Procedural coordination in interaction:
No evidence is better than negative evidence

When participants use dialogue in joint activities, they rapidly converge on idiosyncratic referring conventions. Convergence is inherently interactive, relying on participants providing each other with both positive and negative evidence of understanding (Clark, 1996; Healey et al, 2018; Pickering and Garrod, 2009).

In addition to securing reference, interlocutors need to coordinate on the timing and sequencing of their contributions. Dialogue is replete with procedural expressions that establish who performs which action, when it should be performed, and how initiation and completion of the action should be signaled, e.g. "*when I've done x, do y*", "*wait a moment before doing y*", "*let's start again, but this time you do y*", "*do x and then tell me when you're done*". Recent work has demonstrated that even in the canonical tangram joint reference task (Krauss and Weinheimer, 1996;), 30% of all interaction is concerned with procedural coordination (Knutsen, et al., 2018). Moreover, similarly to the emergence of referring expressions, participants rapidly establish idiosyncratic procedural expressions, which then become conventionalized in new adjacency pairs (Mills, 2011; Fusaroli et al, 2014).

To investigate how procedural coordination develops, we report a computer-mediated "alien language" task which presents dyads with the recurrent coordination problem of performing their contributions in a single sequence. All turns are intercepted automatically by the server, which detects and selectively blocks participants' displays of positive and negative evidence of understanding. Dyads were assigned to one of 4 conditions: (1) Positive evidence blocked; (2) Negative evidence blocked; (3) Positive evidence and Negative evidence blocked; (4) No blocking.

Dyads whose signals of positive evidence were blocked completed fewer trials, made more errors and exhibited more effortful interaction, confirming the basic predictions of the grounding model (Clark, 1996). Surprisingly, participants who had both positive and negative signals blocked performed at the same level as non-blocked participants. We argue this is due to the doubly-blocked participants being forced to develop new, and consequently more complex routines for establishing and sustaining procedural coordination.

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