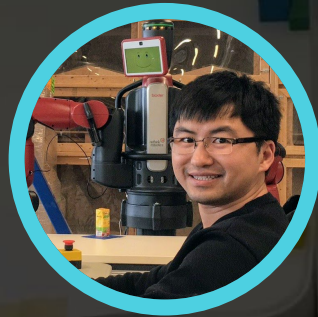


# A Task Design for Studying Referring Behaviors for Linguistic HRI



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# Motivation & Research Questions

**Language-capable robots** must be able to **refer to objects**.

**Referring has received a lot of attention** in Psycholinguistics, Natural Language Generation (NLG) community, and in HRI on Referring Form Generation (RFG).

However, **less attention** is on the **fundamental Referring Form Selection**: use a definite description, or an **efficient referring form** such as **“it”, “this”, or “that”**.

less repeated references like “it”, “this”, and “that” (Ask “cognitive status” in our booth!)

**Current efforts**: simple tabletop scenarios, visible referents (similar cognitive status).

**How can we promote a wide variety of referring forms with richer cognitive status found in human language?**



## Method

# Data Collection & Task Design

**Design a task** to collect a new corpus of data:

1. With wider range of **referring forms** (it, this, that, this-N, that-N, the-N, a-N)
2. With **objects** that are **both physically present** and **not physically present**, using both speech and gesture

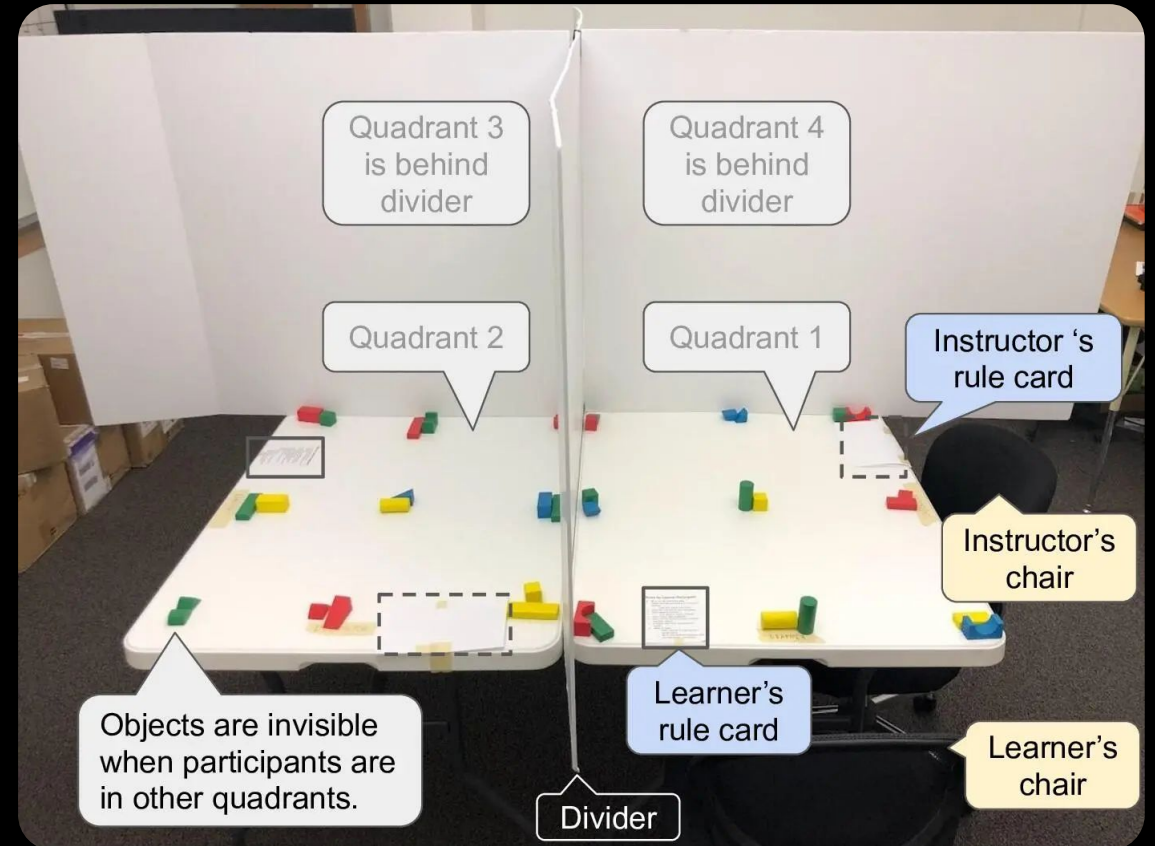
### Goal

Manipulation of **referent visibility**

→ Coarse-grained variance in cognitive status

**Repeated reference** to referents

→ Fine-grained variance in cognitive status

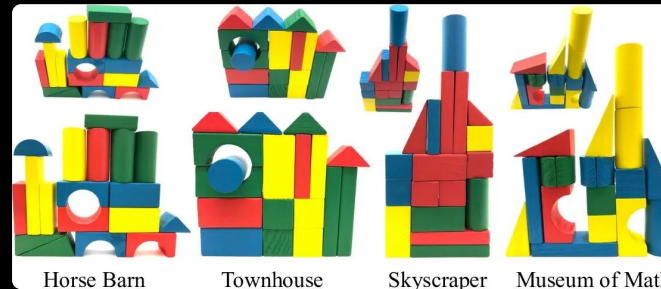


## Results

# Tower Construction in Four Quadrants

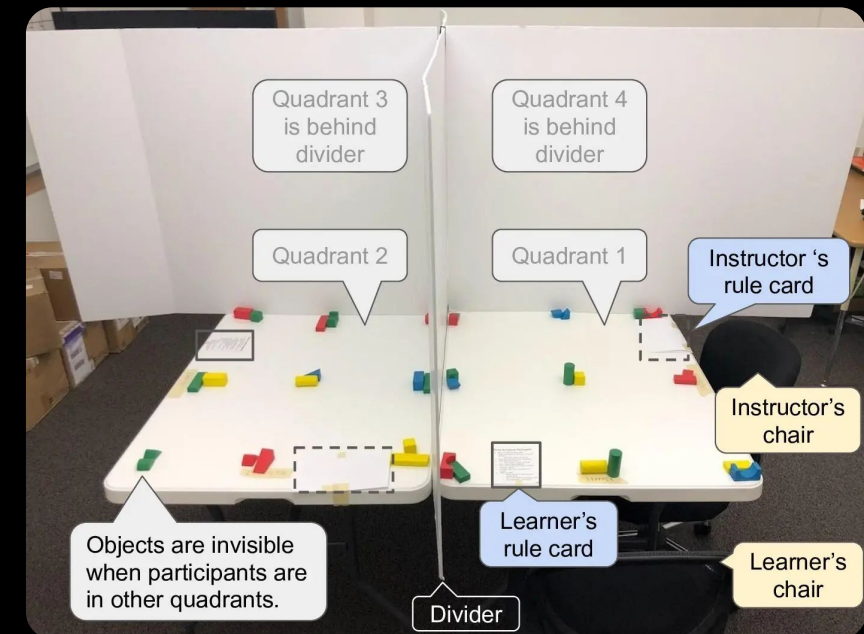
**Pairs of participants:** instructor teach learner to construct buildings

**A building (total 4):**



- 18 **repeated** blocks – for more “this”, “that”, “it”
- Half in current quadrant, half **hidden** in other
  - **non-present** & **no longer present** objects when switching quadrants

**Within a quadrant:** blocks are at vertices of  $3 \times 3$  grid – more referring forms varied by distance (this, that)



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## Takeaways

1. **Language-capable robots** must be able to use a **wider array of referring forms**.
2. In our new four-quadrant tower construction task, we **manipulate referent visibility & use repeated referents**.
3. For more and a **recommended procedure**, read our paper on [bit.ly/hri22lbr](https://bit.ly/hri22lbr)!