THE CLITIC -KIN/-KAAN IN FINNISH*

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Introduction

This paper is an outgrowth of several pieces of work by Frances Karttunen on Finnish clitics (see F. Karttunen 1975) and by Lauri Karttunen and Stanley Peters on conventional implicature and questions (see L. Karttunen and Peters 1975, 1976, and L. Karttunen 1977). In the earlier papers F. Karttunen has attempted to characterize informally the meaning of this particle in a general enough way to explain all of its various uses. Our scope in the present work is more limited; we will focus on the use of -kin in the sense of 'also' although it is clear that -kin is also used in the more pregnant sense of 'even'. To describe the use of the clitic in the latter, stronger, sense, the present analysis of the 'also'-reading of -kin can easily be extended along the lines described in our study of the English word even (F. and L. Karttunen 1977). Another self-imposed limitation is that we will concentrate on cases where -kin is attached to a noun phrase. This narrowing of the domain enables us to give a more concise formal description of the meaning of the clitic. However, we will also outline how this analysis can be extended to cover cases where -kin in the sense explained later -- 'focuses' on a constituent that belongs to some other syntactic category (such as verb, verb phrase, adjective, sentence, etc.).

Central to our current conception of the meaning of -kin is that the semantic contribution of this particle to the sentence in which it occurs is to be characterized as conventional implicature. This concept, which will be explained below, is due to H. P. Grice (1975). In discussing the conventional implicatures associated with -kin, we make use of the method for the formal description of conventional implicatures developed in Karttunen and Peters 1975. This method is an extension of the principles used by Richard Montague (1974) to obtain model-theoretic semantic interpretations for sentences of English. Therefore, we will start with an introductory discussion of what has become known as 'Montague Grammar' (for a detailed introduction, see Partee 1975). The use of these formal methods should not be misunderstood; we do not think that formality in itself is a virtue. However, we do consider it important to construct explicit rules describing both the syntax and the meaning of sentences where -kin occurs. As has often been pointed out by generative grammarians, this makes it possible to ascertain the consequences of a hypothesis and to replace it with a better one if it proves
incorrect.

Montague Grammar

For the time being, Montague's version of model theory is the best one available for describing meaning in natural language. To take advantage of it, we formulate our syntactic rules for Finnish in accordance with Montague's rules for English. Since our main interest is in the meaning of -kin, not the description of Finnish syntax, we limit ourselves to a minimum of syntactic apparatus. As in Montague's PTQ ("The Proper Treatment of Quantification in Ordinary English") we postulate a set of syntactic categories (such as 'sentence', 'noun phrase', 'intransitive verb phrase', 'transitive verb', 'embedded question', etc.). Each category consists of phrases which are either listed in a lexicon or generated by syntactic rules. In Montague's framework, a syntactic rule contains (i) a specification of the syntactic categories of input phrases, (ii) instructions on how they are to be combined, and (iii) a specification of what syntactic category the resulting output phrase belongs to. As a simple illustration, consider the rules in (1) -- these correspond to the rules S4 and S5 in Montague 1974.

1. **Rule 4**: If $\alpha$ is a noun phrase and $\delta$ is an intransitive verb phrase, then $\alpha\delta$ is a sentence, where $\delta$ comes from $\delta$ by replacing the first verb in $\delta$ by its third person singular present from.

2. **Rule 5**: If $\beta$ is a transitive verb phrase and $\alpha$ is a noun phrase, then $\beta\alpha$ is an intransitive verb phrase, where $\beta$ is the accusative form of $\alpha$.

To put these rules to use, we need some basic lexical items. Let us choose the noun phrases Jussi ('John') and Marja ('Mary'), and the transitive verb tunte 'know'. By Rule 5, tunte Marjan 'know Marja' and tunte Jussin 'know Jussi' are intransitive verb phrases. This syntactic category would also contain certain basic (that is, non-derived) phrases such as the verb nukku 'sleep'. By Rule 4, Jussi tuntee Marjan 'Jussi knows Marja' and Marja nukkuu 'Marja sleeps' etc. are sentences. In Montague grammar, the syntactic derivation of any phrase can be represented in the form of an analysis tree, which traces a complex expression back to its basic components and indicates what rules were used to derive it. Two examples of this are given (2).

2. (a) Jussi tuntee Marjan, 4
    Jussi tunte Marjan, 5
    Jussi tunte Marja, 4

(b) Marja nukkuu, 4
    Marja nukku

A complete grammar of Finnish would obviously contain a very large number
of rules of the sort illustrated in (1) and many of them would be quite complicated. For our purposes, it is not necessary to formulate explicitly any syntactic rules which do not directly involve the clitic -kin. In discussing our examples, we simply take it for granted that the other rules we think are involved in their derivation are genuine rules of Finnish and that they could in principle be spelled out explicitly. In order to avoid any difficulties that might arise in this connection, we will deliberately limit ourselves to sentences whose syntactic analysis is simple and unproblematic.

One advantage that Montague-style syntactic description has over transformational descriptions is that it makes it possible to use a fairly straightforward technique of semantic interpretation. A meaning is listed for each lexical item. As in PTQ, we let meanings be represented by expressions of an interpreted intensional logic. By 'interpreted' we mean that the logical expressions, and hence the Finnish phrases whose meaning they represent, are systematically related to non-linguistic objects, such as individuals, truth values, sets, properties, propositions, etc., in accordance with the principles of model theory. Thus each phrase in the lexicon has a 'translation', a corresponding expression of intensional logic with the same meaning. Each syntactic rule of Finnish is accompanied by a translation rule which assigns to each resulting output phrase an appropriate representation of its meaning constructed from the translations of the input phrases.\footnote{Montague's semantics is based on the principle of compositionality: the meanings of complex phrases are determined by the meanings of their parts and the particular syntactic rule by which they are derived. To illustrate how this method of semantic interpretation works, let us consider the two translation rules that accompany the two syntactic rules in (1) according to Montague's PTQ. (Our translation rules are actually a bit more complicated, as shall be seen shortly.)}

\begin{enumerate}
\item Rule 4: If $\alpha$ translates to $\alpha'$ and $\delta$ translates to $\delta'$, then $\alpha \delta$ translates to $\alpha'('\delta')$.
\item Rule 5: If $\beta$ translates to $\beta'$ and $\alpha$ translates to $\alpha'$, then $\beta \alpha$ translates to $\beta'('\alpha')$.
\end{enumerate}

It follows from the rules in (3) that the syntactic analysis trees in (2) correspond to the 'semantic derivations' in (4), which illustrate how the meanings of the phrases in (2) are determined in accordance with the rules in (3).

\begin{enumerate}
\item (a) Jussi('tunte('Marja'))
\item (b) Marja('nukku')
\end{enumerate}
In (4) we follow a convention of using the italicized, primed variants of Finnish phrases as constants of intensional logic, whenever this is practical and possible. Thus we let Jussi', Marja', tunte', and nukku' be constants of intensional logic that designate the extensions (= denotations) of the corresponding Finnish phrases; they translate the Finnish words Jussi, Marja, tunte, and nukku. The symbol "'" is an operator of intensional logic that forms expressions which designate intensions (=senses). For example, given that nukku' stands for the extension of the verb nukku (the set of sleeping individuals), 'nukku' designates the corresponding intension (the property of sleeping). Contrary to what one might expect, in Montague's system the translation of a proper name, such as Marja', does not denote a person; it stands for a set of properties possessed by a particular individual. Thus the extension of the noun phrase Marja is the set of all the properties that Marja has. In order to refer to Marja herself we need another constant of intensional logic, say m, which is of an entirely different type than Marja'. These two expressions are related to each other in the way shown in (5).²

(5) Marja' ≡ P[m]

Here, P is a variable ranging over properties of individuals, and P[m] is an expression which denotes the set of properties possessed by the individual that m stands for. Thus the equivalence in (5) is a concise way of expressing what we just said above: Marja' designates the set of Marja's properties (equivalently: the characteristic function of the set). Given that 'nukku' denotes a property and that Marja' denotes a set of properties, we can understand what is meant by formula (6), the translation of Marja nukkuvu 'Marja sleeps' -- see (2b) and (4b) above.

(6) Marja'(nukku')

This formula simply says that Marja has the property of sleeping, that is, Marja sleeps. Given our convention for choosing translations, rules 4 and 5, the equivalence in (5), and the semantics of Montague's intensional logic, it can be shown that the expressions in (7) are all equivalent.

(7) Marja-nukku' ≡ Marja'(nukku') ≡ P[m]'(nukku') ≡ nukku'(m)

Since it is usually much easier to understand the import of some complex formula when it is replaced by some simpler, equivalent expression, we will make extensive use of equivalences of the sort displayed in (7). In many cases, the steps that we take in pursuing simplicity are anything but obvious to those who are not familiar with the system with which we are working. For this reason, we wish to emphasize in advance that the resulting simple formulas are not arbitrarily made up to suit our semantic intuitions. Every equiv-
alence that we make use of in such reductions can in fact be proven.

As a final example of how Montague's translation rules assign meanings to complex phrases, let us consider the translation derived by the rules in (3) for the sentence Jussi tuntee Marjan 'Jussi knows Marja' -- see (2a) and (4a) above. The formulas in (8) are all demonstrably equivalent.

\[(8) \text{Jussi-tuntee-Marjan'} \equiv \text{Jussi'}(\text{tunte'}(\text{'Marja'})) \equiv \text{PP}(j)(\text{tunte'}(\text{PP}(\text{m})))
\]
\[\text{tunte'}(\text{PP}(\text{m}))(j) \equiv \text{tunte}_{j}^{\prime}(j,m)\]

The expression \(\text{tunte}_{j}^{\prime}\) in the last formula of (8) is a constant of intensional logic which designates a certain relation between individuals; \(\text{tunte}_{j}^{\prime}(j,m)\) -- and hence the Finnish sentence it is a translation of -- expresses the proposition that Jussi stands in that relation to Marja.

We hope that the triviality of our examples does not leave a false impression of the nature of the problem of assigning meanings to sentences. The fact that we can interpret two sentences of Finnish successfully is in itself of no interest. What is important is that the rules can be applied recursively to assign meanings to sentences of arbitrary complexity that contain a wide variety of syntactic constructions. This requires that the relationship between the syntactic rules and the principles of semantic interpretation be explicitly specified. The fact that Montague's descriptive framework meets this criterion makes it very suited for the sort of semantic exploration that we are about to pursue here.

Conventional Implicature

Montague's version of model theory describes what is sometimes called the truthconditional aspect of meaning. It is not designed to give any account of another, additional aspect of meaning which is very important for natural languages (as opposed to formal, artificial languages, such as intensional logic). Linguists have traditionally distinguished two kinds of sentence meaning: (i) what is said (asserted, directly expressed) by a sentence -- this is the kind of meaning truthconditional semantics deals with -- and, (ii) what a sentence conventionally implicates (presupposes). To illustrate this distinction, let us consider example (9).

\[(9) \text{Jussi pitäisi Marjastakin. 'Jussi likes MARJA too'}\]

It is generally accepted that the clitic -kin in this sentence plays no role in determining its truthconditions. The sentence is true just in case Jussi likes Marja and false otherwise. In other words, examples (9) and (10) express the same proposition.
(10) Jussi pitää Marjasta. 'Jussi likes Marja'

At the same time it is clear that the presence of -kin in (9) contributes something to the meaning of the sentence. One is entitled to infer from (9) not just that Jussi likes Marja but also what is expressed by sentence (11).

(11) Jussi pitää jostakin muusta kuin Marjasta. 'Jussi likes someone other than Marja'

By asserting (9) the speaker commits himself to (11) just as much as he commits himself to (10). At the same time, the truth of (11) is clearly irrelevant for determining the truth or falsity of (9). If it should happen that (11) is false while (10) is true, the speaker can justly be criticized for having a wrong idea of how things are, but strictly speaking he hasn't actually said anything false. Following Grice 1975, we interpret these facts to mean that the proposition expressed by (11) is implicated by sentence (9). Furthermore, this implicature is conventional in nature; it is due to the presence of the clitic -kin and it cannot be cancelled or disassociated from the sentence.

The distinction between the two aspects of meaning in (9) can also be brought out by considering the meaning of complex sentences, such as (12), which contain (9) in an embedded position.

(12) Huomasin juuri, että Jussi pitää Marjastakin. 'I just noticed that Jussi likes MARJA too'

(12) says that the speaker has just noticed that Jussi likes Marja. It does not mean that he has just noticed that Jussi likes someone other than Marja. In (12), the meaning of huomat 'notice' applies only to the proposition expressed by (10), not to (11) or to the conjunction of (10) and (11). Another relevant fact about the meaning of (12) is that it commits the speaker to the view that Jussi likes someone other than Marja just as strongly as sentence (9). The implicature associated with the complement sentence is, so to speak, 'inherited' by the larger construction in an unchanged form. This example illustrates an important difference in the roles that the truthconditional part of the meaning and the meaning implicated play in determining the meanings of larger constructions.

The same point can also be made with examples like (13).

(13) Jos Jussi pitää Marjastakin, silloin kaikki on hyvin.

'If Jussi likes MARJA too, then everything is well'

It is clear that (13) does not commit the speaker to (10); on the contrary, it suggests that he is unsure of whether (10) is true. However, (13) clearly
implicates that Jussi likes someone other than Marja. As in the previous case, the meaning expressed and the meaning implicated by (9) have to be distinguished and treated differently by the rules that specify the meaning of a complex construction. (For more examples of this sort, see Karttunen 1974.)

**Extension of Montague's semantics**

To account for these two aspects of meaning we make use of the system of semantic interpretation described in Karttunen and Peters 1975, which is an extension of Montague's system described above. The main difference is that we associate each Finnish phrase with three expressions of intensional logic. One of these, which we call the *extension expression*, is identical to the single translation that Montague would provide. The second one, the *implicature expression*, represents, as the name suggests, the conventionally implicated meaning of the phrase. For certain technical reasons -- and because a phrase may have a particular 'filtering effect' on implicatures 'inherited' from an embedded construction -- we also need to associate each phrase with a third logical formula; this we call the *heritage expression*. In short, the translation *a* of any Finnish phrase *a* has the form shown in (14).

\[(14) \quad a' = <a^e; a^i; a^h>\]

Here *a^e*, *a^i*, and *a^h* stand for the extension, implicature, and heritage expression of *a*, respectively.

In order to illustrate the basic principles of this new system of semantic interpretation, let us consider example (10) Jussi pitää Marjasta 'Jussi likes Marja'. In discussing this sentence our objective is to show how our translation rules treat implicatures that originate with the constituent phrases of a derived expression. This sets the stage for our analysis of -kin. (For a fuller explanation of the system, we refer the reader to Karttunen and Peters 1975.) We assume that this sentence is to be derived syntactically in essentially the same way as our earlier example Jussi tuntee Marjan 'Jussi knows Mary', whose analysis tree is given in (2a). We need of course another syntactic rule of the same general form as Rule 5 -- let us call it Rule 5.1 -- to get the correct case assigned to Marja. (The corresponding translation rules are presumably identical.) The syntactic analysis tree for sentence (10) is given in (15).

\[(15) \quad \text{Jussi pitää Marjasta, 4} \quad \text{Jussi} \quad \text{pitää Marjasta, 5.1} \quad \text{Marja}\]
The reason why we here choose the verb pitä 'like' is that this verb seems to give rise to an obvious conventional implicature. If one is told either one of the two sentences in (16), one is surely entitled to conclude (17), i.e. that Jussi is acquainted with Marja.\footnote{5}

(16) (a) Jussi pitää Marjasta. 'Jussi likes Marja'
(b) Jussi ei pidä Marjasta. 'Jussi doesn't like Marja'

(17) Jussi tuntee Marjan. 'Jussi is acquainted with Marja'

For our present explicatory purposes it would be very convenient if the two noun phrases in (15), Jussi and Marja, also had some conventional implicature associated with them. For the sake of the example, let us assume that these names indicate the sex of the person so named by way of conventional implicature. Thus Jussi implicates that the bearer of the name is male and Marja carries an implicature of female sex. This enables us to show how the new translation rules carry on and modify implicatures that originate from the constituent phrases of a complex expression. In the following, we therefore assume that the equivalences in (18) hold for the implicature expressions of Jussi, Marja, and pitä. (Variable $P$ ranges over noun phrase intensions.)

(18) $\begin{align*}
Jussi^i &= P \text{ miespuolinen}^e(j) \\
Marja^i &= P \text{ naispuolinen}^e(m) \\
pitä^i &= \lambda P \, \checkmark \, P(\checkmark \text{ tuntee}^e(x,y))
\end{align*}$

The role of heritage expressions is to carry on and modify in an appropriate way the implicatures of phrases they combine with. For example, the implicature of female sex originating with Marja should become an implicature of the verb phrase pitä Marjasta in (15). This and many other such considerations lead us to postulate the equivalences in (19) for the heritage expressions of Jussi, Marja, and pitä.

(19) $\begin{align*}
Jussi^h &= P(j) & (\equiv Jussi^e) \\
Marja^h &= P(m) & (\equiv Marja^e) \\
pitä^h &= \lambda P \, \checkmark \, P(\checkmark \, z=z)
\end{align*}$

Note that the heritage expressions of Jussi and Marja are equivalent to their extension expressions, which in turn are -- like all extension expressions in our system -- equivalent to the single translation that would be assigned to the same phrase by Montague's rules.

Having now explained how we represent the two aspects of meaning -- the truthconditional kind and the meaning implicated -- in the case of individual lexical items, let us consider the principles by which the corresponding representations are derived for complex expressions. The new translation rules corresponding to the syntactic rules 4 and 5.1 (as well as 5) are given in (20).
(20) Rule 4: If \( \alpha \) translates to \( <\alpha^e; \alpha^i; \alpha^h> \) and \( \delta \) translates to \( <\delta^e; \delta^i; \delta^h> \), then \( \alpha^\delta \) translates to
\[<\alpha^e(\delta^e); [\alpha^i(\delta^i) \land \alpha^h(\delta^h)]; [p=p]>\).

Rule 5.1: If \( \beta \) translates to \( <\beta^e; \beta^i; \beta^h> \) and \( \alpha \) translates to
\( <\alpha^e; \alpha^i; \alpha^h> \), then \( \beta \alpha \) translates to
\[<\beta^e(\alpha^e); \exists [\beta^i(\alpha^e)(x) \land \beta^h(\alpha^i)(x)]; \exists x=x>\).

Although these rules are complicated to state, the underlying principles of semantic interpretation are very simple. The extension expressions are derived in the same way as in Montague's single translations. The structure of the derived implicature expressions reflects the fact that a derived phrase, such as Jussi pitää Marjasta, which is generated by Rule 4, receives its implicatures from multiple sources; in this case, both from the subject noun phrase Jussi and from the verb phrase pitä Marjasta. A certain amount of interaction between the meanings of the constituents is required for getting all the implicatures into the proper form. For example, the property of being acquainted with Marja, which is implicated by the verb phrase pitä Marjasta must be attributed to Jussi in order to get the correct implicature for Jussi pitää Marjasta. The technical details of this are somewhat tricky but the principles themselves are simple to understand. (For more discussion of this, see Karttunen and Peters 1975.)

To illustrate the effect of the translation rules in (20), we give in (21) the derived extension and implicature expressions for Jussi pitää Marjasta. These can be obtained on the basis of the syntactic analysis pictured in (15).

(21) \[\text{Jussi-pitää-Marjasta}^e \equiv \text{Jussi}^e(\text{pitää}^e(\text{Marjaa}^e))\]

\[\text{Jussi-pitää-Marjasta}^i \equiv \]

\[\text{[Jussi}^i(\text{pitää}^e(\text{Marjaa}^e)) \land \text{Jussi}^h(\exists [\text{pitää}^i(\text{Marjaa}^e)(x) \land \text{pitää}^h(\text{Marjaa}^i)(x)])]\]

The import of the long translations in (21) is by no means obvious, but it can be brought out by making use of the equivalences given in (18) and (19) above. The formulas in (21) are demonstribly equivalent to those in (22).

(22) \[\text{Jussi-pitää-Marjasta}^e \equiv \text{pitää}^e(j,m)\]

\[\text{Jussi-pitää-Marjasta}^i \equiv \]

\[\text{[miespuolinen}^e(j) \land \text{tunte}^e(j,m) \land \text{naispuolinen}^e(m)]\]

In other words, the sentence in question says that Jussi likes Marja -- this is the truthconditional part of the meaning -- and it implicates that Jussi is male, Marja female, and Jussi is acquainted with Marja. This is precisely the result we wanted.

This example illustrates on one hand that our system of interpretation is an extension of Montague's principles: the extension expression in (22) is
equivalent to the single translation of that sentence in Montague's system. Secondly, it demonstrates that we can at the same time account for the conventionally implicated meaning of complex expressions. The fact that the translation rules treat these two aspects of meaning separately will enable us to account for the phenomena discussed in the previous section. We have now set the stage for presenting our analysis of -kin.

Analysis of -kin

The gist of our proposal is this. The conventional implicature associated with -kin is determined by the scope and the focus of the clitic. What we mean by these terms can be seen from the syntactic rule by which we propose to generate -kin sentences. This rule -- let us call it the Kin Rule -- is a 'quantification rule'; it applies to a sentence containing an unbound pronoun and replaces that pronoun with a noun phrase. As the noun phrase is inserted, it is suffixed with -kin. We call the input sentence the scope and the inserted noun phrase the focus of -kin.

'Unbound pronouns' in Montague's syntax are distinguished by a subscript. They correspond to free variables in logical formulas. Such pronouns can either be replaced by 'real' noun phrases or they become bound by an antecedent noun phrase, losing their subscript in the process. Thus we assume that our lexicon for Finnish contains noun phrases such as se₀, se₁, etc. (see 'it'). Like all other phrases in this syntactic category, they denote sets of properties. As a rule, the extension expression of seₙ is equivalent to the formula \( F_P(x_n) \), that is, it denotes the set of properties possessed by whatever individual the variable \( x_n \) happens to pick out (cf. the translation of Marja in (5)).

Our syntactic rule for generating sentences with -kin is given in (23).

(23) **Kin Rule:** If \( \phi \) is an affirmative sentence containing an occurrence of an unbound pronoun SEₙ (seₙ, senₙ, sitₙ, siitₙ, sillₙ, etc.) and if \( \alpha \) is a noun phrase, then \( F_{kin,n}(\alpha,\phi) \) is a sentence, where \( F_{kin,n}(\alpha,\phi) \) is derived from \( \phi \) by replacing the first occurrence of SEₙ in \( \phi \) with the matching case form of \( \alpha \) suffixed with -kin and removing the subscripts of all the remaining occurrences of SEₙ and replacing them with the corresponding forms of HANₙ if \( \alpha \) is human.

As an example of how the rule is applied, consider the following analysis tree for sentence (9) Jussi pitän Marjastakin.
Before we go on to give the translation part of our Kin Rule, let us recall the main points in our earlier discussion of the meaning of (9). As far as the truthconditional aspect of meaning is concerned, (9) expresses the same proposition as (10) Jussi pitää Marjasta 'Jussi likes Marja'. What the clitic -kin contributes to the meaning of (9) is a conventional implicature. This implicated proposition is the one expressed by sentence (11) Jussi pitää jostakin muusta kuin Marjasta 'Jussi likes someone other than Marja'. In addition to having this one special implicature, (9) obviously has all the same conventional implicatures as (10) has (cf. the discussion in the preceding section). We take these observations into account in formulating the translation part of the Kin Rule. This is given in (25).

(25) **Kin Rule:** If \( \phi \) translates to \( \langle \phi^e; \phi^i; \phi^h \rangle \) and \( \alpha \) translates to \( \langle \alpha^e; \alpha^i; \alpha^h \rangle \), then \( \text{Kin}_n(\alpha, \phi) \) translates to \( \langle \alpha^e(x^e_n); [\alpha^i(x^e_n) \wedge \alpha^h(x^i_n)] \wedge \text{kin}^{i, e}(x^e_n, \alpha^i_n, \phi^e) \rangle; \{p = p\} \).

Semantically the Kin Rule is similar to Montague's quantification rules. Since we did not discuss such rules in our brief introduction to Montague grammar and to its semantic extension in Karttunen and Peters 1975, the translation in (25) may look more complicated than it really is. In any case, the principles behind it are very simple. First of all, the resulting extension expression should depend only on the extension expressions of the argument phrases -- as far as the truthconditional aspect of meaning is concerned, the Kin Rule is like Montague's T14 in PTQ. Secondly, all of the implicatures associated with the argument phrases should be passed on to the resulting phrase in the appropriate form. And finally, the implicature brought in by -kin depends on the focus and scope of the clitic, more specifically, on the meanings expressed by the two argument phrases. In order to facilitate the discussion of this implicature, we introduce in (25) a special constant \( \text{kin}^i \), which will be interpreted shortly. However, let us first illustrate the effects of (25) by deriving the extension and implicature expressions for the sentence in (24). These are given in (26). 7

(26) (a) \( \text{Jussi-pitää-Marjastakin}^e \equiv \text{Marja}^e(\hat{x}_0 \text{Jussi-pitää-siitän}^e) \)

(b) \( \text{Jussi-pitää-Marjastakin}^i \equiv [\text{Marja}^i(\hat{x}_0 \text{Jussi-pitää-siitän}^i) \wedge \text{Marja}^h(\hat{x}_0 \text{Jussi-pitää-siitän}^i)] \wedge \text{kin}^{i, e}(\text{Marja}^e, \hat{x}_0 \text{Jussi-pitää-siitän}^e) \)
Given the equivalences we discussed in the preceding sections, it can be shown that formulas in (26) are equivalent to those in (27).

(27) (a) Jussi-pitää-Marjastakin\(^e\) \equiv \pi t\(_a\)(j, m)
(b) Jussi-pitää-Marjastakin\(^i\) \equiv \{\text{Jussi-pitää-Marjasta}^i \land
\text{kin}^i(\^{\text{Marja}}^e, \overset{\wedge}{x}_0 \text{Jussi-pitää-siitää}^\text{\textasciitilde}^e)\}

As can be seen by comparing (27) with (22), it follows from our analysis that sentences (9) Jussi pitää Marjastakin and (10) Jussi pitää Marjastani have otherwise the same meaning except that the former has an additional implicature brought in by -kin. This is as it should be. To spell out the last details of our proposal, we only need to explain how the constant \text{kin}^i in (27b) is to be interpreted. What we want to accomplish, of course, is to make (28) express the proposition that there is someone other than Marja whom Jussi likes.

(28) \text{kin}^i(\^{\text{Marja}}^e, \overset{\wedge}{x}_0 \text{Jussi-pitää-siitää}^\text{\textasciitilde}^e)

Here \^{\text{Marja}}^e stands for the sense of the focus phrase and \overset{\wedge}{x}_0 \text{Jussi-pitää-siitää}^\text{\textasciitilde}^e (\overset{\wedge}{x}_0 \pi t\(_a\)(j, x)_0), denotes a property determined by the scope of -kin, namely, the property of being liked by Jussi. To make (28) have the desired meaning we fix the interpretation of \text{kin}^i (by way of a meaning postulate) so that the following equivalence holds.

(29) \text{kin}^i \equiv \lambda Q \overset{\wedge}{P} P(\overset{\wedge}{\forall} x[\neg(x=y) \land Q(x)])

Given (29), the formula in (28) is equivalent to (30); it expresses the proposition that Jussi likes someone other than Marja, which is just what (11) says.8

(30) \overset{\wedge}{\forall} x[\neg(x=m) \land \pi t\(_a\)(j, x)]

Thus we have achieved our first objectives; we have shown that our analysis accounts for the meaning of (9) -- both the meaning expressed and the meaning implicated -- in the desired way.

Because -kin is syntactically introduced by way of a quantification rule along with its focus noun phrase, we have also accounted for cases like (31).

(31) Jussikin pitää Marjastani. 'JUSSI likes Marja too'

The analysis tree for (31) is given in (32a) and the corresponding extension and implicature expressions in (32b) and (32c).

(32) (a) Jussikin pitää Marjastani, Kin,1
   Jussi  \overset{\wedge}{s}_1 \pi t\(_a\) Marjastani, 4
   \overset{\wedge}{s}_1 \pi t\(_a\) Marjastani, 5.1
   \pi t\(_a\) Marja
(b) Jussikin-pitää-Marjasta$^e$ = pitä$^e_{j,m}$
(c) Jussikin-pitää-Marjasta$^i$ = [Jussi-pitää-Marjasta$^i$ ∧
kin$^i(^{\text{Jussi}}^e, s_{0-\text{pitää-Marjasta}^e})$]

As can be seen by comparing (32b) and (32c) with the corresponding expressions in (27), sentences (9) and (31) differ in their meaning only with respect to the implicate brought in by -kin. In contrast to (9), (31) implicates that someone other than Jussi likes Marja. What is implicated by -kin obviously depends crucially on the focus of the clitic.

Since the implicate is also dependent on the scope of -kin, we can expect to find cases where the possibility of interpreting -kin with wider or narrower scope gives rise to an ambiguity in spite of the fact that the focus remains the same. Good examples of this kind are a bit hard to find since the left-to-right ordering of elements in the sentence and other factors in general make one of the possible readings much more plausible than the others. Consider sentence (33).

(33) Kaksi sheikkiä kosii Marjaakin. 'Two sheiks are courting MARJA too'

On one of its readings, (33) says that two sheiks are courting Marja and it implicates that someone other prospective bride or brides in mind besides her. However, it also seems possible to interpret (33) as synonymous with the most natural -- and perhaps the only possible -- reading of (34).

(34) Marjaakin kosii kaksi sheikkiä. 'MARJA is being courted by two sheiks too'

(34) says that two sheiks are courting Marja; it implicates that someone other than Marja also has two sheiks as her suitors (possibly different sheiks). Both readings of (33) can be correctly derived under our analysis. The two analysis trees are given in (35) leaving out the non-essential parts.\(^9\)

(35) (a) kaksi sheikkiä kosii Marjaakin, 14,0

\[\text{kaksi sheikkiä} \quad \text{se}_{0} \quad \text{kosii Marjaakin, Kin,1} \]
\[\vdash \quad \text{Marjä} \quad \text{se}_{0} \quad \text{kosii sitä,1} \]

(b) kaksi sheikkiä kosii Marjaakin, Kin,1

\[\text{Marjä} \quad \text{kaksi sheikkiä kosii sitä,0,14,0} \]
\[\vdash \quad \text{kaksi sheikkiä} \quad \text{se}_{0} \quad \text{kosii sitä,1} \]

As far as the truthconditional aspect of meaning is concerned, it makes no difference whether (33) is derived as in (35a) or as in (35b). On both readings the sentence says that two sheiks are courting Marja; the resulting extension expressions are equivalent to\( V_{2}x[\text{sheikki}^e(x) \land \text{kosii}^e(x,m)]\). The
resulting implicature expressions, however, are different. Analysis tree (35a) yields the implicature in (36a); on this reading (33) implicates that there are two sheiks who are courting someone else besides Marja. The implicature of (35b) is that there is someone else besides Marja who is being courted by two sheiks (36b). These are different propositions.

(36) (a) $\forall y [\text{sheikki}^G(y) \land \forall x [\neg (x = m) \land \text{kosi}^G_{*}(y, x)]]$

(b) $\forall x [\neg (x = m) \land \forall y [\text{sheikki}^G(y) \land \text{kosi}^G_{*}(y, x)]]$

As we have shown with our examples in the above section, the implicature associated with -kin indeed depends on both the scope and the focus of the clitic. It is precisely for this reason that we proposed to introduce -kin syntactically by means of a quantification rule. Within the descriptive framework we are using here, there is no other way to arrive at the desired semantic result. The proposed treatment of -kin is of course still incomplete in a number of respects. First of all, we have not yet said anything about the other variant of our clitic, -kaan, which occurs in negative contexts. This will be taken up in the next section, followed by a discussion of cases where both -kin and -kaan may appear with contrasting implicatures. Secondly, we have assumed so far that -kin may be suffixed only to noun phrases, but in fact -kin can focus on phrases of many other syntactic categories. This is illustrated in (37). To highlight the intended reading, we have capitalized the focused constituent. For the same reason, a bit of additional context is provided in two of the cases.

(37) (a) V-focus: Jussi SUUTELEE kin Marjaa. 'Jussi KISSES Marja too'

(b) VP-focus: (Jussi keittää miehellään ja) Jussi PESEE PYYKKIÄkin.

'(Jussi likes to cook and) Jussi WASHES LAUNDRY too'

(c) Adj-focus: Marja keräälee VANHOJAkin postimerkkejä.

'Marja collects OLD stamps too'

(d) N-focus: Marja keräälee vanhoja POSTIMERKKEJÄkin.

'Marja collects old STAMPS too'

(e) S-focus: (Jätetään käymättä museossa. 'Let's leave out the

On niin vähän aikaa ja) SINNE museum visit. There

ON NIIN PITKÄ MATKÄkin.

'is so little time and)

IT'S SUCH A LONG WAY THERE too'

In cases like these, the implicature obviously varies depending on the kind of constituent that is being focused on. For example, (37a) implicates that Jussi does other things to Marja besides kissing her. (37e) implicates that there is something else under consideration besides the fact that it is a long
way to the museum, for instance, that there is so little time left.

In its present form our Kin Rule does not generate any of the examples in (37) because the rule allows -kin to focus only on noun phrases. However, this inadequacy can be corrected without changing any essential feature of our analysis. Nothing prevents us from generalizing the Kin Rule in such a way that phrases of other syntactic categories can also be in the focus of the clitic. We do not present the more general formulation here because, while it is conceptually simple, it would require a lot of preliminary work in the syntax. For example, we would need to introduce 'proforms' for each of the syntactic categories listed in (37), that is, lexical items which roughly correspond to our subscripted pronouns se\_0, se\_1, etc. For instance, to derive (37c) we would need a proadjective, say sellainen\_0 ('such'), which can be replaced with a real adjective by the generalized version of our Kin Rule. This is illustrated in (38).

(38) Marja keräilee vanhoja postimerkkejä, Kin, Adj, 0
     vanha— Marja keräilee sellaisia\_0 postimerkkejä

The extension expression associated with (37c) would be equivalent to that of Marja keräilee vanhoja postimerkkejä 'Marja collects old stamps' and the implicature associated with -kin would be that Marja collects other kinds of stamps besides old stamps. The other examples in (38) can be treated in a similar way.

We are not sure whether our envisioned generalized Kin Rule can also account for the implicature associated with -kin in the following example.

(39) (Odottimme Jussin tulevan/Emme odottaneet
     Jussin tulevan.) Jussi tulikin.
     'We expected Jussi to come/We didn't expect
     Jussi to come.) Jussi came too/anyway'

In cases of this sort, -kin invariably attaches to the temporally inflected verb form -- that should already tell us something -- and it seems to imply the existence of some predisposition concerning the truth or falsity of the expressed proposition. Thus (39) can, depending on the circumstances, be used to suggest surprise, disappointment, and the like. We feel strongly that the -kin in (39) is the very same clitic we have discussed above, but so far we have not found a way to capture its meaning with the generalized version of our Kin Rule. We are not sure what -kin focuses on in (39).

As we mentioned in the beginning of the paper, we deliberately concentrate here on the 'also, too'-sense of -kin, although we of course recognize that in all of the cases we have discussed -kin can also have the stronger sense of 'even' (Finn. jopa, vieläpä). In sentences such as (40), -kin is nearly
always understood in this more pregnant sense.

(40) Marja osaa selviytyä vaikeimmistakin tehtävistä.
    'Marja can handle even the hardest assignments'

In (40) -kin not only implicates that Marja can handle other kinds of assignments but that the very hard assignments are the least likely kind for Marja to be able to handle. It is this additional implicature that distinguishes the 'even' sense of -kin from the plain 'also,too' sense. The stronger implicature associated with the 'even' sense of -kin is determined by the focus and the scope of the clitic in just the way we have described here; only the meaning postulate for kin needs to be revised. Since we have already discussed the English word even in F. and L. Karttunen 1977, we do not dwell on the matter here but refer the reader to that paper for details.

*Alternation between -kin and -kaan in declaratives*

The syntactic part of the Kin Rule in (23) is restricted to apply only to affirmative sentences. In negative sentences -kaan occurs in place of -kin, as illustrated in (41).

(41) Jussikaan ei pidä Marjasta. 'JUSSI doesn't like Marja either'

(41) implicates that there is someone else besides Jussi who doesn't like Marja. To generate such sentences and to assign the correct implicatures to them, we only need to change the syntactic, not the semantic part of the Kin Rule. Alternatively we could have another rule -- call it the Kaan Rule -- whose syntactic part is similar and the translation part identical to the corresponding parts of the Kin Rule. For the sake of expository convenience, let us take the latter option (cf. (23) and (25) above).

(42) **Kaan Rule:** If \( \phi \) is a negative sentence containing an occurrence of an unbound pronoun \( SE_n \) (\( se_n, sen_n, sitä_n, siitä_n, sillä_n \), etc.) and if \( \alpha \) is a noun phrase, then \( F_{\text{Kaan},n}^{\alpha,\phi} \) is a sentence where \( F_{\text{Kaan},n}^{\alpha,\phi} \) is ... [as in (23) except for substituting -kaan for -kin].

    If \( \phi \) translates to ... [as in (25) except for substituting \( F_{\text{Kaan},n} \) for \( F_{\text{Kin},n} \)].

An analysis tree for (41) and the corresponding extension and implicature expressions are given in (43). (Cf. the analysis of *Jussikin pitää Marjasta* in (32).)
As shown in (43), (41) says that Jussi doesn't like Marja and implicates that someone else doesn't like Marja. Note that negation has no effect on the implicatures that originate with the phrases Jussi and pitää Marjasta, hence the first conjunct in (43c) comes to be identical to that of (32c). This is as it should be since (41) -- just like its affirmative counterpart (31) -- implicates, among other things, that Jussi is acquainted with Marja.

The fact that our analysis so successfully accounts for both the form and meaning of (41) is a direct consequence of introducing -kin/-kaan syntactically by means of a quantification rule that inserts the focus noun phrase into a sentence. Thus both the form of the clitic and the implicature that goes along with it depend on whether the sentence in the scope of the clitic is affirmative or negative. Several refinements are needed, however, to take care of problems that arise in connection with more complex sentences. In the remainder of this section, we will point out what they are and how we propose to deal with them.

First of all, let us take note of an inadequacy in our treatment of negation. As (43a) illustrates, we have borrowed from Montague's PTQ grammar a rule that forms a negative sentence as it combines a subject NP and a verb phrase. In the PTQ syntax there is no other way to form negative sentences -- in particular, no rule for adding negation to an affirmative sentence. We clearly must assume such a rule because of sentences like (44).

(44) Jussi ei pidä Marjastakin. 'Jussi doesn't like MARJA too'

Although (44) sounds a bit strange in isolation, it is in fact a perfectly good sentence of Finnish; it is a denial of sentence (9) Jussi pitää Marjastakin 'Jussi likes MARJA too'. Consider also examples such as (45).

(45) Haluan kermaa, mutta en halua sokeriakin. 'I want cream but I don't want SUGAR too'

The second part of (45) says that I don't want sugar and it implicates that I want something else, namely cream. One feels that in cases of this sort there is a disturbing discord between the meaning expressed and the meaning implicated, which presumably is why they occur rather infrequently in ordinary
conversation. Note that (44) and (45) are, in spite of their awkwardness, much 'better' than the examples in (46), which we find totally unacceptable and uninterpretable.

(46) (a) *Jussi pitää Marjastakaan. *'Jussi likes MARJA either'
(b) *Haluan sokeriakaan. *'I want SUGAR either'

By assuming a rule of 'sentential negation', which negates an affirmative sentence, we can generate (44) in the manner shown in (47). This derivation correctly accounts for both the form and the meaning of (44). Similarly for (45).

(47)

This necessary enrichment of our syntactic apparatus makes the alternation between *-kin* and *-kaan* more than merely an automatic reflex to the presence or absence of negation in the sentence. The alternation becomes an indicator of the relative scope of the two elements: *-kaan* indicates that the clitic has scope over negation, *-kin* indicates the opposite state of affairs if it occurs together with negation. Because ungrammatical sentences of the sort in (46) are not generated by the system, we have thus also accounted for all of the data of the kind displayed in (48) and (49).

(48) (a) Toivon, etkä Marja loukkaa Jussia *{kin}{kaan}*.

    'I hope that Marja will offend
    JUSSI *{either}*

(b) Jos Marja pyytäisi anteeksi

    Jussilta *{kin}{kaan}*, emme ota häntä
    mukaan.

(49) (a) Toivon, etkä Marja ei loukkaa Jussia *{kin}{kaan}.*

    'I hope that Marja won't offend
    JUSSI *{either}*

(b) Ellei Marja pyydä anteeksi Jussilta

    *{kin}{kaan}*, emme ota häntä mukaan.

    'If Marja doesn't apologize to JUSSI *{either}*
    we won't take her along'

Our rules, properly, do not generate the *-kaan* examples in (48). On the other hand, because of the possibility of quantifying in the cliticized phrase either before or after the sentence is negated, we can derive all of the sentences in (49) and assign the correct implicatures to them. Note that the alternation between *-kin* and *-kaan* in (49) is accompanied by a difference in
what is being implicated. The two versions of the embedded clause in (49a) can be derived in the manner illustrated in (50).

\[ \begin{align*}
(50) \quad & \text{(a) Marja ei loukkaa Jussiakin} \\
& \quad e \, Marja loukkaa Jussiakin \\
& \quad e \, Marja loukkaa sit\tilde{a}_0 \\
& \quad Jussi \, Marja loukkaa sit\tilde{a}_0 \\
& \quad e \, Marja loukkaa sit\tilde{a}_0 \\
& \text{(b) Marja ei loukkaa Jussiakan} \\
& \quad Jussi \, Marja loukkaa sit\tilde{a}_0 \\
& \quad e \, Marja loukkaa sit\tilde{a}_0
\end{align*} \]

As far as the truthconditional aspect of meaning is concerned, the sentences resulting from the derivations in (50) are equivalent. For this reason, (49a) says -- no matter whether the clitic is -kin or -kaan -- that the speaker hopes that Marja won't offend Jussi. (Only the meaning expressed by the complement plays a role in determining what the matrix sentence says.) Because the implicature associated with the clitic depends on its scope, (50a) yields the implicature that Marja offends someone other than Jussi while (50b) implicates that there are non-Jussi's whom Marja doesn't offend. Consequently, (49a) implicates that Marja either does or does not offend someone other than Jussi depending on whether the clitic in the complement is -kin or -kaan. This is clearly the correct result. Similarly for (49b).

It is interesting to note that, while the -kin variants in (49) are a shade less natural than their -kaan counterparts, they are considerably less awkward than examples (44) and (45). The discord that one feels between the meaning expressed and the meaning implicated in these negative -kin sentences seems to become muted as soon as the sentence is embedded within a suitable larger phrase. Note that the sentences in (49) do not commit the speaker to the proposition directly expressed by the embedded sentence.

As we noted above, the alternation between -kin and -kaan in negative sentences is determined by -- and therefore an indicator of -- the relative scope of the clitic with respect to negation. In fact there are a number of quasi-negative adverbs and quantifiers which can affect the form of the clitic in just the same way, such as harvoin 'seldom', tuskin 'hardly', and harva 'few'. Like negation, these can occur either with -kin or -kaan (more often with -kaan) and the corresponding scope difference is accompanied by a difference in what is being implicated. Consider the examples in (51).

\[ \begin{align*}
(51) \quad & \text{(a) (Tavallisesti ihmiset pit\check{a}v\ddot{a}t vain Marjasta.) Harvat ihmiset} \\
& \quad \text{pit\check{a}v\ddot{a}t Jussistakin.} \\
& \quad '\text{(Usually people only like Marja.) Few people like JUSSI too'} \\
& \quad (b) (Tavallisesti ihmiset eiv\ddot{a}t pid\ddot{a} Marjasta.) Harvat ihmiset} \\
& \quad \text{pit\check{a}v\ddot{a}t Jussistakaan.} \\
& \quad '\text{(Usually people don't like Marja.) Few people like JUSSI either'}
\end{align*} \]

The syntactic derivations for (51a) and (51b) are analogous to those given
in (35) for the two senses of sentence (33) *Kaksi sheikkiä kosii Marjaakin*
'Two sheiks are courting Marja'.

(52) (a) harvat ihmiset pitävät Jussistakin

(b) harvat ihmiset pitävät Jussistakaan

Jussi

harvat ihmiset

se_0 pitää Jussistakin

se_0 pitää siitä

... ...

... ...

... ...

Under these syntactic analyses, both sentences express the proposition that few people like Jussi. (51a) comes to have the implicature that someone other than Jussi is liked by some people. The implicature of (51b) is that there is someone other than Jussi whom few people like. (The resulting implicature expressions are analogous to those derived for sentence (33).)
These results are in agreement with our intuitive judgements about what (51a) and (51b) mean.

In order to make the clitic come out as -kaan in (51b), where it has wide scope over harvat ihmiset 'few people', we obviously need to modify our Kaan Rule in (42) to allow for -kaan to occur in a sentence that in lieu of negation has a quasi-negative quantifier phrase or adverb. We will not attempt to do this here because of some further complexities which we have not yet completely unraveled. If the sentence in the scope of the clitic contains the negative verb e, -kaan is obligatory irrespective of the location into which the focused constituent is inserted; with harvoin 'seldom', harva 'few', tuskin 'hardly', etc. the shape of the clitic also depends on whether it ends up to the left or to the right of the quasi-negative element. It seems that in the former case the preferred form is -kin, in the latter case -kaan. This is illustrated in (53).

(53) (a) Jussillakin on harvoin rahaa. 'JUSSI, too, seldom has money'

(b) Harvoin Jussillakaan on rahaa. 'JUSSI seldom has money either'

Both sentences say the same thing: Jussi seldom has money. Furthermore, they also have the same implicature in spite of the -kin/-kaan contrast: someone else besides Jussi seldom has money. Given our earlier observation about the role that left-to-right ordering plays in reducing scope ambiguity (cf. the discussion of (33) and (34)), these facts are not quite as mysterious as they first seem. Suppose that the function of -kaan in these cases is to indicate that the clitic has wide scope over some quasi-negative element. In
(53a), where the left-to-right ordering already gives the clitic priority over harvoin. -kaan would be (from a functional point of view) a case of overkill. In (53b) -kaan clearly serves a useful purpose by indicating that the clitic has wider scope than the preceding quasi-negative element. 14

We do not know how seriously one should take such functional speculations, but we would have been more baffled if the facts had turned out the other way around with -kaan being favored in (53a) and -kin in (53b).

There are a number of additional problems concerning the -kin/-kaan alternation in declarative sentences which we have not yet solved and do not have space to discuss here. (For a survey of data, see Penttilä 1957, pp. 660-662.) In the most obscure cases, such as (54), there seems to be a complete free variation between the two forms of the clitic with no accompanying change of either expressed or implicated meaning. 15

(54) Jos annat hänelle pienimmät kin kän aiheen valittaa, joudut varmasti vaikeuksiin.

'If you give him even the slightest reason to complain, you will certainly get into trouble'

However, in the cases we have discussed here, the alternation clearly indicates the relative scope of the clitic. We are inclined to think that the remaining difficulties can be solved along the lines proposed here.

Alternation between -kin and -kaan in questions

As the examples in (55) and (56) show, both forms of the clitic can occur in affirmative as well as negative direct yes/no questions.

(55) (a) Pitääkö Marjakin Jussista? 'Does MARJA like Jussi too?'
    (b) Pitääkö Marjakaan Jussista? 'Does MARJA like Jussi either?'
(56) (a) Eikö Marjakin pidä Jussista? 'Doesn't MARJA like Jussi too?'
    (b) Eikö Marjakaan pidä Jussista? 'Doesn't MARJA like Jussi either?'

In addition, an alternation parallel to that in (55) also manifests itself in embedded affirmative yes/no questions. This is illustrated in (57).

(Negative yes/no questions in general are not embedded. Hence there are no examples of embedded questions corresponding to (56).)

(57) Olen unohtanut, pitääkö Marjakin kaan Jussista.

'I have forgotten whether MARJA likes Jussi too either'.

In direct 'search questions' (questions beginning with an interrogative quantifier phrase, that is, with words like kuka 'who', mitä 'what', etc.), both forms of the clitic also occur in both affirmative and negative inter-
rogative clauses. This is shown in (58) and (59).

(58) (a) Kuka pitäisi Jussistakin? 'Who would like JUSSI too?'
(b) Kuka pitäisi Jussistakaan? 'Who would like JUSSI either?'
(59) (a) Kuka ei pitäisi Jussistakin? 'Wouldn't like JUSSI too?'
(b) Kuka ei pitäisi Jussistakaan? 'Wouldn't like JUSSI either?'

It is interesting to note that of the four search questions above, only (58a) and (59b) can be embedded -- just those which show the regular correspondence between the form of the clitic and the presence or absence of negation. (58b) and (59a) are 'rhetorical questions', they occur only as direct questions, not in genuine embedded contexts as in (60).

(60) (a) Olen unohtanut, kuka pitäisi Jussistakin.
'Ve have forgotten who would like Jussi too'
(b) Olen unohtanut, kuka ei pitäisi Jussistakaan.
'I have forgotten who wouldn't like Jussi either'

Before we go on with the analysis, let us consider briefly the implicated meaning of sentences (55)-(60). As for the examples in (55) and (57), those with -kin implicate that someone other than Marja likes Jussi, those with -kaan implicate that someone other than Marja doesn't like Jussi. In other respects these questions are 'neutral'; they do not indicate by their form that the speaker has an opinion as to whether Marja in fact likes Jussi. The examples in (56) are similar to those in (55) with respect to the implicature associated with the clitic, but in addition they implicate something else. (56a) is a rhetorical question, in some ways similar to (58b) and (59a); it implicates that the speaker thinks that Marja likes Jussi. (56b), on the other hand, has an insecure ring to it; it implicates that the speaker used to think that Marja likes Jussi but that he now has reason to think that the opposite might be true. The 'sincere search questions', (58a), (59b), and their embedded counterparts in (60) are in every way parallel to the regular yes/no questions in (55) and (57); in particular, they do not implicate that the speaker has any opinion as to who in fact likes Jussi. Finally, the rhetorical search questions implicate a universal proposition with the opposite polarity. (58b) implicates that no one likes Jussi, and that there is someone else besides Jussi whom no one likes. (59a) implicates that everyone would like Jussi and that there is someone else besides Jussi whom everyone likes.

Before presenting our analysis of -kin/-kaan questions, we actually should begin with a general discussion of the syntax and semantics of interrogative clauses. Since that would take up too much space, we will be content to outline the main ideas of our analysis in more informal terms than before. We refer the reader to L. Karttunen 1977 and to Karttunen and Peters
1976 for a discussion of the formal devices we would need to make our proposals more specific. The analysis we are about to present is a further development of the ideas discussed in these two papers.

First of all, we propose to derive questions from declarative sentences. While the latter denote truth values, embedded questions denote sets of propositions. Thus there is a semantic difference as well as a difference in syntactic category. A question inherits all of the implicatures of the declarative sentence from which it was formed, and the syntactic rule by which it is formed may give rise to additional implicatures as well. With these principles we can account for both the form and the implicated meaning of all of the data in (55)-(60). There seem to be three kinds of yes/no questions: regular, insecure, and rhetorical; and two kinds of search questions: regular and rhetorical. For these we propose the following five rules informally outlined below.

(61) REGULAR YES/NO QUESTION RULE: Forms affirmative yes/no questions from either affirmative or negative declarative sentences; if the input sentence is negative, negation is eliminated. This rule gives rise to no new conventional implicatures. The implicatures possessed by the input sentence are inherited by the resulting yes/no question.

This rule accounts for the form and meaning of the examples in (55) and (57) and for the lack of genuine embedded questions corresponding to the examples in (56).

(62) INSECURE QUESTION RULE: Forms direct negative yes/no questions from negative declarative sentences. The implicatures associated with the input sentence are carried over and, in addition, the resulting question implicates that the speaker suspects that the input sentence is probably true, contrary to his own previous beliefs.

This rule accounts for the form and meaning of questions like (56b).

(63) RHETORICAL YES/NO QUESTION RULE: Forms direct negative yes/no questions from affirmative declarative sentences. The implicatures associated with the input sentence are carried over and, in addition, the resulting question implicates that the speaker is confident that the input sentence is true.

This rule accounts for the form and meaning of questions like (56a).

(64) REGULAR SEARCH QUESTION RULE: Forms search questions from affirmative or negative declarative sentences that contain an occurrence of an unbound pronoun by replacing that pronoun with an
interrogative noun phrase. The inserted interrogative phrase is
preposed. The implicatures of the resulting question are ob-
tained by existential quantification from the meaning expressed
and the meaning implicated by the input sentence.

This rule accounts for the form and meaning of sentences like (58a), (59b),
and (60).

(65) RHETORICAL SEARCH QUESTION RULE: Forms direct search questions in
the same manner as the Regular Search Question Rule in (64)
except that the polarity of the input sentence is reversed
(negative becomes affirmative, and vice versa). The implicatures
of the resulting question are obtained by universal quantification
from the meaning expressed and the meaning implicated by the ori-
ginal input sentence.

This rule accounts for the form and meaning of sentences like (58b) and (59a).

We close this section with a few observations about the proposed rules.
While we cannot claim to understand all of the principles that are at work
here, it seems to us that, at least on the level of descriptive adequacy, our
analysis is fairly successful. As far as we can see, it correctly accounts
for all of our observations about the form and the meaning of the examples in
(55)-(60). In particular we would like to understand why rhetorical search
questions are characterized by a fake shift in polarity (sarcasm?) and why
rhetorical yes/no questions and insecure yes/no questions are always negative.
It seems intuitively right that insecure questions are based on negative
sentences and rhetorical yes/no questions on affirmative sentences but we do
not know from what principle that follows. In all of these cases, the im-
plicature associated with the clitic -kin/-kaan is determined by the declar-
ative input sentence, and the polarity of the resulting question itself is of
no consequence. Note that it is not true that the form of the clitic is
always determined by the expected answer: regular yes/no questions are not
biased in favor of either one of the possible answers. Making rule (61) elim-
ine possible negation from the input sentence as the question is formed is
not as unreasonable as it may appear. The presence or absence of negation in
ordinary yes/no questions makes no difference to the meaning expressed by the
question. In cases where it affects the implicatures of the sentence, the
form of the clitic indicates the polarity of the underlying sentence, as it
does in all questions.

One non-trivial consequence of our analysis is that we must treat all of
the questions in (66) as syntactically and semantically ambiguous.
(66) (a) Eikö Suomi ole mukava maa? 'Isn't Finland a nice country?'
(b) Kuka haluaisi elää Suomessa? 'Who would want to live in Finland?'
(c) Kuka ei haluaisi elää Suomessa? 'Who wouldn't want to live in Finland?'

(66a) could be either an insecure yes/no question or a rhetorical yes/no question. (66b) and (66c) could either be sincere search questions or rhetorical search questions. Without the telltale clitic -kin/-kaan, there is no way of knowing (in the absence of intonational or contextual clues) how to take these questions. It is interesting to note that there are in Finnish a number of semantically obscure particles which disambiguate sentences of this kind. For example, inserting nyt after kuka in (66b) and (66c) -- Kuka nyt ... -- resolves the ambiguity in favor of the rhetorical reading. The particle sittä seems to work the same way. One especially intriguing fact is that the clitic -han in (66a) singles out the rhetorical reading -- Eiköhän Suomi ... -- but in (66b) and (66c) it works just the other way around and forces the sincere question interpretation -- Kukahan haluaisi ... We hope that the descriptive framework we have developed can also be utilized to gain a better understanding of such puzzling phenomena.

Conclusion

In this paper we have shown how the meaning implicated by sentences containing -kin/-kaan is determined by scope and focus. The reason we need these two notions follows. The conventional implicature associated with the clitic is roughly of the form 'There is an x other than y which ...'. In other words, the clitic implicitly involves existential quantification. In order to understand what is being implicated by -kin/-kaan, we need to know two things: (i) what the focus constituent y is, and (ii) what the scope of the implicit existential quantifier is. The answer to the first question is in part indicated by the position of the clitic: -kin/-kaan occurs at the end of its focus constituent. Some ambiguity remains, however, because the placement of the clitic does not always indicate the syntactic category of the focus constituent (NP? VP? S?...), that is, how much of that which precedes constitutes the focus. The position of the clitic also gives some hints with regard to the answer to the second question. In general, quantifier phrases that occur to the left of the clitic tend to have wider scope than the implicit existential quantifier, but some ambiguities remain. One important potential ambiguity in negative sentences is resolved by the alternation between -kin and -kaan: -kaan indicates that the clitic has wider scope than
than negation, -kin marks the opposite state of affairs. The same alternation
is also used to indicate the scope of the clitic with respect to certain
quasi-negative quantifier phrases and adverbs. The connection between the
scope of the implicit existential quantifier and the form of the clitic is
somewhat obscured by a fake polarity switch in rhetorical questions and the
elimination of negation from ordinary yes/no questions. However, these trans-
formations have no effect on what is being implicated by -kin/-kaan, and the
real scope of the clitic is correctly indicated by its form even under these
circumstances.

We doubt that we could have achieved as much insight into the nature of
-kin if we had not undertaken the task of constructing explicit rules to
describe both the syntax and the meaning of sentences where the clitic occurs.
To do this successfully, one needs a descriptive framework which distinguishes
two aspects of meaning: meaning expressed and meaning implicated. This is
because the semantic contribution of -kin is entirely of the latter sort: it
has no effect on the truthconditions of sentences in which it occurs. The
extended version of Montague's model theory which we have used seems well
suited to the task.

And so we conclude a lengthy discourse on a single small particle in
Finnish. In the jungle of Finnish syntax, -kin is but a mosquito beside such
elephants as the case of the object. Yet small things are every bit as interest-
ing as large ones and just as complex. Should the reader protest that the
complexity of our analysis is inappropriate to the magnitude (or the lack of
it) of our subject, we ally ourselves with Bertrand Russell, who concluded a
difficult treatment involving the English word the with the following request
("On Denoting", 1905):

"I will only beg the reader not to make up his mind against the view --
as he might be tempted to do, on account of its apparently excessive
complication -- until he has attempted to construct a theory of his
own on the subject ... This attempt, I believe, will convince him that,
whatever the true theory may be, it cannot have such a simplicity as
one might have expected beforehand."
FOOTNOTES

*We owe much credit to Stanley Peters, who has made substantial contributions to this paper through discussion of important theoretical problems and who has developed many of the formal descriptive techniques used here. His collaboration is gratefully acknowledged.

1. In principle, we could dispense with the intermediary step of translating to intensional logic and assign model-theoretic interpretations directly to Finnish phrases. (Montague, and Lewis (1972) have shown how to do this for English.) This alternative is cumbersome and difficult to keep track of; it is more convenient to go first from Finnish to intensional logic. It is important to keep in mind that these translations do not have the importance that is usually attributed to 'semantic representations' by linguists, i.e., no claim of 'psychological reality' is made for any of the many logically equivalent formulas that represent the meaning of a given Finnish phrase.

2. Actually, the right hand side of (5) should be $\overline{PP\{^m\}}$ if we were to remain true to PTQ. Here, as elsewhere, we use individuals where Montague has individual concepts. See Bennett 1974 for a discussion of this.

3. And there are other things as well, such as Grice's conversational implicatures.

4. Since the English gloss would otherwise be even more ambiguous than the Finnish, we indicate here the 'focus' (to be explained later) of too by capitalizing the constituent in question.

5. The fact that (16a) and (16b) both justify the inference that (17) is the case is a clear indication that, at least in the latter case, the inference is based on an implicature. We are not sure, however, that this is a genuine case of conventional, as opposed to conversational, implicature (see Grice 1975). For our present purposes, it is immaterial whether our conjecture is right.

6. $F_{Kin,n}$ is a syntactic operation on two argument phrases similar in concept to a 'generalized transformation' in early writings by generative grammarians. $F_{Kin,n}(a,\phi)$ is the result of performing this operation on strings $a$ and $\phi$.

7. The formula $\gamma_0^i$ Jussi-pitää-siinta$^e_o$ in (26) is equivalent to $\gamma_0^i$ pitää$^e_o (j,x_0)$. It stands for the property of being liked by Jussi. Thus $Marja_o^0$ (Jussi-pitää-siinta$^e_o$) says that Marja has that property, i.e., Jussi likes Marja.

8. The same result could be achieved more directly by replacing the formula $\varphi_i (\,^e_o, x_n^e)$ in the translation rule (25) by $\alpha^e (\,^e_o \forall x [\neg [x=y] \land \gamma_n^e \phi^e (x)])$. 
9. The rule which replaces $se_0$ by kaksi sheikkiä in (35a) and (35b) is in other respects similar to the Kin Rule except that it does not suffix the inserted noun phrase with any clitic nor does it give rise to any conventional implicature. (The corresponding rule in Montague's PTQ is S14.)

10. The generalized Kin Rule must 'know' not only the subscript of the variable that is bound by the rule but its syntactic category as well, hence the marking 'Kin, Adj,0' on the top line of (38). This information is needed to make the translation rule work properly. For example, the existential quantifier corresponding to -kin in (37c) must range over possible adjective intensions, not over individuals as in our previous examples.

11. We also think that this is the very same -kin that shows up in exclamations, wishes, and rhetorical questions, such as Sinullapa vasta onkin tekemistä! 'You sure have a lot to do!', Kunpa hän tulisikin! 'Oh, how I wish he would come!', Kuka olisikaan kuvitellut mitään tällaista! 'Who could have imagined anything like this?', but we do not understand yet how it works.

12. In keeping with Montague's descriptive practice, we assume here that negation is introduced syntactically at the point where the subject NP and the verb phrase are combined to make a sentence. (The corresponding rule in PTQ is S17.)

13. This guarantees that there is at most one negation per sentence, which presumably is why Montague chose to set up his syntax in this particular way. Since there are many other ways to implement the same restriction, it is not an essential feature of his system.

14. This speculative explanation would be a lot more convincing if it were the case that sentences similar to (53b) with -kin substituting for -kaan were common. Unfortunately examples of this kind tend to sound a bit awkward without additional context, although they are interpreted, just as our analysis predicts, with the clitic having narrow scope with respect to the quasi-negative. Consider sentences like

(i) (Marjalla on aina rahaa, mutta) harvoin Jussillakin on rahaa.
    '(Marja always has money, but) JUSSI seldom has money too'

Under our analysis, harvoin Jussillakin on rahaa implicates that someone else besides Jussi has money. (N.B. We assume here that the sentence adverb harvoin is treated like negation, i.e. that one can attach harvoin to the sentence Jussillakin on rahaa, as in (i), or apply the Kaan Rule to Jussi and harvoin sillä on rahaa, as in (53b).)

15. At various times we have had the feeling that this is because it is just too hard to figure out what the correct form of the clitic ought to be, so
everyone has just given up trying.

16. This is because an embedded question such as pitääkö Jussi Marjasta denotes
the unit set containing either the proposition that Jussi likes Marja or the
proposition that Jussi doesn't like Marja, whichever happens to be the true
one. As a yes/no question is derived from a declarative sentence, the corre-
responding translation rule, in effect, pairs the proposition expressed by the
input clause with the proposition expressed by the negation of the input
clause. Because of the law of double negation, the end result is the same
irrespective of whether we start out with Jussi pitää Marjasta 'Jussi likes
Mary' or Jussi ei pidä Marjasta 'Jussi doesn't like Marja', as far as the
expressed meaning is concerned. Note that 'Does Jussi like Marja?' asks the
same question as 'Does Jussi not like Marja?', and vice versa.

17. While this is true for the sentences we have discussed, it is a bit of an
oversimplification, if one also takes full account of cases where -kin
focuses on something other than a noun phrase. An example is (37c), where an
adjective is in focus. The clitic could also be suffixed to the end of the
noun phrase and the adjective could be marked by stress.

(i) Marja keräilee VANHOJA postimerkkiejäkin.

'Marja collects OLD stamps too'

Furthermore, in cases where the whole sentence is in focus, the clitic
typically is suffixed to the end of the first major constituent rather than
to the end of the sentence as our example (37e) somewhat misleadingly suggests.
This is the case in the following example.

(ii) (Jätetään käymättä museossa. On niin pitkä matka. On niin vähän
    aikaa ja) SAAJAMIN SUJAA KAVASTA KASVAEN.

'(Let's not go to the museum. It's such a long way. There is so
    little time and) IT'S RAINING CATS AND DOGS too'

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