Effects of evidential information source on the interpretation of predicates of personal taste

Human languages employ a variety of linguistic means to mark the evidentiality, i.e. the nature of information sources: do we know something based on visual evidence, direct auditory evidence, hearsay and so on. We report a series of psycholinguistic experiments investigating the interpretation of subjective adjectives (specifically, predicates of personal taste; PPTs, e.g. *fun, tasty, amazing*), and argue that our results are best interpreted in terms of evidentiality-based effects. We find that the nature of the evidential source – in particular whether it is auditory, visual or gustatory – plays a central role in how PPTs are interpreted. (We focus especially on the question of whose perspective/point-of-view/opinion the PPT conveys.) Our results show that the *visual modality* differs from *taste* and *smell*. We provide a new account of these findings in terms of evidentiality, and suggest that our findings can be interpreted in relation to typological observations for evidentiality systems which usually treat the visual modality as more reliable than other sensory modalities (e.g. Aikhenvald 2004).

To understand subjective adjectives, one needs to know whose opinion is conveyed, who is the subjective anchor/'judge'? Whose perspective does the adjective refer to? These questions are especially significant in contexts where multiple attitude-holders are potentially available, such as narratives. The possibility of shifting from the speaker's/narrator's point-of-view to the point-of-view of a character (e.g. in free indirect discourse) is arguably one of the hallmarks of narrative. A growing body of linguistic and philosophical work has investigated the importance of *first-hand experience* when it comes to identifying the attitude-holder of subjective expressions (e.g. Ninan 2014 on the Acquaintance Inference). The core intuition is that in order for a speaker to say a sentence like (1a,b), she must have relevant first-hand experience of the cake or the party.

(1a) The cake is tasty. (1b) The party was fun.

In recent work, Anand & Korotkova (2018) propose a new analysis of this Acquaintance Inference requirement of subjective expressions by building on von Fintel & Gillies (2010)'s idea of *kernels*, propositions that encode *direct* knowledge – for example, knowledge which is direct by virtue of immediate perception – rather than *indirect* knowledge which is available via reasoning. Anand and Korotkova's analysis makes key use of the distinction between direct and indirect evidence, and provides a strong argument that in order to understand subjective adjectives, we need to take into account the evidential grounds on which a proposition is based.

In the present work, we take a closer look at how PPT interpretation is modulated by the nature of the evidence – more specifically, by evidence from different sensory modalities. To the best of our knowledge, theoretical work on subjective adjectives has not systematically investigated whether the sensory nature of information source – e.g. whether the evidence is visual, auditory or gustatory – impacts interpretation of subjective adjectives. Thus, ex(1c) would presumably be analyzed the same way whether it refers to the taste, smell or visual appearance of a pizza slice, for example. (But see McNally/Stojanovic 2017 on aesthetic predicates like *beautiful*.)

(1c) That is disgusting.

However, from a broader perspective, it is well-known that the five senses are fundamentally different, not only in their biological but also their social-communicative aspects. For example, ***sight*** is commonly viewed as the dominant sense in most (if not all) human cultures and languages (e.g. San Roque et al. 2015, but Aikhenvald/Storch 2013). The primacy of vision may stem from the fact that the visual modality conveys information that often involves *shared perceptual experiences* between people (San Roque et al. 2015, Moore/Dunham 1995) and is also often viewed as providing relatively *objective* information: Sweetser claims that vision is "our primary source of objective data about the world" 1990:39). Indeed, in **grammaticalized evidentiality systems**, visual evidence is often considered as more reliable than auditory or other kinds of evidence.

Near the other end of the scale, the gustatory modality (***taste***) is regarded as highly subjective and variable across people (Sweetser 1990, Chafe & Nichols 1986, Dubois 2007, Viberg 1984). In contrast to the visual domain (where a person A will tend to assume that she has roughly the same visual experience as person B when they focus their visual attention on the same thing), in the taste domain A is less likely to assume that she has the same gustatory experience as B when they eat the same thing. These are not fixed rules, but prior work suggests that taste and sight differ in terms of how closely linked they are to a *person's internal subjective experience that varies across individuals (taste)* vs. *an experience that tends to be more stable across different people/shared across people* (*sight,* Caballero & Paradis 2015). Linguistic evidence for the distinction between sight and taste again comes from evidentiality systems: Aikhenvald (2007) notes that **no spoken languages are known to have dedicated evidential markers for smell or taste** (although she notes that Catalan sign language is reported to have a special evidential for smell). This is worth emphasizing, as it aligns well with the observation that smell and taste are viewed as more subjective/variable and less 'reliable' than visual information.

Given the striking differences between sensory modalities, we conducted three experiments to test whether interpretation of subjective evaluative adjectives (specifically, **predicates of personal taste**, PPTs) in narratives depends on whether they refer to the *visual* vs. *olfactory* (smell) vs. *gustatory* (taste) domains. Does readers' interpretation of ***who is the 'subjective anchor' (attitude holder, 'judge') of the adjective*** depend on the nature of the evidential information source – that is, whether the situation in the narrative involves seeing, smelling or tasting?

Crucially, our stimuli kept the actual adjectives constant while the verb was manipulated, as in ex.(2). The sense was specified by the verb, except for the baseline condition (2d), where it was underspecified. (*Hear* was not included due to difficulties creating items allowing both *taste* and *hear*.)

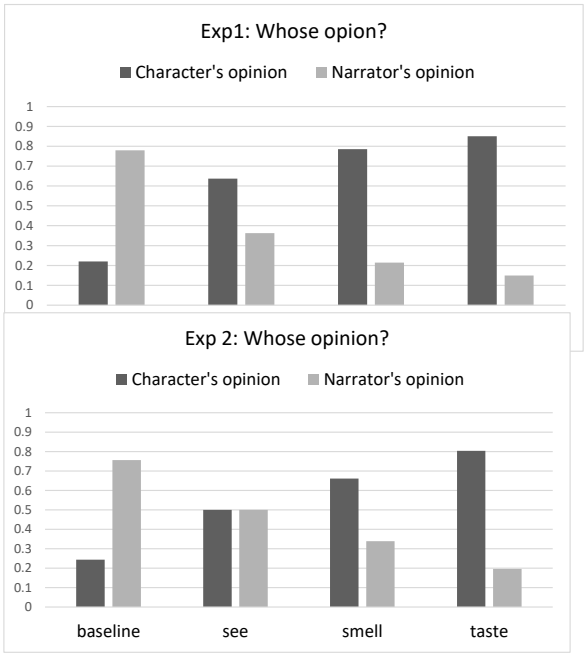
(2a) *[sight]* When I came into the room, Eliza saw the muffin on the platter. It looked disgusting.
(2b) *[smell]* When I came into the room, Eliza smelled the muffin on the platter. It smelled disgusting.
(2c) *[taste]* When I came into the room, Eliza tasted the muffin on the platter. It tasted disgusting.
(2d) *[baseline]* When I came into the room, Eliza put the muffin on the platter. It was disgusting.
(3) *Whose opinion is it that the muffin {looked/smelled/tasted/was} disgusting? The narrator's / Eliza's*

Participants were explicitly instructed to read the texts as ***fiction***, as ***extracts from novels***: We wanted to make available both the perspectives/viewpoints of a 1st person narrator and a character in the fictional narrative. Indeed, on target items, the critical sequence was preceded by a clause mentioning the 1st person narrator by means of a 1st person pronoun. This makes available two possible candidates (narrator and character) for the *'whose opinion'* question after each target (ex.3) Participants' answers indicate who they think is the anchor/evaluator/attitude-holder of the adjective. (We also tested variants where the preamble mentions the 3rd person character rather than the 1st person narrator, '*When she came into the room*', but those are not relevant here as they do not introduce another referent.)

Are there differences between senses? Investigating the link between evidential source and subjective adjectives. The key question is whether the sensory modality influences who participants interpret as the attitude holder of the subjective adjective. To the best of our knowledge, current theories are silent on this matter, though based on (i) Anand & Korotkova (2018)'s work linking subjective adjectives to evidentiality, and (ii) typological work on evidentiality suggesting that some modalities are more likely to have grammaticalized evidential markers than others (vision vs. taste/smell), we expect the *level of directness of the evidence* to play a role. In other recent work, Kennedy & Willer (2016:17) argue that subjectivity is a highly context-sensitive, pragmatic phenomenon that "is not to be explained strictly in terms of any particular semantic parameter, implicit argument, or lexical underspecification." This view contrasts with many competing accounts (e.g. Lasersohn 2005/judge parameter, Bylinina 2014/implicit arguments), but would allow us to explain potential sensory modality effects *without* having to complicate the lexical entries of the adjectives themselves. As a

whole, if we find effects of modality on the interpretation of subjective adjectives, this would further strengthen the evidence linking subjective adjective and evidentiality.

Exploratory question: What *kinds* of differences are predicted? In (2a) and (2c), Eliza is the subject of 'saw' and 'tasted.' Given that gustatory experiences in general involve a *person's internal subjective experience and are variable across individuals* (and rarely encoded in evidentiality systems, Aikhenvald 2007), we predict Eliza, rather than the narrator, will be interpreted as the attitude holder in (2c). However, as visual experiences often involve *shared perceptual experiences*, tend to be more *stable/consistent* across individuals and treated as more reliable by grammaticalized evidentiality systems, the first-person narrator may also be interpreted as the attitude holder in (2a), in addition to Eliza. Thus, if the attitude-holder identification process with subjective adjectives is sensitive to the nature of the information source as conveyed by the verb, we may see more narrator responses with *see* than *taste*. The predictions for *smell* are unclear: It involves more shared perceptual experiences than *taste* but is intuitively less constant across individuals than *see*.



In **Exp1**, native English speakers (n=56) read sentences like (2) (24 targets, 42 fillers) and answered questions like (3). **Exp2** (n=56 new people) was similar, but adjectives were modified by intensifiers (e.g. *totally delightful, absolutely amazing*). If intensifiers strengthen a speaker's commitment to the utterance (e.g. Beltrama 2017), we may see more *1st-person narrator responses* when shared perceptual experiences are possible.

The **results** for Exp1,2 are very similar. Both *baseline* conditions show a default speaker-orientation (expected). Statistical analyses (lmer, R) show that the *baseline* and *see* conditions do <u>not</u> differ from each other (p's>.2) in either experiment. However, the rate of character opinion responses is higher (and the rate of narrator responses lower) in the ***smell* and *taste* conditions than the *see* conditions** (p's<.003) or the *baseline* condition (p's<.001) in both studies. We also find intensification effects: Although *smell* and *taste* do not differ in Exp1, *taste* elicits more character responses Exp2 than *smell* (p<.003), which has more narrator responses. Indeed, the rate of narrator responses with *smell* and *see* is higher in Exp2 than Exp1 (*smell*: p<.05, *see*: p=.052, marginal). This suggests intensification can boost the likelihood of the 1st-person narrator being the attitude holder, *at least in some modalities*.

We are currently analyzing a **follow-up experiment** (**Exp3**) where people had the option of indicating if they feel that a certain opinion is **shared by <u>both</u>** character and narrator (i.e., *narrator's opinion, Eliza's opinion, or <u>both the narrator and Eliza have this opinion</u>*). This addresses important questions regarding sharing of perspectives, and allows us to test more directly the extent to which visual information is viewed as more shared between individuals, as compared to taste, and specifically as compared to smell. Preliminary data suggest that *see* and *smell* are more likely to be shared than *taste*.

In sum, *we provide new evidence that the nature of the information source has a significant effect on the identification of the attitude-holder of subjective adjectives:* There are more 1st person narrator responses with *see* than *taste* or *smell*. We are also investigating the interaction of sensory modality and *free indirect discourse*. As a whole, our results align with the biological and social properties of sight, taste and smell, and link up with typological work on evidentiality. Our data support recent accounts of subjective adjectives that make reference to the (in)directness of evidence, such as Anand & Korotkova (2018).