

Social contexts shape learners' choices during language learning

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Fulfillment of Conceptual Analysis of Dissertation Area. Readers: Michael C. Frank, Hyowon Gweon, and Anne Fernald

Abstract

Human language acquisition presents a remarkable learning challenge. Fortunately, children acquire language from knowledgeable caregivers who can shape the input to help them learn. Moreover, as children get older, they become more adept at choosing behaviors to shape the environment to better support their own learning. But how do these two important learning forces interact? In this paper, I explore the hypothesis that social language learning contexts can be productively construed as opportunities for constrained active learning. I review the literature showing how active and social-pedagogical contexts change learning behaviors. Then, I review work that attempts to synthesize active and social learning. Finally, I present a case study of decisions about where to allocate visual attention during language comprehension as an example of how including the presence of a social learning contexts can change the underlying computations that drive behavior during language learning.

Keywords: language acquisition, active learning, social learning, theory

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Introduction

Human language learning is a remarkable feat. Consider that infants, despite possessing limited information processing capacities, go on to develop adult vocabularies ranging from 50,000 to 100,000 distinct words (Bloom, 2002), allowing them to express internal desires, to coordinate with others, and to transmit cultural knowledge to the next generation. But, to become a skilled language user is by no means trivial and children must solve a variety of complex problems such as word segmentation (Saffran, Aslin, & Newport, 1996), reducing referential uncertainty (Quine, 1960), and making appropriate generalizations (CITE). Moreover, they must do this all while processing a dynamic, ephemeral stream of information that unfolds rapidly in time.

Fortunately, language learners do not have to solve these problems on their own since much of their learning input comes from caregivers, other knowledgeable adults, and older peers (Bloom, 2002; Clark, 2009). Moreover, as children get older and become more adept at intervening on their environments, they can take a more “active” role in shaping the input to their current state (Baldwin & Moses, 1996). And recent work in machine learning (Settles, 2012) and cognitive science (Castro et al., 2009; Markant & Gureckis, 2014) suggests that providing the learner additional control can lead to superior learning outcomes compared to more passive contexts.

However, one of the fundamental open questions in developmental psychology is to explain how children’s developing active learning skills interact with their social learning environments to support their their impressive language learning. In this paper, I present the hypothesis that the social context in which language learning occurs can be productively construed as opportunities for constrained active learning. The key insight

is that language learning is a fundamentally social endeavor where the presence of another agent shapes the cost/benefit calculus for learners' choices. This analysis attempts to explain a range of choice behaviors available to the learner during language learning from the micro (eye-movements to gather information to understand language in real-time) to the macro (decisions about conversational partners).

The plan for the paper is as follows. First, I review the literature on the basic mechanisms that lead to better outcomes for active learning compared to passive learning. Then, I present formal models of how learning changes in social contexts along with evidence that supports the importance of social-pragmatic contexts for language learning. Finally, I present a conceptual analysis of the active allocation of visual attention during language comprehension as a case study of how the active-social conceptual framework provides a way forward for understanding the interplay between social and active learning.

Part 1: Active learning

What is “active” learning?

The potential benefits of active learning have been the focus of much research in education (Grabinger & Dunlap, 1995), machine learning (Settles, 2012), and cognitive science (Castro et al., 2009). In a review of this diverse literature, Gureckis & Markant (2012) suggest that active learning can be superior to passive learning because it allows people to use their prior experience and current hypotheses to select the most helpful examples (e.g., asking a question about something that is particularly confusing). But is active learning always better than passive learning?

Why is active learning superior to passive learning?

What is missing from the active learning account?

Part 2: Social learning

What is social learning?

Social learning is the accumulation of knowledge based on the sampling decisions of other agents (e.g., via the framework in Shafto et al., 2012). Requires reasoning about why the other agent made the choices they did.

Why is social learning so powerful?

Different models of social learning

Examples: * Sobel and Kirkham * observational learning * pedagogical inference * social as attention vs. social as changing underlying inferences because of reasoning about others minds

What is missing from the social learning account?

Part 3: Active learning behaviors in social contexts

Models of seeking information from social targets: * Baldwin & Moses (1998): The Ontogeny of Social Information gathering * Chouinard (2007): Children's questions as learning mechanism

Part 4: Case study of active information gathering via visual fixations**Conclusions**

Models of self-directed learning cannot continue to ignore the social-communicative context in which learning often occurs. Reasoning/inferences about other people should modulate the choices that learners make: whether it's who to talk to, what to attend to, or what questions to ask.

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