A semantic account for the properties of individual-level predicates

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The proposal. Let $\mathcal{W}_{\text{ck}}$ be the set of possible worlds where common knowledge holds. Assume that an individual-level (i-) predicate such as 'tall' has a davidsonian argument as well as a stage-level (s-) predicate as 'available', but that it is subject to the constraint in (1).

(1) For every world $w \in \mathcal{W}_{\text{ck}}$, for every individual $d \in \mathcal{D}_e$ and for every situation/time $\tilde{s}$: if $[\![\text{tall}]\!](d, \tilde{s}) = 1$, then $[\![\text{tall}]\!](d, s) = 1$ for every s s.t. d is located in s (i.e. $\mathbf{loc}(d, s) = 1$).

In this paper, I present an account for i-predicates based on two claims. My first claim is the empirical claim (2).

(2) The constructions from which i-predicates are banned and the readings that they lack (contrary to s-predicates) correspond to truth-conditions φ that admit a ψ as in (3).

(3) a. $\psi \in \mathcal{A}lt(\varphi)$, where $\mathcal{A}lt(\varphi)$ is the set of scalar alternatives of φ;
b. $[\![\psi]\!] \subset [\![\varphi]\!]$, i.e. ψ logically asymmetrically entails φ;
c. $[\![\varphi]\!] \cap \mathcal{W}_{\text{ck}} \subseteq [\![\psi]\!]$, i.e. φ entails ψ given common knowledge $\mathcal{W}_{\text{ck}}$.

In the rest of this abstract, I illustrate (2) with three examples. My second claim is (4).

(4) A sentence with truth-conditions φ which admit an alternative ψ as in (3) is odd.

Here is the idea behind (4). Assume that logic asymmetric entailment rather than asymmetric entailment relative to common knowledge is the relevant one for the computation of scalar implicatures; see Fox & Hackl (2005) for relevant evidence. Thus, φ triggers the implicature that $\neg\psi$, by (3a) and (3b). Hence, φ is odd because of the mismatch between the implicature (that $\neg\psi$) and common knowledge $\mathcal{W}_{\text{ck}}$ (that, together with φ, entails ψ, by (3c)). As an illustration of (4), consider φ and ψ in (5). Plausibly, $\boxed{\psi \in \mathcal{A}lt(\varphi)}$. Since there are worlds where John has 3 hands and only 2 are tied together, then $\boxed{[\![\psi]\!] \subset [\![\varphi]\!]}$. Since John has 2 hands in every world in $\mathcal{W}_{\text{ck}}$, then $\boxed{[\![\varphi]\!] \cap \mathcal{W}_{\text{ck}} \subseteq [\![\psi]\!]}$. Since (3a)-(3c) hold, (5a) is correctly predicted to be odd by (4).

(5) a. φ = ?John was found dead with some of his hands tied together.
b. ψ = John was found dead with his hands tied together.

By (2) and (4), properties of i-predicates can be accounted for simply on the basis of (1), without any need for further syntactic differences between s- and i-predicates.

Example #1. (6a) is fine but (6a′) is odd: i-predicates ban temporal modification. The truth-conditions of (6a) are φ in (6b) with $P = [\![\text{available}]\!]$, for some contextually assigned predicate $\mathbf{C}(j, \cdot) \subseteq \mathbf{loc}(j, \cdot)$; assume that those of (6a′) are the same, with $P = [\![\text{tall}]\!]$.

(6) a. John is available after dinner.
a′. ?John is tall after dinner.
b. $\varphi = \text{GEN}_s[\mathbf{C}(j, s) \wedge [\![\text{after-dinner}]\!](s)][P(j, s)]$.
c. $\psi = \text{GEN}_s[\mathbf{loc}(j, s)][[\![\text{tall}]\!](j, s)]$.

Consider ψ in (6c). Trivially, $\boxed{[\![\psi]\!] \subset [\![\varphi]\!]}$. Furthermore, $\boxed{\psi \in \mathcal{A}lt(\varphi)}$, since the corresponding implicature is available for (6a). Finally, $\boxed{[\![\varphi]\!] \cap \mathcal{W}_{\text{ck}} \subseteq [\![\psi]\!]}$: in fact, for every $w \in \mathcal{W}_{\text{ck}}$, if John is tall in after-dinner situations in w, then he is tall in all situations where he is located in w, by (1). Hence, (3a)-(3c) hold as stated in (2): the oddness of (6a′) is thus predicted by (4).

Example #2. (7a) has a generic reading but (7a′) does not. The truth-conditions of (7a) are φ in (7b) with $P = [\![\text{love each other}]\!]$; assume that those of (7a′) are the same, with $P = [\![\text{tall}]\!]^{\textbf{Dist}}$ (where $(\cdot)^{\textbf{Dist}}$ is the distributive operator, after Link (1983)).

(7) a. Two italians love each other.
a′. Two italians are tall.
b. $\varphi = \text{GEN}_{x,y,s}[x, y \in [\![\text{italians}]\!] \wedge \mathbf{loc}(x, s) \wedge \mathbf{loc}(y, s)][P(x+y, s)]$.
c. $\psi = \text{GEN}_{x,s}[x \in [\![\text{italians}]\!] \wedge \mathbf{loc}(x, s)][[\![\text{tall}]\!](x, s)]$.

Since ‘two’ and ‘a’ are Horn-mates, $\boxed{\psi \in \mathcal{A}lt(\varphi)}$. By (1), $\boxed{[\![\varphi]\!] \cap \mathcal{W}_{\text{ck}} \subseteq [\![\psi]\!]}$. Furthermore, $\boxed{[\![\psi]\!] \subset [\![\varphi]\!]}$: consider $w \notin \mathcal{W}_{\text{ck}}$ s.t. there are two italians d_1 and d_2 in w and d_1 shrinks after the death of d_2 in w: φ is true in w (since only situations where both d_1 and d_2 are located count) but ψ is false in w (since d_1 is not tall throughout his life span $\mathbf{loc}(d_1, \cdot)$). Hence, (3a)-(3c) hold as stated in (2) and the lack of the generic reading of (7a′) is thus predicted by (4).

Example #3. The bare plural subject (BPS) ‘firemen’ admits the existential reading in (8a) but not in (8a′): BPSs of *i*-predicates lack the $\exists$-reading. According to Diesing (1992), the $\exists$-reading of the BPS of (8a) is derived by lowering it into [Spec, VP], yielding truth-conditions φ in (8b) with $P = [\![\text{available}]\!]$. Assume that those of (8a′) are the same, with $P = [\![\text{tall}]\!]$, i.e. assume that the subject of ‘tall’ can be reconstructed as much as that of ‘available’, since there are no syntactic differences between the two predicates.

(8) a. Firemen are available.
a′. Firemen are tall.
b. $\varphi = \text{GEN}_s[\mathbf{C}(s)][\exists_x[[\![\text{firemen}]\!](x) \wedge P(x, s)]]$.

Again, $\mathbf{C}$ is contextually assigned; let’s consider a couple of possible choices. As a first choice, suppose $\mathbf{C}$ is as in (9).

(9) $\mathbf{C}$ = in Cambridge between 8am and 10 pm.

Consider $\psi \doteq \bigvee_{d \in \mathcal{D}_e} \psi_d$, where ψ_d is defined as in (10) for every individual d. Plausibly, $\psi_d \in \mathcal{A}lt(\varphi)$ for every d, since I have only enlarged the restrictive clause, as in (6). Assume that $\mathcal{A}lt(\varphi)$ is closed under disjunction; hence $\boxed{\psi \in \mathcal{A}lt(\varphi)}$. Furthermore, $\boxed{[\![\psi]\!] \subset [\![\varphi]\!]}$: in fact, if $w \in [\![\psi]\!]$, then trivially $w \in [\![\varphi]\!]$; vice versa, consider $w \notin \mathcal{W}_{\text{ck}}$ s.t. there are firemen that are tall between 8am and 10pm while none of them is tall in the portion of its life span which is outside of this range of time: obviously, φ is true and ψ false in w. Finally, $\boxed{[\![\varphi]\!] \cap \mathcal{W}_{\text{ck}} \subseteq [\![\psi]\!]}$: if φ is true in $w \in \mathcal{W}_{\text{ck}}$, then there is at least one firemen, say John, who is tall in a situation $\tilde{s} \in \mathbf{C}$; since $w \in \mathcal{W}_{\text{ck}}$, then John is tall in every situation in $\mathbf{loc}(j, \cdot)$, by (1); hence $\psi_{d=\text{John}}$ is true in w and thus ψ is true too.

(10) $\psi \doteq \text{GEN}_s[\mathbf{C}(s) \vee \mathbf{loc}(d, s)][\exists_x[[\![\text{firemen}]\!](x) \wedge [\![\text{tall}]\!](x, s)]]$.

In the case just considered, it was crucial that I was able to make the restrictive clause a bit bigger. Now let me consider a case in which that is not possible, such as that in (11), and let me show how this case can be handled too.

(11) $\mathbf{C} = \mathbf{loc}(d, \cdot)$ for some individual $d \in \mathcal{D}_e$.

Consider ψ in (12). Plausibly, $\boxed{\psi \in \mathcal{A}lt(\varphi)}$, since ψ is obtained from φ by replacing $\mathbf{C}(\cdot)$ with $\mathbf{loc}(d, \cdot)$ in the restrictive clause and $\exists_x$ with the principal ultrafilter $\mathcal{F}_d$, which I take to be

Horn-mates. Furthermore, $\boxed{[\![\psi]\!] \subset [\![\varphi]\!]}$: in fact, if $w \in [\![\psi]\!]$, then trivially $w \in [\![\varphi]\!]$; vice versa, consider $w \notin \mathcal{W}_{\mathrm{ck}}$ s.t. d is a firemen tall in all the situations in which he is located except than in a situation $\tilde{s}$ and that nonetheless there is another firemen who is tall in $\tilde{s}$: φ is true in w while ψ is false in w. Finally, $\boxed{[\![\varphi]\!] \cap \mathcal{W}_{\mathrm{ck}} \subseteq [\![\psi]\!]}$: in fact, consider $w \in \mathcal{W}_{\mathrm{ck}}$ where φ is true; consider a situation $\tilde{s}$ in which d is located but no other individual is; since φ is true, since such a situation $\tilde{s}$ is in $\mathbf{C}$ and since d is the only individual located in $\tilde{s}$, then d must be a fireman who is tall in $\tilde{s}$; since $w \in \mathcal{W}_{\mathrm{ck}}$, then d is tall in every situation in $\mathbf{loc}(d, \cdot)$, hence ψ is true too in w.

(12) $\psi \doteq \textsc{gen}_s[\mathbf{loc}(d,s)][[\![\text{firemen}]\!](d) \wedge [\![\text{tall}]\!](d,s)]$.

In conclusion, properties (3a)-(3c) hold for truth-conditions (8b) for these two choices (9) and (11) of **C** and thus truth-conditions (8b) with such **C**s are ruled out by (4). In the talk, I will show that this line of reasoning can be applied to *any* choice of **C**, once the theory of scalar implicatures developed in Fox (2006) is adopted. Truth-conditions (8b) are thus ruled out for any choice of **C** and the lack of the existential reading of the BPS of (8a′) is thus accounted for.

References

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