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UMR 5191
Interactions, Corpus, Apprentissages, Représentations

The Productive Multivocality Project

Lund, Rosé, Suthers

Suthers, D. D., Lund, K., Rosé, C. P., Teplovs, C. & Law, N. (Eds.), (2013). *Productive Multivocality in the Analysis of Group Interactions*. New York: Springer

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Productive Multivocality in the Analysis of Group Interactions

- Editors:
  - Dan Suthers, University of Hawai‘i;
  - Kristine Lund, CNRS—University of Lyon;
  - Carolyn Rose, Carnegie Mellon University;
  - Chris Teplovs, Problemshift Inc.;
  - Nancy Law, University of Hong Kong

- **35 authors** from Canada, France, Germany, Great Britain, Hong Kong, Japan, Korea, Romania, Singapore, United States

NAPLES webinar April 2014 : kristine.lund@ens-lyon.fr, suthers@hawaii.edu, cprose+@cs.cmu.edu

Presentation

1. Context and motivations of Productive Multivocality
2. Strategies for supporting Productive Multivocality

[First interactive activity : Two break-out groups brainstorm on one question each]

3. Pitfalls to avoid while collaborating around shared data
4. Examples of epistemological encounters

[Second interactive activity : Two break-out groups brainstorm on same question]

1. Context and motivations of the Productive Multivocality project

Book organization

Suthers, D. D., Lund, K., Rosé, C. P., Teplovs, C. & Law, N. (Eds.), (2013). *Productive Multivocality in the Analysis of Group Interactions*. New York: Springer.

Data collection and sharing

Analyses in different theoretical frameworks

- Analysis 1
- Analysis 2
- Analysis 3

- Analysis 1 <-> Analysis 2
- Analysis 2 <-> Analysis 3
- Analysis 1 <-> Analysis 3

Reflection

X 5

Reflection on our process

[Math, Chemistry, Physics, Education, Biology]

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The general context of *multivocality* (1)

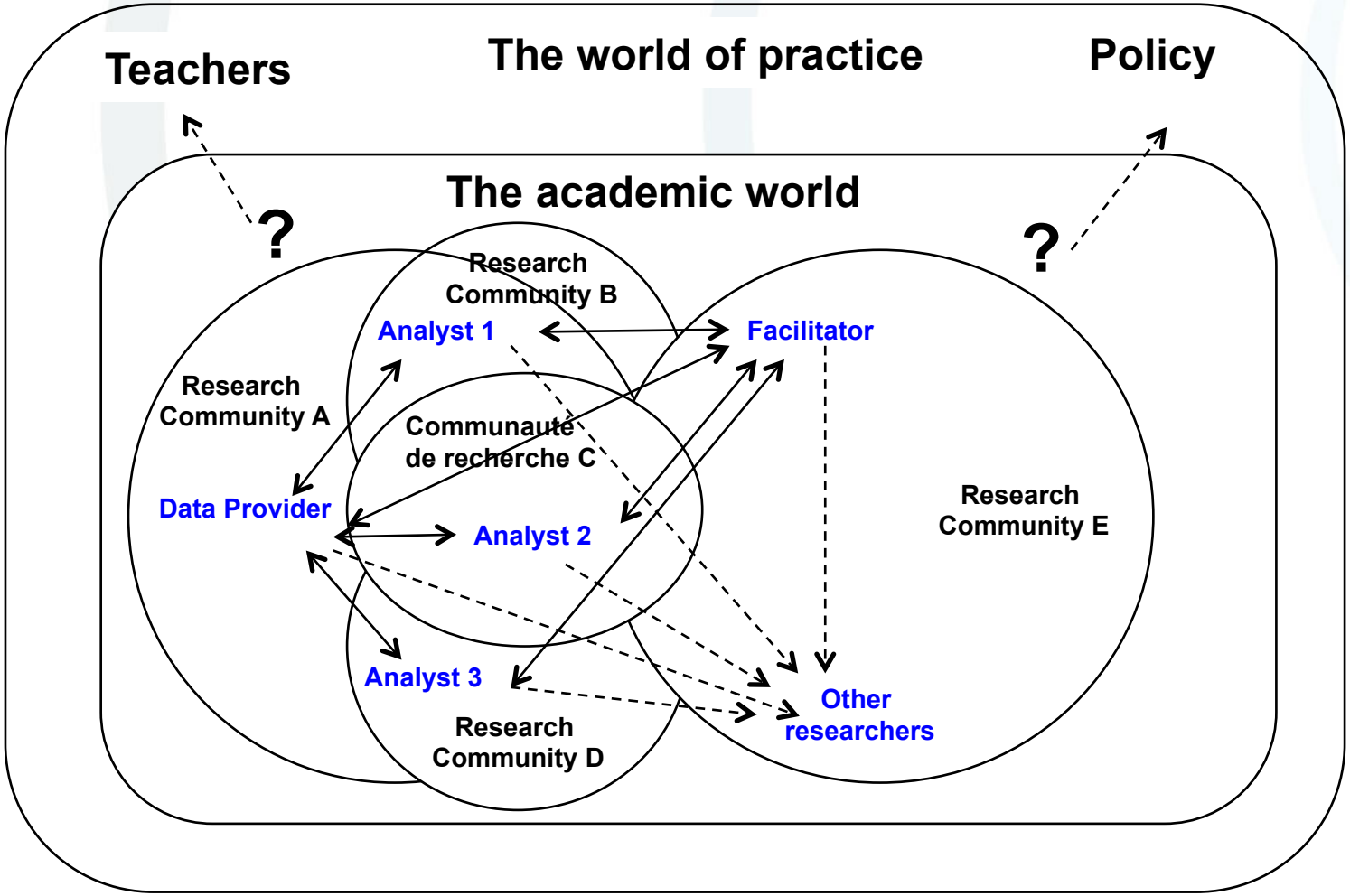
- Researchers in the Learning Sciences
  - Collaborative Learning
  - Cooperative Work
  - Technology Enhanced Teaching and Learning
- Education, psychology, computer science, linguistics
  - Numerous theoretical and methodological frameworks
- *Multivocal?*
  - The presence of multiple voices in texts (Bakhtin, 1981; Koschmann, 1999)
  - The “text” is the collective discourse of researchers in the community LS / CSCL
- *Productive?*
  - Explore the multiple approaches for which the objective is to study the learning and the activity of individuals and the group during group interaction
    - Comparing and contrasting in order to complement or mutually elaborate concepts, theories and methods
    - Rather than eliminating differences and attempting unification, we search for the productive tensions

The general context of *multivocality* (2)

Information flow in formal communication

⇢ one way (e.g. public presentations)

⟷ bidirectional (e.g. transfer of artifacts, data, analyses, instructions, feedback)



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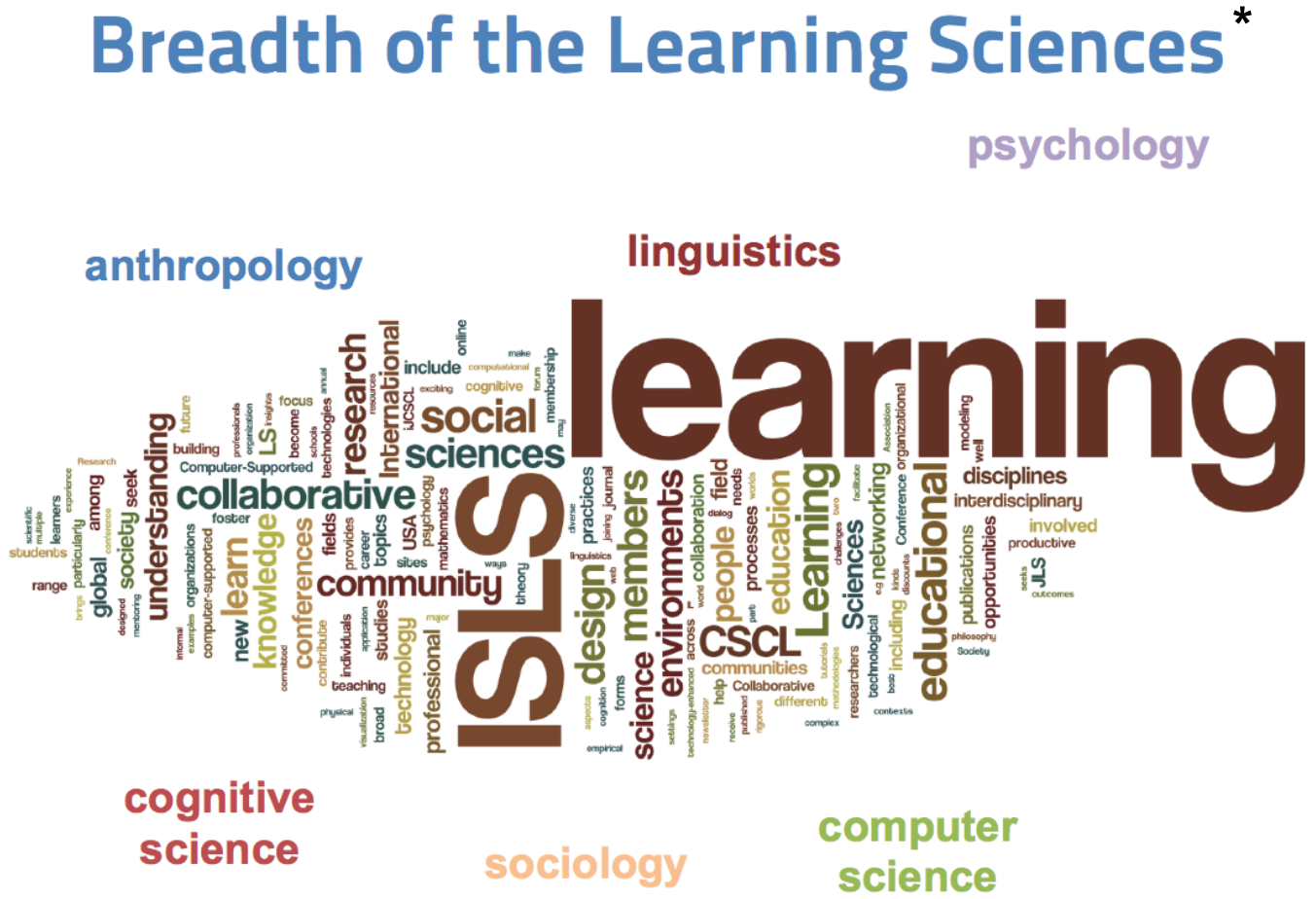
Motivations of the *Productive Multivocality* project

- Make scientific and practical progress
- If different traditions (including those that are supposedly incompatible) work to engage in dialogue with other traditions about…
  - our empirical material
  - our work as researchers



*http://www.isls.org/icls2014/downloads/ICLS14_Webinar_Submitting_to_ICLS.pdf

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The teaching-learning contexts of the 5 corpora

2/3 x 3/4

The photoelectric effect, Broglie's hypothesis

Chapters	*Topic*	*Age and Institutional Setting*	*Interactional Setting and Media*
4-8	Mathematics	6th Grade Japanese Classroom	Face-to-face with origami paper and blackboard
9-13	Chemistry	Undergraduate Peer-led Team Learning	Face-to-face with paper and whiteboard
14-19	Electricity	Primary school in Singapore	Primarily face-to-face with circuit components and Group Scribbles software
20-24	Education	Graduate Level in Toronto	Asynchronous discussions in Knowledge Forum
25-30	Biology	Secondary school in Pittsburgh	Mixed face-to-face and online with Concert Chat & conversational agents in support of collaborative learning

Electricity

Model of a cell

Educational applications of computer mediated interactions

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The five corpora and the analytical approaches (1)

1. Math
    1. Conceptual change as viewed by student trajectories
    2. Voices of students and teacher as convergent or divergent
    3. Statistic Discourse Analysis (new ideas, justifications)

2. Chemistry
    1. Analysis of knowledge, mobilized and communicated, in Peer-Led Team Learning
    2. Social Network Analysis (knowledge building)
    3. Two coding schemes around the cognitive, relational and motivational notions of leadership

3. Physics
    1. Progressive inquiry and uptake
    2. Uptake analysis within an ethnomethodological orientation
    3. Conceptual change and the notion of coherence through a multimodal analysis
    4. Content analysis from a group comprehension viewpoint

The five corpora and the analytical approaches (2)

4. Education
    1. Relation between the social interaction and the semantic content of exchanged messages
    2. Analysis done with the goal of creating a tool that will allow the teacher to monitor student progress
    3. Statistical Discourse Analysis (new ideas, justifications)

5. Biology
    1. Linguistic analysis of social positions in order to pinpoint negative student experiences
    2. How the context contributes (or not) to group consciousness
    3. Analysis of roles within an interaction — ethnomethodological perspective
    4. Roles (ethno + social network analysis)

A variety of approaches inscribed within different theoretical frameworks

- Each set of analyses gave rise to results concerning the corpus in question, but…

- the 5 sections of the book also formed the the data we used for our broader objectives:

    1. Develop strategies so that different traditions discover that dialogue around shared data is worth doing

    2. Understand the implications of our efforts toward Productive Multivocality for theory and practice

2. Strategies for supporting productive multivocality

Strategies for supporting productive multivocality (1)

1. Analyze the same data
   - Make it possible to juxtapose alternative analyses

2. Analyze from different perspectives
   - Which parts of the data “merit” our attention ?
   - How much data do we need ?
   - What information is missing in the provided corpus and why ?
     - What is a corpus, BTW, and what is a transcription ?
   - **Render the perspectives explicit**
     - **From which assumptions is the corpus being considered**

3. Push back the boundaries of research traditions without betraying the traditions
   - Place analysts outside of their comfort zone

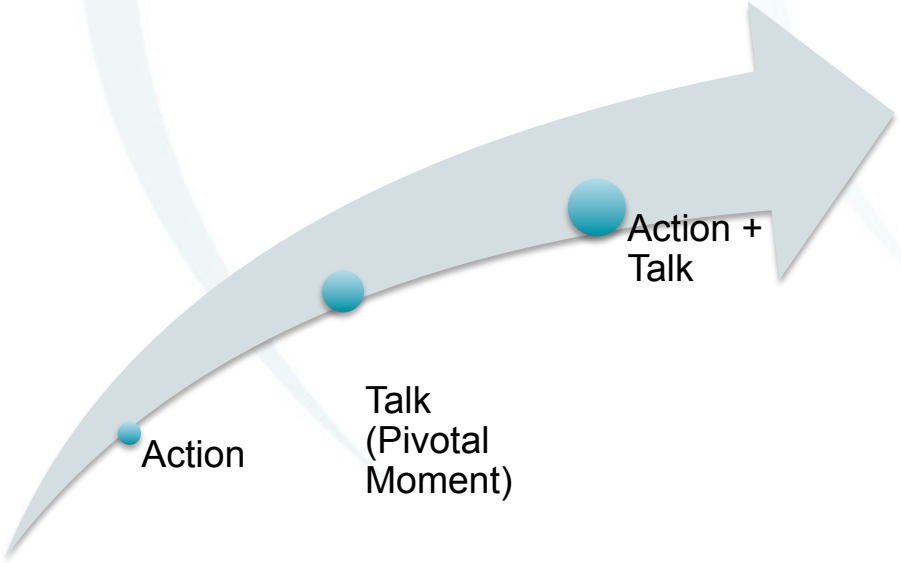
Our methodological dimensions

- 1. **Theoretical assumptions**: What ontological and epistemological assumptions are made about phenomena worth studying, and how we can come to know about them?
- 2. **Purpose of analysis**: What is the analyst trying to find out about interaction?
- 3. **Units of action, interaction, and analysis**: In terms of what fundamental relationships between actions do we conceive of interaction? What is the relationship of these units to the unit of analysis?
- 4. **Representations**: What representations of data and representations of analytic constructs and interpretations capture these units in a manner consistent with the purposes and theoretical assumptions?
- 5. **Analytic manipulations**: What are the analytic moves that transform a data representation into successive representations of interaction and interpretations of this interaction? How do these transformations lead to insights concerning the purpose of analysis? [Back]

Strategies for supporting productive multivocality (2)

4. Begin with a pre-theoretical, shared analytical objective
   - **Go beyond the different visions of the data by using a boundary object like the pivotal moment**
     - Same moments for different traditions ?
     - If they are different moments, why ? How can traditions mutually inform each other?

5. Align the different analytical representations in relation to the original data and thus also in relation to one another
   - *Attempt to relate the different analytical episodes from temporal, spatial and semantic points of view*



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Boundary object: e.g. the pivotal moment

- *« Boundary objects are objects which are both **plastic enough to adapt to local needs and constraints** of the several parties employing them, yet **robust enough to maintain a common identity** across sites. They are **weakly structured in common use**, and become **strongly structured in individual-site use**. They may **be abstract or concrete**. They have **different meanings in different social worlds** but their structure is common enough to more than one world to make them recognizable, **a means of translation**. The creation and management of boundary objects is key in **developing and maintaining coherence across intersecting social worlds** » (Star & Griesemer, 1989, p 393).*

Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, “translations” and boundary objects: Amateurs and professionals in Berkley’s Museum of Vertebrate zoology, 1907-1939. *Social Studies of Science, 19* (387-420).

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Pivotal moments

- Definition purposefully left unspecified, providing a “projective stimulus” that drew out different researchers' assumptions and insights
  - Analysts differed in their definition of pivotal moments…
  - Comparative and integrative discussion of how learning arises from interaction

Strategies for supporting productive multivocality (3)

6. Have someone play the role of the facilitator
   - Counters the natural tendency of researchers to focus on their own analyses: make alignment happen, point out disagreements

7. Eliminate gratuitous differences
   - Due to having chosen different temporal sequences
   - Due to having given a different name to the same conceptual entities
     - or the same name to different conceptual entities (*not* gratuitous)

8. Iterate
   - Gratuitous differences only show up after alignment
   - Comparison helps the analyses of everyone to evolve (**but see math corpus**)

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Strategies for supporting productive multivocality (4)

9. Take good care of the data providers
   - They take risks
   - If the analyses negatively criticize the data, be respectful of the data providers' objectives

10. Reflect on your own practices as a researcher
   - Methods are to a certain extent biased, but researchers can act upon the methods by using practices that change the bias.

Two forms of transcription that illustrate researcher agency

N°	*Participant*	*Temps*	*Énoncé*
1	Enfant	01:23	j'étais à l'école [et
2	Adulte	01:24	[qu' as tu-fait à l'école
3	Enfant	01:24	et puis et puis il y avait une madame
4	Adulte	01:24	la dame étai::[::t
5	Enfant	01 :25	[elle était la copine de la maîtresse

N°	*Temps*	*Enfant*	*Adulte*
1	01:23	j'étais à l'école [et	
2	01:24		[qu'as tu-fait à l'école
3	01:24	puis et puis il y avait une madame	
4	01:24		la dame étai::[::t
5	01 :25	[elle était la copine de la maîtresse	

Deux formes de transcriptions, chacune rendant saillantes des phénomènes différents. Les chevauchements sont désigné par des crochets « [» et les allongements vocalique par des « ::: ».

- A transcription in sequential order: the adjacent pair concept helps to locate overlapping and co-constructed speech
- A transcription that separates the speakers allows the reader to better follow the interventions of one speaker — e.g. young children (Ochs, 1979)

First interactive activity : Two break-out groups, one question each

- What are the benefits of working in an interdisciplinary context?
- What are the dangers of working in an interdisciplinary context?

3. Pitfalls to avoid while collaborating around shared data

Pitfalls to avoid while collaborating around shared data in a PM context (1)

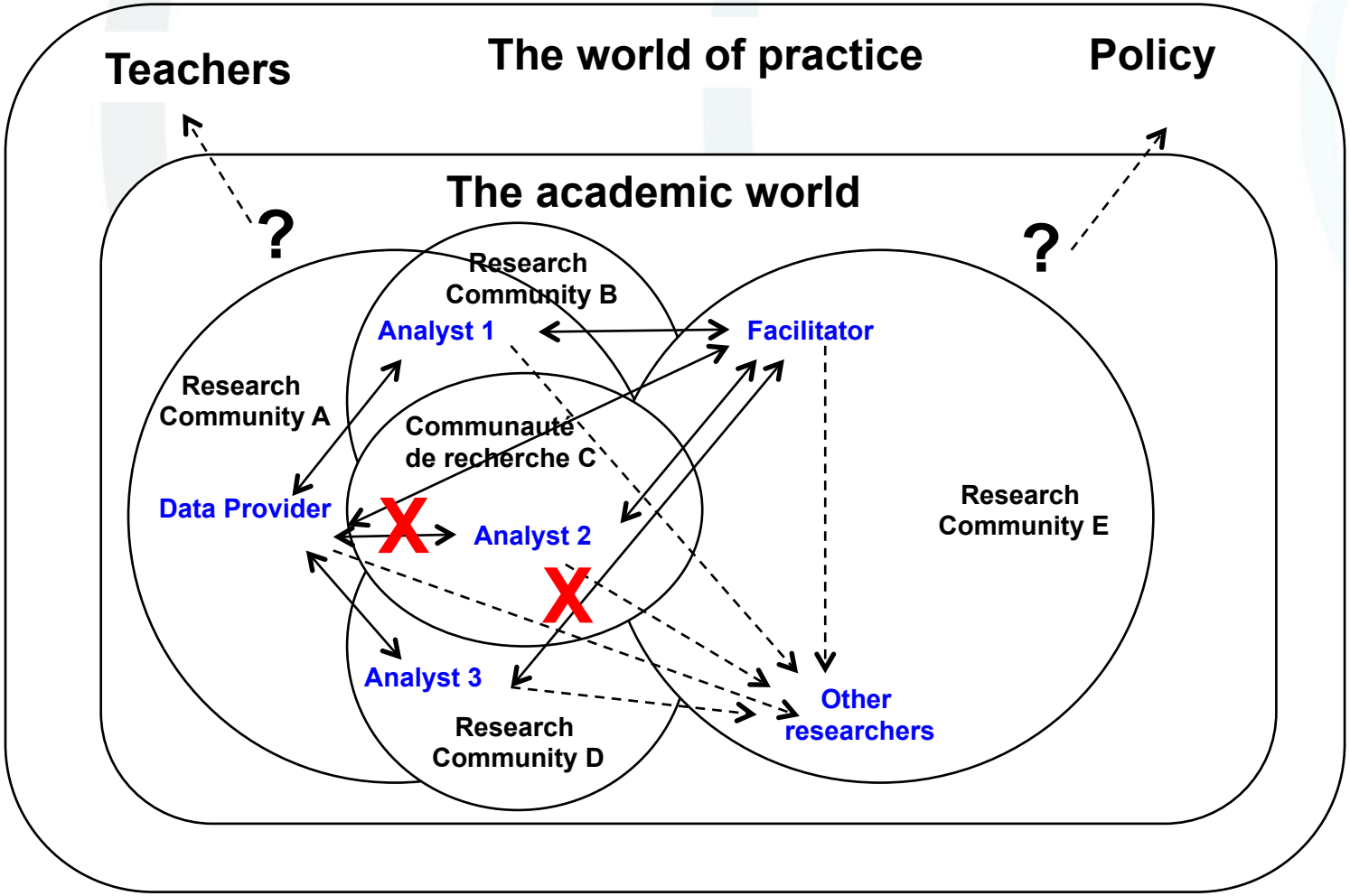
- What are the general challenges of multivocality?
  - It's about working within a team, and within a community, so one danger comes from different forms of isolation
  - Science is social, and theories are receptacles for the collection and integration of knowledge coming from empirical studies
    - So, an isolated contribution (even one of high quality) does not gain meaning unless it is integrated

Pitfalls to avoid while collaborating around shared data in a PM context (2)

Information flow in formal communication

⇢ one way (e.g. public presentations)

⟷ bidirectional (e.g. transfer of artifacts, data, analyses, instructions, feedback)



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Pitfalls to avoid while collaborating around shared data in a PM context (3)

1. Pitfalls around building the collaborative team
   - Forget to ensure a variety of analytical methods
     - Not make explicit the assumptions around data gathering (experimental paradigm vs. “authentic” situation)
     - Not verify that the constraints of the analytical methods to be used are compatible with the corpus (e.g. quantitative, qualitative)

2. Pitfalls around public presentations
   - Not respect the data provider and her loss of control over her data
   - Not know how to communicate the results of a method to a non-expert audience (e.g. a statistical method that implies special background knowledge)
   - Make the mistake of doing a public presentation that is not adapted to the general public, but is instead oriented to one *stakeholder* (e.g. criticisms that are targeted toward a pilot study rather than criticisms that are couched in a larger context)

Pitfalls to avoid while collaborating around shared data in a PM context (4)

3. Pitfalls around data transfer (from the point of view of the data provider toward the analysts)
   - Forget to make sure that the data provider can actually give what the analysts need to analyze (e.g. what's a corpus?)
   - Forget to communicate contextual information concerning data gathering, selection, and "cleaning" (e.g. analysts complained about things that couldn't be changed ; two contrastive cases were such for X, but not for Y)
4. Pitfalls around data transfer (from the point of view of the analysts toward the data provider)
   - Fail to fully engage with the other researchers (e.g. math vs. physics corpus)
   - Make the mistake of thinking the data is representative (e.g. wrongly generalize)
   - Take into account contextual information in a selective manner (e.g. Ignore the heterogeneity of experimental data)

Conclusions relating to pitfalls to avoid during Productive Multivocality

- A single analysis carried out from only one perspective may now seem fragile
  - Positive for the quality of research
- There is a consensus concerning the benefits of “mixed methods”
  - Reinforce conclusions
  - Better understand the analytical concept (from a breadth perspective – GMO example)
- Multivocality benefits both the research and the community
  - Bridges are built between disciplines
  - Assumptions are rendered explicit

4. Examples of epistemological encounters

Epistemological encounters during Productive Multivocality

- Researchers normally work in their discipline without questioning its epistemological foundations
- Multivocality gives a framework that is conducive to epistemological encounters
  - What happens when researchers do engage with each other?
    - Productive and easy
    - Difficult, but productive
    - Missed opportunities
    - They can retreat into their incommensurable positions
  - What happens when they do not engage?
    - Can still be productive

What is an epistemology?

- A reasoned discourse (logos) on *epistémé* (the nature of knowledge and how it can be acquired)
  - Role of theory in research
  - Nature of the object of research
  - Way in which one gathers and represents data
  - Relation between researcher and data
  - Definition of an analytical construction
  - Which units of analysis are pertinent
  - Value judgments in relation to data
  - Which methods should be applied and how
  - Validation of results

Second interactive activity : Two break-out groups, choose from these questions and collect answers from the group to present

- What is one epistemological foundation of your own work?
- How do you define learning (individual? group?)
- What is important in collecting data?
- Does everyone in the group work with transcripts in the same way?
- Do you feel a teacher should teach in a certain way?
- Have you ever modified an existing analytical construct for your own purposes? If so, have you thought about the consequences?

How can epistemologies encounter each other?

- Across domains (e.g. linguistics vs. psychology)
- Across sub-domains (generative linguistics vs. interactional linguistics)
- The research in a given discipline is done on a set of recognizable research questions, by the application of the same methods, using approaches shared by the community (Van den Besselaar & Heimeriks (2001).
- But if you move towards inter-disciplinarity…
  - Exchange ideas, data, methods and procedures
  - Mutually integrate concepts, theories, methodologies, and epistemological principles

Why provoke encounters of epistemologies?

- Researchers who study group interactions come from different disciplines and may not gather in the same communities. Yet, they:
  - Work on similar empirical data
  - Manipulate similar concepts
  - Research as a whole does not progress unless communities exchange with each other
- The comparison of theoretical frameworks generate fundamental questions for scientific communities
  - How do theoretical assumptions drive research ?
  - How can we build bridges between communities that are traditionally isolated, but who work on the same objects ?

Why should we keep a diversity of approaches?

- Diversity is inevitable in a multidisciplinary community
- The study of group interactions reveal distinct phenomena that are only visible at different levels of analysis (micro, meso, macro), and each level needs an appropriate theory
- Understand how explanatory schema can be complementary and give a broader and more complete comprehension of a phenomenon when such schema are combined (example from biology) :
  - Bird migration <- changes in climate provoke physiological modifications (biochemical and physiological explanatory schemas)
  - Bird migration <- moving allows the bird to find more food (natural selection)

Comparisons that did not give rise to epistemological encounters

- Difficulties aligning analytic representations
  - Tension between “for self” and “for others”
  - Even the attempt to align representations is informative
  - When analytical concepts don’t line up, it’s informative
  - Alignment after analyses is tiring and the effort furnished takes away from the energy left to reflect on other more fundamental subjects

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Comparisons giving rise to epistemological encounters (1)

- Missed opportunities for debating modifications made to analytical constructions
  - “Voice”, “adjacent pair”
- The study of pivotal moments can bring about epistemological modifications that can enrich analyses
  - Integrate qualitative analyses within a quantitative approach
- Accept to discuss with those who have different assumptions
  - The role of a teacher in a pedagogical interaction

Comparisons giving rise to epistemological encounters (2)

- Two operationalizations bring to light different aspects of a single analytical construction
  - E.g. « leadership » : differences in researchers' conclusions led to line by line comparisons, which revealed distinctions in the definitions
  - Should a value be associated to a concept (e.g. teaching interventions)?
  - Distinctions between definitions did not have consequences for the design of a pedagogical situation nor did it reflect on the quality of analytical work
- Questions underlying assumptions relating to the activity and the agency of learners
  - Should we study student interaction from a particular theoretical standard or on its own terms, by demonstrating the organized group participation?

Conclusions regarding the Productive Multivocality project

- Researchers who risk multivocality are innovators, working within inter-disciplinarity
  - Aspects of data ignored by researcher A are studied by researcher B
  - Epistemological suppositions are questioned
  - Analytical concepts are refined
  - We can reach a multi-dimensional comprehension of a phenomenon
  - Building successful bridge between traditions makes for better quality communication between communities
    - Isolation is countered → scientific progress

Références

Written for the purpose of giving an overview of the project

http://lilt.ics.hawaii.edu/papers/2013/PMV-Ch-31-Productive-Multivocality-Prepublication.pdf

Suthers, D. D., Lund, K., Rosé, C. P., & Teplovs, C. (2013). Achieving Productive Multivocality in the Analysis of Group Interactions. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs & N. Law (Eds.), *Productive Multivocality in the Analysis of Group Interactions* . New York: Springer. pp. 577-612.

For those interested in the how-to

http://lilt.ics.hawaii.edu/papers/2013/PMV-Ch-32-Pathways-Prepublication.pdf

Rosé, C.P. & Lund, K. (2013). Methodological Pathways for Avoiding Pitfalls in Multivocality. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs & N. Law (Eds.), *Productive Multivocality in the Analysis of Group Interactions*. New York: Springer. pp. 613-637.

For those interested in theoretical issues

lilt.ics.hawaii.edu/papers/2013/PMV-Ch-34-Epistemologies-Prepublication.pdf

Lund, K., Rosé, C. P., Suthers, D. D., & Baker, M. (2013). Epistemological encounters in multivocal settings. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs & N. Law (Eds.), Productive Multivocality in the Analysis of Group Interactions. New York: Springer. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs & N. Law (Eds.), *Productive Multivocality in the Analysis of Group Interactions*. New York: Springer. pp. 659-682.