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Citation for published version (APA):
Davidsen, J., & Ryberg, T. (2015). Bodily-material resources in CSCL: Children's embodied and multimodal collaborative learning of scale around touchscreens. In O. Lindwall, P. Häkkinen, T. Koschmann, P. Tchounikine, & S. Ludvigsen (Eds.), *Exploring the Material Conditions of Learning: Opportunities and Challenges for CSCL* (Vol. 2, pp. 852-853). International Society of the Learning Sciences (ISLS). Exploring the Material Conditions of Learning: The Computer Supported Collaborative Learning (CSCL) Conference 2015

Bodily-material resources in CSCL: Children's embodied and multimodal collaborative learning of scale around touchscreens

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Abstract: Within CSCL language is often perceived as the primary vehicle for knowledge building and collaboration, whereas bodily-material resources are explored to a lesser extent. In this data session we explore the importance of gestures and body movements as bodily-material resources in relation to communication, learning and collaboration and how they are used to organise intra- and inter-psychological processes. By presenting two short video excerpts of children working with the concept of scale around a touchscreen, we want to facilitate a discussion on what can be gained theoretically and methodologically from focusing on bodily-material resources in CSCL.

Keywords: embodied interaction analysis, collaborative learning, bodily-material resources, touchscreens

Description of data excerpts

What is the role of bodily-material resources in relation to understanding collaboration and learning within CSCL? This question is the basic framing of our data session, in which we present two data excerpts (excerpt I=26 seconds and excerpt II=36 seconds) of children's collaborative learning around touchscreens in their classroom. The two excerpts we present are part of a larger collection of video footage (150 hours) from two second grade classrooms in a public school in Denmark (Davidsen & Georgsen, 2010). In each classroom, eight 23-inch large single-touchscreens were integrated to facilitate more collaborative learning among the 8-9 year old children. The research project and data collection lasted for a full school year and the children were working in different pairs throughout the project. The two selected excerpts stem from one week near the end of the project, where the children were working with the mathematical concept of scale. In total, 11 hours and 17 minutes of video footage was recorded during this week. We have selected two short excerpts featuring one of the pairs – Nathalie and Peter. In the two excerpts we see how the children build and interpret the concept of scale together through language, gestures and movement. Further, we have chosen two excerpts as to trace children's bodily-material innovations over time e.g. how they develop specific bodily-material tools to accomplish the task. Thus, we also want to address the historical development of the children's bodily-material resources across time.

Inspired by the Jeffersonian annotation system (Jefferson, 2004), we have developed a multimodal transcription format by converting video stills into pencil drawings (Davidsen, 2014). These drawings are put together as a cartoon to show the subtle details of children's gesture and movement, which is accompanied by a modified Jeffersonian transcript of their dialogue. With the transcript and pencil drawings, we aim to make visible the sequential and simultaneous embodied interactions, which are often left in the background in traditional CA transcripts.

P: noo:: (0.7)   it is a meter (0.2)   that is actually like this::
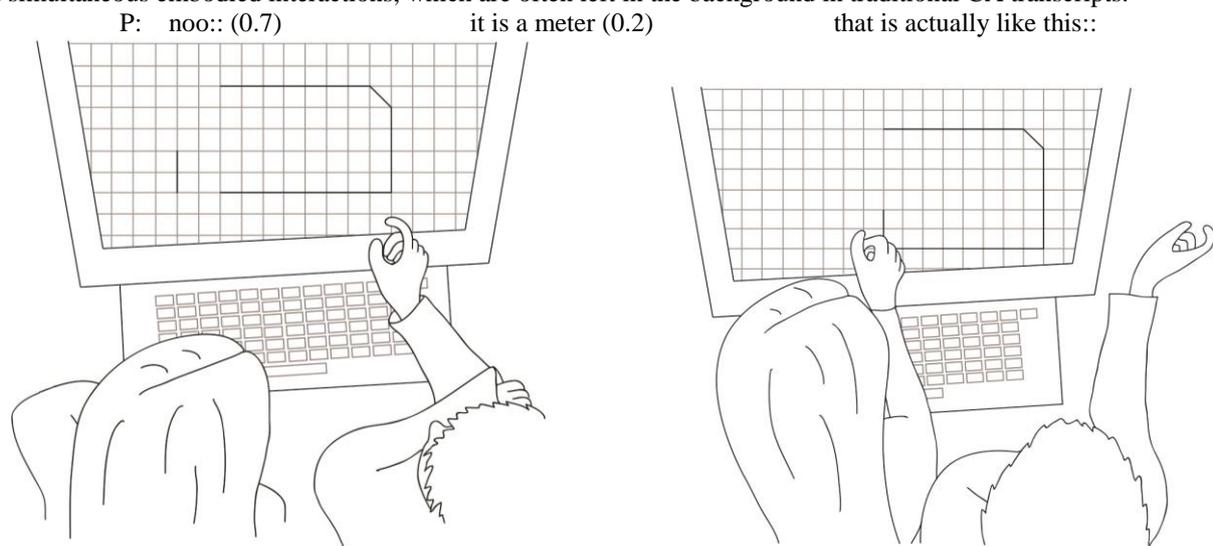

Figure 1. Example of multimodal transcript

In the process of developing the multimodal transcripts, we used a multi-layered transcription template in ELAN (Davidsen, 2014). The template includes language, right and left hand movements, and body orientations in order to dissect each modality and the multimodal meshwork they create together. Moreover, we used the possibilities of playing the video frame-by-frame in ELAN to comprehend the children's embodied and multimodal interaction around the touchscreen.

Theoretical background and relevance to field and conference

Our methodological stance on interaction analysis is inspired by ethnomethodology (Garfinkel, 1967) and embodied interaction analysis (Streeck, Goodwin, & LeBaron, 2011). Particularly, we are concerned with rendering visible children's embodied methods in CSCL contexts. We envision that this focus may potentially move CSCL forward in terms of the situated uses of CSCL systems and the embodied ways they are used.

In brief, the interaction playing out between the two children and the touchscreen in the selected excerpts illustrates body-material conditions for CSCL on a theoretical and methodological level. We have identified three ways the children use bodily-material resources: 1) as a communicative and illustrative tool, 2) as a cognitive auxiliary tool for processing their understandings of scale, and 3) as a tool for instructing or shepherding each other. In CSCL, bodily-material resources are often left in the background while language is given primary attention, both theoretically and methodologically. With these excerpts, we wish to engage in a constructive dialog with the participants about what can be gained from focusing on bodily-material resources in collaborative learning, e.g. what does this particular focus on embodied and multimodal interaction in co-located settings offer CSCL on theoretical and methodological levels?

Expected outcomes and contributions

CSCL have developed detailed methods and theories for exploring, analysing and discussing language in collaborative learning activities. Part of this development has been informed by Conversation Analysis (Koschmann, 2013), moreover, strong affinities with Vygotsky's work on children's language development (Vygotsky, 1986) has also given this development directions. While language has been foregrounded, it seems crucial for CSCL to turn to bodily-material resources in collaborative learning activities mediated by technology.

With the two excerpts we wish to highlight a focus on bodily-material resources in CSCL as we see a potential for theoretical and methodological development emerging from this perspective. Thus, the participants in the session are provided with an opportunity to discuss bodily-material conditions of CSCL interaction on three levels; 1) how can CSCL benefit from scrutinizing the body-material resources, 2) what can CSCL learn from children's gesture innovations and reconfigurations over time in settings mediated by technology, and 3) what can different ways of representing embodied and multimodal interaction convey to CSCL.

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