Switch-Attention (aka Switch-Reference) in South-American Temporal Clauses: Facilitating Oral Transmission

Rik van Gijn

Radboud University Nijmegen & Max Planck Institute for Evolutionary Anthropology Leipzig

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Cultures without a written tradition depend entirely on the oral channel to transmit sometimes highly complex information. It is therefore not surprising that in the languages of such cultures linguistic devices evolve that enhance textual coherence, and thus comprehension. These devices should ideally also be economical in terms of morphosyntactic complexity in order to facilitate both production and comprehension. In this paper, I will argue that switch-attention (a term preferred over the traditional switch-reference) systems in temporal clauses fulfill these requirements of cohesion and complexity reduction, making them particularly apt for orally transmitting texts. Moreover, switch-reference systems seem to diffuse relatively easily. These features taken together are suggested to be (partly) responsible for the widely attested phenomenon in areas without a lengthy written tradition.

1. Introduction

Switch-reference (henceforth SR)[2] marking systems are found in many parts of the world, and in many different forms. There are systematic areal descriptions of SR systems in North America (Jacobsen 1983), for Papua New Guinea (Roberts 1997) and Australia (Austin 1981). The extent of the phenomenon, both geographically and theoretically, requires much more study (cf. Bickel 2010), but it is probably safe to say that the lack of a written tradition forms no obstacle to having an SR system. The three geographical areas mentioned above, as well as the area under study in this paper, South America, exclusively involve languages that do not have a long tradition of writing, and often no such tradition at all. This may be surprising at first sight, since having a SR system seems rather costly in terms of added complexity, and oral transmission does not favor complexity. Given this fact, the question I will try to answer in this paper is: *Why would languages with predominantly oral traditions of information transmission adopt or develop such systems?*

To answer this question, I first define and delineate the object of study. This is the topic of section 2. In this section I also propose the – to my mind – better-suited term switch-attention. In section 3 I argue, and illustrate with data from South America, that switch-reference/attention marking offers advantages for the comprehension of especially orally transmitted information. Section 4 discusses the economizing strategies that languages can use and actually do use to compensate for the complexity of switch-reference/attention systems. Section 5 discusses reasons for the apparently successful diffusion of switch-reference/attention systems. Section 6, finally, concludes the discussion.

[2]The term switch-reference has come to be used in a very broad sense, applying to pivots that are not (entirely) based on reference proper. I keep to this terminology in these opening sections because I want to relate to the previous literature, but later in the paper I argue for and use the more appropriate term 'switch-attention'.

2. Switch Reference vs. 'Switch-Attention'

2.1 What Is Switch Reference (And What Has It Become)?

Switch-reference, a term introduced in print by Jacobsen (1967) is given the following, often cited definition in Haiman & Munro (1983: ix): "Canonical switch-reference is an inflectional category of the verb, which indicates whether or not its subject is identical with the subject of some other verb". Connected to this definition is the function they put forward for switch reference (ibid. xi): "The function of switch reference is to avoid ambiguity of reference." Moreover, Haiman & Munro explicitly define subject syntactically.

Several scholars have questioned these claims, both for specific languages (e.g. Mithun 1993, Watkins 1993) as well as more generally (Givón 1983, Foley & Van Valin 1984, Stirling 1993). These authors argue for a wider definition of switch-reference, as marking event (dis)continuity. They show that SR may work on other pivots than the syntactic subject pivot, like temporal (dis)continuity, unexpectedness, mood, etc.

A number of South-American languages also provide evidence that SR systems can go beyond subject pivots, and consequently have other functions than avoiding ambiguity of reference. A case in point is the SR system of Guanano (Tucanoan), which contrasts implicit and explicit chains, only the latter being morphologically marked - a pattern found in Eastern Tucanoan languages. The appearance of an explicit marker is determined by the identity of the subjects of two verbs, but crucially also by whether the events overlap in time or are successive. The system can be schematically represented by the following diagram (cf. Waltz 1976):

	overlap	succession
SS		+
DS	+	

Table 1: The Guanano SR system

The + sign in the table stands for a marked verb. Marked verbs appear in a medial form, as can be observed in the following examples:[3]

Guanano, Tucanoan (Waltz 1976: 25 & 38)

(1a) **waha**   süre
      go.MED   arrive.PST
      'Having gone, he arrived there.'

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[3]The following abbreviations are used in this paper: ABS absolutive; ACC accusative; ADVR adverbializer; AUX auxiliary; BEN benefactive; CAU causative; CE continued event; CLF classifier; CMPR comparative; CMT commitment ; DE discontinued event; DECL declarative; DEF definite; DEM demonstrative; DR different reference; DS different subject; ERG ergative; FM formative; FUT future; IN inessive; INC incompletive; IND indicative; GEN generic; GER gerund; INT intention; LOC locative; MED medial verb; MID middle voice; MIR mirative; NEG negative; ONOM onomatopoeia; PERF perfect; PL plural; POSS possessive; PP participle ; PROG progressive; PSSA previous event, same subject, A-orientation; PSSS previous event, same subject, S-orientation ; PST past; PURP purpoive; REC recent; REM remote; REP reportative; S subject; SEQ sequential; SG singular; SIT situational; SS same subject; SUF suffix; T transitivizer.

(1b)   tina   **chü**   tiro   cjuri   ñaca   taha   jüna
        they   eat.MED   he   turtle   character come.PST finally
        'While they were eating, that turtle character finally came.'

Unmarked chains tend to be longer than marked ones; marked clauses typically occur in binary structures (i.e. consisting of two predicates). Headland & Levinsohn (1977) report a similar system for nearby Tunebo (Chibchan), in which "temporal succession expects the same subject, and temporal overlap a different subject" (Headland & Levinsohn 1979: 157).

   In parts of the SR system of Yurakaré (unclassified), the pivot seems to be mood value rather than participant (dis)continuity. The language has a SR system that also marks a number of complement relations. Subjunctive/irrealis complements carry the discontinuity (DE) marker, whether their subject is identical to that of the matrix verb or not:

Yurakaré, unclassified (van Gijn 2011: 185)
(2)   nish   poydi=la   [ma-alkansa-ni=**ti**]
        NEG   can:1SG.S=CMT   3PL-reach-INT:1SG.S=DE
        'I could not reach them.'

For matrix verbs that take factual complements, the 'default' interpretation of the SR markers applies (S/A being the pivot):

Yurakaré, unclassified (van Gijn 2011: 185)
(3a)   [ayajta   mala-m=**ti**]   mi-bëjta-y
        fast   go.SG-2SG.S=DE   2SG-see-1SG.S
        'I saw you running.'

(3b)   bëjta-ta-y   ti-manchijsha   [ti-buybu   ka-n-dyuju-y=**ja**]
        see-MID-1SG.S   1SG-self   1SG-language   3SG-BEN-inform-1SG.S=CE
        'I saw myself teaching my language (on video).'

Another type of deviation from the definition by Haiman & Munro is illustrated by Shipibo-Konibo (Valenzuela 2003). In this language (and in other Panoan languages), the system is sensitive to (i) subjecthood versus objecthood, (ii) transitivity status, and (iii) temporal relations.

Shipibo-Konibo, Panoan (Valenzuela 2003: 415)
(4)   [jawen   tapon   bi-**xon**]   [kobin-'a-**xon**]   naka-kati-kan-ai
        3POSS   root.ABS   get.PSSA   ONOM:boil-do.T-PSSA   chew-REM.PST-PL-INC
        'After getting its [the Yotokonti plant's] root, they boiled it and chewed it.'

The suffix *-xon* in the above example is restricted to marking events that take place prior to the main event, with same subjects, if the verb in the reference clause is transitive, i.e. has an A-participant (PSSA). If one of these three conditions is not met, another marker will appear, as in (5), where there are two sentences presented as prior to the main event (on either side of the main clause), which is intransitive, therefore the marker *-ax* (PSSS) appears.

Shipibo-Konibo, Panoan (Valenzuela 2003: 415)

(5) [bachi   meran   jiki-**ax**]   Ashi   manó-res-a
     mosquito.net   inside   enter-PSSS   Ashi.ABS   disappear-just-PP

     iki   [moa   ka-**ax**]
     AUX   already   go-PSSS
     '…Ashi entered into the mosquito net and disappeared, after leaving (for the upper world)'.

While Shipibo-Konibo fits within Haiman & Munro's definition in the sense that the pivot is the subject (in spite of the fact that Shipibo-Konibo is an ergative language), it goes a step further by taking into account transitivity status of the reference clause.

Haiman & Munro's definition does not capture these types of pivots. Switch reference as intended by Haiman & Munro rather seems to be a specific instance of (dis)continuity marking (see Stirling 1993, Bickel 2010 for more detailed discussions of the nature of switch reference). In a selective cross-linguistic overview, Stirling identifies six pivots of switch reference systems (1993: 150-151), however, in all systems she reviewed, participant continuity plays a role, which leads her to assume that participant continuity (which she regards as a form of event continuity) is at the heart of switch-reference systems. Nevertheless, with the expansion to other pivots than reference proper, the term switch reference is no longer a suitable name for capturing these phenomena. In this paper I argue that 'switch-reference' in the wide sense is best seen as a hearer-serving discourse phenomenon. I propose to use the term 'switch-attention' (henceforth SwAt), as a cover term for the different phenomena, including classical switch-reference.

I will restrict myself to temporal clauses and cosubordinate clauses that can be used as temporal clauses. This restriction is due to limitations of time and space, but it has also been chosen because temporal clauses are central to transmission of narratives, and SwAt systems seem to occur particularly in these environments. I will furthermore focus on South American languages, which have received relatively less attention than some other areas where SwAt is predominant. Note, however, that this paper is not intended as an overview of SwAt systems in South America.

2.2 Switch-Attention Marking In South America

SwAt dependency markers in temporal clauses are found in a large contiguous area in the west, from Colombia to Bolivia. Person markers indicating SwAt are also found further east (Tupian). There are a few language families that have SwAt-marked temporal clauses for many or all of their members, like Quechuan, Aymaran, Tucanoan, Tupian, Panoan, Tacanan (Antoine Guillaume, p.c.), Barbacoan, Jivaroan. There are furthermore a number of (near) isolate or unclassified languages that have SwAt dependency markers, like Cofán (Fischer 2007, Fischer & Van Lier 2011), Kwazá (van der Voort 2004), Yurakaré (Van Gijn 2006), and Embera (Chocoan, Mortensen 1999) as well as a few languages with SwAt markers that belong to families that generally do not have this, like Tariana (Arawak, Aikhenvald 2003), Carib languages Panare (Payne 1991) and Tunebo (Headland & Levinsohn 1977), and some Macro-Jê languages (Rodrigues 1999a). This picture suggests a highly successful spread of SwAt systems in South America.

Arguably the most common type of SwAt marking system in South America is where temporal or cosubordinate clauses (with a possible temporal interpretation) are marked for either continuity or shift by the use of different dependency markers, sometimes in addition also by using (slightly) different construction types (e.g. no subject inflection for continuity clauses). A second type of SwAt marking which is common in South America, especially in Tupian and Jivaroan languages, marks continue/shift attention by means of special forms of pronominal affixes.

One important characteristic of an SwAt system is that there is an opposition (typically binary, but there may be more choices too) such that there are contexts in which one of the markers is appropriate and the other(s) are not. The most canonical (clearest) instances of such an opposition are continuity and shift constructions that are functionally and formally completely equivalent, but for the form of the SwAt marker. This is illustrated by the following constructions in Cofán:

Cofán, unclassified (Fischer & van Lier 2011: 237)

(6)   [Khasheye=ndekhu=ja   ñoña]=**si**   te   [matachi=ja   tsa=ma
      old.man=CLF(PL)=DEF   make=DS   REP   clown=DEF   that=ACC

      ondikhu]=**pa**   tsa='ka=en=ja   ko'fe='ya
      wear=SS   that=CMPR=ADVR=DEF   play=MIR
      'Reportedly, after the elders made (the clothes), the matachi clown wore them and played like that.'

This example contains a continuity (same subject) clause, marked with =*pa*, as well as a shift (different subject) clause, marked with =*si*. Both clauses have the same structure (both have the same - reduced - potential for expressing verbal inflection, and the participants are marked in the same way). Moreover, both the SS marker =*pa* and the DS marker =*ju* attach to the final element of the dependent clause - always a verb. In short, there is no structural difference between SS and DS clauses, they are purely distinguished by the form of the dependency marker - see discussion in Fischer & van Lier 2011).

A slightly less canonical situation arises when continuity and shift clauses are functionally equivalent, but have more formal differences besides the difference in dependency marker. This situation can be illustrated with Cavineña.

Cavineña, Tacanan (Guillaume 2008: 702 & 725)

(7a)   udya=tu-ke   =Ø   [imeta-**tsu**]   mare-kware
       then=3SG-FM   (=1SG.ERG)   point.at-**SS**   shoot.at-REM.PAST
       'Then I pointed (my rifle) at it (a peccary) and shot it.'

(7b)   [tu-ra   mare-wa=**ju**]   =tu   pakaka-wa
       3SG-ERG   shoot.at-PERF=**DS**   =3SG(-FM)   fall-PERF
       'He (Lucio) shot at it (the porcupine), and it fell down.'

Same-subject clauses and different-subject clauses encode similar functions: sequential and simultaneous events, and both are used in tail-head linkage. Structurally, however, they are not equivalent. First, different-subject clauses can be marked for imperfective versus perfective

aspect, same-subject clauses are not marked for TMA. Second, the same-subject marker is a suffix, the different-subject marker a clitic (Guillaume 2011).

Karo (Tupí, Ramarama) displays a further deviation from the canonical opposition type: there is a specialized construction for same-subject temporal clauses, but there is no different-subject specialized counterpart. Sequences of events can be encoded by non-finite verb forms marked with the gerund (GER) marker -a in mostly longer chains that end with a finite verb form, only if the subjects of the verbs in these clauses are identical. There is another construction that can mark sequences of events, also consisting of a non-finite verb form marked with the gerund, and in addition with a free element *kanãp* 'when'. This latter construction can encode both same-subject and different-subject clauses:

Karo, Tupí, Ramarama (Gabas Jr. 1999: 200-201)

(8a) péŋ   yaʔwat-t   [to=wé-a   kanãp]
      white.man   leave-IND1   3R=cry-GER   when
      'The white man$_i$ left when he$_i$ cried.'

(8b) o=yaʔwat-t   [aʔ=ket-a   kanãp]
      I=leave-IND   3SG=sleep-GER   when
      'I left when he slept.'

I do not consider the unmarked clauses and clauses marked with *kanãp* to form a SwAt opposition. However, examples (8a) and (8b) are a good example, because structurally they differ only in the person prefix that is used: the dependent verb in (8a) takes a coreferent absolutive prefix (3R), in (8b) it take a 'normal' absolutive prefix (3SG).

2.3 Swat Temporal Clauses and Oral Transmission

To my knowledge, no systematic psycholinguistic research testing processing difficulties of SwAt-marked sentences has been carried out. Intuitively, SwAt-marking seems a rather complex construction type from a language-production point of view. In its most common form, it cataphorically marks a verb for some aspect of an event or verb to come. This means that the speaker when producing the SwAt-marker needs to have decided on the event representation in the form of the final or next verb, not only conceptually, but potentially also in terms of verb choice and its case frame, valency, mood value, relative temporal relation to the previously uttered verb, etc., depending on the language system. This can be done recursively (syntagmatic recursion) in longer clause chains, a device often found in SwAt-marking languages (see below).

There is a large amount of literature on the relation between mode of production (oral vs. written) and complexity, e.g. Chafe 1985, Mithun 2009. These studies generally show that written varieties of language are linguistically (syntactically) more complex than spoken varieties. One hypothesis that could be built upon this general finding is that languages with a long and rich oral tradition and a shorter and less developed written tradition have a preference for developing structures that are less costly in language processing.

South-America - in spite of having produced highly developed societies, like the Wari, Tiwanaku, and Inca empires, has not natively brought forth a writing system.[4] This means that, before the 16th century there was no writing system at all, and up until the present, literary production is almost completely dominated by Spanish and Portuguese. Even a relatively healthy language family like Quechuan does not have a large literary tradition (see Adelaar, with Muysken 2004: 254-6).

How can the fact that a system which, at first sight at least, does not seem to be a very economical choice from a language-production point of view, be so successful in an area without a long tradition of written transmission?[5] My answer to this question is threefold: 1) it is comprehension-supporting, 2) it offers the speaker certain possibilities for compensatory economy, 3) it is a salient feature that spreads easily.

3. Switch Attention as a Communicative Tool

SwAt marking is advantageous for oral communication first of all because it aids comprehension. Apart from helping the hearer with reference tracking (cf. Haiman & Munro 1983: ix) I propose three ways in which SwAt markers help the hearer: they are explicit markers of 1) discourse cohesion, 2) information packaging, and 3) discourse deixis (usually cataphoric).

On a basic level, SwAt markers simply flag the fact that a predicate is connected to some other predicate. Together with the often relatively strict ordering principles of clauses in SwAt systems, the events that are to be connected in the hearer's mind are rather clearly indicated. But SwAt markers do more than just signaling that there is coherence between predicates; they contribute information about the nature of the coherence. Participant (dis)continuity always seems to play some role in the temporal clauses in South America that are marked for SwAt, but more often than not the SwAt markers contain other information that is relevant for interpreting the relation between the combined clauses. See for instance the examples given above from Guanano (temporal sequence/simultaneity) and Shipibo-Konibo (transitivity status). In a number of cases, this 'additional' information can override participant (dis)continuity. Dooley (1992), discussing the switch-reference system of Mbyá Guaraní (Tupian, Tupi-Guaraní) spoken in southern Brazil, mentions that a subject pivot explains about 98% of the occurrences of the same subject or different subject marker. In the remaining 2%, more discourse-like functions are marked, like switch topic, or a switch in agentivity status. In combination with sentence-initial connectives with a temporal interpretation, the different subject marker may be used to indicate an unexpected event.

In the Ecuadorian language Tsafiki, the SwAt system functions on the basis of a subject pivot, but in some cases, the different-reference (DR) marker indicates that there is an intervening stretch of time between the events, even if the subjects are identical.

Tsafiki, Barbacoan (Dickinson 2002: 137)

(9)	junni	[man = ja-na-**sa**]	wata = te	aman	chide
	then	again=come-PROG-DR	year=LOC	now	bone

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[4]The pre-colonial Inca's did develop a non-oral communicative device, the *khipu*, which had some complex patterning of knots and colors to represent information, but there is no convincing evidence that they were used for literary purposes (cf. Adelaar, with Muysken 2004: 254).
[5]South America is no exceptional case in this respect. The languages of North America, Australia, and Papua New Guinea show the same situation.

la-ri-bi   man＝ji-man-ti-e
come.out-CAU.SUF:GEN-PURP   again=go-SIT-REP-DECL
'They say then, coming back, after one year he went to take out the bones.'

As a final example, consider Peruvian Ancash Quechua. A number of Quechua languages have three SwAt markers, two of which mark same subject and one different subject. Often, the difference between the two same-subject markers is unclear, but in Ancash Quechua, in the analysis of Cole (1983), the two same subject markers -*shpa* and -*r* have taken on slightly different functions, the former marking 'unrelated events', the latter marking related events, in the sense that the event in the *r*-marked clause makes the event in the main clause possible.

Ancash Quechua, Quechuan (Cole 1983: 2-3)

(10a)   [Lima-ta   chaa-ri-**r**]   rikaari-shaq   amigu-u-ta
         lima-ACC   arrive-SEQ-SS   see-FUT.1   friend-my-ACC
         'After arriving in Lima, I will see my friend.'

(10b)   [chakra-chaw   urya-**shpa**]   pallamu-rqu-:   wayta-kuna-ta
         field-IN   work-SS   pick-REC.PST-1   flower-PL-ACC
         'While I worked in the field, I picked flowers.' Or: 'I worked in the field and
         picked flowers.'

Apart from marking discourse cohesion in quite a specific way, SwAt-marked clauses also have the advantage that they mark clauses that should be understood as background to a foregrounded event. This is an advantage that SwAt-marked clauses share with all clauses that are marked for dependency. As Tomlin (1985: 87) says: "Independent clauses correlate with, or code, foreground information, dependent clauses correlate with, or code, background information". In this way, SwAt marking contributes to information structuring.

     A third communicative hearer advantage of SwAt markers is that they function as discourse deictics in the sense that they direct the hearer's attention to something to be established or already established in the immediate textual context. As discourse deictic elements, SwAt markers contain information about some other event (expressed in the reference clause, and the interpretation of which depends on the nature of the pivot) and in this way they can be used either to reactivate that event in the mind of the speaker (anaphoric use) or to prepare the reader for an event to come (cataphoric use). I would argue that, given the fact that SwAt relations are most often local (i.e. the reference clause is often adjacent – see Comrie 1989) the cataphoric use is the most advantageous, since it allows the hearer to prepare his or her mind for the next step in the discourse. Anaphoric relations are possibly more useful for long-distance deixis. This may also explain an observation about especially coordinate (cosubordinate) SwAt-marking systems mentioned by Haiman and Munro (1983: xii-xiii), that the order of marked clause and reference clause is normally marked-reference, the exceptions being languages that have SwAt-marking prefixes. In other words: the SwAt-marker in these constructions is preferably in-between the marked and reference clause, and so provides the hearer with information about the event to come (relative to the verb just pronounced).

     A feature often observed in systems with SwAt-marked temporal clauses is the fact that this system can be extended to larger chunks of text. There are basically two mechanisms for this:

clause chaining on the one hand, and tail-head linkage on the other. The Tucanoan SwAt systems are probably the best examples in South America of chaining constructions. The unmarked chains can often be quite long – this in contrast to the marked chains, which are usually groups of two. The marked chain can be embedded within a larger unmarked chain, thus preserving the cohesion at the paragraph level (cf. Longacre 2007: 413-414).

In tail-head linkage constructions, the information of the preceding clause is (partially) repeated in a clause that is dependent on a main clause depicting the next event.

Yurakaré, unclassified (author's data)

(11)   yosse   latijsha   mala-ø = ya   kandala
         again   then   go.SG-3=REP   alone

         lat   [mala-ø = ja]   dula-ø = ya   kukkulë
         DEM   go.SG-3=CE   make-3=REP   plantation
         'Then he went (away) alone again. Having gone, he made a plantation.'

Clause chaining and tail-head linkage, in combination with SwAt marking has the advantage of lifting the SwAt system, with its hearer advantages, to the level of the paragraph, turning a local system (Comrie 1989) to use at a more global level.[6]

As has been argued in this section, there are a number of advantages of SwAt marking for the hearer in oral transmission. Nevertheless, it seems to impose a certain strain on the speaker. In order to relieve this processing load, SwAt systems offer a number of possibilities for compensatory economy, without giving up the advantages for the hearer.

4. Decreasing Complexity: Compensatory Economy

The SwAt systems of South America illustrate a number of compensatory economy possibilities that speakers or languages may revert to to decrease complexity: (i) non-expression of retrievable material, (ii) morphological fusion of SwAt morphemes with other verbal categories, and (iii) doing without functionally overlapping, complex grammatical features such as passives and gender.

A first obvious way of reducing production effort is to not express retrievable information. In Peruvian Tarma Quechua (Adelaar 1977: 101), same-subject clauses are marked with -r, different-subject clauses with -pti. With -pti, person suffixes are obligatory, with -r they are optional.

Desano (Miller 1999), a Tucanoan language spoken in Colombia, goes one step further. Like most other east-Tucanoan languages, it has an implicit chain and an explicit chain. In Desano, unlike Guanano, the implicit chain is used for both sequential and simultaneous events with identical subjects to the main event, explicit chains are used for different subject sequential and simultaneous. In this constellation, the same-subject clauses not only lack person inflection (which can be retrieved from the reference clause) but they also lack an explicit dependency marker. This is possible because it forms a two-way paradigmatic contrast with the marked clauses. Moreover, the fact that they lack inflection is in itself a flag for dependency.

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[6]See for this argument also de Vries (2005) for tail-head linkage in Papuan languages, and Guillaume (2011) for the Tacanan language Cavineña.

Another way of reducing complexity is to restrict it to clause combinations with two third person subjects. This is one of the predictions made by Haiman & Munro on the basis of the function of switch-reference that they stipulate (avoiding ambiguity of reference). This can be observed in Tupian languages, where some retain a full set of coreferential absolutive person markers, whereas others only express coreferentiality for third persons. Compare the person prefix inventory of Mekens (Galucio 2001), with that of Karo (Gabas Jr. 1999):

	Mekens (Tupí Tupari)	Karo (Tupí Ramarama)
1SG		o=
2SG		e=
3SG/PL	se-	to=
1PLINC		i?=
1PLEX		té=
2PL		karo=

Table 2: Mekens and Karo coreferential prefixes

SwAt markers often fuse with other categories, like person marking (e.g. Tupian, Jivaroan languages) or relative time markers (e.g. Panoan languages, Tucanoan languages). This is a measure of syntagmatic economy in the sense that frequent morphological collocations are reduced to simple (and often shorter) units, and as such automatized. It does not, however, necessarily lead to paradigmatic economy. For instance, the Jivaroan language Aguaruna (Overall 2007) has two full person paradigms: one for same subject and one for different subject. So rather than adding a two-way opposition to the existing paradigm, a full new paradigm with more oppositions is introduced.

A different kind of compensatory economy has been addressed by Foley & Van Valin (1984), and is tied to the reference-tracking function of classical (i.e. with subject pivots) switch-reference marking systems. They contrast switch-reference systems with what they term switch-function systems. Switch-reference systems canonically track a certain function (like subject or agent) and use verbal morphology (switch-reference markers) to indicate whether or not the function is fulfilled by the same participant in the next clause. In switch-function systems, by contrast, "a particular *participant* is tracked across clauses, and the verbal morphology in each clause, signals the semantic function of that participant in that clause" (emphasis in original). The verbal morphology intended by Foley & Van Valin is voice morphology, especially passive. Since both systems are different ways of tracking reference across clauses, the presence of one makes the other superfluous. This leads to the prediction that languages with a switch-reference system generally do not have passives.

Another inverse correlation mentioned by Foley & Van Valin, based on Heath (1975), is that between switch-reference systems and gender or noun class. Gender systems allow for reduction of coreferent participants (to either free pronominal forms or verbal affixes) on the basis of inherent features of the referent rather than assigned features (Comrie 1989), and irrespective of the semantic or syntactic function of that participant. Therefore gender systems do not require a pivot of any kind. On the basis of these different logics of reference tracking,[7] Foley & Van

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[7]Another difference between gender and switch reference as reference-tracking devices is that the former are global, i.e. they track reference across larger stretches of texts, whereas the latter are typically local, i.e. restricted to adjacent clauses (see Comrie 1989). Nevertheless, as was discussed above, SR/SwAt systems can be extended to a more global level.

Valin predict that languages with SR systems will generally not have gender systems and vice versa.[8]

The economical trade-off for SwAt[9] languages would then be that they do not need valency-rearranging operations, which are psychologically complex (see Ferreira & Engelhardt 2006: 74-77), and that they do not need gender systems, which take up mental storage space and/or strain on-line computation (see Corbett 1991: 70-104, Schriefers & Jescheniak 1999).[10]

It is beyond the scope of this paper to give a full account of the voice and noun classification systems of SwAt-marking languages in South America, but to get an idea of these correlations in South American languages, I have looked at some overview papers on four language families of which most or all languages have some SwAt-marking system in temporal clauses: Quechuan, Tupian, Panoan, and Tucanoan. It is obvious that this requires further research.

Quechuan languages often have what may be termed as a medio-passive marker, which indicates a lack of control on the part of the subject (Adelaar with Muysken 2004: 229-230). This derives uncontrolled inchoative verbs. In the case of a basic transitive verb, this does mean a demotion of the agent participant and a promotion of the original patient, but it may also apply to intransitive verbs, as for instance in the pair *punu-* 'to sleep' vs. *punu-ka(:)-* 'to fall asleep' (San Pedro de Cajas Quechua, Peru, taken from Adelaar with Muysken 2004: 230). This suggests that the medio-passive in Quechuan has a semantic effect that goes beyond the pragmatic/syntactic effect associated with passives. With respect to gender or class systems: Quechua does not have a gender or class system, not even one based on natural gender.

Tupian languages[11] (Rodrigues 1999b) have a strict transitive-intransitive distinction, and a number of valency-changing morphemes, but passive morphology seems to be restricted to a handful of languages. Rodrigues (1999b:120) mentions Suruí, Karo, and Gavião as having a port-manteau morpheme for reflexive, reciprocal, and passive, which he terms a "general intransitivizing suffix" (ibid.). Grammatical gender is not present in Tupian languages, but Karo and Mundurukú do have classifiers that take part in agreement systems. But at least in Karo, the classifiers are always used in combination with a noun they classify, and always within the noun phrase (see Gabas Jr. 1999: 209), so they do not seem to have a reference tracking function.

Loos (1999:244) mentions a number of markers related to valency that are important for Panoan languages, like reflexive and reciprocal, but passive is not among them. Valenzuela (2003: 775) mentions a middle marker for Shipibo-Konibo which can express agentless-passive situations. Grammatical gender does not seem to play a role in Panoan languages.

Tucanoan languages, finally, may have passive morphology (Barnes 1999: 213), as well as a pronominal gender system (ibid. 217) and a classifier system that can be used as a reference tracking device (i.e. occur without the noun, ibid. 225). This makes it clear that there is no

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[8]Foley & Van Valin discuss systems where both SR and gender occurs, but they stress that in langauges with this combination, neither reference-tracking system is very elaborate.

[9]It is, of course, not a straightforward matter whether these predictions can be extended to the more broadly defined notion of switch-attention, which may include non-referential pivots. However, as was mentioned above, one of the conlusions in Stirling (1993) was that even for languages whose SwAt system allows for pivots that go beyond syntactic subject coreferentiality, pivots based purely on participant reference will still exist. In this sense we might expect the predictions to apply to SwAt systems as well.

[10]I do not take these claims to mean that the co-occurrence of SwAt marking with passive and/or gender is impossible, but rather see them as tendencies. In that sense, the data presented in this section do not, and are not intended to, disprove these claims.

[11]Jensen (1999) has a separate chapter on the large Tupian subfamily Tupí-Guaraní, which is not taken into account in Rodrigues' chapter on Tupí. However, Jensen does not mention Tupí-Guaraní languages with either gender systems or passives.

absolute dependency between SwAt systems and passive on the one hand, and SwAt systems and gender/class systems on the other. However, we might still maintain that a trade-off between SwAt-marking systems, passive, and gender systems forms an area of potential compensatory economy at least in tendency.

Family	Passive	Gender/class
Quechuan	medio-passive	no
Tupian	some	no
Panoan	no	no
Tucanoan	yes	yes

Table 3: Presence of passives and gender/class systems in 4 SwAt-marking language families

In sum, the advantageousness for hearers, and possibly in some cases the compensatory economy potential, may explain part of the success of SwAt marking systems in South American temporal clauses, but there may be a third factor involved, which has to do with the nature of multilingual interaction.

5. Language Contact and the Diffusion of SwAt Systems

The distributional pattern of SwAt marking in temporal clauses in South America, especially that of SwAt-sensitive dependency markers, suggests diffusion through contact, not so much of forms, but of design features. This may occur in situations of extensive bilingualism in combination with a maintenance ideology. This is in fact shown to have happened In other parts of the world, in particular Australia and North America, areal diffusion has also been suggested to account for the distributional patterns of switch reference. The information in this section is necessarily sketchy and tentative. Much more research is needed in order to establish the precise ways in which these diffusion processes have contributed to the current distribution.

Matras (1998) argues that what he calls "utterance modifiers", i.e. "an extended grouping of various discourse-regulating elements, discourse markers, and focus particles" (p. 282) are particularly susceptible to being borrowed. As an explanation for this finding, Matras (2007:34) furthermore observes that markers of connectivity, and especially markers of contrast are likely to diffuse. This makes SwAt systems, especially discontinuity marking likely candidates for diffusion through contact: they are markers of coherence and (usually) cataphoric indexes of events to come, and as such, they guide hearer expectations. In general it does not seem to be the case that languages borrow the forms of SwAt markers in South America (although to my knowledge there is no complete survey of SwAt marker forms). Sakel (2007) argues that whether languages borrow forms ("matter" in her terminology) or patterns without the forms depends on the type of contact situation. One situation that may give rise to matter loans is a deliberate policy of maintenance (cf. Thomason & Kaufmann 1988), such as documented extensively for the Vaupés area at the Colombian/Brazilian border (Aikhenvald 2002), including the spread of a SwAt system from Tucanoan languages to the Arawakan language Tariana. Ethnic maintenance may have been more widespread in South America, especially in areas situated on the eastern slopes of the Andes, where linguistic diversity is extremely high. This is possibly related to ecological diversity creating 'niches' connected to specific ethnic groups, reinforcing maintenance of ethnic markers like in particular language (cf. Eriksen 2011).

Elšik & Matras (2006:385) suggest that borrowing can be an efficient reaction to a situation where multilingual communication and a maintenance policy are common:

> Borrowing (…) reduces the need for choices to be made among alternate systems, and so it increases communicative efficiency in bilingual situations, without compromising wholesale the separation of languages, and so the flagging of separate identity via language.

Diffusion of these markers, then, may tentatively (awaiting more detailed research) be added as an economizing strategy.

6. Conclusion

I have argued in this paper for the fact that, in spite of its complexity, SwAt systems are in fact rather advantageous for oral communication, thus accounting for the widespread occurrence of temporal clauses with SwAt marking in South American languages. SwAt is hearer friendly in that it (i) overtly marks discourse coherence, (ii) relative prominence (information structure), and (iii) it prepares the hearer for things to come.

The complexity of SwAt systems can be reduced in several ways: (i) it allows for the reduction of retrievable material (e.g. person marking in continuity clauses, one of the markers in a two-way paradigmatic opposition, SwAt marking for non-third persons), (ii) the markers may fuse with other categories with which they frequently co-occur, and (iii) they may reduce the necessity of other grammatical features that may strain the speaker's mind, like passive formation or gender systems.

Finally, in situations of intercultural communication, SwAt systems, especially shift marking, are likely to diffuse. This can also be argued to reduce the mental processing load in intercultural information exchange.

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Author's Contact Information:
Rik van Gijn
Radboud University Nijmegen
Dept. of Linguistics
PO Box 9103
6500 HD Nijmegen
Netherlands
E.vanGijn@let.ru.nl