



Tools and methods behind a rigorous video-analysis research project

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Audio and video capture and storage

Acoustically isolated research lab

- Improves audio and video quality
- Allows control of variables but less naturalistic



Networked audio-visual data storage

- Avoids manual transfer by direct capture to hard drive
- Allows quick coding of data (tapeless storage)
- Supports simultaneous access from multiple workstations



Video coding methods

Coders are blind to the nature of the study, treatments, and hypotheses

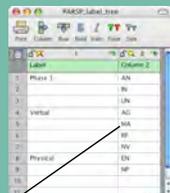
- Reduces bias when it is obvious from video which treatment subjects are in
- *Challenges:* difficult to maintain, isolating experience for coders over time

Rigorous hierarchical coding schemes have been applied

- Based on initial research questions and issues that emerged from the data
- Pilot-tested for efficiency, reliability, ability to distinguish among observable behaviors
- Formalized using rules and borderline cases
- Each coder coded a full block of data (i.e., one group from each condition) to ensure that inter-rater variation does not favor one condition over another
- *Challenges:* can be complex and need many iterations

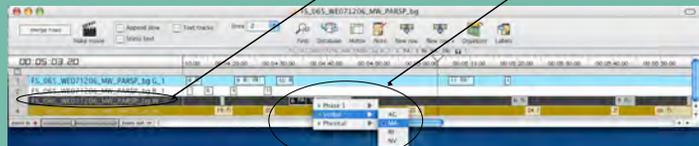
Video-analysis using Studiocode software

- Timeline-based interface allows efficient, high-resolution coding
- Supports rapid implementation of coding schemes with embedded logical structures



Click button if mom speaks

Set options for type of speech



Coded instances appear in the timeline window for later analysis

- Flexible event searches allow independent analyses and export of data subsets



Code Matrix Organizer



Code Matrix Output

Analysis methods

We used Bakeman & Gottman's (1997) sequential analysis techniques for observational data

- Reduced overwhelming number of possible behaviors by coding every second of data into mutually exclusive categories
- Worked well in combination with Studiocode timeline interface

A complex system of inter-rater checks was developed

- Necessary due to subjectivity of behaviors and quantitative focus of study
- *Challenges:* particularly difficult for >2 coders, time-taking, required complex tracking of coders' work, hard to tell when "good enough" with data sample

Inter-rater agreement is determined using Cohen's Kappa

- More accurate, avoids inflated agreements due to chance, typical in "percentage agreements"
- Useful as a formative tool for identifying inter-coder disagreements
- We custom wrote a Cohen's Kappa calculator in Excel

Recruitment methods

Recruiting families was straightforward

- Eligible families were relatively easy to identify and recruit on the museum floor
- Incentives: gift plus unique access to four exhibits

Recruiting school field trips was difficult

- Our IRB agreement required multiple levels of parental consent
- Late arrivals, unprepared schools, frequent cancellations slowed data collection
- We "double-booked" to maximize our sample size, using alternative research activities