Experimentally extracting implicit instruments
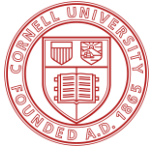
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Research Question
To what extent do people represent **implicit instruments** during event processing?

Background

"The chef chopped an onion."

AGENT   PATIENT

IMPLICIT INSTRUMENT: knife

- Event roles [1]:
  Agents initiate actions;
  Patients are acted upon;
  Instruments are used to carry out an action

- Instruments are **implied** in some events [2]

- While Agents and Patients are easy to distinguish, Instruments are not [3, 4]

Select References
[1] Fillmore (1968), *Foundations of Language*.
[2] Ferretti et al. (2001), *JML*.
[3] Rissman & Majid (2019), *Psychonom. Bulletin & Review*.
[4] Schlesinger (1989), *Journal of Linguistics*.
[5] Zwaan & Radvansky (1998), *Psych. Bulletin*.

Design

The chef chopped an onion. Then, with the same ___

knife

4 answer conditions:
P: primary instrument   (knife)
O: object   (onion)
S: secondary instrument   (bowl)
A: associated item   (oven)

Note: The object (onion) is primed!

Experiments

The chef chopped an onion.

Then, with {the same/a different} . . .

knife (P)
onion (O)
bowl (S)
oven (A)

The chef chopped an onion.

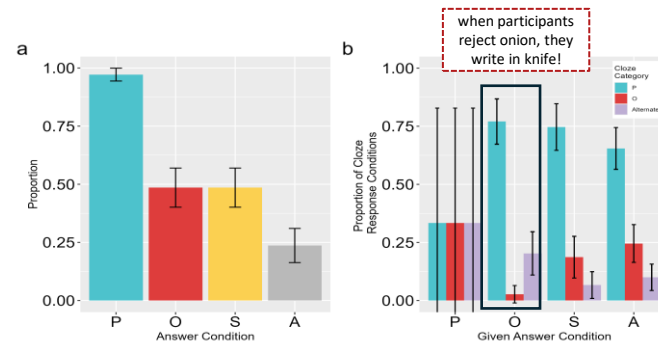Then, the chef used / the chef took / using / taking {the same/a different} ...

knife (P)
onion (O)
bowl (S)
oven (A)

Experiment 1: *with*

with & *use* prime instruments [4]; *take* does not

Experiment 2:
verb bias: *use* vs. *take*
aspect: past vs. progressive

Results: People always represent instruments

blue bar (knife) is always high!

when participants reject onion, they write in knife!

Figure 1: *with*
a. Proportion of answer choices selected over black box
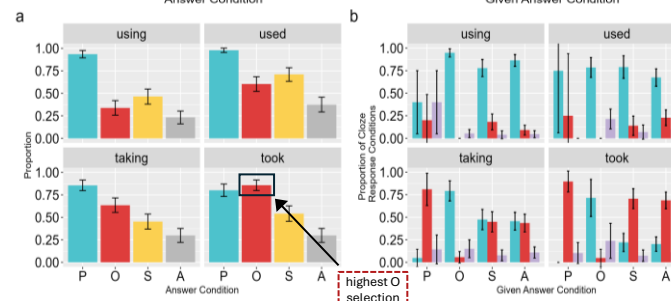b. Cloze response categorizations

highest O selection

Figure 2: *use* vs. *take*
a. Proportion of answer choices selected over black box
b. Cloze response categorizations

Discussion
- Instrument selection increases when introduced by <u>use</u> or <u>with</u>
- Instrument selection <u>decreases in the past tense</u>, when the instrument is less cognitively available [5]
- <u>Object selection</u> increases in past-tense *take*
- When people reject the object or other choices, they <u>write in the instrument</u>

Conclusion
People represent implicit instruments **even though the object is primed**; this is modulated by verb and aspect.