Functional indefinites as conventional implicatures

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handout

Functional indefinites pattern with conventional implicatures (CIs) in terms of their projection behavior.

We provide an account based on the notion of **propositions as types**, which allows CIs to take scope.

Functional indefinites (FIs) can indicate a specific function that the speaker has in mind (Schwarz, 2001).

(1) Every student praised a certain professor. (e.g., their advisor)

Conventional implicatures (CIs): not-at-issue, but new to the discourse (Potts, 2005).

(2) Example: Appositive content
Sandy, who is away, will return tomorrow. (CI = Sandy is away)

Parallels between FIs and appositives

Projection

(3) a. It is not true that Sandy praised a certain professor.
$\Rightarrow$ There is a professor.

b. It is not true that Sandy, who is away, will return tomorrow.
$\Rightarrow$ Sandy is away.

Universal projection: When embedded in the scope of a quantifier, both can yield a universal implication.

(4) a. If [every student makes progress in a certain area], nobody will flunk the exam.
$\Rightarrow$ For each student, there is an area.

b. If [every woman$_i$ has bid farewell to Nate, who gave her$_i$ some great advice], we can close off the session.
$\Rightarrow$ For each woman, Nate gave her some great advice.

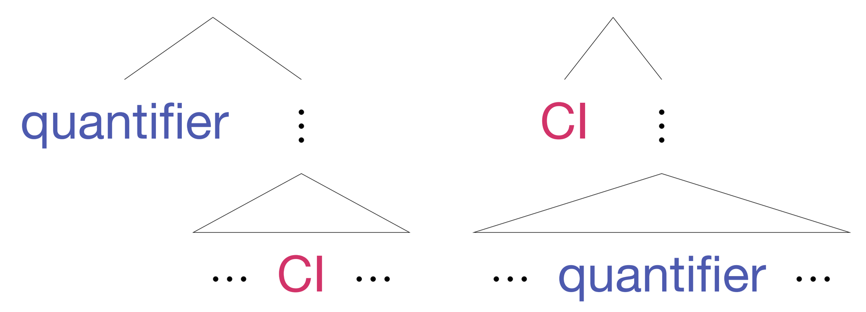
Crossover-like effect: Universal projection shows an effect like weak crossover (e.g., **Her$_i$ mother praised every girl$_i$*).

(5) a. A certain technician inspected every plane. (*FI interpretation)

b. *Nate, who gave her$_i$ some great advice, has bid farewell to every woman$_i$.

Q. How can we give **a unified account** to these facts?

- Solution (?): analyze **the existential implication of an FI as a CI.**
- But most theories assume that **CIs are scopeless**, insensitive to the crossover configuration.



$\rightsquigarrow$ (quantifier ⋯) + $\boxed{\text{CI}}$
scopeless!

We need a way to represent **how CIs scopally interact with quantifiers.**

Framework: Propositions as types

Idea: quantification over the **proofs** of a proposition

(6) Every student sneezed.

$$\rightsquigarrow \underbrace{(x:\mathtt{e})}_{\forall\ \text{entity}\ x} \to \underbrace{((u:\mathtt{std}(x))}_{\forall\ \text{proof of}\ \mathtt{std}(x)} \to \mathtt{snz}(x))$$

($\simeq$ if $\mathtt{std}(x)$ is true)

Formally, we identify propositions with (dependent) types.

- $\forall x \in A.B$ ⋯ function type $(x : A) \to B$
- $\exists x \in A.B$ ⋯ product type $(x : A) \times B$

CI type $(x \lhd A) \times B$: A is directly added to the context, projecting out of the scope of operators (Matsuoka+, 2024).

CI computation for (3b)

$$\Gamma \mid \neg\big((v \lhd \mathtt{away}(\mathtt{s})) \times \mathtt{rtn}(\mathtt{s})\big) \longrightarrow \begin{cases} \text{Context: } \Gamma, \boxed{v : \mathtt{away}(\mathtt{s})} \\ \text{At-issue: } \neg\mathtt{rtn}(\mathtt{s}) \end{cases}$$

CI (projected)

added to Γ

Account

The lexical entry for FIs includes a CI type.

(7) a certain $\rightsquigarrow \lambda n.\lambda p.\ \underbrace{(u \lhd n^*)}_{\text{CI: There is an } n} \times p(\pi_1 u)$

(N.B. $n^* \equiv (x : \mathtt{e}) \times nx$)

Proposal: A CI type can be functionally dependent on the variables that it is in the scope of.

CI computation for the conditional antecedent of (4a)

$$\Gamma \mid (x:\mathtt{e}) \to \big((u:\mathtt{std}(x)) \to \big((v \lhd \mathtt{area}^*) \times \mathtt{prog}(x, \pi_1 v)\big)\big)$$

$$\longrightarrow \begin{cases} \text{Context: } \Gamma,\ \underbrace{f : (x:\mathtt{e}) \to \big((u:\mathtt{std}(x)) \to \mathtt{area}^*\big)}_{\text{For each student, there is an area}} \\ \text{At-issue: } (x:\mathtt{e}) \to \big((u:\mathtt{std}(x)) \to \mathtt{prog}(x, \pi_1(fxu))\big) \end{cases}$$

In the crossover cases in (5), the CI type scopes over the quantifier, so universal projection is correctly blocked.

CI computation for (5a)

$$\Gamma \mid (u \lhd \mathtt{tech}^*) \times \big((y:\mathtt{e}) \to ((v:\mathtt{plane}(y)) \to \mathtt{insp}(\pi_1 u, y))\big)$$

no functional dependency

Summary: We uniformly predict the projection behavior of FIs/appositives via their **scopal relations** with quantifiers.

$(x : A) \gg (y \lhd B)$ ⋯ ✓ $(x : A) \to B$

$(y \lhd B) \gg (x : A)$ ⋯ ✗ $(x : A) \to B$

References [1] Schwarz, B. (2001). Two kinds of long-distance indefinites. *Proc. of the 13th Amsterdam Colloquium*. [2] Potts, C. (2005). *The Logic of Conventional Implicatures*. [3] Matsuoka, D., Bekki, D., & Yanaka, H. (2024). Appositive projection as implicit context extension in Dependent Type Semantics. *Logic and Engineering of Natural Language Semantics*.

Acknowledgments This work was partially supported by JSPS KAKENHI Grant Number JP24H00809, JST CREST Grant Number JPMJCR2565, and JST BOOST Grant Number JPMJBS2418.