The Principle of Morphosyntactic Subsystem Integrity in language contact: Evidence from morphological borrowing in Resígaro (Arawakan)

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Abstract

This paper describes an intriguing case of non-lexical borrowing in the Northwest Amazonian language Resígaro (Arawakan), which has borrowed from the unrelated Bora language entire paradigms of noun class, gender, and number markers, as well as associated bound grammatical roots, while all other morphosyntactic subsystems of Resígaro are virtually unaffected. To account for this case of massive morphological borrowing (and others that have previously been described), this paper proposes the Principle of Morphosyntactic Subsystem Integrity (PMSI), which predicts that in situations where various grammatical morphemes are borrowed, these tend to be morphosyntactically interrelated, rather than being random collections of forms or sets of forms that are best described by well-known borrowability hierarchies, e.g. lexical before grammatical morphemes or derivational before inflectional markers.

Résumé

Cet article décrit un cas intriguant d'emprunt non-lexical en resígaro. Cette langue arawak, parlée dans le nord-ouest de l'Amazonie, a emprunté au bora, une langue non-apparentée, des paradigmes entiers de classe nominale, de genre, de marques de nombre ainsi que de racines grammaticales liées, alors que d'autres sous-systèmes morphosyntaxiques du resígaro ne sont quasiment pas touchés par ce phénomène d'emprunt. Pour rendre compte de ce cas d'emprunt morphologique massif (et d'autres décrits précédemment), cet article pose le Principe d'Intégrité des Sous-systèmes Morphosyntaxiques (PMSI) selon lequel, dans les situations où divers morphèmes grammaticaux sont empruntés, ceux-ci tendent à être liés sur le plan morphosyntaxique, plutôt que de former des ensembles aléatoires de formes ou de séries de formes correspondant à ceux décrits dans les hiérarchies d'empruntabilité bien connues,

privilégiant par exemple les morphèmes lexicaux aux morphèmes grammaticaux ou les morphèmes dérivationnels aux morphèmes flexionnels.

Zusammenfassung

Dieser Aufsatz beschreibt einen interessanten Fall von nicht-lexikalischen Entlehnungen in der Nordwestamazonas-Sprache Resígaro (Arawak), das von der nicht verwandten Sprache Bora ganze Paradigmen von Nominalklassen-, Genus- und Numerusmarkern, sowie mit diesen zusammenhängende gebundene, grammatische Wurzel entlehnt hat, wobei alle andere morphosyntaktischen Subsysteme des Resígaro beinah gar nicht beeinflusst worden sind. Um diesem Fall von massiven morphologischen Entlehnungen (und andere, vormals beschriebene Fälle) zu erklären, wird hier das *Principle of Morphosyntactic Subsystem Integrity* (PMSI) eingeführt, das für Situationen, in denen mehrere grammatische Morpheme entlehnt werden, voraussagt, dass diese tendenziell morphosyntaktisch miteinander zusammenhängen, also nicht zufällig gebildete Mengen von Formen entlehnt werden oder Mengen von Formen, die am besten beschrieben werden können mit den bekannten Entlehnbarkeitshierarchien, wie z.B. lexikalische vor grammatischen Morphemen oder Derivations- vor Flexionsmarkern.

Keywords: Language contact, morphological borrowing, morphology, Amazonian languages, Arawakan languages, Resígaro, Bora

1. Introduction[1]

The case study presented here involves heavy morphological borrowing from Bora into Resígaro (Arawakan), two unrelated languages spoken in the Northwest Amazon. Resígaro borrowed entire paradigms of inflectional and derivational morphemes, among them about 20 noun class and gender markers, six number markers, and eight bound grammatical roots that are used to form numerals, demonstratives, and other pro-forms. Most of the borrowed morphemes belong to the closely interlocking and tightly integrated subsystems for the expression of countable units (through nominal classification), number marking, and quantity. In concordance with this close interdependence of the borrowed morphology, the borrowed morphemes frequently and systematically co-occur in Resígaro texts, as can be observed in the following example (forms borrowed from Bora are underlined).[2]

(1) *tók^{h}o-húúúʔó-hí-gí-n̥a=píi* *oβéɛtsí* *βa-k^{h}á-á-gí=píi*
tree-CM.STRING-PL-INST-REST=TAM trap 1PL-do-SUB-INST=TAM
té-paasí-hí *ɸé-ʔnó*
PN-CM.RING-PL 1PL-put
"We make the *oβéɛtsí*-trap with strings from the *tók^{h}o*-tree, we put the rings"
[res_tramp_1 10]

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[2] The following abbreviations are used in glossing: 1: first person, 2: second person, 3: third person, 3DIM: three-dimensional shape, ABL: ablative case, ALL: allative case, ANIM: animate, AUGM: augmentative, CM: noun class marker, CON: sentence connector, DAT: dative case, DIM: diminutive, DL: dual, F: feminine, M: masculine, INST: instrumental case, NMZ: nominalization, OBJ: object case, PL: plural, PN: pronominal root, POSS: possessive, PRED: predicate marker, REM : remote past, REST: restrictive, SG: singular, SOC: sociative case, SUB: subordination, TAM: tense-aspect-mood. Square brackets after examples indicate the session name and annotation number for Resígaro data from Seifart (2009), examples without indication of source are elicited. Bora data come from Seifart (2005) and Seifart's field notes (partially on the Miraña dialect). Bora data have been checked for consistency with Thiesen (1996), Thiesen & Thiesen (1998), and Thiesen & Weber (2001). Bora translational equivalents of Resígaro phrases were elicited from a Bora speaker by the author in April 2010. Resígaro and Bora data are given in phonological transcription.

A striking fact about Resígaro is that a small number of morphosyntactic subsystems have been borrowed almost entirely, including the morphological markers, while all others have hardly been influenced at all. For instance, not a single verbal derivational or inflectional morpheme was borrowed, and only one nominal derivational morpheme (an augmentative marker) that is not closely related to other borrowed morphemes. Why has this specific set of morphemes been borrowed, rather than any other collection of Bora morphemes? To help account for this, this paper proposes a principle which predicts that in cases of massive morphological borrowing, the borrowed forms tend to be structured sets of morphosyntactically interrelated forms rather than independent forms belonging to separate morphosyntactic subsystems. This principles thus restricts 'mixing' of foreign and native forms to as few morphosyntactic subsystems as possible. Accordingly, despite massive morphological borrowing in Resígaro, only a small number of morphosyntactic subsystems have been influenced, and these are now almost consistently from one language, the donor language Bora.

The following section (2) provides an introduction to morphological borrowing and to the principle proposed here. Sections 3-5 contain the case study on Resígaro, including its historical and ethnographic background (Section 3) and an overview of all contact-induced changes (Section 4). Section 5 presents an analysis of borrowed inflection, derivation, and bound grammatical roots, and the morphosyntactic interdependence between those elements. The theoretical relevance and implications of these data are further discussed in Section 6.

2. Constraints on morphological borrowing

2.1. Previous approaches to morphological borrowing

I refer to morphological borrowing here as the replication of grammatical morphemes, including their shapes, from one language in another language, including derivational and inflectional morphemes, and function words from closed classes, such as pronouns, but excluding lexical roots from open classes such as nouns.[3] Derivational and inflectional morphemes are considered as effectively borrowed only when they are used

[3] This is consistent with, e.g., Matras (2009: 209-217) and Muysken (2010), but different from how this term is used in Sanchez (2008), where it refers to purely structural influence, without the replication of shapes. The process of borrowing is understood here as a creative process of replicating linguistic material and structure (as opposed to a simple transfer), as emphasized by Johanson (1999 and elsewhere), who prefers the term "copy" over "borrowing". The term "borrowing" is nevertheless maintained here because of its long tradition and wide acceptance.

on at least some native stems, i.e. when their use is not restricted to equally borrowed stems.

Morphological borrowing remains relatively understudied in comparison to lexical borrowing (e.g. Haspelmath & Tadmor, eds. 2009) and structural convergence without replication of shapes (dealt with extensively in Matras & Sakel, eds. 2007, in conjunction with some treatment of morphological borrowing). A recent approach to morphological borrowing (Kossmann 2010) studies borrowed morphological paradigms that are used on loanwords only, i.e. cases which the definition of morphological borrowing given above excludes. While early scholars have expressed doubt about the very possibility of morphological borrowing (Meillet 1921: 84; Sapir 1921: 216-17), it is now undisputed that derivational and inflectional morphology can be borrowed (e.g. Gardani 2008; Grant 2008, 2010), even though this may be relatively rare when compared to lexical borrowing or structural convergence. It is generally recognized that morphological borrowing presupposes intensive contact and high proficiency in the donor language (e.g. Thomason 2001; Matras 2009). It also presupposes a certain structural compatibility between donor and recipient language, to the effect that, for example, a fusional affix can hardly be incorporated into an isolating language (e.g. Thomason 2001; Field 2002). It is also well known that morphology is more easily borrowed if it fills a functional "gap" in the receiving language, introducing a new category rather than replacing native morphology for an existing category.

Against this backdrop, structural constraints on the borrowability of grammatical morphemes have been proposed. Many of these constraints are formulated as universal hierarchies of morpheme types, such as the following: lexical elements are borrowed earlier, more often, or more easily than grammatical elements, and among grammatical elements, derivational elements are borrowed earlier, more often, or more easily than inflectional elements (Thomason & Kaufmann 1988; Thomason 2001; Field 2002: 34-48; Myers-Scotton 2002; Matras 2009: 153-165). A number of further, much-cited constraints of this kind, which more specifically relate to morphological borrowing, are summarized in Table 1. This summary is based on Weinreich (1966), Heath (1978a: 105), and Wilkins (1996: 111).

formal properties	syllabic forms > subsyllabic elements
	clear formal boundaries > fusional affixes
	structural and syntagmatic unintegratedness > integratedness
semantic properties	simple, clear meaning > complex, opaque meaning
	non-portmanteau morphemes > portmanteau morphemes
	affective meaning > non-affective meaning

TABLE 1: PROPERTIES OF INDIVIDUAL MORPHEMES USED TO PREDICT BORROWABILITY

2.2. The role of paradigmatic and syntagmatic relations in morphological borrowing

In the above-mentioned approaches, constraints that predict borrowability are based on inherent formal and semantic properties of individual morphemes. The borrowing of various inflectional, derivational, and other grammatical morphemes in one language is hardly an issue for these approaches, although this may in fact be a more common situation than borrowing only one single grammatical morpheme (see Table 2, below, and Grant [2010] for examples). Unlike previous approaches, this paper focuses on the relations between various borrowed grammatical morphemes present in the same language, in terms of morphosyntactic rules of that language. Such language-specific morphosyntactic rules may be subsumed under two basic structure-building relations: paradigmatic relations, which hold between members of the same morphological paradigm, and syntagmatic relations, according to which members of different paradigms regularly concatenate, for example, a rule according to which number markers follow gender markers. Using these two basic relations, this paper proposes the principle given in (2) to account for the regularities in the sets of borrowed morphemes in Resígaro as well as in other languages.[4]

(2) Principle of Morphosyntactic Subsystem Integrity (PMSI):

> Borrowing of paradigmatically and syntagmatically related grammatical morphemes is easier than borrowing of the same number of isolated grammatical morphemes.

[4] Note that this is a positive reformulation of what is called the "morphosyntactic-subsystem-integrity constraint" (MSIC) in Seifart (2010). The current formulation is based on Comrie's (2010) claim that "borrowing of forms related in a paradigm is easier than borrowing of the same number of isolated forms", thus expanding it to syntagmatic relations and restricting it to grammatical morphemes, the focus of the current paper. Comrie (2010) gives examples from Turkic verbal inflection in Uchur Evenki, Russian verbal inflection in Copper Island Aleut, and French kinship terms in English to support his claim.

This principle helps to maintain the integrity of morphosyntactic subsystems in situations of massive morphological borrowing in three ways. Firstly, the paradigmatic aspect of the PMSI predicts that borrowed morphemes belong to as few as possible morphological paradigms. Secondly, the paradigmaticity of borrowed morphemes maximizes internal structural integrity of morphological paradigms, as ideally consisting only of borrowed or only of native morphemes. Thirdly, the syntagmatic aspect of the PMSI, which applies if various morphological paradigms are influenced by borrowed material, limits this influence to syntagmatically related paradigms (e.g. gender and number markers), rather than an influence on various unrelated paradigms (e.g. a verbal derivational paradigm and a case marking paradigm).

Sections 3-5 of this paper investigate the integrative force of morphosyntactic subsystems in morphological borrowing in detail in one case study, fully appreciating the grammatical contexts in both donor and receiving languages. However, it may be useful to briefly discuss here also how the PMSI applies to other languages. Table 2 summarizes relevant facts from five languages: Sebjan-Küöl Ėven (Pakendorf 2009, 2010), Chabacano (Seifart [2010], based on Steinkrüger's [2003, 2009] data), Warndarang, Ngandi, and Ritharngu (Seifart [2010], based on Heath's [1978a, 1978b, 1980a, 1980b] data). For each language, the total number of borrowed grammatical morphemes is given, acknowledging cases that are uncertain according to the original sources. Table 2 also specifies how the borrowed morphemes fall into paradigms, and to what extent these paradigms are made up of borrowed morphemes. For instance, in Sebjan-Küöl Ėven three of the 11 borrowed morphemes are members of the paradigm of subject markers of the necessitative mood. This paradigm contains a total of five forms, i.e. two native forms in addition to the three borrowed ones. Table 2 also indicates how the borrowed morphemes are syntagmatically related. For instance, the Sebjan-Küöl Ėven subject markers just mentioned occur only in connection with the borrowed necessitative mood marker.

Languages involved	**Sets of borrowed morphemes**
Yakut/Sakha (Turkic) morphemes in Sebjan-Küöl Éven (Tungusic)	11 borrowed morphemes (10 uncertain cases not considered here): 3 out of 5 subject markers used only with necessitative mood 4 out of 5 subject markers used only with assertive mood 2 out of about 8 mood markers (necessitative and assertive mood) 1 present participle marker associated with assertive mood 1 ordinal numeral formation marker (unrelated to other borrowed morphemes)
Visayan (Austronesian) morphemes in Chabacano (Spanish-based creole)	8 or 9 borrowed morphemes: 6 or 7 out of 8 derivational prefixes 2 out of 12 derivational suffixes, one of which occurs mainly with a borrowed derivational prefix
Nunggubuyu morphemes in Warndarang (distantly related "Prefixing"/Non-Pama-Nyungan languages)	5 borrowed morphemes: 3 out of 8 noun class markers 2 out of 5 case markers
Ritharngu (Yuulngu/Pama-Nyungan) morphemes in Ngandi ("Prefixing"/Non- Pama-Nyungan)	4, 6, or 8 borrowed morphemes: 2 out of 3 derivational adverbializers (directionality of borrowing unclear) 2 out of 2 verbal derivation markers (directionality of borrowing unclear) 2 out of 7 case markers 2 suffixes which are not interrelated with other borrowed morphemes
Ngandi ("Prefixing"/Non-Pama-Nyungan) morphemes in Ritharngu (Yuulngu/Pama-Nyungan)	4, 6, or 8 borrowed morphemes: 2 out of 2 derivational adverbializers (directionality of borrowing unclear) 2 out of 3 verbal derivation markers (directionality of borrowing unclear) 4 suffixes which are not interrelated with other borrowed morphemes

TABLE 2: PARADIGMATIC AND SYNTAGMATIC RELATIONS IN BORROWED MORPHOLOGY

Table 2 suggests that not only in the case study presented here, but also cross-linguistically, sets of borrowed morphemes are more likely to be paradigmatically and syntagmatically related than not, as predicted by the PMSI. In some of these languages, all borrowed morphemes are interrelated, as in Warndarang, where the five borrowed morphemes fall into two paradigms. In other languages, the effects of the PMSI may be less prevalent, and there may also be languages that are exceptional in terms of the PMSI. For instance, in Ritharngu, it may be that only four morphemes were borrowed and these four are not interrelated, contrary to what the PMSI predicts; these are a kin-term dyadic dual marker, a negative marker, a restrictive postposition, and a semblative case marker. This shows that the PMSI is not an absolute constraint but rather an account for a cross-linguistic tendency observable in Yakut/Sakha, Chabacano, Warndarang, Ngandi, and Resígaro. As such, it does account for regularities in sets of borrowed morphemes that constraints based on properties of individual morphemes (see Table 1) cannot capture. For instance, previous accounts

predict that derivation is borrowed before inflection, which is confirmed in, e.g., Chabacano. But they do not make predictions about the nature of sets of borrowed morphemes, which the PMSI predicts to be internally structured in specific ways. The PMSI should therefore be understood as an additional, complementing principle in a general model of contact-induced language change, which applies when various grammatical morphemes are borrowed.

3. Resígaro and Bora and their history of contact

3.1. Typological profile, genealogical affiliations, and the direction of borrowing

Resígaro and Bora are both moderately polysynthetic, agglutinating, suffixing languages with SOV basic word order and mixed head- and dependent-marking. Bora is closely related to Muinane and perhaps distantly related to the Witotoan languages Witoto, Nonuya, and Ocaina (Aschmann 1993). Resígaro is an Arawakan[5] language with over 50% cognate basic vocabulary shared with Tariana, Baniwa, and other Arawakan languages spoken in roughly the same region (Payne 1991, Aikhenvald 2001) (the subgrouping within Arawakan is still largely unclear, see Aikhenvald 1999). Many of the specific features and forms that Resígaro borrowed from Bora can be traced back to Bora-Muinane, and are not attested in the Arawakan languages related to Resígaro. There is thus good evidence for unidirectional contact-induced influence from Bora to Resígaro.

3.2. History and ethnography

The Northwest Amazon, where Bora and Resígaro are spoken, is a linguistically highly diverse region (see the maps in Lewis [ed., 2009] and Queixalós & Renault-Lescure [eds., 2000]; see also Epps [2009]) which is indicative of repeated prehistoric population movements. The Arawakan languages probably originate in the Upper Rio Negro region, in what is now Northwestern Brazil (Aikhenvald 1999; Heckenberger 2002; Zucchi 2002; Hornborg 2005). When the Resígaros' ancestors arrived in their current territory, this territory may have been populated by Boras already, as suggested

[5] The Arawakan language family has been firmly established by Payne (1991). Some authors (e.g. Aikhenvald 1999; Danielsen 2007) use the term "Arawak" instead of "Arawakan" to refer to this family. I use the latter term here, following Payne (1991).

by Bora loanwords in Resígaro that refer local culture, animals, and plants (see Table 3, below, and Payne [1985]).

Ethnographic facts strongly suggest that Resígaro has been in close and prolonged contact with Bora. The Resígaros are tightly integrated, together with Boras, into a multilingual cultural complex known as the "People of the Center" (Echeverri 1997), which comprises a total of seven languages (Resígaro, Bora, Muinane, Witoto, Ocaina, Nonuya, and Andoke). The People of the Center share many ethnographic features, including their ceremonial systems and festivals (Gasché 2009) for which repertoires of hundreds of songs exist in each language. Resígaros most probably regularly intermarried with Boras (Whiffen 1915: 67) and almost certainly many of them were bilingual in Bora.

The earliest historical accounts of Resígaro from the early 20th century describe Resígaros as a minority group living in close contact with the relatively numerous Boras (Casement 1912: 290; Whiffen 1915; Valcárcel 2004: 37, 61; Tessmann 1930: 583). Starting in the late 19th century, commercial rubber traders had enslaved and deported the local indigenous population for rubber gathering, resulting in drastic depopulation and disruption of cultural traditions (Hardenburg 1912; Casement 1912, 1998 [1909]). As a long-term result of this, only two native Resígaro speakers are alive today, a brother and sister currently in their mid-50s, on whose variety of Resígaro this study is mainly based.

3.3. Time depth of contact-induced changes

The fact that Resígaro is a moribund language may suggest that the massive contact-induced changes observable today are merely an effect of exaggerated variation typical for the last speakers of dissolving speech communities (Campbell and Muntzel 1989; Sasse 1992; Tsitsipis 1998). Therefore it is important to review here the evidence that contact-induced changes in Resígaro occurred at least a number of generations ago and that a variety similar to currently observable Resígaro was used by an entire speech community in various genres at some time. First, the two native speakers alive today, whose father was Ocaina and whose mother was Resígaro, grew up bilingually in Resígaro and Ocaina in an Ocaina-speaking village and did not learn Bora in childhood.[6] One of them acquired good knowledge of Bora as an adult, the other understands it. It is therefore unlikely that these two introduced Bora morphology into their variety of Resígaro. Second, there are some Resígaro data from other speakers and

[6] It is interesting to note that there are no Ocaina loanwords in the speech of these two speakers.

the occurrence of borrowed grammatical elements is equally pervasive and systematic in these. These data include wordlists collected in the 1920s, 1930s, and 1970s (analyzed in Seifart 2011), and data recently collected by the author from Boras who do not speak Resígaro, but who memorized Resígaro songs in the context of ceremonial festivals decades ago from now deceased Resígaros who were unrelated to the two speakers alive today. The systematic use of borrowed elements of all kinds (including noun class markers and bound grammatical roots) in ceremonial songs is a particularly important piece of evidence not only because among the People of the Center the language used in ceremonial songs tends to be archaic, but also because these songs constitute elaborate, large repertoires that must have taken some time to fully develop and that are linked to practices of an entire community, not of individuals.

The phonological shape of Bora loans in Resígaro provides another piece of evidence for the time-depth of borrowing: They preserve word-initial *h* (see examples in Table 3) inherited from Proto Bora-Muinane, which Bora had already lost at its earliest attestation in 1819 (Seifart 2011: 23-25).

4. Overview of borrowed elements

This section gives an overview of all contact-induced changes in Resígaro, including lexical borrowing and structural influence, in order to situate morphological borrowing in this context. Around 5% of stems in the Resígaro lexicon are borrowed from Bora,[7] i.e. remarkably few given the vast amount of morphological borrowing. Borrowed stems include bound grammatical roots forming numerals, possessive pronouns, etc. (which will be treated in detail below), as well as a few verbs and nouns, many of which are ethnobotanical and ethnozoological terms or terms for items of local culture (Table 3).[8]

[7] This figure is based on the identification of approximately 65 stems borrowed from Bora in Allin's (1976: 382-458) list of about 1,590 Resígaro words and very similar proportions in two other, older wordlists (Seifart 2011). Aikhenvald (2001: 182) claims that "lexical comparison of 100 'core vocabulary' and of 218 non-core items between Resígaro and Bora and Witoto shows that about 24% are loans", without, however, revealing the source of the data. It is unclear how Aikhenvald arrived at such a high number of loans, in particular because she recognized that many words in Resígaro are formed with class markers borrowed from Bora (which could have been taken to be lexical loans), and given that no borrowing from Witoto into Resígaro is attested.

[8] The Resígaro forms in Table 3 – as well as those in Table 6, below – are taken from Allin (1976: 382-458) and the Bora forms from Thiesen & Thiesen (1998). Proto Bora-Muinane forms are from Aschmann (1993) or reconstructed based the Bora forms and Muinane forms taken from Walton et al. (1997) and Walton et al. (2000) applying the sound changes proposed by Aschmann (1993). Reconstructed forms given in brackets have no reflex in Muinane and are thus based on Bora forms only. Note that Bora source forms are phonologically nativized in Resígaro by the following processes: /g^w - g; r - d; ts - s (~

domain	**Bora**	**Proto Bora-Muinane**	**Resígaro**	**meaning**
ethnobotany	*mátsahka*	*mátsakka	*matshaákú*	peanut
	áádʒa	(*háága)	*haádʒa-ʔé*	tree species *yaripa*
	mé:mɛʔo	*mé:mɛʔo	*méémɛʔo*	dough from *Guilelma* palm fruit
ethnozoology	*piíymɛ*	*piíme	*piímé*	ant species
	ɛétɛ	*hɛéte	*heété*	fly species
	áákɯrúi	*háákɯrúi	*háákɯdúi*	bird species
local culture	*tsoʔβúmɯ*	(*tsoʔβúmɯ)	*tsoʔβómú*	manioc flour
	í:bii	*hííbi	*hiibí*	coca
	kátsoógʷa	*kátsoógai	*kásoogú*	manioc grater
other nouns	*koomi*	*koomi	*koomi*	village
	toʔkúmɯ	*tokɯ-	*thoʔkhúmú*	Witoto (ethnic group, literally "rotten")
	únɛɯ	(*hɯneɯ)	*húnɛú*	lake
verbs	*piko*	*piko	*piʔko*	put
	ka:háβé-ʔi	(*kaaháβɛ-)	*kaaháβɛʔi*	cause a flood
	ɛkɛ	(*ɛkɛ)	*ɛkɛ*	grab

TABLE 3: LEXICAL BORROWING FROM BORA INTO RESÍGARO

While this assessment of lexical borrowing is based on a wordlist (Allin 1976: 382-458), the analysis of morphological borrowing in this paper is based on the study of the occurrence of borrowed elements in a corpus of Resígaro texts (Seifart 2009, summarized in Table 4), which has been tagged for forms borrowed from Bora. This corpus consists of transcribed and translated texts produced by the two native speakers alive today, as well as some texts produced by their mother before her death in 2005. Not included in this corpus are the Resígaro songs reproduced by non-native speakers of Resígaro mentioned in Section 3.3 above. All texts, except for conversations, were produced on the request of the researcher. The addressee of the main narrator (or singer) was either another native speaker, a younger ethnic Resígaro with good passive knowledge of the language, or in some cases the researcher, as documented in the metadata of each session in this corpus. None of these normally use Bora with one another, making it unlikely that Bora elements in this corpus are instances of code switching.

ts)/; and V_1ʔC (e.g. /aʔb/) - V_1ʔV_1C (e.g. /aʔab/). Bora voiceless plosives and affricates became voiceless non-aspirated plosives and affricates in Resígaro (Resígaro has a three-way distinction in the series of plosives and affricates: voiced-voiceless-aspirated). In Resígaro phrase-final /ɯ/ and /a/ alternate regularly, also in native words.

genre	**number of recording sessions and words**
traditional narratives	14 sessions, total of about 7,470 words
personal narratives	9 sessions, total of about 3,210 words
songs	24 sessions, total of about 1,630 words
procedural texts	14 sessions, total of about 1,880 words
conversation	4 sessions, total of about 910 words
total	**about 15,100 words**

TABLE 4: THE RESÍGARO CORPUS USED IN THIS STUDY

Studying morphological borrowing in texts (rather than in elicited data) allows for a certain measurability of the contact-induced changes by relating the number of occurrences of a certain kind of element to a delimited number of utterances in a corpus, whose composition can be controlled (see Weinreich 1966: 35-37; van Hout & Muysken 1994: 42-47; Wilkins 1996: 112).[9] It also avoids the problem that the Resígaro speaker who can also speak Bora might accept Bora forms in an elicitation situation. All figures relating to the occurrence of borrowed morphemes given in this section are based on counts from this corpus. For illustrative purposes, some additional, elicited examples, based on forms that occur in texts, are used in Section 5.

Table 5 summarizes the set of borrowed grammatical morphemes, i.e. inflectional and derivational suffixes and bound grammatical roots, that occur in this corpus.[10] The figures in Table 5 refer to morpheme types, most of which occur in many word types. For instance, *-ba* "class marker for logs (and other objects)" is one of the 19 borrowed inanimate class markers that are attested in the corpus. It is attested in the corpus in combination with various stems, i.e. in a number of word types, for instance *síʔi-bá* "another (log)" and *aβáána-bá* "wooden log". There are various tokens of many of these word types in the corpus. For instance, the two word types just mentioned each occur twice (Steinkrüger & Seifart 2009). As discussed in the following section, most of the borrowed morphology is morphosyntactically closely interrelated, as indicated in the third column of Table 5. Note again that no verbal morphology was borrowed.

[9] This also allows approximating the productivity of borrowed morphology by relating the number of types to the number of tokens (Steinkrüger & Seifart 2009).

[10] Some more borrowed elements besides those given in Table 5 can be identified in elicited data. For instance, in Allin's (1976) 1,590-item word list, there are a total of 48 borrowed gender and noun class markers (Seifart 2011). These include the 19 forms found in the corpus used in this study in addition to 29 class marker forms. The latter are, however, mostly very rare, i.e. the majority of these occur only once or twice in the entire wordlist. All borrowed number markers given in Table 5, and no additional ones, occur in this wordlist. There is one additional borrowed bound grammatical root, namely one forming the interrogative "which" *kɛ-*. It belongs to the same closed class of bound grammatical roots that are discussed in Section 5.4, below. The occurrences of borrowed forms in this wordlist are thus congruent with those given in Table 5, with some additional, rare forms, but no different type of morpheme.

kind of morpheme	borrowed morpheme in corpus	interrelated with other borrowed morphology
suffixes (28)	19 inanimate noun class markers	yes
	1 feminine gender marker	yes
	6 number markers	yes
	1 augmentative marker	no
	1 dative case marker	no
bound grammatical roots (8)	2 roots of numerals ("one" and "two")	yes
	2 roots forming quantifiers ("all", "other")	yes
	3 roots forming demonstratives and pro-forms	yes
	1 root forming possessive pronouns	yes

TABLE 5: BORROWED GRAMMATICAL MORPHEMES IN THE CORPUS USED IN THIS STUDY

Bora also had some important structural influence on Resígaro. Some of this restructuring is associated with borrowed grammatical morphemes, as discussed in the following sections. In addition, Resígaro probably developed under Bora influence the use of second-position tense-aspect-mood clitics. It possibly had object cross-referencing suffixes (Seifart 2011: 20-22), like other Arawakan languages, which it might then have lost under Bora influence. It is possible that Resígaro also developed phonological tones under Bora influence (Aikhenvald 2001).

In summary, massive morphological borrowing occurred in the context of relatively little lexical borrowing and some structural influence. The remarkable low number of borrowed lexemes may be related to the general avoidance of lexical borrowing among the People of the Center, which is, however, not as strict as in the neighboring Vaupés region (see also note 13).

5. Borrowed suffixes and bound roots

5.1. Introduction

The following sections discuss Resígaro nominal classification and number marking for inanimates, which are almost entirely borrowed from Bora (Section 5.2). Resígaro gender and number marking for animates (Section 5.3) is also strongly influenced by Bora forms. Borrowed bound roots of numerals, demonstrative pronouns, and other pronominal expressions are treated in Section 5.4. Section 5.5 deals with borrowed morphemes that are not closely related to these systems. Section 5.6 is a summarizing discussion of the interdependence and co-occurrence of borrowed morphemes.

5.2. Nominal classification and number for inanimates

In the corpus used in this study, 19 borrowed noun class markers for inanimates occur, as given in Table 6 along with their Bora source forms and reconstructed Proto Bora-Muinane forms (from Seifart 2007). Table 6 also includes the paradigmatically related feminine singular gender marker (see Section 5.3). There is some evidence of pre-contact Arawakan forms that would have been replaced by these borrowed forms, as further discussed below and in Section 5.3.

Gloss	**Bora**	**Proto Bora-Muinane**	**Resígaro**	**Resígaro example**
CM.TREE	*-ʔɛ*	*-ʔɛ	*-ʔɛ*	*koóna-ʔɛ* "almond tree"
CM.HOLE	*-ʔɛhɯ*	*-ʔɛhɯ	*-ʔɛhɯ*	*té-ʔɛhɯ* "this hole"
CM.RIVER	*-ʔi*	*-ʔi	*-ʔi*	*té-ʔi hiβíi* "water-star" (proper name)
CM.OBLONG	*-ʔo*	(*-ʔo)	*-ʔo*	*níítsi-ʔo* "cigarette"
CM.PILLAR	*-ʔahkɯ*	*ʔahkɯ	*-aakɯ*	*té-aakɯ* "this pillar"
CM.3DIM	*-ba*	*-ba	*-ba*	*síʔí-bá* "another (box, log, etc.)"
CM.BUSH	*-bahɯ*	*-bahɯ	*-bahɯ*	*té-bahɯ* "bush"
CM.ROOT	*-ba^{j}hkɛ*	*-baikkɛ	*-bákɛ́*	*pipíigí-ʔɛ-bákɛ́* "root of *pijuayo* palm tree"
CM.BRANCH	*-g^{w}áhka*	*-gákka	*-gáka*	*koóna-ʔɛ-gáka* "almond tree branch"
CM.PLANK	*-g^{w}a*	*-gai	*-gɯ ~ -ga*	*βáʔa-gɯ́* "machete"
CM.HOUSE	*-ha*	*-ha	*-ha*	*dʒídʒáá-há-koba* "big house"
CM.DISC	*-hɨ*	*-hɨ	*-hi*	*daʔm̥óótsi-hí* "hat"
CM.TUBE	*-hɯ*	*-hɯ	*-hɯ*	*kaané-hɯ́* "doing this (story)"
CM.STICK	*-i*	*-i	*-i*	*goʔkoótsi-í* "mortar"
CM.POINTED	*-ko*	*-ko	*-ko*	*tɛɛ́-ko* "this (stick)"
CM.DAY	*-ko:hɨ*	*-ko:hɨ	*-koohi*	*tsá-kóóhi* "one day"
CM.LEG	*-kɯba*	*-kɯba	*-kɯʔba*	*hí-kɯ́ʔba* "this leg"
CM.RIVER	*mo:a*	*moáai	*-moóa*	*té-moóa* "this river"
CM.ROUND	*-ɯ*	(*-ɯ)	*-ɯ*	*sí-ɯ* "another (pebble, etc.)"
feminine SG	*-(pi)dʒɛ*	*-ge	*-(pi)dʒɛ*	*phai-pídʒɛ́* "old woman"

TABLE 6: BORROWED NOUN CLASS AND GENDER MARKERS

Noun class markers for inanimates are used for the derivation of singular nouns (examples 3a-b) and the formation of modifiers (examples 4, 6) and pro-forms (example 5) in both languages. Borrowed noun class markers usually combine with native Arawakan stems to form nouns and modifiers. In contrast, the roots forming pro-forms (example 5) are borrowed from Bora (see Section 5.4), resulting in polymorphemic words that are entirely of a Bora origin. The main function of noun class and gender markers in modifiers and pro-forms is to mark agreement with an aforementioned noun,

or to stand in for that noun when the referent is retrievable without explicit mention example 6).[11]

(3)		Bora	Resígaro
	a.	*aɲú-hɯ*	*ókóniigi-hú*
		burn.NMZ-CM.TUBE	fire-CM.TUBE
		"rifle"	"rifle"
	b.	*aɲú-ɯ*	*ókóniigi-ú*
		burn.NMZ-CM.ROUND	fire-CM.ROUND
		"bullet"	"bullet"

(4)	Bora	Resígaro
	mítʲa-ɯ	*dʒídʒá-ɯ*
	big-CM.ROUND	big-CM.ROUND
	"big (bullet, fruit, etc.)"	"big (bullet, fruit, etc.)"

(5)	Bora	Resígaro
	tɛ:-ɯ	*tɛɛ-ɯ*
	PN-CM.ROUND	PN-CM.ROUND
	"that (bullet, fruit, etc.)"	"that (bullet, fruit, etc.)"

(6) *mɛtsoíigí-ɯ* *dʒídʒaá-ú-koba* *dʒoβí-giko* *tsó-kaʔpʰaaβú*
ripe-CM.ROUND big-CM.ROUND-AUG be-ALL 3SG.F-enter
"Into what was a ripe, big (fruit) she entered" [sacha_res 062]

An important function of noun class markers in combination with noun stems is the expression of countable units. Underived inanimate noun stems are usually grammatically uncountable in both Resígaro and Bora and cannot receive dual and plural marking (examples 7a-b). Dual and plural markers are obligatorily used on nouns that are unitized by noun class markers when these are non-singular in reference (examples 7c-d). Number marking is also obligatory on pro-forms, which also include noun class markers (examples 7e-f).

[11] Because of this agreement function the term "(noun) class marker" is used here, not "classifier", which is associated with non-agreeing nominal classification systems, such as numeral classifiers, verbal classifiers, etc. (Grinevald 2000; Grinevald & Seifart 2004).

(7)		Bora	Resígaro
	a.	*aɲɯ*	*ókóniigi*
		"burning, fire"	"burning, fire"
	b.	*aɲú-:kɯ / -:nɛ*	*ókóniigi-kɯ / -hi*
		burn.NMZ-DL / -PL	fire-DL / -PL
	c.	*aɲú-hɯ́-:kɯ*	*ókóniigi-húú-kɯ*
		burn.NMZ-CM.TUBE-DL	fire-CM.TUBE-DL
		"two rifles"	"two rifles"
	d.	*aɲú-hɯ́-:nɛ*	*ókóniigi-húú-hi*
		burn.NMZ-CM.TUBE-PL	fire-CM.TUBE-PL
		"rifles"	"rifles"
	e.	*té-hɯ-:kɯ*	*tɛɛ-hɯɯ-kɯ*
		PN-CM.TUBE-DL	PN-CM.TUBE-DL
		"these two (rifles, etc.)"	"these two (rifles, etc.)"
	f.	*té-hɯ-ʔhɨ*	*tɛɛ-hɯɯ-hi*
		PN-CM.TUBE-PL	PN-CM.TUBE-PL
		"these (rifles, etc.)"	"these (rifles, etc.)"

All number markers used for inanimates in Resígaro, i.e. a dual and a plural marker, are borrowed from Bora (examples 7b-f, see also Table 7, below). Note that Resígaro uses a form of the plural marker that corresponds to the Bora form that is used only with pronominal expressions, not with nouns (*-hɨ / -hi*) (examples 7d, f). The borrowing of the Bora plural marker *-:nɛ* (example 7d) was probably blocked by the (almost) homophonous inherited Arawakan plural marker for animates *-nɛ* (see examples 11a-b in section 4.3). Note also that along with the phonological segments of the inanimate number marker, the vowel lengthening rule affecting the last syllable of the stem to which it attaches was borrowed (examples 3a vs. 7c, e).

There are no inherited Arawakan inanimate noun class marker forms in the corpus used in this study (as well as in additional elicited data), only the native Arawakan non-

feminine marker is also used with inanimates (see Section 4.3).[12] Noun class and number marking morphology for inanimates in Resígaro is thus almost exclusively of a Bora origin, i.e. where native Arawakan forms existed, these have been completely replaced by Bora forms. However, comparison with other Arawakan languages suggests that it is likely that at least a rudimentary nominal classification system existed in pre-contact Resígaro. Noun class markers (or classifiers) used only with numerals exist in some of the related Arawakan languages, and some forms can be reconstructed within these languages (Aikhenvald 2002: 307), but none of these forms are found in Resígaro. Two languages relatively close to Resígaro, Baniwa and Tariana, use noun class markers not only in numerals, but also in modifiers and pro-forms, similarly to Resígaro and Bora. However, the use of noun class markers in contexts other than numerals is an innovation in Tariana (and maybe to some extent in Baniwa) under influence from Eastern Tucanoan languages (Aikhenvald 2007).[13] In Baniwa and Tariana, bare noun stems have a collective reading, and noun class markers are used as unitizing elements that are required for number marking (Aikhenvald 2007: 488-489), again similar to Resígaro. This structural characteristic may also have been borrowed from Eastern Tucanoan, at least in the case of Tariana.

It is possible that Tariana, Baniwa, and Resígaro (and other relatively closely related Arawakan language) formed a subgroup within Arawakan that used noun class markers in multiple environments. This means that Resígaro may have had these structures before coming into contact with Bora and that noun class markers were borrowed into existing structures. It is, however, at least as likely that Baniwa and Tariana, on the one hand, and Resígaro, on the other, have developed the use of noun class markers in multiple contexts independently, under influence from Eastern Tucanoan and Bora, respectively, based on numeral classifier systems, which are old in the Arawakan family. In this scenario, the structural influence of Bora on Resígaro would have been considerable. Morphological borrowing would have been equally heavy in either scenario. No other Arawakan language has dual as a grammatical category, so this category has almost certainly been introduced into Resígaro together with the forms borrowed from Bora. This holds for inanimates as well as animates (see Section 5.3).

[12] Note that of the 56 class markers for inanimates listed in Allin's (1976: 154-163) grammar, eight or nine are not from Bora (Aikhenvald 2001: 186). These do not occur in the corpus used for the current study, and only some of them occur very sporadically in Allin's (1976: 382-458) extensive wordlist.
[13] Note that Tariana did not borrow class marker forms due to a strong inhibition against lexical borrowing enforced by the regional system of linguistic exogamy in the Vaupés (Aikhenvald 2001, 2002). Baniwa is spoken on the edge of the Vaupés and does not take part in linguistic exogamy. Resígaro is clearly outside this region and not part of this system.

There is some evidence that noun class markers were not primarily borrowed in conjunction with borrowed stems from Bora and used on native stems in Resígaro only at a later stage, but that they were borrowed "directly" (Steinkrüger & Seifart 2009). There are very few borrowed noun stems compared to the number of borrowed noun class markers in the first place (see Section 4). The borrowed noun class markers are far more often used on native Arawakan noun stems than on borrowed noun stems, and far more productively so, as shown by the low token frequencies of most types of such hybrid formations. Many borrowed noun class markers occur only with native stems. This shows that the borrowed noun class markers display a certain independence from open-class noun stems and function as a relatively self-contained subsystem within the overall structure of the language.

5.3. Gender and number for animates

Gender and number marking for animates in Resígaro is strongly influenced by Bora, although a number of native Arawakan forms and associated categories still exist in this section of Resígaro morphosyntax (as will be summarized in Table 7, below). Resígaro has borrowed from Bora animate dual markers, which also mark gender, and two animate plural markers. Dual markers are illustrated in examples 8a-b. Example 8c illustrates the borrowed plural marker that is used for non-human animate nouns in Resígaro (for other animate nouns, an Arawakan form is usually used, see examples 11-12, below).

(8)

	Bora	Resígaro
a.	*okáhi-mútsi*	*aɲóógi-mútsi*
	"two tapirs"	"two tapirs"
b.	*okáhi-mútpɨ*	*aɲóógi-mútpi*
	"two female tapirs"	"two female tapirs"
c.	*okáhi-mɯ*	*aɲóógi-mɯ*
	"tapirs"	"tapirs"

Borrowed animate number markers are also found in non-singular personal pronouns in Resígaro (examples 9a-b). The source form of the borrowed element *-ʔa* (example 9b) occurs in Bora in some quantifying expressions, such as *tsá-ʔa-tsa* (one-PL-some) "some

(groups of animates)", where it occupies the slot of a noun class or gender marker, and it occurs in plural personal pronouns, where it is not segmentable (example 9b). In Resígaro, it is also used in the same slots as noun class or gender markers, e.g. in numerals and quantifiers (see example 16, below).

(9)		Bora	Resígaro
	a.	*mɯʔtsi*	*ɸa-músi*
		1DL.M	1PL-DL.M
		"we two"	"we two"
	b.	*mɯːʔa*	*ɸa-ʔa*
		1PL	1PL-PL.ANIM
		"we"	"we"

Dual animate markers like those in examples 8a and 9a are also used suffixed to verbs as subject markers in Resígaro, like in Bora (examples 10a-b).[14] Dual markers used as subject markers are the only instances of borrowed grammatical morphemes in finite verbs in Resígaro.

(10)		Bora	Resígaro
	a.	*íhkʲa-mútsi*	*na-ʤaá-músí*
		be-DL.M	3PL-be-DL.M
		"they were"	"they were" [fiesta_rec_RA 03]
	b.	*pɛː-múpɨ*	*nɛ-ʔpí-múpí*
		go-DL.F	3PL-go-DL.F
		"they went"	"they went" [cuentores_3 24]

The inherited Arawakan animate plural marker *-nɛ*, which can be traced back to Proto Arawakan (Payne 1991), is used in Resígaro for nouns with human referents (example 11) and body parts (example 12).

[14] This structure is very unusual for an Arawakan language, where all subject markers are prefixes, and suffixes refer to objects (in the Arawakan languages that preserve them, unlike Resígaro) (Aikhenvald 1999).

(11)

	Bora	Resígaro
a.	*gʷadʒɛ́:-mɯ*	*inádo-né*
	woman-PL	woman-PL
	"women"	"women"
b.	*í-ɲaʔbé-mɯ*	*do-tsátɛ-né*
	3-brother-PL	3SG.F-brother-PL
	"his/her/their brothers"	"her brothers"

(12) a. Resígaro
tso-ʔpa-né-dʒá
3SG.NON_F-foot-PL-DIM
"his little feet" [cuentores_3 137]

b. Resígaro
gí-ɲ̥iɯ-né
3SG.NON_F-eye-PL
"his eyes" [res_chac_1 41]

Resígaro has borrowed from Bora a feminine singular marker, which is used in the same morphosyntactic slots as inanimate noun class markers, e.g. as a derivational suffix on nouns and as an agreement marker in numerals or modifiers (examples 13a-b). The Bora source form is in fact bimorphemic, and only used in this form in numerals (example 13a) and quantifying expressions. In Bora, the form used in other contexts, such as descriptive modifiers (formed with a relative clause in example 13b), corresponds to one component of that form.

(13)

	Bora	Resígaro
a.	*tsá:-pídʒɛ-ma*	*sá-pidʒé-nɛ́ɛ́*
	one-SG.F-SOC	one-SG.F-SOC
	"with one (woman)"	"with one (woman)" [dyushi 166]

b. Bora

βahβah	*ɯ*	*mɛ́ɛ́nɯ-dʒɛ*
moving	2SG.SUB	do-SG.F

"you, who are moving (lit. doing "vava")"

Resígaro
βaaβaa *pi-k^{h}á-á-pídʒɛ*
moving 2SG-do-SUB-SG.F
"you, who are moving (lit. doing "vava")" [hijo_sol 13]

One native Arawakan gender marker for animates coexists in Resígaro with the forms borrowed form Bora. The inherited Arawakan singular non-feminine (animate and inanimate) marker *-gi* is used in the same morphosyntactic slots as borrowed noun class and gender markers, such as numerals (example 14), i.e. none of the Bora forms for masculine singular (*-:bɛ, -:pi*) were borrowed into Resígaro. Resígaro thus preserves the original Arawakan feminine vs. non-feminine distinction, and did not adopt the Bora three-way (inanimate vs. masculine vs. feminine) system (where masculine is the unmarked form for animates), except in the dual (examples 8a-b, 9a, 10).

(14) Bora Resígaro
tsa-:pi *sa-gi*
one-CM.M.SG one-NON_F
"one (masculine)" "one (non-feminine)"

Independently of the paradigm of borrowed noun class and gender markers, Resígaro preserves inherited Arawakan gender-marked third person singular prefixes, *gi-*, *tsa-* (and other allomorphs) for non-feminine and *do-*, *tso-* (and other allomorphs) for feminine. These forms are used as subject markers on verbs (e.g. *do-píkó* [3SG.F-put] "she put") and possessive prefixes. Fossilized forms corresponding to Arawakan gender markers (*-do* and *-gi*) can also be found as final syllables in some inanimate nouns (examples 3a-b) and in some ethnozoological terms (example 8).

In sum, number and gender marking for animates in Resígaro is heavily influenced by borrowed forms, which have also introduced new grammatical categories such as masculine (as opposed to non-feminine) and dual. Number and gender marking for animates closely interacts with noun class marking for inanimates, competing to a large extent for the same morphosyntactic slots, e.g. in numerals or as derivational suffixes on nouns. Table 7 summarizes relevant aspects of gender and number marking in Resígaro, illustrating also that native and borrowed categories coexist. As before, forms borrowed from Bora are underlined in Table 7. Note that the singular forms are

the ones used in numerals, relative clauses, and some other contexts, and that all borrowed forms have an etymology in Proto Bora-Muinane.

	feminine	masculine	inanimate	humans, body parts
singular	*-pidʒɛ*	*-gi*	19 class markers	(no special form)
dual	*-mɯpi*	*-mɯsi*	*-ːkɯ*	(no special form)
plural	*-mɯ, -ʔa*		*-hi*	*-nɛ*

TABLE 7: BORROWED AND INHERITED NUMBER AND GENDER MARKERS

5.4. Numerals, quantifiers, possessive pronouns, and other pro-forms

Resígaro borrowed a closed class of bound roots that form numerals, quantifiers, possessive pronouns, and other pro-forms (Table 8). All these forms (expect for the possessive pronoun) have to combine with noun class or gender markers in order to function as words in utterances.

meaning	**Bora**	**Proto Bora-Muinane**	**Resígaro**	**Resígaro example**
numeral one	*tsa-*	*tsa-	*sa-*	*tsá-ʔɛhɯ* "one (hole)"
numeral two	*mi-*	*mi-	*mi-*	*mí-húú-kɯ* "two (paths, songs, etc.)"
quantifier "complete, all"	*pa-*	*pa-	*pa-*	*pá-pásí* "a complete (ring)"
quantifier "other"	*tsi-*	*tsi-	*si-*	*sí-ʔíbá* "another (box, log, etc.)"
possessive pronoun	*-ʔnɛ*	*-nɛ	*-ʔɲɛ*	*gí-ʔɲé* "his", *gí-ʔɲé-gá* "his (plank, etc.)"
proximate demonstrative	*i-*	*hi-	*hi-*	*hi-ko* "this (spear, rod, etc.)"
distal demonstrative	*ɛʔ-*	*hɛʔ-	*hɛʔɛ-*	*hɛʔɛ-hi* "that (coin, disc, etc.)"
third person inanimate	*tɛː-*	*tɛ-	*tɛ-*	*té-ʔi* "it (river, string, etc.)"

TABLE 8: BORROWED BOUND GRAMMATICAL ROOTS

Noun class or gender markers in the numerals "one" and "two" mark agreement with the enumerated noun or stand in for it (example 15a). Numeral "two" must additionally include the (borrowed) dual marker, as in Bora (example 15b). Numerals "three" and "four" are construed as combinations of numerals "one" and "two" and numeral "five" is built on the borrowed classifier for "hand" (see example 23, below).

(15)	Bora	Resígaro
a.	*tsa-ʔbá-kobá-rɛ*	*sá-ʔábá-kobá-ɲa*
	one-CM.3DIM-AUGM-REST	one-CM.3DIM-AUGM-REST
	"just one big (box, etc.)"	"just one big (box, etc.)" [experi_res_1 93]
b.	*mí-úú-:kɯ*	*mí-úúú-kɯ*
	two-CM.ROUND-DL	two-CM.ROUND-DL
	"two (round things)"	"two (round things)"

Borrowed quantifiers and quantifier-like expressions correspond to "other" (example 16) and "complete (in the singular), all (in the plural)" (example 17). When referring to animates, the borrowed form *-ʔa* "PL.ANIM" (see example 9b, above) is used in the noun class marker slot of these forms (examples 16a, 17).

(16)	Bora	Resígaro
a.	*tsi-htʲɛ*	*síí-ʔa*
	other-PL.ANIM	other-PL.ANIM
	"others"	"others"
b.	*tsi-ʔba*	*síʔí-bá*
	other-CM.3DIM	other-CM.3DIM
	"another (fruit, box, etc.)"	"another (fruit, box, etc.)"

(17)	Bora	Resígaro
	pá-mɛ-rɛ	*pa-ʔa-ɲá*
	all-PL.ANIM-REST	all-PL.ANIM-REST
	"everybody"	"everybody"

The root that forms possessive pronouns is also borrowed (examples 18a-c). It obligatorily combines with a native Arawakan personal prefix. Unlike the other expressions discussed in this section, noun class and gender markers are optional with possessive pronouns in both Resígaro and Bora (examples 18a-b). In example 18a, the underlying form in Bora is also given to illustrate that in this case the most frequent allomorph (Bora *-ʔɲɛ* after *i* and underlying *aʲ*) was borrowed, not the underlying Bora form *-ʔnɛ* (example 18d).

(18)		Bora	Resígaro
	a.	*tɑ́ʲ-ʔnɛ́-hɯ* (underlying)	
		tá-ʔnɛ́-hɯ	*nó-ʔnɛ́-hɯ*
		1SG-POSS-CM.TUBE	1SG-POSS-CM.TUBE
		"my (blowgun, etc.)"	"my (blowgun, etc.)"
	b.	*ta-ʔnɛ*	*nó-ʔnɛ*
		1SG-POSS	1SG-POSS
		"my (blowgun, etc.)"	"my (blowgun, etc.)"
	c.	*di-ʔnɛ*	*pí-ʔnɛ́*
		2SG-POSS	2SG-POSS
		"yours"	"yours"
	d.	*mɛ-ʔnɛ*	*βá-ʔnɛ́*
		1PL-POSS	1PL-POSS
		"ours"	"ours"

The most frequent root of those discussed in this section is the one forming the third person inanimate pronoun *tɛ-*, glossed as PN "pronominal root" (see examples 2, 5, 7e-f, above, and 23, below). The borrowed roots for proximate and distal demonstrative pronouns (see Table 8) also have essentially the same distributional properties as the other forms from the closed set of grammatical roots discussed in this section. This set of forms is syntagmatically closely associated with the noun class and gender markers discussed earlier, which are in most cases obligatorily used in them, and which are, in turn, the locus of number marking.

5.5. Borrowed augmentative marker and dative case marker

Two suffixes were borrowed that do not interact as closely with other borrowed morphology as the forms described in the previous sections. First, the augmentative marker in Resígaro is borrowed from Bora (example 19, see also example 15a, above), but the diminutive marker is not (example 20).

(19)

	Bora	Resígaro
a.	*páhtɯ́-koba*	*naápá-koba*
	aguti-AUGM	aguti-AUGM
	"a big aguti"	"a big aguti (species of rodent)" [cuentores_6 42]
b.	*míʲa-há-koba*	*dʒídʒáá-há-koba*
	big-CM.HOUSE-AUGM	big-CM.HOUSE-AUGM
	"a big one (e.g. house)"	"a big one (e.g. house)" [cuentores_4 02]

(20)

Bora	Resígaro
hɛ́:ɯ́-gʷɯ	*píida-dʒá*
pet-DIM	pet-DIM
"little pet"	"little pet" [cuentores_8 116]

Although the borrowed augmentative marker is not linked to other borrowed morphology by a morphosyntactic rule (like bound pronominal roots to noun class markers, for instance), it is frequently used on nouns, adjectives (example 19a), and numerals (example 15a) that are derived with borrowed noun class markers. There is only one borrowed bound morpheme that is completely independent of other borrowed morphology, a dative case marker (examples 21-22). Its source form in Bora is a primary object marker, used for animate objects of monotransitive verbs and recipients of ditransitive verbs. In Resígaro, objects of monotransitive verbs are unmarked (as in other Arawakan languages), and the form borrowed from Bora is only used for animate recipients of ditransitive verbs (example 22).[15]

(21) Resígaro

a.	*no-kɛ́*	*pa-ʔmitóó-kʰó*	*no-kóo*	*pi-βaʔnóótɯ́*
	1SG-DAT	2SG-food-ABL	1SG-ALL	2SG-send

"Send me some of your food, towards me!" [cuentores_8 69]

[15] Aikhenvald (2001: 188) relates the Resígaro dative case marker *-kɛ* to Bora *-ki* "purposive". This is a verbal suffix in Bora, as in, e.g., *ɯ mé:nɯ-ki* (2SG.SUB do-PURP) "so you (can) do". The Bora primary object marker, which is also phonologically closer, is thus a much more likely source for the Resígaro dative marker *-kɛ*. Aikhenvald (2001: 188) also claims that two additional suffixes have been borrowed from Bora. She identifies Resígaro *-maʔ* "without" with Bora *-ma* "without [sic]", which is a sociative case marker in Bora and could thus be translated as "with" (see example 12a). Aikhenvald's identification of Resígaro *-gi* "instrumental/locative" with Bora *-ri* "instrumental/locative" is likewise problematic because Bora *r* always becomes *d* in loans in Resígaro, never *g* (see note 8). This form could rather be related to Proto Arawakan *-kɨ "locative postposition" (Payne 1991: 380).

Resígaro

b. *mí=ʔpɛ* *no-βíkoʔ* *ginómomíí-kɛ́*
CON=REM 1SG-sell white_people-DAT
"I sold (it) to the white people" [experi_res_1 90]

(22)

	Bora		Resígaro	
a.	*o-kɛ*	*ahkú-mɛ*	*no-kɛ́*	*na-ʔ*
	1SG-OBJ	give-PL.ANIM	1SG-DAT	3PL-give
	"They gave to me"		"They gave to me"	

b. Bora
gʷaʔpéh-tɛ-kɛ *ó* *aɲú-ʔi*
bird-PL-OBJ 1SG shoot-PRED
"I shot birds"

Resígaro
koʔpída-né *no-ʔβɛ́ɲ̊ó*
bird-PL 1SG-shoot
"I shot birds" [experi_res_1 95]

5.6. Structural dependency and co-occurrence of borrowed morphology

The previous sections showed that Resígaro has borrowed a large number of grammatical morphemes from Bora and that the great majority of these morphemes are morphosyntactically interrelated. Most of the borrowed morphemes are paradigmatically related, forming closed paradigms of grammatical items. A first paradigm is that of noun class and gender markers, which includes 20 borrowed forms, 19 inanimate noun class markers, and one feminine gender marker. This paradigm is defined by exclusive occurrence in a range of morphosyntactic slots on modifiers, numerals, quantifiers, possessive pronouns, and other pro-forms, where their occurrence is mostly obligatory. Only one inherited Arawakan form survives in this paradigm, the non-feminine gender marker.

A second paradigm is that of number markers, which includes a total of six borrowed dual and plural markers. There is some overlap between this paradigm and the paradigm of noun class and gender markers. Some animate number markers (which also mark gender in the dual) may appear in the same contexts as noun class and (singular)

gender markers, such as in numerals. There is again only one inherited Arawakan form in this paradigm, a plural marker for human and body-part nouns.

A third group of paradigmatically related borrowed morphemes consists of a set of eight borrowed grammatical roots that form numerals, quantifiers, and pro-forms. These would normally not be considered a paradigm, but they also constitute a tightly integrated, closed class of monosyllabic, bound forms that share distributional properties. They all require gender or noun class markers (except for possessive pronouns, where these are optional). Gender and noun class suffixes are used on these roots to mark agreement or – maybe more often – to stand in for a noun whose referent is retrievable in the discourse situation. There is no native Arawakan form that shares these specific properties and would thus be part of this set of forms, although there are other native Arawakan independent third person pronominal forms.

Of the 36 borrowed grammatical morphemes in Resígaro, 34 belong to one of these three sets. The only instances of morphological borrowing that are not part of paradigmatic sets with other borrowed morphemes are an augmentative marker and a dative case marker: The paradigmatically related diminutive marker, and all other case markers, respectively, are native Arawakan forms.

The sets of paradigmatically related borrowed morphemes are, in turn, syntagmatically related to each other, i.e. they concatenate according to morphosyntactic rules, often obligatorily. These morphosyntactic rules were at least partially borrowed along with the morphemes, resulting in structural influence in addition to morphological borrowing. There are primarily two rules to this effect. First, number marking for inanimates requires unitized nominals that are derived with noun class markers. Accordingly, borrowed number markers are used on borrowed noun class markers. Second, the set of roots forming quantifiers, numerals, and various pro-forms are bound and require noun class or gender markers. Therefore, borrowed bound grammatical roots concatenate with borrowed noun class and gender markers.

As a result of these rules, it is common that various borrowed grammatical morphemes co-occur in one Resígaro word. This is particularly common in procedural texts with recurrent reference to inanimate objects for which inanimate noun class and number markers are used. Thus in procedural texts, in over 50% of words that include borrowed morphology, more than one borrowed element occurs, as example (1), above, and the following example (23) illustrate.

(23) *híga-búɪ́* *pi-kʰá* *aɲɛpɨ́ɪ* *apótsí*
higa-CM.3DIM 2SG-do many at_once
sá-ʔosí *téʔé-baá-hí*
one-CM.HAND PN-CM.3DIM-PL
"Of the *hígabúɪ́*-trap, you do many at the same time, five (lit. one hand) traps" [res_tramp_7 47]

In sum, the set of borrowed morphemes in Resígaro is far from being a random collection of forms. It is internally clearly structured by paradigmatic and syntagmatic relations. These relations define two easily identifiable morphosyntactic subsystems of the language, nominal classification and number marking. A closed class of bound grammatical roots is closely associated with these systems. The expressions formed by these grammatical roots, e.g. demonstratives and pro-forms, play an important role in the reference tracking system of the language, as can be observed in example (23). Taken together, the borrowed subsystems are grammatically relatively self-contained in the language. The noun class and gender markers can be thought of as a set of expressions whose primary function is to establish reference to countable units (in derivation), and that come with their own number marking and agreement system, as well as numeral, pronominal, and reference tracking systems, all of which are borrowed from Bora.

Along these lines, one may speculate that morphological borrowing started out with class markers. Note that these are relatively easy to borrow in terms of their semantic and formal properties (see Table 1) – many of them have a concrete, lexical meaning, not unlike nouns. In their derivational function, they may be analyzed as (bound) nouns that are specialized in the formation of complex nouns and pro-forms. They would have replaced a limited number of Arawakan class markers that probably existed in pre-contact Resígaro, and the uses of class markers would have expanded to other morphosyntactic contexts, along the Bora model. Morphology structurally dependent on class markers would have been borrowed along with them, most notably number markers. Borrowed number markers replaced some native Arawakan forms and added dual as a new category in the language.

Finally, let us briefly consider how the PMSI proposed here interacts with and goes beyond some previously formulated claims about borrowability to account for morphological borrowing in Resígaro. First, many of these claims predict that morphemes with certain formal and semantic properties are more borrowable than others, e.g. derivation rather than inflection and free rather than bound forms (see Table

1). These predictions are generally confirmed in Resígaro, but unlike these earlier accounts, the PMSI accounts for regularities within the sets of borrowed morphemes in Resígaro. Second, it has been claimed that morphological material is more easily borrowed if it fills a gap in the receiving language. This factor additionally provides motivation for the borrowing of some of the noun class markers and the dual number markers in Resígaro, but it does not account for the fact that these markers were borrowed as parts of interrelated sets of forms, some of which have replaced native forms, such as the plural marker and the feminine gender marker. In both respects, the PMSI is thus compatible with previous claims about the borrowability of grammatical morphemes, but explains additional regularities.

6. The integrative force of morphosyntactic subsystems in language contact

The aims of this paper have been to present an interesting case of massive morphological borrowing and to account for this by proposing that the integrative force of morphosyntactic subsystems shapes sets of borrowed morphemes. This final section elaborates on the theoretical implications of this approach to contact-induced language change.

Most approaches to borrowability have focused on predicting the likelihood of a given morpheme to be borrowed based on inherent formal and semantic properties, and have derived universal borrowability hierarchies from these (see Table 1, above). These approaches predict, among other things, that borrowing bound grammatical morphemes is very rare when compared to free lexical forms. This makes morphological borrowing appear as something exceptional and maybe irregular; accordingly, it has received little attention (but see Gardani 2008; Grant 2008, 2010). The approach taken here is to systematically investigate morphological borrowing, with the contention that it may be rare, but interesting in itself as well as for a deeper understanding of contact-induced language change. This approach goes beyond relating the borrowability of grammatical morphemes to universal hierarchies, and pays close attention to the morphosyntactic interrelatedness of borrowed morphemes. The Principle of Morphosyntactic Subsystem Integrity (PMSI) was proposed, which predicts that sets of borrowed morphemes are likely to be interrelated in this sense, and it was shown how it applies to Resígaro.

Like other principles that constrain or facilitate borrowability, the PMSI is not an exceptionless rule. However, it does account for a range of data that was previously either not considered or treated as exceptional. While Resígaro closely adheres to this

principle, in other cases of morphological borrowing, the integrity of morphosyntactic subsystems may be a less prevalent factor, but the PMSI may still make an important contribution to explaining the data. For example, the set of five borrowed suffixes in Warndarang (Heath 1978a, 1980a) can be analyzed, following the approach taken here, as structured into two subsets of forms that are internally paradigmatically related, three noun class suffixes, and two case markers (see Section 2.2). The PMSI thus provides at least a partial explanation for a case of morphological borrowing that has sometimes been considered as outright exceptional and unaccountable (Matras 2009: 215-216).

The PMSI is based on the interrelatedness of grammatical morphemes through the two basic structure-building relations of language, paradigmatic and syntagmatic relations, and not on the details of language-specific morphosyntactic structures such as nominal classification. Therefore, at least in principle, any kind of morphosyntactic subsystem should be able to play a role in shaping morphological borrowing similar to nominal classification and related morphosyntactic subsystems in Resígaro. Accordingly, other documented cases of massive morphological borrowing involve very different kinds of morphosyntactic subsystems (see section 2.2). These include inflectional case marking systems as in Warndarang (Heath 1978a, 1980a), verbal inflectional systems as in Sebjan-Küöl Ėven (Pakendorf 2009, 2010), and derivational subsystems as in Chabacano (Steinkrüger 2003, 2009).

The PMSI is probably ultimately motivated by a more basic principle in contact-induced language change, namely the avoidance of restructuring tightly integrated morphosyntactic subsystems (see, e.g., Weinreich 1953: 35; Matras 2009: 216). This principle underlies the fact that borrowing grammatical morphemes is rarer than borrowing lexical items. It also explains that it is easier to borrow grammatical morphemes across structurally compatible morphosyntactic systems than across incompatible systems (Field 2002). The current study shows that this basic principle prevails also in massive morphological borrowing in the sense that if structurally integrated grammatical morphemes are borrowed, then their structural integration with other grammatical morphemes will facilitate their borrowing. The effect of such borrowing, as described by the PMSI, is a minimization of restructuring in various ways. On the one hand, borrowing paradigmatically interrelated morphemes means borrowing into – and thus restructuring – as few as possible paradigms. If paradigmatic relatedness is taken to an extreme, entire paradigms of forms may be borrowed. This means heavy borrowing, but in a sense it affords less restructuring since as a result individual paradigms are coherent in that they are from one language, the donor language. On the other hand, borrowing syntagmatically interrelated forms means that if

various morphosyntactic paradigms are influenced, it will be closely interrelated subsystems, which may form a delimited "chunk" of restructured grammar, and this may avoid the restructuring of other, unrelated morphosyntactic subsystems.

The approach taken here may also be useful in opening a new perspective on the treatment of mixed languages, which have sparked controversial debates (Matras & Bakker, eds. 2003) and defy a commonly accepted characterization in terms of current models of contact-induced language change. Mixed languages may differ from cases like Resígaro in the extent to which material from different languages is mixed, but at least for some cases of mixed languages, a primary determinant seems to be the maintenance of the integrity of morphosyntactic subsystems. In a number of mixed languages, including some that are considered to be close to the "prototype" of mixed languages (Bakker 2003: 124), the sets of etymologically distinct morphological material seem to be divided precisely along the lines of tightly integrated morphosyntactic subsystems, e.g. verbal inflectional subsystems in Copper Island Aleut, whose integrity is thus preserved (Golovko 1996; Thomason 1997). Along with a number of other recently described cases (especially Sebjan-Küöl Ėven, see Pakendorf [2009, 2010]), Resígaro, under the analysis proposed here, constitutes an intermediate case, a "missing link" between borrowing and language mixing that may eventually help to bridge the perceived gap between "normal" contact-induced changes and mixed languages.

The regularities in morphological borrowing described here have further implications for historical linguistics and for the study of code switching. For historical linguistics, the PMSI may be used to derive or refine working hypotheses for the reconstruction of undocumented past language change (see Robbeets 2010). Such working hypotheses are particularly important for grammatical morphemes, especially inflection, because these elements are generally regarded as most resistant to contact-induced change and therefore as good indicators for genealogical links (Nichols 1996). On the one hand, case studies like Resígaro show that such morphemes may also be massively and systematically replaced or added through language contact (see also Grant 2008). On the other hand, the approach taken here suggests that if one grammatical morpheme is identified as borrowed, it is more likely that other paradigmatically or syntagmatically closely related forms are also borrowed rather than that unrelated forms are also borrowed. All other things being equal, such a working hypothesis may be decisive in favoring one possible reconstructed scenario over another.

Finally, the present study may also be relevant for further research on the actual mechanism by which contact-induced changes arise in situations of widespread bilingualism, i.e. code switching. Similarly to how many constraints on borrowability are often modeled (see Section 2.1), the formal regularities of code switching are often described in terms of universally-defined morpheme types that are hierarchically ordered, e.g. in Myers-Scotton's (2002) 4-M[orpheme type] model, which predicts a high likelihood of code switching to lexical items, and an increasingly lower likelihood for three types of grammatical morphemes. The importance of the integrative force of borrowed morphosyntactic subsystems observed in the present study suggests that it could be worth investigating whether a similar principle applies to code-switching data.

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