MAINTENANCE OF THE BRETON MIXED MUTATION

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ABSTRACT

This paper investigates the mixed mutation in Breton, an endangered language which has seen a gap in transmission. Initial consonant mutation is a highly salient feature of the language, but susceptible to change in the context of widespread bilingualism and an ageing population of speakers. We investigate to what extent a younger generation is continuing to maintain the mixed mutation, and find that young adults achieve proficiency equivalent to that of older speakers. Children acquire this feature very late, and need sustained Breton input beyond the early teenage years. To investigate the nature of the mutation itself, we examine measurements of a crucial alternation, which show that acoustically there is little difference in the realisation of the mutation, and this feature is being maintained.

Keywords: initial consonant mutation, Breton

1. INTRODUCTION

Initial consonant mutation (ICM) is a feature common to all Celtic languages, and is rare among Indo-European languages. It involves the replacement of word-initial consonant phonemes with other consonant phonemes, and this replacement is triggered by the morphological or syntactic context. Breton exhibits four types of ICM, one of which is the mixed mutation (MM). As the name suggests, MM combines features of two other forms of ICM, namely lenition and provection, potentially making it susceptible to language change.

Breton is considered to be an endangered language, with the majority of speakers aged over 75. Recent revival efforts have led to the establishment of Breton-medium schooling, and the emergence of a younger generation of speakers. However, it has been noted that the Breton spoken by these younger speakers, sometimes termed 'neo' speakers, has been heavily influenced by French, particularly in terms of its phonology, but also in terms of its morphosyntax (e.g. [6]).

Little is known about what characterises the consonant phonemes involved in Breton ICM. Still less is known about how mutation is used and how these phonemes are realised by the new, younger generation of speakers. We investigate the usage and realisation of MM across generations, seeking to answer the following questions:

1. To what extent do younger Breton speakers maintain the ICM patterns of older speakers?
2. What characterises the phonemes involved in MM? Are there cross-generational differences in the production of these phonemes?

These questions are addressed using data from fieldwork interviews, and measurements of the key phonemes involved in MM.

2. CONTEXT AND FIELDWORK

2.1. Mixed mutation in Breton

Naturally, the interest of this study lies in the consonantal system of Breton. Ternes [9] gives a standard consonant phoneme inventory for Breton, presented in Figure 1.

Figure 1: Breton consonant phoneme inventory

ORAL STOPS	p, b	t, d		k, g	
FRICATIVES	f, v	s, z	ʃ, ʒ	x	h
RESONANTS	m	n	ɲ		
		l	ʎ		
		r			
	w, ɥ		j		

Breton thus has a voicing contrast in stops and fricatives, (with the exception of the velar /x/). Some writers (e.g. [8], [3]) have discussed the existence of a fortis/lenis contrast in Breton, which is dependent on the position of the consonant within the word: for example, word-initial stops are fortis, while word-final stops following an unstressed vowel are lenis. Since this distinction is manifested in certain contexts, it is not directly relevant to this study; however, it will be referred to in the discussion of acoustic measurements.

As mentioned above, in ICM word-initial consonant phonemes are replaced with other consonant phonemes in certain contexts. For example, the noun ***t****i* 'house' becomes *ma* ***z****i* 'my house' but *e* ***d****i* 'his house'. Although it has its

origins in a phonetically-motivated process [5], it is now purely morphosyntactically driven, and importantly, involves only phonemes of the language. ICM can thus be considered a type of neutralisation: the contrast between two phonemes is lost.

The type of ICM under investigation in this study is the mixed mutation (MM), which is one of four types of mutation in Standard Breton. MM is found on verbs and affects four voiced stops, including one nasal stop, and a consonant cluster (see Table 1).

Table 1: The mixed mutation

Unmutated	b	d	g	gw	m
Mutated	v	t	h	w	v

The stops /b/, /g/ and /m/ become fricatives, and the consonant cluster /gw/ loses its initial segment. This is exactly what happens to these segments in lenition: MM is a mix of two other types of ICM. Lenition (see Table 2) is a much more widespread form of ICM, affecting other consonants in addition to those shown in Table 2, and being triggered by many more contexts.

Table 2: Lenition of those segments also affected by MM

Unmutated	b	d	g	gw	m
Mutated	v	z	h	w	v

MM differs from lenition in its treatment of /d/, which is not transformed into /z/, but is devoiced to /t/. This is the same as another type of ICM, namely provection, which transforms voiced stops into their unvoiced counterparts. Provection is found in very few contexts, and affects only nouns. It is the only type of mutation in Breton that makes sounds less rather than more sonorant [8].

This study examines MM following the progressive particle *o*. This is a widespread context, and an example is given below:

(1) emañ ar paotr **o** **t**ebriñ [<debriñ]
be.SIT.3SG DET boy **PRT** eat.PROG
'The boy is eating.'

2.2 Fieldwork methodology

Fieldwork was conducted in the area surrounding Quimper, Finistère. Three groups of speakers were interviewed, comprising two generations:

- Five **senior adults** (SA) aged over 70, who had grown up speaking the language. Many of these speakers spoke no French before attending school.
- Eight **young adults** (YA) aged 20-35, who had grown up in French-speaking homes, but who had attended Breton-medium education.
- Ten **children** aged 8-15, currently in Breton-medium schooling.

The young adults and children together comprise a younger generation of speakers, separated from the senior adults by a middle generation, very few of whom speak Breton.

Participants were interviewed either individually or in groups of two. The interviews were recorded, and data were elicited using pictorial prompts: participants were presented with a series of photographs, and were asked to tell the interviewer in Breton what was happening in each one. Since the focus was on ICM, the actions portrayed in the photographs were chosen based on initial segment of the relevant verb – it had to be affected by the mutation under investigation.

2.2.1. Analysis of the data

The expectation is that speakers will use mutation as described in accounts of the language. However, before looking at the data, it is worth considering the possible alternatives that might be found. First, speakers might do as expected, and use MM. Secondly, speakers might use another form of mutation, which is most likely to be lenition. This would only be apparent with the initial consonant /d/. Thirdly, they might use no mutation at all, leaving verb in its unmutated form. These three possibilities are represented in the data to follow.

3. FINDINGS: MUTATION USAGE

3.1. Adults

The data show that all adults, from both generations, use ICM following the progressive particle as expected. As Table 3 shows, the senior adults rarely deviate from the MM, omitting it in only 6 of 108 utterances, and using lenition of /d/ only once.

Table 3: Adults' use of mutation

	MM	**Lenition**	**None**	**Total**
SA	102	1	6	108
YA	134	0	18	152

The young adults, despite their status as 'neo' speakers, also use MM proficiently in this context. The never use lenition of /d/, and also only omit the mutation in a small proportion of utterances. This is admittedly a little higher than the senior

adults (12% instead of 5%), but there may be two contributing factors in this. In some cases, the lack of ICM followed a pause, perhaps resulting in a loss of the context. Ten of the instances were from a single speaker following the onset cluster /gw/. It is not clear exactly why this should be, but it seems to be idiosyncratic usage.

3.2 Children

The children present a completely different picture, omitting the mutation in over half of instances, and using lenition of /d/ in 18% of instances. In light of this, the additional category of MM/Len appears in Table 4. This refers to mutation of /b/, /g/, /gw/ and /m/, since it is impossible to distinguish lenition from MM for these segments. The children might only be using lenition, and not the mixed mutation. MM /d/ then refers to the transformation of /d/ to /t/.

Table 4: Children's use of mutation

MM /d/	MM/Len	Lenition	None	Total
32	28	41	125	226

As Table 4 shows, the children use MM of /d/ in only 32 instances, and mutate the other segments in only 28 utterances. It is clear that they are far from being proficient in the MM.

This would be a troubling finding from the perspective of Breton's continued survival if it were not for the data from the young adults: they too acquired Breton through immersion schooling, but now as adults are fully proficient in the MM. Indeed, age is a factor in the children's proficiency in MM, with the older children using more mutation generally, and more MM of /d/ than the younger children (21 of the 32 MM /d/ instances are from the two oldest speakers).

These findings echo those of studies into Welsh ICM. Gathercole and Thomas [4] examined the acquisition of the Welsh soft mutation in gender-specific contexts, and found that older children were more proficient in the use of the ICM than younger children.

We are left with two contrasting hypotheses as to why the children struggle to acquire MM. The first is that the problem is acoustic: they cannot hear the alternation because the /t/ and /d/ are not sufficiently distinguished in the mutation context. The second is that it is a grammatical problem: the children are able to distinguish the different forms, but have not yet managed to extrapolate the rule for MM in the correct context. They may also be confusing it with the more widespread lenition. The next section discusses acoustic measurements taken to explore these hypotheses.

4. ACOUSTIC MEASUREMENTS

The alternation between radical /d/ and mutated /t/ is crucially important in distinguishing MM from the more widespread lenition. In light of the findings regarding mutation usage, and the status of ICM as a form of neutralisation, measurements of these consonants were taken, examining the length of the closure duration (CD) and the release of the consonant. Existing studies on the phonetics of Breton (e.g. [3]) are not, for the most part, very recent, and do not examine the language as spoken by younger people. Little is known, therefore, about what characterises the voicing contrast in stops in Breton. CD and release have been identified as playing a part in distinguishing voiced and voiceless sounds [7].

The consonants were measured using the speech analysis program Praat [1]. The expectation was that /t/ and /d/ in the mutation context should be significantly different from one another, but also that they should be the same as non-mutated /t/ and /d/. This is an interesting area, in light of findings [3] that initial /d/ in a non-mutation context is generally longer than /d/ arising from lenition. To address this issue, 'control' consonants were found for each speaker, with the stop appearing in a context where it would never undergo any sort of mutation. Where possible, the consonant was preceded by /o/, to mimic the conditions for the mixed mutation following the progressive particle; however, where this was not possible, contexts with other vowels were used.

Analyses of variance were performed for both closure duration and release. The factors were Consonant Type (/t/ or /d/), Context (mutated or not mutated, i.e. 'control'), Group (senior adults, young adults, children) and Vowel Height (height of the following vowel: high or non-high) with Subjects nested under Group as a random factor.

There was a significant main effect of Consonant Type for both CD ($F(1, 254.1) = 10.47$, $p \leq 0.0014$) and release ($F(1, 255.4) = 71.25$, $p \leq 0.0001$). The measurements are given in Table 5. This shows that /t/ and /d/ are different from one another – MM transforms the phoneme into another distinct phoneme. Context was not a significant effect for either CD or release: the mutated forms did not differ from the control forms.

Table 5: Mean length of release and closure duration in mutation vs. control contexts (ms)

	/d/		/t/	
	Mutation	**Control**	**Mutation**	**Control**
CD	75.3	58.8	93.4	90.1
REL	19.9	21.4	48.7	33.4

The CD and release measurements for the different groups are given in Tables 6 and 7. There is little variation between groups in the CD, and indeed, there were no other significant effects for CD. The release measurements, on the other hand, are more interesting. From the measurements themselves it appears as though the young adults differ sharply from the children and senior adults, who are similar to one another – a most surprising result. However, this is misleading: looking at the results of the ANOVA, release had significant main effects of Group ($F(2, 53.62) = 4.42$, $p \leq 0.0167$) and Vowel Height ($F(1, 250.4) = 79.43$, $p < 0.0001$), and the following interactions were also significant: Consonant Type × Vowel Height ($F(1, 251) = 32.53$, $p \leq 0.0001$) and Group × Consonant Type × Vowel Height ($F(2, 251.5) = 3.63$, $p \leq 0.02$). Paired comparisons showed that the senior adults were significantly different both from the children ($t = 2.96$, $p \leq 0.0047$) and from the young adults ($t = -2.19$, $p \leq 0.03$) with respect to the length of the release.

Table 6: Mean length of closure duration (ms)

	SA	**YA**	**Children**
/d/	51.1	75.6	71.3
/t/	85.9	97.5	89.8

Table 7: Mean length of release (ms)

	SA	**YA**	**Children**
/d/	16.3	18.8	20.9
/t/	38.4	52.4	38.9

The height of the following vowel is clearly crucial in an examination of the length of the consonant release. When the stops, particularly /t/, were followed by a high front vowel (/i/ or /y/), there was palatalisation or affrication – a process which is reasonably well-attested in Breton (e.g. [3]). This process makes the release much longer, and the measurements are given in figure 8 – there is a striking difference between the release of /t/ before high and non-high vowels, with a difference of as much as 56.3 ms for the young adults.

Table 8: Mean length of release of /t/ before high vs. non-high vowels (ms)

Following vowel	**SA**	**YA**	**Children**
high	49	80.2	77.5
non-high	22.8	23.9	33.1

This brings us to two interesting points. First, the contrast between YA and the other groups visible in Table 7: contrary to appearances, the two younger groups are not really so different. The young adults have a much higher proportion of high vowels in the data than the children do (52.3% for the young adults; 18.1% for the children). The children's pronunciation of verbs such as *debriñ* /di:bĩ/ 'to eat' is strongly influenced by the spelling, resulting in /de:bĩ/ or even /de:brĩ/. The vowel /e/ does not result in a longer release. This is confirmed by the data presented in Table 8 for vowel height. Secondly, vowel height is crucial in understanding the significant interactions discussed above: the senior adults are significantly different from the younger generation in the length of the release preceding a high vowel. The contrast between high and non-high following vowels is not nearly so great for the senior adults (a difference of 26.2 ms). The younger generation are therefore increasing the tendency towards affrication preceding a high vowel (something that is not generally found in Standard French [2]), and this would appear to be an ongoing change in Neo Breton.

5. CONCLUSIONS

This study has investigated the Breton mixed mutation in particular context, and the findings indicate that ICM is alive and well in Breton. In terms of usage, there are few errors in the adults' speech, and this is true of both generations of speakers, showing that the young adults are proficient in the use of the MM following the preverbal particle. The children's usage is much more variable, but it would appear that acquisition of ICM is a long and protracted process, which is supported by evidence from Welsh. For Breton, where almost none of the children in Breton-medium schooling come from Breton-speaking homes, the time needed to acquire proficiency in ICM is much longer. Sustained input beyond the early teenage years is clearly crucial.

In terms of the realisation of /d/ and /t/, the key consonants involved in distinguishing the MM from lenition, there is little difference between the two generations. The phonemic contrast is being maintained, and is accessible for the children to acquire. A slight increase in palatalisation preceding a high front vowel was found for the younger generation, and it is possible that these speakers are exaggerating a feature they perceive to be more 'Breton', in an attempt to avoid influence from French.

Overall, the data point to the maintenance of a salient feature of Celtic languages across two generations, despite a gap in the transmission of the language, and widespread bilingualism.

6. REFERENCES

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