‘Gold standard’ versus research in practice: Practical examples from educational research

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General Considerations

- Matching research question(s) to research design
- Sample size and sampling bias
- Use of measures that are fit-for-purpose
  - Qualitative/Quantitative/Mixed methods
  - Balancing applicability of tested measures versus creating new ones
- Practical constraints –
  - Balancing your time, budget, organisational issues
    - Which questions are more important than others?
    - Which measures are more important than others?
  - Planning your analyses prior to data collection

What might ‘gold standard’ research look like in an educational setting?

- Most educational research concerned with evaluating school interventions/processes
- Ideal methods (from a ‘gold standard’ perspectives would involve:
  - Identify group of interest (who the intervention is aimed at targeting)
  - Take measurement of interest for all individuals (i.e., writing test)
  - Randomly assign individuals to 3 groups (one treatment, one ‘placebo’, one ‘control’)
  - Begin ‘treatments’ (i.e., groups 1 and 2) at same time
  - Carefully collect measurements throughout intervention ensuring these are standardised (i.e., comparable across time points and/or across schools)
    - Achievement data
    - Implementation measures
      - Qualitative
      - Quantitative
  - Assess differences between groups at end of treatment

What might this design look like in practice?

- Ethics
  - Issues to do with selecting students – if you have a method/intervention that works, is it ethical to restrict student's access to it?
- Schools often choose a whole-school approach – i.e., school-wide intervention OR work with a target group only but include all members of the target group
- Implications – No "true" control group
  - Alternative: Use other schools with similar characteristics as matched comparison
    - Difficulties in matching, lack of available data - competitive nature of schools
  - Alternative: Use school's own baseline comparisons
    - Assumption that cohorts have not changed significantly over time
    - Assumption that school systems/teaching has not changed significantly over time
    - Assumption that local/social/governmental issues have not changed significantly over time (e.g., housing crisis)

Timing issues and other confounds

- Issues of beginning ‘treatment’ at the same time
  - Possible within schools (i.e., if intervention is only in one school) but almost never happens across schools
  - If project and evaluation are being not run by same people (ideal)
- Issues of collecting data at the same time (especially if these rely on researcher data collection – e.g., observations/interviews)
  - How much does time matter? Does a 2-month lag matter?
- Other confounds
  - Different teachers and teaching styles
  - Different school structures/systems/foci
- Bias
  - Buy-in of participants => lag
  - People that agree to participate may have an agenda

Implementation Measures and limitations - SRMs

- Self reporting measures – might include interviews, surveys, questionnaires
- All SRMs - Good for finding out peoples' perceptions (less useful for finding out what is actually happening)
  - Accessing participants and gaining consent is always an issue in practice
  - Volunteers – agenda of those that agree to participate a bigger issue in SRMs
- All SRMs - Wording of questions (open/closed; biased agenda vs blank agenda)
- Interviews:
  - Place and timing of interview (e.g. McDonalds), selection of interviewer
- Surveys/Questionnaires:
  - How to 'give it' to participants, ensure adequate number and representative responses? – Prioritising of measures? Being there?
  - Question complexity & length
  - Scales?

Implementation Measures and Limitations – Observations/Artefact Analysis

- Better at finding out ‘what’s actually happening’ (?)
- Well-designed tools allow for mixed qualitative/quantitative data collection
- Changing tools/methods on the fly? Time for pilot run?
- Observer bias - lots of moderation and training required
- Observed bias
  - Video recordings – technical constraints, cost, time
  - Peer observers – still have observer bias
- Artefact analysis
  - Consistency of documentation over time/schools/contexts
  - Analysis framework – open vs axial coding

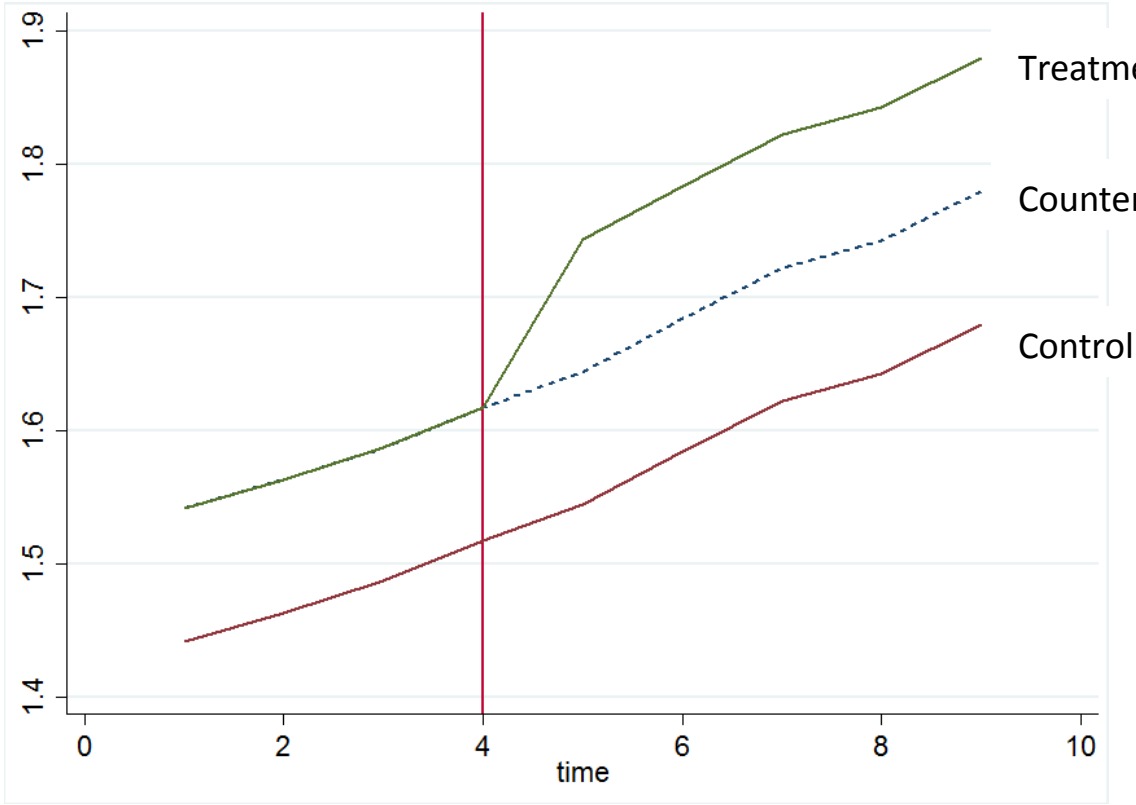
Example of a good observation tool

Teacher group							Other group					# on devices:		
Time	**List of texts used**		**hing activ**	**Feedback (tick)**		**g foci (cir**	**Comment**	**Nature of task (tick)**	**Nature of site (tick)**	**Agency** Evidence of student d		**Working Together (tick)**		**Learning Manage ment**
	Print – general	Teacher created	L/Model	Evaluative		Item		Game bas	Game / Program	Nature of Decision:			Both using computer (CMD)	Discussio n (or one person on computer only) (FTF)	Offline
	Print – student	Student created													
	Digital – general			Descriptive				Constrained practice	Class site						
	Digital – student		Q&A	Generative		APK		Open-ended template	Student product						
				Online (Y/N)				Extended reading (mu	Information site						Online + verbal prompts
#ss	**Group activity**		Conf/ED			Practice		Extended	Book	Task	Order of tasks	My work			
								Extended writing	Email						
			Rove	Example		Strategy		DLO creat	Creation tools	Text	Tool				Totally digitally managed
								Navigating/organising	Googledrive						
			Instruct			Critical		Commenti	Blog	Product	Peer(s)	Our work			
								Other: e.g. off-task	Language						Other
			Managemer						Search Engine	Other:	Topic				
									Other						

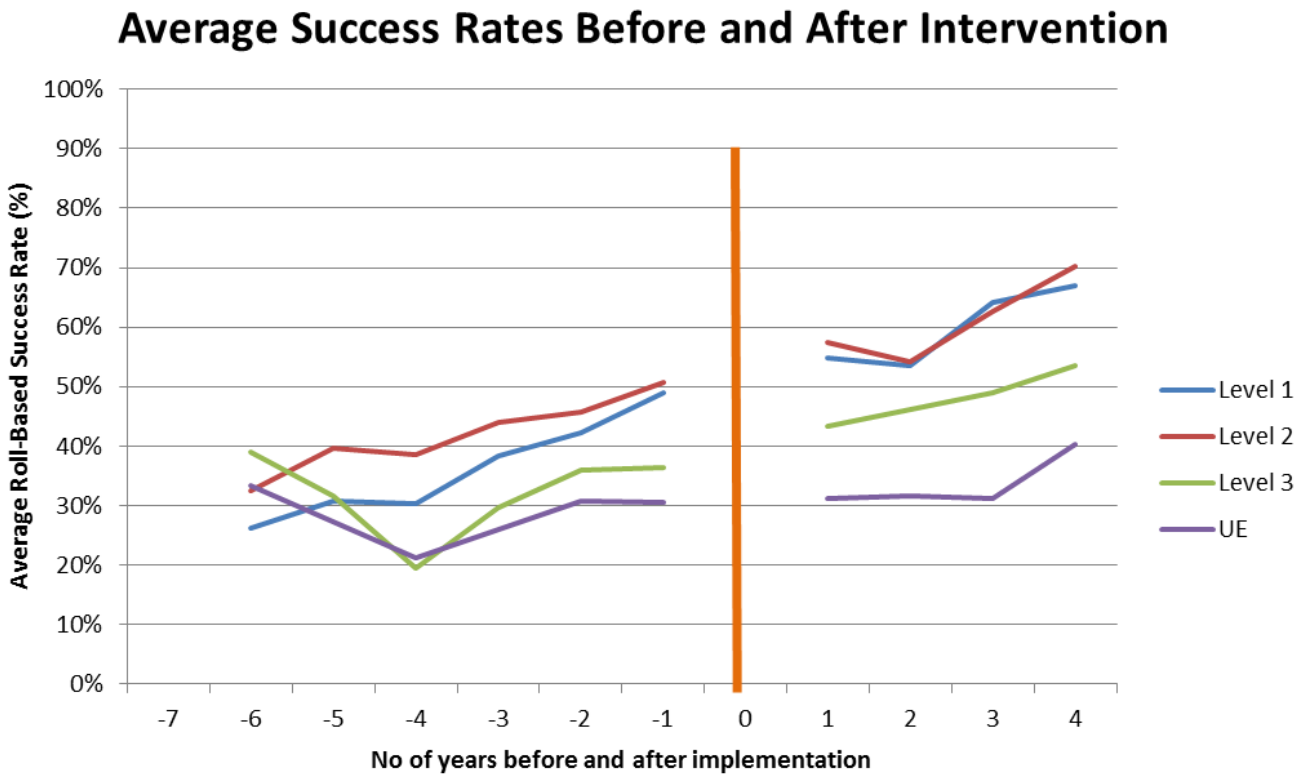
Analysis issues – So many assumptions!

- Quantitative methods:
  - Summary statistics/data visualisation always provides the biggest clue to changes in achievement
  - Options for no controls: Matched/Baseline Comparisons (next slides) allow researchers to determine likely shifts in achievement relative to expected
  - Hierarchical linear models/regressions – usually allow for only correlations
- Qualitative methods
  - Coding – open versus axial coding -> moderation and theoretical perspectives
- All analyses
  - What data you actually get
  - To use it or not to use it
  - 'Incidental' findings

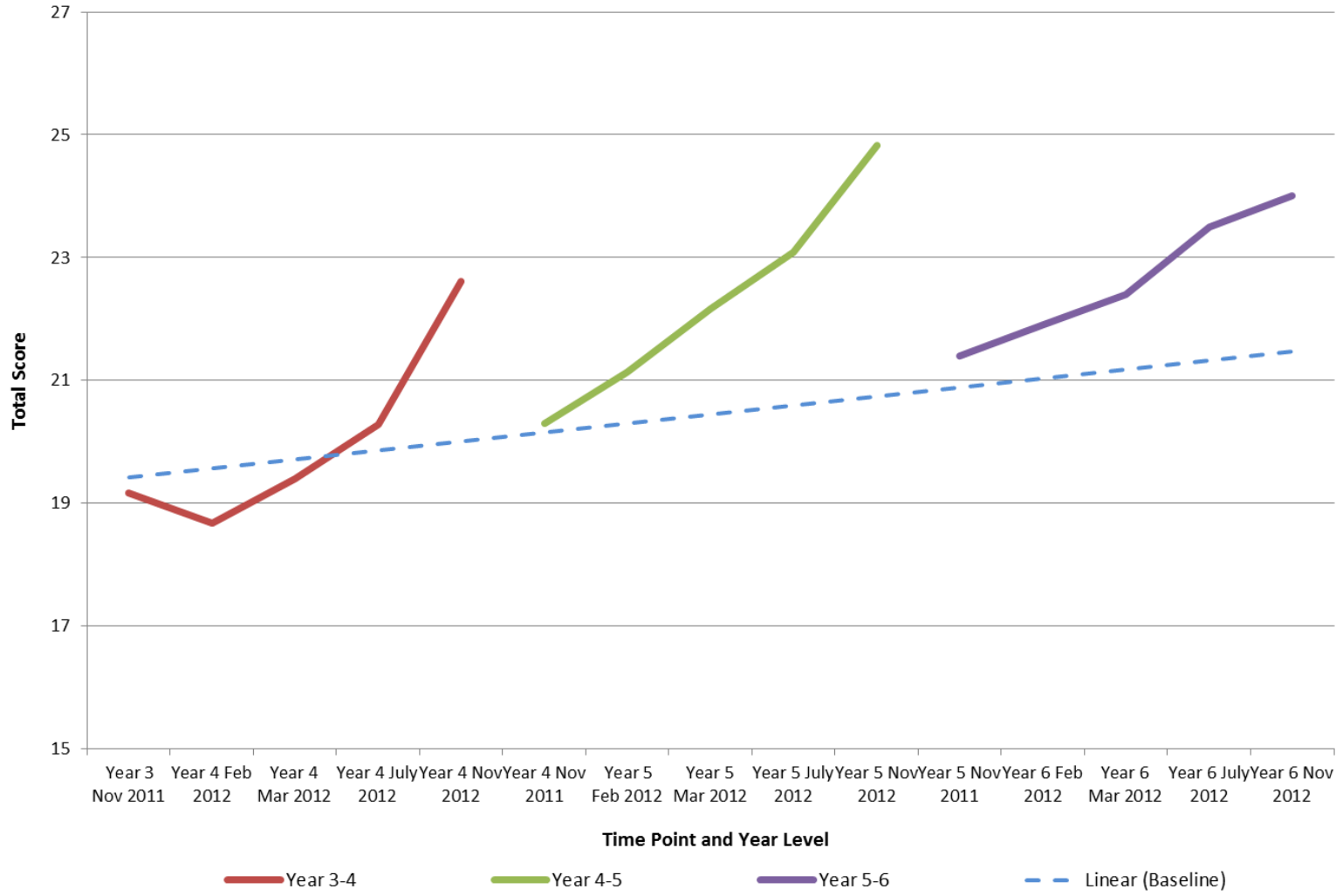
Matched Comparison Example: Difference in Difference



Baseline Comparison Examples:



Baseline Comparison Examples



Thanks for listening....

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