Mutations in Spoken Welsh

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This work describes the use of mutations in the spontaneous speech of a small number of adult Welsh speakers. As such it follows in the tradition of other works which look at spoken Welsh by Awbery (1986), Ball (1988, 1992), Ball and Müller (2002) and White and Roberts (2022) (who provide a wide-ranging source of other references). This study provides copious illustrations and statistical details.

1 The data

All the examples in this study are taken from the utterances of adults in an electronic database of transcribed audio-recordings of spontaneous adult-child interactions which were collected by an ESCR-funded project, the details of which are available at https://users.aber.ac.uk/bmj/abercld/cronfa18_30/sae/intro.html. There are 21 Welsh speakers who variously provide a total of 14,482 examples in which a mutation can occur. This database is not only a valuable resource for the study of the input language which children experience but also provides very useful data for the study of adult Welsh.

The audio-recordings are transcribed in the orthography of Welsh but with spellings which indicate the forms of spontaneous spoken Welsh. Of particular relevance to the examples in this study are spelling conventions which use various markings to distinguish homonyms. For example, the use of the apostrophe distinguishes the first singular personal pronoun *i* 'I' from the preposition *i'* 'to' and the agreement clitic *'i* (*ei* in literary Welsh - agreement clitics are labelled as prefixed pronouns (*rhagenwau blaen*) in traditional reference grammars). The use of numerals distinguishes the aspect marker *yn,* the preposition *yn1* 'in', the predicatival marker *yn2,* the manner adverbial marker *yn3*, the first person plural agreement clitic *yn4*, and the first person singular agreement clitic *yn5*. The circumflex diacritic is represented in the corpus examples by the colon (:), as in *a:* 'with'. Details about all these forms and others are given in table 2. The symbol @c at the end of a word indicates child forms, for example, *mwmws*@c.The examples given in this work also contain transcriptional conventions which indicate characteristics of spontaneous speech, such as repetitions, unfinished words and unfinshed utterances.

2 Mutations

It is a well-known feature of Welsh that certain initial consonants of words are changed in certain contexts. The initial consonants are given in table 1 and it can be seen that there are four sets of changes, three of which traditional reference grammars refer to as the soft mutation, the nasal mutation, and the aspirate mutation. We also include as a mutation the addition of /h/ *h* to words with an initial vowel, which is known as *h*-prothesis. The term radical is used to label the phonemes which can be mutated.

Table 1. Mutations and their sounds / letters

Radical	Soft	Nasal	Aspirate	*h*-prothesis
/p/ *p*	/b/ *b*	/mh/ *mh*	/f/ *ph*	
/t/ *t*	/d/ *d*	/nh/ *nh*	/θ/ *th*	
/k/ *c*	/g/ *g*	/ŋh/ *ngh*	/x/ *ch*	
/b/ *b*	/v/ *f*	/m/ *m*		
/d/ *d*	/ð/ *dd*	/n/ *n*		
/g/ *g*	omitted			
/ɬ/ *ll*	/l/ *l*			
/m/ *m*	/v/ *f*			
/rh/ *rh*	/r/ *r*			
vowel				add initial /h/ *h*

The phonemic distinction between /rh/ and /r/ represents a voiceless phoneme and a voiced phoneme respectively. But it is unclear whether in spontaneous speech all speakers all of the time maintain this distinction for this phoneme. Examples of /r/ *r* following a soft mutation trigger may not necessarily be an example of a mutation.

3 Triggers

Mutations are caused by triggers in the context. These triggers are mainly overt and can be words or grammatical patterns. But the triggers can also be covert, as we shall see. There are also instances of seemingly mutated words which have no overt nor covert trigger.

3.1 Lexical triggers

Table 2 gives the list of lexical triggers which occur in the database. The table also gives constraints on the effect of some of the lexical triggers, based on accounts in traditional reference grammars. The table separately lists *dan1* 'under' and *o+dan* 'under', and also *ar* and *oddi+ar*. They are combined as *dan1* and *ar* respectively in the analyses. The same also applies to *na* and *na5*, which are combined as *na/na5*, and *yn2* and *yn3*, which are combined as *yn2/yn3*.

Table 2. Lexical triggers in the database given as lexemes, ordered alphabetically

		Mutation	Conditions
a	'and'	aspirate	
a1	particle†	soft	
a:	'with'	aspirate	
ail	'second' (2nd)	soft	
am	'for'	soft	
ambell	'occasional'	soft	
ar	'on'	soft	
at	'to(wards)'	soft	
chweched	'sixth'	soft	before sg. fem. noun
cwbl	'all'	soft	
dan1	'under'	soft	
dau/dwy	'two'	soft	
dros	'over'	soft	
dy	clitic††	soft	
ei	clitic††	soft	masculine
ei2	clitic††	aspirate	feminine
		h-prothesis	
ein	clitic††	*h*-prothesis	
eu	clitic††	*h*-prothesis	
fe1	particle†	soft	
fy	clitic††	nasal	
gan	'with'	soft	
go	'fairly'	soft	
gyda	'with'	aspirate	
heb	'without'	soft	
holl	'all'	soft	
hollol	'completely'	soft	
i'	'to, for'	soft	
mi1	particle†	soft	
mor	'so'	soft	except *ll-*, *rh-*
na	particle†	aspirate	
		soft	
na1	'than'	aspirate	
na2	'nor'	aspirate	
na5	particle†	aspirate	
		soft	
naw	'nine'	nasal	before *blwydd*, *blynedd*, *diwrnod*
neu	'or'	soft	
o	'of, from'	soft	
o+dan	'under'	soft	
oddi+ar	'from'	soft	
pa	'which'	soft	
pan	'when'	soft	
pump	'five'	nasal	before *blwydd*, *blynedd*, *diwrnod*; *pump* > *pum*
pwy	'which' cf. *pa*	soft	
rhy	'too'	soft	
rhyw	'some, certain'	soft	
saith	'seven'	soft/radical	except *m-* and *d-*
		nasal	before *blwydd*, *blynedd*, *diwrnod*
sut	'what' cf. 'what sort of'	soft	
tan	'until'	soft	

tri	'three'	aspirate	
trwy	'through'	soft	
tua	'approximate, about'	aspirate	
un	'one'	soft	numeral; before sg. fem. noun except *ll-*, *rh-*
un2	'same'	soft	
wrth	'to, by'	soft	
wyth	'eight'	soft/radical	soft/radical except *m-* a *d-*,
		nasal	nasal before *blwydd, blynedd, diwrnod*
y	'the'	soft	before sg. fem. noun except *ll-* and *rh-*
			before *dau* and sometimes *deu-* and *dwy*
			before ordinals + sg. fem. noun
ychydig	'a little'	soft	
yn1	'in'	nasal/soft	*yn1* > *ym1* before *m-* and *mh-*
			yn1 > *yng1* before *ng-* and *ngh-*
yn2	particle†††	soft	except *ll-* , *rh-* and *braf*
yn3	particle†††	soft	except *ll-* , *rh-* and *braf*
yntau	'or'	soft	

† preverbal particles indicating force and polarity; *na5* occurs in a complement clause

†† agreement clitics indicating number, person and gender, occurring in verb phrases and genitive noun phrases (known as preverbal pronouns (*rhagenwau blaen*) in traditional reference grammars)

††† *yn2* precedes heads of predicatival phrases and *yn3* precedes heads of adverbial phrases of manner

There are nine mutation triggers in the table which do not occur in a mutateable context (see section 4) in the database: *ail* '2nd', *chweched* 'sixth', *cwbl* 'entire', *ein* (first person plural agreement clitic), *hollol* 'completely', *naw* 'nine', *pump* 'five', *saith* 'seven' and *wyth* 'eight'. They are ignored in the remainder of this study.

Reference grammars list the preverbal *oni(d)* as a mutation trigger. In the database, this particle (which occurs as the forms *yn', 'n'* and *on"*) only occurs in responsives (answers and tags) and consistently does not cause a mutation. It is not therefore included in this study.

The small selection of examples in (1) illustrates how lexical triggers mutate immediately following words.

1 a. ***a*** ***chloi*** *wrth droi fel 'na*.
and lock as turn like that
'and lock while turning like that.'

b. *ie,,, mwrthwl* ***i'*** ***drwsio*** *pethau.*
yes hammer to mend things
'yes, a hammer to mend things.'

c. *bag newydd* ***heb*** ***dwll***.
bag new without hole
'a new bag without a hole.'

d. ***rhy*** ***brysur***,,*ie*?
too busy yes
'too busy, yes?'

e. *yn1* ***y*** ***goets***,,, *ie.*
in the pram yes
'in the pram, yes.'

f. *ti 'n mynd i' grafu* ***fy*** ***nghefn*** *i?*
you.2SG PROG go to scratch CL.1SG back I
'are you going to scratch my back.'

g. *ie,,, paid a:* ***'i*** ***dynnu*** *e off nawr.*
yes IMPV.3SG with CL.3SG.M pull it off now
yes, don't pull it off now.'

h. *mae 'r goets* ***yn2*** ***wag***.
be.pres.SG the pram PRED empty
'the pram is empty.'

Several points need to be made about lexical triggers in the spoken Welsh of the database.

For the purposes of computer searches the spelling of the masculine and feminine third person agreement clitics are distinguished as *ei* (masculine) and *ei2* (feminine). *Pwy* 'who' occurs as a mutation trigger as an equivalent of *pa* 'which'. Similarly, *sut* 'how' also occurs to convey *pa fath o* 'what sort of'. The lexeme *trwy* 'through' occurs as the form *trwy* and also *drwy*. The latter looks like the soft-mutated form of *trwy* but there is no clear evidence in the contexts in which the latter occurs that this is the case. The form *drwy* is viewed here as a form of the lexeme *trwy* and not its mutated form. The same applies to *dros* 'over' (compare *tros*) and *dan1* 'under' (compare *tan* 'under'). The form *un* is used as the numeral *un* 'one' and also the adjective *un2* 'same'.

The table shows that some of the triggers cause more than one mutation. In the case of *ei2*, *na* and *na5*, the alternatives are determined by the initial phoneme of the target word. But this is not so in the case of the preposition *yn1* 'in'. In spontaneous speech, some speakers can use the soft mutation in place of the nasal mutation for the same initial phonemes of the target word. More details are given in section 5.2.3. We label this mutational effect as nasal/soft

Several of the lexemes in table 2 are realized differently in spontaneous informal speech when compared with formal written Welsh and it is the spoken forms which are the object of computer searches in the database. Those in table 3 in particular can be noted.

Table 3. Spoken forms of the lexemes which are lexical triggers

Lexemes	Forms
fy	*fy, f', 'y, yn5, 'n5, 'ng5, 'yng5, 'm5, 'ym5*
ein	*ein, yn4, 'n4*
yn1	*yn1, 'n1, ym1, yng1*
gyda	*gyda, 'da*
ei	*ei, 'i*
ei2	*ei2, 'i2*
eu	*eu, 'u*
trwy	*trwy, drwy*
yntau	*ynta, 'ta2*
dau	*dau, dou, ddau, ddou*
neu	*neu, ne'*
ychydig	*ychydig, chydig*
yn2	*yn2, 'n2*
yn3	*yn3, 'n3*
yntau	*'ta2*
sut	*sut, shwt*

In the case of some triggers it is not only the initial consonant of the immediately following word which changes. Elision or regressive assimilation also changes the final consonant of the trigger. This occurs with triggers of the nasal mutation. Those triggers which end in a nasal consonant assimilate features of the nasal-mutated sound into their final consonant. The first person agreement clitic *yn5* has the assimilated forms *'ng5, 'yng5, 'm5, 'ym5*, and the preposition *yn1* 'in' has the assimilated forms *yng1* and *ym1*. The numeral *pump* 'five' has the assimilated form *pum*.

2 a. *ti 'n mynd dros* ***yn5*** *nhraed i.*
you.SG PROG go over CL.1SG feet I
'you're going over my feet.'

b. *mae 'o 'n bwyta* ***'ym5*** *mys i.*
be.PRES.3SG he PROG eat CL.1SG finger I
'he's eating my finger.'

c. *ti wedi blino,,* ***'yng5*** *nghariad i',,, do*?
you.SG PERF tire CL.1SG sweetheart I yes
'you're tired, my love, yes?'

3 a. ***yn1*** *Ninas+Dinlle,, ie*?
in Dinas+Dinlle yes
'in Dinas Dinlle, yes?'

b. *ti 'n baglu* ***ym1*** *mhob+man,, ynd wyt*?
you.SG PROG trip in every where Q.NEG be.PRES.2SG
'you're tripping every where, aren' t you?'

c. *be allwn ni roi* ***yng1*** *nghefn y lori*?
what can.PRES.1PL we put in back the lorry
'what can we put in the back of the lorry?'

4 *wyt ti 'n cal* ***pum*** *munud weithie*?
be.PRES.2SG you.SG PROG have five minute sometimes
'you have five minutes sometimes.'

3.2 Grammatical Triggers

A grammatical trigger is one in which a mutation can occur but for which there is no overt lexical trigger. In the spontaneous spoken Welsh of the database, there are a number of individual grammatical triggers. A finer account can make generalizations which reduce their number.

Some grammatical triggers come under what is referred to by Borsley and Tallerman (1996) and Tallerman (2006) as the XP trigger hypothesis (XPTH), which holds that any phrase (XP) can trigger the mutation of the initial word of a following phrase which is not part of the constituent structure of the trigger phrase. Phrases which occur in post-subject position in finite clauses can be soft-mutated.

5 a. *welest ti* ***gi***?
see.PERF.2SG you.SG dog
'did you see a dog?'

b. *ne'st ti* ***dynnu*** *sgidia,, do*.
do.PERF.2SG you.SG pull shoes yes
'you took off your shoes, yes.'

c. *ge'st ti* ***ddim*** *brecwast*?
have.PERF.2SG you.SG NEG breakfast
'didn't you have any breafast?'

Phrases which occur in post-subject position in *i*-clauses can be soft-mutated.

6 a. *gad i' ni* ***wneud*** *un arall gyntaf*.
leave.IMPV.2SG for us do one other first
'let's do another one first.'

b. *disgwyl i' bwy* ***ddwad***?
expect for who come
'expect who to come?'

c. *rhaid i' ti* ***gau*** *dy llygaid*.
necessary for you.SG close CL.2SG eyes
'you must close your eyes.'

Phrases which occur in post-prepositional phrase position in possessive clauses can be soft-mutated.

7 a. *oes gan Dad* ***fwrthwl***?
be.PRES with Dad hammer
'has Dad got a hammer?'

b. *mae gynni hi* ***wallt*** *hir*.
be.PRES.3SG with.3SG.F she hair long
'she's got long hair.'

c. *ie,,, ma' gyda M---* ***feic***,, *on'd o's e*?
yes be.PRES.3SG with M--- bike Q.NEG be.PRES
'yes, M---'s got a bike, hasn't he?'

Phrases which follow the existential subject *yna* 'there' can be soft-mutated.

8 a. *oes 'na* ***gylch*** *yfanna*?
be.PRES there circle there
'is there a circle there?'

b. *oes 'na* ***fwyd*** *arno fo*?
be.PRES.3SG there food on.3SG.M it
'is there food on it?.'

c. *mae 'na* ***lew*** *yfanna.*
be.PRES.3SG there lion there
'there's a lion there.'

The initial word of adverbial noun phrases can be soft-mutated. Such phrases occur in a variety of positions which follow other phrases including post-subject position in finite clauses, as in (9c).

9 a. *mae Dad yn lliwio nhw* ***bob*** *nos*.
be.PRES.3SG Dad PROG colour they every night
'Dad colours them every night.'

b. *ge'st ti crempogau* ***ddiwrnod*** *crempog*?
have.PERF.2SG you.SG pancakes day pancake
'did you have pancakes (on) pancake day?'

c. *aros di* ***funud***,, *ie*.
wait you.SG minute yes
'wait a minute, yes.'

A word which follows a predicatival demonstrative — *dyma* 'here / this is', *dyna* 'there / that is' and *dacw* 'yonder is' — can be soft-mutated.

10 a. *dyna* ***ddynes***,, *ie*.
there's woman yes
'there's a woman, yes.'

b. *'na2 ti* ***lun*** *a hanner*.
there's you.SG picture and half
'there's a picture and a half.'

c. *'na2 fo* ***geffyl***.
there's he horse
'there's a horse.'

In the example in (10c), the phrase which follows the predicatival demonstrative is an appositional construction — personal pronoun (*fo*) + noun (*geffyl*) — in which the mutation falls on the noun. This could be separately accounted for under apposition as a trigger but in this study such examples are included under the predicatival demonstrative trigger. All these individual triggers in examples (5) to (10) are brought under one general trigger, which we shall refer to as the XPTH trigger.

Attributive adjectives (especially), nouns and verbnouns which occur after singular feminine nouns can be soft-mutated.

11 a. *hogan* ***ddrwg***.
girl bad
'naughty girl.'

b. *ie,,, co:t* ***law*** *yw e,, ynde*.
yes coat rain be.PRES.3SG it Q
'yes, it's a raincoat, isn't it.'

c. *ysgol* ***feithrin***.
school nurse
'nursery school.'

It can sometimes be unclear whether a noun which follows another noun is an attributive element or whether it is the possessor in a genitive construction. Clear examples of the latter are given in the following illustrations.

12 a. *a beth sy yn1 llaw* ***bwni***@*c*?
and what be.PRES.SG in hand bunny
'and what is in bunny's hand?'
b. *beth sydd yn1 llaw* ***mochyn***?
what be.PRES.3SG in hand pig
'what is in (the) pig's hand?'

The following examples are not as clear.

13 a. *siwmper* ***doli***.
jumper dolly
'dolly's jumper / a dolly's jumper.'
b. *na,, dim het* ***plismon***.
no neg hat policeman
'no, not a policemen's hat'
c. *moto+beic a fan1* ***postman*** *a hwn*.
motor bike and van postman and this
'a motor bike and a policeman's van and this.

In the absence of strong evidence for a genitive construction such examples are viewed as [noun + attributive].

Nouns following pre-modifying attributive adjectives can be soft-mutated.

14 a. *hen* ***fisged***,, *ie*.
old biscuit yes
'an old biscuit, yes.'
b. *sychu 'r hen* ***drwyn*** *'na*.
dry the old nose there
'dry that old nose.'

c. *beth yw dy hoff* ***ddiod*** *di*?
what be.PRES.3SG CL.2SG favourite drink you.SG
'what is your favourite drink?'

Adjectives which are modified by a preceding adjective can be soft-mutated.

15 *Tiny yw hwnna os ti isie bod yn2 fanwl* ***gywir***.
Tiny be.PRES.3SG that.M if you.SG want be PRED detail correct
'that one is Tiny if you want to be exactly correct.'

Another partly lexical and partly grammatical trigger involves *newydd* 'new' when used as an aspect marker. The verb which follows can be soft-mutated.

16 a. *ti newydd* ***d'wlu*** *fe allan*.
you.SG new throw it out
'you have just thrown it out.'
b. *newydd* ***gael*** *bwyd mae 'o,,'te*.
new have food be.PRES.3SG he ??
'he's just had food, yes' (lit. 'just had food he has, yes.')
c. *ma' Mam newydd* ***gau*** *dy ddrws di fyny*.
be.PRES.3SG Mam new close CL.2SG door you.SG up
'Mam has just closed up your door.'

There are several grammatical contexts which involve the omission of a lexical trigger. Finite verbs are soft-mutated when they follow a preverbal particle (listed in table 2 in section 3.1), illustrated by the examples in (43). They are also soft-mutated when preverbal particles are omitted (which is commonly the case in spontaneous spoken Welsh).

17 a. ***ge'st*** *ti wy a soldiwrs i' frecwast*?
have.PERF.2SG you.SG egg and soldiers for breakfast
'did you have egg and soldiers for breakfast?'
b. ***welaist*** *ti mwmws@c yn1 y car ddoe*?
see.PERF.2SG you.SG moo-moos in the car yesterday
'did you see moo-moos in the car yesterday.'
c. ***fedra'*** *i ddim weld 'o*.
can.PRES.1SG I NEG see he
'I can't see him.'

Or they can be aspirate-mutated if they occur in a negative context. In the database, only *cael* ‘have, receive’ and *clywed* ‘hear’ are aspirate-mutated (which is likely to be typical of spontaneous Welsh generally).

18 a. *oh,,* ***chlywson*** *ni mo 'r gair hwnnw o+'r+blaen +/.*
oh hear.PERF.1PL we NEG the word that.M before
‘oh, we’ve not heard that word before.’
b. ***chei*** *di 'm+byd wedyn.*
have.FUT.2SG you.SG nothing after
‘you’ll get nothing after.’

In spontaneous speech, finite verbs in negative clauses which can be aspirate-mutated can be soft-mutated instead

19 a. ***ge'st*** *ti ddim brecwast*?
have.PERF.2SG you.SG NEG breakfast
‘you didn’t have any breakfast?’
b. *oh,,* ***ga'th*** *hi ddim parti*?
oh have.PERF.3SG she NEG party
‘oh, you didn’t have a party?’
c. ***gei*** *di ddim+byd.*
have.FUT.2SG you.SG nothing
‘you won’t have anything.’

We shall adopt the view that this alternative is established usage in the vernacular. We have noted that the preposition *yn1* ‘in’ can trigger either the nasal or soft mutation, which we label as nasal/soft. In similar manner, we shall label the appropriate mutation of finite verbs in negative clauses as aspirate/soft mutation. Both are examples of the spread of the soft mutation into the contexts of other mutations.

There are constraints on the mutation of finite verbs. A finite verb can be left unmutated when the finite verb is: (i) an imperative, (iii) a positive responsive or (ii) in a complement clause.

20 a. ***tria*** *di.*
try.IMPV.2SG you.SG
‘you try.’

b. ***cydia*** *di yn1 hwn rwan.*
hold.IMPV.2SG you.SG in this.M now
'hold this now.'

c. ***dwe:d*** *ti wrtho fe tro nesa.*
tell.IMPV.2SG you.SG to.3SG.M he turn next
'tell you him next time.'

21 a. *w i 'm yn credu* ***bydd*** *e 'n dod.*
be.PRES.1SG I NEG PROG believe be.FUT.3SG he PROG come
'I don't believe he'll be coming.'

b. *efallai* ***basai*** *Tom yn licio reidio ar dy feic di,, ie*?
perhaps be.CNTF.3SG Tom PROG like ride on CL.2SG bike you yes
'perhaps Tom would like to ride on yout bike, yes?'

22 a. *fydd hi 'n2 oer,,* ***bydd***.
be.FUT.3SG she PRED cold be.FUT.3SG
'she'll be cold, yes.'

b. *ga'n' nhw sefyll yn1 cefn,,* ***ca'n'***.
have.PRES.3PL they stand in back have.PRES.3PL
'they can / may stand in the back, yes.'

c. *wneith 'o ffitio yfanna,,* ***gneith***.
do.FUT.3SG he fit there do.FUT.3SG
'it will fit there, yes.'

On the basis that we are saying that finite verbs can mutate, we are also saying that finite verbs mutate themselves, that is, that the mutated word is also the trigger. A probing analysis of the mutation of finite verbs would have to critically assess this matter. Our basic approach is a descriptive device which labels the context in which a mutation occurs and thus allows a description of usage.

We see in table 2 in section 3.1 that some agreement clitics can mutate the word which follows. They occur in verbnoun phrases and genitive noun phrases. Examples are given in (1f–g) in section 3.1. In such phrases in spontaneous speech, the agreement clitics can be omitted but the mutation can be retained.

23 a. *wyt ti 'di* ***golli*** *'o*?
be.PRES.2SG you.SG PERF lose it
'have you lost it?'

b. *wyt ti isio* ***wneud*** *'o*?
be.PRES.3SG you.SG want do it
'do you want to do it?'

c. *ti yn* ***fwyta*** *fo,,ie*?
you.SG PROG eat it yes
'you eat it, yes.'

24 *Nia 'dy* ***henw*** *hi*.
Nia be.PRES.3SG name she
'Nia is her name.'

We shall refer to both noun phrases and verbnoun phrases which lack an agreement clitic as cliticless phrases. In spoken Welsh, the form of the verbnoun can be used as an imperative. It can be a challenge in describing performance data to determine whether a verbnoun is being used in a verb phrase or whether it is being used as an imperative, which does not trigger a mutation as we have noted. Another point is that cliticless verbnoun phrases can follow the perfect aspect marker *wedi / 'di* as in example (23a). In such examples, there is the possibility that the final high front vowel of the perfect marker has assimilated the single vowel agreement clitic *'i*. This applies to other words which end in a high front vowel.

Agreement clitics can also occur in extraction contexts. A transitive main verb in a *wh*-clause which questions the complement of the verb (*wh*-extraction) can be preceded by an agreement clitic, which triggers the soft mutation.

25 a. *be ma' doli 'n cal* ***'i*** ***fyta*** *'te1*?
what be.PRES.3SG dolly PROG have CL.3SG.M eat then
'what does dolly have to eat then?'

b. *beth ti 'n lico* ***'i*** ***fyta***?
what you.SG PROG like CL.3SG.M eat
'what do you like to eat?'

The agreement clitic can be omitted but the soft mutation can remain.

26 a. *be ma'n nhw 'di* ***gael*** *yn1 fan+hyn*?
what be.PRES.3PL they PERF have in here
'what have they had here?'

b. *a pwy ma'n nhw 'n **alw** am help*?
and who be.PRES.3PL they PROG call for help
'and who are they calling for help?'

c. *beth mae e wedi **frifo***?
what be.PRES.3SG he PERF hurt
'what has he hurt?'

A transitive main verb in a clause in which its complement has been fronted is also an example of extraction (NP-extraction) and can be soft-mutated. In these cases, too, the clitic can be omitted and the mutation can be retained.

27 a. *cinio mae 'o 'n **gael** rwan*.
dinner be.PRES.3SG he PROG have now
'it's dinner that he is having now.'

b. *llun o be ti 'n **neud***?
picture of what you.SG PROG do
'picture of what are you doing?'

c. *hwnna ti 'n **feddwl***?
that.M you.SG PROG think
'that (is what) you mean/think?'

Wh-extraction and noun phrase extraction which lack an agreement clitic are brought under one trigger, which is labelled the extraction trigger.

We see in table 2 in section 3.1 that the predicatival particle *yn2*, which occurs in a predicatival phrase, triggers the soft mutation as illustrated in example (1h). The particle can be omitted but the soft mutation can be retained.

28 *ti **werth** y byd i+gyd $mae 'n gweud$,, ife*?
you.SG worth the world all be.PRES.3SG PROG say Q
'you're worth all the world he says, is it?'

A predicatival adjective in a clause in which the subject has been fronted can also be soft-mutated without a preceding predicatival particle.

29 *pa liw sy **ore** gen ti*?
which colour be.PRES.3SG best with you.SG
'which colour is your best?'

The examples in (28) and (29) are similar in that an adjective or noun in predicatival position occurs without a preceding predicatival particle. Without pursuing a more detailed analysis, they are brought under one trigger, which we shall label as *yn2*-omission.

Table 2 in section 3.1 shows that the lexical trigger *i'* causes the soft mutation, including when it precedes a verbnoun as shown in example (1b). The verbnoun can also be soft-mutated when the preposition is omitted.

30 a. *o's rhwbeth arall 'da ti* ***ddangos*** *i' ni*?
be.PRES.3SG something other with you.SG show to we
'do you have something else to show us?'

b. *a deud wrth Dad a M--- **ddod** 'n+o:l fan+hyn wedyn,, ie*?
and tell to Dad and M--- come back here after yes
'and tell Dad and M--- to come back here, yes?'

c. *s'o M--- i' fod **gal** hwnna,,#nag yw e*?
be.PRES.NEG.3SG M--- to be have hat.M NEG be.PRES.3SG it
'M--- is not supposed to have that, isn't it?'

The preposition *i'* 'to, for' can also be omitted in a *bod* 'suppose' phrase, that is , *i fod* 'to be'.

31 a. *'dy 'o* ***fod*** *yna*?
be.PRES.3SG he be there
'is he supposed to be there?'

b. *pam d yw e ddim* ***fod*** *mynd fynna*?
why NEG be.PRES.3SG he NEG be go there
'why is he not supposed to be there?

c. *hwnna mae* ***fod*** *i' wisgo*?
that.M be.PRES.3SG be to wear
'is it that he is supposed to wear?'

Both these triggers are brought under one mutational trigger, which is referred to as *i'*-omission.

The adjective *gwell* 'better' can occur in a predicatival copular clause and it can be soft-mutated following the trigger *yn2*, as in the devised example *fasa 'n2 well i mi gal hwn* 'I'd better have this'. In this context, the copular clause can be reduced to such an extent that only the soft-mutated *well* remains.

32 a. ***well*** *i'* *mi gael* *hwn*.
better for I have this.M
'I'd better have this.'

b. ***well*** *i'* *ni* *agor* *y* *bag,,* *ife*?
better for we open the bag Q
'we'd better open the bag, yes?'

c. ***well*** *i'* *ni* *fod* *yn2* *dawel,,* *ie*?
better for we be PRED quiet yes
'we'd better be quiet, yes?'

All the above triggers are themselves of interest for an investigation of syntax. However, we shall not undertake a syntactic account but shall simply treat them as triggers of mutations.

4 Mutateability

4.1 Appropriate, null and zero mutation

For a mutation to occur, there must be a trigger and the initial phoneme of the target word must be in the group of phonemes which that trigger affects. These two conditions provide a mutateable context. On this basis, three distinctions are made.

- appropriate mutation — a mutated word matches the expected effects of a trigger
- null mutation — a word which is mutateable is unmutated in the context of a trigger, that is, a radical phoneme occurs
- zero mutation — a trigger occurs but the following word is not mutateable (the initial phoneme is not one which is listed in table 1)

Examples of each are given in (33), (34) and (35).

33 a. *ar* ***ddydd+sul***.
on Sunday
'on Sunday.'

b. *mae* *'o* *'n* *bwyta* *'ym5* ***mys*** *i*.
be.PRES.3SG he PROG eat CL.1SG finger I
'he's eating my finger?'

c. *cig a* ***thatws***?
meat and potatoes
'meat and potatoes.'

d. *be 'dy ei2* ***henw*** *hi*?
what be.PRES.3SG CL.3SG.F name she
'what is her name?'

34 a. *be am sbio ar* ***llyfr*** *Smot rwan*?
what about look on book Smot now
'what about looking at the Smot book now.'

b. *yn1* ***cwpan*** *Mam*?
in cup Mam
'in Mum's cup?'

c. *yli tedi mawr a* ***tedi*** *bach*.
look.IMPV.2SG teddy big and teddy little
'look at big teddy and little teddy.'

d. *pwy o'dd 'i2* ***enw*** *hi*?
who be.IMPF.3SG CL.3SG.F name she
'what was her name?'

35 a. *rhoi ar y* ***soser***.
put on the saucer
'put (it) on the suacer.'

b. *pa* ***ffordd*** *wyt ti 'n canu pen+blwydd hapus*?
which way be.PRES.2SG you.SG PROG sing birthday happy
'how do you sing happy berthday?'

c. *brown a* ***gwyn***.
brown and white
'brown and white.'

d. *ti 'm yn licio 'i2* ***gwallt*** *hi*?
you.SG NEG PROG like CL.3SG.F hair she
'don't you like her hair?'

There are a very small number examples where a mutation is triggered but the mutation is not one which is appropriate for the trigger.

36 a. *isio hwnna yn1 ei2* ***wallt***?
want that in CL.3S.F hair
'want that in her hair?'

b. *rhoid ei2* ***ddillad*** *hi yn+o:l.*
put CL.3S.F clothes she back
'put her clothes back.'

c. *lle mae ei2* ***wyneb*** *hi*?
where be.PRES.3SG CL.3SG.F face she
'where's her face?'

d. *mae 'n2 bron amhosib gweld ei2* ***wyneb***.
be.PRES.3SG PRED nearly impossible see CL.3SG.F face
'it's nearly impossible to see her face.'

They all involve the use of the feminine singular agreement clitic *ei2*, which triggers the aspirate or *h*-prothesis mutation (neither of which applies to these examples) but in these examples *ei2* triggers the soft mutation. They are accounted for under null mutation.

The contrast of appropriate mutation and null mutation in mutateable contexts is the essential concern of this study but zero mutation is discussed in section 5.3.3.

4.2 Words which do not mutate

There are words which can follow a trigger and have initial mutateable phonemes but which do not mutate. Some of those which occur in the database are given in table 4. They are not examples of null mutation but are, on the basis of wide-spread usage, zero mutation.

Table 4. Words which do not mutate

beth, be	'what'
ble	'where'
di	'you' singular
dy	second person singular agreement clitic
dy+hun, dy+hunan	'yourself' singular
draw	'over there'
mae, ma'	'is'
maen, ma'n	'are' third plural
mai	focus particle
mo	'not'
mi	'me'
pam	'why'
ti, t'	'you' singular
gan	'with, by'
gyda	'with'
proper nouns	various

initial /g/	*g* words	various

Examples of some of these words in mutateable contexts are given in (37).

37 a. *mynd i'* ***be***?
go for what
'go for what?'

b. *i'* ***ble***?
to where
'to where?'

c. *neu* ***ti*** *ddim isio slippers*?
or you.SG NEG want slippers
'or you don't want slippers?'

d. *e'st ti 'n+o:l i'* ***dy*** *wely,, do fe*?
go.PERF.2SG you.SG back to CL.2SG bed yes ??
'did you go back to your bed?'

e. *isio sbia1 ar* ***dy+hun*** *yn1 y drych,, ie*?
want look on your.SG+self in the mirror yes
'want to look at yourself in the mirror, yes?'

f. *gad i'* ***mi*** *gadw rhain*.
leave.IMPV.2SG for I keep these
'let me keep these.'

We shall not explore whether there are reasons why these words do not mutate but only note that they supply a zero mutation context. In spontaneous speech, the pronoun *mi* is confined to following the preposition *i'* and can remain unmutated as in (31a) and (35f), for instance, but *fi* can also occur as in (41a). This study adopts the view that *mi* is established usage in this context. Proper nouns are more complex to discuss. In the corpus, the names of individuals do not mutate and this is viewed as zero mutation. This also applies to the names for parents and grandparents (*Mam* and *Dad* and so forth) when used to refer to specific individuals but not when used as a non-referring expression to a member or members of the set of parents or grandparents. There is one exception which involves *Thaid* 'Grandfather' and there are three examples of the mutation of the names of imaginary characters in books, cartoons and films such as *Fister+Blaidd* and *Fatman*. There is aso one example of the mutation of a chain fast-food company, *Fackdonalds.* In contrast to personal names, the names of places can be mutated.

The soft mutation of some words with initial /g/ *g* is exceptional in that the change involves dropping /g/ *g*. This does not apply to words which are borrowings from English which occur in the corpus: *garej* ‘garage’, *ga:t* ‘gate’, *gat* ‘gate’, *gia:t* ‘gate’, *ge:m* ‘game’, *glasses* ‘glasses’, *good* ‘good’, *greedy* ‘greedy’. The word *glou* ‘quick’ (*clau* in dictionaries), which is not an English word, does not mutate. The question word *pam* ‘why’ is not soft-mutated but can be aspirate mutated.

There are also words which lose an initial vowel and which then create an initial consonant which is a mutateable consonant. They are not mutated. These are given in table 5.

Table 5. Shortened forms which do not mutate

‘da	*gyda* ‘with’
‘di	*wedi* ‘after’ and aspect marker
‘dy	*ydy* ‘is’
‘ma	*yma* ‘here’
‘to	*eto* ‘again, yet’
‘mlaen, mla’n	*ymlaen*, ymla’n ‘onward’
‘ta1, ‘te1, ‘ten	*ynta, ynte* ‘then’

In computer searches, it is essential that such forms, when they occur in a mutateable context, especially in an XPTH position, are excluded as targets.

4.3 More than one trigger

In spontaneous speech, one trigger can occur with another trigger and both can target the same word. For the sake of presentation, double triggers can be thought of as a left-most triggers followed at some place in a string by a right-most trigger, both targeting the same word. Table 6 cross-tabulates the left- and right-most triggers.

Table 6. Double triggers: left- and right-most triggers

	cliticless	verbs	XPTH	extraction
a ‘and’	✓	✓		
a: ‘with’	✓			
am ‘for, about’	✓	✓		
ar ‘on’	✓			
extraction	✓		✓	
heb ‘without’	✓			
i’ ‘to, for’	✓			✓
neu ‘or’	✓			
newydd asp	✓			
o ‘of, from’	✓			
tan ‘until’		✓		
XPTH	✓			
yn1 ‘in’	✓			

There are 13 left-most triggers, of which the majority are lexical triggers with only three grammtical, namely, extraction, *newydd* aspect and XPTH. There are only four right-most triggers and they are all grammatical triggers. Of the latter, the cliticless trigger is by far the most frequent, occurring in the database with all the left-most trigger bar one. The cliticless triggers variously cause all mutations.

Examples of lexical triggers occurring with grammatical triggers are given in (38).

38 a. *beth am* ***drio*** *fo*? [*am* & cliticless phrase]
what about try it
'what about trying it?'

b. *dw i heb* ***weld*** *'o eto*. [*heb* & cliticless phrase]
be.PRES.1SG I without see it yet
'I haven't seen it yet.'

c. *tyd i'* ***weld*** *'o 'ta1*. [*i'* & cliticless phrase]
come.IMPV.2SG to see it then
'come to see it then.'

d. *corn car $am* ***wn1*** *i$,, ife*? [*am* & finite verb]
horn car for know.PRES.1SG I Q
'a car horn, I suppose, is it?.'

Examples of two grammatical triggers in a double-trigger context are given in (39) to (42). In (39), post-subject position in a finite clause (XPTH) is occupied by cliticless phrases and in (40) by adverbial noun phrases.

39 a. *wnawn ni* ***gadw*** *fo yfanna*.
do.FUT.1PL we keep it here
'we'll keep it here.'

b. *gei di* ***weld*** *'o o fama*.
have.FUT.2SG you.SG see it from here
'you can see it from here.'

40 a. *ti 'n cofio pwy arall welon ni* ***ddydd+sadwrn***?
you.SG PROG remember who other see.PERF.1PL we Saturday
'do you remember who else we saw Saturday.'

b. *a da'th Dadi* ***gatre*** *nos+wener,, on'd do*?
and come.PERF.3SG Daddy home Friday night Q.NEG yes
'and Daddy came home Friday night, didn't he?'

Post-subject position in an *i*-clause (XPTH) can also be occupied by cliticless verbnoun phrases and genitive noun phrases.

41 a. *wyt t' isio i' fi* ***wneud*** *'o*?
be.PRES.2SG you.SG want for I do it
'do you want me to do it?'

b. *rhag+ofn i' bry bach* ***gael*** *'o*.
in+case for fly little have it
'in case a little fly gets it.'

c. *ie,,, ar+o:l i' ni* ***blicio*** *fo*.
yes after for we peel it
'yes, after we peel it.'

Wh-extraction can also occur with cliticless verbnoun phrases and genitive noun phrases.

42 a. *dyna be dan ni 'n* ***alw*** *fo*?
there's what be.PRES.1PL we PROG call it
'that's what we call it.'

b. *ymm ymm yy be ti 'n* ***alw*** *fo*?
uhm uhm uh what you.SG PROG call it
'uhm uhm uh what do you call it?'

The problem which arises with dual-trigger contexts is that it is not always clear which trigger causes the mutation. However, the significant matter for this study is that we have a mutation context and that we need then to record whether a mutation takes place or not, without identifying the individual trigger.

The following examples contain preverbal particles preceding finite verbs, both of which trigger the soft mutation.

43 a. *ma' 'n2 amheus 'da fi* ***a1*** ***neith*** *G--- ffitio hyd+yn+oed*.
be.PRES.3SG PRED doubtful with I whether do.FUT.3SG G--- fit even
'I doubt whether G--- will fit even.'

b. *do,,,* ***fe1*** ***ge'st*** *ti fanana,, do*?
yes PT have.PERF.2SG you.SG there yes
'yes, you got (received) there, yes?'

c. ***mi1 gyma'*** *i bisged.*
PT take.FUT.1SG I biscuit
I'll take a biscuit.'

d. ***na chei.***
NEG have.FUT.2SG
'you will not have' (= 'no')

In the case of preverbal articles we can claim that they are the sole trigger: they are restricted to occurring before finite verbs.

There is more to the discussion of double triggers than is outlined here and further points are made in section 5.3.

4.4 Mutated words and no trigger

The database contains examples of words which seem to be mutated forms but there is no basis within the utterance for saying that there is an adjacent lexical or grammatical trigger. Some of these are repetitions of an immediately preceding mutated word.

44 a. *ag o'dd e 'n2 wyn* ***wyn***.
and be.IMPF.3SG it PRED white white
'and it was whte white.'

b. *yn2 bell* ***bell*** *i+ffwrdd.*
PRED far far away
'far far away.'

c. *pawb yn2 lyb* ***lyb***.
everyone PRED wet wet
'everyone white white.'

With examples like these it is reasonable to have a rule which says that a mutated word can be repeated. This is common where an adjective is emphasised. But there are other examples where there is no explanation for a trigger within the utterance.

45 a. ***dipyn*** *bach o ddw:r.*
bit little of water
'a little bit of water.'

b. *oh,,,* ***bobl*** *bach*.
   oh people little
   'oh, little people' [an exclamatory phrase]
c. ***bechod***.
   'pity.'
d. *ah,,,* ***biti***.
   'ah, pity.'

A vocative context could explain examples like the one in (45b) but this example is more like an exclamation than a vocative. It is difficult to explain why a mutated word occurs in a zero context. One speculative possibility is that more frequent use in a mutateable context than in a zero context establishes the mutated word as a radical form outside mutateable contexts (perhaps alongside the existing radical form).

5 Usage: appropriate and null mutation

5.1 Preliminaries

For convenience of reference to individual triggers, table 7 lists in alphabetical order all the triggers, including double-trigger contexts (indicated by &), and the mutations which they cause. In this table and other tables ok indicates an appropriate mutation.

*Table 7.*Triggers of mutations and their effects, ordered alphabetically
medial & indicates double trigger context

	Speakers	Trigger	Ok	Null	Total	%Ok
a	13	aspirate	61	337	398	15.33
a&Cliticless	3	aspirate&*h*-prothesis	0	3	3	0.00
a&Cliticless	1	aspirate&aspirate	0	1	1	0.00
a&Cliticless	5	aspirate&soft	2	7	9	22.22
a&Verbs	10	aspirate&soft	46	3	49	93.88
a:	12	aspirate	3	66	69	4.35
a:&Cliticless	2	aspirate&*h*-prothesis	0	11	11	0.00
a:&Cliticless	8	aspirate&soft	9	33	42	21.43
a1	1	soft	1	0	1	100.00
Adj+adj	2	soft	2	0	2	100.00
Adj+noun	8	soft	39	3	42	92.86
am	13	soft	335	42	377	88.86
am&Cliticless	1	soft&*h*-prothesis	2	6	8	25.00
am&Cliticless	3	soft&aspirate_*h*-prothesis	2	1	3	66.67
am&Cliticless	5	soft&soft	11	15	26	42.31
am&Verbs	1	soft&soft	1	0	1	100.00
ambell	2	soft	2	0	2	100.00
ar	12	soft	151	119	270	55.93
ar&Cliticless	1	soft&*h*-prothesis	0	1	1	0.00
ar&Cliticless	3	soft&soft	1	2	3	33.33
at	5	soft	3	3	6	50.00
Cliticless	8	*h*-prothesis	1	34	35	2.86

Cliticless	4	aspirate	1	14	15	6.67
Cliticless	15	soft	206	517	723	28.49
Cliticless	2	nasal	7	0	7	100.00
dan1	5	soft	5	13	18	27.78
dau/dwy	10	soft	43	10	53	81.13
dros	3	soft	4	1	5	80.00
dy	13	soft	370	18	388	95.36
ei	9	soft	339	19	358	94.69
ei2	5	*h*-prothesis	4	4	8	50.00
ei2	6	aspirate	52	4	56	92.86
eu	4	*h*-prothesis	6	1	7	85.71
Extraction	18	soft	1308	276	1584	82.58
Extraction&Cliticless	3	soft&*h*-prothesis	0	5	5	0.00
Extraction&Cliticless	2	soft&aspirate_*h*-prothesis	0	2	2	0.00
Extraction&Cliticless	4	soft&soft	2	10	12	16.67
Extraction&XPTH	11	soft&soft	42	2	44	95.45
fe1	2	soft	4	0	4	100.00
fy	6	nasal	31	0	31	100.00
gan	8	soft	10	14	24	41.67
go	1	soft	1	0	1	100.00
Gwell	5	soft	59	1	60	98.33
gyda	2	aspirate	1	33	34	2.94
heb	3	soft	14	2	16	87.50
heb&Cliticless	2	soft&soft	2	0	2	100.00
holl	2	soft	5	0	5	100.00
i'	17	soft	955	232	1187	80.45
i'&Cliticless	8	soft&*h*-prothesis	20	9	29	68.97
i'&Cliticless	1	soft&aspirate	1	0	1	100.00
i'&Cliticless	2	soft&aspirate_*h*-prothesis	2	0	2	100.00
i'&Cliticless	11	soft&soft	61	7	68	89.71
i'&Extraction	8	soft&soft	85	0	85	100.00
i'-omission	6	soft	55	7	62	88.71
mi1	4	soft	20	2	22	90.91
mor	5	soft	8	0	8	100.00
na/na5	2	aspirate	6	0	6	100.00
na/na5	8	soft	27	0	27	100.00
na1	1	aspirate	1	0	1	100.00
na2	2	aspirate	1	1	2	50.00
neu	6	soft	14	21	35	40.00
neu&Verbs	4	soft&soft	17	1	18	94.44
Newydd asp	6	soft	7	2	9	77.78
Newydd asp&Cliticless	1	soft&*h*-prothesis	0	1	1	0.00
Newydd asp&Cliticless	1	soft&soft	1	0	1	100.00
Noun+adj	17	soft	306	259	565	54.16
o	13	soft	356	84	440	80.91
o&Cliticless	1	soft&soft	1	0	1	100.00
pa	12	soft	177	9	186	95.16
pan	1	soft	0	1	1	0.00
pwy	2	soft	23	1	24	95.83
rhy	8	soft	162	3	165	98.18
rhyw	4	soft	16	2	18	88.89
sut	2	soft	1	1	2	50.00
tan	1	soft	2	0	2	100.00
tan&Verbs	1	soft&soft	1	0	1	100.00
tri	3	aspirate	1	11	12	8.33
trwy	2	soft	1	1	2	50.00
tua	1	aspirate	0	1	1	0.00
un	3	soft	3	2	5	60.00
un2	4	soft	2	51	53	3.77
Verbs	6	aspirate_soft	9	1	10	90.00
Verbs	19	soft	1667	84	1751	95.20

wrth	3	soft	2	4	6	33.33
XPTH	18	soft	1767	632	2399	73.66
XPTH&Cliticless	7	soft&*h*-prothesis	33	20	53	62.26
XPTH&Cliticless	2	soft&aspirate	2	0	2	100.00
XPTH&Cliticless	3	soft&aspirate_*h*-prothesis	2	3	5	40.00
XPTH&Cliticless	12	soft&soft	152	20	172	88.37
y	13	soft	573	130	703	81.51
ychydig	2	soft	0	11	11	0.00
yn1	16	nasal&soft	143	395	538	26.58
yn1&Cliticless	2	nasal/soft&*h*-prothesis	0	3	3	0.00
yn1&Cliticless	1	nasal/soft&aspirate	0	1	1	0.00
yn1&Cliticless	2	nasal/soft&aspirate_*h*-prothesis	0	2	2	0.00
yn1&Cliticless	5	nasal/soft&soft	1	5	6	16.67
yn2/yn3	14	soft	875	64	939	93.18
Yn2-omission	6	soft	6	5	11	54.55
yntau	3	soft	0	7	7	0.00
			10753	3729	14482	74.25%

For convenience of reference, too, table 8 lists all the triggers, again including double-trigger contexts, ordered by the types of mutation which they cause.

Table 8.Triggers of mutations and their effects, ordered by types of mutations
medial & indicates double trigger context

a	13	aspirate	61	337	398	15.33
a:	12	aspirate	3	66	69	4.35
Cliticless	4	aspirate	1	14	15	6.67
ei2	6	aspirate	52	4	56	92.86
gyda	2	aspirate	1	33	34	2.94
na/na5	2	aspirate	6	0	6	100.00
na1	1	aspirate	1	0	1	100.00
na2	2	aspirate	1	1	2	50.00
tri	3	aspirate	1	11	12	8.33
tua	1	aspirate	0	1	1	0.00
a&Cliticless	1	aspirate&aspirate	0	1	1	0.00
a&Cliticless	3	aspirate&*h*-prothesis	0	3	3	0.00
a:&Cliticless	2	aspirate&*h*-prothesis	0	11	11	0.00
a&Cliticless	5	aspirate&soft	2	7	9	22.22
a&Verbs	10	aspirate&soft	46	3	49	93.88
a:&Cliticless	8	aspirate&soft	9	33	42	21.43
Verbs	6	aspirate_soft	9	1	10	90.00
Cliticless	8	*h*-prothesis	1	34	35	2.86
ei2	5	*h*-prothesis	4	4	8	50.00
eu	4	*h*-prothesis	6	1	7	85.71
Cliticless	2	nasal	7	0	7	100.00
fy	6	nasal	31	0	31	100.00
yn1	16	nasal/soft	143	395	538	26.58
yn1&Cliticless	1	nasal/soft&aspirate	0	1	1	0.00
yn1&Cliticless	2	nasal/soft&aspirate_*h*-prothesis	0	2	2	0.00
yn1&Cliticless	2	nasal/soft&*h*-prothesis	0	3	3	0.00
yn1&Cliticless	5	nasal/soft&soft	1	5	6	16.67
a1	1	soft	1	0	1	100.00
Adj+adj	2	soft	2	0	2	100.00
Adj+noun	8	soft	39	3	42	92.86
am	13	soft	335	42	377	88.86
ambell	2	soft	2	0	2	100.00
ar	12	soft	151	119	270	55.93
at	5	soft	3	3	6	50.00
Cliticless	15	soft	206	517	723	28.49

dan1	5	soft	5	13	18	27.78
dau/dwy	10	soft	43	10	53	81.13
dros	3	soft	4	1	5	80.00
dy	13	soft	370	18	388	95.36
ei	9	soft	339	19	358	94.69
Extraction	18	soft	1308	276	1584	82.58
fe1	2	soft	4	0	4	100.00
gan	8	soft	10	14	24	41.67
go	1	soft	1	0	1	100.00
Gwell	5	soft	59	1	60	98.33
heb	3	soft	14	2	16	87.50
holl	2	soft	5	0	5	100.00
i'	17	soft	955	232	1187	80.45
i'-omission	6	soft	55	7	62	88.71
mi1	4	soft	20	2	22	90.91
mor	5	soft	8	0	8	100.00
na/na5	8	soft	27	0	27	100.00
neu	6	soft	14	21	35	40.00
Newydd asp	6	soft	7	2	9	77.78
Noun+adj	17	soft	306	259	565	54.16
o	13	soft	356	84	440	80.91
pa	12	soft	177	9	186	95.16
pan	1	soft	0	1	1	0.00
pwy	2	soft	23	1	24	95.83
rhy	8	soft	162	3	165	98.18
rhyw	4	soft	16	2	18	88.89
sut	2	soft	1	1	2	50.00
tan	1	soft	2	0	2	100.00
trwy	2	soft	1	1	2	50.00
un	3	soft	3	2	5	60.00
un2	4	soft	2	51	53	3.77
Verbs	19	soft	1667	84	1751	95.20
wrth	3	soft	2	4	6	33.33
XPTH	18	soft	1767	632	2399	73.66
y	13	soft	573	130	703	81.51
ychydig	2	soft	0	11	11	0.00
yn2/yn3	14	soft	875	64	939	93.18
Yn2-omission	6	soft	6	5	11	54.55
yntau	3	soft	0	7	7	0.00
i'&Cliticless	1	soft&aspirate	1	0	1	100.00
XPTH&Cliticless	2	soft&aspirate	2	0	2	100.00
am&Cliticless	3	soft&aspirate_*h*-prothesis	2	1	3	66.67
Extraction&Cliticless	2	soft&aspirate_*h*-prothesis	0	2	2	0.00
i'&Cliticless	2	soft&aspirate_*h*-prothesis	2	0	2	100.00
XPTH&Cliticless	3	soft&aspirate_*h*-prothesis	2	3	5	40.00
am&Cliticless	1	soft&*h*-prothesis	2	6	8	25.00
ar&Cliticless	1	soft&*h*-prothesis	0	1	1	0.00
Extraction&Cliticless	3	soft&*h*-prothesis	0	5	5	0.00
i'&Cliticless	8	soft&*h*-prothesis	20	9	29	68.97
Newydd *asp*&Cliticless	1	soft&*h*-prothesis	0	1	1	0.00
XPTH&Cliticless	7	soft&*h*-prothesis	33	20	53	62.26
am&Cliticless	5	soft&soft	11	15	26	42.31
am&Verbs	1	soft&soft	1	0	1	100.00
ar&Cliticless	3	soft&soft	1	2	3	33.33
Extraction&Cliticless	4	soft&soft	2	10	12	16.67
Extraction&XPTH	11	soft&soft	42	2	44	95.45
heb&Cliticless	2	soft&soft	2	0	2	100.00
i'&Cliticless	11	soft&soft	61	7	68	89.71
i'&Extraction	8	soft&soft	85	0	85	100.00
neu&Verbs	4	soft&soft	17	1	18	94.44
Newydd *asp*&Cliticless	1	soft&soft	1	0	1	100.00

o&Cliticless	1	soft&soft	1	0	1	100.00
tan&Verbs	1	soft&soft	1	0	1	100.00
XPTH&Cliticless	12	soft&soft	152	20	172	88.37
			10753	3729	14482	74.25

Table 9 gives the frequencies and percentages of the use of mutations by the 21 adult speakers who, to varying degrees, have taken part in the interactions mainly with the children and also with each other. The adult interlocutors are researchers, mothers, other family members and friends. Their contributions to the interactions vary considerably. The researchers and mothers contribute more than other interlocutors. This study has no details about the sociolinguistic backgrounds of the adults.

Table 9. Speakers and mutations ordered by total frequencies in mutateable contexts
(#digit preserves anonymity of the individual interlocutors)

	triggers	ok	null	total	% ok
#20	57	4775	1522	6297	75.83
#7	61	2932	939	3871	75.74
#15	38	531	345	876	60.62
#13	54	562	179	741	75.84
#14	40	475	188	663	71.64
#17	34	337	143	480	70.21
#1	32	272	78	350	77.71
#12	22	241	78	319	75.55
#11	38	194	87	281	69.04
#9	33	193	74	267	72.28
#10	24	111	40	151	73.51
#2	16	52	17	69	75.36
#21	15	26	11	37	70.27
#16	8	11	4	15	73.33
#19	8	12	3	15	80.00
#6	8	8	4	12	66.67
#4	4	7	3	10	70.00
#3	5	3	6	9	33.33
#5	3	4	5	9	44.44
#8	6	4	4	8	50.00
#18	3	2	1	3	66.67
		10752	3731	14483	74.24

The contributions of several of the adults are so small that they do not provide a sound basis for generalizations. But we can make a subjective judgement that 151 utterances or more allow more reliable generalizations. Two comments can be made about the speakers in this group. First, no speaker mutates all of the time: the average for the speakers in this group is 74.31%. Second, there is variation amongst the speakers in this group: the highest percentage is at 75.84% and the lowest is at 60.62%.

5.2 Single triggers

For clarity of presentation it is advantageous to discuss single triggers and double-triggers separately. In this section we discuss single triggers. Double triggers are discussed in section 5.3.

5.2.1 Overall picture

Table 10 gives the frequencies for the types of mutations which are triggered in the context of an appropriate trigger and those which are not.

Table 10. Frequencies of the types of mutations of single triggers

	Triggers	Speakers	Ok	Null	Total	% Ok
soft	47	21	9926	2653	12579	78.91
aspirate	10	14	126	468	594	21.21
nasal	2	6	38	0	38	100.00
h-prothesis	3	9	11	39	50	22.00
aspirate/soft	1	6	9	1	10	90.00
nasal/soft	1	16	143	395	538	26.58
			10253	3556	13809	74.25

There are two main conclusions which can be made on the basis of table 10. First, the totals for appropriate and null uses of all mutations (given in the bottom line of the table) show that overall the triggers in mutateable contexts cause an appropriate mutation in 74.25% of cases, which is just less than three-quarters of all examples. In the spontaneous speech of the speakers in the database, mutations are not followed in all instances. Second, the soft mutation is the dominant mutation. But there are two aspects of its dominance. One is that it has numerical advantages that the other mutations lack: (i) it has more triggers and (ii) it affects more initial phonemes, as table 1 shows. It is the other aspect of its dominance which is significant, namely, that it is used appropriately in 78.91% of its examples. The aspirate mutation and *h*-prothesis have much lower percentages of appropriate use. Another indication of the dominance of the soft mutation is that it can be used in place of the nasal mutation when the preposition *yn1* 'in' is the trigger and the aspirate mutation of finite verbs in negative clauses. Table 14 in 5.2.3 shows that *yn1* triggers the nasal mutation 34 times and the soft mutation 109 times. It would achieve a more complete picture if these details were given in table 10. But the problem is that it is not possible to determine whether null mutation in the case of *yn1* relates to not triggering the nasal mutation or not triggering the soft mutation. A more detailed discussion of *yn1* 'in' is given in section 5.3.2. The same also applies to the aspirate/soft mutation, which is also further discussed in section 5.3.2.

5.2.2 A closer look

The data are made up of numerous examples of triggers in mutateable contexts. Any account which seeks to describe all individual triggers would be unwieldy and fragmentary, failing to provide general trends. This study seeks generalizations about the use of mutations in spontaneous speech by taking into consideration numbers of speakers, frequencies and percentages. Individual triggers of note can be referred to within this general framework.

This study distinguishes the extent of use of a trigger in a mutateable context from the productivity of its appropriate mutation. The greater is the extent of use of a trigger the more reliable are the generalizations that can be made about the productivity of the mutation but the smaller is the the extent of use of a trigger the less reliable are the generalizations about the mutation.

The extent of use of a trigger in a mutateable context is measured in terms of (i) the number of speakers who use it and (ii) the number of its occurrences — its frequencies. The number of speakers is judged to be more indicative of the extent of the use of a trigger than its frequencies. Compare the triggers *i'* 'for, to' and *tua* 'about' in table 7: the former is used by 17 speakers and it occurs 1187 times while the latter is used once by one speaker.

The productivity of an appropriate mutation is measured by the percentages of appropriate mutations in mutateable contexts. Consider the trigger *a* 'and' in table 7. It occurs 398 times in a mutateable context but only 61 cause the aspirate mutation, which is only 15.33% of the total. In contrast, the trigger *i'* 'for, to' occurs 1187 times in a mutateable context and 955 of these cause an appropriate mutation which is 80.45% of the total.

In a further attempt to achieve generalizations, quartiles are exploited. The range of speakers for individual triggers is 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, which provide 17 speaker groups and which can be divided into quartiles: 1–4, 5–9, 10–14 and 15–19 (the 15-19 quartile has one more member than the others). The quartiles provide a scale of the extent of use of the triggers which, for convenience of reference, we can label respectively as low, mid-low, mid-high and high.

Second, within each speaker group, the triggers can be presented in descending order of the percentages of appropriate mutations. The percentage groups can also be grouped by quartiles: 0–25%, 26–50%, 51–75%, and 76–100%. Again, we have a scale of productivity of appropriate mutations which we can label respectively as low, mid-low, mid-high and high.

Table 11 cross-tabulates the speaker groups and the percentage groups and gives an overall statistical view of the triggers.

Table 11. Cross-tabulation of number of triggers in speaker groups and percentages of ok mutations

Speaker Groups	Percentage Groups					
	76–100%	51–75%	26–50%	0–25%		
16–19	3	2	2	0	=	7
9–14	7	1	0	2	=	10
5–8	11	1	5	1	=	18
1–4	16	1	4	8	=	29
	37	5	11	11	=	64

There is an inverse relationship between the numbers of speakers and the number of triggers in the percentage groups: the lowest number of triggers is in the highest speaker group but the numbers of triggers increase as the numbers of speakers decrease — seven in the highest speaker group to 29 in the lowest speaker group. The lowest speaker group also has the greatest number of appropriate mutations in the 76–100% group but many of these are single examples produced by one speaker (see table 12) and generalizations on the basis of such data are unreliable

Table 12 provides details of the individual triggers within the framework of speaker groups and percentage groups. Within each speaker group the triggers are organized in descending order of percentages of appropriate mutations (indicating their productivity, as previously mentioned).

Table 12. Single mutation triggers and their effects, ordered by quartiles and then percentages of appropriate (Ok) mutations

Quartiles	Speakers	Trigger	Ok	Null	Total	%Ok
15,16,17,18,19						
Verbs	19	soft	1667	84	1751	95.20
Extraction	18	soft	1308	276	1584	82.58
i'	17	soft	955	232	1187	80.45
XPTH	18	soft	1767	632	2399	73.66
Noun+adj	17	soft	306	259	565	54.16
Cliticless	15	soft	206	517	723	28.49
yn1	16	nasal/soft	143	395	538	26.58
10,12,13,14						
dy	13	soft	370	18	388	95.36
pa	12	soft	177	9	186	95.16
yn2/yn3	14	soft	875	64	939	93.18
am	13	soft	335	42	377	88.86
y	13	soft	573	130	703	81.51
dau/dwy	10	soft	43	10	53	81.13
o	13	soft	356	84	440	80.91
ar	12	soft	151	119	270	55.93
a	13	aspirate	61	337	398	15.33
a:	12	aspirate	3	66	69	4.35
5,6,8,9						
na/na5	8	soft	27	0	27	100.00
fy	6	nasal	31	0	31	100.00
mor	5	soft	8	0	8	100.00
Gwell	5	soft	59	1	60	98.33
rhy	8	soft	162	3	165	98.18
ei	9	soft	339	19	358	94.69

Adj+noun	8	soft	39	3	42	92.86
ei2	6	aspirate	52	4	56	92.86
Verbs	6	aspirate_soft	9	1	10	90.00
i'-omission	6	soft	55	7	62	88.71
Newydd asp	6	soft	7	2	9	77.78
Yn2-omission	6	soft	6	5	11	54.55
at	5	soft	3	3	6	50.00
ei2	5	*h*-prothesis	4	4	8	50.00
gan	8	soft	10	14	24	41.67
neu	6	soft	14	21	35	40.00
dan1	5	soft	5	13	18	27.78
Cliticless	8	*h*-prothesis	1	34	35	2.86
1,2,3,4						
Adj+adj	2	soft	2	0	2	100.00
ambell	2	soft	2	0	2	100.00
Cliticless	2	nasal	7	0	7	100.00
fe1	2	soft	4	0	4	100.00
holl	2	soft	5	0	5	100.00
na/na5	2	aspirate	6	0	6	100.00
a1	1	soft	1	0	1	100.00
go	1	soft	1	0	1	100.00
na1	1	aspirate	1	0	1	100.00
tan	1	soft	2	0	2	100.00
pwy	2	soft	23	1	24	95.83
mi1	4	soft	20	2	22	90.91
rhyw	4	soft	16	2	18	88.89
heb	3	soft	14	2	16	87.50
eu	4	*h*-prothesis	6	1	7	85.71
dros	3	soft	4	1	5	80.00
un	3	soft	3	2	5	60.00
na2	2	aspirate	1	1	2	50.00
sut	2	soft	1	1	2	50.00
trwy	2	soft	1	1	2	50.00
wrth	3	soft	2	4	6	33.33
tri	3	aspirate	1	11	12	8.33
Cliticless	4	aspirate	1	14	15	6.67
un2	4	soft	2	51	53	3.77
gyda	2	aspirate	1	33	34	2.94
yntau	3	soft	0	7	7	0.00
ychydig	2	soft	0	11	11	0.00
pan	1	soft	0	1	1	0.00
tua	1	aspirate	0	1	1	0.00
			10753	3729		

We can re-arrange the data which are given in table 12 by cross-tabulating speaker groups and percentage groups, given in table 13. The columns provide the scale of productivity of an appropriate mutation form high (76–100%) to low (0–25%) and the rows indicate the extent of use of the triggers.

Table 13. Single triggers in speaker groups and percentage groups
the rows indicate the top three quartiles of speaker groups 15–19, 10–14, 5–9, 1–4

76–100%	51–75%	26–50%	0–25%
finite verbs soft 95.20% extraction 82.58% *i'*-omission in 80.45%	XPTH 73.66% noun+adjective 54.16%	cliticless soft 28.49% *yn1* 'in' 26.58%	
dy agreement clitic 95.36% *pa* 'which ('one') 95.16% *yn2/yn3* 93.18% *am* 88.86% *y* 'the' 81.51% *dau/dwy* 81.13% *o* 'of, from' 80.91%	*ar* 'on' 55.93%		*a* 'and' 15.33% *a:* 'with' 4.33%
na/na5 soft 100% *fy* 100% *mor* 100% *gwell* 98.33% *rhy* 'too' 98.18% *ei* agreement clitic 94.69% adj+noun 92.86% *ei2* aspirate 92.86% finite verbs asp/soft 90.00% *i'*-omission 88.71% *newydd* aspect 77.78	*yn2*-omission 54.55%	*at* 50% *ei2 h*-prothesis 50% *gan* 'with' 41.67% *neu* 'or' 40.00% *dan1* 27.78%	cliticless *h*-proth 2.86%
Adj+adj 100.00% *ambell* 100.00% Cliticless nasal 100.00% *fe1* 100.00% *holl* 100.00% *na/na5* aspirate 100.00% *a1* 100.00%	*un* 60.00%	*na2* 50.00% *sut* 50.00% *trwy* 50.00% *wrth* 33.33%	*tri* 8.33% Cliticless aspirate 6.67% *un2* 3.77% *gyda* 2.94% *yntau* 0.00% *ychydig* 0.00% *pan* 0.00%

go 100.00% *na1* 100.00% *tan* 100.00% *pwy* 95.83% *mi1* 90.91% *rhyw* 88.89% *heb* 87.50% *eu* 85.71% *dros* 80.00%			*tua* 0.00%

Table 13 shows that the greatest number of high productivity triggers (76–100%) are in the group which has the lowest extent of use (1–4 speakers). There are 10 triggers which have 100% productivity but they are used only by one or two speakers and their frequencies do not exceed six. We shall adopt the view that the low use group overall does not provide data on which reliable generalizations can be formed (with the possible exceptions of *mi1*, *rhyw*, *eu*, cliticless (aspirate) and *un2*). The three other higher speaker groups provide more reliable data for generalizations and the discussion which follows is based on the triggers in these higher groups.

The data for the mid-low to high speaker groups show that there is variety in the productivity of the mutations: 21 have high productivity, four have mid-high productivity, seven have mid-low productivity and three have low productivity. These numbers show that the majority of triggers which have higher extent of use have high productivity in triggering an appropriate mutation: of the the 35 triggers in these groups, 21 triggers have high productivity. Three triggers, *na/na5*, *fy* and *mor* 'so, as' have 100% productivity but others have more than 90% productivity. In particular, we can note finite verbs, extraction and *i'*-omission which are high use and high productivity. The remainder in the higher use groups are not as productive and we can say that they are atypical of higher use triggers. In particular, we can note the triggers *a* 'and', *a:* 'with' and cliticless *h*-prothesis have the lowest productivity. This raises the possibility that they may fall out of the mutation system in spontaneous speech. In sum, triggers in the higher use groups have higher productivity but there are atypical members of these higher use groups.

5.2.3 Additional matters

Table 10 records that the nasal mutation is used in 100% of its occurrences, which would seem to exceed the dominance of the soft mutation. But we can make two points about the nasal mutation.

First, table 10 records only two triggers, and table 8 shows that they are the agreement clitic *fy* and cliticless phrases. Table 10 shows that the extent of use of the nasal mutation is low (only 38 times in a mutateable context) but it is used by six speakers (which is a more reliable indication of its frequency). But the nasal mutation in these terms is far short of the productivity of the soft mutation. Second, the nasal mutation is also triggered by the preposition *yn1* 'in' but this lexeme in spontaneous speech can also trigger the soft mutation in place of the nasal mutation, as shown by the examples in (46) to (49).

46 a. *ym1* ***mhen*** *pwy*?
in head who
'in whose head?'

b. *po+po@c yn1* ***ben***.
pooh-pooh in head
'pooh-pooh in head.'

47 a. *poced yn1* ***nhrowsus*** *E---,, ie*.
pocket in trousers E--- yes
'a pocket in E---'s trousers.'

b. *twll yn1* ***dro***. [% dro is a rendering of *droed*]
hole in foot
'a hole in a foot.'

48 a. *mae 'na dwll yng1* ***nghanol*** *hwn, hon*.
be.PRES.3SG there hole in middle this this
'there's a hole in the middle of this (one).'

b. *oh,, yn1* ***ganol*** *y llun*.
oh in middle the picture
'oh, in the middle of the picture.'

49 a. *yng1* ***ngardd*** *N---*?
in garden N---
'in N---'s garden.'

b. *o's bananas yn tyfu yn1* ***ardd*** *M---*?
be.PRES.3SG bananas PROG grow in garden M---
'are there bananas growing in M---'s garden?'

Table 14 gives the details about the frequencies of *yn1* 'in' with both mutations.

Table 14. Yn1 and the nasal or soft mutation

	nasal	soft	null	totals
yn1 / ‘n2	5	107	395	507
ym1	17	0	0	17
yng1	12	2	0	14
	34	109	395	538

This table shows that in the database *yn1* ‘in’ triggers the soft mutation more than the nasal mutation. Of its total occurrences which trigger either the nasal or the mutation (143), 76.22% trigger the soft mutation. We can look in more detail as to whether the choice of either the nasal or soft mutation is related to the type of initial phoneme in the target word. We shall concentrate on the number of lexemes which are mutated and not their frequencies. For example, in the case of /p/ *p*, there are nine lexemes and of these four are nasal-mutated and five are soft-mutated. Table 15 gives details of the choices which are made in the database.

Table 15. Yn1 ‘in’ and the nasal or soft mutation based on the number of lexemes and not their frequencies

	nasal	soft	totals
/p/	4	5	9
/t/	1	2	3
/k/	4	11	15
/b/	3	0	3
/d/	1	0	1
/g/	3	3	6
/m/	-	3	3
/ɬ/	-	1	1
	16	25	41

The table does not show that there is widespread preference for either mutation in relation to the initial phoneme of the target word apart from /k/ *c*.

The use of *yn1* is not confined to phonemes which can be nasal-mutated. There are examples in which the soft mutation has been applied to lexemes where the nasal mutation does not apply. Lexemes beginning with /m/ can be soft-mutated after *yn1*.

50 a. *ah,,, mae 'n2 sownd yn1* ***fysedd*** *E--- rwan.*
ah be.PRES.3SG PRED sound in fingers E--- now
‘ah, it’s stuck in E---‘s fingers now.’

b. *bydd hi 'n dod lawr nawr yn1* ***funud****.*
be.FUT.3SG she PROG come down now in minute
‘she’ll be coming down now in a minute.’

c. *yn1* ***fynwent*** *mae Mister+Blaidd,, ie.*
in cemetery be.PRES.3SG Mister+Wolf yes
‘in a cemetery is Mr+Wolf, yes.’

In the case of (50b), there could be an omitted definite article, which can cause the soft mutation before singular femimine nouns. There is one lexeme which involves the soft mutation of /ɬ/ *ll*, namely *lle* ‘where’.

51 a. *yn1* ***le***?
‘in where?’

b. *yn1* ***le*** *ma'* *llygoden fach*?
in where be.PRES.3SG mouse little
‘in where is the little mouse?’

c. *yn1* ***le*** *mae* *e* *'n* *gweithio*?
in where be.PRES.3SG he PROG work
‘in where is he working?’

There are 42 examples and they have all been produced by one speaker from a southern region and may be a dialect feature.

We have also seen that finite lexical verbs whose forms begin with the phonemes /p/, /t/ and /k/ and which occur in a negative context can be either aspirate-mutated or soft-mutated — examples are given in (18) and (19). There are a very small number of examples and the statistical details are given in table 16.

Table 16. Negative verbs and the aspirate or soft mutation

aspirate mutation	3
soft mutation	6
	9
null mutation	1
	10

Of the nine examples which are mutated, 66.66% are soft-mutated, which along with the use of the preposition *yn1* ‘in’ is an indication of the spread of the soft mutation in place of other mutations.

The XPTH triggers include XP adverbials. The percentage for XPTH could be even lower when we consider that the form *bob* ‘every’ occurs in phrases which occur in the XPTH context but that this form also occurs outside of a mutation context.

52 a. *oh,, mae* ***bob*** *dim1* *yn* *disgyn.*
oh be.PRES.3SG every ‘nothing’ PROG fall
‘oh, everything is falling.’

b. *oh,,, mae hi 'n cadw* ***bob*** *math o styff.*
oh be.PRES.3SG she PROG keep every sort of stuff
'oh she keeps all sorts of stuff.'

c. *wyt ti 'di golchi dy bompoms a* ***bob*** *dim1*?
be.PRES.2SG you.SG PERF wash CL.2SG pompoms and every 'nothing'
'have you washed your pompoms and everything?'

d. *do,,, yn1 ganol me:s yn1* ***bob*** *man.*
yes in middle mees in every place
'yes, in the middle of the mees [sheep] everywhere.'

Examples like this suggest that the lexeme *pob* 'every' has two radical forms *pob* and *bob*. These comments are similar to those which are made about the lexeme *trwy* in section 3.1. On this basis, instances of *bob* in an adverbial noun phrase may not necessarily be a soft-mutated form and the frequencies of an appropriate mutation may be lower. There are only ten examples of XP adverbials and this small number has little effect on the statistics for XPTH examples.

The lexical trigger *a* 'and' occurs medially between phrases or words and also initially at the beginning of an utterance. Examples are given in (53).

53 a. *Dad a* ***phwy***?
Dad and who
'Dad and who?'

b. *a* ***phwy***?
and who
'and who?'

It is interesting to compare the productivity of the mutation when the trigger occurs in these two positions. The details are given in table 17.

Table 17. The lexical trigger *a* in medial and initial positions

	ok	null	totals	%ok
medial	25	56	81	30.86
initial	36	281	317	11.36
	61	337	398	15.68

The percentages of an appropriate mutation is higher in medial position than initial position, which gives grounds for claiming that syntax is an influence on the use of this trigger.

There may be grounds for claiming that high collocations of trigger and target has preserved the mutated form. Possible examples of these are seen in *ambell waith* ‘sometimes’ and *gan bwyll* ‘take care’.

In some instances a null mutation may be due to an omitted definite article. Consider the examples in (54).

54 a. *a mynd at* ***doctor***.
and go to doctor
‘and go to (the) doctor / a doctor

b. *rhywbeth i’* ***me:s***.
something for sheep
‘something for (the) sheep / for sheep’.

c. *Dad yn mynd i’* ***gwaith*** *nawr.*
Dad PROG go for work now
‘Dad going to (the) work / work

d. *I--- yn mynd i’* ***llofft*** *rwan,,, yndy.*
I--- PROG go to bedroom now be.PRES.3SG
‘I--- going to (the) bedroom / a bedroom.’

In the case of singular masculine nouns and plural nouns, zero mutation occurs after the definite article. It can be argued that users who are aware of the role of zero mutation, as outlined in section 5.3.3, block the influence of the preceding lexical trigger. However, it is not always clear in performance data whether the definite article has been omitted or whether we have an indefinite noun (especially in the case of examples like (54c)).

In the case of the nouns for toys or pets it can be a challenge to determine whether the noun is being used as a common noun or whether it is used as a proper name for the particular toy of the child or the particular pet of the household.

55 a. *’da* ***tedi***.
‘with teddy.’

b. *ti 'm isie rhoi sgarff am* ***doli***.
you.SG NEG want put scarf about dolly
‘you don’t want to put the scarf on dolly.’

c. *be* *wnest* *ti* *ddweud* *wrth* ***pws***?
what do.PERF.2SG you.SG say to puss
'what did you say to puss?'

If the nouns are being used as proper nouns then a zero mutation context is created. Otherwise, if they are being used as common nouns, in the case of a radical occurring in a mutateable context, we have zero mutation.

5.3 Double triggers

Table 18 lists the double triggers in alphabetical order along with statistical details.

Table 18. Double triggers and their effects, ordered alphabetically

	Speakers	Trigger	Ok	Null	Total	%Ok
a&Cliticless	3	aspirate&*h*-prothesis	0	3	3	0.00
a&Cliticless	1	aspirate&aspirate	0	1	1	0.00
a&Cliticless	5	aspirate&soft	2	7	9	22.22
a&Verbs	10	aspirate&soft	46	3	49	93.88
a:&Cliticless	2	aspirate&*h*-prothesis	0	11	11	0.00
a:&Cliticless	8	aspirate&soft	9	33	42	21.43
am&Cliticless	1	soft&*h*-prothesis	2	6	8	25.00
am&Cliticless	3	soft&aspirate_*h*-prothesis	2	1	3	66.67
am&Cliticless	5	soft&soft	11	15	26	42.31
am&Verbs	1	soft&soft	1	0	1	100.00
ar&Cliticless	1	soft&*h*-prothesis	0	1	1	0.00
ar&Cliticless	3	soft&soft	1	2	3	33.33
Extraction&Cliticless	3	soft&*h*-prothesis	0	5	5	0.00
Extraction&Cliticless	2	soft&aspirate_*h*-prothesis	0	2	2	0.00
Extraction&Cliticless	4	soft&soft	2	10	12	16.67
Extraction&XPTH	11	soft&soft	42	2	44	95.45
heb&Cliticless	2	soft&soft	2	0	2	100.00
i'&Cliticless	8	soft&*h*-prothesis	20	9	29	68.97
i'&Cliticless	1	soft&aspirate	1	0	1	100.00
i'&Cliticless	2	soft&aspirate_*h*-prothesis	2	0	2	100.00
i'&Cliticless	11	soft&soft	61	7	68	89.71
i'&Extraction	8	soft&soft	85	0	85	100.00
neu&Verbs	4	soft&soft	17	1	18	94.44
Newydd *asp*&Cliticless	1	soft&*h*-prothesis	0	1	1	0.00
Newydd *asp*&Cliticless	1	soft&soft	1	0	1	100.00
o&Cliticless	1	soft&soft	1	0	1	100.00
tan&Verbs	1	soft&soft	1	0	1	100.00
XPTH&Cliticless	7	soft&*h*-prothesis	33	20	53	62.26
XPTH&Cliticless	2	soft&aspirate	2	0	2	100.00
XPTH&Cliticless	3	soft&aspirate_*h*-prothesis	2	3	5	40.00
XPTH&Cliticless	12	soft&soft	152	20	172	88.37
yn1&Cliticless	2	nasal/soft&*h*-prothesis	0	3	3	0.00
yn1&Cliticless	1	nasal/soft&aspirate	0	1	1	0.00
yn1&Cliticless	2	nasal/soft&aspirate_*h*-prothesis	0	2	2	0.00
yn1&Cliticless	5	nasal/soft&soft	1	5	6	16.67
			10753	3729		

There are two problems with double triggers which mean that they cannot be discussed in the same way as single triggers. One is that it cannot be reliably determined which trigger is causing the mutation, and similarly the other is that in the case of null mutation it cannot be determined which trigger fails to cause the mutation. However, discussion of double triggers can be simplified by dividing the double-trigger examples into four groups:

i. those in which both triggers cause the same mutation
ii. those in which the two triggers cause different mutations
iii. those in which only one trigger is in a mutateable context
iv. those in which neither trigger is in a mutateable context

The fourth group causes zero mutation and is of no relevance to this study. But zero mutation needs more detailed discussion in the case of the third group as we shall see.

5.3.1 Double triggers with the same mutation

There are double triggers where both triggers can cause the same mutation, namely, soft&soft and aspirate&aspirate. We can also include here the nasal/soft mutation (caused by *yn1* 'in') which can match either the nasal mutation or the soft mutation of the other trigger. Examples of soft&soft are given in (56).

56 a. *ti* ***am*** ***droi 'o***? [*am* & cliticless phrase]
you.SG for turn it
'do you want to turn it?'

b. *dw* *i 'n* *cael* *bag* ***i'*** ***gario fo***. [*i'* & cliticless phrase]
be.PRES.1SG I PROG have bag to carry it
'I get a bag to carry it.'

c. *dw* *i* ***heb*** ***weld*** ***'o*** *eto*. [*heb* & cliticless phrase]
be.PRES.1SG I without see it yet
'I haven't seen it yet.'

d. *corn* *car* ***$am*** ***wn1*** *i$,,* *ife*? [*am* & finite verb]
horn car for know.PRES.1SG I Q
'car horn I suppose, yes?'

e. ***neu fyddan'*** *nhw 'n* *mynd* *yn2* *sych*. [*neu* & finite verb]
or be.FUT.3PL they PROG go PRED dry
'or they will be getting dry.'

f. *chwarae efo toys rwan* ***tan*** ***fydd*** *I--- 'di deffro*. [*tan* & finite verb]
play with toys now until be.FUT.3SG I--- PERF wake
'play with toys now until I--- has woken up.'

The effects of all the examples of double triggers which cause the same mutation in a mutateable context are given in table 19.

Table 19. The same mutation in double trigger contexts

	Ok	Null	total	%ok
soft	377	58	435	86.67
aspirate	0	1	1	0.00
nasal/soft	1	5	6	16.66
	378	64	442	85.52

As the table shows, the use of an appropriate mutations with double triggers which cause the same mutation is high at 85.71% in total.

5.3.2 Double triggers which cause different mutations

There are double triggers where the triggers, when in mutateable contexts, cause different mutations. This arises when triggers which can cause the soft mutation (the majority) occur in the context of a small number of triggers which can cause the aspirate mutation.

In the example in (57) the co-ordinating conjunction *a* 'and', which can cause the aspirate mutation, occurs in clause-initial position before finite verbs, which can trigger the soft mutation. It is the latter which over-rides the mutational effect of the co-ordinator.

57 a. *a* ***gei*** *di weld toys newydd,, iawn*.
and have.FUT.2SG you.SG see toys new right
'and you'll see new toys, right.'

b. *a* ***glywes*** *i bod ti ddim 'di mynd i' 'r gwely tan yn2 hwyr hwyr*.
and hear.PERF.1SG I be you.SG NEG PERF go to the bed until PRED late late
'and I heard that you have not gone to bed until late late.'

c. *a* ***ge'st*** *ti dorri dy wallt*?
and have.PERF.2SG you.SG cut CL.2SG hair
'and you had your hair cut?'

In (58) the preposition *a:*, which can trigger the aspirate mutation, occurs in the context of a cliticless verbnoun phrase, which can trigger the soft mutation. It is the mutational effect of the latter which dominates.

58 *paid* *a:* ***dynnu*** *‘o*!
IMPV.NEG.2SG with pull it
‘don’t pull it.’

In (59a), XPTH (in this case the post-subject position in an *i*-clause), which triggers the soft mutation, occurs in the context of a cliticless phrase, which can trigger the aspirate mutation. In (59b), the preposition *i’* ‘to, for’, which triggers the soft mutation, occurs in the context of a cliticless phrase, which can again trigger the aspirate mutation. As can be seen, it is the soft-mutation which dominates.

59 a. *oh,,, well* *ti* ***dynnu*** *ddi* *allan,,ie*.
oh better you.SG pull she out yes
‘oh, you’d better pull her out, yes.’
b. *i'* ***gadw*** *hi* *'n2* *gynnes,,* *ie*?
to keep she PRED warm yes
‘to keep her warm, yes?’

Table 20 gives the statistics for double-triggers which cause different mutations.

Table 20. Different mutations in double-trigger contexts

	Ok	Null	Total	%ok
Aspirate&soft	15	16	31	48.39
Soft&aspirate	3	0	3	100.00
Nasal/soft&aspirate	0	1	1	0.00
	18	17	35	51.43

As can be seen, the frequencies are low and only the aspirate&soft triggers reach double figures.

Given that an appropriate mutation is triggered (under ok in the table), the question arises as to which mutation dominates. There are only 18 examples which trigger an appropriate mutation and it is the soft mutation which dominates. This is not surprising given the high occurrence of the soft mutation in the mutation system. A related question is whether one of the triggers dominates, namely, whether it is the left-most trigger or the right-most trigger. Examples in the database show that the choice of trigger is determined by the mutation which it triggers: that is, the trigger which causes the soft mutation is the trigger which is selected.

5.3.3 Double triggers with only one trigger in a mutateable context.

In examples in which only one trigger is in a mutateable context we effectively have a single trigger. Details are given in table 21.

Table 21. One mutateable trigger in double trigger contexts

	ok	null	total	%ok
soft	103	78	181	56.91
aspirate	0	13	13	0.00
h-prothesis	0	4	4	0.00
Nasal/soft	0	5	5	0.00
	103	100	203	50.74

Only the triggers of the soft mutation have appropriate instances and its productivity overall is mid-high (and in the lower reaches of this band).

There is an interesting matter concerning the role of zero mutation in some of these examples. In one view of the use of the mutation system, the zero mutation which relates to the right-most trigger can be seen as blocking the effect of the left-most trigger. Consider the following examples.

60 a. *paid a: **tynnu** nhw.* [*a:* & cliticless phrase]
IMP.2SG with pull they
'don't pull them.'

b. *wnei di **torri** nhw*? [XPTH & cliticless phrase]
do.FUT.2SG you.SG break they
'you'll break them?'

c. *dyna be oedd dy fam yn **galw** hi.* [extraction & cliticless phrase]
DEM what be.IMP.3SG CL.2SG mother PROG call she
'that's what you're mum calls her.'

d. *ac yn gwneud yn1 **ty**: ni*? [*yn1* & cliticless phrase]
and PROG do in house we
'and doing in our house?'

These examples contain left-most triggers (*a:*, XPTH, extraction, *yn1*) which respectively can cause the aspirate mutation (*a:*), the soft mutation (XPTH and extraction) and the nasal/soft mutation (*yn1*). But in each example the target words occur in cliticless phrases in which zero mutation occurs. In an ideal view of the mutation system a covert zero mutation can be said to block the effects of the left-most triggers. On the other hand, it can be claimed that not all speakers are aware of the role of zero mutation in this respect and we can say that null mutation relating to the left-most trigger occurs and not zero mutation relating to the righ-most trigger. There is no way of knowing which system the adult interlocuters in the database are operating. In terms of overt material, we have null mutation and this is how such examples have been interpreted.

6 Conclusions

The establishment of generalizations is constrained by the extent of use of mutation triggers. There are examples of triggers in the database which are used many times by several speakers but there are examples of one speaker producing one example of a trigger. More frequent examples produced by several speakers provide reasonable bases for generalizations.

The analysis of peformance data (as opposed to the analysis of elicitation data or introspective data) can be elusive due to the lack of sufficient context to adequately assess the speaker's intentions. Also, the possibility of the assimilation of an agreement clitic makes it uncertain as to whether there is or is not a cliticless phrase. But overall there are sufficient reliable data in the corpus to indicate the main trends.

There is considerable variation in the mutation system. It arises due to the competence of individual speakers (as shown in table 9), due to the type mutation (as shown by table 10) and due to individual triggers (as shown by tables 7, 12 and 13). Overall, it is not the case that all speakers use mutations all of the time. It is more reasonable to say that some speakers mutate some of the time.

The extent of use of a trigger plays a role in the maintence of the mutation system: the higher the extent of use the more likely is an appropriate mutation. But there are atypical triggers which have a reasonably high extent of use but do not cause an appropriate mutation to match their frequencies.

The soft mutation is not only the most frequent in mutateable contexts but also the one which is used most appropriately in spontaneous spoken Welsh. The aspirate mutation, the nasal mutation and especially *h*-prothesis are used not only less frequently but also less appropriately. The soft mutation is also used in place of the nasal mutation and the aspirate mutation in the case of some triggers.

There is a possibility that some triggers may be falling out of the mutation system. This can be said of the co-ordinationg conjunction *a* 'and', *a:* 'with' and *gyda* 'with'.

Spoken Welsh creates context in which two triggers can target the same word. This arises where one trigger has been omitted but its mutational effect can remain.

There are examples of seemingly mutated forms occurring in a context in which there is no trigger, which may indicate that mutated forms can establish themselves as radical forms.

It is misleading to account for the use of mutations in the spontaneous spoken language on the basis of accounts of mutations in reference grammars. The latter can be said to be appropriate for assessing the

use of mutations in the formal written language. The use of the conventions of the written language in the spoken medium is determined by literacy and not all Welsh speakers are sufficiently familiar with formal written Welsh to transfer its conventions to spontaneous speech. The spoken language has its own conventions, which may not necessarily be contemporary developments but which may be long-standing. It is more reasonable to assess spoken Welsh independently and to accept that it is not the case that all speakers mutate all of the time. It is especially unenlightening to adopt a prescriptive approach and make value-judgements about what is correct and incorrect. We achieve a greater understanding of language through objectively describing what occurs or does not occur, which has been attempted in this study.

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