

Big duck, small duck, what do you see? Real-time integration of perspective information

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While formal theories of conversation assume that interlocutors are sensitive to each other's knowledge and how it differs from their own, psycholinguists disagree on whether, and under what circumstances, listeners integrate perspective information. Some studies find that listeners initially process relative to their egocentric perspective (Keysar et al. 2000, Barr 2007). Others find evidence for early use of common ground information (Nadig & Sedivy 2000, Hanna, et al., 2003). One explanation is that listeners use speaker perspective only under special circumstances. For example, in studies finding early effects of perspective, some instructions using definite referring expressions were globally ambiguous and thus infelicitous from the egocentric perspective (Keysar et al. 2003). Using temporarily ambiguous instructions that are globally unambiguous and fully felicitous we show that (a) common ground information is used immediately and (b) listeners integrated it into their own perspective.

Participants followed a confederate's instructions like (1) to manipulate objects in a 3x3 vertical display while eye-movements were recorded. Scalar adjectives create the expectation that the speaker will refer to a member of a size contrast (Sedivy, et al., 1999). Thus in displays with one size-contrast (conditions A&B) participants should look to the target upon hearing *big* and before encountering the noun. For displays with two size-contrasts (condition C), target identification should be delayed because the noun is necessary to distinguish the target from its competitor. Critically, when the competitor-contrast is privileged (condition D), listeners should identify the target before hearing the noun ONLY if they take into account the speaker's perspective. If listeners initially process egocentrically, target identification will be delayed until the noun. Because temporary ambiguity is ubiquitous in language, it should not trigger strategic use of common ground.

We measured target-advantage ratios (looks to target over looks to target and competitor) during the processing of the adjective (200ms after adjective onset to 200ms after noun onset). ANOVA on quasi-logit transformed averages revealed a reliable interaction of number of contrast by ground ($F(1,15)=4.76, p<.05$, $F(1,15)=7.62, p<.05$). Targets were identified early in the two-privileged condition (D) and the one-contrast conditions (A,B), and late only in the two-shared condition (C).

Moreover, subjects do not selectively avoid encoding information in privileged ground. Rather, they take the speaker's perspective into account while being aware of the contents of the privileged ground information. We calculated looks to the privileged objects over the sum of looks to that object and the target-contrast. Since Sedivy et al. (1999) observed looks to the contrast after the target was identified, we predicted that this ratio would be higher for a privileged competitor-contrast (D) than an unrelated object (B). It was in fact was higher during the processing of the noun ($F(1,15)=4.32, p<.05, F(1,15)=3.06, p=.055$).

We argue that listeners use knowledge about common ground information to narrow the domain of potential referents, even when they are aware of the privileged information, indicating that common ground information is integrated into the listener's perspective. We present a Bayesian explanation for why effects of common ground are masked by stronger cues under some circumstances.

Instructions. (1) “pick up the big duck and...” (the rest was produced on the fly).

Displays. objects in CAPS were not visible to the speaker.

(A) one-shared: big duck (target), small duck (target-contrast), big box (competitor), soap (distracter);

(B) one-privileged: big duck, small duck, big box, BAR OF SOAP;

(C) two-shared: big duck, small duck, big box, small box (competitor-contrast);

(D) two-privileged: big duck, small duck, big box, SMALL BOX.

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