Investigating Peer, Family, and Informal Learning through Video Research

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Overview of talk

- Contributions of video data to studies of peer, family, and informal learning
  - Communication tool
  - Inquiry tool for hypothesis testing
  - Discovery tool

- Challenges
  - Collection
  - Analysis

- Insights that will lead to high standards - not standardization
  - Advancing our conceptual tools for video analysis
  - Emerging strategies to “tame the complexity”
  - Combining performance and video-based process data
Early Explorers

- Kurt Lewin: Film as communicative tool
  - Concept of life space, field
  - Focus on ecologies of interaction
As complementary Approach

- Studies of leadership style on qualities of peer interaction
There are the judgements of observers who found themselves using terms such as “dull”, “lifeless”, submissive, repressed, and apathetic in describing the non-aggressive reaction to autocracy. There was little smiling, joking, freedom of movement, freedom of initiating new projects, etc.; talk was largely confined to the immediate activity in progress, and bodily tension was often manifested. *Moving pictures tell the same story.*

From Lewin, Lippet, White (1939)
Other pioneers

- Boas
  - Film studies of native peoples in interaction
- Efron
  - Comparative studies of street corner interactions
- Mead & Bateson
  - Baby bathing studies & Bali family interactions
- Birdwhistell, Bateson, others
  - Family interactions in therapy contexts
Video as tool for hypothesis testing
Video as Microscope

- Subtle interactions can be magnified
- Time can be sped up, slowed down, stopped
- Multilayered signals such as tone, gaze, gesture, attention can be attended to separately or together
- Data streams can be looked at in terms of temporal relationships
- Revisiting allows for conceptual development
Example analysis: Collaborative problem solving

- Complex problem solving task
- Controlled setting, random assignment
- Three days of assessments
Supports to Students

- Storyboards
- Workbooks
  - Travel time
  - Fuel
  - Time to get Fuel

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Distribution of group scores
Analytical Approach

- Compare written work to conversations.
- Observed more ideas in talk than were documented.
- Began coding of proposals.
Number of correct proposals made in conversation

Number of correct proposals made

More Successful

Less Successful
Analytical Approach

- Compare written work to conversations.
- Observed more ideas in talk than were documented.
- Began coding of proposals.
- Began categorizing responses.
Responses to proposals that engage the idea
Analytical approach: Quantification of cross-case discourse patterns

- Case studies: Triad as “ensemble” (Herb Clark, 1996)
- *Contextualize* proposal/reaction sequences by utilizing tone, eye gaze, bodily alignment, affect, use of resources, and attention
- *Capture* temporal unfolding of interaction to identify conversational moves that shift interaction patterns
- *Conceptualize* underlying relational/interactional constructs that may be general
Joint attention was more continuous in successful groups.
Workbook was often a “center of coordination”
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Writers would often “broadcast” their work.
However, in many groups individual and joint thinking went on simultaneously.
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And many took advantage of the capacity to distribute attention to further the work.
#1: Management of attention is critical

- Conversational metrics reflected issues with joint attention in terms of responsiveness to proposals and timing of contributions.
- Video analysis revealed group level differences.
- All groups had fluctuating joint attention.
- How were groups managing attention?
- Why was it a fatal problem for some?
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Pointing …
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Peering around to share point of view
Strategies included commands, meta-communicative comments.
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More extreme interventions involved physical contact.
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Strategies worked best when there was mutual intent to maintain a coordinated state.
Obtaining floor was particularly difficult if partners were occupied and the bid was mild.
Both speakers and listeners have consequential roles to play.

- Groups used a wide range of strategies to manage and provide for joint attention.
- The success of strategies depended on both the initiator and his or her partners.
- Bids for joint attention varied in strength.
- Yet, that didn’t explain all the problems.
Relational space includes challenges and opportunities beyond the content of the problem.
In conversation and in use of resources, intentions are revealed.
Overlapping talk, competing claims and counter claims of “I know what I’m doing.”
Increasingly explicit strategies to achieve coordination by one partner.
Fourth attempt at explaining proposal for solution.
This attempt was not successful and the push for co-regulation did not seem welcomed.
And, it was not successful.
Resisting co-regulation in this case lead to temporary withdrawal from collective efforts.
Still, engagement was dynamic and one partner was persistent.
Which paid off, though a bit late for the collective effort.
#3: Relational aspects of the context needed to explain differences

- Dual problem space:
  - *Content space*: problem to be solved
  - *Relational space*: interactional challenges & opportunities

- These can compete for limited attention.
Collective achievements require more than content knowledge. Expertise is multidimensional and involves managing aspects of both relational and content space.
Why video is important

- Allows new phenomena to be discovered, labeled, shared
- Allows for cycles of inquiry that capitalize on emergence of questions and classes of interactions that were unanticipated (e.g. how attribution of authorship critical in Engle’s analysis of learning).
- Allows for the integration of broad range of phenomena - tone, gaze, affect, gesture, use of resources, attention, physical alignment.
- Allows for revisiting and multiple perspectives
Towards collective data mining

- Starting project with Leslie Herrenkohl, Na’ilah Nasir to look cross data set for examples
  - Collaborative capacities
  - Practice based and ecological supports
CHALLENGES OF COLLECTION

1. Desire to capture over time and context
2. Issues of audio, particularly in classrooms or other very busy settings
3. What about capture when participants move?
4. Single point of view always limits what you see
5. IRB and informed consent
Challenges for analysts

1. Volume of data
   - Ease of collection tempting. Result may be bookshelves filled with tapes.
2. Complexity and richness
   - “Problem generally not finding something to say but choosing among them and fashioning a coherent account” (Engle, et. al.)
3. Vividness of examples & issues of representativeness/generализability
   - Investment of time and tendency to hold on to salient examples
4. Challenges of data reduction
   - How to choose episodes for analysis
5. Challenges of annotation and re-representation
   - Transcription is costly and difficult
6. Developing ways of looking, describing, reporting
   - Units of analyses, codes, descriptive accounts
INSIGHTS FROM AUTHORS

- **Museum settings**
  - Ash
  - Vom Lehn & Heath
  - Palmquist & Crowley
  - Callanan, Valle, & Azmitia

- **Home and community**
  - Angelillo, Rogoff, & Chavajay

- **Peer based learning groups in classrooms**
  - Engle, Conant, & Greeno
  - Hmelo-Silver, Katic, Nagarajan, & Chernobilsy
1) Importance of theory inquiry cycles

- Focusing first on theory driven questions & plans for the collection of video records
- Good questions critical for maintaining a perspective that prevents one from getting lost in detail
- Emergence of questions expected
- *Progressive refinement of hypotheses (Engle, et al.)*
- Cycling between hypothesis generation and evaluation, multiple times
2) Intermediate representations are critical

- Diagramming of participant involvement
- Flow charts of sessions, significant events, microanalyses
- Conversation maps
- Transcriptions - using conventions that offer the right level of detail for the purposes at hand
3) Interpretation & Question Generation
Benefit from Explicit Social Processes

- Group viewing sessions
- Bringing in views of participants
- Share with other theorists who may have unique perspective
- Non team members’ perspectives valuable
4) Coding and transformation of video

- Coding systems developed through above process
- Cycling between cases and coding can be productive
- Importance of not being blind, need to read participants
- Future orientation important, thinking ahead to reporting
- May become established over the course of several research projects
- Sometimes these are applied and used in quantitative analyses
Conclusions

- Video rich scientific tool
- Digital video making capture and representation easier
- Major work is conceptual - field will make progress as we develop and share ways of looking and describing in the context of central questions
- New tools can help
- Examples can help
The End
Collaborative capacities

Metacommunicative capacities
- Awareness and monitoring of between person states of engagement
- Strategies that facilitate joint attention and encourage mutual understanding
- Strategies that elicit ideas from collaborators
- Recruitment of distributed cognitive resources of the group to monitor solutions

Interpersonal capacities or dispositions that support collaboration
- Resiliency and persistence in the face of interpersonal or problem based challenges
- Willingness to build and elaborate on co-members ideas

Design capacities that facilitate creating conditions that support productive interaction
- Use of conversational tools that help recruit joint attention
- Productive use of representational tools to capture ideas
- Understanding of how to build a team that has right distribution of skills
- Effective seeking out of informational resources or expertise when needed
- Awareness of outside constraints and adaptation of group interactions to accommodate
Supportive activity structures & practices

1) Classrooms designed to support productive interactions

   - Roles, participation structures, task structures, practices of sharing work, distributing authority (Barron et. al; 1998; Herrenkohl & Wertsch, 1999; Engle & Conant, 2003; Engle, Conant, & Greeno, in press; Fischer, 2005; Stevens, 2000; Stevens, Wineberg, Herrenkohl, & Bell, 2005).

2) Cultural practices and forms outside of school can create contexts for productive learning interactions (Rogoff, 2003; Nasir, 2002).

   - Games, sports teams, cooperative adult/child interactions, way that patterns of attention are socialized.
Contemporary Questions

- How do we understand learning interactions between people AND between people and tools within diverse settings?

- How does culture and history of participation play out in interaction?

- How does learning and development occur across the contexts of homes, schools, community settings?
  - Units of analyses go beyond individuals
  - A goal is to articulate processes underlying development discontinuities and trajectories of the phenomena.