# CHOICE FUNCTIONS & BINDER ROOF CONSTRAINT

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**PROBLEM.** While choice functional accounts of indefinites are successful in accounting for their island-escaping behavior, it has been widely argued that they fail to derive the Binder Roof Constraint (using the terminology of Brasoveanu & Farkas (2011)). Under the choice functional analysis, no limitation on the exceptional upward scope of indefinites is predicted to exist. As observed by Abusch (1993), and extensively discussed in Chierchia (2001); Schwarz (2001) and Schwarz (2011), this account over-generates unattested readings. An indefinite cannot scope over a quantifier that binds into its restrictor. The example (1a) by Schwarz (2001) shows this. Consider a scenario where Sue wrote two papers SP=$\{S_1,S_2\}$ but only submitted $S_1$, and Mary wrote two papers MP=$\{M_1,M_2\}$ but only submitted $M_2$.

(1) a. No candidate$_1$ submitted *a* paper they$_1$ had written.

b. $(\exists)f$[No candidate$_1$ $\lambda_1$[ $t_1$ submitted $f$ [paper they$_1$ had written.]]]

The choice functional account can assign the LF in (1b) to the sentence (1a). This LF conveys that there's a way of choosing among papers that each candidate wrote such that no candidate submitted whatever paper is selected by $f$ for them. As we can find such a function, namely a function that picks $S_2$ for Sue, and $M_1$ for Mary, the choice function account predicts that the sentence (1a) should be judged true in this scenario, contrary to the fact. The sentence in (1a), however, only means that for no candidate there is a paper they wrote that they submitted. The problem of indefinites' scope is more complex though. Not all indefinites are subject to the Binder Roof Constraint. Schwarz (2001, 2011); Kratzer (2003) show that a corresponding sentence containing *a certain* indefinites do in fact have the reading presented in (1b).

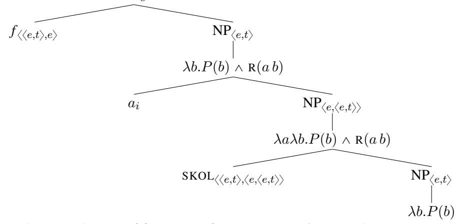
A successful account of indefinites needs to distinguish between the two kinds of indefinites (Schwarz, 2001, 2011). In light of the difficulties to find a unified account, it has been argued that multiple scope mechanisms are needed to account for the diversity of indefinite expressions. In this paper, I argue for a unified in-situ mechanism in terms of choice functions for both kinds of indefinites in English. I propose a new formalization of skolemization that separates the dependency between DPs from the semantics of determiners. I show that this solution avoids overgenerating unattested readings (Binder Roof Constraint). I argue that the difference between the two kinds of indefinites is derived from the contribution of the NP determiner *'certain'*.

**PROPOSAL.** I take indefinite determiners to always denote variables over choice functions (type rigid $\langle\langle e,t\rangle,e\rangle$) which is existentially closed in the topmost level of the derivation (Matthewson, 1999). I propose that the dependency between a DP and a higher quantifier is built in the NP level. I introduce a type-shifter that builds such a functional dependency by shifting a $\langle e,t\rangle$-type noun to an $\langle e,\langle e,t\rangle\rangle$-type noun. As a result of this type-shifter, which I call SKOL, a functional variable R, and an individual variable $a_i$ are introduced. R is free variable whose referent is contextually determined. The variable $a_i$ has to be bound by a higher quantifier in the structure. The discourse referent of the functional variable introduced by SKOL has to be a total function on its domain.

(2) $\langle\!\langle \textsc{skol}\ P \rangle\!\rangle = \lambda a \in \mathrm{A}.\ \lambda b \in \beta.\ [\ P(b) \wedge \mathrm{R}(a,b)]$, where R is a total function.

The choice function $f$ denoted by the indefinite determiner takes this function as argument, and chooses a unique witness for every value of the variable $a$, as shown in (3). Notice that at this point of derivation, the NP is of type $\langle e,t\rangle$ again, as it has been fed an individual pronoun $a$ co-indexed with other bound variables in the larger structure.

(3)




This has the effect of narrowing the NP restrictor of the choice function to only those elements in the extension of the NP $b \in \beta$ that have been mapped to a unique $a \in \mathrm{A}$. Thus, this choice function is equivalent to a choice function over a singleton set (See also (Schwarzschild, 2002)). The functional variable R introduced via skolemization, like other pronouns, triggers a referent/existence implication *m* that there is a discourse referent with which the pronoun can be identified. The referent/existence implication imposes a strong contextual felicity condition (SFC) (Tonhauser et al., 2013; King, 2018). Given the SFC, the existence of R has to be entailed in the context: either by virtue of the composition of existing salient relations in the linguistic context of utterance, as in (4c), or by being lexically specified via a relative clause, as in (4a). As accommodation depends on the hearers trusting that the speaker (Von Fintel, 2008), the accommodation strategy only becomes possible with the presence of the NP modifier "*certain*" which overtly signals speaker's commitment (4b).

(4) a. Every student$_i$ read every book some teacher they$_i$ like had praised.

b. Every student read every book praised by a certain teacher.

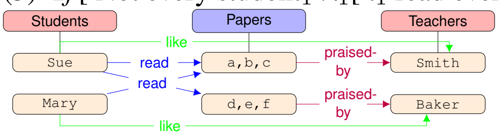
c. Every student read every book praised by some teacher.

$\forall$x [ Student(**x**) $\rightarrow$ $\forall$y [ book (y) $\wedge$ **praised-by**$_2$ (y, $f$(R(**x**, teacher))) $\rightarrow$ **read**$_1$(**x**, y) ]]

R is computed from the information in context: R(x,teacher) $\subseteq$ praised-by(y, teacher) $\circ$ read(x,y)

I show that all cases of over-generation in non-upward monotone contexts (Binder Roof constraint) are cases where we have a indefinite DP which is dependent on another quantifier but its referent implication is not entailed in the context. That is, R lacks a suitable referent in the discourse. Let's consider (5) in the context below, ignoring 'like' relation for now.

(5) $\exists f$[ Not every student$_1$ $\lambda_1$[ t$_1$ read every book]].



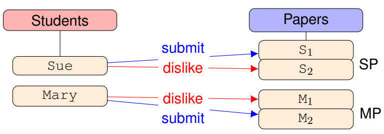

Computing R(x,teacher) from the composition of the existing relations in the linguistic context (praised-by & read), there are two candidates entailed in the context to serve as a referent of R: R$_1$={$\langle Sue, Smith\rangle$, $\langle Mary, Smith\rangle$}; and R$_2$={$\langle Sue, Baker\rangle$, $\langle Mary, Smith\rangle$}. As none of these options verifies (5), this sentence is correctly predicted to be false (note that as Schwarz (2001) argues, a skolemized CF that $f$ can randomly pick among students and teachers ($f$'=$\langle Mary, Baker\rangle$) wrongly verifies (5)). Lexically specifying a relation that satisfies the functional dependency, however, is predicted to render a functional reading, like *a-certain* indefinites. This prediction seems to be borne out. In the same scenario, assume that Sue likes Smith and Mary likes Baker. Both (6a) and (6b) are judged true, as predicted.

(6) a. Not every student$_i$ read every book **some** teacher they$_i$ like had praised.

b. every student$_i$ read every book **some** teacher had praised.

Now let's consider (7) in the context below.

(7) $\exists f$[No candidate$_1$ $\lambda_1$[ t$_1$ submitted a$_{f_1}$ [paper they$_1$ had written.]]]




The relation *write* between students and one of their papers does not satisfy the definition of a functional dependency. The only functional dependency *write* is between the candidates and the *set* of papers they wrote, R={$\langle Sue, SP\rangle$,$\langle Mary, MP\rangle$} which is not consistent with singularity of the determiner *a*. The sentence is correctly predicted to be false. Note that if the linguistic context entails the existence of a referent for the function R, the functional reading becomes available. Assume Sue and Mary disliked the papers that they didn't submit.(8a) is judged true, as predicted.

(8) a. No candidate$_1$ submitted **a** paper they$_1$ wrote but disliked.

b. $\exists f$[No candidate(**x**) $\lambda_1$[ t$_1$ submitted $f$ [$\lambda$z.paper(z)$\wedge$R(**x**, z)$\wedge$write(**x**, z)$\wedge$dislike(**x**, z)]]]

**Conclusion.** Proposing that the functional dependency between a DP and a higher quantifier is built in the NP level, I have argued for a unified semantics for indefinite determiners in English. The scopal behavior of *a-certain* indefinites is a result of the contribution of *certain* as implying speaker's commitment, which makes accommodation strategy possible. The cross-linguistic prediction of this approach is that espistemically specific indefinites are not subject to the Binder Roof Constraint.