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In *Conditions on Rules of Grammar* the question is raised whether the general conditions on anaphora, such as the Specified Subject Condition, are to be formulated as conditions on the application of syntactic rules (e.g. wh-movement) or as conditions on the interpretation of surface structures in Logical Form (Chomsky, 1976).

Here the latter alternative will be explored. It will be argued that the interpretation of Quechua causative constructions, which are morphological in nature, is constrained by equivalent conditions on interpretation. If this is correct, the specified subject condition has to be formulated as a condition on Logical Form, since no syntactic structure is involved.

It will be argued here that the rules that translate syntactic structure into Logical Form operate in an unmarked way, while rules building up Logical Form out of morphological structure operate in a marked way. The difference is related to the essential differences between the syntax and the lexicon, as sketched e.g. in Jackendoff (1975: 668).

* I am grateful to R. Freidin, H. Bennis, H. den Besten, R. Bok-Bennema, W. Adelaar, C. Lefebvre, and F. Zwarts for discussions of earlier portions of this paper. Of course they are in no way responsible for the misconceptions remaining in it.
Is there, then, a strict formal division between phrase structure rules and morphological redundancy rules, or between the semantic projection rules of deep structure, and the semantic redundancy rules? I suggest that perhaps there is not, and they seem so different simply because of the differences in their normal mode of operation. These differences in turn arise basically because lexical rules operate inside words, where things are normally memorized, while phrase structure rules operate outside words, where things are normally created spontaneously.

The conception of markedness defended here claims that not the individual components of the grammar (the base, the transformational component, the word formation component, etc.) are subject to markedness conventions, but rather that it is the interpretation of these systems in terms of either phonetic or semantic representations which can be marked or unmarked. In the familiar outline of the grammar as sketched in Chomsky (1980):

\[
\begin{array}{c|c}
\text{deletion} & \text{construal} \\
\text{filters} & \text{interpretive rules} \\
\text{stylistic \\ \\ \\ phonological} & \text{conditions on} \\
\text{trf} & \text{binding} \\
\end{array}
\]

it is the interaction of the components which is subject to markedness. Not the rules of word formation themselves, which are involved in Quechua causative formation, are marked in nature, but the way that causatives are interpreted.

This paper is organized as follows:

In I the general descriptive framework is sketched used here to deal with Quechua morphology: word formation rules and cyclically operating interpretation rules. A distinction is proposed on the level of semantic interpretation between « inflectional » and « derivational » morphology, related to the distinction made in Chomsky (1975) between Logical Form and Semantic Interpretation.

In section II an informal account is given of Quechua reciprocals, reflexives, causatives, and object markers, the categories
dealt with in this paper. Then the interpretative rules for these categories are presented.

Section III describes the ways in which causatives, reciprocals, reflexives, and object markers interact in Quechua verb forms. The principle of successive cyclic operation, combined with very general principles such as Disjoint Reference, the Nominative Island Condition, the Opacity Condition, and Locality principles ensure the correct interpretations.

In section IV we return to the issue of markedness. Some evidence for markedness is explored, and the issue of in what sense Quechua causatives exactly constitute a marked phenomenon.

1. The descriptive framework

1.1. The interpretation of word structure

In Muysken (1978) a theory was sketched of Quechua word structure, which can be formulated as follows. Successive application of word formation rules that add suffixes leads to a hierarchical word structure, which is cyclically interpreted. Each word formation rule includes a specific translation rule. When in a given string the verb form has been interpreted, the other elements in the clause are related to it, through a process here described as LINKING.

In a sentence such as the following:

(2) \( \text{ñuka-ga wagra-ta riku-rka-ni} \)

I TO cow AC see PA Is

'I saw a cow'.

(3) 

\[ \begin{array}{c}
\text{S} \\
\text{NP} \quad \text{VP} \\
\text{ñuka-ga} \quad \text{wagra-ta} \quad \text{riku-rka-ni} \\
\end{array} \]

first /riku-rka-ni/ is interpreted:
Then /ñuka-ga/ « I » is linked to (1), and /wagra-ta/ « cow AC » to (y). A fully interpretable form results:

(5)  PAST (I (SEE, COW))

The assumption that the building up of Logical Form proceeds cyclically is crucial to the arguments presented in this paper. It will be used throughout. A sharp distinction will be maintained between morphology and syntax. Apart from a few cases, irrelevant here, Quechua morphological elements are generated by word formation rules. These include the causative suffix, the reciprocal, the reflexive, and the subject, object, and tense marking suffixes.

Normally, morphological elements remain uninterpreted at the level of Logical Form, and are only analyzed at the level of Semantic Interpretation. In most languages, however, inflectional elements of the categories Tense, Person, Number, and Case, are interpreted at the level of Logical Form.

If we assume that lexical analysis proceeds cyclically, it may be that not all morphological structure is interpreted at once: normally what is often called « derivational morphology » remains uninterpreted. Schematically, we find the following situation in natural languages (for the sake of simplicity I am using the example of a suffixing language; I hope the schema can be generalized):

(6)  

In the above diagram, the suffixes l...n are analyzed at the level of Logical Form, and the suffixes i...k at the level of Semantic Interpretation, together with the Root.
This division of the morphology into two parts solves an apparent paradox which emerges if we adopt the idea that the morphology is interpreted « from the inside outwards »: in most if not all languages « derivational » morphology is internal to « inflectional » morphology, but it is not interpreted in the same way before « inflectional » morphology. Here it is assumed that it simply remains uninterpreted as part of the predicate at the level at which inflectional interpretation takes place, from the inside outward.

What I would like to argue, then, is that languages differ in the extent to which morphological material is analyzed at the level of Logical Form, and that the very substantial interpretation of Quechua morphology at that level constitutes the marked case.

A much stronger claim would be that all interpretation of morphological material at the level of Logical Form is marked. This would be tantamount to the claim that non-inflecting languages represent the unmarked case. I do not think that claim can be defended very easily, although it merits investigation.

The much more reasonable claim would be that certain specific categories, such as the ones listed above, may be interpreted at the level of Logical Form without leading to increased markedness. The strongest candidates at the present moment would be Case and Tense, since both play a role in the binding conditions operating on that level. Quite possibly, other categories may be involved as well. Rather than surveying a wide number of languages, it may be most fruitful to develop a theory from which a specification of the categories involved would follow.

1.2. Causatives: a preliminary typology

I assume that there are three types of causatives: lexical causatives, morphological causatives, and syntactic causatives. The distinction between these three types is crucial to the argument in this paper.

Lexical causatives (such as English *kill*) and morphological causatives (such as we find in Turkish and Quechua) have in common that in syntactic structure they appear dominated by a single V node, and that they do not involve clause embedding. They differ in that lexical causatives are not analyzed by the translation rules converting syntactic structure into Logical Form, while morphological causatives are.

Morphological causatives differ from syntactic causatives in
that the latter involve S complementation, while the former do not, as was indicated before. They have in common that both are interpreted as complex predicates on the level of Logical Form.

In several Quechua dialects we find a difference between lexicalized causatives, such as Imbabura Quechua (Northern Ecuador) wanchi- /« kill », and morphological causatives such as /wañu-chi-/ « cause to die ». They differ not only semantically, but also in the way they are analyzed in Logical Form. I would like to claim that (7) has (8) as its Logical Form, while (9) has (10) as its Logical Form. Compare:

(7) Manil wagra-ta wanchi-rka-0.
Manuel cow AC kill PA 3
'Manuel killed a cow'.
(8) PAST (MANUEL (KILL, COW))
(9) Manil wagra-ta wañu-chi-rka-0.
Manuel cow AC die CAU PA 3
'Manuel caused a cow to die'.
(10) PAST (MANUEL (CAUSE (COW (DIE))))

Thus (7)-(8) and (9)-(10) differ significantly on the level of Logical Form: only the latter is interpreted there as a complex predicate. On the level of Semantic Interpretation they differ only in minor ways.

Summing up, we can schematically represent the three-way division as follows:

(11) syntactically simplex at the simplex level of LF

<table>
<thead>
<tr>
<th>syntactic causatives</th>
<th>morphological causatives</th>
<th>lexical causatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>(e.g. French faire, Dutch laten)</td>
<td>(e.g. Quechua, Turkish)</td>
<td>(e.g: kill, /wanchi-/)</td>
</tr>
<tr>
<td>—</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

It is with these distinctions in mind that we can formulate the concept of markedness defended in this paper.

If we analyse Quechua causative interpretation at the level of
Logical Form as a marked phenomenon, we may have a partial answer to the question of which elements of morphology are interpreted in Logical Form in the unmarked and which in the marked case. We could simply say that interpretation which leads to a lack of parallelism in complexity between the syntax and the Logical Form is marked, interpretation which preserves the parallelism is unmarked.

Schematically we can represent the options given in (11) as follows:

\[(12) \begin{array}{ccc}
\text{syntactic causatives} & \text{morphological causatives} & \text{lexical causatives} \\
\text{SYNTAX} & \begin{array}{c} u \\ m \end{array} & \begin{array}{c} u \\ m \end{array} \\
\text{LOGICAL FORM} & \begin{array}{c} u \\ m \end{array} & \begin{array}{c} u \\ m \end{array}
\end{array}\]

The fourth option available, a complex structure at the level of the syntax, a simplex one at the level of the Logical Form, is the one corresponding to certain idioms presumably.

This notion of marked interpretation of morphological material would need considerable elaboration and refinement, before it can be extended to other cases. At this point we can do no more than regard it as the starting point for further research.

2. The Quechua suffixes and their interpretation

2.1. Causatives in Quechua

Causatives in Quechua are formed by adding the suffix /-chi-/ to a verb. Thus we find:

\[(13) \begin{array}{l}
\text{puñu-} & \text{‘sleep’} \\
\text{puñu-chi-} & \text{‘cause to sleep’} \\
\text{miku-} & \text{‘eat’} \\
\text{miku-chi-} & \text{‘cause to eat’}
\end{array}\]

We have /-chi-/ both with transitive and with intransitive verbs. It can be interpreted as a coercive and as a permissive:
The process of causative affixation in Quechua seems to be completely productive with verbs. In addition, we find it improductively used with nouns:

(15) miza-chi- ‘to have a mass said’
waira-chi- ‘to cause wind, to fan’

The latter category will not concern us here.

There is some dialect difference with regard to the way in which the logical subject and object of the underlying verb are marked. When the underlying verb is intransitive, we find that its subject is marked accusative, with /-ta-/:

(16) pay-ta puñu-chi-ni
he AC sleep CAU Is
‘I cause him/her to sleep’.
pay puñu-n
he sleep 3
‘he/she sleeps’.

With transitive verbs, we find three configurations. The underlying object is marked accusative, but the underlying subject is either marked dative, with /-man/, instrumental, with /-wan/, or accusative:

(17) pay papa-ta miku-n
he potato AC eat 3
‘he/she eats potatoes’.
\[
\begin{array}{c}
\text{pay} \quad \begin{cases}
-\text{man} \\
-\text{wan} \\
-\text{ta}
\end{cases} \\
\text{papa-ta miku-chi-ni}
\end{array}
\]
he potato AC eat CAU Is
‘I make him eat potatoes’.

The latter type of dialects, in which both NP’s are marked accusative, appears to be rare. In this paper, we will focus on dialects which mark the underlying subject in the instrumental case, /—wan/.

In some dialects (cf. Bills, 1969) there is a difference between
underlying subjects, marked with dative /-man/, and underlying agent phrases, marked with /-wan/, the instrumental case:

    doctor DAT mother AC cure CAU Is
    ‘I have the doctor cure the mother’.

    doctor INS mother AC cure CAU Is
    ‘I have the mother cured by the doctor’.

This distinction corresponds neatly to the one between faire-à and faire-par causatives discussed by Kayne (1975):

(19) Je fais curer maman au médecin
    Je fais curer maman par le médecin

Interestingly enough, there is no real passive construction in Quechua that includes an agent marked with the /-wan/ case. Thus (18) b. could not be derived through a passive transformation on the underlying clause.

So far, the terms « underlying subject », « underlying verb », etc. have been used quite freely. This was not meant literally, however. I will assume here without argument that Quechua causatives are not derived via a Raising transformation of the type postulated in Aissen (1975) and other work, but that they correspond to simplex sentences in underlying and in derived structure.

Sentences such as (18) a. would then simply have a structure such as (20):

(20)  
  S
     /\  
    NP VP
       /\   
      NP NP V
     [-man] [-ta] [. . . -chi-]

The various NP’s in the VP would be interpreted through their case-marking and the object marking (for first and second person) of the verb.
2.2. Reciprocal marking

In Quechua, reciprocality is not indicated by a pronoun, but rather by a verbal marker, /-naku-/.

\[
\begin{align*}
(21) & \quad \text{riku-n-ku} & \text{they see'}. \\
& \quad \text{see 3 PL} \\
& \quad \text{riku-naku-n-ku} & \text{they see each other'}. \\
& \quad \text{see REC 3 PL} \\
(22) & \quad \text{maka-nchik} & \text{we hit'}. \\
& \quad \text{hit 1 PL} \\
& \quad \text{maka-naku-nchik} & \text{we hit each other'}. \\
& \quad \text{hit REC 1 PL}
\end{align*}
\]

In some dialects, we find reciprocal markers used with intransitive verbs. In such cases, it indicates that the action is performed together, and /-naku-/ functions as a plural marker:

\[
\begin{align*}
(23) & \quad \text{puri-naku-rka-∅} & \text{they walked'}. \\
& \quad \text{walk REC PA 3}
\end{align*}
\]

In many dialects, the suffix /-naku-/ is separable into /-na-/ and /-ku-/. Here it seems that /-na-/ refers to the reciprocality of the action, and /-ku-/ to its reflexivity. This matter will be taken up again later.

2.3. Reflexive marking

Reflexivity is only one of the interpretations of the Quechua suffix /-ku-/; it often has a medial interpretation, or a medio-passive one. Thus the following form has four interpretations:

\[
\begin{align*}
(24) & \quad \text{riku-ku-n} & \text{he sees himself'}. \\
& \quad \text{see RE 3} \\
& \quad \text{he sees it for his own benefit'} \\
& \quad \text{he often sees it'} \\
& \quad \text{it appears'}
\end{align*}
\]

Here we will focus on the reflexive interpretation.

2.4. Object marking

Quechua verbs can be marked both for subject and for object person marking. There are four persons; these can be distinguished with the
aid of the features $[\pm I]$ and $[\pm II]$. I will not give the whole paradigm here, but describe individual cases as they turn up in the examples. It is important to note here that object marking does not occur for the third person, $[I, II]$, and that object marking does not only refer to accusative objects, but to any NP’s in the domain of $V$. An example:

(25) riku-wa-n see lob 3 'he sees me'.

The most detailed description of Quechua person marking can be found in Lefebvre & Dubuisson (1978).

2.5. The translation rules

The preliminary formulation of the translation rules used in this paper to map morphological structure onto Logical Form are the following:

causative

(26) $V$-chi- $\Rightarrow$ x (CAUSE ($V$))

Embed the predicate expressed by the verb in the domain of $/-chi/-$ as an argument to a causative predicate.

reciprocal

(27) $V$-naku- $\Rightarrow$ $x_p$ (V . . . $y_{rec}$)

Bind the subject of the predicate expressed by the verb in the domain of $/-naku/-$ with a reciprocal argument.

Later on we shall have to modify this interpretation rule by splitting it up into a $/-na/-$ translation rule and a $/-ku/-$ translation rule, which would be in fact the reflexive rule.

(28) $V$-na- $\Rightarrow$ x (V . . . $y_{rec}$)

Mark a given argument as the reciprocal anaphor. This argument cannot be the subject of the verb in the domain of $/-na/-$.

It will be seen that the combination of the $/-na/-$ and the $/-ku/-$ rules yields the output of the $/-naku/-$ rule, with some problems to be discussed later.

reflexive

(29) $V$-ku- $\Rightarrow$ x$_i$ (V . . . $y_i$)
Bind the subject of the predicate expressed by the verb in the domain of /-ku-/ with an anaphor.

**object marking**

\[ V \left[ \alpha \ I \ \ \beta \ II \right] \Rightarrow x \ (V \ldots \left[ \alpha \ I \ V \ \beta \ II \right] \]

Interpret an argument which is not the subject of the predicate expressed by the verb in the domain of the object marker as being marked for \([\alpha \ I, \beta \ II]\).

**subject marking**

\[ V \left[ \alpha \ I \ \ \sub \beta \ II \right] \Rightarrow \left[ \alpha \ I \ \ x \ \beta \ II \right] (V \ldots \]

Interpret the subject of the predicate expressed by the verb in the domain of the subject marker as being marked for \([\alpha \ I, \beta \ II]\).

I will ignore Tense, Aspect, Mood, etc. specifications in the forms discussed here. I will also use abbreviatory conventions for the marking of the persons, as follows:

\[ \left[ +1 \right] = \ 1; \ \left[ -1 \right] = \ 2; \ \left[ -1 \right] = \ 3; \ \left[ +1 \right] = \ 4 \]

4 is the so-called first person inclusive, which includes both speaker and hearer.

Before going on to the interaction between the translation rules presented, it would be useful to elucidate the theoretical concepts involved in their formulation. First of all, the notion « subject » is employed, and it would be one of the claims of this paper that this notion is crucial to the version of Logical Form sketched here.

No crucial claims are involved in the use of the term « predicate expressed by the verb », however, as long as it is clear that predicates as they are used here can have subjects. More important is the notion « In the domain of » a given suffix. It is used here in the familiar sense of c-commanded by. It is important, however, that only the verb immediately c-commanded by the suffix (disregarding tense markers, aspect, and other extraneous morphological material) is referred to. Consider for instance a configuration such as the following:
In this configuration the subject of $V_j$ is distinct from the subject of $V_i$. And the subject marking rule only should refer to $V_j$, not to $V_i$. This is one of the ways in which the morphological rules are bound by locality principles.

Further refinements of the conditions of operation of the translation rules will be given throughout this paper.

3. The interaction between causatives and other processes

3.1. Causatives and reflexives

The most intricate pattern of interaction between causatives and reflexives we find in the dialects of central Peru. Relevant examples include:

(34) a. mayla-chi-ku-n 'he causes someone to wash
    wash CAU RE 3 him,' ('se hace lavar').
    b. mayla-ku-chi-n 'he causes someone to wash
    wash RE CAU 3 himself,'
       ('hace que otro se lave').

(35) a. maqa-chi-ku-n 'he lets himself be beaten'.
    hit CAU RE 3
    b. maqa-ku-chi-n 'he causes someone to beat
    hit RE CAU 3 himself.'

These examples, (34) from Tarma (Adelaar, 1977) and (35) from Junín (Sayk, 1974), pattern the same way, and since other examples also follow this pattern, we'll assume it to be general.

We assume that the translation rules have access to information about the number of arguments that a given verb or predicate has. Thus the cyclical interpretation of the forms in (35) will be:
In both cases, the theory of cyclic operation of interpretation rules produces exactly the right type of results: the difference in meaning between the (a) cases and the (b) cases follows from the cyclic operation of the rules.

The interesting aspect of these derivations is the particular way in which reflexivity operates. The (b) case is unproblematic in that reflexivity holds between the two arguments of the embedded predicate. In the (a) case, however, the subject of the causative predicate is linked to one of the arguments of the embedded predicate, specifically to the non-subject argument. This is consistently the case for the two examples cited, and is more specific than the translation rule formulated before, which allowed assignment of the anaphoric index to be free.

We will return to this problem at the end of this section.

3.2. Causatives and reciprocals

The interaction between causatives and reciprocals is considerably more complicated than the one between causatives and reflexives. In the dialects of Ancash and Huanca, also located in central Peru, we find the following cases (all examples are from Cerrón Palomino’s treatment of Huanca Quechua (1976)):

\[
\begin{align*}
(37) \quad & V\text{-chi-naku-} \\
& V\text{-naku-chi-} \\
& V\text{-na-chi-ku-}
\end{align*}
\]

It is possible that there is a partial overlap between the reflexive and the reciprocal in the last sequence given. This possibility will be explored later.
The relevant examples are the following:

(38) ariiti-n-ta lika-chi-na-ku-yka-n
earring3 AC see CAU REC DUR 3
‘They are showing each other their earrings’

\[ \text{ cycle 1 } \quad x \ (\text{SEE, } y) \]
\[ \text{ cycle 2 } \quad z \ (\text{CAUSE (x (SEE, y)))} \]
\[ \text{ cycle 3 } \quad z_{pl} \ (\text{CAUSE (x}_{rec} (\text{SEE, y)))} \]
\[ \text{ cycle 4 } \quad \text{durative} \]
\[ \text{ cycle 5 } \quad \text{3pl (CAUSE (3}_{rec} (\text{SEE, y)))} \]

(39) kikin-pula-lka-m likcha-chi-na-ku-lqa-0
self among DEL AF wake up CAU REC PA 3
‘Among themselves they caused each other to wake up’

\[ \text{ cycle 1 } \quad x \ (\text{WAKE UP}) \]
\[ \text{ cycle 2 } \quad y \ (\text{CAUSE (x (WAKE UP)))} \]
\[ \text{ cycle 3 } \quad y_{pl} \ (\text{CAUSE (x}_{rec} (\text{WAKE UP)))} \]
\[ \text{ cycle 4 } \quad \text{past tense} \]
\[ \text{ cycle 5 } \quad \text{3pl (CAUSE (3}_{rec} (\text{WAKE UP)))} \]

In both cases, the subject argument of the causative predicate is related to the subject argument of the embedded predicate.

Next we turn to the sequence V-naku-chi-; it is interpreted quite straightforwardly:

(40) pay-mi taka-na-ku-chi-yka-n walash-kuna-kaq-ta
he AF beat REC CAU DUR 3 boy PL DEF AC
‘he is causing the boys to beat each other’

\[ \text{ cycle 1 } \quad x \ (\text{BEAT, } y) \]
\[ \text{ cycle 2 } \quad x_{pl} \ (\text{BEAT, } y_{rec}) \]
\[ \text{ cycle 3 } \quad z \ (\text{CAUSE (x}_{pl} (\text{BEAT, } y_{rec}))) \]
\[ \text{ cycle 4 } \quad \text{durative} \]
\[ \text{ cycle 5 } \quad \text{3 (CAUSE (x}_{pl} (\text{BEAT, } y_{rec}))) \]

(41) wik qaqli-kaq-mi triqni-na-ku-chi-ma-nchik
that bast. DEF AF hate REC CAU 4ob 3su
‘that bastard makes us hate each other’

\[ \text{ cycle 1 } \quad x \ (\text{HATE, } y) \]
\[ \text{ cycle 2 } \quad y \ (\text{CAUSE (x (HATE)))} \]
\[ \text{ cycle 3 } \quad y_{pl} \ (\text{CAUSE (x}_{rec} (\text{HATE)))} \]
\[ \text{ cycle 4 } \quad \text{past tense} \]
\[ \text{ cycle 5 } \quad \text{3pl (CAUSE (3}_{rec} (\text{HATE)))} \]
In both cases, the reciprocal relation holds between the arguments of the embedded predicate, and they are non-coreferential with the argument of the causative predicate. The object marking rule will be discussed later in detail.

The third case is the most complicated one: V-na-chi-ku-. Obviously the reciprocal rule as it has been interpreted so far can not be used here. The relevant examples are the following:

(42) wamla-kuna-kag lika-na-chi-ku-n Albirtu-wan
girl PL DEF see CAU 3 Alberto INS
‘The girls let Alberto see them’.

(43) wipya-na-chi-ku-qla-ali-nki-man-tak
beat CAU EDU PL 2 POT EMP
‘Don’t let yourselves get beaten up’.

In both cases we find that the configuration /-chi-ku-/ is interpreted quite like the reflexive /-chi-ku-/ described earlier:

(44) V-chi-ku- ⇒ x₁ (CAUSE (y₁ (V, z₁)))

Here the subject argument of the causative is linked to a non-subject argument of the embedded predicate.

The main difference, then, between the third type of reciprocal and the reflexive discussed before is that the reflexive refers to a (not necessarily plural) identity relation, and the reciprocal to a plural reciprocality relation. What then, is the translation rule for /-na-/ in (42) and (43)? Suppose we wrote a rule such as:

(45) V-na ⇒ x (V, y_rec)

The rule would label a non-subject argument as the second element in a potential reciprocality relation. Later translation rules and general conditions would be needed to provide an antecedent, and verbs which would just include /-na-/ would not be well-formed.

Consider how the rules as sketched would interpret the examples given:
(46) lika-na-chi-ku-n

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x (SEE, y)</td>
</tr>
<tr>
<td>2</td>
<td>x (SEE, (y_{rec}))</td>
</tr>
<tr>
<td>3</td>
<td>(z) (CAUSE (x (SEE, (y_{rec}))))</td>
</tr>
<tr>
<td>4</td>
<td>(z_i) (CAUSE (x (SEE, (y_{rec,i}))))</td>
</tr>
<tr>
<td>5</td>
<td>(3_{pl}) (CAUSE (x (SEE, (3_{rec}))))</td>
</tr>
</tbody>
</table>

(47) wipya-na-chi-ku-la-ali-nki-man-tak

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x (BEAT UP, y)</td>
</tr>
<tr>
<td>2</td>
<td>x (BEAT UP, (y_{rec}))</td>
</tr>
<tr>
<td>3</td>
<td>(z) (CAUSE (x (BEAT UP, (y_{rec}))))</td>
</tr>
<tr>
<td>4</td>
<td>(z_i) (CAUSE (x (BEAT UP, (y_{rec,i}))))</td>
</tr>
<tr>
<td>5</td>
<td>eductive</td>
</tr>
<tr>
<td>6</td>
<td>(z_{pl}) (CAUSE (x (BEAT UP, (y_{rec}))))</td>
</tr>
<tr>
<td>7</td>
<td>(2_{pl}) (CAUSE (x (BEAT UP, (2_{rec}))))</td>
</tr>
</tbody>
</table>

Given some minor adjustment rules which relate reciprocals and reflexives, the solution sketched produces the correct results.

What is the relation between /-na-/ and /-na-ku-/, however? It would be optimal if the translation rule for /-na-ku-/ would be the combination of the /-na-/ and /-ku-/ translation rules. In non-interacting reciprocals, this is indeed the case:

(48) lika-na-ku-n  ‘they see each other’

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x (SEE, y)</td>
</tr>
<tr>
<td>2</td>
<td>x (SEE, (y_{rec}))</td>
</tr>
<tr>
<td>3</td>
<td>(x_i) (SEE, (y_{rec,i}))</td>
</tr>
<tr>
<td>4</td>
<td>(3_{pl}) (SEE, (3_{rec}))</td>
</tr>
</tbody>
</table>

With interacting reciprocals, we find three configurations, as we have seen, which can be represented schematically as follows:

(49) V-na-chi-ku-
    V-chi-na-ku-
    V-na-ku-chi-

\[
\begin{align*}
\text{X}_{pl} & \quad \text{Y} & \quad \text{Z}_{rec} \\
\text{X}_{pl} & \quad \text{Y}_{rec} & \quad \text{Z} \\
\text{X} & \quad \text{Y}_{pl} & \quad \text{Z}_{rec}
\end{align*}
\]

Here \(x\) refers to the subject argument of the causative predicate, \(y\) to the subject argument of the embedded predicate, and \(z\) to a non-subject argument of the embedded predicate.

A moment’s reflexion reveals that all three cases can be handled properly if we reformulate the /-ña-/ translation rule as follows, crucially employing the notion « non-subject argument of a given
predicate »:

\[ V-na- \Rightarrow x (P, \ldots y_{rec} \ldots) \]

In the first and third configuration given in (49), only one such argument is available at the moment the translation rule applies: the non-subject argument of the embedded predicate, \( z \). In the second configuration, \( y \) and \( z \) are available in principle for the /-na-/ translation rule, since they are both non-subject arguments of the relevant predicate, which is the causative one. We assume general principles, to be investigated later, lead to the choice of \( y \) as the target argument.

Let us return for a moment to the interactions between causatives and reflexives, and see whether they can be fitted into the same framework. Above, we have been assuming a /-ku-/ translation rule formulated roughly as follows (involving the same notion « non-subject argument of a given predicate »).

\[ V-ku- \Rightarrow x_i (P, \ldots y_i \ldots) \]

« relate the subject argument of the predicate in the domain of /-ku-/ to an argument which is not the subject of that predicate (but which may be the subject of a different predicate) ».

When the /-ku-/ translation rule does not interact with any other rule, obviously the only argument available is a non-subject argument of the same predicate:

\[
\begin{array}{ccc}
\text{cycle 1} & \text{lika-ku-n} & \text{‘he sees himself’}.\\
\text{cycle 2} & x (\text{SEE, } y) & x_i (\text{SEE, } y_i) \\
\text{cycle 3} & 3_i (\text{SEE, } 3_i) & 3_i (\text{SEE, } 3_i)
\end{array}
\]

With interacting reflexives, we find two configurations:

\[
\begin{array}{ccc}
\text{cycle 1} & \text{V-ku-chi-} & x \\
\text{cycle 2} & \text{V-chi-ku-} & x_i \\
\text{cycle 3} & & y \\
\end{array}
\]

The first configuration is similar to (53). The second one is similar to the first configuration above in (49), which was also a /-chi-ku-/ configuration.

The /-na-/ translation rule and the /-ku-/ translation rule can have different effects. Consider, once again, (54):
Here the two translation rules have applied independently, producing an uninterpretable result, since now $x_{\text{rec}}$ has no antecedent, not being linked to $z$ by the /-ku-/ rule.

How can we avoid such cases of misgeneration? One way would be to allow the /-na-/ translation rule to freely select either argument, and to restrict the /-ku-/ interpretation rule to the non-subject argument of the embedded verb, as (53). Only one of the two possible outcomes is interpretable, given independent conditions on binding, which state that no anaphor can be free within a given opaque domain (Chomsky, 1980).

A more radical approach leaves both /-na-/ and /-ku-/ translation free in their choice of arguments. There will be four possible outcomes:

(55)  
\begin{align*}  
a. & \quad * \ x_i \quad y_i \quad z_{\text{rec}} \\
b. & \quad x_i \quad y \quad z_{\text{rec},i} \\
c. & \quad * \ x_i \quad y_{\text{rec}} \quad z_i \\
d. & \quad x_i \quad y_{\text{rec},i} \quad z \\
\end{align*}

Two outcomes are ruled out by the opacity condition, and two outcomes are interpretable, which is the desired result.

We will assume that the account given before holds: (55b) is associated with the /-na-chi-ku-/ sequence, and (55d) with the /-chi-na-ku-/ sequence. The general principle which determines the interpretation of /-chi-na-ku-/ as (55d) may well be some version of the Locality Principle as proposed by Koster (1978): When the possible arguments available for the assignment of reciprocal anaphors (the /-na-/ translation rule) are:

(56)  
\[ x \ (V \ldots y \ldots z) \]

the Locality Principle predicts that $y$ is selected.

Above we have been tacitly assuming that the /-ku-/ translation rule was free in its choice of anaphors (cf. (55)). This would mean that the data presented in (34a) and (35a) were incomplete. Indeed we find in Ayacucho Quechua (Parker, 1965) ambiguous forms such as:
(57) suwa-chi-ku-nki
rob CAU RE 2s
‘You permit yourself to rob y/You permit y to rob you’.

It can be schematically represented as:

(58) \[ x_i \quad y_i \quad z \]
\[ x_i \quad y \quad z_i \]

Obviously, more and more detailed data are needed to decide this issue. The general idea would be that dialects can differ to the extent that the Locality Principle is applied in absolute (proscribing certain interpretations) or in relative terms (suggesting a preferred interpretation).

3.3. Causatives and object marking

The translation rule for object marking can be formulated quite straightforwardly. Object marking can only appear in penultimate or ante-penultimate position in the verb form, following reciprocal, causative, and reflexive. Consider the following examples:

(59) maxa-chi-ma-n Tarma (Adelaar, 1977)
hit CAU lob 3
‘He causes me to hit y/He causes y to hit me’.

(60) triqni-na-ku-chi-ma-nchik (= (41))
Huanca (Cerrón Palomino, 1976)
hate REC CAU 4ob 3su
‘He makes us hate each other’.

(61) riku-na-qi-sa-ykichik Ayacucho (Parker, 1965)
see REC CAU 1FU 2pl ob
‘I will cause you (pl) to see each other’.

(62) kuska-na-ku-ra-chi-wa-nchik Ayacucho (Parker, 1965)
go t. REC CON CAU 4ob 3su
‘He forces/permits us (inc) to keep going together’.

In this last example we find the sequence /-na-chi-/ without /-ku-/ because in Ayacucho Quechua there is an optional rule of /-ku-/ deletion in the context /-chi-.

All cases can be interpreted fairly straightforwardly if we assume a translation rule of the following type:
Again, in the case of non-interacting object marking, assigning the features $[\alpha I, \beta II]$ to a non-subject argument is limited to arguments of the same predicate:

$$V^{[\alpha I]}_{[\beta II]_{obj}} = x \left( P \ldots \left[ \alpha I \right]_{\beta II} \ldots \right)$$

In the cases (55)-(62), however, which all involve complex predicates and the structure $x$ (CAUSE ($y (P, z)$)), both arguments of the embedded predicate, $y$ and $z$ are available in principle for object marking. I will schematically represent the predicate structure of the forms in (59)-(62) prior to object marking:

$$x (CAUSE (y (HIT, z))) = (59)$$
$$x (CAUSE (y_{pl} (HATE, z_{rec}))) = (60)$$
$$x (CAUSE (y_{pl} (SEE, z_{rec}))) = (61)$$
$$x (CAUSE (y_{pl} (GO TOGETHER, z_{rec (?)}))) = (62)$$

Of these forms, the first one shows that any argument which is not the subject can be marked as object. In two cases, only the subject of the embedded predicate can be the target of the object marking rule, since it is the antecedent to the reciprocal anaphor, (66)-(67). Note that if the reciprocal anaphor itself were marked for person, we find an improper binding relationship:

$$x_{pl} \ldots \left[ \alpha I \right]_{rec}$$

where $y$ does not precede and c-command $x$.

We can leave the object marking rule to apply quite freely, and then only allow the interpretable indexations, which are the ones given above.

The final case involves a one-place predicate, possibly. If we have to interpret /kuska-/ « go together » as transitive in Quechua, it would be subject to the same restrictions as (66) and (67).

3.4. Conditions on interpretation

We have sketched a model in which interpretive rules operate on free-
ly generated morphological structures, creating structures in Logical Form. These rules have specific properties:

1. They crucially involve the notion « subject » in their formulation;
2. They are not dependent on individual lexical items, except in that they are associated with specific morphological elements, such as /-chi-/ « causative », etc. No information is needed on whether a given verb is transitive or intransitive, what type of arguments it involves, etc. This type of information is only available at the level of Semantic Interpretation, where properties of the lexicon play an essential part.

The interpretive rules are quite general, and are themselves constrained by quite general conditions. In section 3.2. we have already seen that in some cases general Locality Principles apply to link an antecedent to the nearest reflexive anaphor. Also the Opacity Condition or some similar condition is needed to establish the antecedent of the reciprocal anaphor associated with it.

\[
(70) \begin{align*}
a. & \text{ lika-na-chi-ku-n} & \text{they cause x to see each other}\leftarrow\text{REC CAU REF 3} \\
b. & * x_i & y_i & z_{rec} \\
c. & x_i & y & z_{rec,i}
\end{align*}
\]

It also serves as was mentioned before to rule out forms in which /-na-/ is generated without /-ku-/:

\[
(71) \begin{align*}
a. & * \text{ lika-na-n} & \text{see REC 3} \\
b. & * x & y_{rec}
\end{align*}
\]

In the structure of Logical Form (71b) the second term \(y_{rec}\) is free in the relevant domain, and it is an anaphor. Only the interpretive rule associated with /-ku-/ can serve to bind /-na-/ anaphors, and therefore /-na-/ can never occur without /-ku-/. This is a highly desirable result, since a cooccurrence constraint on /-na-/ and /-ku-/ in the morphology would involve a violation of Siegel’s subjacency condition (1978).

Another general condition limiting the possible structures at the level of Logical Form is Disjoint Reference: all cases in which /-ku-/
interpretation has not linked an antecedent and an anaphor as being coreferential, are marked as non-coreferential. Thus in (70c), to take a simple example, the second term \( y \) is automatically marked as being disjoint in reference from the first and the third terms \( x \) and \( z \).

A final condition which can be fruitfully exploited to constrain the structures occurring at the level of Logical Form in Quechua is the Nominative Island Condition (cf. Chomsky, 1980). It states that:

\[(72)\] No nominative anaphor can be free in \( S \).

It is formulated to rule out sentences such as (73):

\[(73)\] *Each other went to the bar.

With regard to Quechua verbal morphology, it can be interpreted as prohibiting verbs without subject marking. Consider (74) and (75):

\[(74)\]
- a. lika-nki
- b. see \( 2 \)

\[(75)\]
- a. *lika-
- b. see

\[(76)\]
- a. lika-nki
- b. see \( 2 \)
- c. * x (SEE, \ldots)

What we would like to claim is that (75) is ungrammatical because \( x \) is not bound in the relevant domain, while (74) is grammatical because there the subject is bound by the agreement marker /-nki/.

Here we have seen that the Nominative Island Condition applies to rule out ungrammatical strings. It can also apply to rule out incorrect interpretations of a grammatical string, as is argued in Muysken (1978). Suppose the person marker interpretation rules would be formulated without reference to subject. Then (74), repeated here as (76) would have two interpretations:

\[(76)\]
- a. lika-nki
- b. see \( 2 \)
- c. * x (SEE, \ldots)

Here (76c) would not be ruled out as an interpretation of (76a) because of the formulation of the interpretive rule, but by the Nominative Island Condition.
4. Markedness

We will now return to the question posed in an earlier section: what type of evidence do we have that the grammar of Quechua causatives is in fact marked, and in what sense is it marked?

4.1. Types of evidence for markedness

Evidence for markedness we may find in several places:

(a) interlinguistic evidence, relating to the distribution of particular grammatical rules or rule systems in the languages of the world;

(b) diachronic and dialect evidence, relating to the distribution and development of particular rules within a given language or language family;

(c) acquisition evidence, relating to the acquisition by children, primarily, of the rules of a grammar.

In later work we hope to return to the acquisition evidence for the claims presented. Here we will focus on evidence of types (a) and (b).

4.1.1. Interlinguistic evidence

Some of the papers in the Shibatani volume on causative constructions (1976) provide relevant evidence for the question of whether causatives of the type discussed in this paper are frequent or rare among the languages of the world. Zimmer (1976) discusses relevant facts from Turkish, French, Hindi, and Italian, commenting on earlier claims by Aissen (e.g. 1974) that some of the rule-interactions which are claimed to be marked here for Quechua in fact do not exist.

Much further research is needed, but the general picture that emerges is that:

A. Any type of interaction between morphological causatives and reflexives and reciprocals is infrequent;

B. Specifically, the situation in which the arguments of the embedded predicate bear a reflexive or reciprocal relationship is highly infrequent.

Of course, the major problem with interlingual comparisons is that we often do not know very much about the specifics of the
languages involved. For this reason evidence from dialect variation or from acquisition may be more accessible and reliable on the short term.

4.1.2. Dialect evidence

Since a large part of the insight we have into the development of Quechua comes from dialect research, the earliest written source being from 1560, we will limit ourselves here to a dialect comparison.

The sequences of suffixes that we have to account for are the following:

(77)  
   a. chi na ku  
   b. na ku chi  
   c. na chi ku  
   d. chi ku  
   e. ku chi

These suffix combinations find the following distributions among a number of Quechua dialects:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ancash (Parker, 1976)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Huanca (Cerrón Palomino, 1976)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Tarma (Adelaar, 1977)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2</td>
<td>Ayacucho (Parker, 1965)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Ayacucho (Soto Ruiz, 1976)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cuzco (Cusihuamanán, 1976)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cajamarca (Quesada, 1976)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>4</td>
<td>San Martin (Coombs et al., 1976)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Arajuno (Muysken, 1975)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inga (Levinsohn, 1976)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Salasaca (Muysken, 1977)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Here the actual form which appears is /-na-chi-/ with the same meaning as the /-na-ku-chi-/ occurring elsewhere;  
2) In the dialect groups 5) and 6) we find the reflexive suffix /-ri-/ in stead of /-ku-/ and in Inga we find the combination /-chi-ri-/.
The survey of which the results are given above is not altogether reliable, and still incomplete, given that not all material was available to us at the time of writing. No data from Bolivia have been included, which would belong in group 2), and the data for Cuzco are sketchy.

The distributions of the five sets of suffix combinations is significant in two respects. First of all, we find a wide variety of dialects, although not a random variety. The dialects of group 1) and 2) correspond to the traditional Quechua dialects of South and Central Peru. They can be considered to present the most conservative forms of the language. The status of 3), which represents the highland dialects of Northern Peru, is not quite clear. It is not a recent formation, but presents many innovative tendencies.

The major differences appear, however, when we look at the dialect groups 4), which represents the Peruvian jungle dialects, and 6), which represents the Ecuadorian highland dialects, or at least some of these. Here the combinatory possibilities are very much more limited. The highland dialects of 6) allow reciprocal to both precede and follow causative; this does not appear to be possible in the jungle dialects. In some cases, we find reflexive following causative, but this appears to be very limited in its distribution.

The variation we find among the Quechua dialects corresponds fairly closely (a precise correspondence still has to be investigated for Southern Peru and Bolivia) to a three-way division among the Quechua dialects into:

- conservative dialects (groups 1 and 2, and maybe 3)
- early expansion dialects (group 6, and maybe dialects not studied here)
- late expansion dialects (groups 4 and 5)

In Muysken (1975) it was argued that the expansion of Quechua through large stretches of the Andean highlands and the Amazon basin led to the simplification of some features of Quechua morphology. Here it is argued that it is precisely the marked features that disappeared.

What generalizations can be made about the order of disappearance of combinations a through e? Fairly consistently, we find the following implications:
(78)  
\begin{align*}
  &a. \quad \text{na chi ku} \supset \text{na ku chi} \supset \text{chi na ku} \\
  &b. \quad \text{ku chi} \supset \text{chi ku} \\
  &c. \quad \ldots \text{ku} \ldots \supset \ldots \text{na ku} \ldots
\end{align*}

To begin with (78c), reciprocals can be combined more easily with causatives than reflexives. Since they are morphologically more complex, the restrictions can not simply be due to limitations on word formation processes.

Regarding (78a) and (78b), the relevant generalization is that reciprocals or reflexives which have the subject of the causative predicate as their antecedent represent the more frequent case. This goes along with Aissen’s claim (1975) that reflexives on the embedded predicate are impossible. They turn out to be more marked. The difference in frequency of distribution of /-na-chi-ku-/ and /-na-ku-chi-/ may not be real. The theory presented here offers no explanation. It may simply be the case that the /-na-ku-/ reciprocal combination is frequently lexicalized as a single suffix, separate from reflexive /-ku-/.

4.2. In what sense are the rules described here marked?

In section I it was claimed that Quechua causatives have marked character in that the morphological causative interpretation rule in this language does not operate at the level of Semantic Interpretation, which would be its unmarked domain of application, but at the level of Logical Form. As such its interaction with reflexive, reciprocal, and object marking is constrained by the conditions that constrain Logical Form.

An alternative view would be that Quechua causatives are marked because certain principles of core grammar, which have their unmarked domain of operation at the level of Logical Form, are here applied in a derivative fashion at the level of Semantic Interpretation.

Schematically, the two views can be represented as follows:

(79)  
\begin{align*}
  &a. \quad \text{Quechua causatives} \\
  &b. \quad \text{core principles}
\end{align*}
On what basis can we choose for either view? An argument for the first view would be that there appears to be little or no lexical variation with respect to causatives. One would expect phenomena at the level of Semantic Interpretation to be lexically dominated. An argument for the second view would be that reciprocals appear to be much freer here than reflexives. Reciprocals have a much less specific interpretation, and can as such appear more easily in exceptional constructions. At this moment we have no way of deciding for either view, although the first one seems in many ways to be the more attractive one.

5. Conclusions

We have developed a preliminary theory for causative interpretation in Quechua, arguing that morphological structure is translated onto Logical Form. A number of claims have been made about the Logical Forms involved:

a) that it crucially involves the syntactic notion « subject »;
b) that it is constrained by the Opacity Condition;
c) that Locality Principles are operant in it.
d) Disjoint Reference appears in it;
e) the Nominative Island Condition holds.

The Logical Form was derived by cyclically interpreting morphological material. We would like to argue that markedness conventions evaluate the morphological material interpreted at the level of Logical Form, and that Quechua causatives in certain dialects constitute the marked case. This is because the phenomena involved are quite rare among the languages of the world, and because even within the Quechua language family itself there is considerable variation in this respect. These matters merit much further investigation, however. Quite possibly, a far more subtle typology in terms of markedness has to be set up.
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