

## Cognitive Consequences of Physical Assembly

Tuesday, May 14th, 2024

10:00AM-12:00PM

Cognitive Science Building (CSB), Room 003

or

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### Abstract

The modern world is densely populated by physical structures that were designed and made by people, from transient arrangements like stacks of books and sandwiches, to enduring constructions like bridges and skyscrapers. Physical assembly— the construction of a new object from existing parts— accounts for some of the most complex acts of human cognition. What are the core cognitive processes that underlie this ability? The study of physical assembly presents unique opportunities and challenges because it relies on interactions between multiple cognitive processes, including perception, working memory, planning, and action selection. This dissertation introduces new experimental methods to investigate these processes, by characterizing the impact of physical assembly experience on our ability to build. Moreover, it explores far-reaching consequences of assembly experience on cognition, including the ability to remember objects, as well as the language we use to communicate about them. Over three chapters, I investigate three consequences of assembly experience. In Chapter 1, I investigate how practice assembling objects changes the procedures we use to construct them, finding that people learn to build more quickly and accurately, and use increasingly consistent procedures to do so. In Chapter 2, I explore how assembling objects impacts our memory of those objects, finding that how well we remember an object depends crucially on the way we encode it during assembly. In Chapter 3, I go beyond the consequences of assembly for individuals to ask how shared assembly experience impacts how collaborators communicate about objects, and find that people coordinate on linguistic conventions for referring to increasingly abstract procedures over time. These results comprise a set of ways that people— individually or collectively— leverage prior assembly experience to improve their ability to build, elucidating one of the most pervasive and complex human behaviors. By clarifying the impact of a creative, generative behavior on our representations of the things we make, these findings have implications for understanding how we relate to the world of constructed objects we inhabit, and the development of technologies that help people create more effectively.

### Committee members:

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