

**On the perceived generalizability vs. specificity of subjective predicates:
Both linguistic factors and non-linguistic individual differences are at play**

Subjective predicates (including predicates of personal taste, PPTs, e.g. *tasty*, *scary*) convey opinions, in contrast to objective predicates (e.g. *organic*, *plastic*). However, as noted by [4,7,9] and others, subjective predicates can be ambiguous in terms of whose opinion they express. If Ana says “Wugs are funny,” is she talking only about her opinion of wugs (*specific reading*) or making a generalization about people-in-general (or people she identifies with [6]) finding wugs funny (*generic reading*)?

While some assume a generic reading is always available, others distinguish the two more clearly. E.g., [4] notes that (1a) is ambiguous between generic and specific, but for Mary’s reply (1b) to be a real argument, (1b) must be construed generically. Further, Mary’s reply shows she assumed (1a) to be generic. But in (1c), John clarifies he intended (1a) specifically, and treats (1b) as specific as well.

(1a) John: The chili is tasty. [*generic or specific (John)*] **(b) Mary:** No, the chili is not tasty. [*generic*]
(c) John: OK, the chili is not tasty for you (Mary), but it is tasty for me [*specific (John)*] (from [4])

Thus, the readings can be distinct, and which is intended can depend on context and speaker intent. We refer to the specific/generic distinction as a difference in *referential scope*, i.e., whether a subjective predicate is interpreted as having (i) limited scope, conveying the personal opinion of the speaker (*specific*), or as having (ii) broader scope and expressing what people in general think (*generic*).

Some attribute this specific/generic ambiguity to a **covert, implicit element**, often analyzed as an implicit pronoun or, more generally, a free variable (e.g. [4,7,9]), which can (i) refer to a **specific individual** (typically the speaker) or (ii) be interpreted **generically**, referring to *people in general* [5,6]. For example, according to [4], PPTs “make use of a hidden pronoun [whose] value (...) can be either generic or specific” (p.74). We follow this approach. But regardless of how one analyses subjective predicates or PPTs (i.e., even if one does not assume a covert element), our results have consequences for theorizing about semantics and pragmatics of subjective predicates.

If subjective predicates can receive generic or specific readings (e.g. due to a covert element), we face the question of **what influences which interpretation is preferred?** Although ‘regular’ 3rd person pronouns are well-researched, less is known about how we resolve other kinds of pronoun-like elements. We report a psycholinguistic experiment on whether and how linguistic and non-linguistic factors guide the specific vs. generic interpretation of subjective predicates.

Linguistic factors: Earlier work by [2] suggests that boosting speaker prominence by explicit mention of the speaker (e.g. “**I think** wugs are funny”) can boost the specific (speaker-anchored) reading, while plain matrix sentences (e.g. “Wugs are funny”) are more easily construed as having broader referential scope (generic reading). We take this as evidence for a **Prominence hypothesis**, according to which the covert element is *sensitive to referent prominence, akin to regular pronouns*. Under this view, similar to 3rd person pronouns that refer to highly salient antecedents, the covert element prefers highly salient antecedents (see also [8])— such as the explicitly-mentioned first-person speaker in *I think*. In the current study, we test if this result replicates in a novel context and with a large set of linguistically naïve participants, and whether it extends to another attitude verb, *consider*.

Cognitive factors: We also hypothesize that, unlike regular pronouns, interpretation of the covert element is impacted by our bias to egocentrically over-project our opinions to others ([1] *inter alia*). It is well-known in psychology that our own mental states ‘leak into’ our representations of others’ mental states. Building on this large body of work, we propose the **Shared opinion hypothesis**, according to which a participant is more likely to interpret the covert element *generically* if they share the opinion being expressed (and conversely, are more likely to interpret the covert element as *specific*, referring only to the speaker, if the participant does *not* share the speaker’s opinion). In other words, the prediction is that if you tell me ‘These oysters are tasty’ and I love oysters, I’m more likely to interpret your statement as being about people in general (generic

reading), but if I hate oysters, I'm more likely to think that you are expressing only your own opinion (specific reading). This novel prediction is rooted in nonlinguistic work on human cognition and perspective-taking but has not previously been tested with subjective predicates.

Experiment: We conducted a psycholinguistic study on English to test these the Prominence and Shared opinion hypotheses. 131 native U.S.-English speakers read sentences with subjective predicates (Table 1), said by aliens about novel viruses (Fig.1). Use of aliens means people cannot directly map their own opinions onto the experimental stimuli, which allows us to probe the generalizability of the effects. The participants' **task** was to type in a number indicating how many aliens (out of 100) they think share the speaker's opinion. This essentially asks: To what extent do people think the opinion is held by aliens-in-general – i.e., how available is the *generic reading*?

Design: We manipulated **(i) linguistic form** (plain matrix clauses vs. embedded under *think/consider*) and **(ii) opinion type**: anxious vs. non-anxious (Table 1). For **linguistic form**, we tested both *think* and *consider*. In both cases the first-person speaker is explicitly mentioned, but as noted by [3], *consider* differs from *think* in not allowing fully objective information. Thus, we might find that *consider* boosts the prominence of the first-person speaker more than the more neutral *think*. More generally, testing two verbs allows us to check the generalizability of our findings. ([2] did not test *consider*.) For **opinion types**, we use the term 'anxious' for opinions that express fear or worry about a virus or its health consequences as well as opinions regarding the importance of projecting oneself from infection. We call 'non-anxious' opinions that are the opposite (i.e., dismiss risks of the virus, dismiss the need for health precaution). All viruses had different, made-up names.

Individual differences: At the end, participants answered questions probing whether the COVID pandemic made them anxious/worried/stressed. Based on a series of questions (adapted from prior work on the pandemic's effects on people's mental well-being), we computed an **anxiety score** for each person. The *higher* someone's score is, the *higher their COVID related anxiety level* is. This allows us to test whether individual differences in COVID anxiety predict likelihood of generic readings for subjective predicates describing made-up viruses (i.e., a related but distinct context).

Results: Linguistic form. Opinions mentioning the speaker (*I think/consider*) are rated less generalizable than opinions in matrix sentences (Fig.2, lmer, $t's > |3|$, $p's < .01$; *think/consider* do not differ; $p's > .3$). This supports the *Prominence hypothesis*. *Think* and *consider* pattern alike, suggesting that speaker mention boosts its prominence regardless of fine-grained semantic differences in the verbs.

Results: Individual differences. Before getting into individual differences, we note that anxious opinions are rated more generalizable than non-anxious opinions ($t=6.74$, $p<.001$). Most relevantly for us, *this effect increases with participants' COVID anxiety level* (opinion type x anxiety level interaction, $t=10.86$, $p<.001$, see the V-shape in Fig.3). The more anxious someone is about COVID, the more likely they are to interpret (i) anxious-opinion sentences as more generalizable and (ii) non-anxious-opinion sentences as less generalizable. The less anxious someone is about COVID, the smaller the difference in how they perceive anxious/non-anxious opinions. Thus, as predicted by the *Shared opinion hypothesis*, if someone encounters a subjective predicate describing a novel opinion (e.g. *the zorgavirus is dangerous*) resembling their own opinion on a similar-but-not-identical topic (*COVID-19 is dangerous*), they are likely to interpret the novel opinion as generic.

Conclusions: We tested factors modulating the referential scope of subjective predicates – whether they are interpreted as expressing an opinion held by people-in-general or only a specific speaker – by measuring their perceived generalizability, which indicates how available the generic reading is. We find that the perceived generalizability of subjective predicates is guided (i) not only by linguistic cues (whether the speaker is mentioned as the subject of an attitude verb) but (ii) also by extra-linguistic factors, namely people's own attitudes. This work uncovers a new link between subjective predicates, individual differences, and humans' egocentric cognitive biases, and raises questions about how to capture these effects within current accounts of subjective predicates.

Table 1. Sample target (3x2 within-subjects; 30 targets; 30 different subj predicates of each type, e.g. <i>intimidating, frightening, fascinating, irritating, awful, exciting, harmless, dangerous</i> ; 45 fillers)	
<i>Matrix/plain</i>	The zorgavirus is dangerous _{anxious} /harmless _{non-anxious}
<i>think</i>	I think that the zorgavirus is dangerous _{anxious} /harmless _{non-anxious}
<i>consider</i>	I consider the zorgavirus to be dangerous _{anxious} /harmless _{non-anxious}

We are visiting an alien planet. You overhear one of the aliens say:

"I think that the zorgavirus is harmless."

If we randomly select 100 aliens from this planet, how many of them do you think **share this alien's opinion** about the zorgavirus?

Fig1. Example display illustrating the task

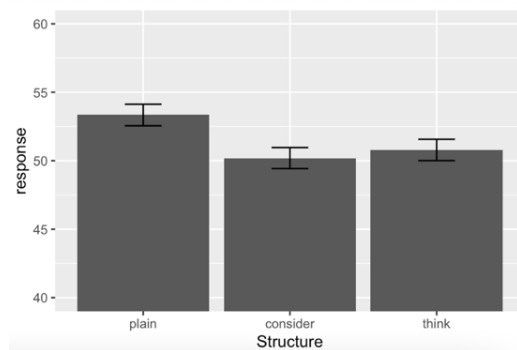


Fig2. Perceived generalizability as a function of linguistic form (y-axis = how many aliens do you think share this alien's opinion?)

Error bars show +/- 1 SE

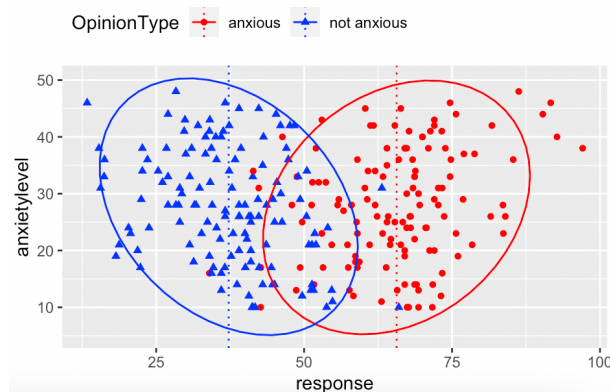


Fig3. Perceived generalizability (x-axis = how many aliens share the opinion) of sentences conveying **anxious** vs. **non-anxious** opinions, **relative to participants' COVID anxiety scores** (y-axis)

Dotted vertical lines: mean generalizability of anxious and non-anxious opinions

References [1] Epley & Caruso 2009. Perspective Taking [2] Kaiser & Lee 2019. On the generalizability of subjective opinions [3] Kennedy & Willer 2022. Familiarity inferences, subjective attitudes and counterstance contingency [4] Keshet 2020. A matter of taste. [5] Moltmann 2010. Generalizing Detached Self-Reference and the Semantics of Generic *One* [6] Pearson 2013. A Judge-Free Semantics for Predicates of Personal Taste. [7] Pearson 2022. Individual and stage-level predicates of personal taste [8] Stephenson 2007. Judge dependence, epistemic modals, and predicates of personal taste [9] Snyder 2013. Binding, Genericity, and Predicates of Personal Taste

ADDITIONAL SUBMISSION A different, shorter, and less-semantically-oriented version is under review for *Human Sentence Processing Conference*, a conference for psycholinguists and cognitive psychologists, typically not attended by semanticists/formal linguists. The work submitted to SALT engages with semantic theory, articulates research questions on grounds explicitly motivated by semantic theories, and focuses on theoretical implications in a way not addressed in the HSP submission.