The discourse status of implicit objects: evidence from language production

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Implicit objects (IOs) are the unrealized theme arguments of optionally transitive verbs (e.g., *eat, read*) in intransitive frames (*Lisa ate.*). Work on IOs' discourse status reveals that, like implicit agents [1], IOs are less available than overt objects for anaphoric reference [2]. These findings fit with implicit arguments' reputation for being *discourse inert* [1,3,4]. However, prior work on implicit arguments has only focused on their availability for subsequent anaphoric reference using comprehension tasks. This is not sufficient for understanding their discourse behavior, given that research on *overt* referents shows that (a) choice of anaphoric form (pronoun vs. noun) and (b) likelihood of subsequent mention can diverge, and thus need to be analyzed separately [5,6,7]. To assess both (a) and (b), production tasks are needed. We conducted two production studies in order to take a closer look at the discourse status of implicit arguments.

In **Experiments 1-2**, we used production-oriented tasks to assess *both* (i) implicit objects' (IOs') likelihood of re-mention in subsequent discourse (their *persistence*) and (ii) which referring expression is used to refer back to IOs. **Predictions**: Theoretical work suggests arguments are left implicit when they are low in discourse prominence [8]. This predicts IOs will be referred to less often than overt objects. We test this in **Experiments 1 and 2.** Moreover, IOs may also be less likely to be referred to with a pronoun than overt objects. We test this in **Exp2.** If these effects are a *categorical consequence of implicitness*, we do not expect contextual factors to modulate them. However, if implicit objects can *vary* in terms of their discourse prominence – i.e., if not all IOs are uniformly low-prominence due to their implicitness – their discourse behavior may be modulated by their contextual salience. We test this in **Exp2**.

Exp.1 (n=32) used a forced-choice completion task with **sluicing** (e.g.…*I'm not sure which* {*student/book*}), a construction suited for investigating reference to unspecified objects. We investigated how often participants choose to re-mention implicit objects vs. overt objects, by asking them to complete the final clause in each item. (Exp.1 had 20 targets and 30 fillers). An example target is in Table 1. For the example in Table 1, do people choose to complete the fragment with "which student" (subject) or "which book" (object)? We expect an overall preference to re-mention objects, since sluices with overt antecedents exhibit a locality effect [9,10,11]. Finding that IOs are selected less often than overt objects would indicate that implicit objects are less prominent that overt ones. We also tested whether making the object explicitly relevant to the discourse goals, by means of an overt question/QUD [12,13], would boost its prominence.

Table 1. Experiment 1 example item

condition	*example*	*results*
Implicit obj	*Me: I gave some students several books to read. Later, I saw a* ***student*** *reading, but I'm not sure [ ] which student [ ] which book*	*65.6% obj*
Overt obj	*Me: I gave some students several books to read. Later, I saw a* ***student*** *reading a* ***book****, but I'm not sure [ ] which student [ ] which book*	*64.3% obj*
Implicit obj w/ question	*Me: I gave some students several books to read.* *Friend: Did they read them?* *Me: Later, I saw a* ***student*** *reading, but I'm not sure [ ] which student [ ] which book*	*63.7% obj*
Overt obj w/ question	*Me: I gave some students several books to read.* *Friend: Did they read them?* *Me: Later, I saw a* ***student*** *reading a* ***book****, but I'm not sure [ ] which student [ ] which book*	*70% obj*

Results: All conditions yielded > 50% object continuations (p's<.05): sluices prefer objects *even when the object is implicit*. Furthermore, implicit objects are as likely to be mentioned as overt ones: implicitness and the question manipulation had no effect (glmer, p's>.3). However, Exp.1 only used sluices and '*which noun*' phrases - constraints which may mask differences in the discourse behavior of overt vs. implicit objects.

Exp.2 (n=48) used a story-continuation task to test (i) how likely implicit (vs. overt) objects are to be mentioned in subsequent discourse, and (ii) with what kind of referring expression. We manipulated **(a)** object type (implicit/overt) and **(b)** context type (*strong*: mention of a set containing the object vs. *irrelevant*: mention of something unrelated to the object), shown in Table 2. Exp.2 had 20 targets and 20 fillers. Forty-eight native English speakers wrote continuations which we annotated for whether (i) the implicit/overt object from the prompt is mentioned and (ii) if yes, what referring expression is used.

Table 2. Experiment 2 example item ('story prompt' for story continuation task, below)

Implicit, strong context	I gave Sarah several books to read. Later, I saw her reading. …
Overt, strong context	I gave Sarah several books to read. Later, I saw her reading a book. …
Implicit, irrelevant context	I went to the gym with Sarah. Later, I saw her reading. …
Overt, irrelevant context	I went to the gym with Sarah. Later, I saw her reading a book. …

Table 3. Experiment 2 example continuations (below)

Prompt:	Continuation (1st clause shown)	Coded as:
I handed Victoria several books to read. Later, I saw her reading.	I asked her if she liked **it** so far.	Object mention: yes Form: pronoun
I sent William several melodies to play. That night, I saw him playing.	**The melody** was so soothing.	Object mention: yes Form: definite NP
I gave Vanessa some emails to type. That evening, I saw her typing an email.	**It** looked boring.	Object mention: unclear; ambiguous *(excluded)*
I went to the park with Albert. That night, I saw him writing.	I decided not to bother him.	Object mention: no Form: n/a

Results: Implicit objects were (i) mentioned and (ii) pronominalized less often than overt objects (glmer, p's<.05). Crucially, the context manipulation affected referents' persistence: *implicit objects (but not overt ones) are more likely to be mentioned when a salient context set has been mentioned (strong context) than in irrelevant-context conditions* (glmer, p<.02, Fig.1). However, pronoun use for implicit objects was unaffected by the context (Fig. 2).

Figure 1. Proportion of object re-mention

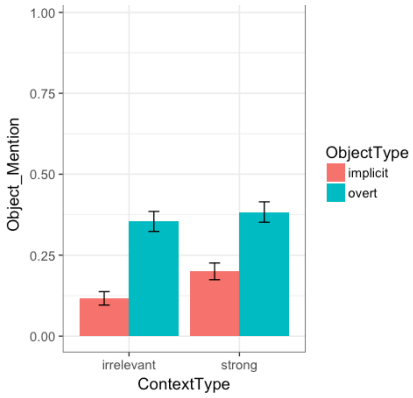
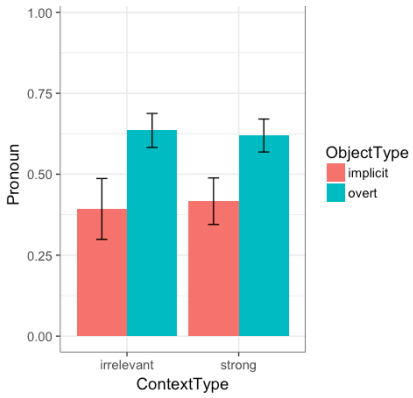


Figure 2. Proportion of pronominalization



In sum, implicit objects' persistence in discourse is influenced not only by their implicitness but also by preceding context: contexts that allow for more specific interpretations of IOs (via inferred set membership) make them more more likely to be re-mentioned. In contrast, rate of pronoun usage referring back to IOs was *not* affected by prior context. Differences between likelihood of subsequent mention (persistence) and likelihood of pronominalization of IOs suggest that persistence may be more connected to general notions of discourse prominence (and thus affected by preceding context), whereas pronoun use may be more constrained by how the antecedent is linguistically realized (implicit/overt). Our work is the first to identify a divergence between likelihood of mention and likelihood of pronoun use with implicit arguments.

References: **[1]** Koenig&Mauner'99. A-definites and the discourse status of implicit arguments **[2]** Besserman&Kaiser'18. The discourse status of existential implicit arguments **[3]** Martí'11. Implicit indefinite objects: grammar, not pragmatics **[4]** Williams'15. Arguments in syntax and semantics **[5]** Kehler et al.'08. Coherence and coreference revisited **[6]** Fukumura&vanGompel'10. Choosing anaphoric expressions **[7]** Kaiser'10. Investigating the consequences of focus on the production and comprehension of referring expressions **[8]** Goldberg'01. Patient arguments of causative verbs can be omitted **[9]** Frazier&Clifton'98. Comprehension of sluiced sentences **[10]** Carlson et al.'09. Information structure expectations in sentence comprehension **[11]** Harris'15. Structure modulates similarity-based interference in sluicing **[12]** Ginzburg'96. Dynamics and the semantics of dialog **[13]** Roberts'98. Information structure in discourse