

Top-down goals modulate the use of argument roles in prediction: Evidence from ERPs

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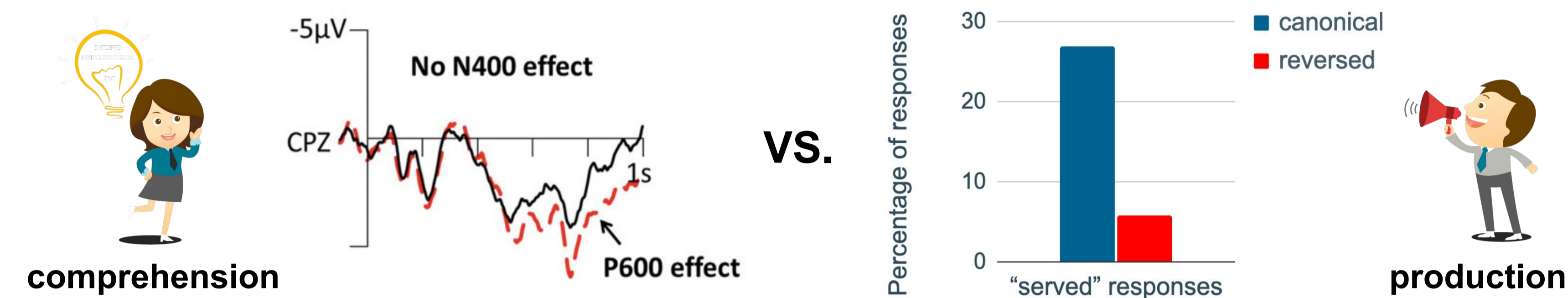


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A conflict in the literature: N400 vs. speeded cloze findings

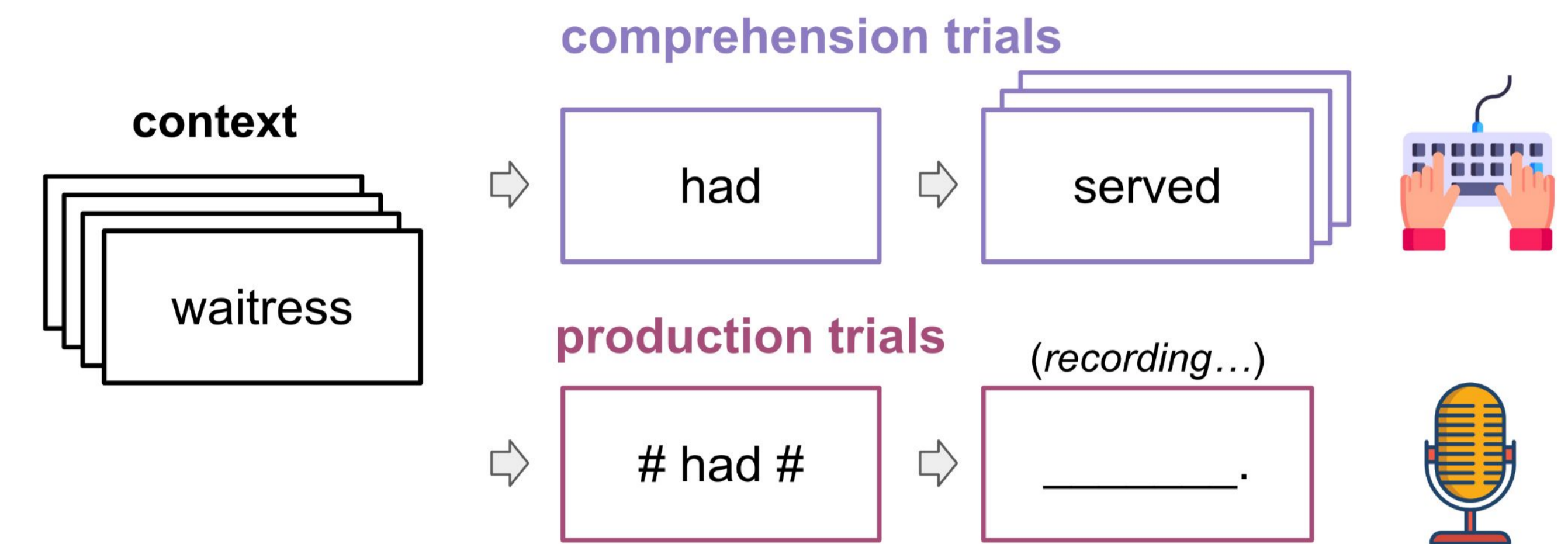
Do people actively use argument role information to constrain expectations for upcoming verbs?

- The restaurant owner forgot which **customer** the **waitress** had **served** last night.
- The restaurant owner forgot which **waitress** the **customer** had **served** last night.



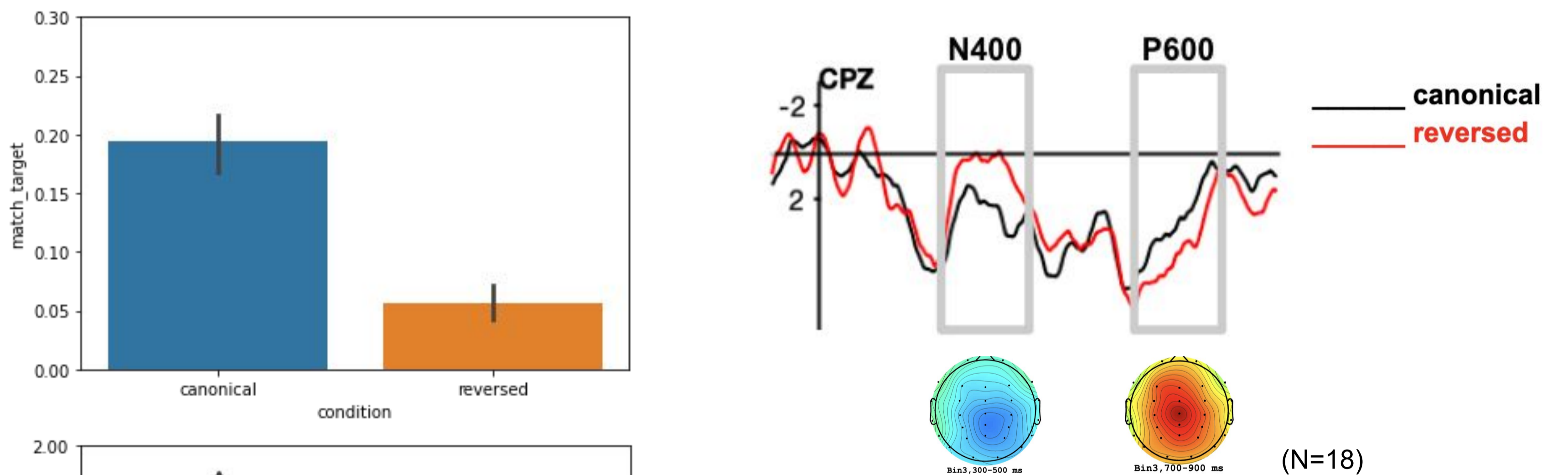
Will role-reversal anomalies elicit the N400 effect when people are producing cloze responses?

Measuring the N400 when people are ready to produce



	critical	control
canonical	The restaurant owner forgot which <u>customer</u> the <u>waitress</u> had served ...	Abby brushed her teeth after every meal ...
reversed	The restaurant owner forgot which <u>waitress</u> the <u>customer</u> had served ...	Abby brushed her teeth after every game ...
plausible		
implausible		

Cloze results as expected; N400 results surprising!



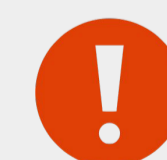
Production trials: sensitivity to argument roles

- Role-reversals are rarely produced as completions
- Role-reversals are produced with longer RTs than role-appropriate verbs



Comprehension trials: sensitivity to argument roles!

- Role-reversals elicit larger N400 and P600 amplitudes than role-appropriate verbs



Key takeaways

- Role-reversal anomalies elicit the N400 effect during production.
- Production processes accelerate the use of argument roles in verb prediction.



'People are trying harder in production' is not enough

- Many previous replications of the lack of the N400 effect; no N400 effect despite highly accurate judgments
- N400 effect is observed if given more time ahead of the role-reversed verb
- Robust N400 effects observed with other unpredictable sentences, without any production involved
- Initial blindness to role-reversals when people are 'trying hard' (visual world eye-tracking, eye-tracking during reading), and rapid role-sensitivity when people are not 'trying hard' (read aloud, lexical decision)

Possible underlying mechanisms

There is a critical difference in top-down goals:

Comprehension: INTEGRATION of input vs. Production: SELECTION of one output

What are the potential underlying mechanisms for predicting verbs using argument roles, and how could those mechanisms lead to the comprehension-production contrast?

... which waitress the customer had... **served** / **tipped**

- Post-monitoring account:** **served** and **tipped** are both initially strongly pre-activated, then a subsequent monitoring process inhibits **served** when its activation reaches threshold
 - Typical N400 non-effects reflect the early matched activations
 - Production accelerates the monitoring process
- Differential pre-activation account:** **served** and **tipped** are both initially not strongly pre-activated, but sometimes **tipped** can be strongly pre-activated
 - Typical N400 non-effects reflect the early matched activations
 - Production accelerates pre-activation of **tipped** and causes it to cross threshold more quickly

→ Production facilitates either the monitoring process or the generation of strong candidates