

Cognition in Sound Change: The Mate/Meat Paradox from the Listener's Perspective

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ABSTRACT

This paper intends to explore a wide series of questions related to linguistic change from a cognitive point of view. This cognitive approach, propugnated a.o. by Kroch (1989) and Labov (1995), has its basis on Social Psychology, and focuses on the different attitudes of the listener during the process of language decoding.

In this case, and taking as our starting point the pronunciation of mare and meat items in the Belfast vernacular, I offer a cognitive interpretation of contemporary and historical data with the following results: the advancement of the sounds in conflict is directly related to the level of misunderstanding they imply in the interaction between speakers and to the different strategies developed by the listeners of the next generation in order to avoid such misunderstandings.

KEY WORDS: linguistic change, *mate/meat*, Belfast vernacular. sound advancement

RESUMEN

En este artículo se exploran una serie de cuestiones relacionadas con el cambio lingüístico desde un punto de vista cognitivo. El enfoque cognitivo, propugnado entre otros por Kroch (1989) y Labov (1995), tiene su base en la psicología social, y se centra en las distintas actitudes de los oyentes a la hora de "procesar" la información lingüística que llega a su cerebro.

En este caso, y tomando como punto de partida la situación existente en el dialecto de Belfast en cuanto a la pronunciación de pares de palabras como mare y meat, ofrecemos una interpretación cognoscitiva de una amplia serie de datos contemporáneos e históricos acerca de la pronunciación de ambos sonidos, con los siguientes resultados: el avance de los sonidos en conflicto depende directamente del nivel de error que cada uno de ellos implique en la interacción entre los hablantes y de las diferentes estrategias creadas por los oyentes de la siguiente generación para evitar dichos errores.

PALABRAS CLAVE: cambio lingüístico, *mate/meat*, dialecto de Belfast, avance de sonidos

1. THEORETICAL FRAMEWORK: SOCIAL ASPECTS OF LINGUISTIC COGNITION.

I.1. From a socio-psychological perspective, cognition is understood as the set of processes through which the psychic system receives, selects, transforms and organizes information in order to build representations of reality and create knowledge. Cognition develops a regulating activity of adaptation of the individual, who learns to identify and recognize the numerous objects that surround him, giving them a concrete sense (Leyens and Codol 1988: 99).

Cognition is considered a collective or social phenomenon in three different ways (Lukes 1973: 7): firstly, it has a social origin, since it is created and reinforced through social interaction. Secondly, cognition has a social object, as far as it deals with the recognition of what is social. Finally, cognition is socially shared, as it is common to all the members of a given society or social group.

Throughout its history, researchers in the field of Social Psychology have given priority to one of the manifold aspects that conform the process of acquisition of social knowledge (Moscovici 1982), producing five different approaches to the figure of the "social thinker". In general terms, these descriptions represent diverse approaches to the problem of probability matching, i.e. the set of principles that guide the individual's choices in cases of ambiguity. Two radical poles can be distinguished in this sense: (1) choices made on the basis of purely objective data; (2) choices based on the individual's subjective perception of probability.

In order to test empirically the way people make such choices, Kahneman and Tversky (1973) carried out the following experiment: a group of subjects were told that 30 engineers and 70 lawyers had been interviewed in order to get a description of their personalities. Thereafter, they were given a description of the type: «Richard is a 30 year old married man; he is skilled and highly motivated; his colleagues have great esteem for him. Is Richard an engineer or a lawyer?» Since the description included no supporting information about the job of the person in question, each subject had to decide between focusing on the proportion of engineers and lawyers interviewed (i.e. 30% vs. 70%) or simply ignoring it.

In general terms, in the case of the hypothetical thinker who chooses his answer on the basis of the overwhelming rate of lawyers interviewed before the experiment, any unsupported description given by the researchers will immediately be matched to the idea of lawyer, so that the possibility of person X being included into this laboral category will match 100%. Social psychologists usually refer to this type of personality as the naive psychologist (Rosenberg & Sedlack 1972). A second type of thinker, the so-called data processor, will base his answer on the following argument: since the description given by the researchers is not representative of any of the two professions, the possibilities of matching it to one or the other should be the same as the rate of subjects with that profession interviewed in the previous phase of the experiment. For this reason, the possibilities of X being a lawyer would expectedly descend to 70% in this second case.

However, it should be recalled here that none of these two cognitive processes will necessarily induce the subject to give a correct answer. The man of the street is liable to a very high number of mistakes of appreciation when trying to understand the social reality around him. Such misunderstandings can be usually related to two different sorts

of causes: (1) to the **existence of** preconceived ideas on the way **some features** are distributed among the population and on the different ways these **features** are associated, and (2) to errors of calculation during the automatic processing of the information received.

I.2. According to Langacker, it is self-evident that «no two speakers share **precisely the same linguistic system**» (1987: 376). Actually, the fact that speakers **operate** with markedly divergent prototypes had **been** demonstrated by researchers from the fields of anthropology and **linguistics** already in the early 1970s. Labov's innovative experiments on the linguistic categorization of household receptacles (such as cups, bowls and **vases**; see Labov, 1973), showed that the boundaries between the categories are **fuzzy** in the extreme, so that the **same** receptacle can be categorized differently by two speakers. Moreover, whereas certain prototypical receptacles were unanimously and uncontroversially included in the same category by **all the subjects**, other non-so-clear instances had to be disambiguated on the basis of their attributes and their similitude to more prototypical objects. The analysis of the different ways «**language translates meaning into sound through the categorization of reality into discrete units and sets of units**» (Labov 1973: 342) **becomes here** the main goal of linguistic description.

Obviously, in day-to-day exchanges, differences in the conceptual centre are **likely** to pass unnoticed. However, to what extent such differences might hinder human communication, eventually leading to gross misunderstanding, is a matter that **would** merit much more research. A cognitive approach to the problem of linguistic misunderstanding in cross-dialectal communication has **been** recently given by Labov (1994) who, on the basis of the analysis of 613 **instances** of misunderstanding detected in Philadelphia, establishes the following modes of correction:

	%
Corrected by the listener before the utterance was finished	13
Correction elicited by immediate inquiry of the listener	48
Inferred from later utterances in the conversation	27
Corrected from events that followed accidentally	10
Never corrected by hearer or listener [observed by a third person]	2

TABLE 1: Modes of detection of **naturally** occurring misunderstandings

However, it is obvious that the frequency of the last category of misunderstandings is much larger than that expressed in Table 1. In spite of this, the possibility of estimating the approximate rate of misunderstanding that are never corrected **constitutes** a rather **difficult** task. Moreover, recent studies **have** demonstrated that the analysis of linguistic misunderstanding can throw new **light** on our **knowledge** of diachronic processes.

In his approach to the process of development of periphrastic *do* in early Modern English, Kroch (1989) demonstrates that the four basic sentence types distinguished for his research (declarative, interrogative, negative declarative and negative interrogative) show parallel growth rates during a period of 300 years. This means that each generation of speakers of English used a different proportion of periphrases for each type of sentence, that was increased at an identical rate by the following generation. Further, the progressive **decrease** in the use of constructions without *do* (see [1a]) is associated with the linguistic ambiguity developed by them as a consequence of other parallel diachronic processes (such as the loss of case markings), and the development of new, clearer constructions with periphrastic *do* (as in [1b]) is **seen** as a disambiguation strategy.

- [1a] Which knight saw the king?
 [1b] Which knight did the king see?

In Kroch's reanalysis of this process, listeners play a decisive role in the evolution of old and new constructions. Linguistic change is thus conceived as a direct consequence of the superposition of misunderstandings between speakers from one generation and listeners from the following one, that leads to a long-term generalization of the more unambiguous form.

II. DISAMBIGUATING LINGUISTIC AMBIGUITY: A REANALYSIS OF THE BELFAST DATA.

II.1. From the above discussion, it **becomes** clear that listeners are frequently faced with the interpretation of linguistic forms that present a **certain** degree of ambiguity. The listener's reactions to **this** situation will **depend** again on **his** own method of recognition of linguistic **variation**. As **in** the case of the naive psychologist previously **described**, the interpretation of a given case of ambiguity by a naive **listener** will be determined by his own tendency to match unsupported items to the **less** marked linguistic category. On the other **side** of the scale, the data processor who has no previous way of knowing how to interpret such a form will prefer to disambiguate unclear items on the basis of the proportion of clear cases previously determined.

Labov's recent analysis of hypothetical data on plural /s/ deletion in Spanish (1994: 588-596), based on the effects of probability matching on sound change, distinguishes these two types of listeners, **in** order to determine two different types of cognitive processes related to the disambiguation of unclear forms: the Privative Theory and the Facultative Theory. Both theories constitute two ways of cognitive representation, and the interaction between them will determine the progress or decay of a given linguistic item.

Our analysis **here** is based on a set of data on the distribution of *mate* and *meat* items extracted from a previous study by Milroy and Harris (1980) on the different pronunciations of such items in the vernacular variety of English spoken in Belfast. This data, **taken** from the informal observation of 8 male informants, points to a situation of near-merging between both classes of items. However, and although the realizations of these items may sometimes be identical, the research **proves** that lexical misunderstanding

between words from these **two** classes is not a very frequent phenomenon among speakers of the Belfast vernacular. Table 2 represent the distribution of the 159 examples **analysed**, classified by vowel height.

	mate	meat
[ɪe]	33	0
[e]	6	2
[ee]	54	18
[e̞e]	4	18
[e]	2	20
[ɛ]	0	2

TABLE 2: Disuibution of mate and mear items in the Belfast vernacular (based on Milroy and Harris, 1980)

As can be **seen** from the above distribution, both groups of words **have** an **unambiguous form** ([mɪe] for mate and [mɛt] for meat) and, more frequently, a wide number of ambiguous pronunciations. However, from a statistical point of view these realizations can be easily associated with either mate or meat (see Fig. 1), which in general **terms** indicates the **existence** of very low levels of misunderstanding **within** this subsystem¹.

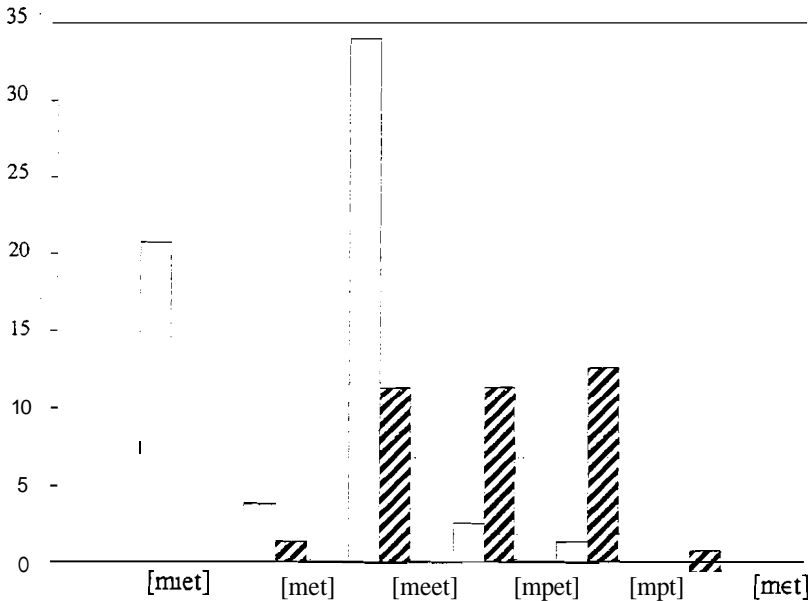


FIG. 1: Relative rates of overlap for six realizations of *mate* (white) and *meat* (shaded) (based on Mfilroy and Harris, 1980)

11.2. In this situation, the listener must be able to disambiguate all the occurrences of [me(e)t] and [mɛ(e)t] by matching them with either *mate* or *meat*. Obviously, most of the unclear realizations of each item will be immediately disambiguated by the listener on the basis of linguistic or cultural information. In spite of this, a small rate of these marked forms will remain unsupported (i.e., «not accompanied in the stream of speech by other sources of the information that it carries», Labov 1994: 589), producing an indeterminate number of misunderstandings. In order to get an approximation to these figures, the hypothetical rate of unsupported pronunciations of *mate* and *meat* used in this research will be fixed at 5%² (which is the rate used by Labov in his analysis of Spanish final /s/; 1994: 589).

II.3. The Privative Theory foresees that 5% of the occurrences of each of the realizations referred to here as marked will be misunderstood by the listener from the following generation; the relative inputs of three consecutive generations of speakers show the following distribution for every 100 occurrences of *mate* and *meat*:

	1st generation		2nd generation		3rd generation	
	mate	meat	mate	meat	mate	meat
1. [ie]	20.75	0.00	20.75	0.00	20.75	0.00
2. [e]	3.77	1.26	3.84	1.20	3.90	1.15
3. [ee]	33.96	11.32	34.54	10.76	35.08	10.24
4. [eē]	2.52	11.32	2.40	11.46	2.28	11.58
5. [el]	1.26	12.58	1.20	12.65	1.15	12.72
6. [ɛ]	0.00	1.26	0.00	1.26	0.00	1.26
TOTAL	62.26	37.74	62.73	37.27	63.16	36.89

TABLE 3: Hypothetical rates of evolution of mate and meat in three consecutive generations of speakers (Privative Theory)

The long-term result of the evolution of this paradigm under the Privative Theory consists in a progressive generalization of two different pronunciations for each item: [met] (+0.13 after three generations) and [meet] (+1.12) for mate, [mɛt] (+0.26) and [meɛt]. (+0.14) for meat.

Figs. 2.a and 2.b give a graphic representation of the relative evolution of these forms under this model.

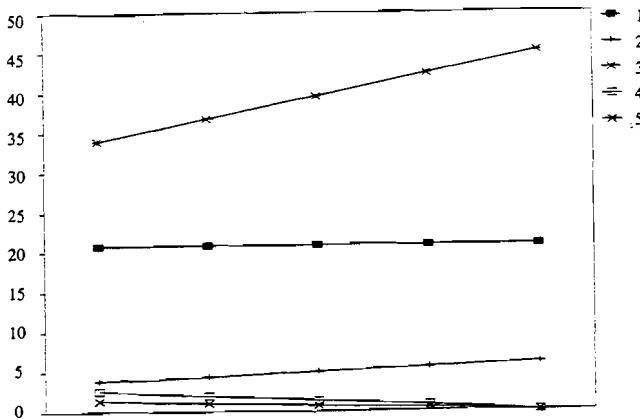


FIG. 2.a: Predicted graphs of the evolution of mate under the Privative Theory (1.[met]; 2.[mɛt]; 3.[meɛt]; 4.[mɛt]; 5.[mɛt])

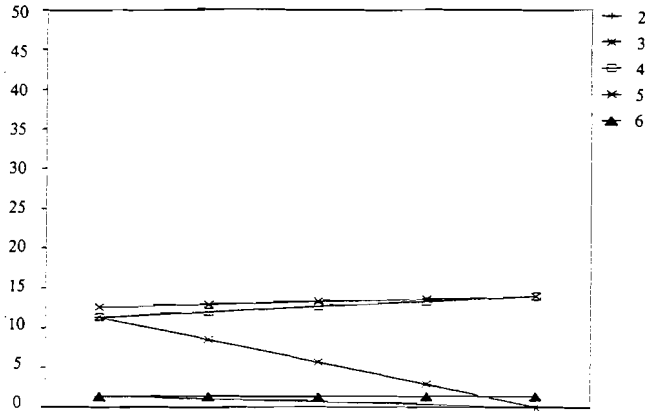


FIG. 2.b: Predicted graphs of the evolution of meat under the Privative Theory (2.[met]; 3.[meət]; 4.[mɛət]; 5.[mɛt]; 6.[mɛ])

11.4. A second way of interpreting linguistic ambiguity consists in giving the same treatment to all the realizations of both mate and meat. Under the Facultative Theory, the listener will calculate the perceived proportion of each item uttered by the speaker by dividing the total number of unambiguous and supported references to it by the number of forms perceived. According to the data in Table 3, the listener from the following generation will perceive a 62.62% of mate and a 36.98% of meat. The next stage of the calculation applies these proportions to the total number of unsupported occurrences of both items. The hypothetical results produced by the application of this algorithm to the outputs of three consecutive generations of speakers are given in Table 4.

	1st generation		2nd generation		3rd generation	
	mate	meat	mate	meat	mate	meat
1. [ie]	20.75	0.00	20.75	0.00	20.75	0.00
2. [e]	3.77	1.26	3.74	1.29	3.71	1.32
3. [ee]	33.96	11.32	33.68	11.60	33.43	11.85
4. [ɛɛ]	2.52	11.32	2.83	11.02	3.12	10.72
5. [ɛ]	1.26	12.58	1.63	12.20	1.99	11.85
6. [ɛ̃]	0.00	1.26	0.00	1.26	0.00	1.26
TOTAL	62.26	37.74	62.63	37.37	63.00	37.00

TABLE 4: Hypothetical rates of evolution of mate and meat in three consecutive generations of speakers (Facultative Theory)

The progression indicated by the Facultative Theory is radically different to the one sketched in our account on the Privative Theory. In this second case, the long-term solution to this situation of partial ambiguity will be finally resolved by the slow generalization of the realizations [mɛt] (+0.73 after three generations) and [mɛɛt] (+0.60) for mate items, [met] (+0.06) and [meɛt] (+0.53) for meat items. Figs. 3.a and 3.b give a graphic representation of the relative evolution of these forms under the model of the Facultative Theory.

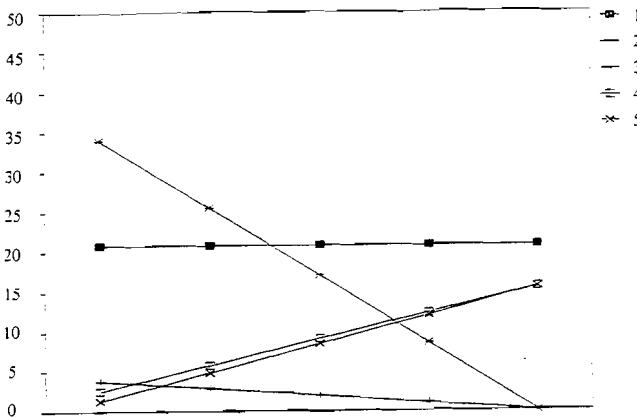


FIG. 3.a: Predicted graphs of the evolution of mate under the Facultative Theory (1. [mɛt]; 2. [met]; 3. [meɛt]; 4. [mɛɛt]; 5. [mɛt])

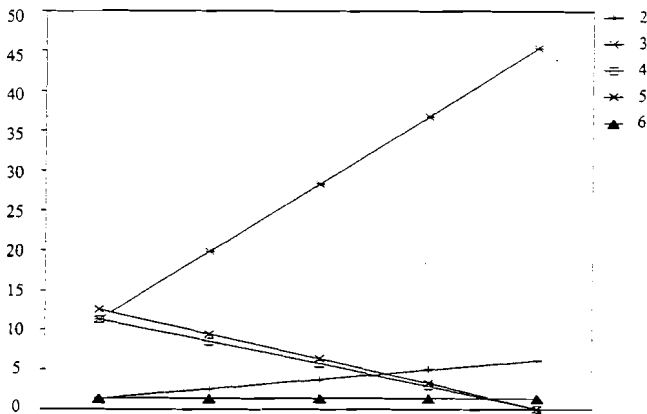


FIG. 3.b: Predicted graphs of the evolution of meat under the Facultative Theory (2. [met]; 3. [meɛt]; 4. [mɛɛt]; 5. [mɛt]; 6. [met])

II.5. The mismatches of production and perception calculated **here** on the basis of the Privative and Facultative Theories are radically opposed, and so are the long-term results predicted by them. In the first case, high vowels (with or without glide) prevail on the low realizations of ME 2, while ME ea **maintains** a lower mid position. In the second, the **relative distance** between the two original vowels is kept, with a slight tendency towards raising.

Furthermore, the balance implied by both theories regarding the use of these forms in the near future points to a stability of the distribution given in Table 2. However, it should be remembered **here** that this data corresponds to a very concrete type of informant: **inner-city** Belfast men who **continue** to make use of this highly stigmatized vernacular. The increasing use of the standard realizations of both items in Belfast is thus to be understood as a disturbance in the system caused by forces of sociolinguistic origin. Our data is not to be **seen** as an exact prediction of future developments, but rather as general tendencies regarding the listener's attitudes towards ambiguity and its role in the process of sound change. The future evolution of these paradigms will depend on the interaction between these attitudes and other **intralinguistic** and **extralinguistic factors**.

III. PROJECTING BACKWARDS: VOCALIC CHANGE IN EARLY MODERN ENGLISH.

III.1. The next step we **have** to take **here** is to apply these two general tendencies to our data on early Modern English³. Our analysis **here assumes** the **existence** of a near-merging situation for mate and meat items in 16th-century **London**, that, in general terms, can be paralleled to the one previously sketched for contemporary vernacular Belfast English.

According to Gorfach (1991: 68-9), the raising of ME a to /ɛ:/ took place around 1500 in progressive pronunciations, while ME ea partially maintained its quality until 1600, a date after which it coalesced in /i:/ with ME ē. In his account on this process, **Samuels** (1972: 147) **points** to the **co-existence** of **three** different subsystems for the front series (see Table 5).

System I corresponds to the numerous descriptions given by orthoepists in the 16th and 17th centuries, while System II is based on the **evidence** of rhyming usage. The progressive **transfer** of speakers from these two systems to the third one **becomes** more evident from 1600, a date after which **references** to the different quality of ea and ā start to be frequent **among** contemporary grammarians.

	I	II	III
meed	i:	i:	i:
mead	e:	e:	i:
maid	e:	e:	e:
made	e:	e:	e:

TABLE 5: Three differernt mergers in 16th century London English (Samuels 1972)

Differently to previous approaches to this question, Samuels's analysis of the Great Vowel Shift is based on the functional load **inherent** to the various phonemes involved in the process. **Ambiguity is understood here** as the result of a homophonic clash between items of two phonetic classes, and the speaker's **desire** to avoid linguistic miscomprehensions **becomes** thus a cmcial factor in this explanation of the change. However, this approach to the Great Vowel Shift implies a complete merging between ME \bar{a} and ea in London English and a **later** separation of the resulting sound into two new phonemes that roughly reflect the original **pattern** of distribution of both classes. According to the theoretical **principle** of irreversibility of mergers, the **later** distinction between mate and meat items can not be accounted for on purely intralinguistic **factors**.

Socially oriented approaches to this question (of which Dobson 1968 constitutes an early example) largely rely on the **existence** of socially marked dialects in 17th-century London, the most stereotyped of which roughly corresponds to Samuels's System III as respects to the pronunciation of long front vowels. The **reversal** of the merger is thus conceived as a complete substitution of System II (traditionally associated with the emerging merchant class of London) by the "good English" forms represented by System III. However, this second type of phonological reconstmction fails to explain, among other things, the formation of System III, where ME ea is exporadically raised to /i:/. In short, approaches to this change exclusively based on either intralinguistic or sociolinguistic factors **have** produced very **partial** and incomplete descriptions of it.

Our **claim here** presupposes the absence of a complete merger between ME \bar{a} and ea in London English as the one described by the studies previously sketched (Labov 1994: 387). As in the case of Belfast, the **reported** cases of **confusion** between these two classes by the orthoepists' **observations** and richly attested **in** puns and rhymes from the 16th century will be treated **here** as near-mergers.

111.2. To start with, we will concentrate on the analysis of the different ways a near-merger of Speaker A can affect Speaker B's **later** output. However, and contrary to Samuels's approach, our study is no longer based on the speaker's need to make himself understand, but on the different consequences of misunderstanding by the listener.

Most accounts of the Great Vowel Shift agree in presenting the raising of ME \bar{a} as the **first** step towards the complete **restructuring** of the English vowel system. This change

is attested by a wide number of misspellings both for ME *ā* and *ea* words (e.g. *mead* for "made", *spake* for "speak"). Further, an apparent merging between these two phonemes in early Modern English is frequently testified by grammarians and orthoepists until the end of the 16th century⁴. Raising of *ā* in 16th century London was apparently more advanced among the merchant class (Labov 1994: 302-3), and its origin is to be found in the dialects spoken in the South-West of England, where a general raising of long tense vowels had previously occurred (Wyld 1936: 41). Since ME *ea* was maintained until one century later, we are bound to suppose that London speakers who adopted the southeastern pronunciation of *ā* (but not that of *ea*) were not able to distinguish between previous minimal pairs of the type *mate/meat* or *hate/heat*. Our approach to this question will focus now on the later evolution of ME *ea* in London English and the subsequent unmerging of these two classes.

The rapid change of *ea* to [e:] in 17th century London has been seen as an acceleration of the existing process of vowel raising produced by the continuous arrival of immigrants from Kent and Sussex. However, this explanation is unsatisfactory to the extent that it fails to explain why, in a situation of merging between *ā* and *ea*, only *ea* items were raised to [e:]. On the other hand, it is widely admitted that the dialects spoken in these regions were highly stigmatized (Leith 1983: 42), which would eventually have prevented London middle-class speakers from adopting or even imitating that pronunciation.

The scenario where this second raising took place could be hypothetically reconstructed as follows, where [ɛ:/-1] and [e:/+ 1] represent the impressionistic levels of vowel height contiguous to the lower and upper security margins of the phoneme /e:/:

	mate	meat
[/ɛ:/+1]	0	Y ³
/e:/	0	Y ¹
[/ɛ:/-1]	X ²	Y ²
/a:/	X ¹	0

TABLE 6: Hypothetical representation of the distribution of *mate* and *meat* items in 16th century London

At the initial stages of the vowel shift, the raising of ME *a* affected a limited quantity of tokens, from which we can infer that X¹ was the predominant realization for the bulk of ME *ā* items. Similarly, Y² and Y³ are intended to represent respectively the most and the less advanced realizations of ME *ea*, so that they will be found in a very scarce group of words.

By applying the principles derived from previous cognitive approaches to the analysis of linguistic changes in progress to this situation, we can try to throw some new

light on this complicated process. Our next task will thus consist in **determining** the results of the application of the two cognitive theories outlined before to the paradigm represented by Table 6.

III.3. As in the case of contemporary Belfast English, by applying the Privative Theory to this distribution we will get a continuous **decrease** of the less frequent realizations of each phoneme, i.e. /ɛ:/ for ME \bar{a} and of [e:/-1] for ME ea. Obviously, this process would **have** led to a **conservation** of the system of long vowels characteristic of Middle English, which is not the case of 16th century London English.

On the other hand, the Facultative Theory points towards a progressive elimination of [e:/-1] for ME S, and a completion of the process of advancement of /ɛ:/ at a relatively high speed (depending on the **number** of homophones created by the new phonological situation). This rapid raising of ME S caused a massive transfer of ea items into the [e:/+1] category, in a way that these tokens rose the margin of security of the contiguous phoneme /e:/. Moreover, the **later** evolution of ME ea and \bar{e} clearly indicates a full merging of both sounds in /i:/.

Obviously, the quality of the allophones given in Table 6 is not easily **reconstructable**. However, we can get an approximation to their **relative** height by analyzing the behaviour of the three ME ea items of Anglo-Saxon origin that merged with ME \bar{a} in early Modern English (Díaz, in preparation). Break, drain and great appear as the only Middle English words with initial clusters of voiced obstruent plus /r/ where the long quantity of the vowel has **been** maintained **until** today⁵. Recent studies **have** demonstrated that front vowels preceded by **obstruent/liquid clusters** tend to be slightly lower and further back than **those** appearing in other environments. In this situation, we can **assume** that during the first phase of raising \bar{a} items had fully **collapsed** with these three tokens in their upward movement. The acoustic difference between ME \bar{a} and ea at this point can be paralleled to the one found in the present day English pronunciation of /æ/ in fan (which exemplifies the most advanced realization of this phoneme) and flat (with /æ/ neighbouring the security limit of /a/)⁶.

III.4. Raising of ME S and ea has **been seen here** as a consequence of the growing rate of **misunderstanding** created after the invasion of the acoustic space of the second by the first. When facing up to these items, listeners develop different strategies of disambiguation that will **determine** their **later** linguistic usage with regard to the realizations of both phonemes. Given the social situation found in 16th century London, miscomprehension among speakers is to be primarily conceived as a **direct** consequence of cross-dialectal **communication**. Further, social factors related to the stigmatization of **certain** dialectal **features** and to the social aspirations of middle-class speakers can be claimed to account for the progression of the changes among the different social strata. However, the **internal** mechanism of the Great Vowel Shift is to be described within the framework of everyday conversation and exchange **among** individuals who learn to speak by hearing and interpreting what other speakers **utter**.

IV. CONCLUSIONS

In the preceding pages we **have** presented an analysis of the evolution of ME *ā* and *ea* in two different subsystems of English. Linguistic cognition has **been** understood **here** as the different ways listeners interpret language. From this perspective, sound change appears as a consequence of linguistic misunderstanding between speaker and listener. Obviously, this claim **does** not pretend to account by itself for the whole bulk of sound changes related to the Great Vowel Shift. In spite of **this**, we hope that the reader will **become** aware of the **importance** of the role played by cognitive factors in any process of linguistic change. **Further**, we expect that our initial intention of **linking** language and society on the means of social cognition has **been fulfilled**.

NOTES

¹ This fact constitutes the demonstration that, **contrary** to traditional accounts of this variety of English, no merger has occurred between both classes in the Belfast vernacular (Milroy 1992: 160).

² It should be underlined that this 5% is conceived **here** as a working rate that will allow the approximate **reconstruction** of the whole process of linguistic change; the real rate of linguistic misunderstanding between both lexical items in vernacular Belfast English will not necessarily coincide with this figure, **and** its calculation is out of the scope of the present **research**.

³ For a **full** account on recent approaches to the Great Vowel Shift from different **theoretical** frameworks see Wolfe (1972), Guzmán (1994), **and** references there **cited**.

⁴ Laneham (1575), Bullokar (1580), Bellot (1589) and Delamothe (1592) consider these two sounds to be identical.

⁵ The number of items belonging to this **category** was drastically reduced **after** the shonening of ME *ea* and *o* before **dentals**, e.g. bread, dread (Gorlach 1991: 72).

⁶ Labov (1994: 180) calculates the lowering of the phonerne /æ/ in this environment in 106 Hz, and its backing in 160 **Hz**.

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