

Indefinite Scope and Referential Anchoring. Evidence from Russian.

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Indefinite NPs have certain wide scope readings that generally cannot be modeled as “simple” existential quantifiers because that would mean that island constraints would be violated. For modeling some of these readings of indefinite NPs choice functional analyses have been proposed by a number of scholars including Reinhardt (1997), Kratzer (1998), Matthewson (1999), all of which have been criticized for various reasons, most importantly because choice functions do not provide any significant improvement upon simpler Skolem function analysis (cf. Bende Farkas & Kamp 2001 and Endriss 2006 for a summary).

We start with the following observation: indefinites can be interpreted in such a way that the referent they introduce into the discourse is anchored to the speaker or another discourse item, which can be called referential anchor. We assume that the dependency between the referent and the anchor can be modeled by Skolem functions. Different linguistic markers of indefiniteness like *a certain* in English or *kakoj-to* in Russian may impose restrictions on the type of the anchor or on the type of the function. In this paper, we propose a compositional analysis of indefinites that builds on insights from von Heusinger (2002) and Kratzer (1998) but improves on their proposals in two respects: **a)** we assume a unified treatment of indefinites as existential quantifiers and account for different readings and scope relations in terms of pragmatic enrichment that we model as Skolem functions and **b)** we propose an analysis of indefinite determiners in terms of presuppositions about Skolem function itself: hereby we present a detailed analysis of two Russian indefinite pronouns *kakoj-to* and *kakoj-nibud'*, which are subject to a vast debate in the literature (cf. an overview in Geist 2008) but are most straightforwardly described in our a framework.

Our proposal is this: we assume that the indefinite article is an existential quantifier over a set determined by the descriptive material of the indefinite NP. Hence, we assume that the **denotation of the indefinite article** in English is $\lambda P\lambda Q.(exists)(\lambda x.Q(x), \lambda x.P(x))$. We further define a **pragmatic enrichment operation** that operates on an indefinite determiner and enriches it by a variable y , which we call the referential anchor, such that the possible value of x is now dependent on the value of y . This enrichment operator can be formally represented as: $\lambda\Psi\lambda P\lambda Q.\Psi(\lambda x.P(x) \ \& \ x=f(y), \lambda x.Q(x))$, where y is a referential anchor while f is a function existentially bound at the highest discourse level. After functional application to an indefinite article we get $\lambda P\lambda Q.(exist)(\lambda x.P(x) \ \& \ x=f(y), \lambda x.Q(x))$. Note that the reason we opt for this representation as compared to a simple Skolem function analysis is that we hereby keep the quantificational nature of indefinites transparent. We assume that this enrichment operation can be lexicalized by natural language. The enrichment operation itself could be then spelled out as a more elaborate lexical semantics of *a certain* in Kratzer (1998), since in effect adding a Skolem function to the restrictor of a quantifier leads to widely equivalent results as Kratzer's parametrized Choice function. The other difference is that we assume that f and y must be presupposed variables if the enrichment operation is lexicalized.

Except for replacing a Choice function with a Skolem function, the most important difference to Kratzer's 1998 framework is that we model scope pragmatically. We assume that there are two ways in which indefinites can take both narrow and wide scope over some operator: one with and one without the pragmatic enrichment proposed above. **Without** the enrichment operation we allow for

any scope relation that is “normal” for quantifiers. **With** the pragmatic enrichment exceptional wide scope can be modeled as referential anchoring to some higher level discourse referent.

We claim that our pragmatic enrichment analysis leaves plenty of space for grammaticalization, i.e. natural language may lexically encode a number of different constraints on the kind of Skolem function that is needed to interpret indefinites marked by determiners (or determiner modifiers). Hence, for instance *a certain* in English is a grammaticalized lexical marker for a pragmatic enrichment operation, with the constraint proposed in Ebert & Endriss (2007) that the Skolem function should be **nameable** and **informative**.

Further evidence comes from the distributional properties of the Russian indefinite pronouns *kakoj-to* and *kakoj-nibud'*, which can be used as determiners. As opposed to *kakoj-to* the marker *kakoj-nibud'* is not licensed in transparent contexts as (1) but is available in any context that involves universal quantification over worlds or individuals. Hence, *kakoj-nibud'* can occur in intentional contexts as in (2), which can be analyzed as containing universal quantifiers over worlds (Pereltsvaig 2008), or in the scope of any overt universal quantifier as in (3). In contexts with quantifiers, indefinites with *kakoj-nibud'* differ from indefinites with *kakoj-to* with respect to their possible scope realizations: while *kakoj-nibud'* only allows for narrow scope (the narrow scope reading can be elucidated via pair-list continuation as in (3)); *kakoj-to* allows for functional wide scope (as can be elucidated by naming the function ‘his favorite dish’ in the continuation in (4)), or for plain wide scope (5).

- (1) *Kakoj-to/*-nibud'* rebenok spit.
wh-to/*-nibud' child sleeps.
‘Some child is sleeping.’
- (2) Petja hochet kupit' *kakaju-to/-nibud'* mashinu.
Petja wants buy wh-to/-nibud' car
‘Petja wants to buy some car.’
- (3) Kazhdyj gost' prigotovil *kakoe-nibud'* bljudo, Anja – sup, Olga – salat, ...
Every guest made wh-to dish Ann, the soup; Olga, the salad; ...
‘Every guest made a dish: Ann, the pasta; Olga, the salad; ...’
- (4) Kazhdyj gost' prigotovil *kakoe-to* bljudo, a imenno svoe ljubimoe bljudo
Every guest made wh-to dish namely his favorite dish.
‘Every guest made a dish, namely his favorite dish.’
- (5) Kazhdomu mal'chiku v etom gorode nravitsja *kakaja-to* tancovshchica. A Ane ona ne nravitsja.
Every boy in this town likes wh-to dancer. But Ann her NEG like.
‘Every boy in this town likes a dancer. But Ann doesn't like her at all.’

So what needs to be formally modeled is the fact that *kakoj-nibud'* can only take narrow scope and is restricted to contexts of universal quantification, and the fact that *kakoj-to* can only have wide scope or functional wide scope. In the current literature about Russian this task has not yet been achieved in a satisfactory manner. E.g. the analysis in Yanovich (2005) predicts functional wide scope readings for *kakoj-nibud'* and does not predict functional wide scope for indefinites with *kakoj-to*. The framework we propose can account for this contrasts if we assume that these indefinite determiners lexically encode constraints on the Skolem functions.

We analyze *kakoj-to* as lexically encoding the presupposition that the Skolem function that selects the denoted individual from the restrictor set is **nameable** and **informative** or the Skolem argument is **referentially stable** in the sense that it is not quantified over (or in DRT terms: it is part of the main DRS). Crucially, by this simple presupposition we rule out both narrow scope readings that only allow pair-list interpretations in general (since in all these cases there is no nameable function) and we allow for functional wide scope as well as plain wide scope. In addition, the nameability and informativity constraint predicts a functional wide scope reading even under negation similar to the case of topicalized indefinites in German as proposed in Ebert & Endriss (2007). This prediction is born out for Russian.

Kakoj-nibud' on the other hand lexically encodes the enrichment operation presented above and presupposes that the Skolem function is **not nameable**, **not informative** and that the referential anchor is **not stable** (it is universally quantified over). Moreover, by assuming that there is no type restriction on the variable the *nibud'*-indefinite must depend on, we can also model the narrow scope behavior of *-nibud'* in intensional contexts.

Hence, the key element of our proposal is adding a pragmatic dimension to the formal modeling of indefinite scope. Note that for modeling the behavior of the Russian indefinite pronouns only the Skolem function analysis per se is needed, the pragmatic dimension of the analysis, however offers an additional level providing flexibility to account for both, cross linguistic variation in the semantic value of indefinite pronouns and variation within one language. In addition, by adding this pragmatic layer we also get additional analytic tools to deal with classical problems of Skolem functional or choice functional analysis of indefinites, such as Chierchia's (2001) problem.

References

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