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- Key benefits include a library of over 30 archived webinars on diverse topics; on-line course modules leading to an acknowledgement of completion, and monthly interactive webinars.
- Membership Fees: regular \$65; student \$8; developing nation \$5



Developing and Connecting Claims in Mixed  
Methods Research  
A Case-Based Approach

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# Overview

- A *meta-inference* is a conclusion that connects or integrates various *claims* from quantitative and qualitative research.
- This presentation will show how mixed methods researchers can gradually weave or develop their meta-inference throughout their studies
- A mixed methods study develops *a case*, that is a theoretical understanding of a phenomenon. It develops:
  - » *a controversial case* when one claim contradicts another claim from previous research or another claim within the same study,
  - » *subcases* when different claims apply to different subgroups,
  - » *a moderated case* when it shows under which circumstances one of its claims does or does not apply, which leads to the subcases,
  - » in the order: controversial case – subcases – moderated case.
- This process is independent of whether the study's original design is concurrent or sequential.
- These processes of case and claim development affect how quality in mixed methods research is defined.

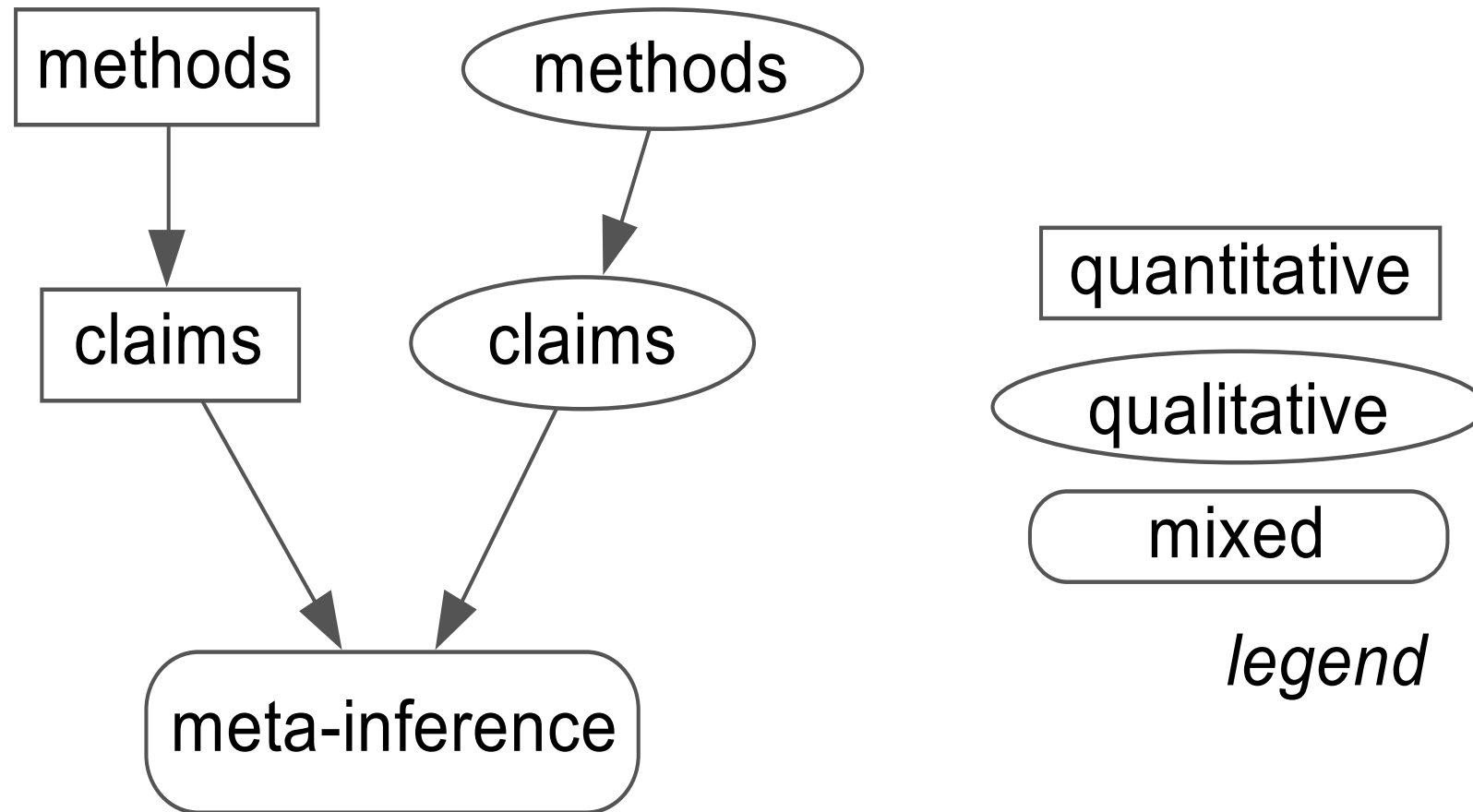
# The meta-inference in the mixed methods literature

- A mixed methods study contains one or more qualitative research strands and one or more quantitative research strands.
- Each of these strands generates its own conclusions / inferences / claims.
- The meta-inference
  - » is the overall conclusion, in which the claims of the research strands are integrated, blended, or linked;
  - » occurs at the end of a mixed methods study;
  - » is the hallmark of mixed methods research.

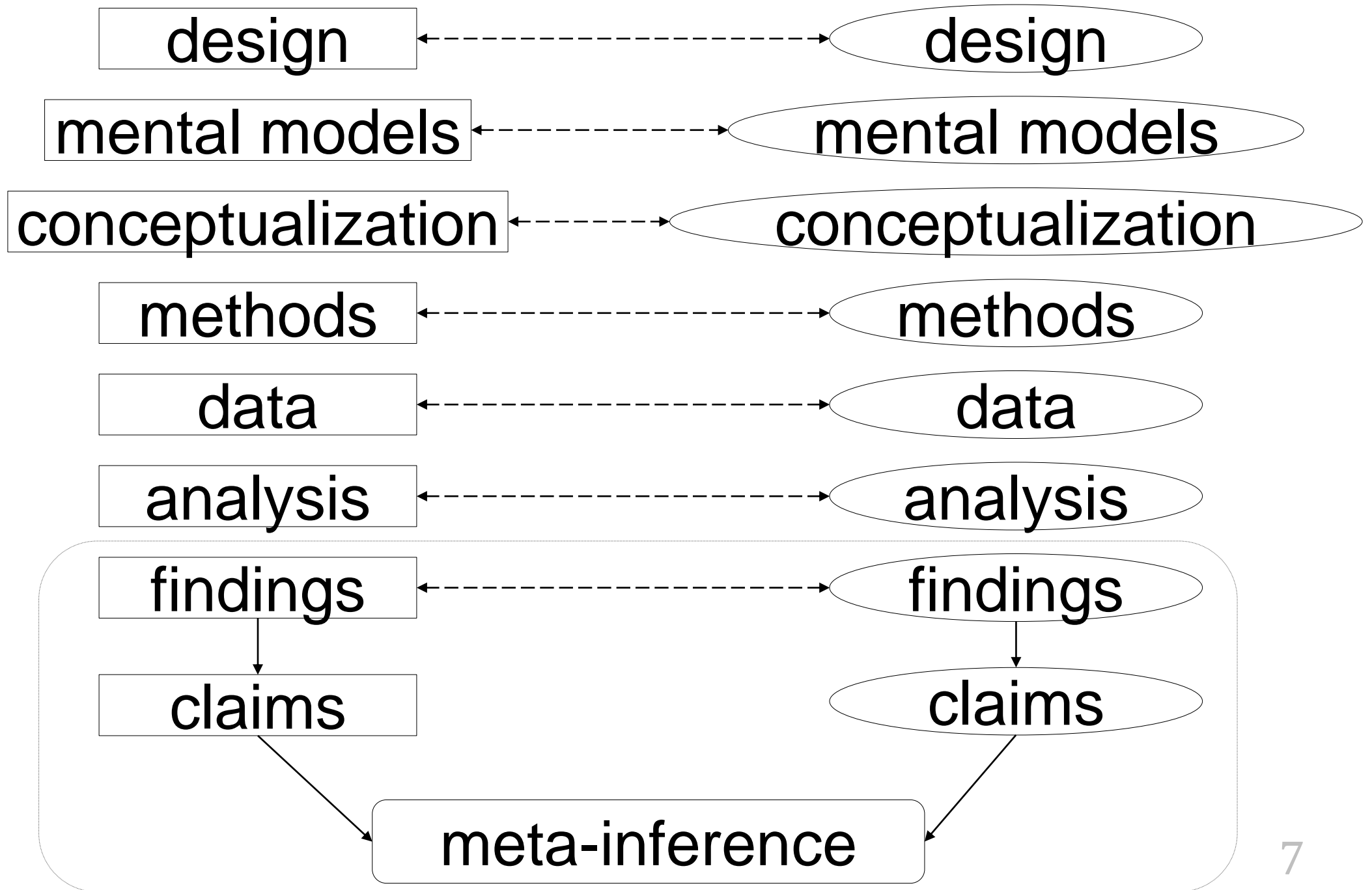
# The meta-inference in the mixed methods literature

***the quality of the entire research project*** depends on the degree to which integration, blending, or linking of QUAL and QUAN ***inferences*** is achieved (Teddlie & Tashakkori, 2009, p. 292 [emphasis added])

# The meta-inference in the mixed methods literature



# Fully-integrated mixed methods design

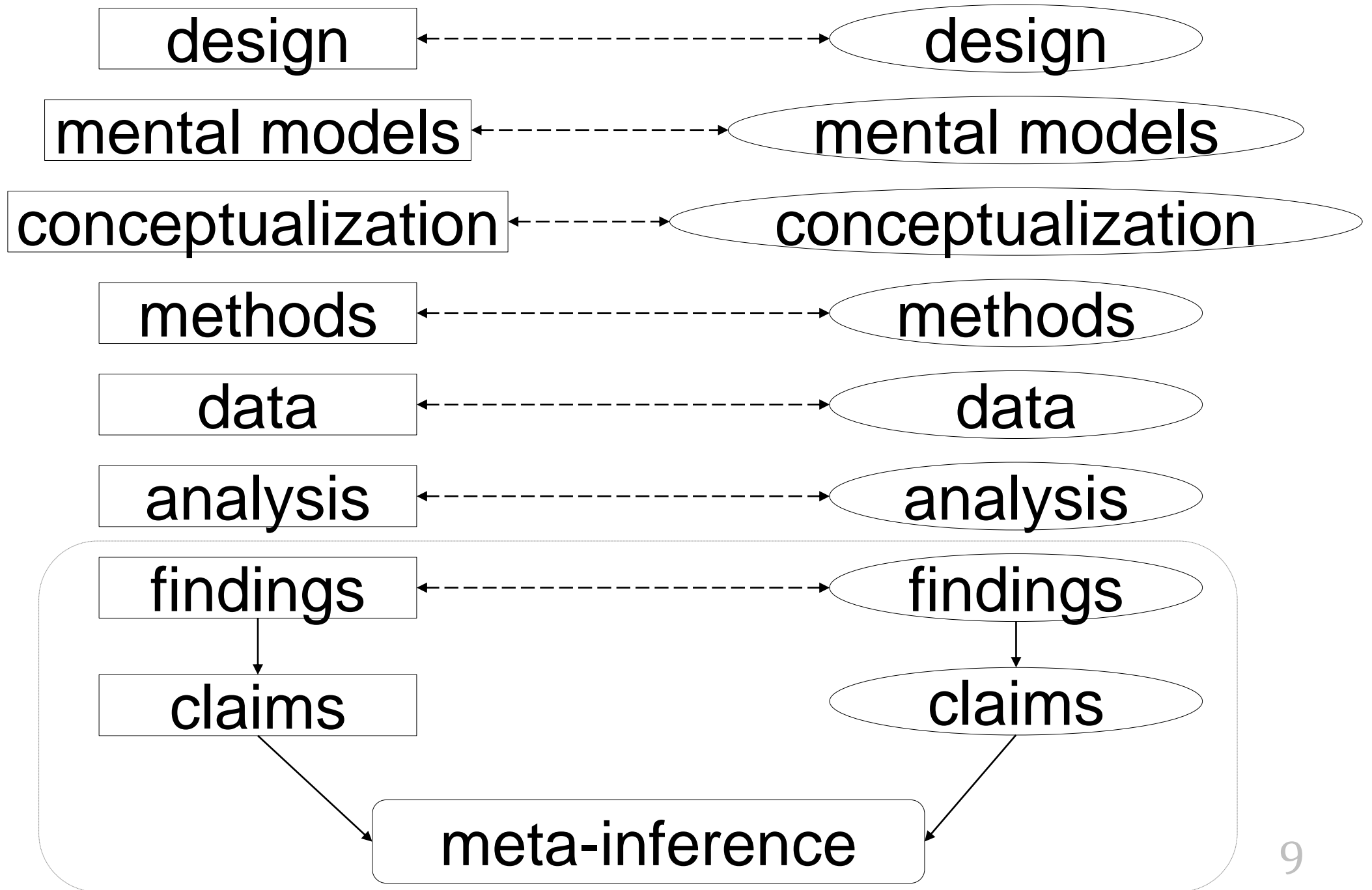


## But: mixed methods research is iterative

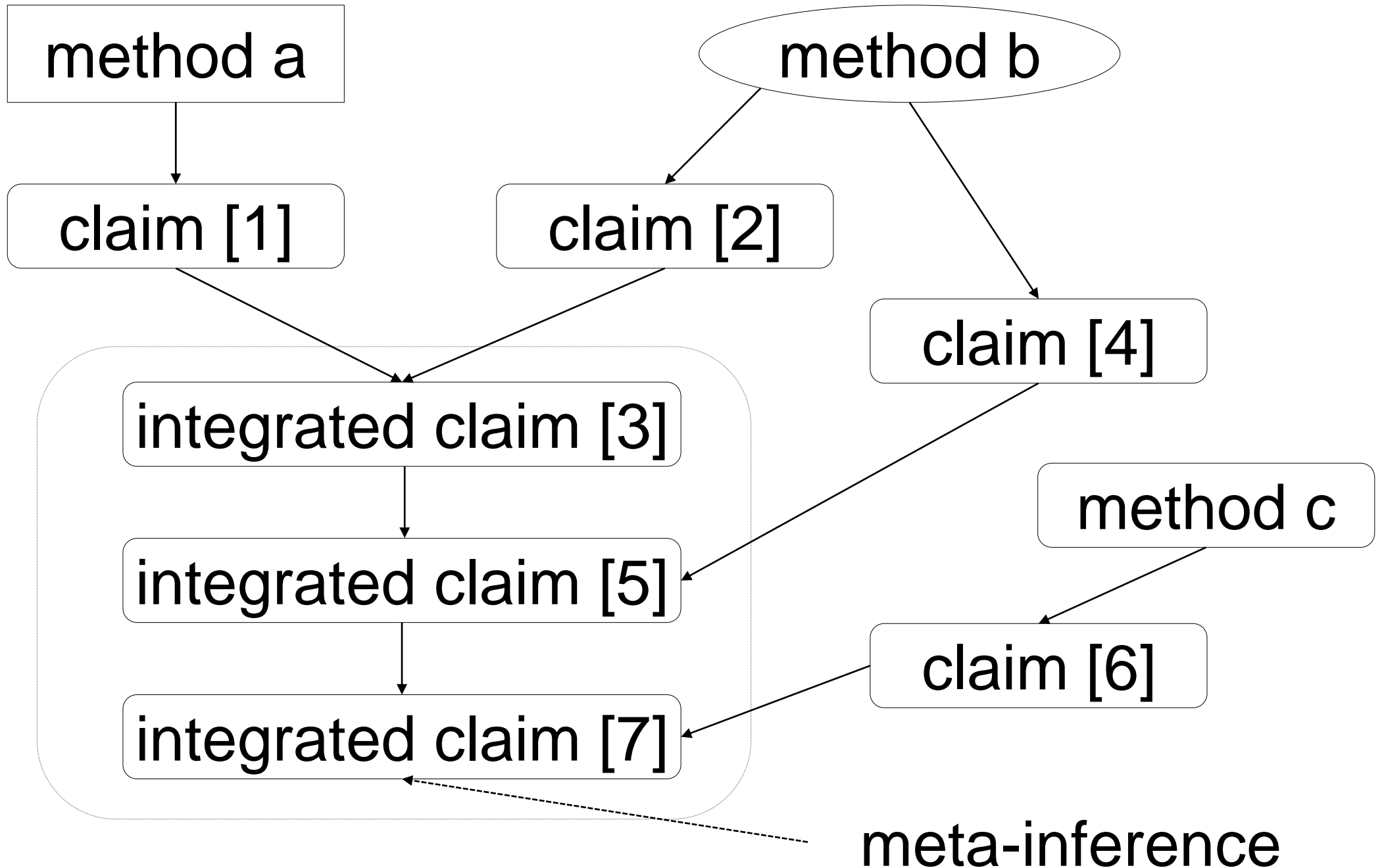
- Mixed methods research has the potential “to spiral iteratively around the different data sets, adding depth of understanding with each cycle.” Caracelli and Greene, 1993, p. 202
- “Interaction between ideas and evidence results in a progressive refinement” (Ragin 1992) of theoretical understanding.
- This iteration is not reflected in the position of the meta-inference, which is located at the end of the study.



# Fully-integrated mixed methods design



# The emerging meta-inference



## The emerging meta-inference: a first example

Unlike previous studies, Glewwe, Kremer, and Moulin (2009) found that the provision of textbooks to primary school children in rural Kenya had no effect on students' quantitative test scores. A subsequent qualitative inquiry in the schools, in which children were asked to read the textbooks, revealed that the majority of the children were unable to read these difficult textbooks, written in English, which was not their first language. Further quantitative subgroup analysis showed that there was an effect for students with high pretest scores, who were probably able to read their textbooks. 11

previous research

Providing textbooks raises average test scores in primary schools.

contradiction

Providing textbooks raises average test scores elsewhere, but it does not do so in primary schools in rural Kenya.

explanation

Providing textbooks raises average test scores elsewhere, but it does not do so in primary schools in rural Kenya, because children could not read their textbooks.

contradiction

Providing textbooks raises average test scores elsewhere, but it does not do so in primary schools in rural Kenya. Textbooks did not have an effect for most children because they could not read them because they were written in English, which is not their native language. However, textbooks did increase the scores of the students with high pretest scores, because these children were most likely able to read them.

quantitative analysis of test scores

Providing textbooks does not raise average test scores for children in primary schools in rural Kenya.

The median child could not read their textbook because it was written in English, which is not its native language.

qualitative observations of the median child

Textbooks did increase the scores of the students with high pretest scores.

quantitative subgroup analysis of test scores

reasoning

explanation

Most probably, these students could read their textbooks.

# The emerging meta-inference as case development

- A mixed methods study develops deep understanding of a ***phenomenon***, in other words, a case in the sense of a theoretical construct:
- “[An] investigator interested in tyranny, for example, would study many possible instances of tyranny. This investigation might lead to an identification of an important subset of instances with many common characteristics, which might be conceived, in turn, as cases of the same thing (e.g., as cases of “patrimonial praetorianism” or as cases of “modern tyranny”). ***Interaction between ideas and evidence results in a progressive refinement of the case conceived as a theoretical construct.***” Ragin 1992, p. 9 [emphasis added]

# Meta-inference development stages

A mixed methods study develops:

- ***A controversial case*** when it develops a claim that contradicts previous research or another claim within the same study,
- ***Subcases*** when it shows that different claims apply to different subgroups,
- ***A moderated case*** when it shows under which circumstances one of its claims does or does not apply, leading to the subcases.
- In general, a mixed methods study moves from a controversial case to subcases to a moderated case.

Providing textbooks raises average test scores in primary schools.

←-- contradiction --→

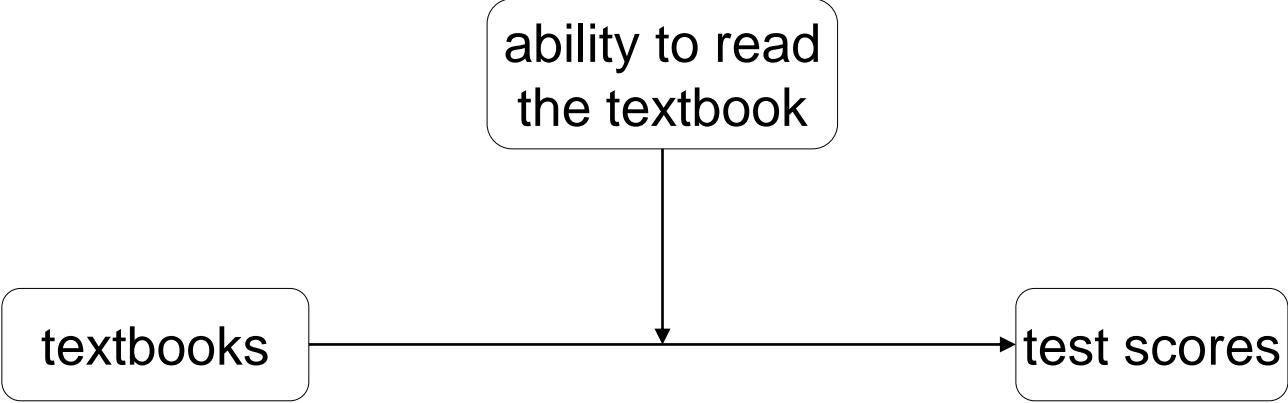
Providing textbooks does not raise average test scores for children in primary schools in rural Kenya.

controversial case

Textbooks did increase the scores of the students with high pretest scores.

Textbooks did not increase the scores of the other students.

subcases



moderated case

## The emerging meta-inference: a second example

One of the findings in Lee and Greene (2007) was that graduate students' placement test scores for English as a second language (ESL) did not affect grade point average [GPA] in their first semester. In a reanalysis of the data available in the published article, including test scores, GPA, and interview fragments of 20 students, I identified a group of successful students, who, despite an imperfect command of the English language, still obtained the highest GPA possible. Further analysis showed that these students, but not others, mentioned strategies for overcoming their language problems in their interviews.



ID	C	GPA	Quote	ID = student ID; C = CEEPT score; GPA = Student GPA; Quote = Utterance by student.
0607	4	4.00	I do not have any language problems.	
0609	3	4.00	The professor is old so that his pronunciation is not clear. He usually handed out important contents and I could understand it by reading the textbook.	
1315	3	4.00	My biggest problem is related with speaking in English. I will get a good grade because my mathematical background is strong.	
2020	3	4.00	I understand 80% of the lectures. Careful reading complements 20% of lack of understanding.	
0620	2	4.00	I understand only 60–70% of the lectures. It has made my scores less than my expectation.	
1310	3	3.89	I want to participate and argue the subject. But I cannot find myself enough. This does not affect my grade.	
0624	2	3.80	It is easy to understand the lectures and participate in class discussions. The instructor speaks slowly.	
2036	3	3.57	The major problem is speaking. I spoke once or twice during the whole semester.	
0610	3	3.53	Listening is a problem. Lack of cultural knowledge interferes with understanding the concept.	
0605	2	3.50	Because of my poor listening, I am struggling with catching up with my content courses.	
0603	3	3.39	I still have some problem in speaking. This difficulty doesn't affect my ability to do well in all the courses I take.	
2037	2	3.22	Lack of knowledge about idiomatic expressions prevents me from understanding questions on the homework assignment.	
2025	3	3.18	I was not able to finish all the reading assignments every week.	
2031	3	3.11	I have problems with my hearing and how to speak correctly.	
0608	4	2.89	I understand almost 100% of the lectures. I understand the professor completely. [...] Grades are not important. That is the least of my worries. [...]	

language problems affect GPA

← contradiction →

language problems do not affect GPA

controversial case

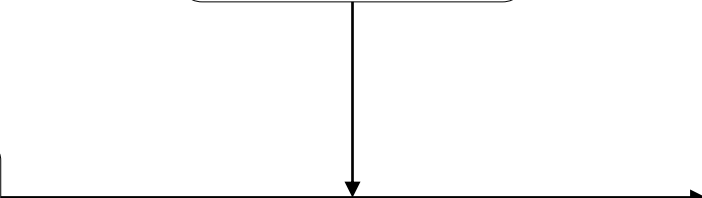
some students with language problems had highest GPA

other students with language problems did not obtain highest GPA

subcases

compensating strategies

language problems



low GPA

moderated case

# Summary

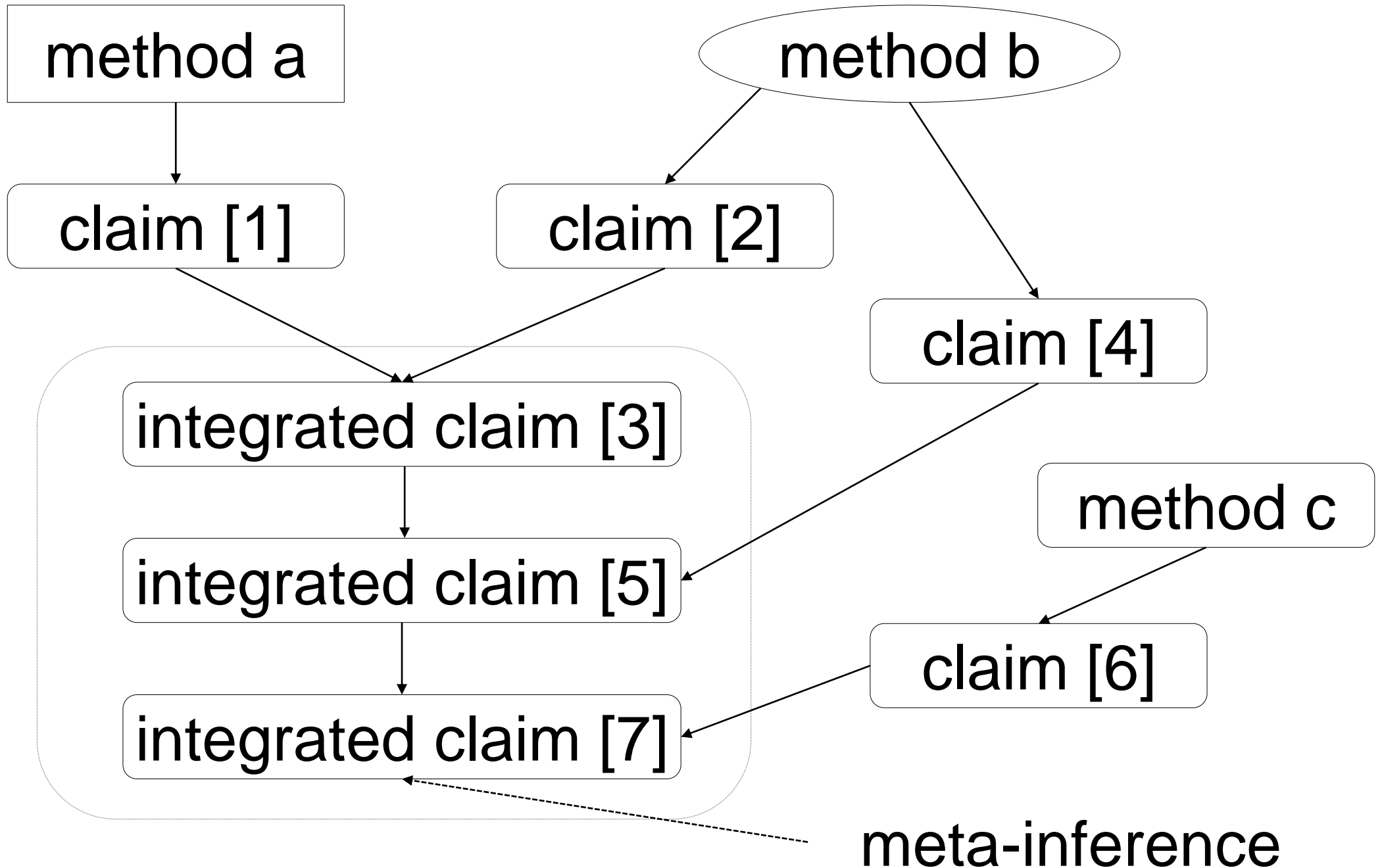
- Mixed methods research develops a case, related to a specific phenomenon.
- The meta-inference in mixed methods research develops throughout a study, reflecting a growing understanding of the case as a theoretical construct.
- This development process often, but not always, progresses through the stages controversial case – subcases – moderated case.

# Implications for mixed methods research

# Implications for the meta-inference

- A meta-inference can go on and on and on.
- Whether an integrated claim is ***the*** meta-inference of a study does not depend on its form, but
- depends on where a researcher decides to stop.

# The emerging meta-inference



previous research

Providing textbooks raises average test scores in primary schools.

contradiction

Providing textbooks raises average test scores elsewhere, but it does not do so in primary schools in rural Kenya.

explanation

Providing textbooks raises average test scores elsewhere, but it does not do so in primary schools in rural Kenya, because children could not read their textbooks.

contradiction

Providing textbooks raises average test scores elsewhere, but it does not do so in primary schools in rural Kenya. Textbooks did not have an effect for most children because they could not read them because they were written in English, which is not their native language. However, textbooks did increase the scores of the students with high pretest scores, because these children were most likely able to read them.

quantitative analysis of test scores

Providing textbooks does not raise average test scores for children in primary schools in rural Kenya.

The median child could not read their textbook because it was written in English, which is not its native language.

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Textbooks did increase the scores of the students with high pretest scores.

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Most probably, these students could read their textbooks.

# Research question is not leading

Not the research question, but the aim to obtain deep understanding of a phenomenon is leading in making decisions during the research process, such as choosing methods.



subsequent research questions

claims

Does providing textbooks raise average test scores in primary schools in rural Kenya?

Providing textbooks raises average test scores in primary schools.

Providing textbooks does not raise average test scores for children in primary schools in rural Kenya.

Why did providing textbooks not raise average test scores in primary schools in rural Kenya?

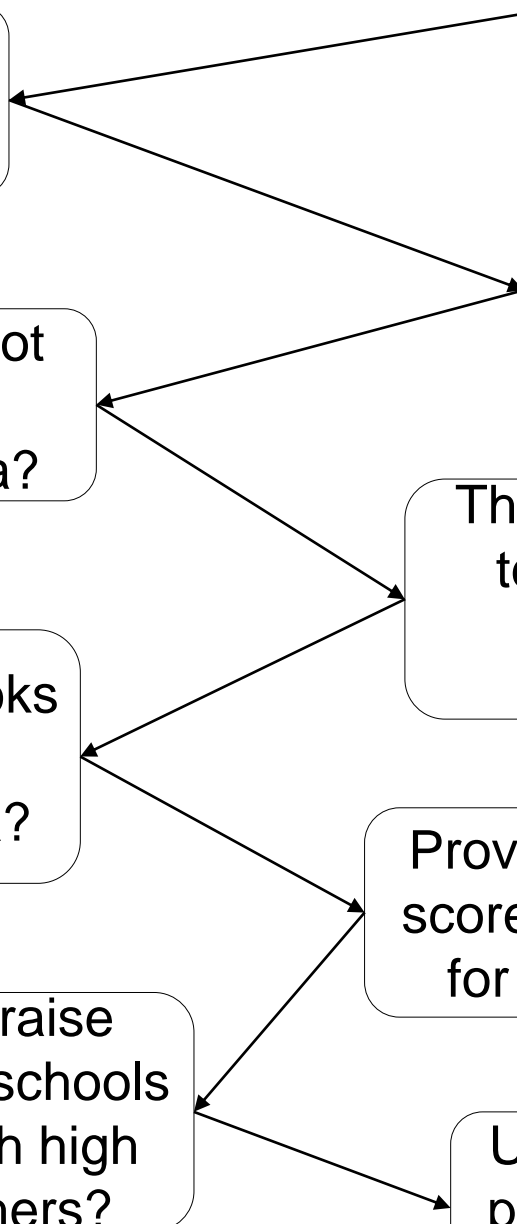
The median child could not read their textbook because it was written in English, which is not their native language.

For whom did providing textbooks raise average test scores in primary schools in rural Kenya?

Providing textbooks raises average test scores in primary schools in rural Kenya for children with high pretest scores.

Why did providing textbooks raise average test scores in primary schools in rural Kenya for students with high pretest scores, but not for others?

Unlike the others, students with high pretest scores were probably able to read their textbooks.



# Claims lose their relevance

Claims that are relevant at the beginning often lose their relevance by the end of the study

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←-- contradiction --→

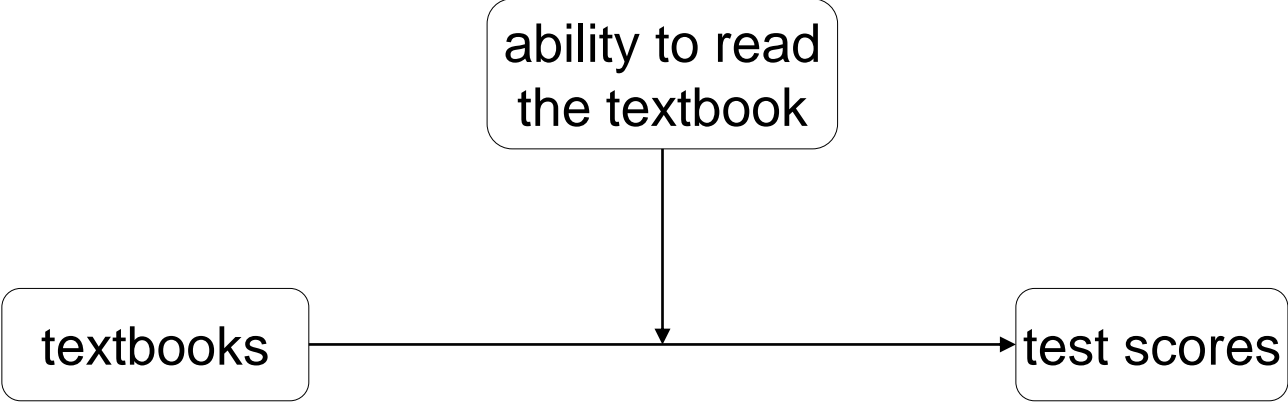
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subcases



moderated case

language problems  
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subcases

compensating  
strategies

language  
problems



low GPA

moderated  
case

## Case development process independent of study design

- The mixed methods case development process is independent from the classification of a study as a concurrent or a sequential study.
- Glewwe et al. (2009) has a sequential design: quantitative analysis of test scores is followed by qualitative data collection and analysis (observations).
- Lee and Greene (2007) has a concurrent design: Interviews and quantitative analysis are performed at around the same time.
- Yet both display the order: controversial case – subcases – moderated case.

# Validity criteria for mixed methods research

Quality is the extent to which

- different perspectives (stakeholders, theories, disciplines, methods, et cetera) have been included.

# Validity criteria for mixed methods research

Quality is the extent to which

- claims have been further developed;
- data have been exhausted.

previous research

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Most probably, these students could read their textbooks.



# Validity criteria for mixed methods research

Quality is the extent to which

- claims have been further developed;
- sound decisions about further development have been made during the research process.

subsequent research questions

claims

Does providing textbooks raise average test scores in primary schools in rural Kenya?

Providing textbooks raises average test scores in primary schools.

Providing textbooks does not raise average test scores for children in primary schools in rural Kenya.

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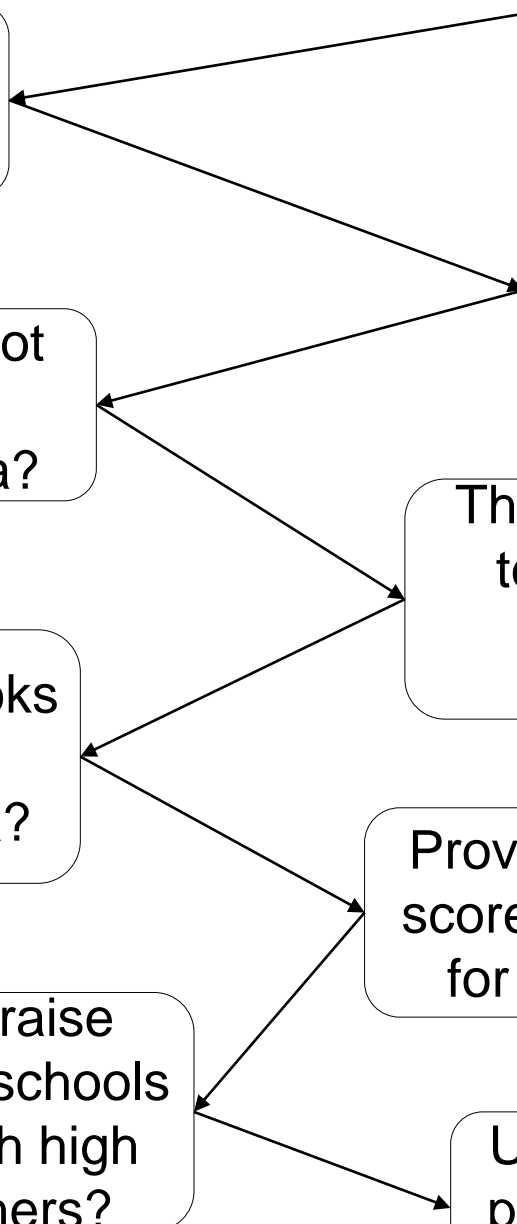
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# Validity criteria for mixed methods research

Quality is the extent to which

- a moderated claim has been developed.

Providing textbooks raises average test scores in primary schools.

←-- contradiction --→

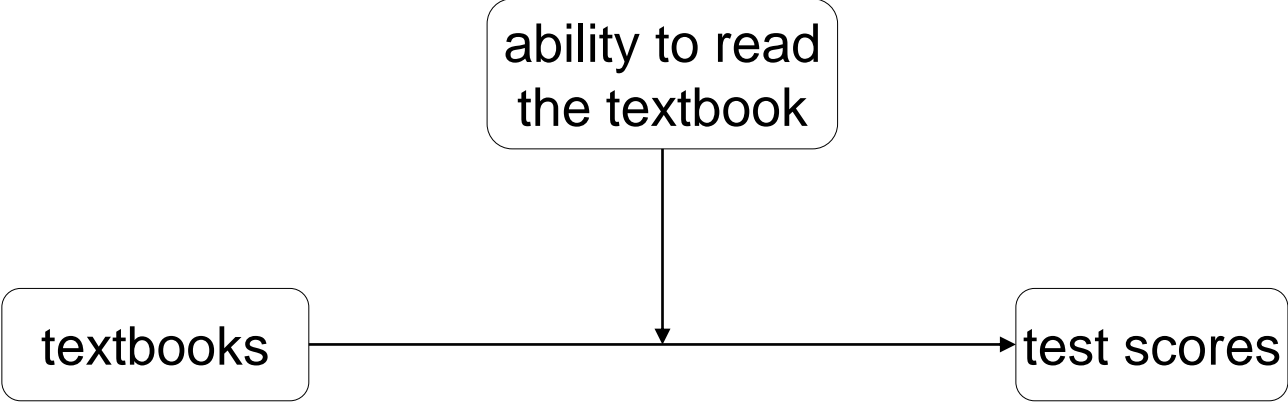
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← contradiction →

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controversial case

some students with language problems had highest GPA

other students with language problems did not obtain highest GPA

subcases

compensating strategies

language problems



low GPA

moderated case

Not limited to mixed methods research

The mixed methods case development process is not unique to mixed methods research, but can be applied to all research, including multi-method and mono-method research.

## Open Access article

Schoonenboom, J. (2019). Develop your case! How controversial cases, subcases, and moderated cases can guide you through mixed methods data analysis. *Frontiers in Psychology, 10*(1369).

<https://doi.org/10.3389/fpsyg.2019.01369>

# Literature

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Thank you!

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# Mixed Method Webinar Series

- Please join us on **February 18, 2020** for our next Mixed Method webinar, presented Dr. Leah Cain - *Ethical Considerations in Mixed Methods Research*. To register, visit <https://www.ualberta.ca/international-institute-for-qualitative-methodology/webinars/mixed-methods-webinar/index.html>
- For archives of this video series, including slide presentations, please visit the Mixed Methods archive through IIQM at the University of Alberta found here:  
<https://www.ualberta.ca/international-institute-for-qualitative-methodology/webinars/mixed-methods-webinar/archived-webinars.html>
- Registration and abstract submission is now open for **Thinking Qualitatively Conference**, featuring a Focus on Intersectionality in partnership with the University of Alberta's Faculty of Nursing and Research at the Intersections of Gender. To register or submit, visit  
<https://www.ualberta.ca/international-institute-for-qualitative-methodology/conferences-workshops-and-events/thinking-qualitatively-workshops/index.html>

