Memorial
University of Newfoundland

Faculty of Education

Issues in the Analysis of Online Asynchronous Discussions

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Canada

Collaborative learning supported by online asynchronous communication in university-based courses

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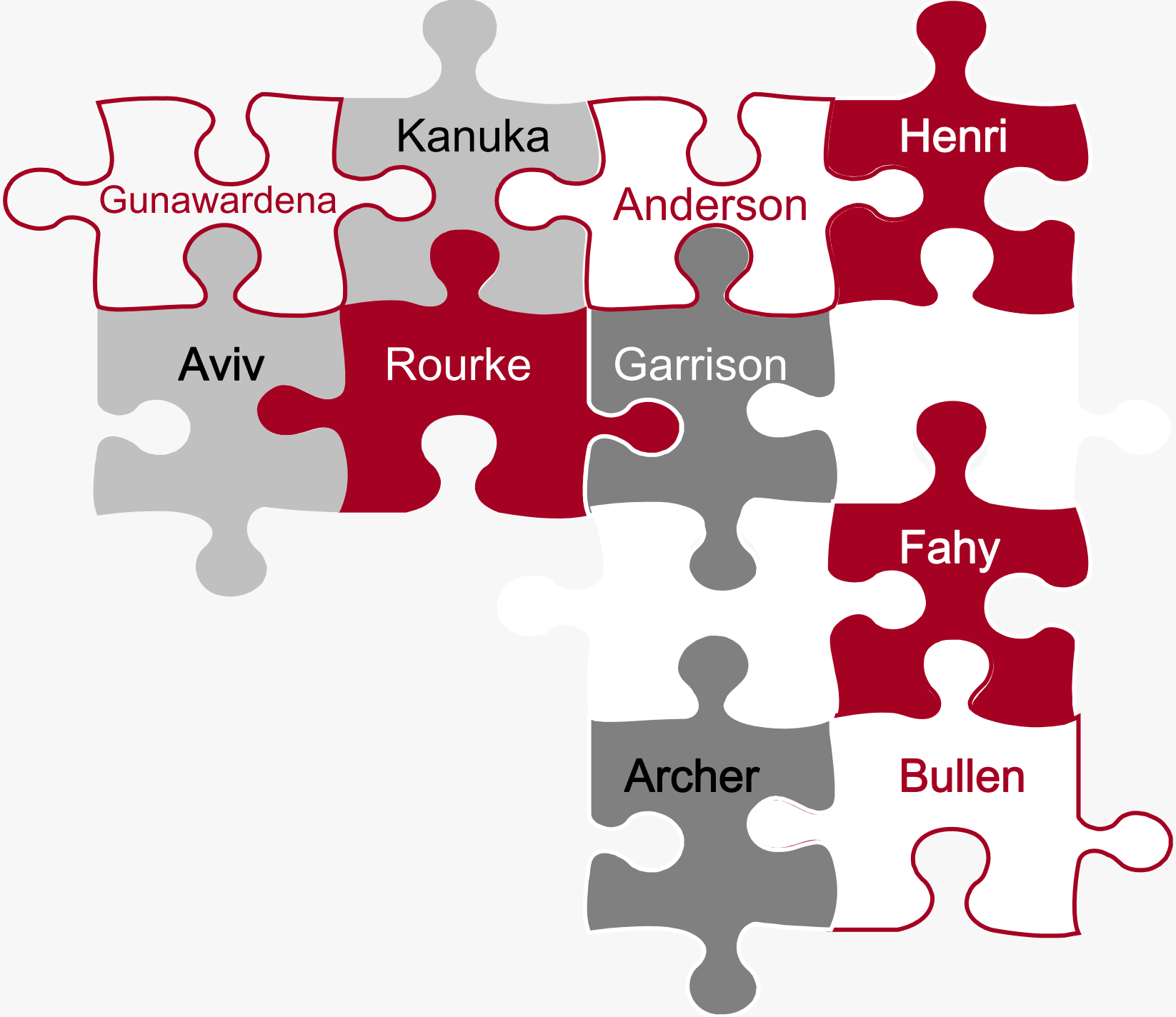
Purpose

Present an overview of issues and lessons learned related to content analysis of online asynchronous discussions

Outline

1. Overview of content analysis (Elizabeth)
2. Validity (Maria)
3. Syntactic vs. semantic units of analysis (Justyna)
4. Reliability (Justyna)
5. Latent vs. manifest content (Maria)
6. Open discussion


Kanuka
Gunawardena
Anderson
Henri
Aviv
Rourke
Garrison
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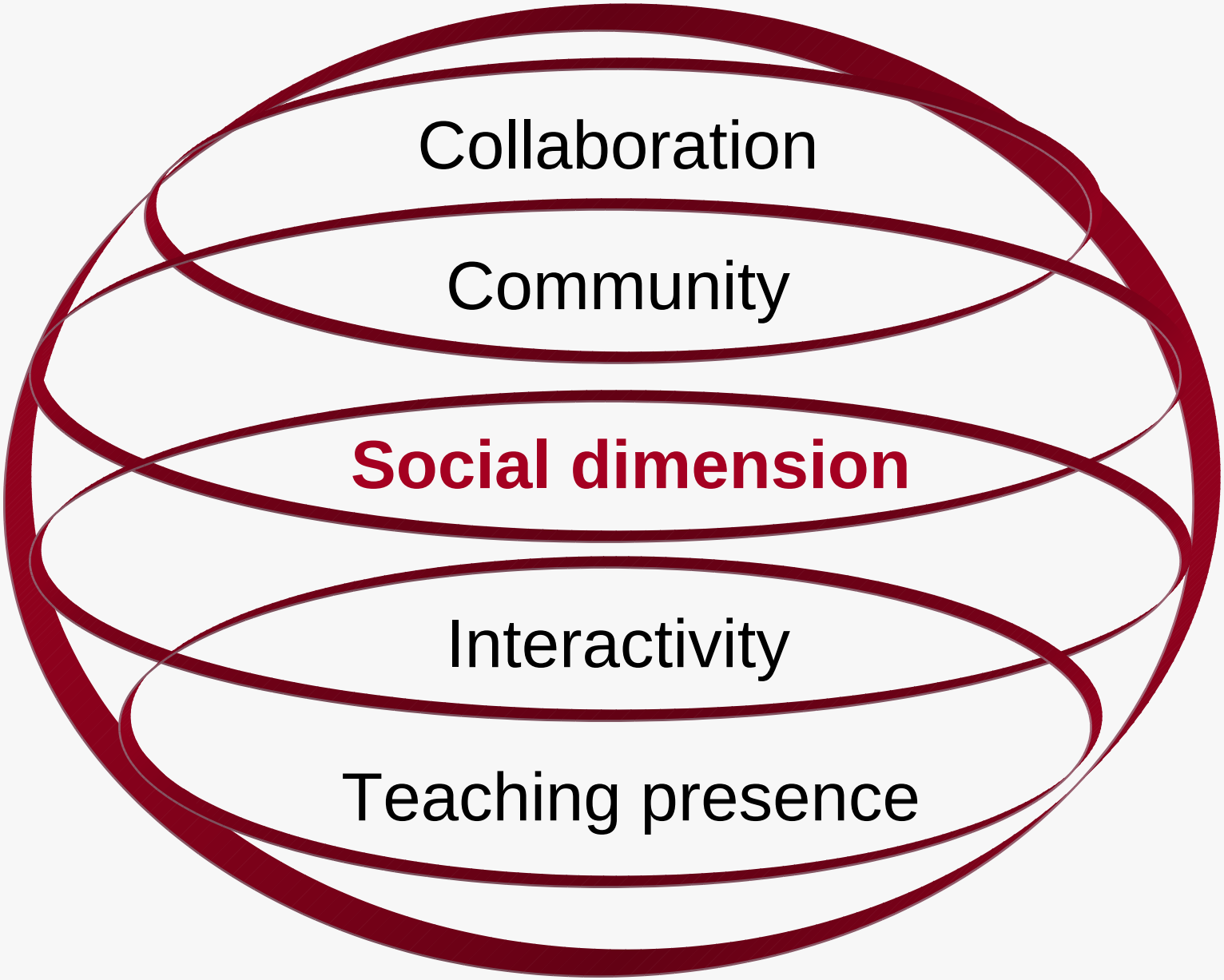
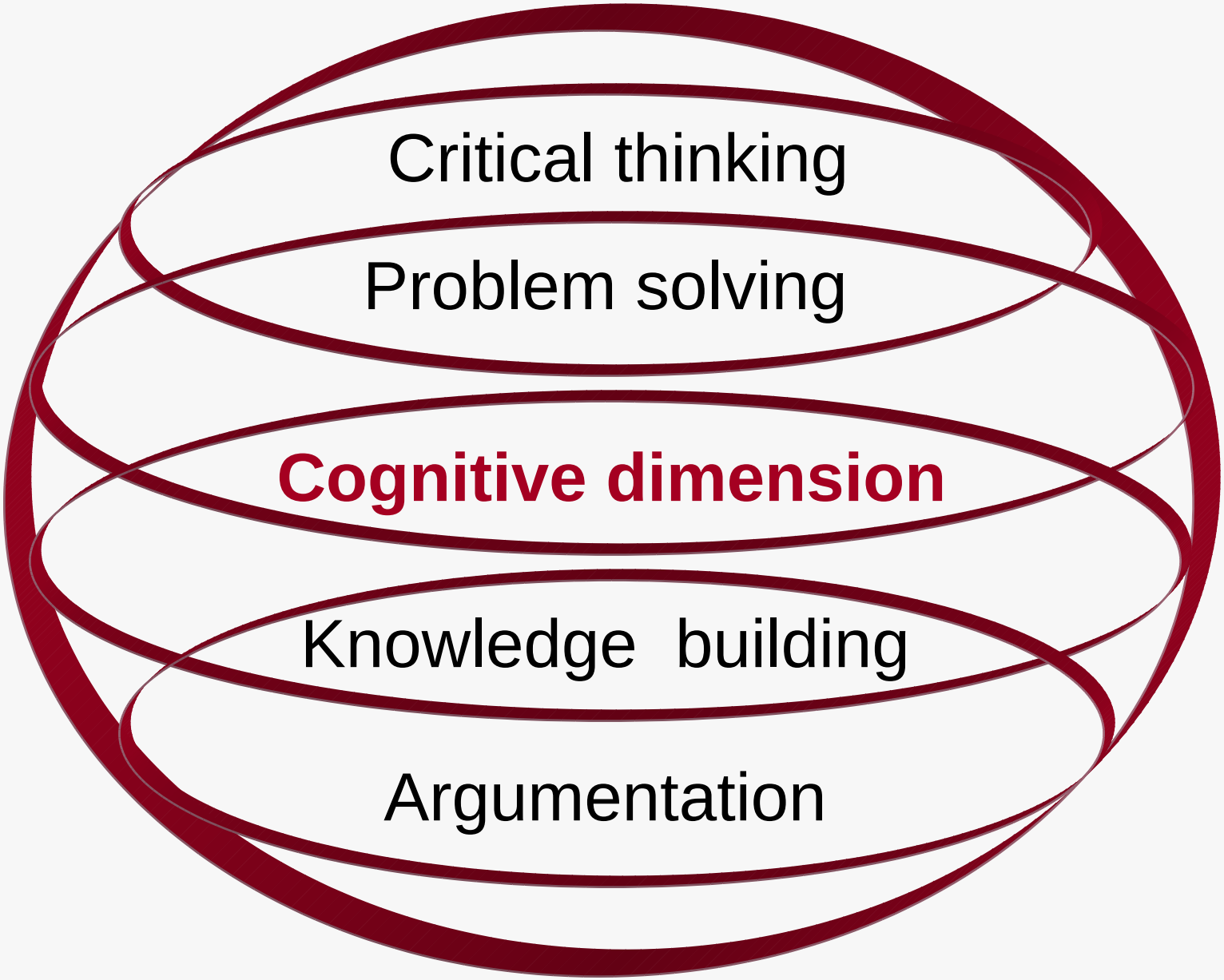
Archer
Bullen


Collaboration
Community
Social dimension
Interactivity
Teaching presence

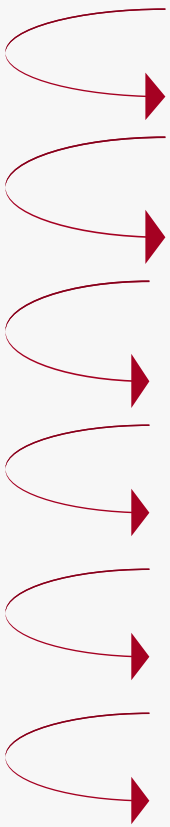

Critical thinking
Problem solving
Cognitive dimension
Knowledge building
Argumentation

Content analysis: Purpose

Observe, identify, describe, classify, measure engagement in social & cognitive processes

- Did discussants engage in_____?
- In what ways they engage in it?
- How much did they engage in it?

Content analysis: Process



Define the construct

Operationalize construct with instrument

Select unit of analysis

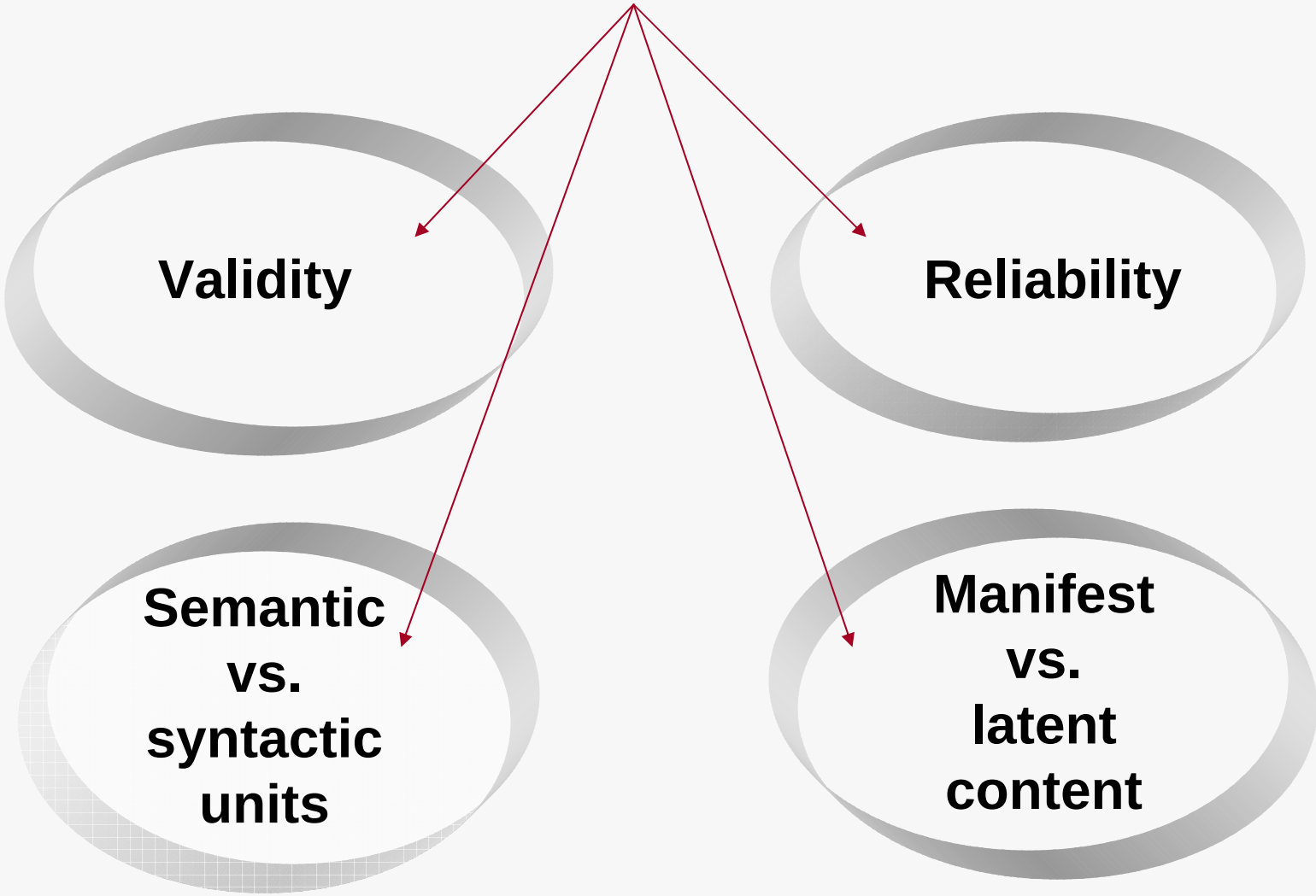
Code behaviors in transcript

Verify agreement between coders

Triangulate

Analyze and interpret results

Methodological issues



Validity

Activity 1

Problem solving is

_____

_____

_____

_____

Problem-solving instrument

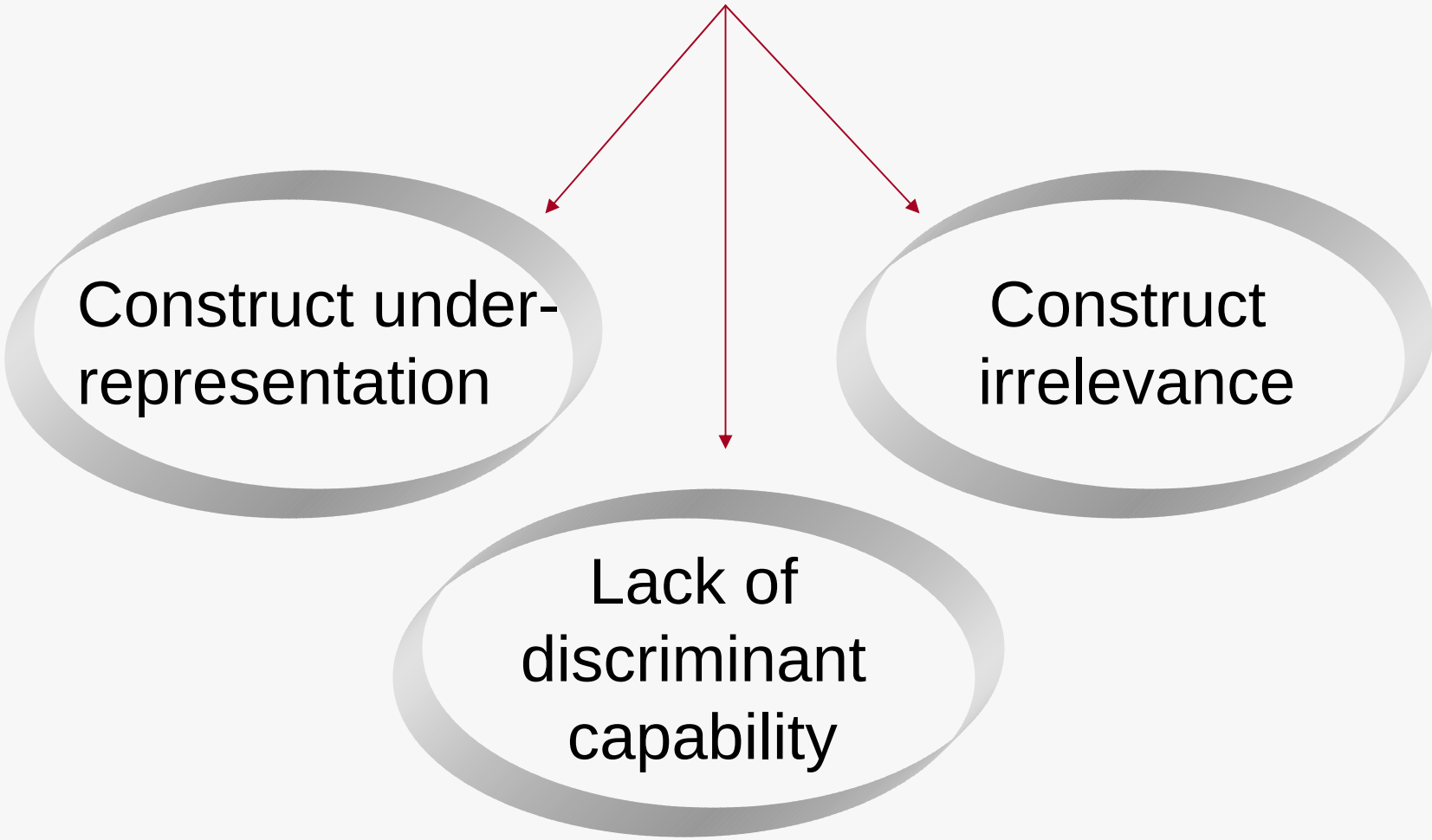
2 Categories

Problem formulation	Problem resolution
2 processes	3 processes
11 indicators	8 indicators
11 examples	8 examples

Category: Problem Formulation (version 2) [2]		
Process	**Indicator**	**Example**
Defining problem space	Agreeing with problem as presented in OAD	… there is a problem with getting students to speak French in the classroom, or for that matter to get the teacher to speak French in the classroom.
	Specifying ways that the problem manifests itself	The reality is that students will use English, or their first language to communicate as often as possible.
	Redefining problem within problem space	Perhaps the ultimate question really should be: when should L1 be used in the classroom, what contexts make it acceptable and beneficial to speak English instead of French?
	Minimizing and/or denying problem	I would argue that you can indeed use English in the Core French classroom.
	Identifying extent of problem	It seems to me that this issue of French/English use in the classroom will be one of the biggest challenges we will face as teachers.
	Identifying causes of problem	My understanding of the problem is that core French teachers are unsure of how much French to use because they don't know how much their students will understand.
	Articulating a problem outside problem space	I believe it is true that non-English speaking children are losing their mother tongue through the education system. Look at the focus of our ESL programmes.
Building knowledge	Identifying unknowns in knowledge	How can we reach those students who have below grade level skills, and provide them with some understanding of the target language?
	Accessing and reporting on sources of information	According to the author, pupils should be allowed to use English between themselves while working in teams.
	Identifying value of information	This article was not effective in teaching me about this problem.
	Reflecting on one's thinking	Once again, the negative view I previously had on this problem is becoming increasingly more positive.

Category: Problem Resolution (version 2) [2]		
Process	**Indicator**	**Example**
Identifying Solutions	Proposing solutions	I feel teachers need to use French more if they expect their students to use it.
	Hypothesising about Solutions	I believe that if a teacher were to make mistakes and correct them in front of a class, it would ease the students' minds about making mistakes themselves and enable them to correct themselves.
Evaluating Solutions	Agreeing with solutions proposed by others	I agree strongly with participant 6's views. Especially for Immersion students.
	Weighing & comparing alternative Solutions	I sincerely believe that using the target language 100% of the time creates a stagnant environment for learning. On the other hand, too much use of English would only serve to 'baby' students.
	Critiquing solutions	While I agree somewhat with participant 3, I think some students at lower levels may become too frustrated when trying to learn the language when a teacher uses only French.
	Rejecting solutions judged unworkable	I don't think it is right to start the year off with a solid plan of attack.
Acting on Solutions	Planning to act	Personally, I have decided to speak English the first day of classes.
	Reaching conclusions, or an understanding of the problem	The methods which all of these sources have suggested prove that language use in the classroom is a major problem, but is also easily mended with use of the proper tools, and creativity.

Threats to validity



Construct under-representation: Definition

The inability of an instrument to adequately define or encompass important aspects of the construct[3,4]

Construct under-representation: Example²

Category: PROBLEM FORMULATION
Process: *Defining problem space*

A

Indicators
Agreeing with problem as presented
Specifying ways that the problem manifests itself
Identifying extent of problem
Identifying causes of problem

B

Indicators
Agreeing with problem as presented
Specifying ways that the problem manifests itself
Redefining problem within problem space
Minimizing and/or denying problem
Identifying extent of problem
Identifying causes of problem
Articulating problem outside problem space

Construct irrelevance: Definition

The tendency to include irrelevant constructs distinct from, or surplus to the intended construct to be measured[3,4]

Construct irrelevance: Example

Recognising group presence	≠	Problem Formulation and Resolution

Recognising group presence	=	Collaboration

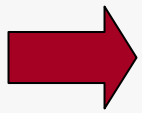
Discriminant capability: Definition

Discriminant capability refers to the ability of an instrument to “readily and unambiguously [permit] placing of conference content into discrete and useful categories”[5]

Discriminant capability: Example

Avoiding ambiguity in wording and lack of exclusivity between terms:

Understanding the nature of the problem and the ways in which it manifests itself



Specifying ways that the problem manifests itself

Validity:
Lessons learned

✓ is key as a starting point in content analysis

✓ requires systematic and detailed consideration

✓ requires repeated testing

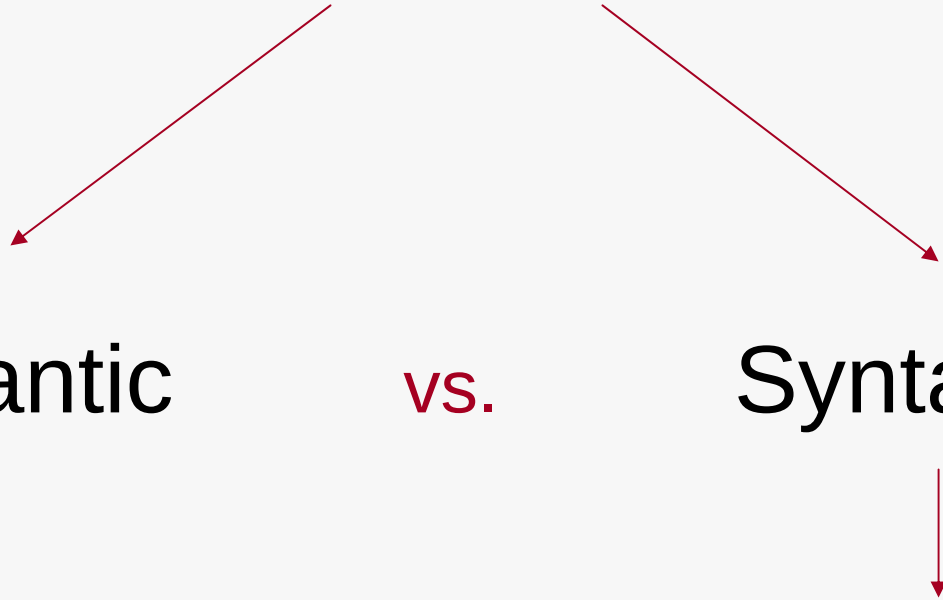
Unitizing

Activity 2

Read the following excerpt. Draw brackets around the parts of the text (units) to be coded.

It is very important to try and get parents involved for this reason. Parents are very important role models to their children. It is important to try to get parents involved so their children will look at their school as a place of importance to their own lives. Laura also noted that it was important to give parents the message that the school cares. This caring message should come from the people that they have contact with every day i.e.: their teachers, the principal, and other school staff.

Types of units of analysis



Semantic vs. Syntactic

Theme, idea, meaning

Sentence, paragraph, message

Identifiability

Are sentences and paragraphs easily identifiable in the transcripts?

Reliability

Will the coders be able to agree on the units?

Discriminant capability

Do the units discriminate between behaviors?

Feasibility

Will coding the units be feasible in terms of time and resources?

Data sources

- ✓ Online learning module for Problem Formulation and Resolution
- ✓ Month-long discussion
- ✓ 1 problem and 8 tasks
- ✓ Problem = parental involvement in schools

- ✓ Fall 2004 @ Memorial
- ✓ Discussants were 7 graduate and 3 undergraduate students from 2 Counselling psychology courses

Choice of semantic units: Maria vs. Justyna

M 1

M 2

It is very important to try and get parents involved for this reason. Parents are very important role models to their children. It is important to try to get parents involved so their children will look at their school as a place of importance to their own lives. Robert also noted that it was important to give parents the message that the school cares. This caring message should come from the people that they have contact with every day i.e.: their teachers, the principal, and other school staff.

J 1

J 2

J 3

Choice of syntactic unit: Sentence vs. Paragraph

1 It is very important to try and get parents involved for this reason.

2 Parents are very important role models to their children.

3 It is important to try to get parents involved so their children will look at their school as a place of importance to their own lives.

4 Robert also noted that it was important to give parents the message that the school cares.

5 This caring message should come from the people that they have contact with every day i.e.: their teachers, the principal, and other school staff.

1

Agreement in unitizing

	# of **SEMANTIC** UNITS	
Discussant	Maria	Justyna
A	23	44
B	36	30
C	31	43
D	42	47
E	48	48
F	30	41
G	47	44
H	26	38
I	30	65
J	80	57
Total	393	457

Agreement in unitizing

	# of **SYNTACTIC** UNITS	
Discussant	Maria	Justyna
A	31	31
B	29	29
C	35	35
D	40	40
E	32	32
F	35	35
G	55	55
H	32	32
I	32	32
J	34	34
Total	355	355

Unitizing: Lessons learned

✓coding cannot begin until the units have been defined

✓definition of the units will depend on the context and characteristics of the discussion

✓ effective choice of unit will involve balancing the different issues

Reliability

Activity 3

Read the following excerpt. Refer to the PFR instrument (handout) to associate a category, process, and an indicator with the excerpt.

In rural settings the distance from a student's home to the school may be great and this will hinder involvement from the parents… In some cases, parents do not have the resources available to be regularly involved in the school because of socio-economic factors.

Problem _____ (formulation or resolution)

Process _____

Indicator _____

Inter-rater reliability: Definition

Extent of agreement between independent coders[6]

Inter-rater reliability: Example

5.4	6.0	3.2	4.9	3.6

Measuring reliability

Cohen's kappa -
chance corrected measure

Scale for rating agreement levels[7]

Kappa	Agreement
0 → 0.40	**poor**
0.40 → 0.75	**fair** to **good**
0.75 → 1.00	**excellent**

Value of agreement between Maria & Justyna[8]

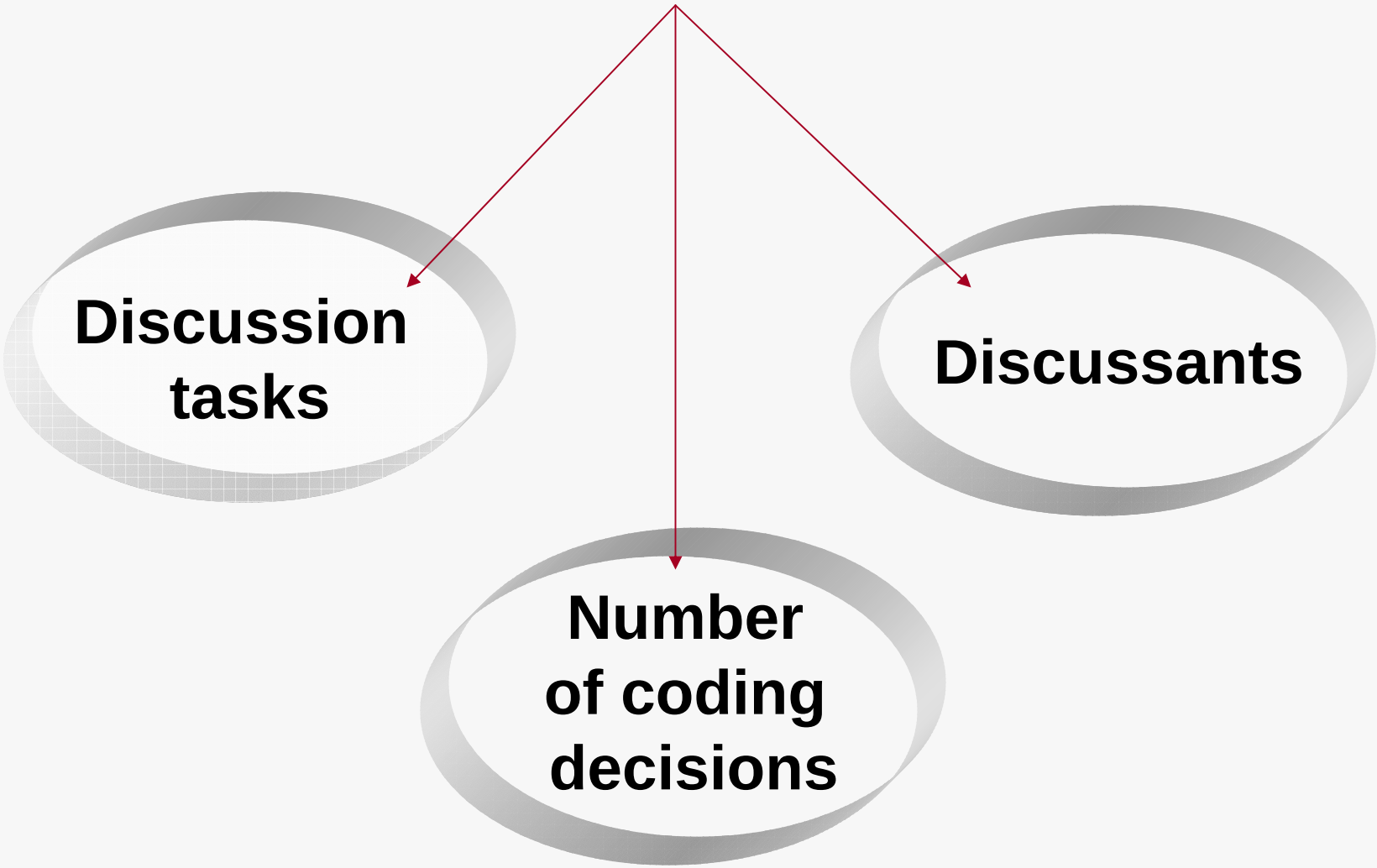
Total agreement

0.591

Reliability: A complex issue

Crocker, R., & Schulz, H. (2001). *Design of a generalizability study for SAIP assessments*. Report submitted to the Council of Ministers of Education, Canada.

Sources of difference



Differences in agreement across discussants

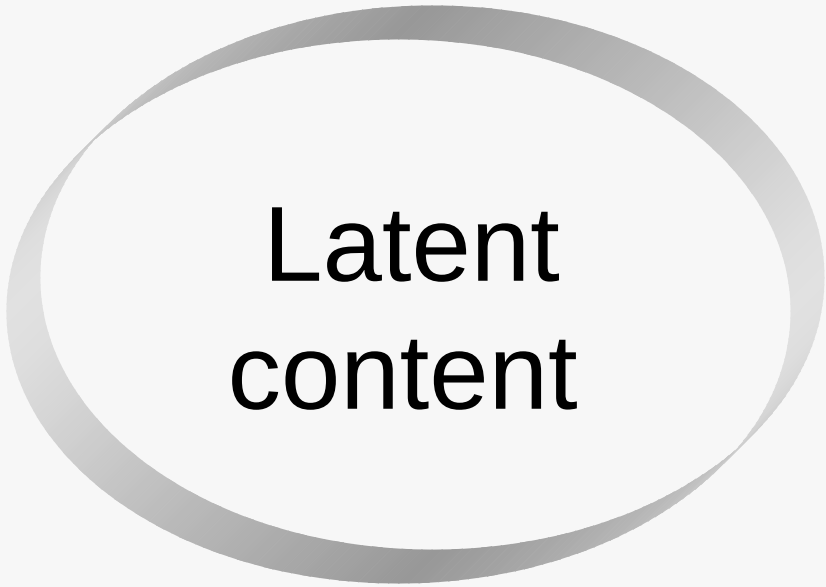
Discussant	Reliability value
A	0.638
B	0.853
C	**0.390**
D	0.702
E	0.891
F	0.668
G	0.714
H	0.596
I	**0.907**
J	0.706
MEAN	*0.707*

Reliability: Lessons learned

✓reporting reliability as a percentage agreement can be misleading

✓ a single measure of inter-rater reliability will mask many others sources of difference

✓ a focus on many variables can provide insight into intricacies of agreement


Latent
content

Activity 4

Read the following excerpt. What question would you ask this discussant in a subsequent interview situation to gain more insight into his approach to problem resolution?

My first initial reaction to reading your 2 plans of action was excitement, as they are being currently implemented and are most importantly successful in creating a school community, parents included! Good job! I saw many positives to what you and your schools are doing for your children and their parents.

_____

_____

_____

Manifest content

↓

Observed behaviors

↓

Transcript analysis

↓

Which behaviours discussants engaged in
How much they engaged in those behaviours

Latent content

↓

Intended behaviors

↓

Interviews

↓

Why discussants didn’t engage in certain behaviours

Why they favoured some behaviours over others

Examples from interviews

Why discussants didn't engage in critiquing solutions:

A

I disagreed with [discussant 15] to a certain extent …. I remember when I was writing that comment I spent a lot of time rewording ... so that it wouldn't come off as being too critical.

B

When I reflect back to people, a lot of times it is to congratulate, them, support them, and compliment them…. You want to point out to people "Hey, that's a good idea!' … not "That's no good!" That's not the way I operate in real life.

Examples from interviews

Why discussants favored proposing solutions:

A

When faced with a problem, automatically I just think to myself 'What can I do to solve this problem?'

B

I am more of a solution person [because] in life there are always going to be problems.

Examples from interviews

Why discussants favored using experience:

A

I [shared my experience] because others may only have had the perspective from the school.

B

I really identified with the problem and different solutions that we come up with at work … [I was] dealing with my own experience and what other people said. I just kind of built on that.

Latent vs. manifest content: Lessons learned

✓ a form of triangulation to provide more in-depth and meaningful results

✓ requires protocols or approaches to help discussants engage in meta-cognitive activity

Content analysis: Conclusions

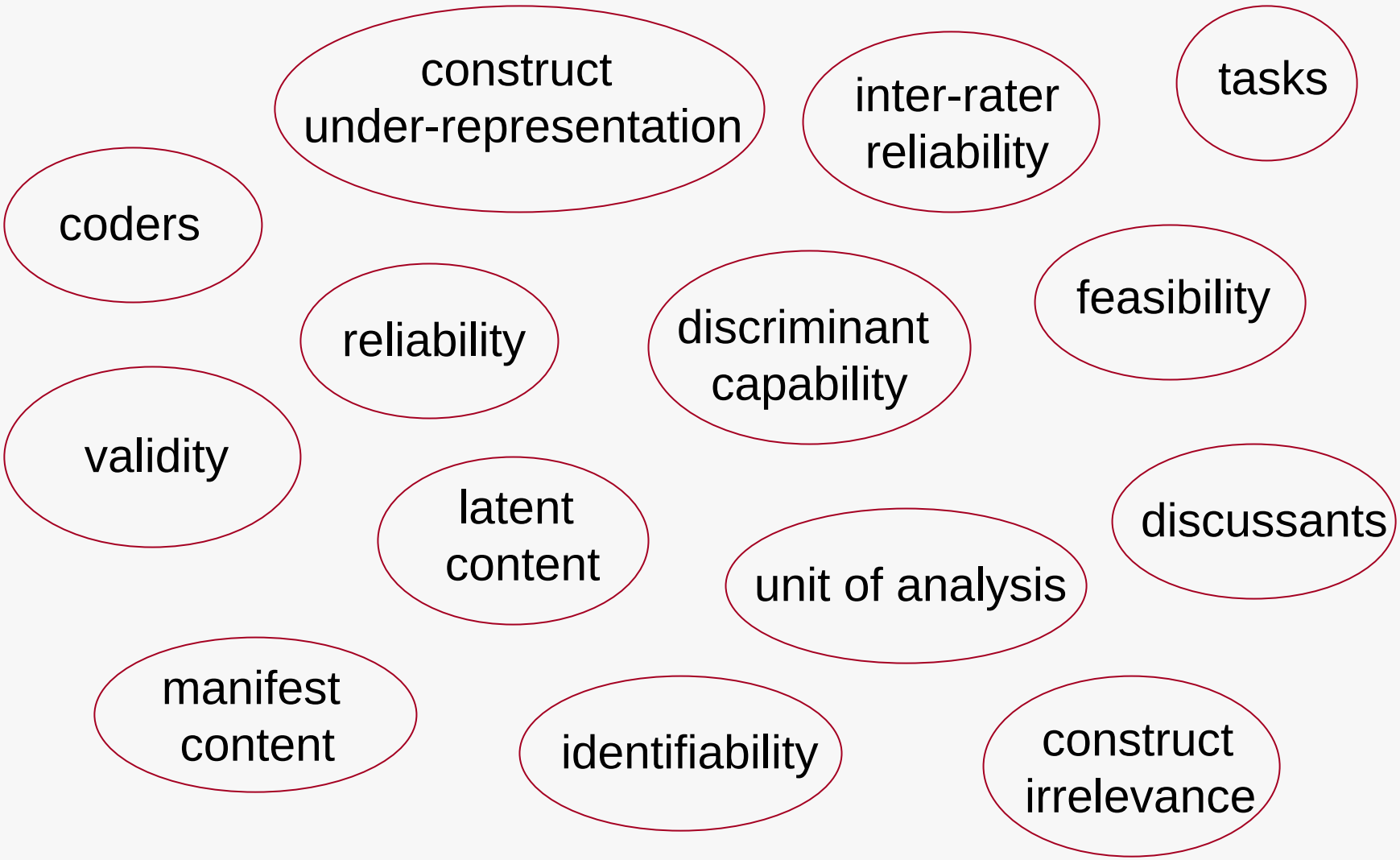
can provide detailed insight into discussants' performance

provides insight into the effectiveness of the discussion

there are issues within issues

is complex, problematic, and onerous

Content analysis: Complexity



Notes

[1] Neuendorf, K. A. (2002). *The content analysis guidebook.* Thousand Oaks, CA: Sage Publications.

[2] Murphy, E. (2004). Promoting construct validity in instruments for the analysis of transcripts of online asynchronous discussions. *Educational Media International, 41*(4), 346-354.

[3] American Educational Research Association, American Psychological Association, & National Council on Measurement in Education (1999). *Standards for educational and psychological testing.* Washington, DC: American Educational Research Association.

[4] Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings.* Chicago, IL: Rand McNally College Publishing Company.

[5] Fahy, P.J. (2001). Addressing some common problems in transcript analysis. *The International Review of Research in Open and Distance Learning, 1*(2).

[6] Krippendorff, K. (1980). *Content analysis: An introduction to its methodology.* Beverly Hills, CA: Sage.

[7] Capozzoli, M., McSweeney, L., & Sinha, D. (1999). Beyond kappa: A review of interrater agreement measures. *The Canadian Journal of Statistics, 27*(1), 3-23.

[8] Murphy, E. & Ciszewska-Carr, J. (2005). Identifying sources of difference in reliability in content analysis of Online Asynchronous Discussions. *International Review of Research in Open and Distance Learning,6*(2).

Online bibliography

Online Asynchronous Discussion in Teaching and Learning: A Bibliography
http://www.ucs.mun.ca/~emurphy/biblio.htm

- Content Analysis
- Moderating/Facilitating/Structuring
- Communities
- Collaboration/Interaction
- Quality Improvement
- Problem Formulation and Professional Practice
- Evaluating/Grading
- General
- Critical Thinking
- Participation
- Case Studies

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Murphy, E. & Rodriguez-Manzanares, M. (accepted). Creating individual profiles of problem-solvers in an online asynchronous discussion. *Canadian Journal of Learning and Technology.*

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Thanks, Gracias, Dziękujemy