Expressive inferences & mighty obstacles

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Abstract

Predicates of personal taste (PPTs, i.e. *tasty*) carry so-called ACQUAINTANCE INFERENCES (AI), to the effect that the speaker has first-hand experience. In addition, Willer and Kennedy (2020) have observed a parallel phenomenon in the moral domain: moral predicates (MPs, i.e. *okay*) carry what they call PRACTICAL INFERENCES (PI), to the effect that the speaker has a practical stance towards whatever they are judging. My purpose is two-fold. First, whereas extant accounts have characterize modals and other operators as *obviating* AI/PI, the right generalization is stronger, namely that these inferences "flip" in those environments. Secondly, available theories provide either a principled account of AI that can hardly be extended to PI (Anand and Korotkova 2018; Ninan 2024), or a uniform but unexplanatory account of both inferences (Willer and Kennedy 2020). I propose a minimal amendment of Ninan 2024 so that it can be extended to PI in a principled way.

1 Data

1.1 The acquaintance inference of PPTs

Predicates of personal taste (PPTs, i.e. *tasty*) carry so-called ACQUAINTANCE INFERENCES (AI), to the effect that the speaker has first-hand experience (Ninan 2014; Pearson 2013; Bylinina 2017).[1] Compare *tasty* vs *vegetarian*:

(1) I have never tried Kaassoufflé.
   a. # ...It's tasty.
   b. ✓ ...It's vegetarian.

AI has peculiar properties. First, it cannot be cancelled (as just shown). Secondly, the AI has a peculiar projective pattern: whereas it projects under negation,

(2) I have never tried Kaassoufflé. # It's not tasty.

the AI does not project under modals and certain operators. But crucially, the AI does not just disappear in such environments; it *flips*. That is, the following sentences imply that the speaker lacks acquaintance (call this ¬AI):

(3) I have tried Kaassoufflé.
   a. # ...It might/must be tasty.
   b. # ...Probably, it is tasty.
   c. # ...If it is tasty, then...
   d. # ...Apparently, it is tasty.

[1] I set aside *exocentric* interpretations of PPTs, which do not carry this requirement (Stephenson 2007; Lasersohn 2005). In what follows, all PPTs are intended to be interpreted *autocentrically*. I similarly set aside PPTs with overt judges (*tasty to me*, see Anand and Korotkova 2018).

Whereas all theorists correctly observe that AI *vanishes* under the operators in (3) (Pearson 2013; Ninan 2014; Franzén 2018; Anand and Korotkova 2018; Willer and Kennedy 2020; Ninan 2024), they hardly make the stronger observation that AI *flips* in such environments (although see Anand and Korotkova 2018, p.13, ex. (39)). But it AI was merely obviated in these environments, the pattern in (3) would be surprising, as embedding PPTs under these operators should be compatible, not just with lacking acquaintance, but with having it as well.

1.2 The practical inference of MPs

Willer and Kennedy 2020 have uncovered a broadly parallel phenomenon in the moral domain: moral predicates (MPs, i.e. *okay*) carry what they call PRACTICAL INFERENCES (PI), to the effect that the speaker has a practical stance towards whatever they are judging. PIs are broadly similar to AIs, in that they project under negation and flip under operators:[2]

(4) I have no opinion about whether to commit tax fraud.

a. # ...It's okay. b. # ...It's not okay.

(5) I have an opinion about whether to commit tax fraud.

a. # ...It might/must be okay.
b. # ...Probably, it's okay.
c. # ...If it's okay, then...
d. # ...Apparently, it's okay.

2 Previous accounts

2.1 The implicature view: Ninan 2014

Ninan accounts for AI as a quality implicature, arising from a general norm of assertion (*assert what you know*, Williamson 1996), combined with a specific *Acquaintance Principle* for PPTs: If you know whether a is tasty, then you have tried a. This view rightly predicts the data about bare assertions and negation (the reader can check this). But it only makes the weaker prediction that in (3) the AI goes away. The explanation is that conversational implicatures similarly vanish in these environments.[3]

2.2 Presuppositional views: Anand and Korotkova 2018

Pearson 2013; Anand and Korotkova 2018 argue that PPTs carry an acquaintance presupposition. Anand and Korotkova 2018 (hf. A&K) encode this as a presupposition that the judge has direct evidence concerning the object. This direct-evidence requirement is captured using the notion of a KERNEL (von Fintel and Gillies 2010).

Definition 2.1 (Kernel)**.** A (K)ernel is a set of propositions that represent direct knowledge. K settles whether p iff $\exists q \in K[q \subseteq p \vee q \subseteq \neg p]$

Kernels are an additional parameter of evaluation, together with world and judges. PPTs presuppose that the judge's kernel settles the proposition:

[2]There's much more data on the behavior of AI/PI in different environments, such as attitude verbs, connectives, and quantifiers (see especially Ninan 2024; Willer and Kennedy 2020). Here, my focus is on AI/PI under modals.

[3]One might complain that any CI-view wrongly predicts that AI is cancellable. But as Ninan notes (2014, p. 297), this possibly makes AI a non-standard kind of conversational implicature.

(6) $[\![a \text{ is tasty}]\!]^{\langle j,w,K\rangle}$ = defined only if $K_{\langle j,w\rangle}$ settles whether a is tasty. If so,
$[\![a \text{ is tasty}]\!]^{\langle j,w,K\rangle} = 1$ iff a is tasty to j at w.

A&K then assign a meaning to modals where the direct evidence requirement of PPTs is overwritten, by shifting the kernel parameter in the prejacent from K to $\{\bigcap K\}$. $\bigcap K$ is meant as a vanilla doxastic state, comprising direct and indirect knowledge (Anand and Korotkova 2018, p. 10). However, as Willer and Kennedy 2020, p. 847 observe, $\{\bigcap K\}$ settles a proposition only if K settles it too, and thus the AI actually projects over 'might'. Thus, Ninan 2024, p. 8 suggests substituting $\{\bigcap K\}$ for $\mathcal{P}(W)$, the set of all propositions:

(7) $[\![\text{might } p]\!]^{\langle j,w,K\rangle}$ = defined only if $[\![p]\!]^{\langle j,w,\mathcal{P}(W)\rangle}$ = defined. If so,...

The problem now is that (7) merely *obviates* the acquaintance requirement. Thus, it does not predict the flip, i.e. (3a). To fix this, we should overwrite the kernel requirement, but so that K does *not* settle the prejacent (this, in fact, is von Fintel & Gillies' (2010) requirement). Here is the full entry for 'might':

(8) $[\![\text{might } p]\!]^{\langle j,w,K\rangle}$ = defined only if $K_{\langle j,w\rangle}$ does not settle whether p. If so,
$[\![\text{might } p]\!]^{\langle j,w,K\rangle} = 1$ iff $\exists w' \in \bigcap K_{\langle j,w\rangle} : [\![p]\!]^{\langle j,w',K\rangle} = 1$.

This provides a straightforward account of the contrast between (1a) and (2) vs. (3). However, there are 2 difficulties. First, note that 'a might be tasty' is defined only if 'a is tasty' is undefined. This implies that the former cannot be true. For if it is defined, then its prejacent will be undefined, and so there can be no epistemically accessible world at which it is true (this might just be a technicality, which can be solved by letting the kernel parameter shift in the assertive component of 'might' as well):

(9) $[\![a \text{ might be tasty}]\!]^{\langle j,w,K\rangle}$ = defined only if $[\![a \text{ is tasty}]\!]^{\langle j,w,K\rangle} \neq$ defined. If so,
$[\![a \text{ might be tasty}]\!]^{\langle j,w,K\rangle} = 1$ iff $\exists w' \in \bigcap K_{\langle j,w\rangle} : [\![a \text{ is tasty}]\!]^{\langle j,w',K\rangle} = 1$.

Second, it is not trivial to extend the presuppositional view to MPs/PI. A natural thought would be that MPs carry a "practical opinionated" presupposition (parallel to the acquaintance presupposition of PPTs). But given (8), embedding MPs under modals will not interact with such presupposition. Further tweaks in the semantics of modals would be necessary.[4]

2.3 Expressivist views

Expressivists treat AI as a *sui generis* inference, explained as follows: PPTs express *affective* states, which require acquaintance (Franzén 2018; Ninan 2024; Briesen n.d.). E.g., (1a) expresses *liking* pizza, and one cannot like something without trying it. In addition, Willer and Kennedy 2020 (hf. W&K) aim for a unified expressivist view of AI & PI. The thought for MPs is that they express *normative* states, which require "practical opinionatedness". E.g., (4a) expresses *accepting a norm* that sanctions tax fraud, which requires an opinion about whether or not to do it.

2.3.1 Willer and Kennedy 2020

W&K claim that different predicates come with specific GROUNDING REQUIREMENTS, that their use be based on certain aspects of the speaker's psychology, which they characterize

[4] In fairness, accounting for PI was never A&K's purpose.

as GROUNDING COMMITMENTS.[5] Grounding commitments are just specific sets of worlds representing propositions with special psychological status (similar to a set DOX representing plain belief):

- $\text{EXP}_{(a,w)}$: the propositions entailed by a's experiential attitudes at w
- $\text{NORM}_{(a,w)}$: the propositions entailed by a's norms at w

EXP/NORM *grounds* a proposition p iff $p \in$ EXP/NORM.

Next, predicates like *tasty* and *okay* carry specific grounding requirements:[6]

(10) a. $[\![a \text{ is tasty}]\!]^{\langle j,w\rangle}$ = defined only if $\text{EXP}_{(j,w)}$ grounds $[\![a \text{ is tasty}]\!]$. If so, $[\![a \text{ is tasty}]\!]^{\langle j,w\rangle} = 1$ iff a is tasty to j at w.

b. $[\![F\text{-ing is okay}]\!]^{\langle j,w\rangle}$ = defined only if $\text{NORM}_{(j,w)}$ grounds $[\![F\text{-ing is okay}]\!]$. If so, $[\![F\text{-ing is okay}]\!]^{\langle j,w\rangle} = 1$ iff F-ing is okay to j at w.

Then, W&K propose lexical entries for *not* and modals that respectively inherit and obviate the grounding requirement of their arguments

(11) a. $[\![\text{not-}p]\!]^{\langle j,w\rangle}$ = defined only if $[\![p]\!]^{\langle j,w\rangle}$ = defined. If so,...

b. $[\![\text{might } p]\!]^{\langle j,w\rangle}$ = defined only if $\mathcal{P}(W)$ grounds $[\![p]\!]^{\langle j,w\rangle}$. If so,....

Besides predicting only obviation under modals, a more specific concern with W&K's view is that it is somewhat *ad-hoc*. Recall that, for A&K, there is a principled reason why modals should overwrite the acquaintance presupposition, namely that modals require indirect evidence. W&K can co-opt that explanation for why modals overwrite *experiential* grounding requirements. But why should modals overwrite *normative* requirements too? Indirectness can't be the answer. This problem can be stated more dramatically: Why do modals, but not negation, overwrite grounding requirements? Why is it not the other way around? After all, we can define connectives/operators with switched grounding requirements:

(12) a. $[\![\text{not* } p]\!]^{\langle j,w\rangle}$ = defined only if $\mathcal{P}(W)$ grounds $[\![p]\!]^{\langle j,w\rangle}$ = defined. If so,...

b. $[\![\text{might* } p]\!]^{\langle j,w\rangle}$ = defined only if $[\![p]\!]^{\langle j,w\rangle}$ = defined. If so,....

The problem with W&K is that they provide no reason why, e.g., *might* behaves like (11b) and not like (12b).[7] So, W&K's descriptive breadth comes at some explanatory cost.

2.3.2 Ninan 2024

Ninan 2024 offers the most ambitious account of AI to date. His main empirical contribution is new data regarding PPTs under disjunction and quantifiers (see also Cariani 2021) which his theory predicts correctly. Behavior under modals is comparatively less prominent, and he inherits A&K's obviation mechanism. To get a grasp of his view, we need some definitions:

- A **generator** χ is a function from judges and worlds to categorical standards of taste

[5] W&K's view is couched in dynamic terms, but I present it in static terms to ease the presentation. I don't think anything crucial gets lost—and I hope the heresy is excused ;-)

[6] W&K claim that grounding requirements are not presuppositions, but I am formulating them as such to ease presentation.

[7] On the assumption that grounding requirements are not presuppositions, the same question arises for negation: why is negation (11a) rather than (12a)?

- A **categorical standard of taste** of judge j at world w, $\chi^{j,w}$, is a possibly partial function from D to {0,1} s.t.:
  - $\chi^{j,w}(o) = 1$ if j has tried and liked o
  - $\chi^{j,w}(o) = 0$ if j has tried and not liked o
  - not in the domain of $\chi^{j,w}$ if j has not tried o
- A **complete extension** σ of χ, $\sigma \succ \chi$, is a total function that agrees with χ on all the cases that χ decides, but decides all the other cases as well.

Sentences are evaluated at $\langle w, j, \sigma, g\rangle$-points. Here are the truth conditions for 'a is tasty' ($T(a)$):

(13) $[\![T(a)]\!]^{w,j,\sigma,g} = 1$ iff $\sigma^{w,j}(a^g) = 1$

The key to Ninan's account is the following assertability norm:

- **($\mathcal{A}$)ssertability norm**: $[\varphi]^c = \mathcal{A}$, iff $\forall\sigma \succ \chi$, $[\![\varphi]\!]^{w_c,j_c,\sigma,g_c} = 1$.

A sentence is assertable just in case it is true relative to every complete extension of the judge's categorical standard of taste. The following fall out of Ninan's account (*plus* Boolean negation):[8]

- $[T(a)]^c = \mathcal{A}$ iff $\chi^{w_c,j_c}(a) = 1$
- $[\neg T(a)]^c = \mathcal{A}$ iff $\chi^{w_c,j_c}(a) = 0$

To account for PPTs under modals, Ninan defines a *dispositional standard of taste* δ, defined as the things a judge is *disposed* to like. He then proposes that modals shift the taste parameter—roughly like A&K:

(14) $[\![\text{might } p]\!]^{\langle w,j,\sigma,g\rangle} = 1$ iff $\exists w' \in R(w) : [\![\text{might } p]\!]^{\langle w',j,\delta,g\rangle} = 1$ $(R(w) = \text{an epistemic state})$

2 problems remain: first, just like all other accounts, Ninan's view incorrectly predicts that AI disappears under modals, but not that it flips. Secondly, Ninan's view is not straightforwardly applicable to MP/PI. One can rehearse defining corresponding "moral" parameters (see below), but the result will be the same as in W&K: A good description of the facts, but at most a partial explanation for the interaction between modals & AI/PI.

In sum: there is no satisfactory account of the interaction between modals and expressive inferences. All accounts predict that modals *obviate* these inferences, but they don't predict the flip. Secondly, among available accounts, whereas A&K can explain why AI flips under modals (indirectness), there is no explanation for why PI would pattern similarly.

3 Expressivity & uncertainty

In what remains, I want to rehearse an explanation for the flipping behavior that can be extended beyond AI. Let us consider a different requirement of modals, namely *uncertainty*. The modals in (15) require that the speaker is uncertain about its prejacent p (Yalcin 2007, a.m.o.):[9]

[8] See Ninan 2024, fn. 31 & 34 for the relevant proofs.

[9] In fact, Goodhue 2017; Giannakidou and Mari 2016 argue that von Fintel and Gillies 2010's indirectness requirement boils down to uncertainty. We need not take a stance in that debate; it suffices to recognize that modals require uncertainty.

(15) It's raining.

a. # ...It might/must be raining.
b. # ...Probably, it is raining.
c. # ...If it is raining, then...
d. # ...Apparently, it is raining.

Uncertainty is a sufficiently general requirement to offer an explanation for the "flipping" behavior of AI and PI under modals. The idea is simple: uncertainty is incompatible with acquaintance / practical opinionatedness. Thus, PPTs/MPs under modals imply ¬AI / ¬PI.

Let us implement this idea enriching Ninan's account. We need to take 5 steps. First, define a categorical standard of morality and a complete extension thereof:

- A **categorical standard of morality** of judge j at world w, $\xi^{j,w}$, is a possibly partial function from D to {0,1} s.t.:
  - $\xi^{j,w}(F) = 1$ if j has a practical position and approves of F-ing
  - $\xi^{j,w}(F) = 0$ if j has a practical position and disapproves of F-ing
  - not in the domain of $\xi^{j,w}$ if j has not taken a stance on F-ing
- υ is a **complete extension** of ξ

Secondly, sentences are evaluated at $\langle w, j, \sigma, \upsilon, g\rangle$. Truth conditions for '$a$ is tasty' ($T(a)$) and 'F-ing is okay' ($O(F)$):

(16) a. $[\![T(a)]\!]^{w,j,\sigma,\upsilon,g} = 1$ iff $\sigma^{w,j}(a^g) = 1$ b. $[\![O(F)]\!]^{w,j,\sigma,\upsilon,g} = 1$ iff $\upsilon^{w,j}(F^g) = 1$

Thirdly, the assertability norm needs to be generalized too:

- **($\mathcal{A}$)ssertability norm (v2)**: $[\varphi]^c = \mathcal{A}$, iff $\forall\sigma \succ \chi, \forall\upsilon \succ \xi$, $[\![\varphi]\!]^{w_c,j_c,\sigma,\upsilon,g_c} = 1$.

Fourthly, by parallel reasoning as for $T(a)/\neg T(a)$, we predict that $O(F)/\neg O(F)$ are assertable iff the speaker has a practical position about F-ing:

- $[O(F)]^c = \mathcal{A}$ iff $\xi^{w_c,j_c}(F) = 1$
- $[\neg O(F)]^c = \mathcal{A}$ iff $\xi^{w_c,j_c}(F) = 0$

Lastly, turning to modals, we can write the uncertainty requirement as a presupposition:

(17) $[\![\text{might } p]\!]^{\langle w,j,\sigma,\upsilon,g\rangle}$ = defined only if j at w is uncertain whether p. If so,...

To generate the right predictions, we need the following psychological principles (for any x):[10]

- If x is uncertain whether $T(a)$, then x is not acquainted with a [ACQ ⇒ K]
- If x is uncertain whether $O(F)$, then x has not taken a stance on F-ing [PRAC ⇒ K]

It these principles are correct, then meeting the uncertainty requirement implies lacking acquaintance / practical stance. That is, the following come out true:

- [might $T(a)$]$^c = \mathcal{A}$ only if $a \notin dom(\chi^{w_c,j_c})$
- [might $O(F)$]$^c = \mathcal{A}$ only if $F \notin dom(\xi^{w_c,j_c})$

Proof for $T(a)$ (mutatis mutandis for $O(F)$): if [might $T(a)$]$^c = \mathcal{A}$, then $\forall\sigma \succ \chi, \forall\upsilon \succ \xi$, $[\![\text{might } T(a)]\!]^{w_c,j_c,\sigma,\upsilon,g_c} = 1$. If so, then by (17) j_c at w_c is uncertain whether $T(a)$. By [ACQ ⇒ K], j_c is not acquainted with a; that is, $a \notin dom(\chi^{w_c,j_c})$.

[10] These principles might need to be tweaked or made more precise—after all, it is possible to have tried a food and be unsure whether it's tasty, perhaps because it was neither clearly tasty nor not tasty, or because one does not remember its taste.

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