Employing Social Learning Analytic Methods (SLAMs) to Reimagine the Social Dynamic of Online Learning Collaborations

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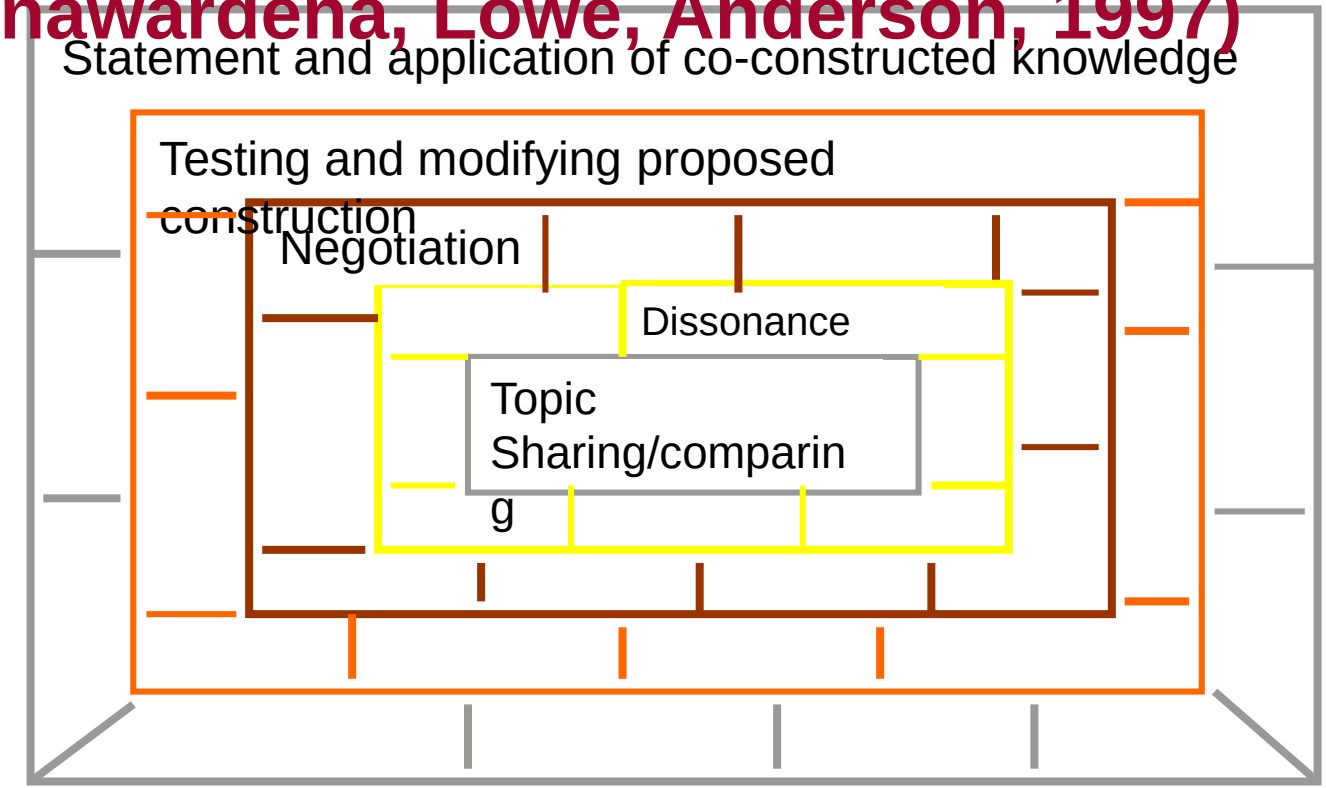
Introduction

- Learning definition
  - Social construction of knowledge that occurs through the exchange of multiple perspectives in a discussion forum
- Social Learning Analytic Methods (SLAMs)
  - Learning Analytics Methods that focus on interactions between people
- Combining SLAMs with interaction analysis, can provide a better understanding of how multiple perspectives of online participants can interact online to create knowledge

Interaction Analysis Model (IAM) for Assessing Social Construction of Knowledge (Gunawardena, Lowe, Anderson, 1997)



Analyzing an Online Discussion with IAM

- Message as unit of analysis and coded for phase(s)
- Type of cognitive activity (questioning, synthesizing)
- Types of arguments advanced
- Resources used to explore differences
- Changes in understanding as result of group interaction

Research Questions

1. How can SLAMs be used to assess the social dynamic that supports knowledge construction in formal online discussions?
2. How can SLAMs be used to assess the social dynamic that supports knowledge construction in an informal learning environment to determine how voluntary participation can lead to learning?

Social Learning Analytics Methods (SLAMs)

- Clustering
  - Collection of techniques for grouping data according to feature similarity like word commonality
- Sentiment Analysis
  - Positive words (“great”, “amazing”) and negative words (“bad”, “awful”)
  - Possible to expand to various constructs
- Lexica Development
  - Content Analysis conducted to generate lists of words for classification
- Social Network Analysis
  - Methods for analyzing the relational aspects of social structures typically used to study the information exchange between people in groups

Method – Datasets

FORMAL ONLINE LEARNING ENVIRONMENT

- Online graduate level discussion aimed at defining culture
  - 2-week long discussion
  - 42 postings
  - 14 contributing students

INFORMAL ONLINE LEARNING ENVIRONMENT

- #Blacklivesmatter Twitter dataset centered around Freddie Gray protests
  - April 21 – April 28, 2015
  - 45,646 tweets

Method – Formal Online Environment

- IAM Analysis
  - Content Analysis in Excel using 5 IAM Phases

Count	Name	Date	Time	Thread	Initial	PhI/A	PhI/B	PhI/C	PhI/D	PhI/E	PhII/A	PhII/B	PhII/C	PhIII/A	PhIII/B	PhIII/C	PhIII/D	PhIII/E	PhIV/A	PhIV/B	PhIV/C	PhIV/D	PhIV/E	PhV/A	PhV/B	PhV/C
1	Jack	08/27/08	20:49:00	My own definition	JG	2																				
2	Jan	08/28/08	8:32:00	I agree that there	JL	2	2			1																
3	Marta	08/28/08	21:16:00	When I think of	MM	1			1																	
4	Leslie	08/29/08	9:02:00	I, too , am	LW	1	1						1													
5	Alex	08/29/08	12:34:00	Jack, These are	AJ		1					1														1
6	Alex	08/29/08	12:50:00	Hi Leslie, You	AJ																1					
7	Emily	08/29/08	16:53:00	Defining culture	EP	1	2														1				1	
8	Emily	08/29/08	17:16:00	Hello Marta, I	EP		1	1													1					
9	Emily	08/29/08	17:43:00	Hi Leslie, Its great	EP	1															1					
10	Alex	08/29/08	13:04:00	My personal	AJ	2					1	1								1	1					
11	Betty	08/29/08	22:22:00	What a devilishly	BS																					
12	Leslie	08/30/08	8:00:00	Hi Alex, I just	LW																					
13	Leslie	08/30/08	8:03:00	I agree, Emily, and	LW	1	1																			
14	Cassidy	08/30/08	19:00:00	Hello class- great	CJ	1	1	1																		
15	Jack	08/31/08	12:38:00	Hi Jan, I liked in	JG	1	1																			
16	Jack	08/31/08	12:45:00	Hi Cassidy, I	JG		2																			1
17	Jack	08/31/08	13:00:00	Hi Alex! Thank	JG														1					1		
18	Jack	08/31/08	13:13:00	Hi Marta, I liked	JG	1	2														1					

Method – Formal Online Environment (Cont.)

- Cluster Analysis
  - R - *hclust*
- Sentiment Analysis
  - Liu, Hu, and Cheng (2005) positive and negative words lexicon
  - Social presence words
- Social Network Analysis
  - R – social edges
  - NodeXL

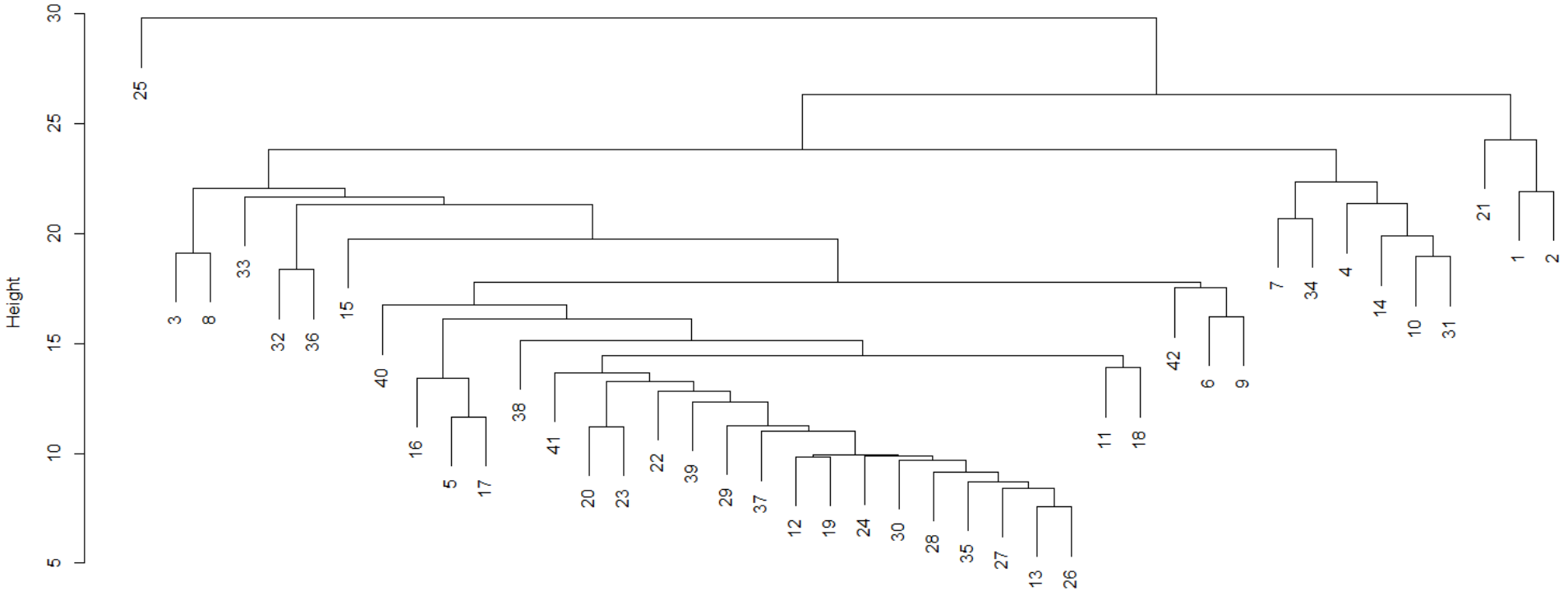
Method – Informal Online Environment

- Data Collection
  - OILS Twitter Scraper (Flor, 2014)
- SCK Lexica Development
  - Manual and Dictionary approaches (Liu, 2012)
  - Social Construction of Knowledge (IAM)
- Sentiment Analysis
  - Word counts
  - Social Construction of Knowledge word counts

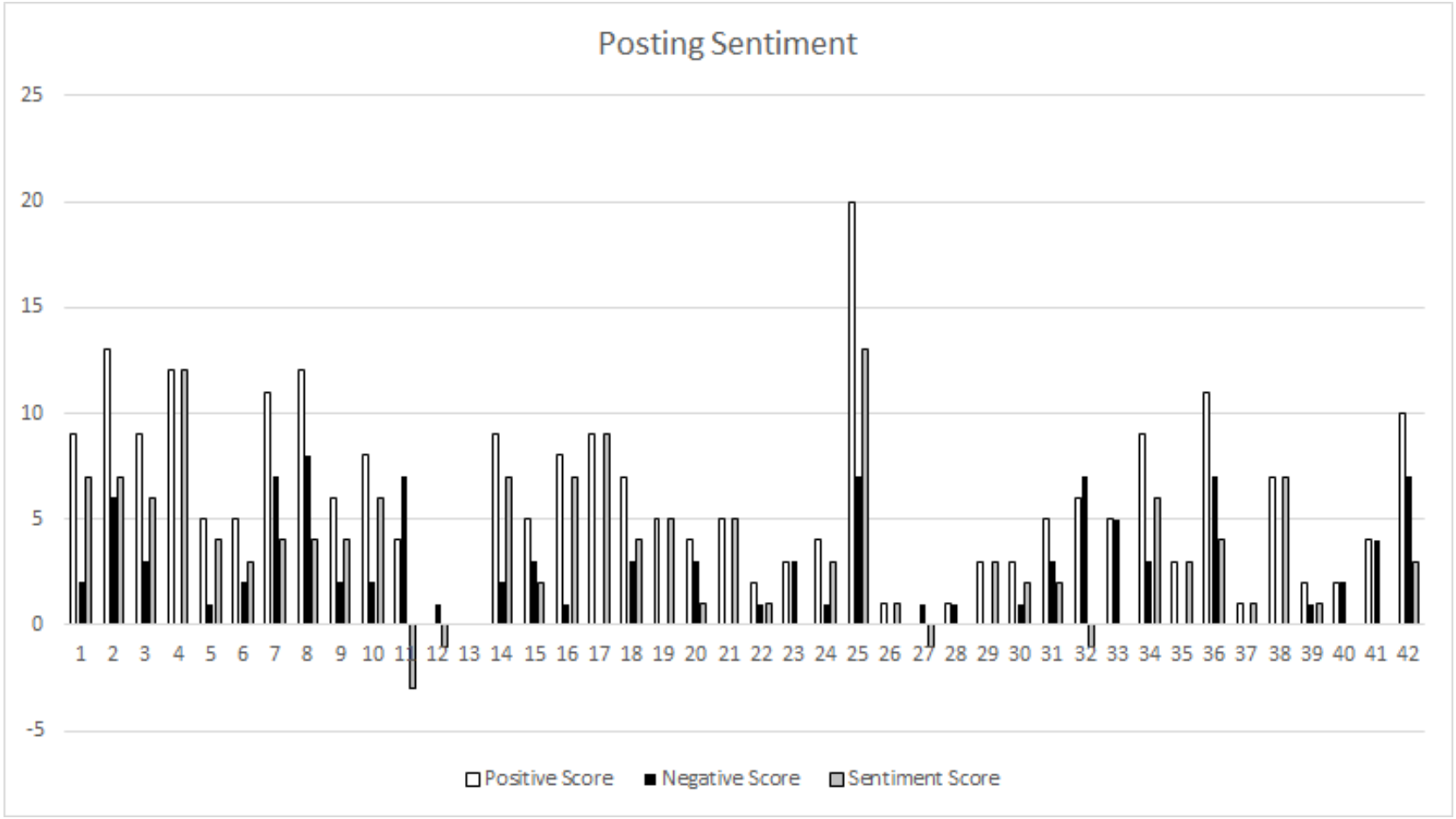
Research Question 1

Results

Results – Cluster Analysis

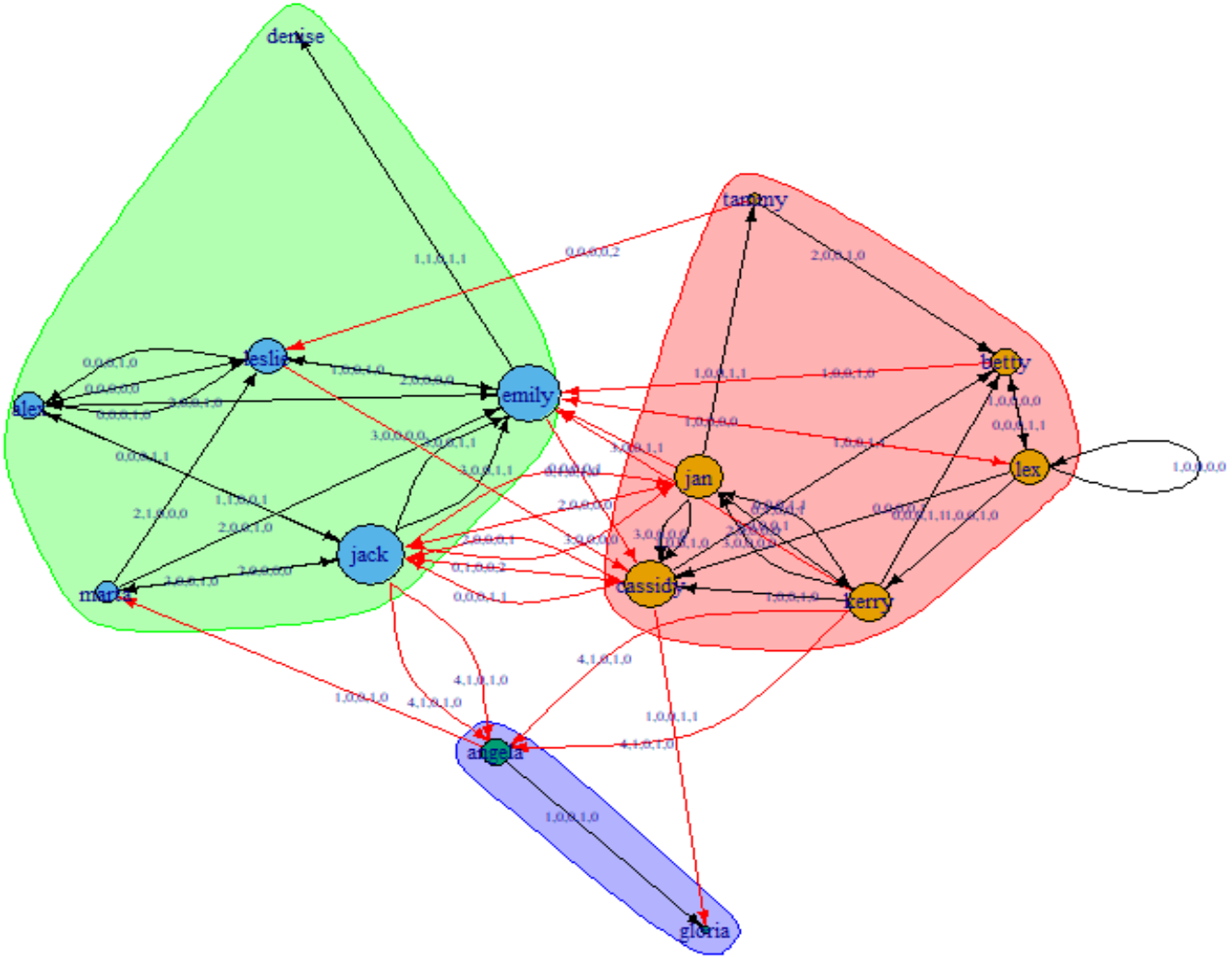


Results – Sentiment Analysis



SNA

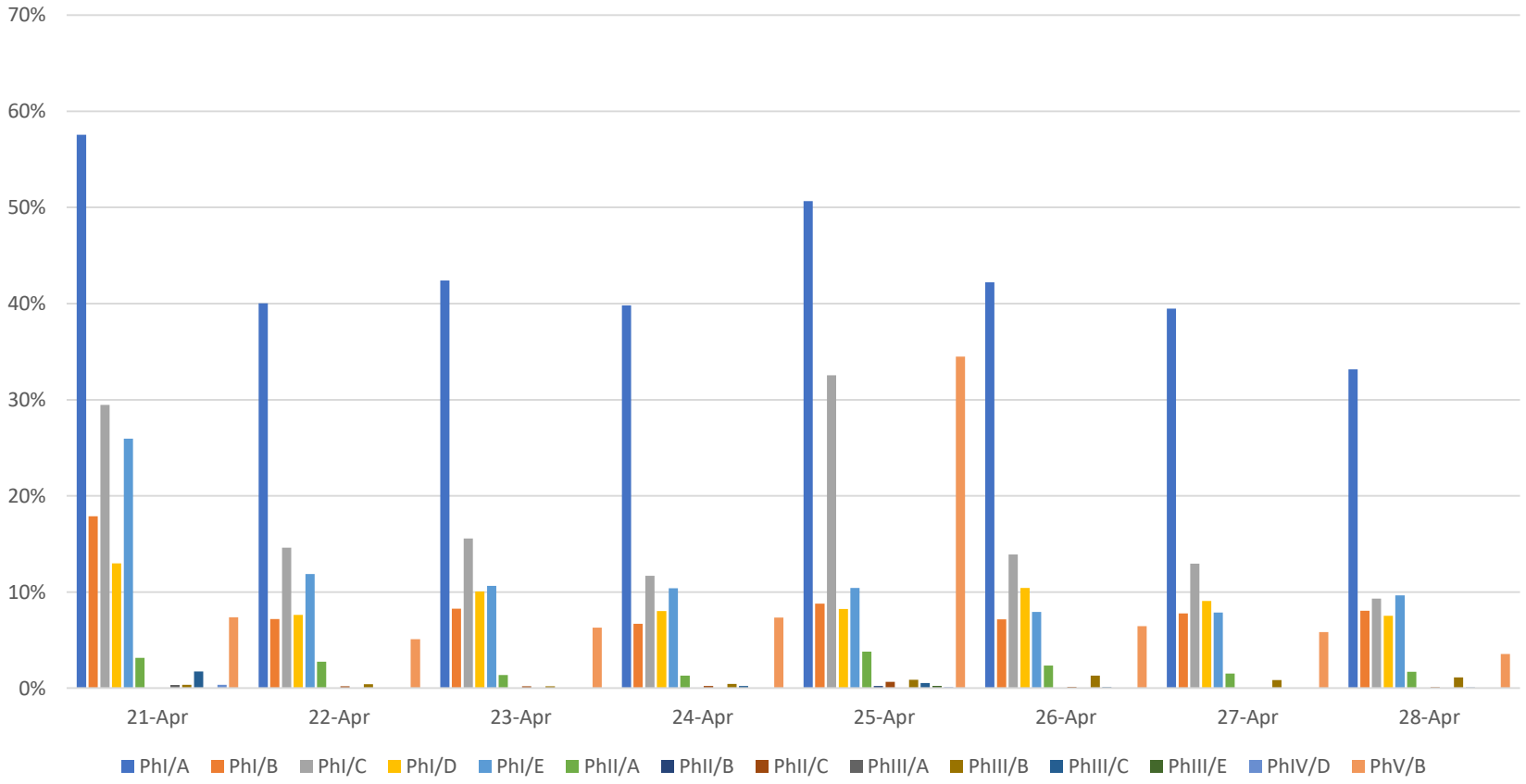
- A sociogram depicting who received information from whom in the discussion. The edge labels represent the IAM phases associated with the information.



Research Question 2

Results

Results – SCK Analysis



Discussion – Formal Online Environment

- Clustering
  - Word choice similarity
- Sentiment Analysis
  - Changes in attitudes and social presence
- Social Network Analysis
  - Knowledge exchange, group formation, and knowledge construction phases
- Hypothesis Generation
  - Postings that are different, with high positive sentiment and high social presence scores can help others reach higher phases of knowledge construction

Discussion – Informal Online Environment

- Sentiment Analysis
  - SCK identified mostly in Phase I
  - Consistent word usage and identification
- Low level knowledge creation identification consistency
  - Delimitations removed instances of dissonance

Conclusions

- SLAMs can be used by researchers to
  - Suggest course corrections
  - Highlight areas that a qualitative researcher should focus on
  - Suggest hypotheses for future research
- SLAMs significantly reduce time/money needed to conduct qualitative research
  - Responsive and timely

Questions

Comments

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