A grounded theory approach to identifying teaching experiences in acquisition of recursion

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Whether recursion exists as an element of universal grammar or is understood and mastered through social learning, the use of recursion in spoken or written interaction is inevitable, and that learning is equally as inevitable owing to that interaction (Ochs, 2004; Ochs & Schieffelin, 2011; Vygotsky, 1978). Research where interaction between researcher and subject is a necessary component requires the identification of aspects of teaching and learning, either to temporally operationalize the acquisition of recursion through interaction or to provide guidance to cognitive linguists in crafting interaction that minimizes opportunities for learning to isolate a priori knowledge.

To that effect, this presentation presents a grounded theory analysis of interactions taking place within a study focused on identifying the age at which research participants understand recursion, as well as the relative difficulty of particular structures of recursion. Specifically, the primary study assesses research participants' understanding of adjective and possessive recursion in English at various levels (see Table 1) using a storytelling protocol conducted over online conferencing software as a consequence of the ongoing COVID-19 pandemic (see Figure 1). The secondary study, which is the focus of this presentation, employs grounded theory (Glaser & Strauss, 1967) to analyze transcriptions of 40 sessions with children and 10 sessions with adults. The analysis first identifies episodes where research subjects encounter challenges during the study and where the researcher subsequently intervenes to scaffold understanding, isolating relevant data from instances where the subject successfully completes tasks within the protocol without any intervention from the researcher. Through methods for qualitative coding (e.g., Adu, 2019; Saldaña, 2013), teaching episodes were coded by different forms of teaching as judged by the presenter to propose a set of common themes apparent across sessions and researchers within the primary study.

This presentation explores each of three main themes that the presenter saw as commonly employed throughout the primary study's data collection process. The analysis indicates that researchers employed direct intervention, readback/revoicing (Inan, 2014), and softeners while in interaction with research participants encountering challenges during the protocol (see Table 2 for examples). Each of these instructional strategies appear intended to scaffold learning and maintain the respondent's motivation in engaging in interaction during the protocol. The presentation of examples of each of these themes is intended to elicit discussion regarding the importance of the training of researchers in interview-style protocols (Brinkmann & Kavale, 2018), whether to promote learning or isolate innate knowledge. This discussion thus has implications regarding how interview-style protocols should be designed in a manner that aligns with the aim and orientation of the study, requiring qualitative methodologies to analyze interactional data for the purposes of identifying interactional moves that align or conflict with the intended orientation.

Table 1 – examples of recursion employed in the primary study.

2-level possessive recursion	Who should <u>Chippie's father's friend</u> buy the big big small mushrooms from?
3-level possessive recursion	And will you draw a circle around the deer's friend's and the <u>deer's friend's sister's mushrooms</u>?
2-level adjective recursion	If these are the group of <u>big big mushrooms</u>, which ones do you think are in the small big mushroom group?
3-level adjective recursion	Which box has the <u>small big small mushrooms</u>?

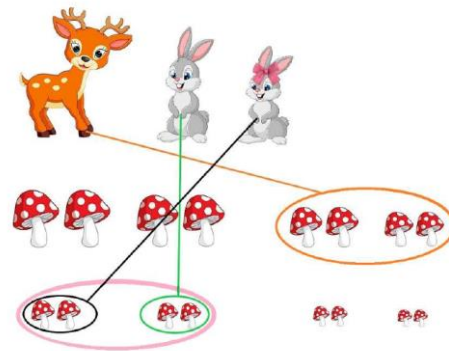Figure 1 – sample picture from primary study's protocol.

Table 2 – examples of teaching strategies analyzed in secondary study.

Direct intervention	Adult L1 Spanish speaker I: Are the deer's friend's mushrooms big big small mushrooms? (**NO, THEY ARE BIG SMALL SMALL MUSHROOMS**) R: No, they are not. I: And why? R: Because the deer's friend's mushrooms are the smallest, is small mushrooms. (**???**) I: <u>Yes, small small mushrooms. But, but these mushrooms remember are bigger than these. Right? So they are which category?</u> R: They are the big, small small mushrooms. (**CORRECT**)
Readback	L1 English speaker, 8 years old I: And will you please circle the small big mushrooms? R: The small big mushrooms? I: <u>The small big mushrooms. Not the big big mushroom. The small big mushrooms.</u> […] Yeah. Perfect. Oh, I think that's great. That's going to help them on the other side of the line. (**CORRECT**)
Softener	L1 English speaker, 8 years old I: See, the bunny's sister is different than the bunny. She has a pink bow. Okay, so [xxxxxx], can you draw a little dot on the deer's friend? R: Little dot? I: Or a little circle on the deer's friend. R: Boy, let's see. It's hard to use this. I: It's okay. You, you…<u>we're still learning how to use that annotate, so don't worry</u>.