

An interclausal agreement approach to switch-reference in Quechua

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Abstract

In this paper, I propose that switch-reference in Quechua can best be analyzed as agreeing tense. Given the properties of the Quechuan switch-reference system and the clause structure of Quechua, I assume that a switch-reference adverbial clause does not have a valued tense feature and must agree with its superordinate clause in tense. Tense agreement is only possible if the subjects of both clauses are identical. The same subject marker is analyzed as the realization of successful tense agreement, while the different subject marker is the realization of failed agreement. I argue that this approach to switch-reference is conceptually as well as empirically compelling and raises the interesting question as to whether switch-reference is a true morphosyntactic category or not.

Keywords: Switch-reference; Quechua; Agree; minimalist framework; non-local dependencies

1 Introduction

Switch-reference is a system of morphological marking that indicates whether the syntactic subjects of two different clauses are identical or not (Jacobsen 1967). In a canonical switch-reference system, the same subject (SS) marker is used in case the two subjects refer to the same

entity; otherwise the different subject (DS) marker is used. In a non-canonical system, the use of the two markers depends on additional factors (cf. Stirling 1993).

Switch-reference systems occur in many unrelated languages, mainly in Australia, Papua New Guinea, and North and South America. Even though there are cross-linguistic tendencies concerning the syntactic and morphological properties of switch-reference systems (see Haiman & Munro 1983 for an overview), the systems are characterized heavily by language-specific properties, which leaves no clear basis for a morphosyntactic definition of switch-reference. Even the functional definition of switch-reference has been questioned for languages like, e.g., Kiowa, where ‘switch-reference’ marks the identity of certain aspects (time, place, reason of doing something etc.) of two different situations rather than the referential identity of syntactic subjects (Watkins 1993, McKenzie 2007; see Weisser 2012 for a discussion that such languages do not exhibit switch-reference marking).

Theoretically, the main challenge one faces when dealing with switch-reference is that switch-reference constitutes a non-local dependency, which invokes information of two different clauses. Therefore, one goal for an analysis of switch-reference carried out in a phase-based deriva-

tional framework should be to model this non-local dependency locally, thereby minimizing the representational residue of the theory.

A second theoretical problem shows up in cases where the two sentences to be compared are in a subordination-superordination relation. In this case, the switch-reference markers show up in the subordinate clause cross-linguistically (Haiman & Munro 1983). This results in a potential look-ahead problem if syntactic derivation proceeds bottom-up since the subordinate clause is built before the subject of the superordinate clause enters the derivation. This potential look-ahead problem must be overcome.

Finally, the empirical challenge for an analysis of switch-reference is its cross-linguistic diversity. In a successful analysis of switch-reference, the language-specific properties should fall out from the system without further ado.

In this paper, I focus on switch-reference marking in Quechua, an Amerindian language, spoken in Argentina, Brasil, Bolivia, Chile, Columbia, Ecuador and Peru. The aim of this paper is to derive the properties of the Quechuan switch-reference system. Although the analysis may be transferred to other languages with similar properties as well, there is no claim that this analysis is suited for all switch-reference systems.

The main claim is to analyze switch-reference in Quechua as the morphological realization of an interclausal agreement relation between the heads of two clauses. More precisely, I claim that in Quechua, certain subordinate adverbial clauses lack tense and must enter into a tense agreement relation with their superordinate clauses. This agreement relation then additionally transmits information about the subject of the superordinate clause to the subordinate clause and enables a comparison between the subjects. The analysis will be carried out in the minimalist framework (Chomsky 1995, 2000, 2001, 2008). Importantly, the transmission of information about the superordinate subject is enabled without invoking a mechanism of feature sharing (cf. Pollard & Sag 1994, Frampton & Gutman 2000, Legate 2005, Pesetsky & Torrego 2007, Heck & Cuartero 2012) as done by Camacho (2010) for Pano and Muskogean languages.

The paper is structured as follows: in section 2, I introduce the reader to the main properties of switch-reference in Quechua. In section 3, an analysis of switch-reference is presented which overcomes the two theoretical problems of non-locality and look-ahead outlined above. Furthermore, it is shown how this analysis captures the properties of switch-reference marking in Quechua naturally. Section 4 pro-

vides a comparison between the current approach and other approaches to switch-reference. Section 5 concludes.

2 Data

2.1 Switch-reference in Quechua

Quechua is a suffixing SOV language that has a switch-reference system in adverbial clauses. The subjects of the subordinate adverbial and the superordinate main clause are compared. If they are identical, the verbal suffix *-shpa* is used; if not, the verbal suffix *-pti* is used.¹

(1) summarizes four important properties of switch-reference in Quechua based on the research by Cole (1982, 1983), Cole & Hermon (2011), Lakämper & Wunderlich (1998) and Weber (1989).

¹There is another same subject marker *-r*, which is in complementary distribution with *-shpa*. In what follows, I will not take this marker into account. See Cole (1983:3), Weber (1983:299) for details about the difference between *-r* and *-shpa*. Cole (1983) claims that the marker *-r* is used if the two actions described by the subordinate and the superordinate clause are contextually related, while *-shpa* is used if the two actions are not related. Weber (1983), on the other hand, says that there is no clear difference between the two markers with respect to their distributions.

(1) *Observations*

- a. Switch-reference is canonical.
- b. The switch-reference marker occurs in the position of the tense marker.
- c. Switch-reference markers and tense/case-markers are mutually exclusive.
- d. Switch-reference markers can only occur with nominal person agreement markers.

In the rest of this section, these observations are explained in more detail and illustrated by data. In the data summary that follows I am abstracting away from differences between the Quechuan dialects. The points I am focusing on here are the same in all dialects. As far as I know, the only differences between the dialects concern (i) the morphological realization of the switch-reference markers and (ii) the cooccurrence of switch-reference markers and person agreement markers. Peculiarities of certain dialects will be mentioned in the footnotes.

The first observation (1-a) is that switch-reference in Quechua is canonical, i.e., the same subject marker *-shpa* is used whenever the subjects of the adverbial and the main clause are identical and the different

subject marker *-pti* is used when the two subjects differ (Cole 1982, 1983, Weber 1989).

(2) *Identical subjects (Ancash)*

a. *chakra-chaw urya-shpa, pallamu-rqu-u wayta-kuna-ta*

field-LOC work-SS pick-RPST-1 flower-PL-ACC

“While I worked in the field, I picked flowers.” (Cole 1983:2f.)

b. **chakra-chaw urya-pti-i, pallamu-rqu-u wayta-kuna-ta*

field-LOC work-DS-1 pick-RPST-1 flower-PL-ACC

“While I worked in the field, I picked flowers.” (Cole 1983:3)

(3) *Different subjects (Ancash)*

a. *chakra-chaw urya-pti-i, María pallamu-rqu-n*

field-LOC work-DS-1 Maria pick-RPST-3

wayta-kuna-ta

flower-PL-ACC

“While I worked in the field, Maria picked flowers.”(Cole 1983:3)

b. **chakra-chaw urya-shpa, María pallamu-rqu-n*

field-LOC work-SS Maria pick-RPST-3

wayta-kuna-ta

flower-PL-ACC

“While I worked in the field, Maria picked flowers.”(Cole 1983:3)

In the sentences in (2), the subjects of the adverbial clause and the main clause are identical. In this case, the same subject marker *-shpa* must be used. In (3), the two subjects are different and therefore, the different subject marker *-pti* occurs.²

Note that the choice of the marker does not depend on the ϕ -features of the subjects but rather on the referential index of the subjects (Weber 1980, 1989). Even if the ϕ -features of the two subjects are identical as in (4), but the subjects refer to different persons, the different subject

²The only exception to this cross-dialectal generalization is found in Imbabura Quechua where subjunctive adverbial and complement clauses are not marked by the suffixes *-shpa* and *-jpi* (\sim *-pti*), like indicative adverbial clauses, but by *-ngapaj* and *-chun* respectively (Cole 1982, 1983, Cole & Hermon 2011). Cole (1983) shows that this additional switch-reference system is non-canonical in contrast to the system outlined in (2)–(3). In what follows, I will only consider the canonical *-shpa/-pti*-system found in all dialects of Quechua.

marker *-pti* is chosen.

(4) *Huallaga*

a. *Maqa-rkU-ma-pti/*shpa-n hayta-shu-ra-yki*

hit-thereupon-1-DS/SS-3 kick-2-PST-2

‘After he_i hit me, he_j kicked you.’ (Weber 1989:298)

b. *Maqa-rkU-ma-*pti/shpa-n hayta-shu-ra-yki*

hit-thereupon-1-DS/SS-3 kick-2-PST-2

‘After he_i hit me, he_i kicked you.’ (Weber 1989:298)

The second observation (1-b) is that switch-reference markers occur in the position of tense markers, i.e., between object and subject agreement markers, as can be seen in (5).

(5) *Ancash*

a. *rika-ya-ma-rqa-yki*

see-PL-1OBJ-PST-2

‘you(pl) saw me/us’

‘you(sg) saw us’ (Lakämper & Wunderlich 1998:115)

b. *rika-ma-pti-yki*

see-1OBJ-DS-2

“when you see me” (*Lakämper & Wunderlich 1998:123*)

In (5), the past tense marker *-rqa* as well as the different subject marker *-pti* occur between the object agreement marker *-ma* and the subject agreement marker *-yki*.³ Note that the switch-reference clause in (5-b) could be translated as “*when you saw me*” as well, in case the matrix clause is past, that is, semantically, the tense of a switch-reference adverbial clause is identical to the tense of its superordinate clause (Cole 1982, p. 61). Now, except for the verbal present tense marker, all tense markers are overt (see section 3.5.1.2). Since the tense of a switch-reference adverbial clause is not fixed but depends on the tense of its matrix clause, there is no empirical evidence that switch-reference clauses exhibit a zero tense marker. Instead, the position of the tense marker is filled by the switch-reference marker.

³Lakämper & Wunderlich (1998:115, fn.1) note that Ancash Quechua uses the nominal 2nd person marker *-yki* instead of the expected verbal marker *-nki* when it follows the past tense marker *-rqa*. This is an idiosyncrasy of Ancash and not found in other dialects.

The third observation (1-c) states that switch-reference markers do not cooccur with tense and case markers. Since switch-reference markers occupy the position of tense markers, they are expected not to cooccur with tense markers. But interestingly, case markers are excluded from these contexts as well, whereas such markers can occur in adverbial clauses that have a tense marker and no switch-reference marker, as shown in (6-a) vs. (6-b).^{4,5}

⁴The tense markers in adverbial clauses are claimed to be nominalizers or nominalizing subordinators (Cole 1982, Lefebvre & Muysken 1988, Weber 1989). However, like verbal markers, they have a tense function (Costa 1972, Cole & Hermon 1981, Weber 1983, 25). See section 3.5.1.2 for a paradigm of verbal and nominal tense markers.

⁵Oblique cases are glossed as case in Cole & Hermon (1981), Lefebvre & Muysken (1988), Weber (1989) but as adpositions in Cole (1982). Here, I follow Cole & Hermon (1981), Lefebvre & Muysken (1988), Weber (1989) and take such markers to be case markers.

(6) *Huallaga*

a. *non-SR adverbial clause*

tamya-na-n-pita

rain-NMLZ.FUT-3-ABL

“because it is going to rain”

(Weber 1989:294)

b. *SR adverbial clause*

maqa-rkU-ma-shpa-n-∅

hit-thereupon-1OBJ-SS-3

“after he hit me”

(Weber 1989:298)

In (6-a) the nominalizing tense marker *-na* occurs together with the ablative case marker *-pita*. In (6-b), the SS marker *-shpa* occurs instead of a tense marker and the adverbial clause is not case-marked, illustrated above by a zero marker \emptyset .

Finally, the last observation (1-d) is illustrated in (7). The data show that person agreement markers are taken from the nominal paradigm in switch-reference clauses, even though no nominalizing tense markers occur (Cole 1983, Lakämper & Wunderlich 1998).⁶

⁶Here, dialects differ in the way person agreement is realized in switch-reference

adverbial clauses. Imbabura Quechua has no person agreement markers at all, which results from the lack of a nominal paradigm for person agreement markers (Cole 1983). In Ancash Quechua, on the other hand, subject agreement is only realized in different subject contexts (Lakämper & Wunderlich 1998). Finally, in Huallaga Quechua, subject agreement is realized in different subject as well as same subject contexts (Weber 1989) when the same subject marker *-shpa* is used. Interestingly, the same subject marker *-r* cannot cooccur with person agreement markers, as shown in

(i).

(i) a. *Maqa-rkU-ma-shpa-n hayta-shurayki*

hit-thereupon-1.OBJ-SS-3 kick-3.2PST

“After he hit me, he kicked you”

b. *Maqa-rkU-ma-pti-n hayta-shurayki*

hit-thereupon-1.OBJ-DS-3 kick-3.2PST

“After he_i/you hit me, he_j kicked you”

c. *Maqa-rkU-r hayta-maran*

hit-thereupon-SS kick-3.1.PST

“After he_i hit him_k, he_i kicked me.”

d. **Maqa-rkU-r-nin hayta-maran*

hit-thereupon-SS-3 kick-3.1.PST

(Weber 1980:48f.)

In what follows, I will not provide an explanation for the dialectal variation concerning the occurrence of person agreement markers in switch-reference contexts since it goes

(7) *Ancash*

a. *punu-nki*

sleep-2

“you sleep”

(Lakämper & Wunderlich 1998:119)

b. *wamra-yki*

child-2

“your child”

(Lakämper & Wunderlich 1998:119)

c. *Alqu-wan puklla-pti-yki wamra asi-n.*

dog-INSTR play-DS-2 child laugh-3

“When you play with the dog, the child laughs.”

(Lakämper & Wunderlich 1998:122)

In (7-a), the clause is not nominalized and the verbal marker *-nki* is used.

(7-b) shows that in nominal phrases a different marker *-yki* is used. Now

in the switch-reference clause in (7-c), the same nominal marker *-yki* as

in (7-b) is used.

In the rest of this section, I will briefly summarize the main points

far beyond the aims of this paper. Presumably, there are dialect-specific morphological
cooccurrence restrictions for switch-reference markers and person agreement markers.

about Quechuan clause structure. Afterwards, in section 3, an analysis is developed that is able to derive both the clause structure of Quechua and the four observations about switch-reference summarized in (1).

2.2 Clause structure in Quechua

Quechua is an SOV language which realizes all grammatical categories as suffixes (Cole 1982, Stewart 1988). There are no independent grammatical morphemes.⁷ The order of the suffixes is in principle the same in all dialects of Quechua with the exception of the plural marker, which occurs right after the verbal stem in Quechua I dialects and before or after an optional mood marker in Quechua II dialects (Lakämper & Wunderlich 1998). In the analysis presented below, I will focus on the markers in boldface, i.e. the order ‘stem-object-tense-subject-case’.⁸

⁷See, however, Lefebvre (1980) for arguments that Quechua has lexical complementizers.

⁸In most cases, the agreement marker after the tense marker realizes the person features of the subject. There are, however, cases where the marker realizes the features of the object. See Lakämper & Wunderlich (1998) for details. Since person agreement in switch-reference clauses is to some extent dialect-specific (see also footnote 6), I will not provide an analysis of it here.

(8) *Suffix Order in Quechua I and Quechua II dialects*

(adapted from Lefebvre & Muysken 1988:73; Lakämper & Wunderlich 1998:116)

a. QI:

Stem-Number-Object-Tense-Subject-(Mood)-(Case)

b. QII:

Stem-Object-Tense-Subject-(Mood)-Number-(Mood)-(Case)

The orders of the markers in boldface are illustrated in (9) for Hual-laga Quechua, a Quechua I dialect, and in (10) for Cuzco Quechua, a Quechua II dialect.

(9) a. pro [pro pro ***mucha-ma-na-n-ta***] *muna-n*

3SG_i [3SG_j 1SG kiss-1OBJ-NMLZ.FUT-3-ACC] want-3

“He_i wants him_j to kiss me.” (Weber 1989:289)

b. Stem Object Tense Subject Case

mucha ma na n ta

- (10) a. *Xwan* [*tata-y-pa* pro *maqa-wa-sqa-n-ta*]
 Juan [father-1-GEN 1SG beat-1OBJ-NMLZ.PST-3-ACC]
uyari-n.
 hear-3
 “Juan heard that my father had beaten me.”

(Lefebvre & Muysken 1988:16)

- b. Stem Object Tense Subject Case

maqa wa sqa n ta

Note that Quechua has subject as well as object *pro*-drop. In (9), all arguments are *pro*-dropped, indicated by different covert *pros*. In (10), the 1st person object is dropped, again indicated by *pro*.

In (9) and (10), the suffix orders are exemplified for verbs of subordinate clauses. Subordinate clauses are always nominalized, while main clauses are not. Three properties are used to detect nominalizations: (i) case markers, (ii) nominalizing tense markers and (iii) nominal person agreement markers.

Since switch-reference adverbial clauses lack the nominalizing tense morpheme as well as the case marker (cf. (6)), Cole (1982), Weber (1989), Cole & Hermon (2011) claim that these clauses are not nomi-

nalized, in contrast to all other subordinate clauses. Under these analyses, however, there is no explanation why switch-reference markers can only be combined with nominal person agreement markers.⁹

In the next section, I will present an analysis of switch-reference which assumes that switch-reference adverbial clauses are nominalized and which thereby captures the fact that nominal person agreement markers occur even though no nominalizing tense markers nor case markers occur. In the first part of the next section (3.1–3.3), I will show how the facts about the clause structure of Quechua follow from standard assumptions of the minimalist framework and the framework of Distributed Morphology. Afterwards (3.4–3.5), I will show how the system can be extended in order to derive switch-reference and how the

⁹Cole & Hermon (2011) also note that in Cuzco Quechua, subjects in switch-reference clauses may receive genitive case. Since genitive case is a property of nominalized clauses, this suggests that switch-reference clauses are indeed nominalized.

(i) *Cuzco*

Pidru-q lisa alla-chi-qtí-n, bindi-pu-saq-mi.

peter-GEN potatoes dig-CAUS-DS-3 sell-BEN-FUT.1-AF

‘After I make Peter dig potatoes, I will sell them.’

(Cole & Hermon 2011:1238)

system accounts for the properties of switch-reference listed in (1).

3 Analysis

3.1 Assumptions about the syntactic derivation

3.1.1 Clausal structure

The analysis of the data presented in section 2 will be carried out in the minimalist framework (Chomsky 1995, 2000, 2001, 2008). I assume that the derivation is cyclic and proceeds bottom-up.¹⁰ Clauses have a structure as in (11) with three functional projections above the phrase containing the root and the internal argument. Since Quechua is an SOV language, all phrases are right-headed.

$$(11) \quad [CP [TP [vP DP_2 [vP DP_1 \sqrt{\quad}] v] T] C]$$

The functional head v marks the clause as being verbal (Aoun (1981), Riemsdijk (1983), Picallo (1991), Marantz (1996, 1997), Alexiadou (2001), Arad (2005), Embick (2010) and others), introduces the external argu-

¹⁰Note that strict cyclicity will have to be relaxed in favor of allowing late adjunction. See section 3.5.2.1 for details.

ment (the subject), agrees with the internal argument (the object) in ϕ -features and assigns internal case.¹¹ T bears tense and aspect features, agrees with the external argument in ϕ -features and assigns external case. Finally, C contains features that are relevant to the whole clause, such as topic/focus features, clause type etc.

Nominalized clauses differ from verbal clauses as (11) in two functional heads (cf. Adger 2003).

$$(12) \quad [\text{DP} [\text{nP} \text{DP}_2 [\sqrt{\text{P}} \text{DP}_1 \sqrt{\text{V}}] \text{n}] \text{D}]$$

Instead of the verbal functional projection v , nominalized clauses contain a head n that basically fulfills the same tasks as v , but marks the clause as being nominal at an early point in the derivation (cf. Adger 2003; see also references above for the head v). D is the nominal counterpart to the verbal T . More concretely, I will assume that there are two kinds of D heads: a clausal D head and a non-clausal D head. The

¹¹Note that in these analyses, v is simply a category marking head. Additional functions such as introducing the external argument are assigned to another functional head Voice (cf. Kratzer 1996). Nothing crucial hinges on that. For sake of concreteness, I will follow Chomsky (2000) among others and assume that it is v rather than Voice which introduces the external argument and agrees with the object.

main difference between these two heads lies in whether D enters the derivation with valued (non-clausal D) or unvalued ϕ -features (clausal D). Only a clausal D head that lacks ϕ -features to begin with is a counterpart to T. In contrast to the clausal D head, a non-clausal D head bears ϕ -features.

Of course this raises the question why both heads are labeled ‘D’. I assume that categories are simply features that induce a certain morphosyntactic behavior, rather than mnemonics for lexical items with certain features. Then, D is a feature that brings certain nominal properties with it, while T is verbal. Feature compatibility restrictions on lexical items – that are part of virtually every syntactic theory, even though not always mentioned explicitly – will narrow down the number of possible lexical items. For example, T is supposed to be incompatible with valued ϕ -features, due to its verbal nature that conflicts with the nominal character of valued ϕ -features, while nominal D is compatible with them.¹² In order to increase the readability of the analysis below, I will refer to D heads with clausal properties (e.g. unvalued ϕ -features) as

¹²This view on lexical categories resembles the mixed category account of Lefebvre & Muysken (1988) who treat the head of nominalized clauses as having both nominal properties (here the D feature) and verbal properties (here the unvalued ϕ -features).

D_c , while non-clausal D will be referred to simply as D. Note however that this is only a mnemonic device.

Finally, in nominal clauses, there is no functional head that corresponds to C. Since nominal clauses are DPs, they must be case-marked, in contrast to verbal clauses. In what follows, I assume that there are two ways how a DP can receive a case value. The first way is that it agrees with v/n or T/ D_c . As a reflex of agreement with v/n, it will receive internal case, as a reflex of agreement with T/ D_c , it will receive external case.¹³

The second way how a DP can receive a case value is by assignment of a semantic case. A DP is assigned a semantic case if it has not agreed with a functional head T/ D_c or v/n. See section 3.5.2.3 for more details.

The derivation consists of two basic operations: a structure-manipulating operation Merge, which operates on entire syntactic objects

¹³It might be that the actual case values differ between v and n or T and D_c respectively, as it is the case in English where the external argument of a DP gets a genitive marker -'s instead of a nominative zero marker while the internal argument receives *of*-case instead of accusative case (Adger 2003:270ff.). In Quechua, the subject in nominalized clauses can receive either genitive or nominative case; thus, there the differences between verbal and nominal functional heads concerning case assignment are not as clear as in English. See Cole & Hermon (2011:1237) for more details.

and creates new structures and a feature-manipulating operation Agree, which operates on features of lexical items. Assumptions about these two operations are outlined below.

3.1.2 Merge

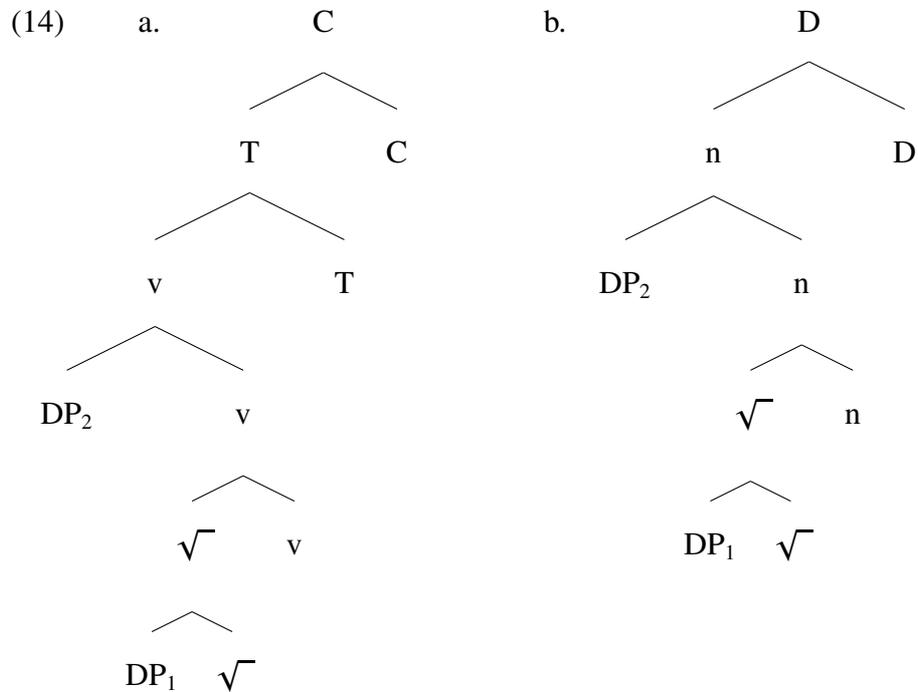
The operation Merge is defined as in (13).¹⁴

$$(13) \quad \text{MERGE } (\alpha, \beta) \qquad \qquad \qquad (\text{Chomsky 1995}) \\ = \{ \alpha, \{ \alpha, \beta \} \}$$

The operation Merge in (12) connects two independent syntactic objects α and β , whereby one of the two objects, here α , is the head and functions as the label (*Bare Phrase Structure*; Chomsky 1995). The label of a phrase is identical to the head of the phrase (Chomsky 1995:246).¹⁵ Thus all the features of the head are available on the label as well. Assuming that, a more accurate version of the clause structures in (11) and (12) would be the structures in (14).

¹⁴Syntactic movement will not be an issue in the analysis of switch-reference. For the sake of completeness, I assume that movement is Rmerge (Epstein et al. 1998, Bobaljik 1995, Gärtner 1997, Starke 2001, Zhang 2004, Boeckx 2008 among others).

¹⁵For the sake of simplicity, the syntactic structures are represented by trees or labeled bracketing.



3.1.3 Agree

The operation Agree in (14) creates a relation between the features of two lexical items in the structure. I assume that lexical items are feature bundles with an internal structure, that is, they are sets of feature sets. An abstract lexical item X is given in (15-a), f and g being variables for features and v and w variables for feature values. A shorthand notation of X is provided in (15-b).

(15) a.
$$X = \{ \{ f_1: \text{---}, \dots, f_i: \text{---}, f_{i+1}: v_{i+1}, \dots, f_n: v_n \}, \dots, \{ g_1: \text{---}, \dots, g_j: \text{---}, g_{j+1}: w_{j+1}, \dots, g_m: w_m \} \}$$

$$\text{b. } X[\boxed{f_1:__}, \dots, \boxed{f_n:v_n}], \dots, \boxed{g_1:__}, \dots, \boxed{g_m:w_m}]$$

In (15), X consists of at least two feature sets, which each consists of valued and unvalued features. An unvalued feature $[f:__]$ must receive a value via Agree with a valued feature $[f:v]$ during the derivation. Henceforth, the set containing $[f:__]$ is called a *probe*; the set containing the valued feature $[f:v]$ is called the *goal*. In sum, a feature is an element of a probe/goal, a probe/goal is an element of a lexical item.

Note that a lexical item can contain more than one probe, an assumption adopted from Richards (2008). Which features constitute a probe together, is language-specific. For example, Richards (2008:196) argues that one difference between Icelandic and English concerns the tie of the number and the person feature on the head responsible for subject agreement (T in his analysis). The difference is shown in (16).

- (16) a. *Icelandic*
- $$D[\boxed{\text{pers:}__}, \boxed{\text{num:}__}, \dots]$$
- b. *English*
- $$D[\boxed{\text{pers:}__}, \boxed{\text{num:}__}, \dots]$$

The assumption that there can be several probes and that the composition of probes on one head is language-specific will become important in the analysis of switch-reference in section 3.5.1.1.

The feature manipulating operation Agree is defined as in (17) (based on Chomsky 2001, Baker 2008, Richards 2008).

$$(17) \quad \text{AGREE} (X[\boxed{f:_}, \dots], \dots) \\ = X[\boxed{f:v, \dots}, \dots]$$

iff

- a. there is a head Y that contains a goal with a feature [$f:v$]
- b. X and Y are in a c-command relation and
- c. there are no feature values on the probe containing [$f:_$] and the goal containing [$f:v$] that conflict

$$(18) \quad \text{C-command (cf. Reinhart 1976)}$$

X c-commands Y, iff

- a. X does not dominate Y
- b. Y does not dominate X
- c. the first branching node dominating X also dominates Y

Agree, as defined in (17), operates on a lexical item X that contains a probe with an unvalued feature [f :—]. If there exists a head Y that contains a goal with a valued feature [f : v], if either X c-commands Y or Y c-commands X, that is, if X and Y are in a c-command relation, and if the feature values occurring on the probe and the goal do not conflict, f on X receives the value of f on Y. The two conditions of Agree in (17-b) and (17-c) diverge from the assumptions about Agree in Chomsky (2000, 2001) but are nevertheless not new. Condition (17-b) says essentially that upward probing is allowed. This assumption has been argued for in Koopman (2006), Baker (2008) among others. Condition (17-c) is adapted from Richards (2008). The understanding of ‘match’ differs from the Chomskyan understanding in that not only features count for matching but also feature values. Richards (2008) shows that this assumption leads to an elegant analysis of PCC effects in Icelandic, partial agreement in English *there*-constructions and the Russian genitive of negation. (See also Assmann 2010, who uses this approach to derive PCC effects in Tagalog.)

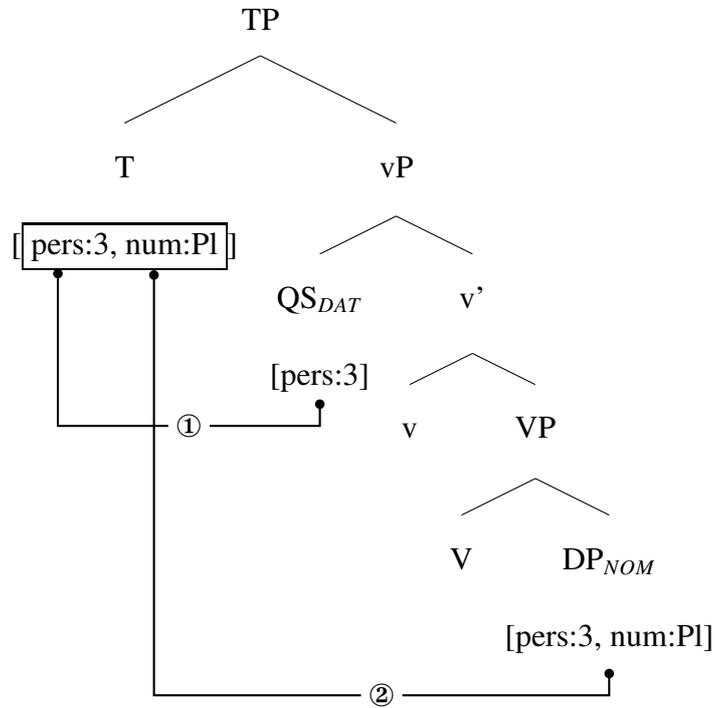
Basically, the idea of Richards’s (2008) analysis of PCC effects in Icelandic is as follows: in certain constructions in Icelandic the subject

bears dative case and the object bears nominative case. The peculiarity of these constructions is, however, that the nominative argument has to be third person, as shown in (19).

- (19) a. Honum myndu alltaf líka Þeir
 him.DAT would.3PL always like they.3PL.NOM
 ‘He would always like them.’ (Sigurðsson 2002:125)
- b. *Honum mynduð alltaf líka Þið
 him.DAT would.2PL always like they.2PL.NOM
 ‘He would always like you(pl).’ (Sigurðsson 2002:125)
- c. *Honum myndum alltaf líka við
 him.DAT would.1PL always like they.1PL.NOM
 ‘He would always like us.’ (Sigurðsson 2002:125)

Richards assumes that the quirky dative subject is structurally complex and consists of a DP and an additional expletive which consists only of a third person feature. Only the expletive may enter into an Agree relation. The T head bears an unvalued person and number feature which must Agree with valued features in the structure. An abstract schema of a clause like (19-a) is given in (20) (cf. Richards 2008:194).

(20)



The first valued feature T finds is the person feature of the expletive in Spec-vP. Since the value of this feature does not clash with a feature value of T (T does not bear a person feature value yet), Agree may apply and the person feature of T receives a value (step ① in (20)). But since T still has an unvalued number feature it has to enter into an Agree relation again, this time with the object in the VP, because the subject does not have an accessible number feature. As shown in (20), the object has both a number and a person feature. In order for Agree to apply between T and the object, the feature values may not

clash. Trivially, the number features cannot conflict because there is no number value on T. The person features of T and the object do not clash either, because both have the same value, namely ‘3’. Thus, the probe on T and the goal on the object match and Agree is possible. If the person features of T and the object bear different values, as in the cases in (19-b) and (19-c), Agree is not possible and the derivation will crash. This excludes the possibility for a non-third person nominative argument in constructions like (19).

From a more abstract perspective, there are six different possibilities for probes and goals to look like. All of them are given in (21).

- (21) a. $X[f: _]; Y[f:v] \rightarrow_{Agree} X[f:v]$
 b. $X[f: _, g: _]; Y[f:v, g:w] \rightarrow_{Agree} X[f:v, g:w]$
 c. $X[f: _, g: _]; Y[f:v] \rightarrow_{Agree} X[f:v, g: _]$
 d. $X[f: _]; Y[f:v, g:w] \rightarrow_{Agree} X[f:v]$
 e. $X[f: _, g:w]; Y[f:v, g:w] \rightarrow_{Agree} X[f:v, g:w]$
 f. $X[f: _, g:u]; Y[f:v, g:w] \rightarrow_{Agree}$

no match \rightarrow no Agree possible

In (21-a) and (21-b), the probe has only unvalued features and the goal can value all of the probe's features. In (21-a), both the probe and the goal consist of one feature, while in (21-b) both consist of more than one feature. In both cases Agree is successful since there is no clash of feature values.

In (21-c) and (21-d), the numbers of features of the probe and the goal are not the same. However, as in (21-a-b), the probe has no feature values and thus, there can be no clash with the feature values of the goal.¹⁶ The most interesting cases with respect to the analysis of switch-reference in section 3.5 are (21-e) and (21-f). In both cases the probe contains an unvalued as well as a valued feature. But only in (21-e) is the value of the feature *g* identical to the value of *g* on the goal.

¹⁶Note that the definition of the matching condition on Agree in (17-c) is slightly different from the condition in Richards (2008). This difference has the consequence that Agree in a configuration like (21-d) is successful in this approach while it is not successful in Richards's (2008) approach, where a probe and a goal only match if the goal is maximally as specific as the probe and there is no feature clash. Since in (21-d), the goal has more features than the probe, Agree is not possible in Richards's (2008) approach. Since the case of (21-d) does not occur in the structures below, this minor difference between Richards's and the current proposal has no further consequences for the data discussed here.

Thus, there is no mismatch in (21-e) and Agree is possible but there *is* a mismatch in (21-f) and Agree is not possible. The former case will occur in same subject contexts, the latter in different subject contexts.

3.2 Assumptions about morphological realization

The morphological part of the analysis is carried out in the Distributed Morphology framework (Halle & Marantz 1993, Halle 1997, Noyer 1997). Distributed Morphology is a realizational framework, i.e., morphosyntactic features of terminal nodes (*morphemes*), which have been manipulated in the syntax, are realized post-syntactically by *markers* with phonological content (*(Late) Vocabulary Insertion*). The combination of the markers and the morphosyntactic feature bundles they are specified for are called *vocabulary items*. Importantly, a vocabulary item need not be fully specified, i.e., its feature specifications may be a proper subset of the morpheme's feature specification (cf. *Subset Principle* in (22)). In case, more than one marker matches the feature specification of a morpheme, the most specific item is chosen, that is, the one with most features.

(22) *Subset Principle* (Halle 1997)

The phonological exponent of a vocabulary item is inserted into a morpheme if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the vocabulary item contains features not present in the morpheme. Where several vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

In order to get the right linear order of the morphemes, I adopt the *Mirror Principle* in (23) (Baker 1985).

(23) *The Mirror Principle* (Baker 1985, 375)

Morphological derivations must directly reflect syntactic derivations (and vice versa).

The Mirror Principle ensures that the linear order of the markers is the same as the order in which the respective heads they realize have entered the derivation. Note that the Mirror Principle might be a theorem derived from theoretical primitives (cf. Surányi 2005).

3.3 Deriving Quechuan clause structure

With these assumptions in mind, we can now derive the facts about clause structure in Quechua, outlined in section 2.2.

The embedded clause in (24), repeated from (10-a), can be derived as follows.

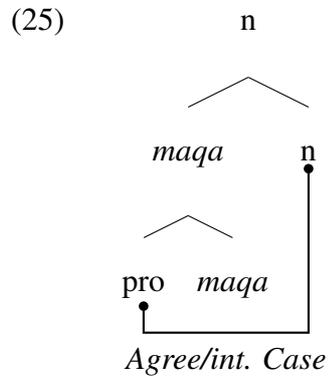
- (24) *Xwan* [*tata-y-pa* *pro* *maqa-wa-sqa-n-ta*]
Juan [father-1-GEN 1SG beat-1OBJ-NMLZ.PST-3-ACC]
uyari-n.
hear-3

“Juan heard that my father had beaten me.”

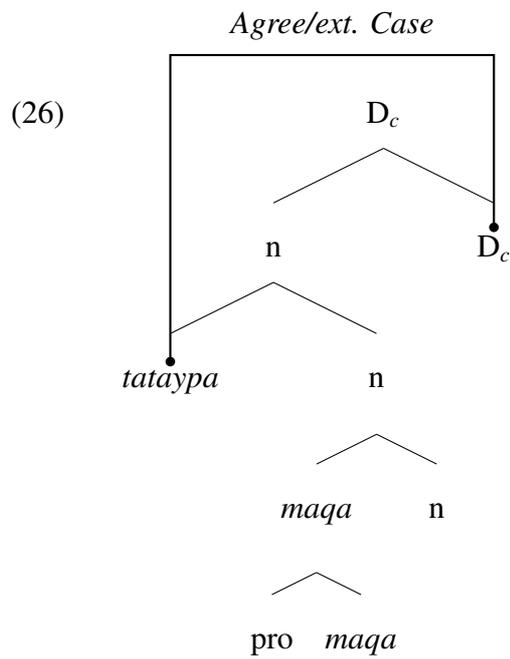
(Lefebvre & Muysken 1988:16)

At first, the root *maqa* and *pro* are merged.¹⁷ Then, *n* is merged, agrees with the internal argument in ϕ -features and the internal argument receives internal case.

¹⁷Note that under these assumptions, there must be different *pros* with different ϕ -features. Alternatively, a phonologically overt pronoun is merged, agrees with the predicate and is deleted under recoverability (Chomsky 1980). Nothing hinges on which option is preferred.



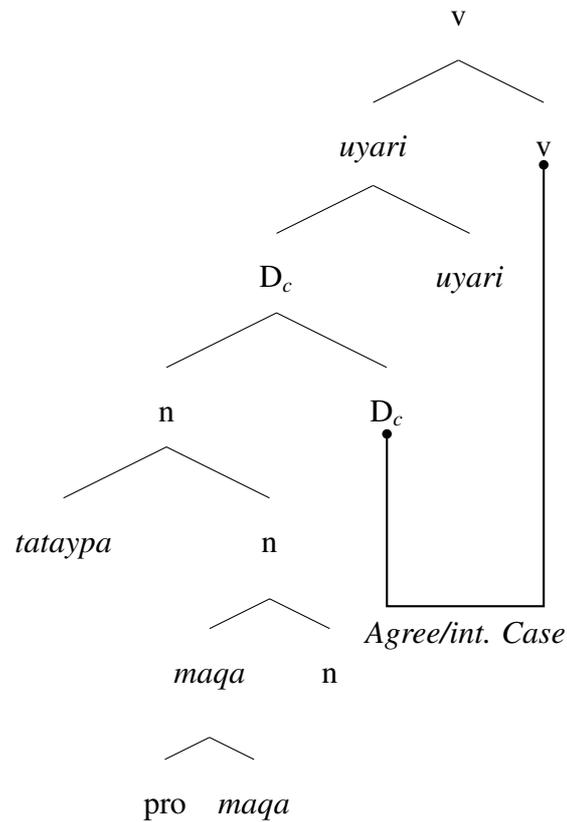
Next, *tataypa* is merged as the external argument, followed by D_c . D_c agrees with *tataypa* in ϕ -features and *tataypa* receives external case.



Afterwards, the entire DP is merged as the internal argument of the

matrix clause and receives internal case from matrix v.

(27)



After the derivation has finished, vocabulary insertion takes place and the features are realized by markers. For the ϕ -features on n, which have been valued by the internal argument *pro*, the object agreement marker *-wa* is inserted. The tense features on D_c are realized by the nominal past marker *-sqa*.¹⁸ The ϕ -features of D_c are realized by *-n*. Finally, the

¹⁸The possibility of having tense features on a D_c head is discussed below in sec-

case features on D_c are realized by the accusative marker *-ta*. (In order for this to happen, I assume that D_c undergoes *Fission* (Noyer 1997), so that more than one marker can be inserted into D_c .) The vocabulary insertion is summarized in (28).

- (28)
- | | | |
|------------------|-------------------|-------|
| $n[\phi:1sg]$ | \leftrightarrow | <wa> |
| $D_c[tense:pst]$ | \leftrightarrow | <sqa> |
| $D_c[\phi:3sg]$ | \leftrightarrow | <n> |
| $D_c[case:acc]$ | \leftrightarrow | <ta> |

Now, the markers are ordered following the Mirror Principle in (23). The n head bears the agreement features of the object after Agree. Since it is the first functional head that has entered the derivation, the object agreement marker is realized right after the stem. Next, the features on D_c , viz., the subject agreement features, the tense features, and the case features, must be realized. They follow the object agreement marker because D_c enters the derivation after n .

tion 3.4.

(29) *Order of heads and morphemes*

Steps: ① ② ③

Heads: $\sqrt{\quad}$ n D

Markers: *maqa* *-wa* *-sqa-n-ta*

Having derived the clause structure and order of the morphological exponents of a simple Quechuan nominalized clause, I will now outline concrete assumptions about the feature specification of the heads v/n and T/D_c and show how the properties of switch-reference in Quechua (cf. section 2.1) can be derived.

3.4 Assumptions about the feature specifications of v/n and T/D_c

There are two points which are important for the analysis of switch-reference in the next section. They concern ϕ -features and tense features.

ϕ -features are important for agreement of the functional heads with the arguments. Unvalued ϕ -features on v/n trigger Agree with the internal argument and unvalued ϕ -features on T/D_c trigger Agree with the external argument as described above in section 3.3.

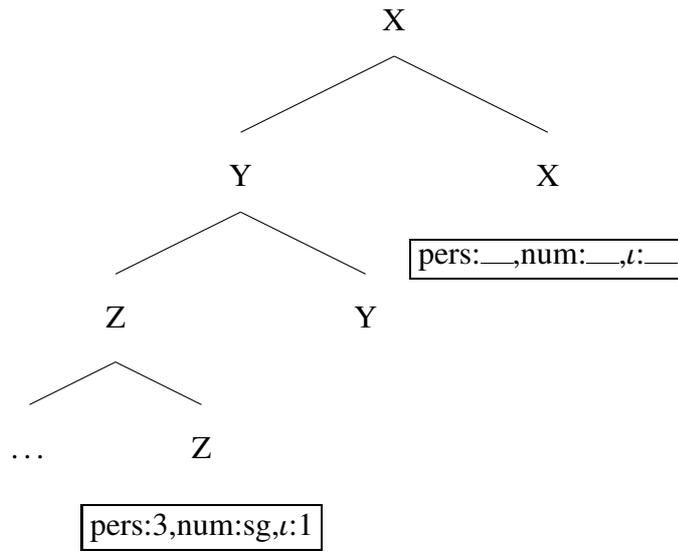
ϕ -features are person, number and gender. Henceforth, gender will be ignored as it is of no importance for the analysis of switch-reference in Quechua. Following Řezáč (2004*a,b*, 2006) (cf. also Browning 1987, Wechsler & Zlatic 2000, 2003, Wechsler to appear for similar ideas), I assume that the referentiality of nominal phrases is encoded by an index feature [*l*], which takes part in object and subject agreement. Possible values for [*l*] are integers $i \in \mathbb{N}$. It should be noted that the index feature presented here does not necessarily violate the inclusiveness condition (Chomsky 1995, 228). Index features can be considered to be already present on DPs in the numeration, with a value maybe yet to be specified (cf. Agree approaches to binding à la Fischer 2004).

Since, similarly to T, D_c bears unvalued ϕ -features, it also has an unvalued index feature. Respective things hold for the functional heads *v* and *n*. Unvalued index features [*l*] on the functional heads are checked by valued index features on the internal and the external argument. As any other feature, the index feature might be part of a complex probe or constitute a probe by itself. I assume that in Quechua, the index feature is part of the ϕ -probe on *v/n* and T/D_c .

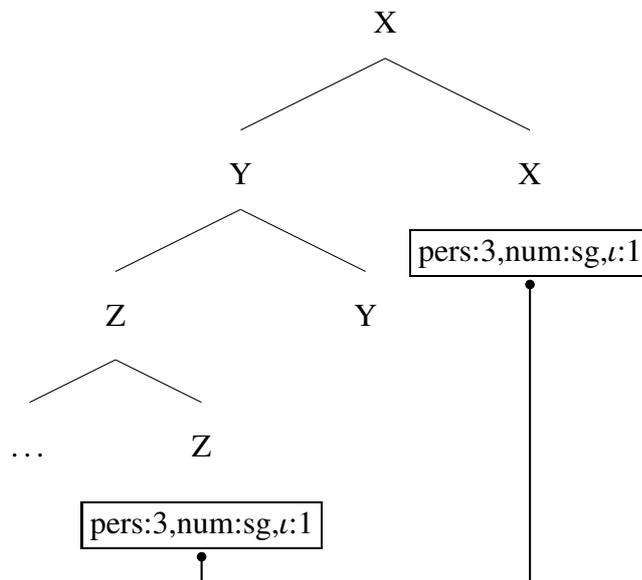
Now, a more concrete version of ϕ -Agree can be given. A head *X* that bears an unvalued person, number and index feature enters into

Agree with a head Z that bears valued features.

(30) a. *Before Agree*



b. *After Agree*



In (30), X agrees with Z in the ϕ -features [pers] and [num] and in the index feature [ι]. The c-command condition of Agree is fulfilled since X c-commands Z. The matching condition is trivially fulfilled because there are no valued features on X in (30-a), hence, no conflict of feature values arises.

The second feature I want to make concrete assumptions about is the morphosyntactic tense feature, which might take values such as [past], [future], [present] etc.¹⁹ The tense feature is located on T or D_c respectively. The possibility of having a morphosyntactic tense feature comes from the lack of valued ϕ -features. Thus, D_c has a tense feature. In what follows, I assume that D_c might bear a valued tense feature or an unvalued one (cf. also the feature sharing approach of Szucsich 2009 and the zero-tense approach of Kratzer 1998), i.e., the value of a tense feature can also be received via Agree with the valued tense feature of another clause.

Concretely, I assume that a D_c head may enter the derivation with

¹⁹Later in section 3.5, I will decompose the tense feature into two binary features [\pm pst] and [\pm fut]. The decomposition does not affect the syntactic analysis in any way and is only relevant for the morphological analysis, so that the tense feature will not be decomposed until section 3.5.1.2.

a valued or an unvalued tense feature. There are no restrictions concerning the occurrence of these two kinds of tense feature. If the tense feature is unvalued, D_c has to enter into tense Agree with another clause.

I assume that in Quechua, all embedded clauses, also adverbial clauses, are nominalized, hence they are headed by D_c . If the D_c of an adverbial clause bears an unvalued tense feature, it must Agree with the superordinate clause in tense. As shown below in section 3.5.1.2, this tense Agree will be realized morphologically by switch-reference marking.

On the other hand, if the D_c of an adverbial clause bears a valued tense feature, this will be realized by a nominal tense marker.²⁰

Following (Partee 1973, Kratzer 1998, Schmitt 2000), I assume that tense is not an operator but a referential feature that shows similarities to pronouns. Hence, in addition to the morphosyntactic feature [tense], T and D_c bear a tense index feature [t_i]. The tense index feature [t_i] is

²⁰There is no clarity regarding the question in which contexts switch-reference adverbial clauses are used and in which contexts non-switch-reference adverbial clauses are used. Cole (1982) gives the impression that the use of switch-reference marking depends on the semantic function of the adverbial clause, i.e., whether it is a time, manner, purpose clause etc. Weber (1989:297), on the other hand, notes particularly that there is no semantic and/or pragmatic difference in the use of the two types of adverbial clauses.

not the same feature as the referential index feature [ι]. It is important to make a difference between these two indices because semantically, tense is not of type e like nominal arguments of predicates but of type i (Abusch 1997, Musan 1997, Kratzer 1998).²¹ Heads that bear the same tense index are interpreted as having the same tense.

The tense index feature on D_c is unvalued when the tense feature is unvalued, i.e., a tense index can only be present if tense is present as well. This in turn means that in cases where tense Agree is necessary, tense binding happens as well (cf. Kratzer 1998). This assumption accounts for the fact that in Quechua, the tense of clauses with no tense markers of their own, that is, switch-reference clauses, is identical to the tense of the superordinate clause (cf. (6), section 2.1).

Putting the assumptions about ϕ -features and tense features together, (31) shows the two different feature specifications of an adverbial D_c in

²¹Remember that T/D_c has a (unvalued) referential index feature and a tense index feature at the same time. A reviewer asks what consequences this has for the interpretation. Even though a full semantic analysis of the structures would lead us to far away from the main issue of this paper, the idea that is in line with the assumptions made above is simple: whether the DP is interpreted as an argument of type e or as a clause depends on the presence of a value for the referential index feature. If there is no value, it cannot be a nominal argument.

Quechua.

- (31) a. *Valued tense feature (no switch-reference marking)*

D_c [[pers:___, num:___, ι :___, tense:VAL₁], [ι_i :VAL₂]]

- b. *Unvalued tense feature (switch-reference marking)*

D_c [[pers:___, num:___, ι :___, tense:___], [ι_i :___]]

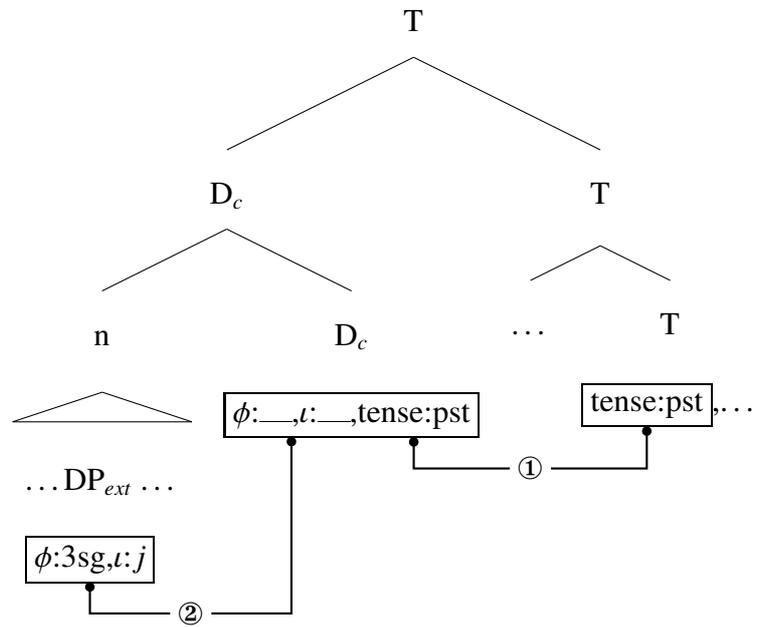
Important is the structure in (31-b) with the unvalued tense feature. Since the tense feature, the ϕ -features and the index feature form a single probe, tense Agree is only possible, if the values of the ϕ -features and the value of the index feature on the probe and the goal do not conflict.²²

Assuming that the unvalued tense, ϕ , and index features are part of

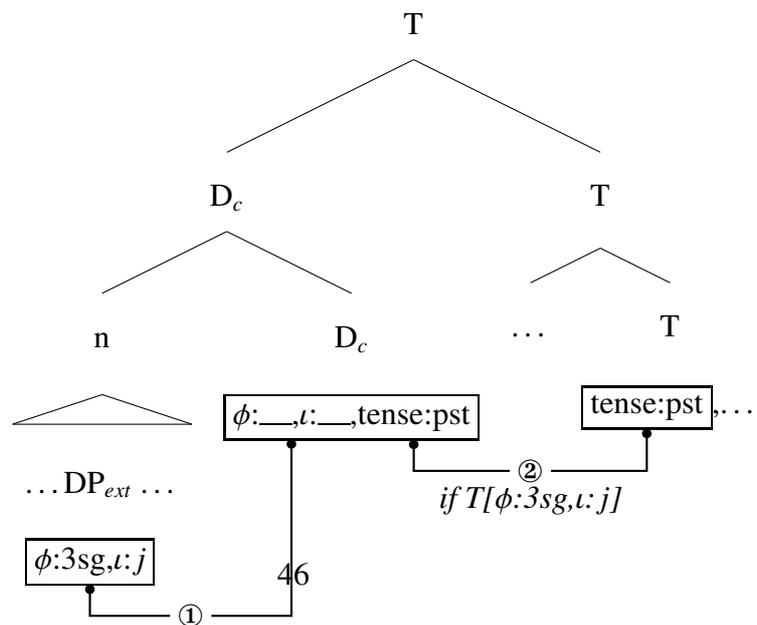
²²A reviewer asks whether the restriction that states that the morphosyntactic tense feature and the tense index feature are located in different probes is somehow at odds with the feature cooccurrence restriction that either both the tense feature and the tense index feature have a value or both do not have a value. Note however, that although the feature cooccurrence restriction seems to be to some extent universal – similar to the cooccurrence of an unvalued index and unvalued ϕ -features on anaphors, the probe constitution restriction is subject to linguistic variation. While both features are distributed among different probes in Quechua, a switch-reference language, both features are part of the same probe in languages like English.

the same probe on T/D_c, there are basically two options for a successful valuation, depicted in (32).

(32) a. *Counter-cyclic Agree*



b. *Same Subject Configuration*



The first option in (32-a) shows that the subject agreement features (ϕ and index) on D_c are valued after the tense feature. However, this option runs afoul with the assumption that derivation proceeds bottom-up and is cyclic. The adverbial clause is already built when it is adjoined to the matrix clause. If tense Agree applied first, the entire sentence would be affected. Subsequent subject agreement in the adverbial clause would however affect only a proper subdomain of the sentence, namely the embedded adverbial clause. Hence, applying ϕ -Agree inside the embedded clause after tense Agree would violate the Strict Cycle Condition (Chomsky 1973, 243).²³

(33) *Strict Cycle Condition*

No rule can apply to a domain dominated by a cyclic node A in such a way as to affect solely a proper subdomain of A dominated by a node B which is also a cyclic node.

²³In section 3.5.2.1 I will loosen Strict Cyclicity in order to allow late adjunction. Note however that the point made here, is nevertheless true since the late insertion of adjuncts might affect the timing of interclausal tense Agree as shown in section 3.5.2.1, but not intraclausal subject Agree that still has to apply in line with the Strict Cycle Condition.

Thus, only the second option in (33-b) remains, which essentially states that tense Agree is only possible if the subjects of the two clauses are identical (have identical ϕ and index feature values), i.e., if there is a same subject configuration. If the subjects were different, Agree could not apply due to a violation of the matching condition (17-c). Importantly, as shown in (31-b), the tense index in Quechua is not part of the same probe as the tense feature, but the tense index feature can probe independently from the tense feature. Thus tense binding will always be possible. Even if the unvalued tense feature of a D_c head does not receive a value via Agree, the tense index feature can be valued by another tense index feature.

3.5 Deriving switch-reference in Quechua

3.5.1 How switch-reference marking comes about

3.5.1.1 The syntax

With the analysis developed so far, switch-reference adverbial clauses can now be derived. I assume that adverbial clauses in Quechua are left-adjoined in the left periphery of the clause. For the sake of concreteness, I assume that they are adjoined to TP. Adverbial clauses often appear to

the left of the matrix clause but they may also follow the matrix clause (Weber 1989:297f).²⁴ Since there is also no clear evidence that there is subject movement to Spec-TP, I will not assume subject movement

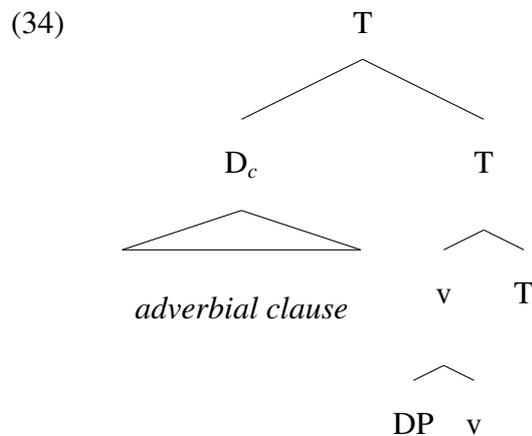
²⁴A reviewer points out that data such as (i) suggest that adverbial clauses are actually attached higher than TP.

- (i) [Toopa-ykU-chi-**pti-n**] mishi-qa [“chash” ni-r] [kaara-n-pita-shi
touch-DIR-CAUS-DS-3 cat-TOP say-SS face-3-ABL-REPORT
runa-ta raska-r] shillu-n-wan
man-ACC scratch-SS fingernail-3-INSTR
‘When he_i caused it to touch him_j, the cat_j spitting (lit. :saying ”chash”),
scratching the man_i in his face, damages (lit.: finishes him_i) with his_j claws.’
(Weber, 1980, 51)

Here, the adverbial clause precedes the topic that is supposed to be in a projection higher than TP, maybe CP. There are two ways to make these data compatible with the analysis to follow: First, there is movement of the adverbial clause from its TP-internal base to the CP-domain. Second, the adverbial clause is base-generated in a higher projection. Since both options do not change anything about the c-command relations between the matrix T head and the adverbial clause, it does not matter which option is chosen. For reasons of simplicity I will stick to the assumption that adverbials are base-generated as an adjunct to the TP.

here.

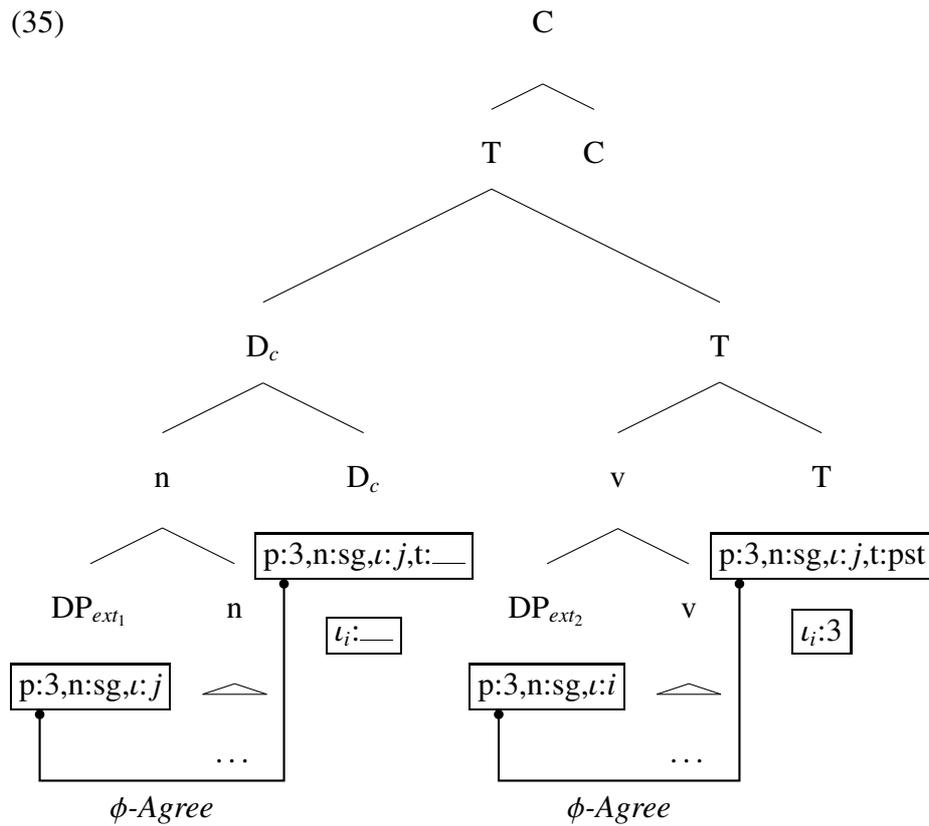
Like all other subordinate clauses, adverbial clauses are nominalized, i.e., they are headed by D_c .



Now, there are two types of adverbial clauses. The first type subsumes adverbial clauses which have tense of their own. The second type of adverbial clauses is tenseless and must get a tense value from another clause.

If the tense feature of the adverbial clause is unvalued, it has to enter into tense Agree with the T head of the matrix clause. Remember that an unvalued tense feature constitutes a probe together with the features for subject agreement, which must have been valued before the tense feature gets valued. The configuration before tense Agree, but after

ϕ -Agree is shown in (35) (with arbitrarily chosen values for [p(ers)], [n(um)] and [t(ense)], and variables i and j for the subject indices).



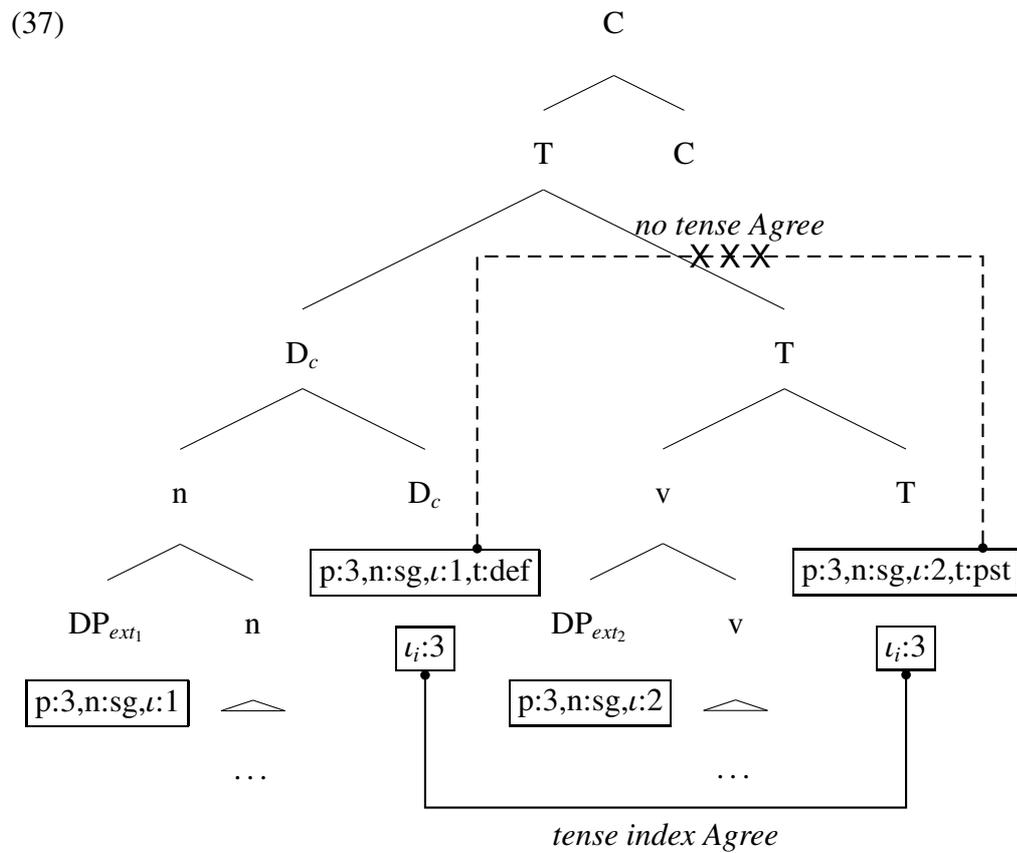
In this configuration, the D_c head of the adverbial and the T head of the matrix clause have already Agreed with their subjects, so that the ϕ -features and the index of the subjects are available on the respective heads. Next, D_c needs to get its tense feature and its tense index feature valued. In order for this to happen, D_c must be in a c-command

relation with a head that bears a matching goal. A potential goal for the probe on D_c would be T of the matrix clause since it contains a valued tense feature. Now, assuming Bare Phrase Structure, as pointed out in section 3.1.2, D_c in fact c-commands the T head, since the label of the phrase, which is D_c , c-commands T.²⁵ Hence the c-command condition of Agree is fulfilled. Thus, only the matching condition decides whether Agree is possible or not. The probe on D_c matches the goal on T if the values for the subject agreement features are identical. There are two possible scenarios that can emerge: either the values are identical and tense Agree is possible or the values are different and tense Agree is not possible. In order to illustrate the most interesting case, the person and number feature of the two subjects are taken to be identical. Then, only the values of the index features decide whether the matching condition is fulfilled or not.

The first possibility is that $i = j$. In this case, tense Agree is possible

²⁵Note that the assumption that the head of the specifier of X c-commands the head X is necessary anyway, assuming that Merge also involves a feature checking relation similar to the Agree relation (cf. Heck & Müller 2007, Müller 2010, 2011 among others). Then, subcategorization of a subject, which is the specifier of v, is only possible if v and the head of the subject are in a c-command relation.

Here, D_c and T are not matching and tense Agree is not possible. Note that the tense index feature can always be valued since it constitutes a probe of its own.



In (37), the tense feature of the embedded D_c does not receive a value because there is no matching goal for the probe: the values of the index features on D_c and T conflict, which violates the matching condition. Assuming that every feature must have a value by the end of the syn-

tactic derivation, the derivation illustrated in (37) is supposed to crash. Here, I would like to propose that a mechanism of default valuation assigns a default value [def] in case that the feature does not receive a value due to failed Agree (see Frampton & Gutman 2000, Cho & Park 2004, Heck & Cuartero 2012 for similar proposals; Preminger 2010, 2011 for a proposal where morphological realization differs directly between failed Agree and successful Agree). The exact structure of [def] in the case of tense in Quechua will be outlined below in section 3.5.1.2.

Note that a mechanism of default valuation is wide-spread in the literature about agreement, though it has not always been mentioned explicitly. If, e.g., 3rd person is considered to be absence of person (Kayne 2000, Sigurðsson 2001, Anagnostopoulou 2003), the person feature of a ϕ -probe cannot be valued by a 3rd person argument and must be given a default value.

Up to this point, we have achieved the following result: in same subject configurations, where the subject of the adverbial clause and the subject of the matrix clause are identical, tense Agree is possible and in different subject configurations, where the two subjects are different, tense Agree is not possible and the tense feature on the embedded T

receives a default value.

- (38) a. Same subject: D[tense:pst|pres|fut|. . .]
b. Different subject: D[tense:def]

3.5.1.2 *The morphology*

Now, the morphological realization of the features decides which markers are inserted. The main point of this part of the analysis is that the switch-reference markers are inserted whenever the morphosyntactic tense feature is valued during the derivation, either by Agree or default valuation, while tense markers occur in case the tense feature enters the derivation valued. In other words, the important outcome of the analysis is that switch-reference markers and tense markers are realizations of the same morphosyntactic category, namely tense, that is, there is no morphosyntactic category ‘switch-reference’ in Quechua. This directly raises the question of how tense interpretation comes about in case that switch-reference markers are inserted.²⁷ As pointed out in section 3.5.1.1, the morphosyntactic tense feature is accompanied by a tense index feature. Valuation of this index feature via Agree means

²⁷Thanks to an anonymous reviewer for asking this question.

nothing but tense binding (cf. Kratzer 1998). Thus, even in contexts where the tense feature receives a default value, the correct tense interpretation, namely that the tense of a switch-reference clause is identical to the tense of the superordinate clause, results from tense binding, that is valuation of the tense index feature. Thus, the interpretation of tense does not necessarily depend on the morphosyntactic tense feature.

(39) provides a closer look at the different morphosyntactic contexts for marker insertion. According to the analysis above, the tense feature comes in the four different forms given in (39).

(39) where $\alpha \in \{pst, pres, fut\}$, $i, t \in \mathbb{N}$

- a. T [tense: $\alpha, \phi: 3sg, \iota: i$, $\iota_i: t$, ...]
- b. D [tense: $\alpha, \phi: 3sg, \iota: i$, $\iota_i: t$, ...]
- c. D [tense: $\alpha, \phi: 3sg, \iota: i$, $\iota_i: t$, ...]
- d. D [tense: *def*, $\phi: 3sg, \iota: i$, $\iota_i: t$, ...]

There are three parameters that are important here. First of all, the tense feature may appear in context of a D head, i.e., the clause is nominalized (39-b,c,d), or not (39-a). Second, the tense feature was valued during the derivation (39-c,d), or not (39-a,b). In (39), features that are valued

during the derivation are italicized. Finally, the value of the tense feature is default (39-d) or not (39-a,b,c).

The paradigm of markers that occur in the slot between the object and subject agreement markers (cf. section 2.1) is given in (40) for Imbabura Quechua (Cole 1982:142f., Cole & Hermon 1981:10; for discussion see Kusters 2003, Hintz 2007). Note that this paradigm is simplified with respect to the tense/aspect paradigm of Quechua in order to illustrate the main point, namely why switch-reference markers and tense markers are mutually exclusive. If further tense/aspect distinctions are made, the morphological analysis outlined below must be refined.

(40)

TENSE		
	verbal markers	nominal markers
present	∅	/j/
past	/rka/	/shka/
future	/nga/	/na/

SWITCH-REFERENCE	
same subject	/shpa/
different subject	/jpi/

In (41), the morphological tense feature is decomposed into binary features [pst] and [fut]. This is just a refinement of the feature specification given above; all other points of the analysis stay the same. Here I assume that the default value for tense features is '+'. Note that the decomposition is entirely morphological and does not necessarily hold for the semantics as well.

(41) present = [-pst-fut]

past = [+pst-fut]

future = [-pst+fut]

default = [+pst+fut]

The vocabulary items that derive the correct distribution of the markers are given in (42). Following Béjar (2003:155ff.), I assume that vocabulary items may differ between values that are added to a probe during the derivation (italized features and feature values), either by Agree or default valuation, and values that are already present on heads. Béjar (2003) needs this distinction in order to derive so-called *second cycle effects* of Agree.

An obvious alternative, though not fully in line with DM, would be to assume that the markers in (42-a-f) are markers available already prior to the syntactic derivation, while the markers in (42-g-h) are post-syntactic markers. Furthermore, one would have to assume that markers are inserted as soon as possible (cf. the Earliness Principle, Pesetsky (1989)). Then, the markers in (42-a-f) would be inserted pre-syntactically since the feature values already come from the lexicon, while the markers in (42-g-h) have to wait after syntactic Agree has applied (or failed to apply). Assuming that the difference between feature values being added during the derivation and those coming from the lexicon can be modeled from primitive mechanisms such as, e.g., timing, I

will stick to the diacritic notion of italicizing feature values added during the derivation in what follows.

(42) *Vocabulary items for the tense feature in Quechua*

- a. [-pst–fut] ↔ ∅
- b. [+pst–fut] ↔ <rka>
- c. [-pst+fut] ↔ <nga>
- d. [-pst–fut]/D ↔ <j>
- e. [+pst–fut]/D ↔ <shka>
- f. [-pst+fut]/D ↔ <na>
- g. [] ↔ <shpa>
- h. [+pst+fut] ↔ <jpi>

The idea of the analysis in (42) is that the alleged switch-reference markers *-shpa* and *-jpi* (~ *-pti*) are in fact realizations of tense features that received its value via Agree, in contrast to the tense markers, which are realizations of tense features that are valued from the outset. As shown in (42-a-f), the tense markers are inserted when the tense features have the respective feature values. Nominal tense markers are inserted in the context of a nominal head D (42-d-f). The different subject marker *-jpi* (~ *-pti*) is inserted if both tense features have default values

due to failed Agree (42-h). The same subject marker *-shpa* is inserted in case the tense features do not have values of their own and do not both have default values (42-g). In the vocabulary item (42-g), *-shpa* is an extremely underspecified marker. Since it is not specified for any features, it fits into any context. However, due to the definition of the Subset Principle (see (22), section 3.2), the *elsewhere marker -shpa* will only occur if no other marker that is more specific matches the context. This is only the case if a tense feature receives a value via Agree.

To illustrate the marker insertion, the possibilities for tense features on T and D heads given in (39) are listed in more detail in (43) with the tense features being decomposed as in (41). (All other features of T/D are omitted here for reasons of simplicity.)

(43)	<i>Context</i>	<i>Most specific matching vocabulary item</i>
a.	T [-pst,-fut,...],...]	[-pst-fut] ↔ ∅
b.	T [+pst,-fut,...],...]	[+pst-fut] ↔ <rka>
c.	T [-pst,+fut,...],...]	[-pst+fut] ↔ <nga>
d.	D [-pst,-fut,...],...]	[-pst-fut]/D ↔ <j>
e.	D [+pst,-fut,...],...]	[+pst-fut]/D ↔ <shka>
f.	D [-pst,+fut,...],...]	[-pst+fut]/D ↔ <na>
g.	D [-pst,-fut,...],...]	[] ↔ <shpa>
h.	D [+pst,-fut,...],...]	[] ↔ <shpa>
i.	D [-pst,+fut,...],...]	[] ↔ <shpa>
j.	D [+pst,+fut,...],...]	[+pst+fut] ↔ <jpi>

In (43-a-c), the verbal tense features on T are given, which have not received a value via Agree. Since the nominal tense markers are too specific and can only be inserted in context of a D head, the verbal tense markers (42-a-c) must be chosen. The verbal markers are all fully specified for tense features. Thus, there is no competition among them and $-\emptyset$ is correctly inserted in a present tense context ([-pst-fut]), *-rka* is inserted for past tense ([+pst-fut]), and *-nga* is chosen for future tense ([-pst+fut]). Note that in principle, the same subject marker *-shpa*

would also fit and is thus in competition with the verbal tense markers. However, since the verbal tense markers are more specific than the same subject marker *-shpa*, the same subject marker cannot occur in these contexts.

The contexts in (43-d-f) are matched by the nominal tense markers, the verbal tense markers, and the same subject marker. But since the nominal tense markers in (42-d-f) are more specific than the verbal tense markers – they are specified for the context "D" as well – and the same subject marker, only the nominal tense markers can be inserted. Thus *-j* is chosen for present tense ([–pst–fut]), *-shka* is chosen for past tense ([+pst–fut]), and *-na* is chosen for future tense ([–pst+fut]).

More interesting are the contexts in (43-g-i). Here, only markers can be inserted that are specified for feature values acquired during the derivation. Therefore, only *-shpa* in (42-g) and *-jpi* in (42-h) can be considered. However, since *-jpi* is specified for [+pst+fut], it does not match the contexts in (43-g-i), so that the elsewhere marker *-shpa* is the only matching marker and must be inserted.

Finally, the most specific matching marker for the context in (43-j) is *-jpi* ([+pst+fut]). Therefore, *-jpi* is inserted whenever both tense features have a default value.

In sum, the decomposition of tense features and values as in (41) and the feature specification of vocabulary items in (42) guarantee that tense markers are inserted whenever a head T or D has tense values of its own, while switch-reference markers are inserted whenever tense features are valued during the derivation. Valuation during the derivation can be accomplished by successful tense Agree, which is only possible in same subject contexts, or by default valuation, which applies when tense Agree fails in different subject contexts. In the first case, only the same subject marker can be inserted in the morphological component, since it is the only matching marker, while in the latter case, default valuation forces the insertion of the different subject marker.

In conclusion, I have developed an analysis of switch-reference that is able to overcome the two theoretical problems with switch-reference. First of all, the non-local dependency between the subjects of two different clauses is split up into different local Agree operations. Second, the look-ahead problem is overcome by postponing the insertion of the switch-reference markers until a post-syntactic morphological component. More precisely the analysis can be summarized as follows: when subjects Agree with the T and D_c heads of their respective clauses, the ϕ -features and the index of the subject become available on T and D_c .

Then, the T and D_c heads enter into an Agree relation which is needed for independent reasons since the D_c head of the embedded clause lacks tense values. However, this Agree relation can only be established in case the subjects are identical. Otherwise, D_c receives default values. The different versions of the tense features are then realized by tense or switch-reference markers. Switch-reference markers realize tense features if their values have been added during the derivation and tense markers are used if the tense features have values of their own.²⁸ Note that this analysis resembles previous analyses of switch-reference in several ways. A comparison of the approach developed here and other approaches to switch-reference is given in section 4.

In the final part of this section, I will show how the properties of the Quechuan switch-reference system fall out from the analysis of switch-reference developed so far, that is, I will show how the agreement analysis of switch-reference can also overcome the empirical problem with switch-reference.

²⁸Ritter & Wiltschko (2009, 2010) argue that T (their “INFL”) actually bears an abstract morphosyntactic category [\pm coincidence] which encodes *clausal anchoring* and can be instantiated by different concrete categories in different languages, e.g., tense, location or participant. In a way, the present analysis of switch-reference being a realization of T captures the spirit of their analysis.

3.5.2 Deriving the properties of switch-reference in Quechua

The empirical problem with switch-reference is its cross-linguistic diversity. Switch-reference systems differ immensely in their properties. This makes it hard and probably impossible to analyze switch-reference cross-linguistically alike. In this paper, I solely focus on Quechua and show how the interclausal agreement analysis developed in this section so far is able to derive the four observations that can be made for switch-reference in Quechua (cf. section 2.1 for details).

(44) *Observations*

- a. Switch-reference is canonical.
- b. The switch-reference marker occurs in the position of the tense marker.
- c. Switch-reference markers and tense/case-markers are mutually exclusive.
- d. Switch-reference markers can only occur with nominal person agreement markers.

3.5.2.1 *Switch-reference is canonical*

The first property (44-a) follows from the assumptions about tense Agree. If the subjects are identical, tense Agree is possible and the tense features receive non-default tense values and must be realized by the same subject marker *-shpa* (cf. (43-g-h)). If the subjects are not identical, tense Agree is not possible and the tense features bear default values, which in turn leads to insertion of the different subject marker *-pti* (\sim *-jpi*; cf. (43-i)). Thus the switch-reference system in Quechua is correctly predicted to be canonical, with the different subject marker only occurring in different subject contexts and the same subject marker only occurring in same subject contexts.

One potential problem for the analysis developed above is posed by data as in (45), with more than one switch-reference clause (Weber 1980, Weber 1989:fn.5,p.302).²⁹

²⁹Thanks to an anonymous reviewer for raising a question about these data.

(45) *Cuzco*

[[[[*Manuel-cha-qa phawaylla haykuru-sha-**qti-n***]

Manuel-DIM-TOP quickly enter-IMPFV-DS-3

*runa-kauna-taq hapi's-**spa**] tanqayurusha-**qti-n***]

man-PL-EMPH grab-SS push-DS-3

*Manuel-cha-qa hap'iparquku-**spa**] llusirqu-sqa*

Manuel-DIM-TOP grab-SS get.out-PST

t'uqu-manta

hole-ABL

‘When, after Manuel quickly entered, the men grabbing pushed
him, Manuel grabbing hold (of something) got out of the hole.’

Adopting the current approach, the abstract structure of the sentence in
(45) would be as in (46).

D₂).

One possibility to extend the current proposal in order to derive the data in (45) would be to exempt the insertion of adverbial clauses, or more generally adjuncts, from the Strict Cycle Condition, that is, to allow late adjunction (for motivation, see Riemsdijk 1983, Freidin 1986, Lebeaux 1988). Then, the adverbial clauses in (46) could be brought into the structure in the opposite order, the highest clause being adjoined first. Consequently, tense Agree could also apply in the opposite order. A derivation of the structure in (46) is sketched in (47).³⁰

(47) a. *Matrix clause*

[_T Manuel[ϕ :3sg, ι :i] T[ϕ :3sg, ι :i, tense:pst], [ι_i :t]]

b. *Adjunction D₄*

[_T [_{D₄} Manuel[ϕ :3sg, ι :i] D₄[ϕ :3sg, ι :i, tense:___], [ι_i :___]]]

Manuel[ϕ :3sg, ι :i] T[ϕ :3sg, ι :i, tense:pst], [ι_i :t]]

c. *tense Agree D₄ and T*

[_T [_{D₄} Manuel[ϕ :3sg, ι :i] D₄[ϕ :3sg, ι :i, tense:pst], [ι_i :t]]]

Manuel[ϕ :3sg, ι :i] T[ϕ :3sg, ι :i, tense:pst], [ι_i :t]]

d. *Adjunction D₃*

³⁰In the following derivation, i, j, t are variables standing for natural numbers.

[_T [_{D₄} [_{D₃} man[ϕ :3sg, ι :j] D[ϕ :3sg, ι :j, tense:___], [ι :___]]]
 Manuel[ϕ :3sg, ι :i] D₄[ϕ :3sg, ι :i, tense:pst], [ι :t]]] Manuel T]

- e. *no tense Agree D₃ and D₄ due to mismatch, default valuation of tense on D₃*

[_T [_{D₄} [_{D₃} man[ϕ :3sg, ι :j] D[ϕ :3sg, ι :j, tense:def], [ι :t]]]
 Manuel[ϕ :3sg, ι :i] D₄[ϕ :3sg, ι :i, tense:pst], [ι :t]]] Manuel T]

- f. *Adjunction D₂*

[_T [_{D₄} [_{D₃} [_{D₂} man[ϕ :3sg, ι :j] D₂[ϕ :3sg, ι :j, tense:___], [ι :___]]
] man[ϕ :3sg, ι :j] D₃[ϕ :3sg, ι :j, tense:def], [ι :t]]] Manuel
 D₄] Manuel T]

- g. *tense Agree D₂ and D₃*

[_T [_{D₄} [_{D₃} [_{D₂} man[ϕ :3sg, ι :j] D₂[ϕ :3sg, ι :j, tense:def], [ι :t]]
] man[ϕ :3sg, ι :j] D₃[ϕ :3sg, ι :j, tense:def], [ι :t]]] Manuel
 D₄] Manuel T]

- h. *Adjunction D₁*

[_T [_{D₄} [_{D₃} [_{D₂} [_{D₁} Manuel[ϕ :3sg, ι :i] D₁[ϕ :3sg, ι :i, tense:___],
 [ι :___]]] man[ϕ :3sg, ι :j] D₂[ϕ :3sg, ι :j, tense:def], [ι :t]]]
 man D₃] Manuel D₄] Manuel T]

- i. *no tense Agree D₁ and D₂ due to mismatch, default valuation of tense on D₁*

$$\begin{array}{l}
[_T [_{D_4} [_{D_3} [_{D_2} [_{D_1} \text{Manuel}[\phi:3\text{sg}, \iota:i] D_1[\phi:3\text{sg}, \iota:i, \text{tense:def}], \\
[\iota_i:t]]] \text{man}[\phi:3\text{sg}, \iota:j] D_2[\phi:3\text{sg}, \iota:j, \text{tense:def}], [\iota_i:t]]] \\
\text{man } D_3] \text{Manuel } D_4] \text{Manuel } T]
\end{array}$$

As shown in this derivation, counter-cyclic adjunction of the adverbial clauses followed by counter-cyclic tense Agree, would bring the desired result. Here it should be noted that applications of tense Agree must obey the Earliness Principle (Pesetsky 1989, Řezáč 2004*b*) which says that operations apply as soon as possible. Only then is the order of operations as shown in (47) guaranteed. If tense Agree could wait, we would expect the possibility for long-distance tense Agree which would eventually result in the wrong switch-reference marking.³¹

Still, the assumption of exempting adjuncts from the Strict Cycle Condition together with the Earliness Principle does not suffice. The problem is that tense Agree between D_2 and D_3 in (47-g) copies a default tense value onto D_2 . Thus, D_2 is expected to carry a different subject marker. To overcome this problem, the morphology must be able to differ between default values due to failed Agree and default values due to successful Agree. In other words, another feature or diacritic is

³¹Thanks to a reviewer for asking this question.

needed, in order to guarantee the correct distribution of the same and the different subject marker.

In sum, in order for the agreement approach of section 3.5.1 to derive the data in (45), one has to assume (i) that adjuncts are exempted from the Strict Cycle Condition with the consequence that tense Agree may be counter-cyclic, (ii) that tense Agree obeys the Earliness Principle, and (iii) that the morphology can distinguish between features valued by Agree and features valued by default valuation.

3.5.2.2 *The switch-reference marker occurs in the position of the tense marker*

The second observation (44-b) follows as well because there is no morphosyntactic category ‘switch-reference’, but only ‘tense’. Switch-reference is analyzed as *agreeing tense*. Hence, the switch-reference markers are tense markers which must occur in the slot of tense markers between the object and subject agreement markers.

Note that the correct interpretation of tense is guaranteed in all cases. If the morphosyntactic tense features are valued from the start, they have a tense index of their own. In this case, the semantic component can

simply interpret the morphosyntactic tense value. If, however, the morphosyntactic tense features are not valued but receive a value during the derivation, the tense index feature will also receive its value during the derivation, that is, the head bearing the tense features will be bound. In this case, the semantic component does not have to interpret tense via the morphosyntactic tense feature but can instead use the tense index feature. Consequently, in (adverbial) clauses which do not have a tense value of their own, tense is interpreted as being identical to the tense of the superordinate clause that contains the tense binder. This is especially important in the case of tense features that have a default value, which can be interpreted neither as past, present or future. However, since in these cases, the tense index is identical to the tense index of the superordinate clause (see (37)), the tense is interpreted as identical to the tense of this clause.

3.5.2.3 Switch-reference markers and tense/case-markers are mutually exclusive

The third property (44-c) combines two facts. First, tense markers and switch-reference markers cannot cooccur. Since both types of markers

realize the tense feature, it is expected that the markers cannot show up at the same time. However, overt case marking of the adverbial clause is also not possible when a switch-reference marker occurs. This is interesting since it is not obvious why this should be so. In what follows, I will provide an explanation for this puzzling fact.

Quechua has structural as well as semantic cases. The case markers for Huallaga Quechua, according to Weber (1989:55ff.), are given in (48).³²

³²The marker *-ta* is also used for dative case and case of direction. The genitive marker is not only used to indicate possession but also to indicate direction etc.

(48)

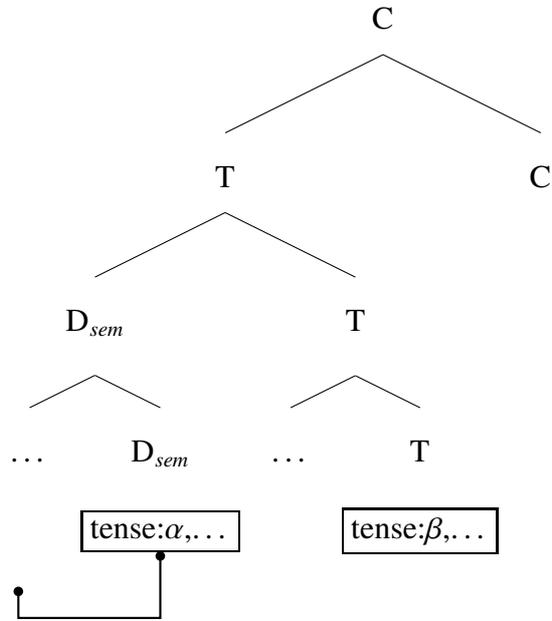
Structural case	∅	nominative
	/-ta/	accusative
	/-pa/	genitive
Semantic case	/-yaq/~/-kama/	limitative
	/-man/	goal
	/-chaw/	locative
	/-paq/	purposive/benefactive
	/-pita/	ablative
	/-rayku/	sake
	/-naw/	similarity
	/-niraq/	like
	/-wan/	comitative
/-pura/	among	

Here I assume that structural case is a reflex of Agree (George & Kornfilt 1981, Schütze 1997, Chomsky 2000). If a category agrees with T or D_c , it is marked with external case (nominative or genitive case); if it agrees with v or n, it receives internal (accusative) case. Semantic cases, on the other hand, are typically assigned to adjuncts depending on their relation to the matrix clause (Wunderlich & Lakämper 2001).

A DP is marked by semantic case, if it has not received structural case, i.e., if it has not agreed with T/D_c or v/n.

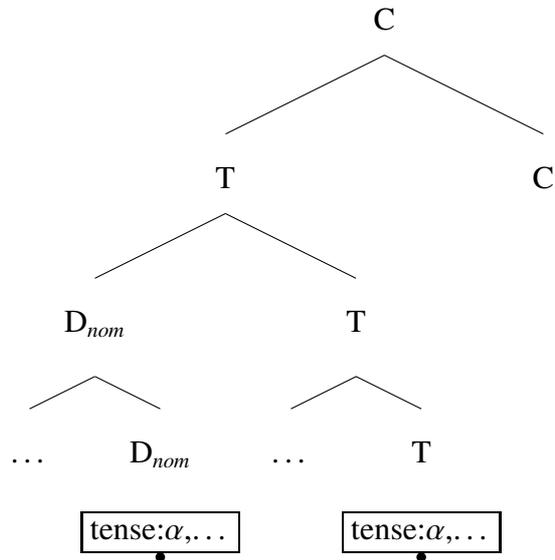
Now, in the theory developed above, the difference between switch-reference and non-switch-reference adverbial clauses is that the complex head of the former Agrees with the matrix T in tense while the head of the latter does not do so. Since an Agree relation with T induces nominative case assignment, we expect that adverbial clauses which Agree with T must receive nominative case. Adverbial clauses which do not Agree with T do not receive structural case and must be marked by a semantic case. Note that if case is viewed as a true reflex of Agree and not constructed as an uninterpretable feature that T must get rid of, it must be possible for two categories α and β which Agree with the same head H to receive the same case. Concretely, it must be possible for both the matrix subject and the adverbial switch-reference clause to receive nominative case.

(49) a. *Non-agreeing adverbial clause*



no Agree with T, assign semantic case to D

b. *Agreeing adverbial clause*



Agree with T, assign nominative case to D

Note that this kind of case assignment differs from canonical case assignment in that here the case assignee bears the unvalued features and not the valued features, as is the case with, e.g., ϕ -Agree. But if the only condition for case assignment is that structural case is assigned to a DP when its head agrees with a functional projection, then case assignment to the adverbial nominal clause in (49-b) is possible. Alternatively, one could assume, that both members of an Agree relation receive a structural case, i.e., in the (49-b), both T and D receive structural case. However, case is only realized morphologically on nominal elements.

So far, we have seen that a further consequence of tense Agree between the adverbial clause and the matrix T is nominative case-marking on the adverbial clause. Thus, switch-reference markers, which realize the probing tense feature are compatible only with nominative case. As (48) shows, nominative case is realized by a zero marker (\emptyset). Thus, switch-reference adverbial are mutually exclusive with overt case markers.

3.5.2.4 *Switch-reference markers can only occur with nominal person agreement markers*

Finally, the last property (44-d) follows from the assumption that switch-reference clauses in Quechua are nominalized, i.e., headed by D. The subject agreement markers of Ancash Quechua are given in (50).³³ Object agreement markers are identical in verbal and nominal contexts.

³³Whether verbal or nominal markers are used, can only be seen in the 2nd person. All other markers are identical. In other dialects of Quechua, the marker for 1st person differs as well, e.g., Ayacucho Quechua in (i).

(i) *Person markers (Ayacucho)* (Lakämper & Wunderlich 1998:120)

	VERBAL	NOMINAL
1	-ni	-y
2	-nki	yki
3	-n	-n
12	-nchik	-nchik

(50) *Person markers (Ancash)* (Lakämper & Wunderlich 1998:119)

	VERBAL	NOMINAL
1	-:	-:
2	-nki	-yki
3	-n	-n
12	-ntsik	-ntsik

For the person agreement markers in (50), the vocabulary items in (51) are plausible. (The 1st person is marked by lengthening of the stem-final vowel: ‘-:’.) Note that the person feature might be decomposed into binary features just like the tense feature. Nothing hinges on that.

- (51)
- a. [1] ↔ <:>
 - b. [2] ↔ <nki>
 - c. [2]/D ↔ <yki>
 - d. [3] ↔ <n>
 - e. [] ↔ <ntsik>

If nominal person markers are specified by the context ‘D’, it is correctly predicted that in switch-reference adverbial clauses, which are

nominalized just like any other embedded clauses, the nominal person agreement markers must be used despite the absence of other markers that indicate nominalization. This is an important outcome of the theory. In fact, to my knowledge, it has always been a puzzle for analyses of Quechua that switch-reference adverbial clauses occur with nominal person agreement markers but lack any other markers that indicate nominalization. Therefore these clauses have often been assumed to be verbal in contrast to all other embedded clauses in Quechua (cf. e.g. Cole & Hermon (2011), see also the discussion in section 2.1). In the agreement analysis presented above, the occurrence of nominal subject agreement markers is captured by letting every embedded clause, including switch-reference clauses, be headed by D. However, the lack of a morphosyntactic tense value in switch-reference clauses, which enforces tense agreement with a higher clause, ensures that they are incompatible with both nominal tense markers (due to Agree, the tense feature must be realized by a switch-reference marker) and overt case markers (due to Agree, the adverbial clause receives the zero nominative case).

To sum up, I have shown that the observations about switch-reference in Quechua can be captured by the agreement theory developed in this

section. As far as I can see, no other theory of switch-reference is able to derive the same facts. I have also shown that an account that treats switch-reference adverbial clauses in Quechua as nominalized, thereby explaining the fact that nominal person agreement markers are used, is compatible with the fact that this kind of adverbial clause does not show any other sign of nominalization. It follows from the theory of interclausal tense agreement that switch-reference markers are mutually exclusive with nominal tense as well as with overt case markers.

4 Other approaches to switch-reference

In this section, the analysis developed in section 3 is compared to other approaches to switch-reference with respect to conceptual properties and empirical adequacy.

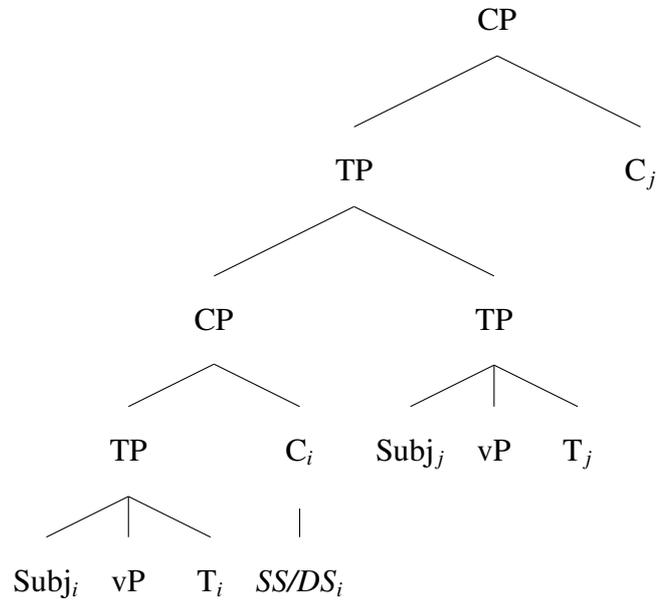
4.1 Comparison with other approaches based on referential indices

In general, it should be mentioned that the account presented here, is highly reminiscent of the binding approach of Finer (1985) (cf. Broadwell 1997, Watanabe 2000, Peachey 2006 for variants of it). In this type

of theory, the switch-reference dependency is also split up into dependencies between the subject and the head of the clause and a dependency between the heads of two clauses, i.e., the comparison between two subjects is only established indirectly via clausal heads. The same idea was pursued in the agreement analysis developed above in section 3.5.

The main idea of *Finer's* approach is that the head of a switch-reference clause is either the same subject marker – an anaphor, which must be bound by the head of the superordinate clause – or the different subject marker – a pronoun, which must not be bound. Binding is possible if the two heads bear the same index, which they have obtained through an indirect agreement relation with the subject. The analysis of *Finer* (1985) is outlined in (52) (cf. *Finer* 1985:48; category labels in (52) are replaced by modern labels).

(52)



In (52), the T heads of the embedded and the matrix clause agree, and the index of the subject becomes visible on T, the head that bears the subject agreement features. Through a (not clearly specified) connection between T and C, the index is copied from T onto C. Now, the embedded C contains either an anaphor (the same subject marker) or a pronoun (the different subject marker). If it contains an anaphor, it must be bound by a coindexed C. If it contains a pronoun, binding is not allowed. Since the indices on both Cs are the subject indices, only the same subject marker can be inserted in same subject contexts (the different subject marker would be incorrectly bound by the higher C),

while the different subject marker can only be inserted in different subject contexts (the anaphoric same subject marker could not be bound in these contexts).

This derives the fact that the same subject marker can only be used if the subjects of the two clauses are identical (binding is obligatory), and the different subject marker can only be used if the two subjects differ (binding is not allowed). Since the agreement analysis pursued here involves referential indices which enter into a syntactic Agree relation, the dependency may also be considered to be a binding dependency, just as in *Finer (1985)*. (See also *Weisser 2009* for the idea that binding is involved in switch-reference.)

There are, however, three major points in which *Finer's* approach and the present approach differ. First of all, the agreement analysis is built upon the idea that switch-reference is *not* a proper morphosyntactic category. Rather, what we observe as switch-reference marking is in fact only a subsystem of another morphosyntactic category, namely tense.

Another difference as compared to the binding approaches of *Finer (1985)*, *Broadwell (1997)*, *Watanabe (2000)*, *Weisser (2009)* is that whether a morpheme is a same subject marker or a different subject marker is

not settled at the beginning but is an outcome of morphological realization after syntax has manipulated features and feature values (see also Georgi 2012, Keine to appear for analyses where same and different subject marking is not fixed from the beginning).

Finally, the binding approach is clearly representational in nature, since it involves the representational binding principles A and B.

(53) *Binding Principles* (Chomsky 1981:188)

A. An anaphor is bound in its governing category.

B. A pronominal is free in its governing category.

The agreement approach developed here is, however, entirely derivational since it does not rely on representational constraints such as binding principles. Thus, the interclausal agreement approach is in line with the tenet of reducing the representational residue in derivational theories (cf. Brody 2001).

A possible flaw of the agreement as well as the binding analysis might be that both are based upon referential indices in the syntax. This seems to be hardly desirable as the minimalist program tries to eliminate indices in narrow syntax and considers them to be a purely semantic

object. In fact, theories have been proposed where switch-reference is analyzed without invoking referential indices. However, as I will argue below, theories which do not make use of indices, encounter difficulties with deriving canonical different subject marking.

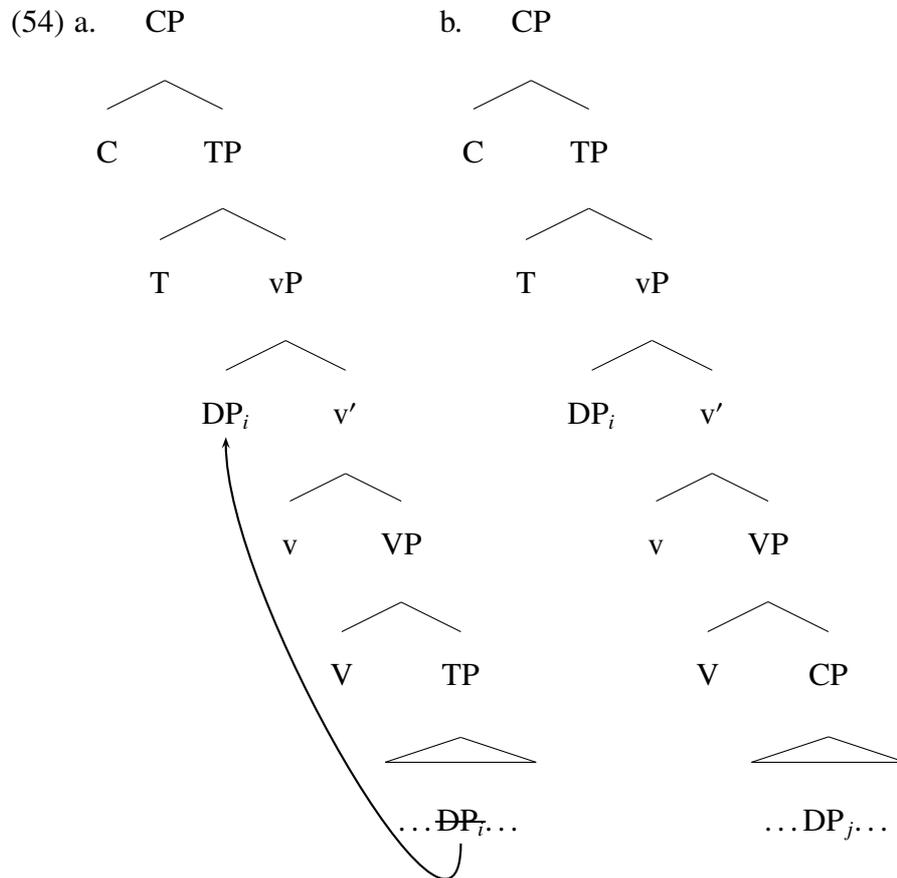
Empirically, the binding approach of Finer (1985) can cope with the Quechuan data only by adding additional stipulations. Even though Finer's approach can account for the canonicity of switch-reference in Quechua and might capture the occurrence of nominal person agreement markers simply by adopting the same basic clause as in this approach, Finer's approach has a hard time explaining the lack of tense markers and case markers in switch-reference clauses.

In sum, even though the agreement approach makes use of referential indices just like the binding approach, the agreement approach has two advantages concerning the aims of this paper: it is more derivational in nature and it can naturally account for the facts about switch-reference in Quechua.

4.2 Comparison with approaches not based on referential indices

Here I would like to summarize three different accounts of switch-reference that do not make use of referential indices and compare them to the agreement approach presented in this paper.

The first approach is the movement approach by Georgi (2012) which assumes that in some subject contexts there is only one DP that is merged as the subject of the subordinate clause and then moves to the subject position of the superordinate clause. In different subject contexts there are two DPs which are merged in the two subject positions. The structures for both contexts are given in (54) (cf. Georgi 2012:15).

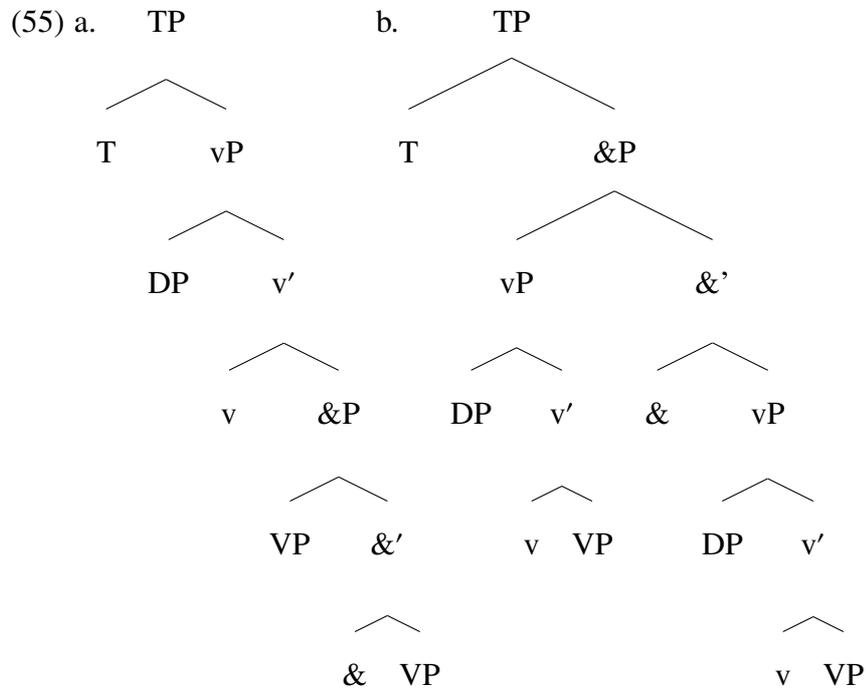


In same subject contexts, the embedded clause is a TP which is headed by a defective T that cannot assign nominative case to its subject DP_i. If there is no DP to be merged in the subject position of the matrix clause, the subject of the embedded clause may be moved to this position where it can also receive case from the non-defective matrix T. Thus in Georgi's (2012) approach, same subject contexts are actually contexts for obligatory control, here modeled as movement (cf. Boeckx

et al. 2010).

In different subject contexts, the embedded clause is a CP which contains a non-defective T. Both subject positions are filled by separate DPs. Thus, there is no relation between the two clauses in different subject contexts.

Keine (to appear) proposes that in switch-reference contexts, clauses are coordinated. In same subject contexts, low coordination of VPs excluding the subject applies, so that only one subject is present in the structure, while in different subject contexts high coordination of vPs applies with two subjects being present in the structure.

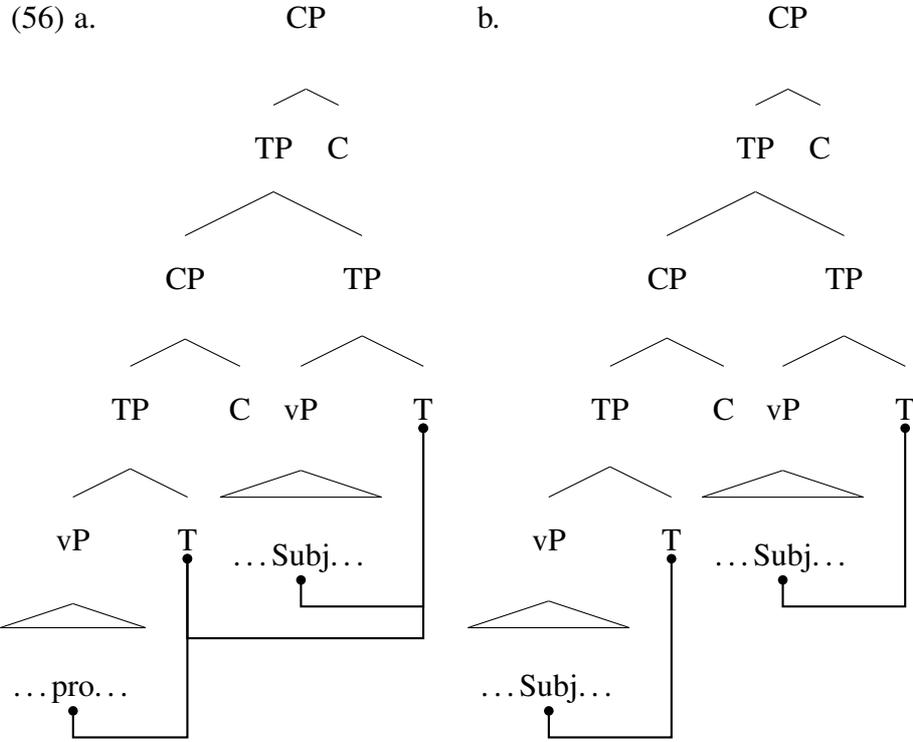


If two VPs are coordinated as in (55-a), the head of the coordination phrase is realized by the same subject marker, while if two vPs are coordinated as in (55-b), the head of the coordination phrase is realized by the different subject marker.

Finally, Camacho (2010) assumes that the clause bearing switch-reference morphology has an empty pronominal as its subject which is ϕ -defective and cannot value the ϕ -features on T. Camacho then proposes that the T head of a same subject clause has a valency feature which must be valued via Agree with the superordinate clause. Since

he assumes feature sharing (Pollard & Sag 1994, Frampton & Gutman 2000, Legate 2005, Pesetsky & Torrego 2007), the valency Agree relation establishes a link between the subject of the superordinate clause and the subordinate clause. In other words, the subject of the superordinate clause is identified as the subject of the subordinate clause. In different subject contexts, however, no such interclausal dependency is established, and two different subjects are present.³⁴

³⁴This is also an important difference between Camacho's approach and the current agreement approach. Though both approaches show superficial similarities regarding the mechanisms to establish a switch-reference dependency, namely Agree, the approaches differ in that only in the current approach, also different subject constructions involve a relation between the embedded and the matrix clause, more concretely a failed Agree relation.



In (56-a), the empty *pro* establishes a feature sharing relation with the embedded T and the subject establishes a feature sharing relation with the matrix T. Similar feature sharing relations are established between the subjects and the T heads in (56-b). The difference between (56-a), which constitutes a same subject context, and (56-b), which constitutes a different subject context, is that in (56-a), the T heads of the embedded and the matrix clause have an additional feature sharing relation due to the fact, that in (56-a), the embedded T needs a valency feature of the matrix T. Because of this relation, the empty *pro*, which has no

ϕ -features of its own, and the embedded T receive the ϕ -feature values of the matrix subject so that the matrix subject becomes the subject of the embedded clause. No such relation is established in (56-b) where there is no interclausal feature sharing.

Now, what the three approaches summarized above have in common is that a dependency between two clauses is only established in same subject contexts, while different subject contexts exhibit no dependency between the clauses. This, however, means that it cannot be guaranteed that the subjects in different subject contexts are truly different, and additional stipulations are necessary in order to rule out accidental identity.

Keine (to appear:19), e.g., rules out accidental identity of subjects in different subject contexts by the principle of *Economy of Coordinate Structures* in (57) (cf. also Chomsky 1995, Rizzi 1997, Bresnan 2001, Grimshaw 1997, 2001, 2008 among others).

(57) *Economy of Coordinate Structures*

Given semantic equivalence, minimize structure.

Since vP and VP coordination are semantically equivalent if both sub-

jects are identical, only VP coordination may be used. Note, however, that this constraint is at least translocal (maybe even transderivational), that is, it involves a comparison of possible structures that go back to the same input numeration. Since such constraints increase the complexity of syntactic computation immensely, they are not desirable and should be dispensed with, if possible.

It should be noted that there are in fact languages which have non-canonical different subject marking, i.e., the different subject marker is used even though the subjects are identical, e.g., Seri (cf. Moser 1978, Marlett 1981, 1984*a,b*, 2010, Farrell et al. 1991), Amele (cf. Roberts 1987, 1988*a,b*, 1990, 1997, 2001), Eastern Pomo (cf. McLendon 1975, 1978) or Lenakel (cf. Lynch 1983).³⁵ Nevertheless, canonical different subject marking as can be observed in Quechua, does not follow directly from such accounts and needs additional assumptions. Canonical different subject marking, however, follows directly within the agreement approach developed here.

Note that the main idea of the interclausal agreement analysis can be maintained in order to derive non-canonical switch-reference marking. Presupposing that an Agree relation between two clauses can be estab-

³⁵The references are taken from Keine (to appear).

lished in any case, the constitution of probes decides whether Agree can be established (SS marking) or not (DS marking). Even though I do not claim that the agreement account is suited for all switch-reference systems – in fact, it rather seems to me that switch-reference is a term covering syntactically distinct phenomena – it is in principle possible to adapt the agreement analysis to other languages and derive non-canonical switch-reference marking without altering the main assumptions.

Furthermore, one main advantage of the interclausal agreement analysis is that it is able to derive the language-specific properties of the Quechuan switch-reference system, viz., that the switch-reference markers behave morphosyntactically like tense markers and are not compatible either with verbal person agreement markers or with case markers. None of the three approaches above can account for these facts without additional stipulation.

To sum up the discussion of this section, I have argued that the interclausal agreement approach to switch-reference in Quechua has several advantages over other accounts of switch-reference. On the one hand, the analysis is completely local and derivational in nature, which makes it more compatible with a local derivational framework than Finer's

(1985) binding approach. (It seems to me that for reasons of complexity, it is also more attractive than Keine's account, which relies on a translocational economy constraint.) Furthermore, I have argued that, at least with respect to Quechua, the interclausal agreement analysis can capture the data in a more elegant way, without invoking additional assumptions.

5 Conclusion

In this paper, I have developed an approach to switch-reference in Quechua, which analyzes switch-reference as an instance of the morphosyntactic category tense. Adverbial clauses in Quechua might enter the derivation without a valued tense feature and must receive a value via Agree with the head of its superordinate clause. Due to assumptions about Agree, which are needed for deriving completely independent phenomena (cf. Richards 2008, Assmann 2010), tense Agree may only apply if the subjects of the adverbial and its superordinate clause are identical. The complementary distribution of tense and switch-reference markers can now be derived by sensitizing vocabulary insertion rules to whether feature values have been obtained during the derivation or not. Tense markers are used if the tense features were valued from the start. The

same subject marker is used if Agree has applied and the different subject marker is used if Agree has failed.

This agreement analysis of switch-reference in Quechua is not only attractive on empirical grounds since it captures the major facts about the Quechuan switch-reference without further ado, but it is also compelling in light of the discussion of an elegant syntactic theory (cf. Brody 2001). The agreement analysis does not make use of representational or transderivational devices and constraints and can, thus, be considered to be in line with conceptual tenets of local derivational frameworks.

An interesting question, which arises given the discussion in this paper, is whether switch-reference should be analyzed cross-linguistically alike, or whether it is an epiphenomenon from a syntactic perspective, which results from other (perhaps even different) syntactic phenomena. At least for Quechua, I have argued that switch-reference can best be analyzed not as a proper morphosyntactic category.

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A Appendix: Abbreviations

1	–	1st person
2	–	2nd person
3	–	3rd person
ABL	–	ablative
ACC	–	accusative
AF	–	affect marker
BEN	–	benefactive
CAUS	–	causative marker
DAT	–	dative
DIM	–	diminutive
DIR	–	direct information
DS	–	different subject
EMPH	–	emphatic
FUT	–	future
GEN	–	genitive
IMPFV	–	imperfective
INSTR	–	instrumental
LOC	–	locative
NOM	–	nominative
NMLZ	–	nominalizer
OBJ	–	object
PL	–	plural
PST	–	past
RPST	–	recent past
SEM	–	semantic case
SG	–	singular
SS	–	same subject
TOP	–	topic