. We send project managers on a Prince 2 course.
- More rigorous mental simulation of the implications of a problem solution can be beneficial.
- Pre-mortems can be useful.

# Decision Making





# Reinforcement Sensitivity Theory

(based on the neuroscience of people and animals)

Behavioural Activation System

*Dopamine pathways draw you to rewards.*

*Serotonin pathways create a fear response to threats.*

*The BIS is activated when there is conflict between or within the other two systems. It creates anxiety, risk-assessment and hyper-vigilance.*

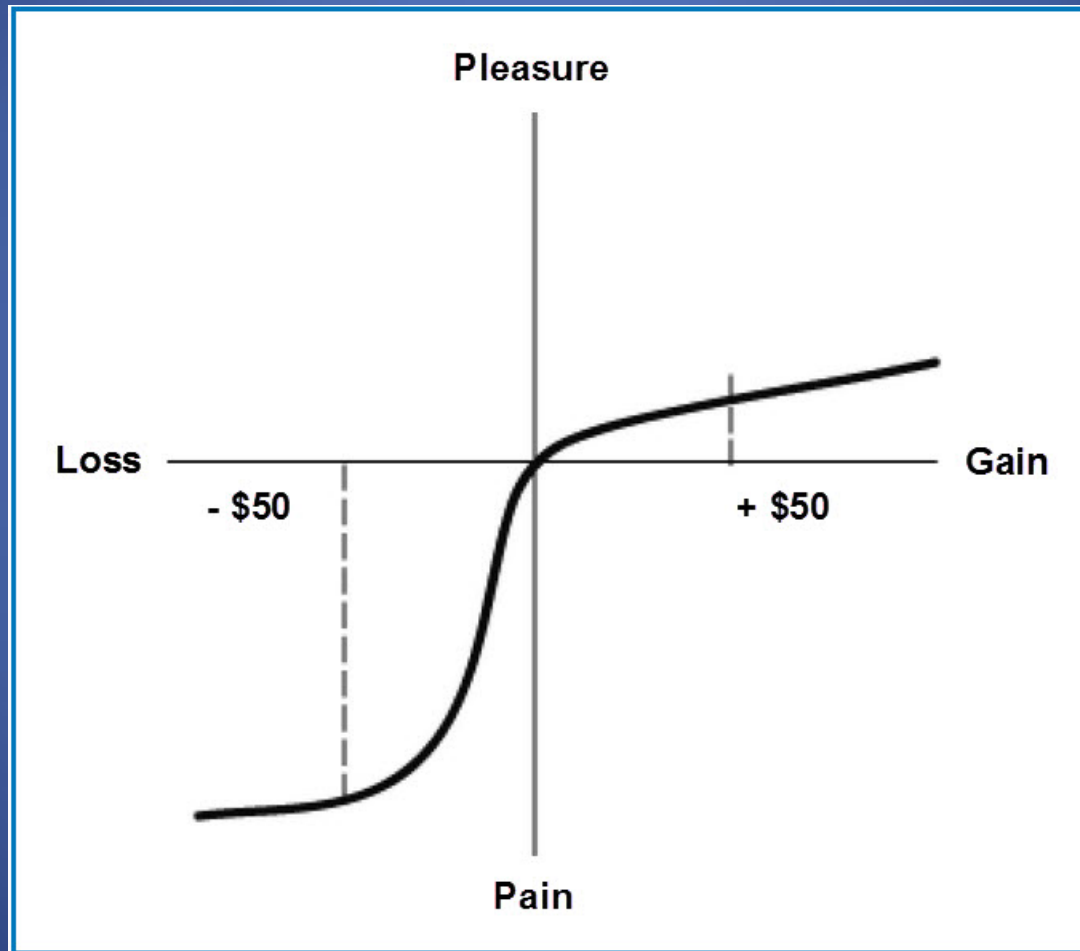
Behavioural Inhibition System

Fight, Flight, Freeze System

# Decision Making

- People are subject to a wide range of biases in decision making. One perspective is Prospect Theory (next slide).
- When faced with gains, we tend to be risk averse. Our perceived value of rewards does not increase linearly with the reward. It tapers off.
- At times we fail to take risks that would be to our advantage.
- The perceived impact of losses increases much more sharply than the perceived impact of gains.
- When we suffer losses, sometimes we are prepared to take risks to recoup the losses (the gamblers fallacy or doubling down).

# Decision Making: Prospect Theory



# Decision Making: Project Managers

- Recently, Fiolet & Haas at the University of Waterloo, Canada gave 53 North American construction project managers a series of scenarios to investigate their decision making behaviour.

## Question 15:

You are working on a project which is on time and on budget.

We need to install many shingles, and there are 2 types of shingles A and B which match the specifications. Which shingle type are you going to choose? The differences between the 2 types are:

- Shingle A costs \$194 per unit and there is a probability of 97% it will not crack or break during the installation.
- Shingle B costs \$200 per unit and there is a probability of 100% it will not crack or break during the installation.

## Question 2:

You are working on a project which is on time and on budget.

We need to install many shingles, and there are 2 types of shingles A and B which match the specifications. Which shingle type are you going to choose? The differences between the 2 types are:

- Shingle A costs \$162 per unit and there is a probability of 97% it will not crack or break during the installation.
- Shingle B costs \$207 per unit and there is a probability of 100% it will not crack or break during the installation.

# Results

Options	Shingle A (Risk Taking)	Shingle B (No Risk)
Expected Value Equal (Q15)	36%	<b>64%</b>
Expected Value Different (Q2)	<b>72%</b>	28%

- In Q15, there is little to choose between A or B so most people take the ‘no risk option’.
- In Q2, taking the risk with Shingle A is the most cost-effective choice. Over 100 shingles you could save thousands. Most people go for it.
- But 28% still go for the ‘no risk’ option – i.e. risk aversion.
- Over large numbers of decisions, how much opportunity does risk aversion lose?

# Decision Making: Summary

- Be aware of one's risk aversion and perhaps take some more measured risks.
- Be aware of one's risk seeking (to get out of a hole) and find other options.
- Subjective biases are deep-rooted and difficult to overcome.
- Set up feedback loops to collect data and estimate quantifiable risks.
- Consider event chain methodology.



# Overall Summary

- Project management is about people: who we select to work on the project; how we lead, motivate, influence, work together as team, make decisions and solve problems. Psychology runs through project management like “Blackpool” through a stick of Blackpool rock.
- Don’t accept models, explanations and suggestions uncritically. Look for good quality evidence.

Thank you...

Please get in touch at [jbarr@self-insight.com](mailto:jbarr@self-insight.com)