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Introduction to Professor Bidwell

Professor Matthew Bidwell

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Staffing Analytics

Professor Matthew Bidwell

The Staffing Cycle

- Basic facts about staffing processes
- The value of analysis
- Possible analytic approaches

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Hiring 1: Predicting Performance

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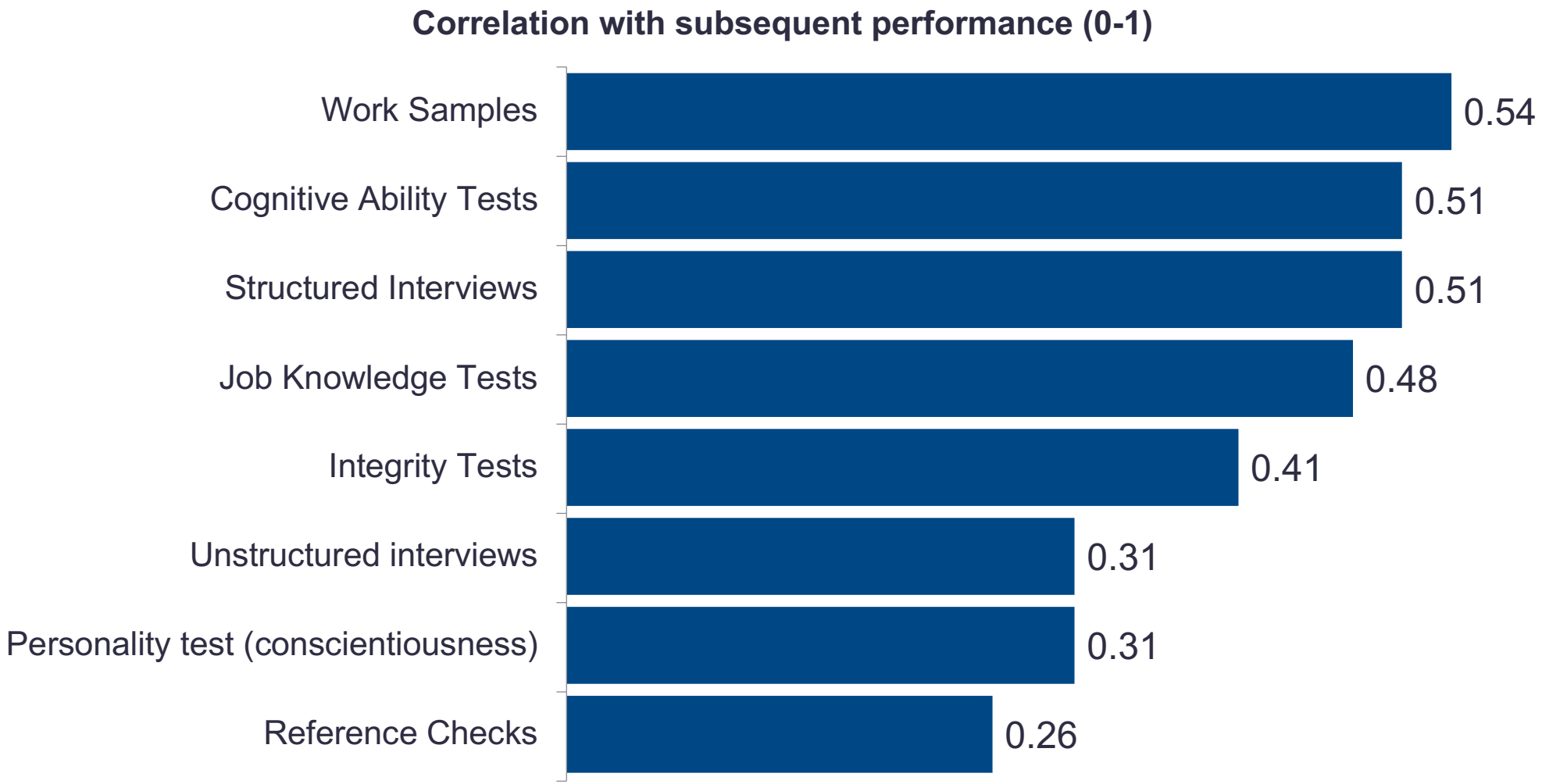
Selection: A Question

- Which of the following methods of evaluating job candidates is most effective at predicting subsequent performance?
- Which is least effective?
  - Job knowledge tests
  - Cognitive ability tests
  - Personality tests
  - Reference checks
  - Structured interviews
  - Unstructured interviews
  - Work samples
  - Integrity tests

Getting Selection Right



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Hiring 2: Fine-tuning Predictors

Professor Matthew Bidwell

Fine-tuning Your Selection

Performance	Predictors

• Performance Evaluations
• Objective Performance Metrics
  - Sales
  - Productivity
  - Customer Satisfaction
• Attrition
• Rate of promotion
	• Background/experience
	• Test scores
	• Interview performance
	  - Specific questions
	  - Specific interviewers

Predicting New Hire Performance: Hints, Tips, Issues

- Comparing Apples with Apples
  - The work
  - The location
  - The manager / unit
  - The level
  - Time in the Job
- Disentangling Influences
  - Beware spurious correlations
  - Apply common-sense / understand the mechanism
- Accounting for Selection
  - Who got hired
  - Who stayed

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Hiring 3: Using Data Analysis to Predict Performance

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Approaches to Predicting Hire Performance

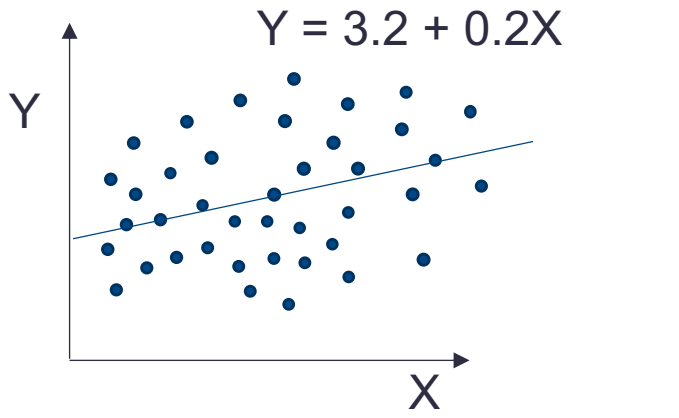
Best:
- Use multivariate regression to separate out influences of different characteristics
- Apply selection correction to account for who was hired and attrition from sample

Good:
- Use multivariate regression to separate out influences of different characteristics

Better:
- Compare characteristics of best and worst performers **within same cohort and job**

Okay:
- Compare characteristics of best and worst performers
- Test for statistical significance

$$Y = 3.2 + 0.2X_1 + .5X_2 + 1.8\ X_3$$



How Does Data Analysis Compare to Human Judgment

The Bad News

- Combination of various tests and selection methods leaves much of performance unexplained

The Worse News

- Implementation of algorithms reduced turnover in call centers
- Turnover was lower the less often managers over-ruled the algorithm

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Internal Mobility 1: Analyzing Promotibility

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Bringing Data to Internal Mobility: Beyond the Pete Principle

The Peter Principle

"In time, every post is occupied by an employee who is incompetent to carry out its duties"

Peter and Hull, 1969

OR:

How well does success in the current job predict performance in a higher level job?

OR:

What does predict success in higher level jobs?

Analyzing Promotability

Requirements	Potential
• Multiple dimensional performance indicators - Output measures - Competence - Assessments	• Which dimensions of lower level performance best predict performance in the higher level job?

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Internal Mobility 2: Optimizing Movement within the Organization

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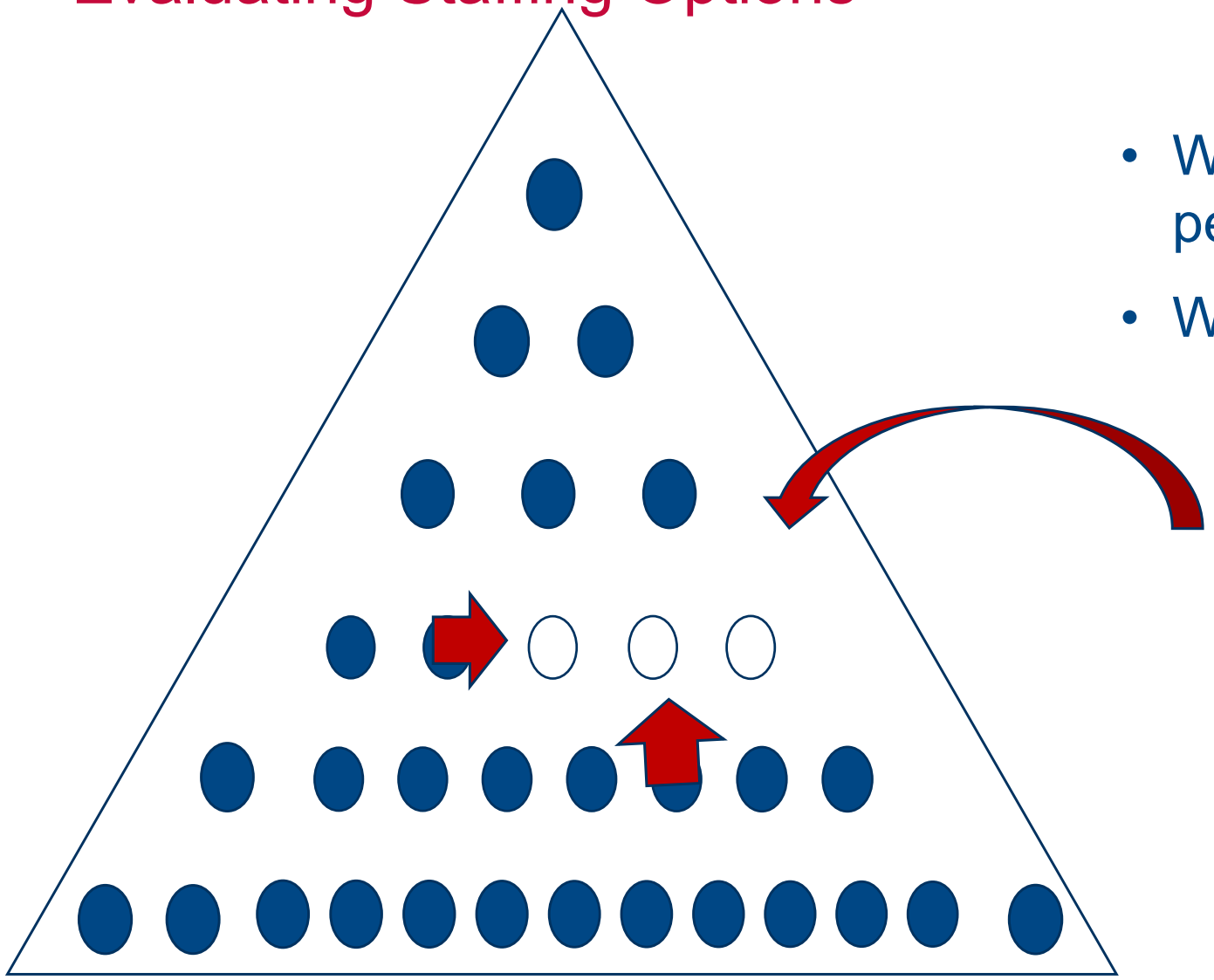
Evaluating Staffing Options



- Which routes lead to better performance?
- What is the effect on cost?

A Practical Example

- Personnel data from large investment banking division
- Wide variety of functions
- Annual snapshots of employees from 2003-2009
  - Performance Evaluations
  - Compensation
  - Job

- Focus on effect of how workers entered their **current** job (hired versus promoted)
- Use very detailed job controls to compare workers entering similar jobs by different routes
- Study only jobs that
  - Can be entered by promotion
  - I observe being filled

Does it Matter How People Enter Jobs?

Performance

- Hires performed substantially worse than similar promotes

  75% less likely to get top rating

  270% more likely to get lowest rating

- Takes 3 years to acquire similar performance to those promoted into the job

Pay

- New hires receive 18% more compensation than promotes

  Pay gap only closes very slowly (up to 7 years)

Comparing Hiring Inside Firms

Internal Posting

Internal market

- Manager posts job & invites interested candidates to apply
- Creates competition for jobs within the firm

Vs.

Sponsorship

Social network

- Manager identifies candidates through her personal network
- Appoints preferred candidate to the job

Comparing Hiring Inside Firms

Internal Posting

Internal market

- Manager posts job & invites interested candidates to apply
- Creates competition for jobs within the firm

- Creates "unconventional" career paths
- Leads to higher performance ratings:
  - Larger pool of candidates
  - Disciplines decision-making
- Associated with higher salaries (3% - 6%)

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Causality 1

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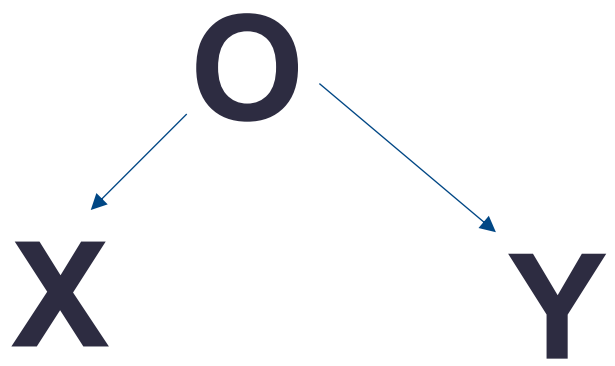
Why We Care About Causality

- People who enter jobs through formal posting perform worse → Should we avoid posting?
- People who have been in the job longest have lower performance → Should we move people around more?
- People who have taken a training program perform better → Should we send more people to training?
- People who have taken a training program show greater performance improvements → Should we send more people to training?

Why We Care About Causality

Omitted Variable Bias



- Do we only post when jobs are hardest to fill?
- Do people only get trained following dips in their prior performance?

Reverse Causality

- Are our highest performing people getting promoted out of the job leaving middle performers?
- Are our highest performing people being trained?

The Central, Underlying Question

- What is leading to difference in our main predictor variable?

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Causality 2

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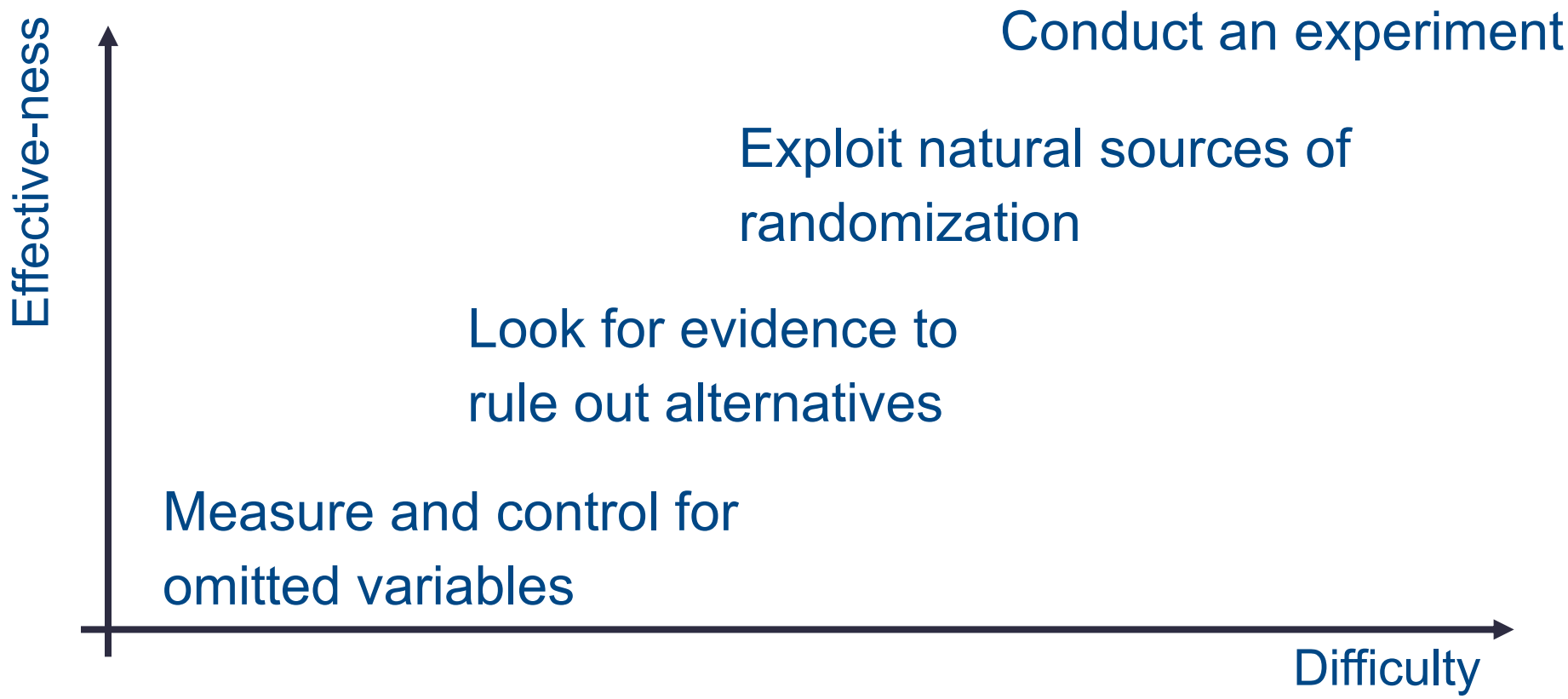
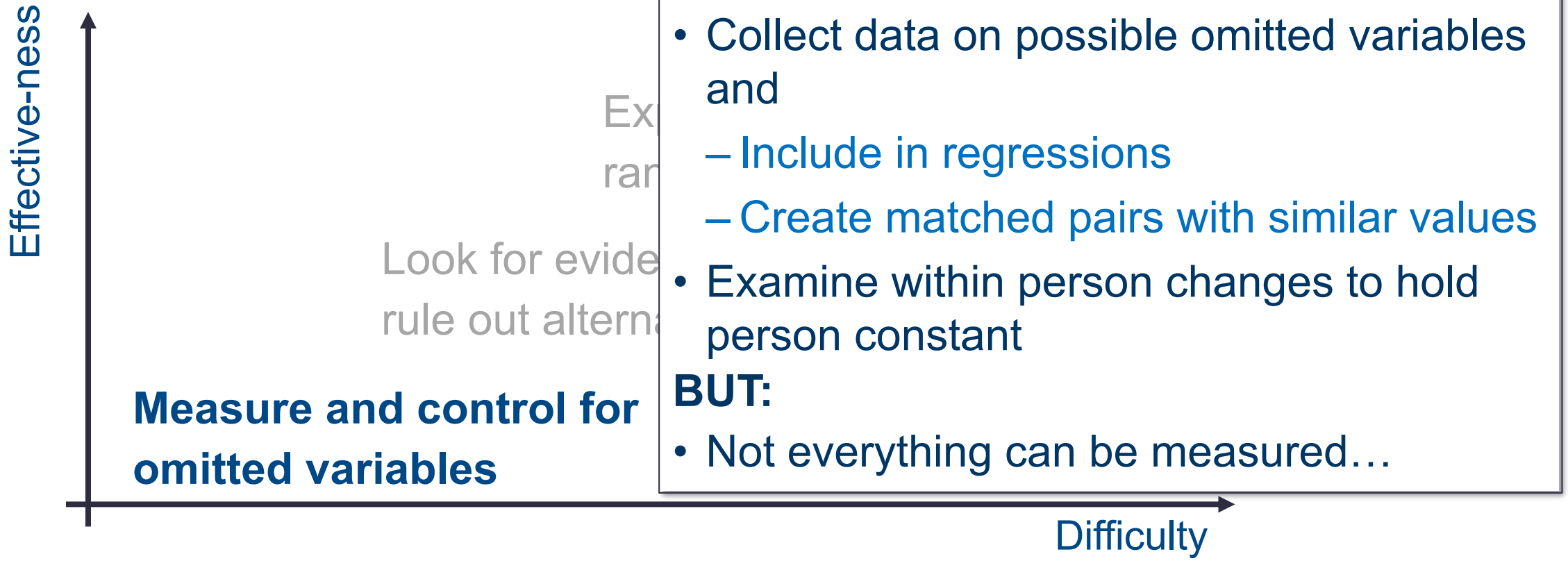
Approaches to Addressing Causality



Approaches to Addressing Causality



Approaches to Addressing Causality

- What would be some implications of alternative explanations?
- Can you find evidence for or against those explanations in the data?

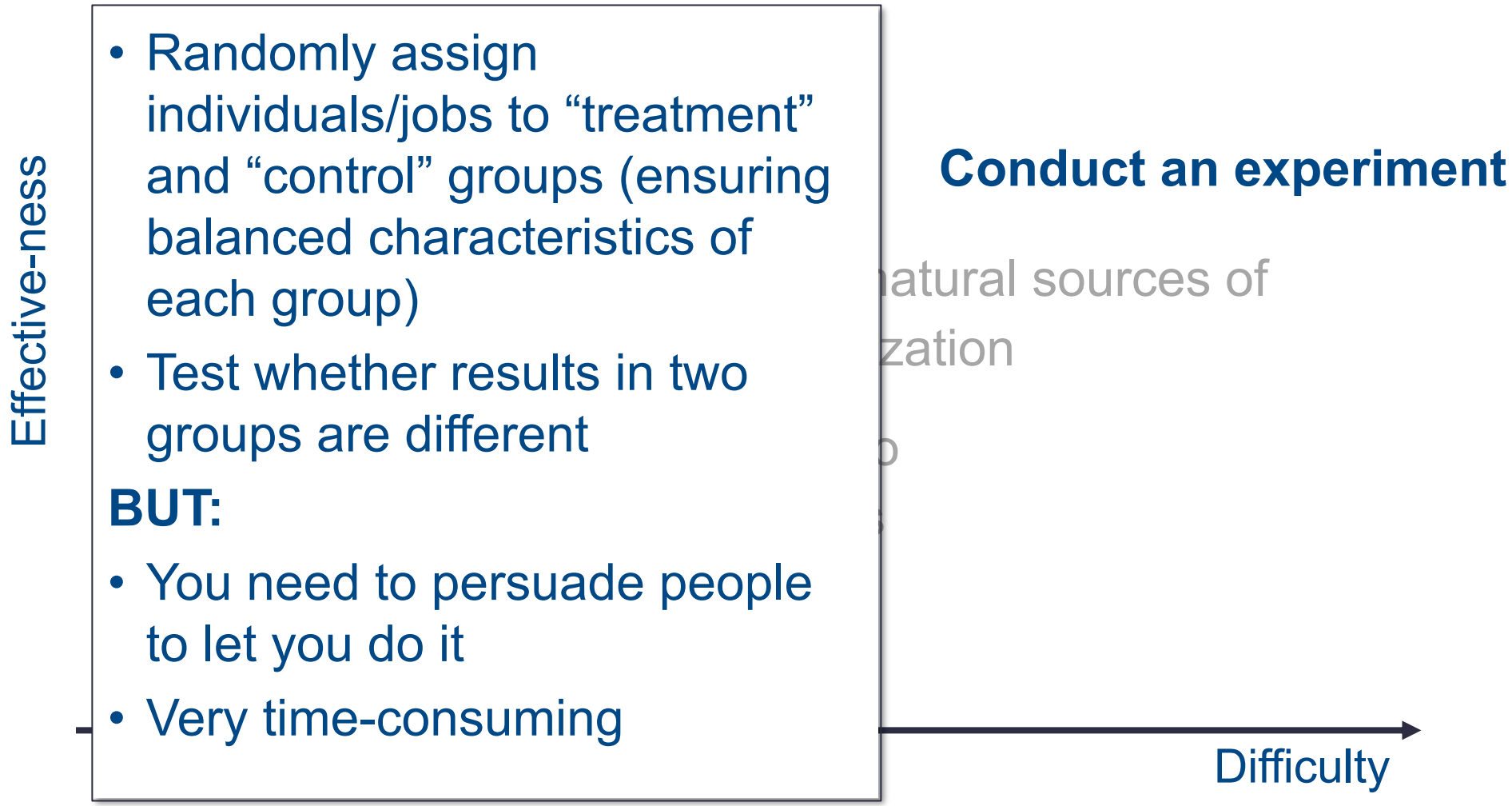
Approaches to Addressing Causality

- "Natural Experiments" change your X variable in ways that shouldn't also affect Y
- Mimics assignment to treatment vs control group in genuine experiment
- Allows for assessment of "causal effects"

BUT:

- You need to be lucky

Approaches to Addressing Causality



- Randomly assign individuals/jobs to “treatment” and “control” groups (ensuring balanced characteristics of each group)
- Test whether results in two groups are different

BUT:

- You need to persuade people to let you do it
- Very time-consuming

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Attrition: Understanding and Reducing Turnover

Professor Matthew Bidwell

Understanding and Managing Attrition

Problems

- Hiring Costs
- Training Costs
- Loss of Critical Knowledge
- Impact on Customer Relationships

Levers

- Inform hiring strategy
- Target interventions
  - Improve conditions
  - Address unmet needs
  - Train managers
  - Focus retention efforts

Understanding Attrition – A Sample View

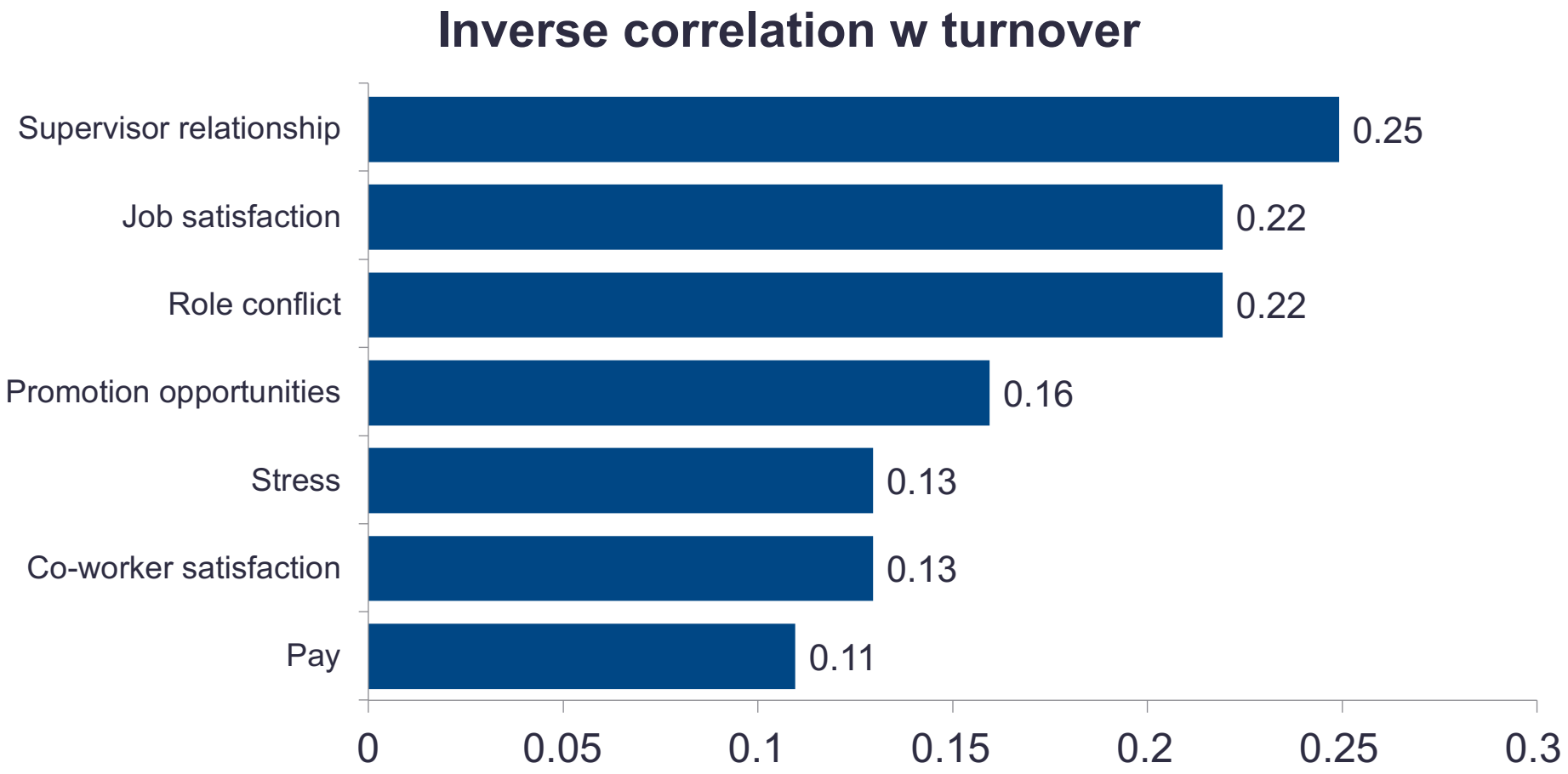
- People leave their jobs because there is something else that they would rather be doing

- Attractiveness of outside opportunities
  - Demand for skills
  - Industry / regional growth
- Planned career evolution

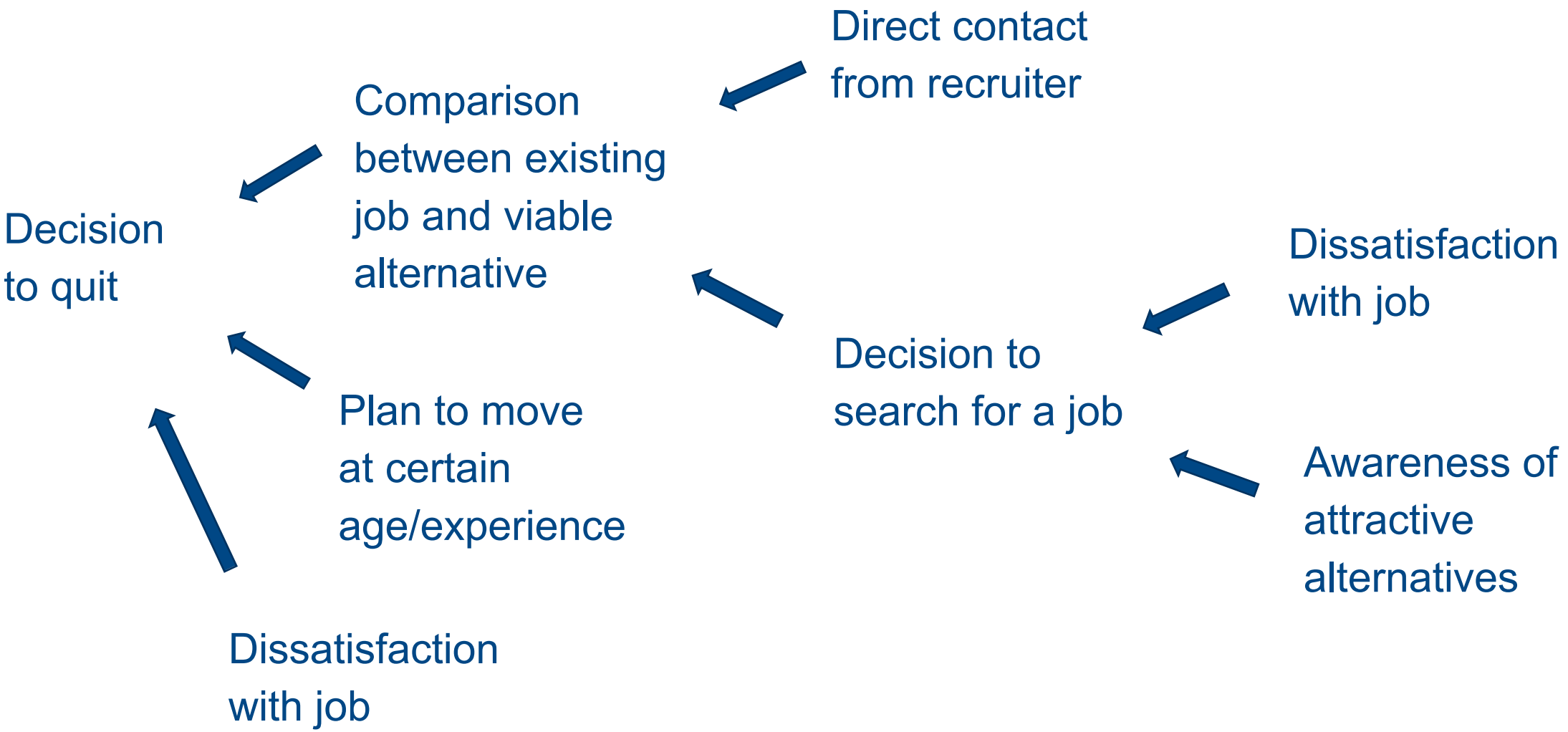
Vs.

- Satisfaction with current job situation
- Perception of future opportunities/trajectory in organization

Why People Move – Some Basic Predictors



Process Perspectives on Turnover



Turnover as a Search Process

Assumptions:

1. We will enjoy and be better at jobs that are a better fit with our abilities and preferences
2. We can only assess fit once we are actually in the job
3. If we turn out to be a poor fit, we will quit

Implications:

1. Probability of turnover decreases the longer people have spent in the job
   - Have learned whether it is a good fit or not
2. Rate of turnover falls as workers get older
   - More likely to know what fits and what doesn't

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Turnover: Predicting Attrition

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Some Common Predictors of Turnover

- Manager
- Pre-hire background
- Type of work / project / function
- Performance evaluations
- Geography
- Social network behavior

Approaches to Predicting Attrition

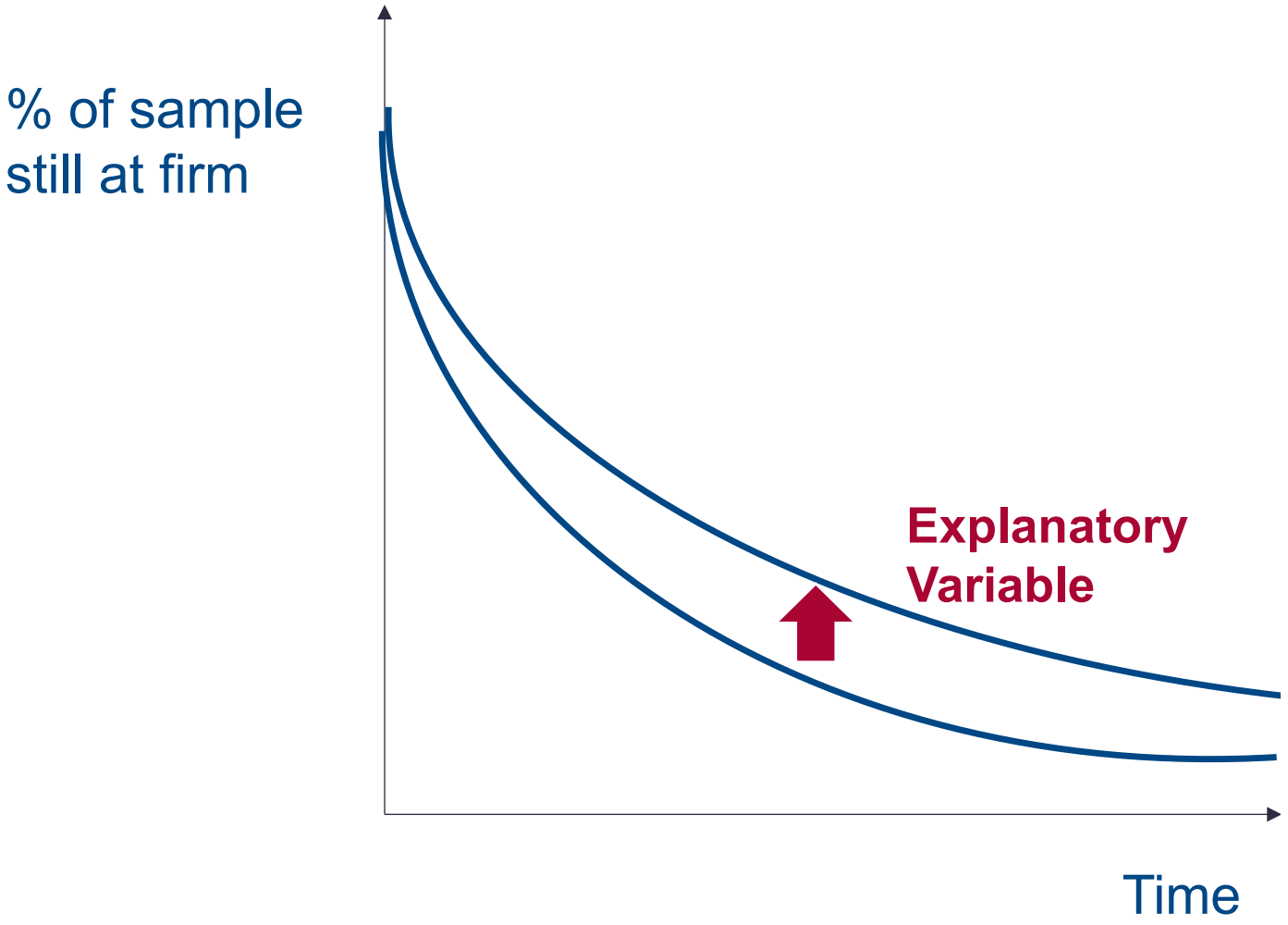
Best:
- Use of survival / hazard rate models to test which factors accelerate risk of exit

Good:
- Use multivariate regression to predict who reaches each milestone

Better:
- Comparison of % leaving before specific milestones
  - 3 months
  - 6 months
  - 1 year

Okay:
- Comparisons of % attrition across time and across units
- Test for statistical significance

The Survival Model



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Staffing Analytics Conclusion

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