

Socially Facilitated Alignment and Novelty in an Interactive Micro-Task with Online Crowdsourcing

Monica A. Riordan, Rick Dale, Roger J. Kreuz & Andrew Olney
Department of Psychology, The University of Memphis



Introduction

Several researchers (e.g. Pickering & Garrod, 2004) propose that priming is a central mechanism underlying alignment. When two people communicate, their levels of linguistic representation align by co-activating similar words, sentence structures, and so on.

Using crowdsourcing technology, we contrast this “socially facilitated priming” perspective with a “socially facilitated novelty” perspective, in which there is a disadvantage to high alignment because it stunts the flow of conversation by reducing novel contributions.

Participants

161 were participants recruited through Amazon’s Mechanical Turk, which operates as a micro-task market in which researchers post tasks that are completed for money. Each received 75 cents for participating, which required approximately 12 minutes.

Method

The experiment consisted of a computer game, programmed in Adobe Flash (see Fig. 1) and linked to a Human Intelligence Task (HIT) posted on Amazon’s Mechanical Turk (www.mturk.com; see Fig. to the right). Participants supplied their own statement after each conversation turn.

All participants were presented with statements in an “I never...” format that were pre-constructed. These statements did not differ between conditions (see Table 1). The pseudo-confederate/database always presented the first statement.

After 12 interaction turns, participants were asked to recall the endings of six of the given statements. For the talk (pseudo-confederate) condition, an open-ended comment box asked how participants felt about the interaction.

Coding

Each response given by a participant was binary coded according to whether certain alignment dimensions matched or did not match the given prompt, including verb, tense, and topic. Two coders achieved high inter-rater reliability ($\kappa = .82$). We calculated an alignment score across the three dimensions of possible alignment (verb, tense, topic) ranging from 0 (none) to 3 (all). The responses to the six recall questions were coded as either correct or incorrect and a total score was calculated for each participant.

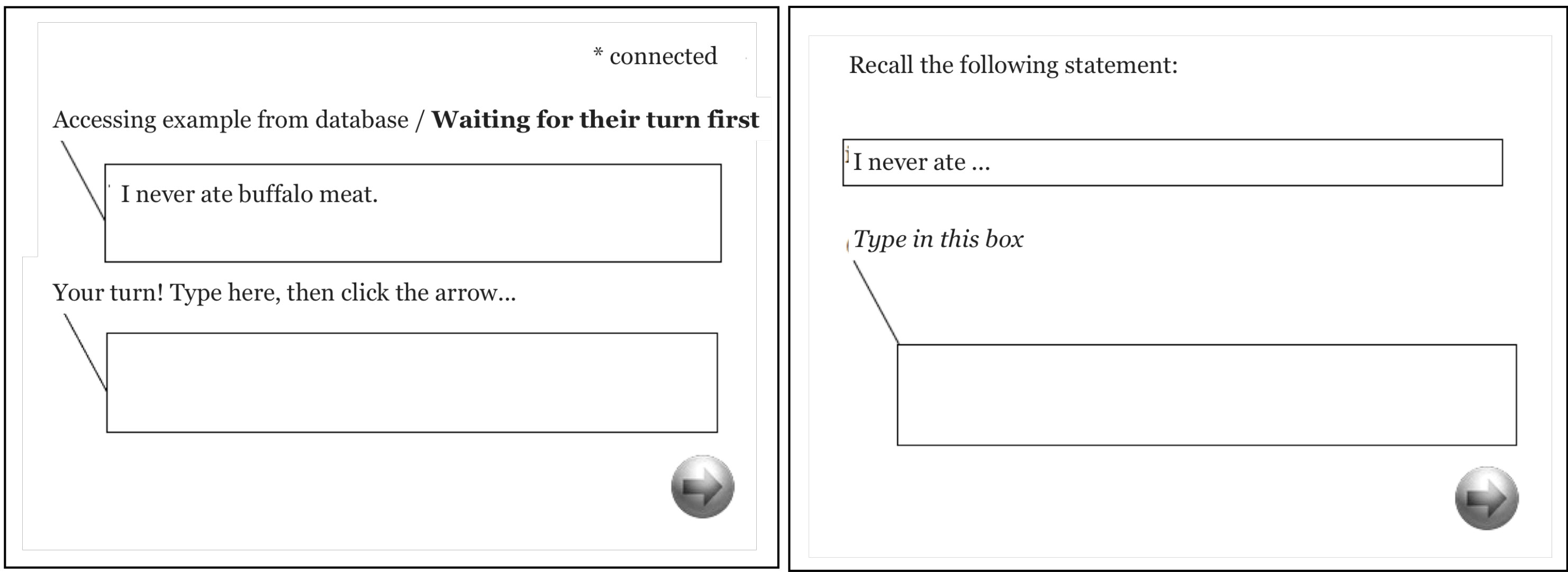
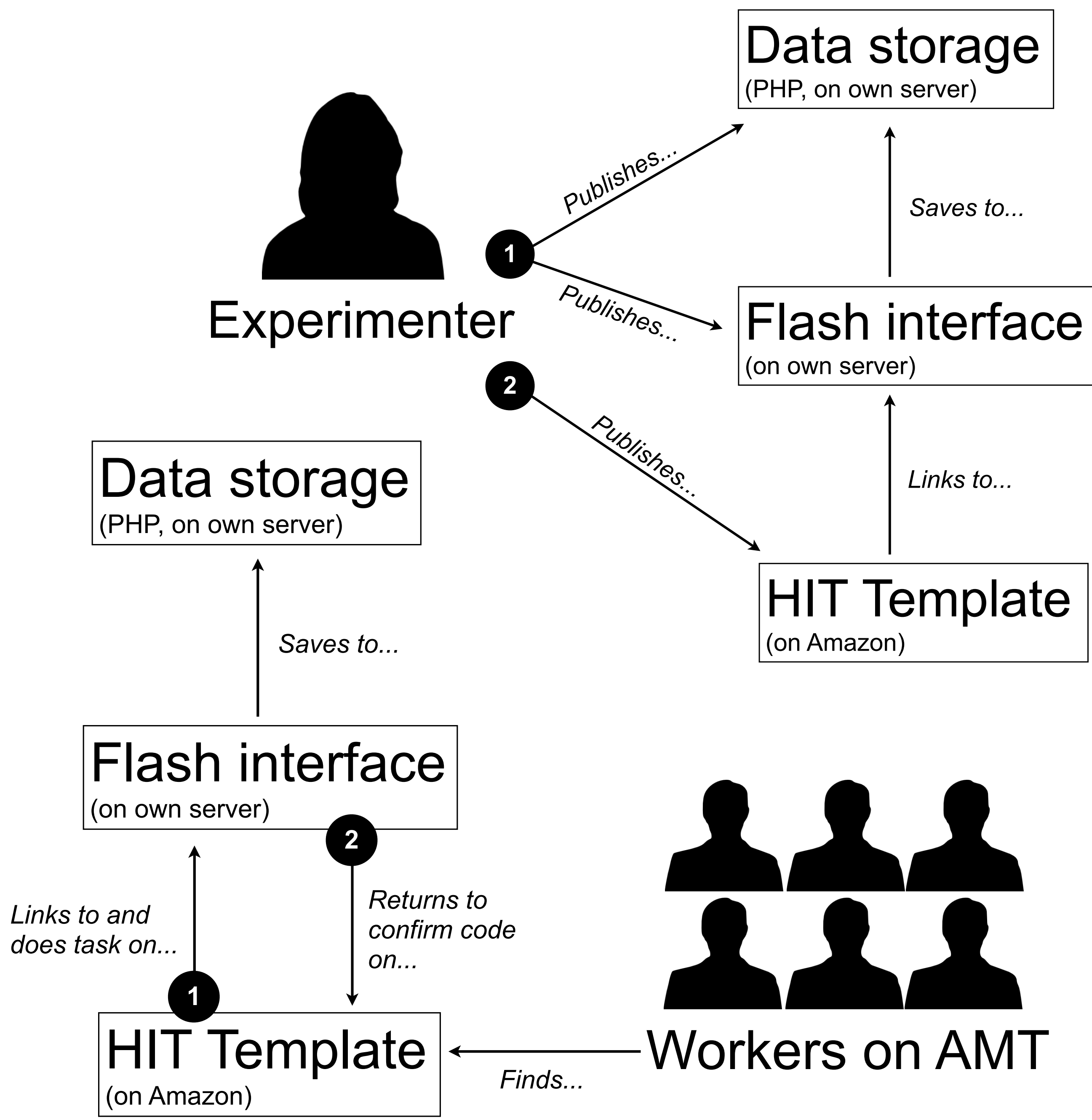


Figure 1: The basic interface for the 12 “I never” statements.

Table 1: Example Prompt Stimulus Lists	
Set Type	Example
Past Tense / Frowns	I never ate buffalo meat :-(
Past Tense / Smiles	I never watched a documentary :-)
Present Tense	I never get Starbucks coffee
Present Perfect Tense	I have never climbed a mountain

Note: Other lists included past perfect tense, present perfect tense with mixed emoticons, past tense with mixed emoticons, and two additional lists with mixed properties.



Results

The examples condition showed more alignment than the talk condition. It appears this difference is generated by alignment of verb and topic (see Fig. 3).

Emoticons were extremely rare in the participant responses (total of 13 generated despite 696 presented). All emoticons except 2 occurred with primes that contained emoticons, suggesting emoticon alignment. Emoticons were mostly used in the talk condition (11 vs. 3, $X_1 = 11.5$, $p < .001$).

The talk condition had better recall for prompts (Fig. 3).

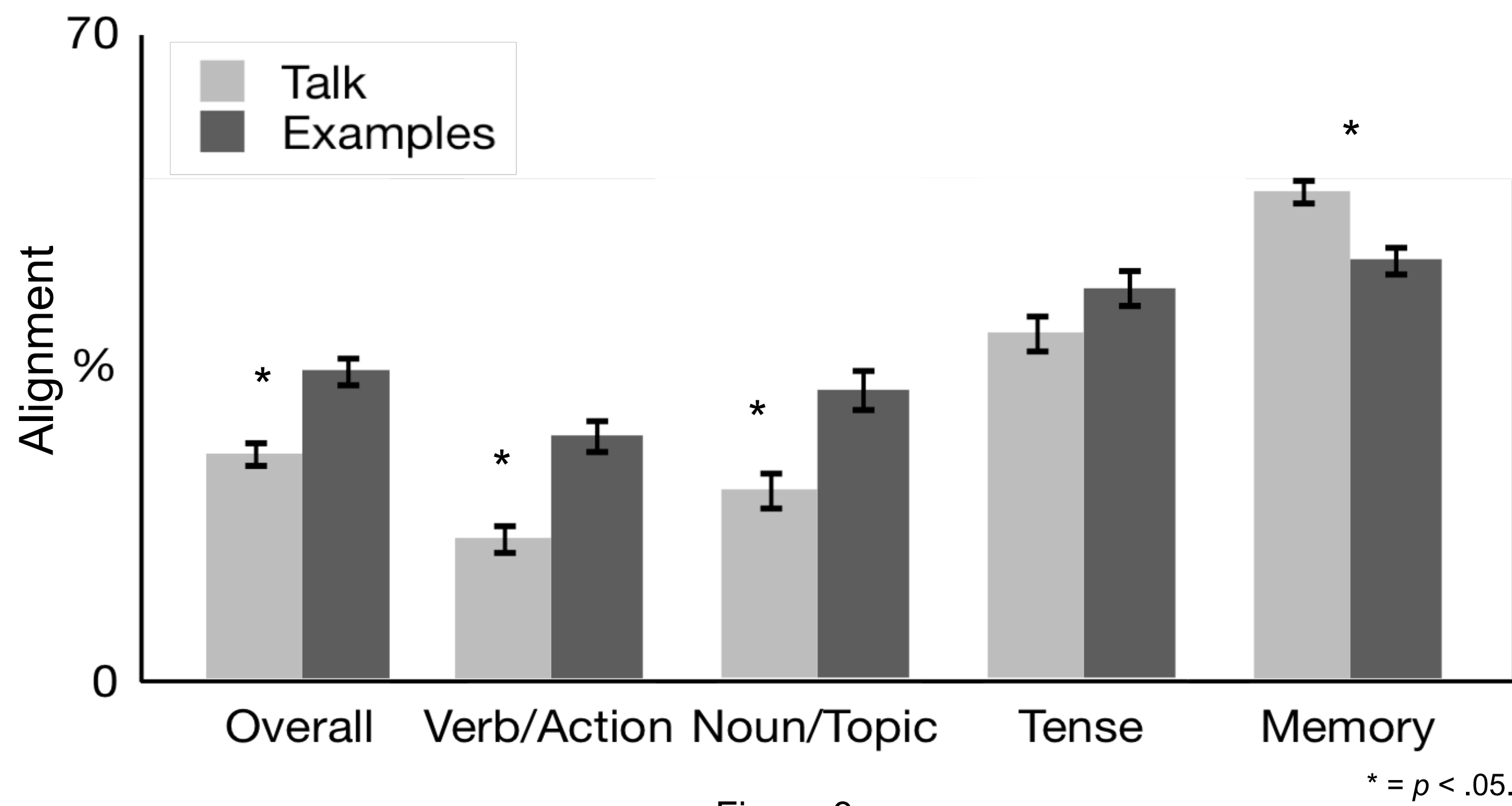
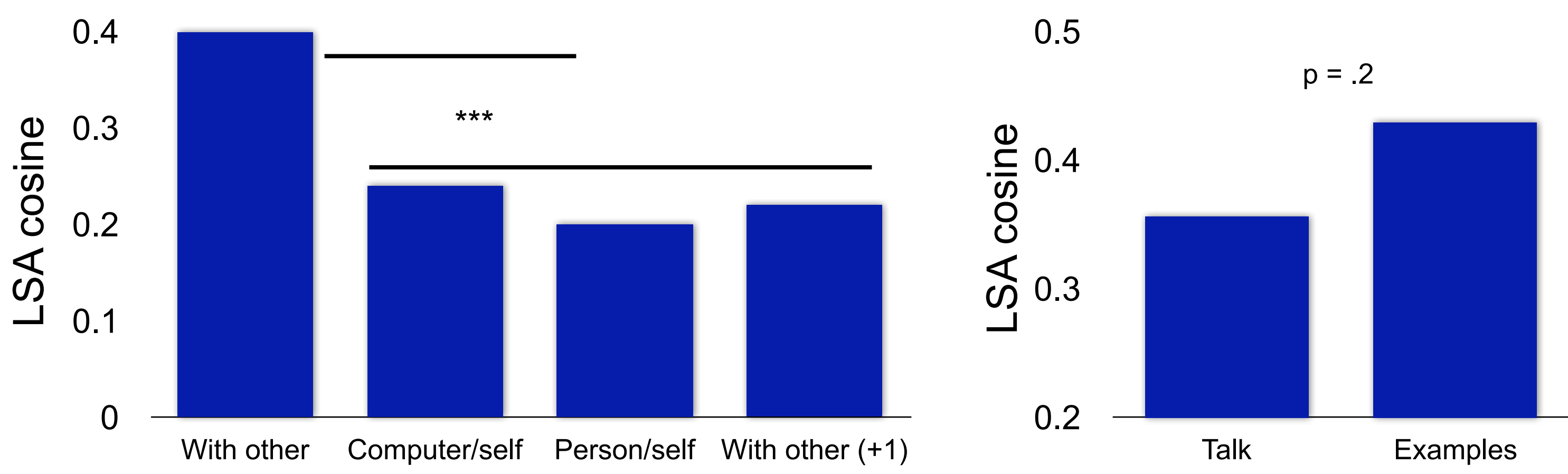


Figure 3

* = $p < .05$.

Future Directions: Automation with LSA

Using the same design, we have formulated prompts that are embedded in an LSA space (vector representations of meaning). This allows automated comparison of primes and responses at the semantic level. Participants collected so far (N = 31) have produced some consistent results (see below).



Discussion

Our data suggest that:

- Verbal alignment is significantly lower in natural communication than in bare priming circumstances.
- Nonverbal alignment is significantly higher in natural communication than in bare priming circumstances.
- Shared facts are more effectively encoded for recall.

Facilitated priming or novelty may depend on the communicative channel being examined. Novelty is favored in the verbal channel; priming is favored in the nonverbal channel. These results further suggest that it may be important to consider distinct functions of alignment at different communicative levels or channels.

Pure alignment is less in the talk conditions because it does not necessarily facilitate socializing; conversations must be driven forward with ties to prior topics to maintain flow.

In addition, this study shows that computer-mediated communication may provide an efficient method for studying alignment without the use of human confederates.

Online interactive micro-tasks with crowdsourcing represent an promising new avenue for interaction research.