Linguistic change, social network and speaker innovation[1]

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(Received 9 January 1985)

1. INTRODUCTION

This paper is concerned with the social mechanisms of linguistic change, and we begin by noting the distinction drawn by Bynon (1977) between two quite different approaches to the study of linguistic change. The first and more idealized, associated initially with traditional nineteenth century historical linguistics, involves the study of successive 'states of the language', states reconstructed by the application of comparative techniques to necessarily partial historical records. Generalizations (in the form of laws) about the relationships between these states may then be made, and more recently the specification of 'possible' and 'impossible' processes of change has been seen as an important theoretical goal.

The second approach, associated with modern quantitative sociolinguistics, involves less idealization of the data base. An important objective is to specify HOW languages pass from state A to state B in terms of both the social processes involved and the effect on linguistic structure of a given change. The major goal is to develop a theory which is sensitive both to the constrained and regular nature of change and to its relationship with social structure.

Some sociolinguists have borrowed quite heavily from older scholars – notably Bailey, who has tried to apply a 'wave' model to contemporary data (Bailey, 1973). Similarly, Labov has assessed, in the light of recent findings, the theoretical approaches of nineteenth century historical linguistics; in one article, he compares 'lexical diffusion' models of change with those which claim that change comes about as a result of the operation of regular phonetic

laws. Conversely, the present can be used to explain the past, i.e. to shed light on historical linguistic problems (Labov, 1974a; Milroy & Harris, 1980).

What seems to be well established now is that variability of a structured and regular kind is characteristic of normal language use and is a key to understanding mechanisms of linguistic change. At the phonological level change appears to affect contextually defined subsets of phonological classes in a (generally) regular way, spreading through the community in waves in a manner controlled by extra-linguistic factors such as the age, sex, social status and geographical location of the speaker. Except where the ongoing change originates with a high-status group and is more or less consciously adopted by others, spontaneous speech appears to be affected earlier than the speech characteristic of more careful styles.

These general principles have emerged fairly clearly from the work of Labov carried out over the last two decades (see Labov, 1972) and are confirmed elsewhere. To exemplify the quantitative approach, we comment briefly on one particular study.

Eckert's (1980) account of Souletan, a dialect of Gascon, quite explicitly attempts to bring together the concerns of traditional historical linguistics and those of sociolinguistics. She examines the relationships between long-term phonological changes which affect whole classes of linguistic items, and the 'competence' of speakers who are involved in an ongoing linguistic change. Historical, geographical and synchronic variable data are analysed to illuminate the processes involved in an upward chain shift of the back vowel system of Souletan; the back chain shift is particularly advanced here and is still in progress.

Eckert characterises the change in terms of *waves*, which affect one word class at a time; as we might now predict, items lagging behind in the shift occur in the speech of older informants, as stylistic variants. Thus, the item *sulamént* 'only' occurs with [ɑ] in careful speech, but with the more innovative [o] in rapid connected speech. Arguing that phonological rules (which reflect speaker competence) ought to be written in such a way as to reveal this pattern, Eckert gives a formal characterization of such a variable rule. If the language choices open to the individual are placed in this broader context, they may be seen as reflections of 'earlier' and 'later' overlapping states of a dynamic phonological system. The capacity of a variable rule formalism to handle linguistic constraints on the implementation of the rule may be seen as characterizing successive 'waves' of the change. Thus, it is argued, individual language behaviour is related to historical changes by rules which are seen as reflecting the competence of a speaker whose range of linguistic choices is congruent with the waves of change which proceed regularly through time and space.

In a sense, Eckert's work, like much of our own, straddles the two approaches distinguished by Bynon, attempting to see how they fit together. Micro-level studies of this kind which are both 'sociolinguistic' and

'historical' appear to support the claims of Weinreich, Labov & Herzog (1968) that linguistic innovations move systematically through space (social, geographical and historical) affecting linguistic structure also in an ordered manner. The task of explaining linguistic change was, they argued, best divided into five main areas.

These are, first, the very broad problem of UNIVERSAL CONSTRAINTS on possible changes. As Weinreich *et al.* note (101) this is part of a larger theoretical linguistic issue and falls beyond the scope of quantitative socio-linguistics. Within historical linguistics it has been examined by many scholars including Lass (1980) and Vennemann (1983).

Second, the TRANSITION problem concerns the 'intervening stages which can be observed, or which must be posited, between any two forms of a language defined for a language community at different times' (Weinreich *et al.*, 1968: 101). As we have already noted, quantitative analysis has contributed a great deal here, showing clearly that transition is evidenced by variation between conservative and innovatory forms, with the former gradually giving way to the latter as relative frequency changes.

The EMBEDDING problem is concerned with determining regular patterns in both the linguistic and the extra-linguistic context of change. Included here would be an account of the phonetic environments most favouring change and the relative ranking of these environments. Much of Labov's own work has addressed this issue (and see also Eckert, 1980). Included also would be the vowel analyses of Labov, Yaeger and Steiner (1972) which follow Martinet's 'chain shift' model. EXTRA-LINGUISTIC aspects of the embedding question may be tackled indirectly by inspecting the distribution of innovatory linguistic forms in speech communities. Labov cites his own work, in addition to that of Trudgill in Norwich and Cedergren in Panama City, as supporting the generalization that where sound change in progress is located, linguistic variables display a curvilinear pattern of distribution (often showing up on a graph as an unexpected 'crossover' pattern). Innovating groups appear to be located centrally in the social hierarchy, and are characterized by Labov as upper-working or lower-middle class. (Labov, 1980: 254). Moreover, younger speakers use more innovatory forms than older speakers (both quantitatively and qualitatively) and again according to Labov's analysis, sexual differentiation of speech often plays a major (but as yet not clearly understood) role in linguistic change.

The EVALUATION problem pertains principally to social responses to change 'at all levels of awareness, from overt discussion to reactions that are quite inaccessible to introspection' (Labov, 1982: 28). This embraces notions of prestige, attitudes to languages (both overt and covert), as well as linguistic stereotyping and notions of correctness.

The principal contribution of Labov himself to the EMBEDDING and EVALUATION problems has been, particularly in his New York City study, to provide a GENERAL model of the social location of a linguistic innovation and

of the manner in which it spreads from a central point upwards and downwards through a speech community. Shortly we shall look at some of the problems associated with this model and indeed in much of this paper we shall be presenting a critique of parts of it.

Until fairly recently, Labov had not attempted to tackle the fifth area of investigation outlined by Weinreich *et al.*: this is the ACTUATION problem, articulated here in its most challenging form:

> Why do changes in a structural feature take place in a particular language at a given time, but not in other languages with the same feature, or in the same language at other times? This *actuation problem* may be regarded as the very heart of the matter (Weinreich *et al.*, 1968: 102).

It is the actuation problem which we discuss in this paper; appropriate strategies are suggested for addressing it and some partial answers are offered to the questions posed by Weinreich *et al.* Most importantly, we try to explain why investigators have failed to make much headway in tackling the issue which was described in 1968 as 'the very heart of the matter'.

Such a programme as was presented by Weinreich *et al.* is not necessarily the best way of organizing a systematic study of linguistic change. While we do not attempt here to offer a comprehensive critique of the paper, some difficulties should be noted.

First, although the five aspects of the problem of change have been presented as relatively discrete, they do in fact overlap. While this does not in itself necessarily constitute a difficulty, a reading of Labov's 1982 article which reviews work on the problems up to that time shows clearly that his interpretation of the issues covered by each of the five categories is different from Weinreich's (it was in fact Weinreich who was mainly responsible for the early sections of the 1968 paper from which we have quoted in this section). So while we have drawn freely on Labov's review, the categories are discussed in terms of Weinreich's formulation where there appears to be a discrepancy. This difficulty is compounded by the fact that we ourselves have sometimes categorized a phenomenon rather differently from Labov. For example, while he regards diffusion of innovation as part of the TRANSITION question, we have treated it here as an aspect of ACTUATION. Now it is certainly clear that no single aspect of linguistic change can be discussed coherently without reference to at least some of the others specified by Weinreich *et al.* But since the disagreements which emerge when attempts are made to specify how phenomena should be categorized are sometimes quite radical, it seems reasonable to suggest that the distinctions drawn in the 1968 paper are not final and that they require further critical consideration if they are to serve as a comprehensive programme for the study of linguistic change.

We look briefly now at Labov's attempt to tackle the actuation problem by first locating the innovators themselves and then examining their social

characteristics and relationships within their own (Philadelphian) neighbourhoods[2]. His main conclusions are as follows.

(1) Speakers who lead sound change are those with the highest status in their local communities as measured by a social-class index.

(2) Among persons of equal status 'the most advanced speakers are the persons with the largest number of local contacts within the neighbourhood, yet who have at the same time the highest proportion of their acquaintances outside the neighbourhood' (1980: 261). Labov then goes on to comment 'Thus we have a portrait of individuals with the highest local prestige who are responsive to a somewhat broader form of prestige at the next larger level of social communication.'

Both points are relevant here. Labov presents in effect one superordinate locus of change, *viz.* a central position in the status hierarchy (and here his model is implicitly one dependent on the existence of social stratification) and one more refined or micro-level locus, within a group of roughly equal status. The diffusion of change is accomplished by individuals who have many ties within the close-knit community and who also have a relatively large number of outside contacts. Our own arguments, which arrive at conclusions rather different from those of Labov, focus almost entirely on the position of linguistic innovators in localised networks which are made up of persons of roughly equal status. We shall also discuss more broadly the type of network structure associated with (often rapid) linguistic change and are less willing than Labov evidently is to present a model based ultimately on status or class. After all, these are no more than rather controversial constructs (see Halsey, 1978, for an accessible discussion) and the universal applicability of such constructs to theories of change is dubious.

We pass now to a discussion of what is meant by the term 'linguistic change', highlighting some problems and ambiguities. Changes in the realization of two Ulster vowels are then reviewed in some detail, to exemplify the principle that evidence of linguistic change may be found in data which are variable on historical, geographical and social dimensions. Using the network concept developed previously in this research programme (Milroy & Milroy, 1978; L. Milroy, 1980), the informal social ties of linguistically innovative groups are examined, and a model of linguistic change, based partly on our own conclusions and partly on work by Granovetter (1973) is presented. This model, which suggests that innovations flow from one group

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[2] A 'neighbourhood' study (Labov's term) is distinct from a survey in that no effort is made to elicit comparable data from isolated individuals sampled in accordance with some principle of random selection. Rather, the language of speakers is investigated with attention to their position in relation to others in their local neighbourhoods. Thus, both language and social structure may be examined in very much greater depth, at the expense of some social and linguistic breadth.

to another through 'weak' network links is designed to offer a practical solution to an aspect of the actuation problem; as such it is concerned with SPEAKER innovation, of which the reflex in the language system is a change which is always observed *post factum*. Finally, we suggest (more speculatively) that the model is capable of elucidating particular problems of language change and variation which so far have seemed quite mysterious.

2. LINGUISTIC CHANGE AND SPEAKER INNOVATION

Although the ultimate aims of historical linguistics may be to specify universals of change (what is, or is not, a possible change and, within the set of possible changes, the kinds of change that are more or less PROBABLE), the methodology of historical linguistics has ALWAYS been comparative.

Nineteenth-century linguistics ('comparative philology') aimed at RECONSTRUCTION of proto-languages by comparison of sister languages, and so the term COMPARATIVE acquired, in linguistics, an association with reconstruction[3]. Here, however, we use the term COMPARATIVE in a more general and literal sense, without any necessary implication that reconstruction is aimed at. Thus, the comparison of two attested historical states of the same language is also *a* comparative method.

Sociolinguistics also uses a comparative method, in that the language of different individuals or groups is compared. The difference is that the changes are observed, or argued for, at a micro-level rather than a macro-level.

In a sociolinguistic analysis, the observation of change is narrowed down to comparisons based on age and sex of speaker, stylistic variation and social grouping; observed synchronic variation can be viewed as the counterpart of change in the diachronic dimension. In practice, these micro-level synchronic patterns are usually supplemented by 'real-time' observations. The testimony of nineteenth-century and early twentieth-century observers of a speech-community are used to help to establish the long-term direction of change (Labov, 1972: 163–171). Notice that as soon as the methodology is extended to take account of past states of language, it becomes to that extent the same as comparison of two or more attested past states. Instead of comparing two past states, we are comparing a present state with a past state. The important differences that do exist between sociolinguistics and historical linguistics (as described by Bynon, 1977) depend fundamentally on the fact that sociolinguistic method is rooted in the present, which means that there is direct access to the rich detail of variation in speech-communities. Thus, it is possible to observe very fully both the linguistic and the social embedding of observed changes. It becomes possible to specify the constraints imposed by a

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[3] 'In using the comparative method we contrast forms of two or more related languages to determine their precise relationship. We indicate this relationship most simply by reconstructing the forms from which they developed' (Lehmann, 1962: 83).

pre-existing language system on the possibilities of change within that system (Eckert, 1980; Labov, Yaeger & Steiner, 1972; J. Milroy, 1976) and to suggest and evaluate the possible social motivations of observed changes.

The question of social motivation is not uncontroversial. On the one hand, there is a view, pioneered by Weinreich, Labov and Herzog and assumed in this paper, that the study of social motivations constitutes an important part of any possible explanation of change. On the other hand, there is a strong tradition in language study of separating languages from speakers and looking for some of the ultimate explanations for change in languages as systems. As Lass (1980: 120) has put it:

> Linguists have, I would maintain, normally treated language as if it were in fact an autonomous natural object (or an autonomous formal system): 'language changes' – it is not (necessarily) speakers that change it...

It is tempting to suggest that the separation of languages from speakers is partly a hangover from the nineteenth-century insistence on the 'life' of the language independent of speakers – a view very commonly expressed, e.g. by Trench (1888: 224): 'For a language has a life as truly as a man or a tree...'.

Although functional explanations (avoidance of homophony, etc., as discussed by Lass, 1980: 64–90) seem to take speaker-strategies into account, these and most other current explanations (e.g. physiological and psychological ones) do not normally make a PRIOR distinction between speaker behaviour on the one hand, and language as a formal system on the other; they address themselves to the explanation of changes observed in languages rather than explanation of speaker-behaviour. Some of them are, in any case, seriously flawed (as Lass points out). What is clear is that functional explanations do not address the ACTUATION PROBLEM as formulated by Weinreich *et al.* Such explanations may account for some instances of, e.g. avoidance of homophony, but they do not explain why homophony was NOT avoided in other instances. In general, they do not explain why a particular change took place at a given time and in a given language or dialect, but not in similar circumstances in other languages and dialects or at other times in the same language or dialect.

If we are to address the actuation problem (which is 'the very heart of the matter'), we must break with tradition and maintain that it is not languages that innovate; it is speakers who innovate. The reflexes of speaker-innovations are then observed in language states, where they appear as systematic and rule-governed linguistic change.

As the best-known findings of sociolinguistics have tended to concentrate on phonetic and phonological matters, it has been possible for some to dismiss them as superficial, non-explanatory and purely descriptive (Chomsky, 1975). Even at the phonological level, however, these approaches have called into question some of the theoretical positions of the dominant (Chomskyan) paradigm. Parts of the phonological model proposed in *The sound pattern of*

English (Chomsky & Halle, 1968), if applied to variation in modern English phonology, necessarily distort and misrepresent the 'competence' of native speakers. More suitable phonologies have, in practice, to be constructed and many of the assumptions of *SPE* phonology are not borne out in such cases (J. Milroy, 1976; 1981). Furthermore, the findings of sociolinguistics are not confined, as is often suggested, to the description of configurations of surface PHONETIC variants: it is in sociolinguistic work and not, as far as we know, in other approaches, that we can observe cases of rule change in progress (and therefore hope to explain such phenomena). We now briefly discuss an example: the gradual loss of /a/ raising after velars in Belfast.

David Patterson (1860) attests that /a/ was raised to [ɛ] *after* the velar consonants /k, g/, and lists given by Gregg (1964) for the Ulster Scots town of Larne suggest that this rule applied regardless of FOLLOWING consonant. In present-day Belfast we have attested no cases of raising after /g/, and the rule is variable after /k/. It is variable to the extent that male working class speakers can vary between [ɛ] and [a, ɑ] in the same lexical items. Their choice reflects the application of different rules, rather than application or non-application of a single rule. Thus TM (Clonard) has [kʲɛ·n]: 'can', rapidly followed by three tokens of [kʲɑ·n]: 'can', in succeeding utterances. As we shall see in Section 3, the trend in the /a/ system has been towards backing of /a/ since Patterson's day (conditioned by the following consonant), and in these post-velar environments the rules are in conflict. The choices open to speakers in monosyllables may be listed as instructions, as follows:

(1) After /k/, choose either *mid* or *low*, unless /r/ follows, in which case *low* must be selected,

(2) If *mid* is chosen, select low-mid, short [æ] before voiceless stop; otherwise select mid, long,

(3) If *low* is chosen, select short front [a] before voiceless stop; otherwise select long, back [ɑ·].

Clearly the rule for raising after velars is recessive: it has disappeared after /g/ and before /r/ (Patterson has *care* to represent the pronunciation of 'car'), and is otherwise variable for many speakers. For many younger East Belfast speakers, however, it has actually disappeared. In general, it is the following consonant more than the preceding one that dictates which realizations of /a/ are adopted. We shall see in Section 3 that the choice listed in 3 (above) is somewhat idealized: in fact there are greater and lesser probabilities of backing in an ordered series (depending on following consonant), and some environments are more likely than others to allow back-raising and rounding to [ɔ]. (For other examples of rule-change in progress, restructuring and merger, see J. Milroy, 1984b; J. Milroy & Harris, 1980).

In presenting such a configuration of change it is clear that we are primarily

describing a state of language rather than the 'competence' of individual speakers. The speakers themselves may, or may not, have access to all the possible variants, and (as shown in J. Milroy, 1982a), some middle-class speakers exhibit little variation; individuals may converge for all items EITHER on front [a] or back [ɑ]. Such speakers may be said – in a linguistically-oriented dimension – to have 'lost' the rules for raising and backing in different environments. In a speaker-oriented dimension, however, these speakers merely display a different pattern, and we cannot assume that they ever had the rules for fronting and backing in their active competence. Nor do we know whether they are aware of them in their passive competence. In other cases, speakers may be observed to vary in their realizations of the same lexical items in the same phonological environments; such speakers have variable rules.

Thus, when we consider speaker-competence, there are difficulties in specifying what a linguistic change actually is and how it is implemented. At the macro-level, claims for change have normally been assumed to rest on an observed difference between State A and State B, and have not depended on speaker intuition or competence (twentieth-century speakers, for instance, are not assumed to have intuitions about fourteenth-century states). At the micro-level, in which observed change depends on variation in speech-communities, speaker intuition has been assumed to be relevant, in that speakers may have access to both recessive and incoming variants and know when to use them. Even at this level, however, it seems that speaker-behaviour varies, and it is possible that individual speakers have – to a degree – differential competence and intuitions. The difficulty is that linguistic change must presumably originate in speakers rather than in languages. We therefore find it convenient to distinguish between linguistic CHANGE, on the one hand, and speaker INNOVATION on the other. It is the origin and diffusion of SPEAKER INNOVATIONS with which we are concerned in this paper.

Speaker innovations, like other innovations, may be classified in terms of their success in subsequent diffusion, as follows:

(1) A speaker innovation may fail to diffuse beyond the speaker.
(2) A speaker innovation may diffuse into a community with which he/she has contact, and go no further.
(3) A speaker innovation may diffuse into a community with which he/she has contact and then subsequently diffuse from that community into other communities *via* a further innovator who has ties with both the relevant communities. When the results of this process are observed, we tend to label the results as 'linguistic change'. The set of possible communities through which such a change can diffuse is in principle infinite, and although linguistic and social constraints on a change can

in some instances be specified, the limits of POSSIBLE diffusion cannot be precisely stated – either in terms of space and time or in terms of the possible states of language or society that may favour or disfavour the change.

It is not suggested in the present state of our knowledge, that the innovators can be precisely located. The linguistic innovator to whom we refer is as much an idealization as Chomsky's 'native speaker-listener', and it is our aim to model the sources and processes of linguistic innovation in more detail than has been possible in the past. We consider arguments about probabilistic grammars and the status of variable rules (Romaine, 1981) to be, in principle, irrelevant here. For, although much of the data presented in this paper has been collected from speakers and (necessarily) subjected to quantification, our arguments are not based on quantities, but on processes that have been observed to take place in speech communities. Although such processes may have been analysed quantitatively, they are not in themselves quantitative phenomena. By using such methods, however, we may have made some progress in locating the idealized speaker-innovator.

We end this section by commenting on (1)–(3) above (pp. 347–348). Notice that speaker innovation is not identical with linguistic change. As (1) implies, some innovations may not be accepted by a community and hence may not lead to change. On the other hand, speaker innovation may lead to a change in one segment or part of the grammar, which then sparks off a chain reaction that seems to be internal to the language system. Thus, in the English Great Vowel Shift, it may be argued that ME $\bar{a}$ was first raised, and that as a consequence of this, the ME vowels above it in phonetic space were also raised (or diphthongized in the case of the highest vowel). In such a case, it is possible that speaker innovation is relevant only to one vowel and that movements in the other vowels are motivated by the language system. Yet even here it must be admitted that speakers have been motivated to keep vowels distinct within the system.

With reference to (3) above, we must also note that, as the limits of possible speech communities (like the limits of social networks) cannot be specified, we do not know that a change observed to have entered a community (through the activities of certain speakers or groups) is in fact original to those who are observed to carry the innovation. The apparent innovation may already have been well established in some other community, and this in turn may have adopted the innovation from elsewhere. In observing change in a given community, therefore, we do not know beforehand at what point in a cycle of change we have entered the community. Although, from a synchronic point of view, certain individuals and groups may be identified as innovatory (see Section 3 below) and as responsible for introducing an innovation to their immediate communities, it is possible that the change concerned has had a long history elsewhere. We shall see that this is so in

the case of changes in the vowels /ɛ/ and /a/ in Belfast – to which we now turn.

3. Reviewing the evidence for change in progress: the vowels /ɛ/ and /a/ in Hiberno-English

If we compare the range of variation in Belfast vernacular vowels with text-book descriptions of RP it is obvious that many of them have a startlingly wide phonetic range of realizations (J. Milroy, 1976; 1981; 1982). Realizations of /a/ range from [ɛ] or above before velar consonants, as in *bag*, *bang*, etc, to /ɔ/, in *hand*, *bad*, etc. This is further complicated by a variation in vowel-length and diphthongization. Briefly, vowels in monosyllables tend to be short before voiceless stops and before clusters consisting of sonorant + voiceless stop; they are long before fricatives and voiced consonants. Closing diphthongs ([aˑi]) can also occur before voiced velars, and centring diphthongs ([aˑə] [ɔˑɐ]) occur when the vowel is back, long and, especially, also raised and rounded. The range from front to back is represented in Table 1.

[ɛː]	[æ]	[a]	[ɑː]	[ɔː]
bag	back	bat	bad	bad
bang		snap	grass	grass
		ant	hand	hand
		back	snap	

Front only	Velar environments
Back only	Fricative & voiced consonant environments (excluding velars)
Front ~ back	Voiceless stop environments (excluding velars); back variants attested only amongst East Belfast youths

Table 1

Simplified representation of phonetic range of /a/ in
Belfast vernacular, using key words

The range for /ɛ/, in e.g. *step*, *bed* is also wide. Qualitatively, the range is from [a] to around [ẹ]: similar rules of vowel-length apply, with centring diphthongs of the type [ẹˑə] tending to develop in long environments (see Table 2).

Such a wide range in two neighbouring vowels results in overlapping. Some realizations of /ɛ/ are like realizations of /a/, and vice versa. Projecting backwards in time, it is possible to argue that restructuring has taken place

Mid	Low
[eː, e·ə, ɛː, ɛ·ə]	[a, æ]
bed, bend, best	wet, went
(Fricative and voiced	(Voiceless stop, sonorant+
consonant environments)	voiceless stop environments)

Table 2

Simplified representation of phonetic range of /ɛ/ in Belfast vernacular, using key words

at some time in the past and that, for example, the /a/–/ɛ/ distinction may have been neutralised before velars, with *bag* and *beg* having been possibly identical. However, restructuring (with transfer from /a/ to /ɛ/ and vice versa) cannot be adequately demonstrated from the present-day evidence. Although some speakers have difficulty in disentangling pairs like *pack/peck*, speakers are aware in most cases that [ɛ] realizations before velars are tokens of /a/, whereas [a] realizations before voiceless stops are tokens of /ɛ/. As raising applies to /a/ before voiceless and voiced velars, items like *back, bag* are often realized with [ɛ]. However since low realizations of /ɛ/ apply before ALL voiceless stops (including the velar), items like *neck, wreck* (with velars) tend to be realized with [a]. This results in an apparent flip-flop, and the following examples are typical:
  'The back [bɛk] of my neck [nak];
  'Will you pay by Access [ɛksɛs] card or by cheque [tʃak]';
  'Jet [ʤat] – lag [lɛ·g]'.

There are two overlapping systems, informally stated as follows:
/a/→[ɛ]/ — Velar
/ɛ/→[a]/ — Voiceless Stop

The complexity of such systems, together with the range of socially motivated variation that occurs in the realizations of the vowels, present a considerable challenge to our abilities to identify the direction of change in progress, but the sheer amount of variation provides many clues. First, we consider the regional and social range of realizations of /ɛ/.

(i) *Raising of /ɛ/*
Figure 1 shows the result of a quantitative analysis of /ɛ/ realizations in two Belfast outer-city communities (Andersonstown and Braniel) and a smaller town (Lurgan) situated 17 miles south-west of Belfast. The symbol T indicates a following voiceless stop or sonorant+voiceless stop cluster; C$ indicates that the vowel is in the stressed syllable of a polysyllabic word (this
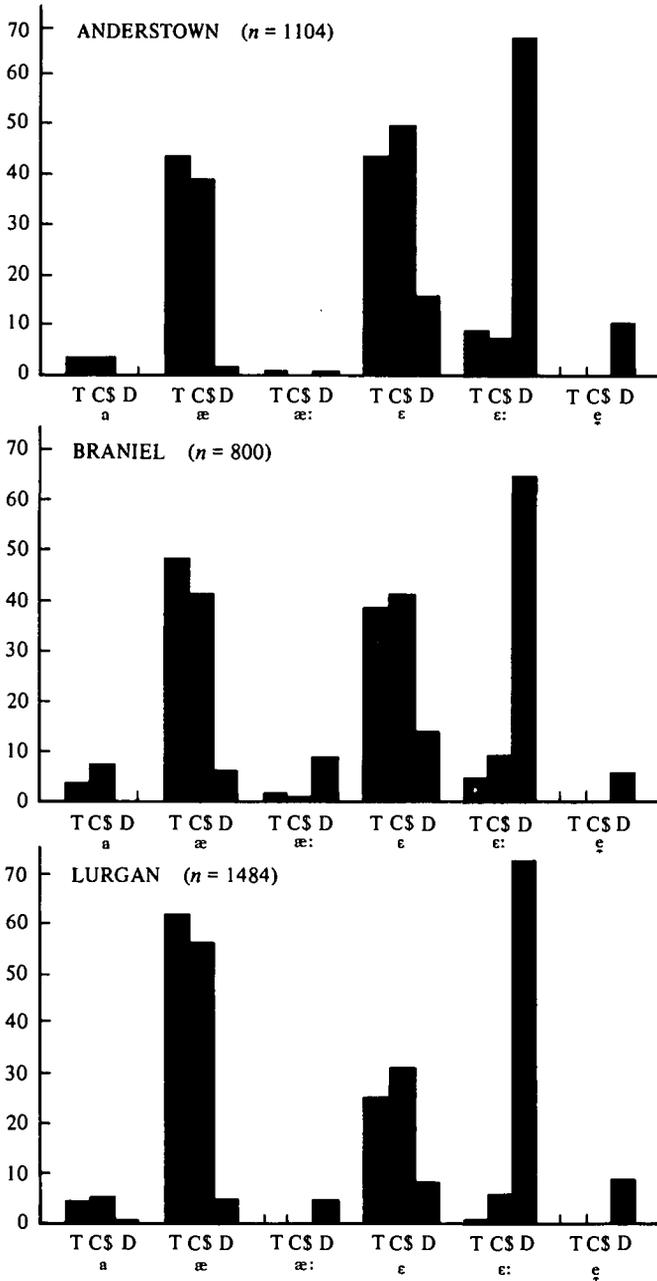
Figure 1

Percentage distribution of /ɛ/ (*bed*, *bet*) variants by following environment in outer-city Belfast (Andersonstown, the Braniel) and Lurgan. (After Harris, 1983: 157.)

environment tends to favour short realizations); D indicates following fricative or voiced consonant (excluding /r/). Notice that the lowest short realization, [a], is not favoured, but that in Lurgan short and low realizations in short environments (T, C$) are more favoured than elsewhere (see also below), and that long realizations [æ:, ɛ:] in these short environments are rarer in Lurgan. The inner-city figures (Ballymacarrett, Clonard, Hammer) in Table 3 clearly show some contrasts with the outer-city figures. Before

		Men 40–55	Women 40–55	Men 18–25	Women 18–25
T	B	100	68	100	56
	C	97	81	84	73
	H	97	75	98	67
C$	B	73	56	78	50
	C	81	67	75	60
	H	76	68	76	52

Table 3

Percentage low realizations of /ɛ/ in typically 'short' phonetic contexts in three inner-city Belfast communities, Ballymacarrett (B), the Clonard (C) and the Hammer (H)

voiceless stops, a low short realization ([a], [æ]) is categorical for many male speakers, while the women more often prefer higher and often lengthened realizations. Thus, for typically low vowel environments, as in *wet, went* females often have [wɛ:t, wɛ:nt] for 'vernacular' [wat, want]. In this respect the inner-city female pattern is similar to that found generally in these higher status outer-city communities.

These variable data give us a basis for examining processes of change, since they suggest initially that either the higher or lower variants are innovatory, or – more properly – that the direction of change is either raising or lowering of /ɛ/.

In fact, an examination of historical documentation (real-time evidence) suggests that the direction of change is towards raising. Moreover, it appears that mid realizations are gradually appearing in environments (such as pre-voiceless stop) where low realizations were once the norm. It also appears that as the low variants are replaced by higher ones, the relevant vowels are lengthened and sometimes diphthongized: thus, as the rules are applied, conservative variants such as [rant, rænt]: 'rent', are replaced by [rɛ·nt] (raising and lengthening) and [rɛ·ənt] (diphthongization). (For a discussion see J. Milroy, 1976). The options open to speakers for the realization of /ɛ/

before Voiceless Stop or before Consonant + Voiceless Stop may be described as follows:

(1) Choose either *mid* or *low*;
(2) If *low*, realize as *short*;
(3) If *mid*, realize as *long*;
(4) If *mid-long*, realize as monophthong or diphthong.

This is of course an idealized and simplified account, and the aim of listing such options is descriptive only. We do not claim that we know the ordering of rules, and if we do wish to order them, it is possible that LENGTH should precede HEIGHT or that lengthening and raising are simultaneous. Nor is there any implied claim that all individual speakers have the same rules or rule-order – far from it. For the great complexities that do exist when speaker-variation is studied, see now Milroy *et al.* (1983), Harris (1983). Accepting this as a broad description of the current state, we now examine some real-time data in order to confirm the direction of change.

Patterson gives a list of five words of the /ɛ/ class, which were then (1860) pronounced in Belfast with low realizations: *wren, wrestle, wretch, grenadier, desk*. These few examples are enough to show that the low realization was then more widespread than today: *wren* and *desk* do not satisfy the Voiceless Stop or Sonorant + Voiceless Stop condition in monosyllables, and are now categorical [ɛ:] or [ɛ·ə] environments. Even the disyllable *wrestle* is unlikely to appear with [a], as the rule for raising and lengthening before [–s] now almost always overrides the tendency to lower and shorten in disyllables and polysyllables.[4] Items like *wretch* and *grenadier* are now variable. Staples (1898) and Williams (1903), additionally give quite detailed descriptions of the vowel in the city, which allow us to infer that low variants had a much wider distribution then than they do today. The complete list, taken from those early writers allows us to see that the low vowel appeared in environments where it would not appear now – for example, before voiceless fricatives and voiced stops (Harris 1983: 160). The distribution in present day Belfast is quite different, as is shown by Table 3 and Figure 1. In conservative working class speech, low variants are maintained in 'short' environments, very much as in the nineteenth century: but low realizations have been almost entirely replaced in long environments by mid realizations of /ɛ/. More prestigious and less conservative speakers are less likely to use 'low' realizations, even in short environments.

It is evident that over the last hundred years or so mid realizations have been spreading at the expense of low realizations. Mid /ɛ/ has now almost totally replaced low /ɛ/ in 'long' contexts (pre-voiceless stop, pre-sonorant + voiceless stop, and in polysyllables). Low status inner-city speakers

[4] Items like *wren, wretch, wrestle* were historically affected by lowering after /w/, and still appear in many Irish and American varieties with a low vowel.

(males) sometimes still have categorically low realizations in short environments, but in the more progressive outer-city housing estates, the vowel is now categorically mid for some speakers. Interestingly, the distribution of variants in Lurgan is more similar to that of the inner-city areas than that of the outer areas (a pattern that applies also to other vowel and consonant variables). This relatively rapid linguistic change in Belfast has accompanied its rise in population from about 120,000 in 1860 to nearly half a million in the early years of this century, and Belfast may be taken as an exemplar of linguistic change in fast-growing communities (while rural towns and villages adhere to older patterns). The characteristic NETWORK structures of these different types of community are also relevant to the manner in which change may come about, in so far as urban growth tends at first to weaken strong pre-existing rural networks.

We may supplement our observations on /ɛ/ by considering evidence from present-day Ulster dialects. These are divided into two distinct types. Ulster Scots dialects are found in East Ulster in a belt extending from around Coleraine in the North, through most of County Antrim and much of County Down (which is south of Belfast – see map). Most of Ulster to the west of this belt is English-based or mixed Scots-English. Present-day Belfast dialect is often described as an intrusion of this Mid-Ulster type into the Scottish eastern belt. Now, the long mid variants of /ɛ/ are overwhelmingly associated with present-day Ulster Scots dialects (Gregg, 1972) and are characteristic of modern central Scots dialects generally (an exception is very conservative Galloway Scots, on which see J. Milroy, 1982b). Traditional Mid-Ulster English, on the other hand, is characterized by lower realizations in all environments (Harris, 1983: 181). The pattern of distribution in these dialects is remarkably similar to that of nineteenth-century Belfast vernacular as described in Patterson, Staples and Williams. We may infer that this pattern is a residue of some earlier English vowel pattern that has not been well identified or described by historical linguists. There is sixteenth-century orthographic evidence (discussed by J. Milroy, 1984b) that suggests some distribution of low vowel realizations for /ɛ/ in London English of the period: it seems possible that this pattern of lowering of historic short vowels has been overtaken in recent Standard English and Central Scots by a pattern of raising and (in the latter case) lengthening. The Mid-Ulster dialects may therefore have preserved to a great extent an older general English vowel pattern, and they may help us to project knowledge of the present on to the past.

The historical and geographical evidence then both suggest that the low realizations of /ɛ/ (conservative English in background) are giving way in a linguistically ordered way to the long mid realizations characteristic of present-day Scots. It is clear that this change carries prestige in Belfast in terms of social class hierarchy and status, as it is the more prestigious groups that tend to adopt it and the more 'advanced' (generally female and younger) group who introduce it to the conservative inner-city communities (which are
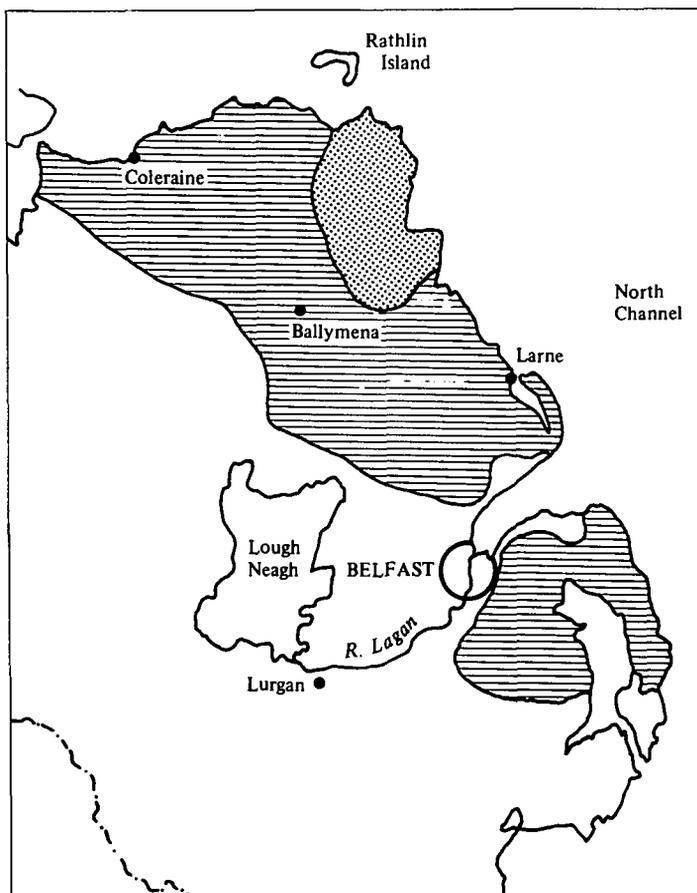
Map representing 'core' Ulster Scots areas of north-east Ulster (shaded areas): adapted from Gregg (1972).

characterized by dense and multiplex network ties that tend to resist innovation and maintain conservative forms). The tension between innovative and conservative social mechanisms gives rise to a identifiable pattern of gradual diffusion, which may be represented as a historical shift from an older English-type pattern towards a pattern characteristic of modern Scots. As we have implied, the manner in which the change proceeds is conditioned by both social and phonological factors. We now turn to a description of change in /a/, with which the /ɛ/ system can be compared.

(ii) *Backing of* /a/
As we have indicated above (p. 349), the range of realizations of /a/ in present-day Belfast vernacular is considerable – from [ẹ] through [a] and [ɑ]

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to back raised and rounded [ɔ]. Again, as for /ɛ/, patterns of lengthening and diphthongization are present, with long vowels being associated mainly with back realizations and with the higher front realizations before voiced velars (see Table 1). In what follows, we are concerned only with backing and retraction, and we therefore largely exclude the pre-velar environments (in which backing is not found).

Table 1 also shows that back realizations are favoured by following fricatives, non-velar voiced stops and non-velar nasals (on the rules for preceding velars, as in *cab, carrot,* see p. 346 above). Nasals favour backing particularly strongly. Middle-class urban speakers (J. Milroy, 1982a) tend to narrow the extreme range described above and in some cases converge on a point somewhere in the middle of the range, around [a] (but see below). The widest range is found mainly in the speech of inner-city male speakers. Furthermore, it is the MALES of Ballymacarrett (East Belfast) who use the backed variants most and who show evidence of spreading the backed realizations into VOICELESS stop environments (as in *that, wrap*), where short, front variants are expected. If there is evidence of change in progress towards backed variants of /a/, it will therefore be male speakers who are leading it, rather than the females who lead the change towards raised /ɛ/.

Historical documentation suggests that /a/ backing is a recent trend. The elocutionist Patterson (1860) does not comment on /a/ backing at all. On the contrary, his remarks suggest that the Ulster tendency was towards fronting and raising and that the most salient Belfast feature was fronting and raising in velar environments.

> In some places [presumably in the north of Ireland: JM, LM] the short
> sound of *e* is improperly substituted for *a*, in almost every word in which
> it occurs; in Belfast, however, this error is almost exclusively confined to
> those words in which *a* is preceded by *c* or *g*, or followed by the sound
> of *k*, hard *g* or *ng*.
>
> (Patterson, 1860: 15)

A very few of Patterson's spellings may indicate that /a/ backing and rounding had been observed sporadically in *-r* and *-l* environments: he has *form* for 'farm' and *canaul* for 'canal'. However, examples of this kind are so few that they indicate only a slight tendency (possibly confined to some pre-sonorant environments), which is not enough for /a/ backing to be discussed as a stereotype. The item *car* appears in Patterson as 'care', in which the now highly recessive rule for fronting and raising after velars is clear. Items like *hand, band,* in which [ɔ] is now stereotypically expected, are given simply as *han, ban,* etc. Frequently, however, items that now have low and/or back vowels, are given with [ɛ]: these include *rether* for 'rather' (a rural Scots residue), *e* for *a* in single nasal environments in polysyllables such as *exemine, Jenuary* and in nasal cluster environments such as *demsel, exemple, Entrim* ('Antrim'), *slent, bendy* '(bandy'), *brench.*

Whereas Patterson's account indicates a system generally inclined towards front-vowel realizations, Staples (1898), writing nearly 40 years later, reports a 'low back wide' vowel before non-velar nasals, in e.g. *man, hand, land.* Since Patterson's time $-/r/$ environments have become categorically back realizations. Otherwise, the figures on present-day variation confirm that since then it is nasal environments that have subsequently led the change, closely followed by fricative and voiced stop environments. In East Belfast, as we have noted above, backing is spreading even into voiceless stop environments, and this is most clearly attested in young men (those in our sample were aged 18–20).

THUS, ALTHOUGH RAISING AND LENGTHENING OF /ɛ/ AND BACKING OF /a/ ARE BOTH CHANGES ASSOCIATED WITH MODERN CENTRAL SCOTS, THE FORMER IS AT PRESENT LED IN BELFAST BY FEMALES AND THE LATTER BY MALES. It is clear from patterns of stylistic variation that (as we might already have inferred) the two changes have different prestige values attached to them. As Table 4 indicates, the backing of /a/ tends to be resisted by speakers in careful

| | East Belfast (Ballymacarrett) | | | |
	Men (40–55)	Women (40–55)	Men (18–25)	Women (18–25)
IS	3.03	1.75	2.89	1.89
SS	3.58	2.58	3.43	2.10
	West Belfast (Clonard)			
	Men (40–55)	Women (40–55)	Men (18–25)	Women (18–25)
IS	2.79	1.77	2.36	2.36
SS	2.79	1.85	2.33	2.61

Table 4

Incidence of retraction and backing of /a/ by age, sex and conversational style in two Belfast communities, calculated by an index score ranging from 0 (minimum) to 4 (maximum). IS, interview style; SS, spontaneous style

'interview' style (whereas raising of /ɛ/ is MORE likely in careful styles). Thus, men seem to be principally associated with a change that speakers do not consciously view as being of high prestige, while women are associated with one adopted by speakers in their more carefully monitored styles (for further discussion of these figures, see Section 6 below).

Our real time evidence confirms that the movement in /a/ is phonetically from front to back. This means that sporadic front-raising (found mainly in West Belfast) in words like *flat, trap* ([flɛt, trɛp]) must be seen as residues and not as innovations. The belief of many casual observers that raising before velars (and very occasionally before voiceless non-velar stops) are attempts

to imitate conservative RP ('Received Pronunciation', as described, e.g. by Gimson, 1980) is also shown to be wrong by quantitative and diachronic evidence. The quantitative evidence shows that the fronting and raising rule in Belfast vernacular is virtually confined to velar environments and cannot apply to words like *bad*, *hand*, *stab* (which are front in RP). The diachronic evidence shows that, for a century or more, the trend has been towards retraction and backing.

The evidence also indicates that the rule for backing diffuses geographically from East to West Belfast (see Table 4). Scores for /a/ backing are higher for East Belfast males than for any other groups studied, and the range of environments in which backing operates is extended to voiceless stops amongst younger East Belfast males. It appears to be inner East Belfast (Ballymacarrett) that provides the model for working-class speech in the city (L. Milroy, 1980); this is discussed by Harris (1983) in terms of a 'labour aristocracy' represented by the (relatively) fully employed protestant population of East Belfast.

Both /a/ backing and /ɛ/ raising are relatively recent phenomena in Belfast (but see below), and both are associated with a background in Scots. Patterson's account of Belfast shows characteristics of conservative rural Scots lexical distribution, much of which appears to have been residual and is now obliterated by restructuring. However lengthening and raising of /ɛ/ and backing of /a/ are modern Scots. Gregg's (1972) account of Ulster Scots gives overwhelmingly back realizations of /a/ and describes /ɛ/ as often long in realization (contrast the very short low realizations in conservative Belfast vernacular, such as [stap, ʤat] for *step, jet*). Similarly, /a/ backing seems to be a very general modern Scots feature (Lass, 1976). East Belfast adjoins the Ulster-Scots region of North Down (where backing is strong), whereas West Belfast points south-west down the Lagan Valley, the speech of which is Mid-Ulster with less Scots influence; furthermore, immigration to West Belfast is recent and is largely from a Mid- and West-Ulster non-Scots hinterland. Present day quantitative studies in Lurgan, a small country town south-west of Belfast in the Lagan Valley, confirm the existence of an /a/ system with little backing (front vowels have been noted in that area even before [r] and finally), which is quite similar to Patterson's 1860 account of Belfast in this respect (Pitts, 1982).

Finally, we must note that if we take a general overview, these two vowels appear to be moving away from one another in phonetic space, rather than in the same direction (as we would expect, e.g. in a chain-shift). We are not in this paper primarily concerned with the embedding of changes in language systems (and arguments based on this could suggest that one change – /ɛ/ raising – is slightly more recent in origin than the other), but we may comment that if data for individual speakers and homogeneous groups are examined, the overall picture of vowels moving away from one another does not appear so prominently as it does when we focus on the language rather

than the speaker. Speakers who have [ɛ] raising tend to have more fronted realizations of /a/ (these speakers are often female), and those who have lower realizations of /ɛ/ are more likely to have [a] backing (these speakers are often male). Thus, an account based on what speakers actually *do* looks very different from a generalized account of change in the language system.

In the next section, we move from an account of the language system to a discussion of speakers and their social role in phonological innovations.

4. SOCIAL NETWORK STRUCTURE AND SPEAKER INNOVATION: AN ANALYSIS OF /a/ AND /ɛ/

In addition to the variables of age, sex and status discussed in Section 3, a further social variable associated with a speaker's DEGREE OF INTEGRATION into his closeknit community appeared to affect the probability of his being linguistically innovative with respect to choice of vowel variants.

Generally speaking, it seems to be true that the closer the individual's ties to a local community network, the more likely he is to approximate to vernacular norms (see L. Milroy, 1980, for details). Following some well-developed anthropological findings, we have suggested that a closeknit network has an intrinsic capacity to function as a norm-enforcement mechanism, to the extent that it operates in opposition to larger scale institutional standardising pressures. One corollary of this capacity of a closeknit network to maintain linguistic norms of a non-standard kind is that the LOOSENING of such a network structure will be associated with linguistic change (L. Milroy, 1980: 185; Gal, 1979). It is the implications of that corollary on which we concentrate here.

A major point emerging from our earlier analysis of language/network relationships was that the variable NETWORK needed to be considered in relation to the variable SEX OF SPEAKER. Indeed, as Gumperz has remarked (1982: 71), the network variable is in general closely associated with many others, including generation cohort, geographical location, and social status. Thus, our next task here is to pick out briefly the relevant parts of our analysis of the social distribution of innovatory realizations of /a/ and /ɛ/, as identified in Section 3.

First of all, realizations of /a/ and /ɛ/ are strongly affected by the variable SEX OF SPEAKER. Thus, although incoming variants of both vowels appear to have originated in the same hinterland Scots dialect, each has assumed a diametrically opposed SOCIAL value in its new urban setting.

Raised variants of /ɛ/ are, in the low status inner city, associated particularly with women and with careful speech styles. They are also associated generally with slightly more prestigious OUTER city speech, and data collected by survey methods confirms that the higher the status of the speaker, the more likely he is to use raised variants (see Milroy *et al.*, 1983). Different levels of use according to SEX OF SPEAKER are particularly evident

in Ballymacarrett, where it appears to be YOUNGER FEMALE speakers who are most strongly associated with the incoming raised variants.

The incoming variants of /a/ show an almost perfectly converse pattern of social distribution. High levels of backing are associated with males (particularly Ballymacarrett males, although levels in other inner city areas are still quite high) and with casual styles appropriate to interaction between peers. The most extremely backed variants do not appear at all in outer city speech. Interestingly, the sex differentiation pattern across the three inner city areas is not as consistent for /a/ as it is for /ɛ/; there is some indication that the young Clonard WOMEN are increasing their use of backed realizations when compared with other female groups (see Table 4). They also use these variants MORE than their male counterparts although they follow the expected sex differentiation patterns with respect to other phonological variables (see Section 6 below for a discussion of the Clonard pattern).

In summary then, it appears that incoming variants of /a/ are associated with core Belfast vernacular, while incoming variants of /ɛ/ are associated with careful higher status speech.

If we look at the relationship between speaker choice of variant and individual network structure, the picture becomes even more complicated. With respect to both vowels, choice of variant shows a correlation with personal network structure in some subsections of the inner city communities; but the details of this correlation are quite different for each vowel.

The vowel /a/ is particularly sensitive to variation according to the network structure of the speaker; but WOMEN appear to correlate their choice of variant more closely with their personal network structure than do men. This means that among women a relatively large amount of /a/ backing is more likely to be associated with a high level of integration into the network than is the case among men – a relationship analysed by Spearman's Rank Order Correlation (L. Milroy, 1980: 155). Although, as we have noted, women are much less likely than men to select back variants of /a/, this generally lower level of use does not prevent individual women from varying their realization of /a/, within the female norms, according to their social network structure. Thus, the DEGREE OF FIT between phonological choice and network structure may be seen as an issue quite separate from the ABSOLUTE LEVEL OF USE of a particular range of variants. We may thus argue that /a/ functions for women as a NETWORK MARKER to a greater extent than it does for men; by this we mean that there is for them a higher correlation between choice of variant and network structure, a tendency to select relatively backed variants being associated with higher levels of integration into the community.

When we look at the relationship between choice of /ɛ/ realization and individual social network structure, we find a pattern emerging converse to the one described for /a/; recall also that the incoming variants of the two

vowels showed an almost converse social distribution with regard to status, sex of speaker, and speech styles.

Most importantly, there appears to be no tendency at all for women to use /ɛ/ as a NETWORK MARKER in the sense described above; but there is a significant correlation between network scores of MALE speakers (particularly young male speakers) and choice of /ɛ/ realization. A tendency to select relatively LOW (conservative) variants is associated with a relatively high level of integration into the community (see L: Milroy, 1980: 155 for details).

This complex relationship between network structure, sex of speaker and language use is summarised in Table 5. However, our interest here is in a

	Change led by	High correlation with network strength
/a/	Males	Females
/ɛ/	Females	Males

Table 5
Contrasting patterns of distribution of two vowels involved in change, according to sex of speaker, relative frequency of innovatory variants and level of correlation with network strength

generalization which we are now able to make concerning on the one hand the relationship between language and network structure, and on the other the social identity of the innovating group. IN THE CASE OF BOTH /ɛ/ AND /a/ IT IS THE PERSONS FOR WHOM THE VOWEL HAS LESS SIGNIFICANCE AS A NETWORK MARKER WHO SEEM TO BE LEADING THE LINGUISTIC CHANGE. It is as if absence of this language/network relationship (a relationship that fulfils a cohesive social function) enables a particular social group to adopt the role of linguistic innovators. This appears to be the case regardless of whether the innovation is evaluated by the wider urban community as being of high or of low status. For although it is clear that /ɛ/ raising is diffusing on a much broader social front than /a/ backing, the generalization still seems to hold true that it is those persons in the inner city for whom the vowel functions less clearly as a network marker who are the principal innovators into their own communities.

It is important to note that even though backed variants of /a/ are strongly emblematic of vernacular speech, they are nevertheless spreading to higher status groups in the wider community. But this diffusion is being implemented in a manner very different from that affecting /ɛ/. We have noted that [ɛ] raising is characteristic both of low-status female speech and more generally

of higher status speech. The diffusion of [ɛ] raising on this wide social front is confirmed both by linguistic survey data and by more detailed outer-city community studies.

When we look at the social distribution of variants of /a/ (on which see J. Milroy, 1982a) we find by way of contrast that higher status Belfast speakers avoid both extreme front AND extreme back realizations, as they converge around Cardinal Vowel 4 in the middle of the phonetic range. However, a very interesting group of young, male, middle-class speakers can be identified in the sample of speakers studied in the survey. They also show the characteristic middle-class tendency to converge around a limited phonetic area, with relatively little conditioned variation. However, phonetically, the point at which they converge is further back than that characteristic of older middle-class speakers.

It appears therefore that the mechanism of diffusion associated with each of the vowels is different. Raised variants of /ɛ/ are apparently spreading in a linguistically ordered way, with 'long' environments affected first. For many outer-city and middle-class speakers, a raised vowel is already categorical in all environments. Although backed variants of /a/ appear to be diffusing historically and laterally (through the low status inner-city communities) in a linguistically ordered manner parallel to the processes affecting /ɛ/, the mechanism of diffusion upwards (socially) through the community is quite different. What seems to be involved here is a 'drift' phonetically to the back of the characteristic middle-class realization.

The data presented here suggest that social network structure is implicated in processes of linguistic change in at least two ways. First, a strong closeknit network may be seen to function as a conservative force, resisting pressures to change from outside the network. Those speakers whose ties are weakest are those who approximate least closely to vernacular norms, and are most exposed to pressures for change originating from outside the network.

Second, a detailed sociolinguistic analysis of [ɛ] raising and [a] backing – processes which have a common dialectal point of origin but have taken on very different social values in their new urban context – suggests that the VERNACULAR speakers associated most strongly with the innovation are in each case those for whom the vowel functions least prominently as a network marker. It is as if a strong relationship between the network structure of a given group and choice of phonetic realization of a particular vowel disqualifies that group from fulfilling the role of innovators with respect to that vowel. Conversely, it may be the case that dissolution of the language/network relationship with respect to a group of speakers is a necessary condition for that group to fulfil the role of linguistic innovators.

Both of these observations suggest that since the variable NETWORK STRUCTURE is implicated in a negative way in linguistic change, a closer examination of WEAK network ties would be profitable. For it might well be

that it is speakers who lack strong network ties or are loosely attached to closeknit groups who are characteristically linguistic innovators.

The problem is that a general weakness of social network analysis is its superior ability to handle CLOSEKNIT ties as opposed to weak, diffuse types of network structure. This difficulty arises from the fact that personal networks are in principle unbounded; the number and strength of ties which bind an individual to others are not, in the last analysis, definable. However in closeknit territorially defined groups it is possible to treat personal networks AS IF they were bounded groups (see Milroy, 1980: Ch. 3) whereas in socially and geographically mobile sectors of society this is not feasible. Our own work has reflected this in that it has concentrated on the function of closeknit ties, observed within a defined territory, as an important mechanism of language MAINTENANCE. Yet, it is evident that a very large number of speakers, particularly in cities, do not have personal social networks of this type. We have suggested that, in British society at least, closeknit networks are located primarily at the highest and the lowest strata, with a majority of socially and geographically mobile speakers falling between these two points. (But see Kroch, M.S., for an interesting study of a closeknit upper-class AMERICAN network). Significantly, Labov and Kroch have noted that in the United States linguistic change seems always to originate and diffuse from some point in this central area of the social hierarchy – never from the highest or the lowest social groups (Labov, 1980; Kroch, 1978).

Thus, despite the difficulties of studying looseknit network ties in the outer city using the methods adopted in the inner-city areas, a search for some other means of following through their evident association with linguistic change seemed well worthwhile.[5] This cannot be accomplished by analysing statistically relationships between language and network, as was possible in the inner city communities, simply because there is no obvious way of characterising quantitatively looseknit uniplex ties which extend over vast distances and are often contracted with large numbers of others. Indeed, such an undertaking might be neither possible nor desirable, given the very different role fulfilled by the closeknit groups at either end of the social hierarchy in maintaining polarised sets of linguistic norms. It is certainly not clear that quantitative examination of the looseknit networks contracted by a majority of speakers in the centre of that hierarchy would be particularly illuminating.

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[5] The initial difficulties were the practical ones which might be predicted. We found that network ties of outer-city individuals in the key network sectors of kin, friendship and work often straggled over extensive areas. Conversely, ties of neighbourhood, which were crucial in the inner city, often seemed not to be significant, since people frequently hardly knew their neighbours. Thus, in the inner city, where ties were dense and territorially bounded, it seemed reasonable to study community linguistic norms using a network model which was itself part of a theory of language maintenance. But it was not at all clear what kind of hypothesis we might derive from a comparable study in the outer-city areas – or even what might constitute a comparable study.

We therefore proceed to examine the relationship between looseknit network ties and linguistic change in quite a different way. First, a theoretical model of the social function of 'weak' network ties is presented; second, we look at the social characteristics of innovators in general, and on this basis suggest a new model of linguistic innovation and diffusion.

5. WEAK TIES AND INNOVATIONS

The discussion in this section depends heavily on a suggestive paper by Granovetter (1973), who sees 'weak' ties between individuals as important links between micro-groups (small, closeknit networks) and the wider society. Perhaps it is best at this point to grasp the nettle, and attempt a definition of what is meant by 'weak' and 'strong' ties, for this contrast cannot easily be characterized quantitatively. Granovetter suggests the following: 'the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding) and the reciprocal services which characterise a tie' (1361). Note that by this measure multiplex ties – i.e. those with multiple content – would be counted as relatively strong; the notion of multiplexity was an important basis of the network strength measures used in the Belfast inner-city studies.

Granovetter's definition is probably sufficient to satisfy most readers' intuitive sense of what might be meant by a 'strong' or 'weak' interpersonal tie, corresponding as it (approximately) does to an everyday distinction between an 'acquaintance' and a 'friend'. It is certainly satisfactory for our purpose here.

Granovetter remarks that most network models deal implicitly with small, well-defined groups WITHIN which many strong ties are contracted (cf. p. 363 above). His fundamental argument is that weak ties BETWEEN groups provide bridges through which information and influence are diffused, and that weak ties are more likely to link members of DIFFERENT small groups than strong ones, which tend to be concentrated WITHIN particular groups. Thus, while strong ties give rise to local cohesion, they lead, paradoxically, to overall fragmentation.

Only weak ties can form a bridge between cohesive groups, for the following structural reason (which Granovetter expresses as a hypothesis and initially supports by aprioristic argument rather than by adducing empirical evidence):

If we consider two arbitrarily selected individuals, A and B and the set S, consisting of C, D, E...of all persons who have ties with either or both of them, the stronger the relationship between A and B, the more the networks of each are likely to overlap. Extensive overlap, which will inhibit the flow of NEW information between A and B, is predicted to be least when the A–B tie is absent and to increase in proportion to its strength. This relationship between network overlap and strength of tie results largely from the tendency

for strong ties to involve more time commitment; for example if A spends a large proportion of his time with B, it is likely that this time investment will bring him ultimately into contact with the individuals C, D and E who initially formed part of B's network. Conversely, the networks of A and B are less likely to overlap if the tie between them is weak, and so we may derive the more general (and for our purpose more important) principle that links BETWEEN closeknit groups are normally WEAK ties between the individuals who have contracted them. These weak ties between non-overlapping groups provide important bridges for the diffusion of innovations.

Examining various likely and unlikely configurations of strong and weak ties, Granovetter notes that individuals vary in the proportion of each which they contract. While not all weak ties function as bridges between groups, all bridges must, Granovetter suggests, be weak ties. For the sake of the argument, a bridge is defined as the ONLY route through which information flows from A to B, or from any contact of A to any contact of B (see Figure 2).
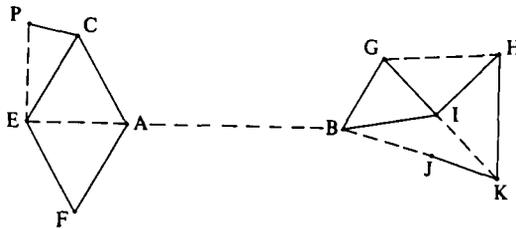

Figure 2
A bridge between two networks. ----, Weak ties; ——, strong ties.

Granovetter's interest is in exploring the interpersonal mechanisms which connect small groups to each other and to a larger society, and his model predicts that innovation and influence will flow through weak ties rather than strong ones. It is the relationship between strength of tie and network overlap which leads him to suggest that NO STRONG TIE CAN BE A BRIDGE. And while it must be acknowledged that in practice there is likely to be more than one link between groups of any size, the principle that these links are likely to be weak is of great importance here. Weak intergroup ties, by Granovetter's argument, are likely to be critical in transmitting innovations from one group to another, despite the commonsense assumption that STRONG ties fulfill this role (see for example Downes (1984: 155) who suggests that networks may be important in developing a theory of linguistic diffusion, but assumes that it is strong ties which will be critical).

Although Granovetter's principle might at first seem counter-intuitive and paradoxical, a little thought confirms that it works out well empirically. First of all, it is likely (in the networks of mobile individuals at least) that weak ties are more numerous than strong ties. Second, it is clear that many more individuals can be reached through weak ties than through strong; consider

for example the number of contacts made by a salesman in the course of his business, during which he builds up an elaborate structure of bridges. Consider also the elaborate bridges set up by participants at academic conferences, which link the cohesive groups associated with each institution. It is *via* these bridges that new ideas pass from one institutional group to another. Conversely, information relayed through strong ties tends not to be innovatory; as Granovetter remarks, 'If one tells a rumour to all his close friends and they do likewise, many will hear the rumour a second and third time, since those linked by strong ties tend to share friends' (1366). But it is evident that genuine diffusion of the rumour will take place if each person tells it to acquaintances with whom he is only weakly linked; they in turn will transmit it to a large number of non-overlapping groups, so that the 'retelling effect' will not occur.

It has often been noted (see, for example, Turner, 1967) that a closeknit network structure will usually not survive a change of location, and it is clear in general that social or geographical mobility is conducive to the formation of weak ties. Moreover, a mobile individual's weak ties are likely to be much more numerous than his strong ties. If a man changes his job, he is not only moving from one network of ties to another, but establishing a link between each relatively cohesive group. Thus, mobile individuals who are rich in weak ties, but (as a consequence of their mobility) relatively marginal to any given cohesive group are, it is argued, in a particularly strong position to diffuse innovation. Note that this contention is in line with the traditional assumption by historians of language that the emergent, mobile merchant class were largely responsible for the appearance of Northern (and other) dialectal innovations in Early Modern (Standard) English (see, for example, Strang, 1970: 214 f.; Ekwall, 1956; Baugh & Cable, 1978: 194); if it is correct, Granovetter's principle that the overlap of two individuals' social networks varies directly with the strength of their tie to one another has considerable implications for any theory of diffusion. (Strength of tie is of course a continuous variable although 'weak' and 'strong' ties have been treated here as if they were discrete.) It might appear that this relatively clear hypothesis could easily be supported or disconfirmed empirically; but unfortunately network or sociometric studies cannot easily be used directly as a source of corroboratory (or disconfirmatory) evidence simply because their research design usually entails relative neglect of weak ties. Thus, for example, when persons are asked to name others from whom they have received information (or friendship, as in Labov's 'lames' study) the number of permitted choices is usually restricted so that the naming of weak ties is effectively inhibited. Even if the research design permits identification of persons with weak ties to specified others, as did our own (see Milroy, 1980, for details), it is extremely difficult to study those ties just because they ARE weak and perceived as relatively unimportant to EGO.

Fortunately, empirical evidence to support Granovetter's model has emerged from elsewhere – notably Rogers' and Shoemaker's (1971) study of the diffusion of around fifteen hundred innovations. Some general principles can be extracted from this large body of empirical evidence which tend to support Granovetter's contention that innovations first reach a group *via* weak ties.

A distinction discussed in some detail by the authors is between INNOVATORS and EARLY ADOPTERS of an innovation. This distinction turns out to be important whether the innovation is agricultural (the introduction of hybrid seed corn to an Iowan community); technological (machinery to engineering firms); educational (new methods of mathematics teaching); or concerned with public health (introducing the habit of boiling contaminated water to Peruvian villagers). There is even an early linguistic study of the introduction of lexical innovations to an oilfield (Boone, 1949). All of these studies, and very many more, confirm the principle that INNOVATORS are marginal to the group adopting the innovation, often being perceived as underconforming to the point of deviance.

The EARLY ADOPTERS of the innovation are, on the other hand, central members of the group, having strong ties within it, and are highly conforming to group norms; they frequently provide a model for other non-innovative members of the group. After its adoption by these central figures (from more marginal persons), an innovation is typically disseminated from the inside outwards with increasing speed, showing an S-curve of adopter distribution through time. While it is clear that linguistic innovations differ in a number of respects from, for example, technical innovations (see Trudgill, 1983: 63, for a discussion), they do not appear to be DIFFUSED by mechanisms markedly different from those which control the diffusion of innovations generally. For linguistic innovations also show this characteristic S-curve of distribution through time (see Chambers & Trudgill, 1980: 176–181; Bailey, 1973).

Bearing in mind the norm-enforcing character of a group built up mainly of strong ties, and its consequent lack of susceptibility to outside influence, we can see why innovators are likely to be persons who are weakly linked to the group. Susceptibility to outside influence is likely to be greater in inverse proportion to strength of tie with the group and by implication also in inverse proportion to susceptibility to norm-enforcing pressure from the group. Thus, where groups are linked by many weak ties they will be susceptible to innovation partly for this (social) reason, and partly because innovation is for structural reasons unlikely to be transmitted *via* a strong tie (see pp. 364–365 above).

Persons at the centre of a norm-enforcing group (i.e. persons who share strong ties within it) will, as a corollary, not be susceptible to outside pressures. Because of the investment in time and commitment needed to maintain these strong ties, they will almost certainly lack opportunities to

form many bridges (weak ties) with other groups. Thus, typically, for these various reasons, innovators (as opposed to early adopters) will be persons marginal to their community, with many weak ties to other groups.

It appears at first to be difficult to explain how these marginal innovators could diffuse innovations successfully to central members of the group; but two related points can help us here. First, in view of the very general finding of sociolinguistic research that the prestige values attached to language are often quite covert and difficult to tap directly, we may suggest that a successful innovation needs to be evaluated positively, either overtly or covertly. This is of course a necessary but not a sufficient condition for its ultimate adoption, and is binding on non-linguistic innovations also.

Second, we may surmise with Granovetter that since resistance to innovation is likely to be great in a norm-conforming group, a large number of persons will have to be exposed to it and adopt it in the early stages for it to spread successfully.

Now weak ties are, in a mobile society, likely to be very much more numerous than strong ties, and some of them are likely to function as bridges to the group from which the innovation is flowing; thus an innovation like the Cockney merger between /v/:/ð/ and /f/:/θ/ reported in teenage Norwich speakers by Trudgill (1983: 73) is likely to be transmitted through a great many weak links contracted between Londoners and Norwich speakers. Quite simply, before it stands any chance of acceptance by the central members of a group, the links through which it is transmitted NEED to be numerous (cf. Granovetter, 1973: 1367).

Returning to our first point, we assume that some kind of prestige, either over or covert, is associated with the innovation. In other words, Norwich speakers, whether they are marginal or central to their local groups, in some sense view vernacular London speech as desirable – more desirable than the speech of other cities.[6] Again, following through the arguments presented in this section, we suggest that persons central to the network would find direct innovation a risky business; but adopting an innovation which is already widespread on the edges of the group is much less risky. Thus, instead of asking how central members of a group are induced to accept an innovation from marginal members, we can view this as a sensible strategy on their part. In order to adopt an innovation which is seen as desirable, they diminish the risk of a potentially deviant activity by adopting it from persons who are already linked to the group, rather than by direct importation.

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[6] The merger between dental and labio-dental fricatives has been noted in the speech of Sheffield adolescents also. By the reasoning which we are using here, we must assume first that weak ties exist between Sheffield adolescents and London speakers and second (crucially) that London speech has some kind of prestige for Sheffield speakers. Although we cannot at this stage enumerate the factors which give rise to covert attitudes of this kind, it seems reasonable to suggest that for reasons of (for example) local loyalty, combined with perceptions of relative autonomy, not all cities will share them.

We are now in a position to relate the substantive points emerging from this discussion to earlier arguments concerning the relationship between social network structure and linguistic change. It is clear that the link noted earlier between the dissolution of closeknit networks and the susceptibility of a group to linguistic change fits in with the observations of Granovetter and Rogers and Shoemaker. Further, we showed that the groups most strongly associated with the diffusion of the innovative raised /ɛ/ and backed /a/ variants appeared to be those very groups who tended least to use these phonological elements as 'network markers'. It is likely that the social locus of the innovations is, at least in part, a consequence of the use a given group is making (or failing to make) of them as network markers.

If we return to Labov's discussion of the actuation problem (see pp. 342–343 above), it is clear that the model elaborated here does not entirely agree with his account of the individuals who actuate linguistic change, i.e. introduce an innovation to a definable group. Recall that they are described as persons who have high prestige and a large number of ties BOTH INSIDE AND OUTSIDE the small local group. They do not sound at all similar to the typical innovator, described by Rogers and Shoemaker as underconforming to the point of deviance.

One serious difficulty appears to be that there is apparently no easy way for empirical studies of linguistic change in progress (particularly phonological change) to make the crucial distinction between INNOVATORS (who are socially marginal) and EARLY ADOPTERS (who occupy a central position in the network). We can only track an innovation through historical, geographical and social space, finally linking it with a specific group. It is not clear how, without being able to pinpoint the time of the first introduction of an innovation to a community, we could identify this group confidently as innovators on the one hand or early adopters on the other. But it is important in principle to distinguish between the two groups and it seems likely that phonological innovation will already have begun to diffuse throughout the group if it is sufficiently well established to be observable. We shall shortly discuss this question in relation to the group which appears to be leading the change to /a/ backing in the Clonard, Belfast.

Most probably, the persons described by Labov are EARLY ADOPTERS. But there is still a problem in that it is not at all clear how their group–internal ties could be strong when they have simultaneously a large number of such ties (relative to others) and a high proportion of ALL their ties outside the group. One difficulty in assessing Labov's work from the perspective we have adopted here is that he seems to rely fundamentally on the explanatory power of the notion of the PRESTIGE of the innovators, paying less attention to the content or structure of INTERPERSONAL LINKS. We have argued, on the other hand, that although a successful innovation needs in some sense to be positively evaluated, generalizations can be made about the social mechanisms controlling innovation and diffusion quite independently of the prestige value

attached to any given innovation (see the discussion of /a/ and /ɛ/ in Section 4 above). Despite these difficulties arising partly from differences in theoretical orientation, the persons described by Labov do in fact correspond reasonably closely to Rogers' and Shoemaker's account of highly conforming individuals with strong ties inside the group who serve as models to others. What is clear is that the marginals who are identified as typical innovators are precisely the kind of individuals to whom Labov, in the best tradition of small-group studies, is likely to pay little attention. In fact, they closely resemble the famous 'lames' of the Harlem study, who belong centrally neither to the community youth networks nor to other networks outside the community. They are marginal to both, providing a tenuous link between them.

We thus emerge with a model of linguistic innovation and diffusion which at first sight seems counter-intuitive, although we have tried to suggest at various points that it agrees reasonably well with historical and sociolinguistic observations. Specifically, it is suggested that at the small group level linguistic innovations are transmitted across tenuous and marginal links. Thus, for the very reason that persons who actuate linguistic change may do so in the course of fleeting, insignificant encounters with others occupying a similarly marginal position in their social groups, direct observation of the actuation process may be difficult, if not impossible. What we most probably CAN observe is the take-up of the innovation by the more socially salient EARLY ADOPTERS.

At the macro-level, societies undergoing social processes which entail social and geographical mobility and the dissolution of closeknit networks (processes associated with industrialization) provide the conditions under which innovations can be rapidly transmitted along considerable social and geographical distances (see Trudgill (1983, Chapter 3) for a relevant study of geographical diffusion).

Bearing in mind the difficulty of studying directly the early stages of an innovation, we proceed now to assess the usefulness of the model developed here. Specific problems associated with innovation and diffusion are discussed, first at the level of small groups and then at the level of larger national communities.

6. WEAK TIES AND LINGUISTIC CHANGE: A MICRO-LEVEL EXAMPLE

The possible explanatory value of a theory of weak ties can be considered in relation to observed patterns of language variation. In certain cases, these patterns are difficult to explain in terms of the usual assumptions about linguistic diffusion, *viz.* that it is encouraged by frequency of contact and relatively open channels of communication, and discouraged by boundaries of one sort or another, or weaknesses in lines of communication (see, for example, Labov (1974b) for an empirical study which links the location of dialect boundaries with a trough in north–south links).

In Belfast, two instances stand out which are difficult to explain in this apparently common-sense way. They are (i) the social configuration of the spread of /a/ backing from the protestant east of the city into the Clonard, a West Belfast catholic community and (ii) the city-wide younger generation consensus on evaluation of variants of the (*pull*) variable (as against greater variability in the older generation). Details of these variables, referred to as (a) and (ʌ), are most easily accessible in Milroy & Milroy (1978), and details for /a/ are also given in Table 4 (above, p. 357) and Figure 3.

(a) index score

350

300

250

200

150

Men 40–55   Women 40–55   Men 18–25   Women 18–25

C
H
B
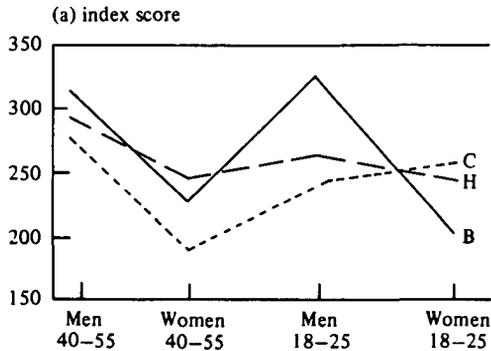
Figure 3
Backing of /a/ in Ballymacarrett, the Clonard and the Hammer.

The backing of /a/, as we have seen, is led by East Belfast males: this much is indicated by Table 4. However, as the significance of the details in Table 4 is difficult to interpret, we discuss them briefly here in the light of the general argument of this paper. Figure 3 is a diagrammatic representation of the spontaneous style pattern for all three inner-city communities; it shows the 'cross-over' pattern that tends to characterize change in progress (Labov, 1972a). The change appears to be carried, not by West Belfast protestant males (as might be expected), but by the younger FEMALE group in the CATHOLIC Clonard community. This is the group that exhibits the cross-over pattern.

It may be objected, however, that there is a moderately high incidence of backing amongst older Clonard males, even though this group shows no stylistic differentiation (on which see below). But it is the young Clonard females who REVERSE THE GENERALLY EXPECTED PATTERNS. Amongst them, the city-wide female pattern (away from /a/ backing) is reversed: the incidence of /a/ backing in this group is higher than in older and younger female groups, higher than in the older Clonard female group, and – surprisingly – higher than amongst their younger male counterparts in the Clonard area. When measured against other groups, these young women appear to be reversing a trend.

When STYLISTIC patterning is additionally taken into account, it is clear that

this young female group is the only Clonard group with significant stylistic differentiation on the East Belfast model (see Table 4). Their usage is innovatory in West Belfast in that the social value attached by them to the variants is the same as the social evaluation evident in the East Belfast data, but not well established in the west of the city. Thus, while superficial consideration of the figures cited might suggest that the young Clonard female pattern is modelled on older Clonard males, such an explanation would not account for reduction of /a/ backing in other groups, nor would it account for the use of (a) as a stylistic marker by the Clonard girls.

The social barriers that inhibit contacts between working-class communities have been well described (see for example a discussion of this work in L. Milroy, 1980) and it is clear, as Boal (1978) has shown, that the inter-community conflict in Belfast has strengthened these barriers. In fact, the major traditional sectarian boundary in West Belfast is now marked physically by a brick and barbed wire structure, which is described by the military authorities, apparently without intentional irony, as 'The Peace Line.' The puzzle is, that an East Belfast pattern can be carried across these boundaries, evidently by a group of young women whose physical movements and face-to-face contacts have been constrained from a very early age. It is clear that the diffusion of patterns of /a/ backing from east to west, pro-gressing in a linguistically and stylistically ordered manner, is a continuation of the long term shift in the Belfast vowel system (together with the social values attached to it) described in Section 3. That this shift is continuing apparently unhindered across the iron barriers, both physical and psycho-logical, which separate protestant East and catholic West Belfast, is a fact for which up until this point we have not felt able to propose any principled explanation.

The continuation of the change may now be considered in terms of the claim that INNOVATORS who are marginal to a group introduce innovations, to EARLY ADOPTERS who are central figures within that group. The innovation is likely to be transmitted by means of weak, rather than strong, ties.

In addition to scoring high on /a/ backing – a score reflecting both quantitatively and qualitatively the speaker's choice of realization – the Clonard girls scored extremely high on the Network Strength Scale, which was designed to measure relative centrality of position in the closeknit group. Hence, they resemble Rogers' and Shoemaker's EARLY ADOPTERS rather than, strictly, INNOVATORS.

As described in L. Milroy (1980), the girls were all in employment and were all associated with the same rather poor city-centre store. This store was located in North Street, a shopping area on the sectarian interface which served both protestants and catholics, mainly those living west of the river (the girls' male counterparts contrasted sharply with them in being un-employed and scoring low on network strength).

We need to emphasize at this point that when we argue, with Boal, that

there are few ties between working-class groups in Belfast we mean more properly that there are few STRONG TIES such as those of kin, friendship or work, particularly across the sectarian divide. But there are plenty of weak ties (to which we have hitherto paid little attention) between, on the one hand, West Belfast catholics and protestants and on the other, between East and West Belfast protestants. Some of the settings in which they regularly meet are (as reported by informants in the inner city study) shops, hospital waiting rooms, social security offices and job centres. The Clonard girls working in the shop would be extremely well placed to adopt innovations transmitted by persons on the edge of their network who in turn provided weak links with other communities. We have already argued that if an innovation is to stand any chance of adoption, these weak tie encounters would need to be frequent – that is, they would need to be with a large number of back [a] users. It may be surmised, given the number of service encounters in the shop in any one day, that weak-tie encounters with back [a] users who transmit the innovation will greatly exceed in number strong-tie encounters with non-back [a] users. Hence the capacity of innovation-bearing weak ties to compete with innovation-resisting strong ties.

If we have a theoretical perspective such as the one developed here, which explicitly predicts that an innovation will be transmitted through weak ties, perhaps in casual service encounters perceived by participants to be of no affective value, the back [a] diffusion problem dissolves. The problem arises in the first place only if we assume that strong ties must be involved in diffusion of innovations; for in that case, a search for an explanation in casual encounters in waiting rooms, shops and dole queues looks like the worst kind of *ad hoc*-ery.

The second puzzle concerns the (*pull*) variable, which is associated with a small number of lexical items alternating between the two phonological classes /ʉ/ and /ʌ/ – examples are *pull, push, took, shook, foot*. The complex history of this subset (see J. Milroy 1980 for details) is apparently reflected in great instability among all but the younger inner city speakers both with regard to the specific lexical items assigned to one or another of the phonological sets, and with regard to the social value assigned to the [ʌ] variant. Thus, for example, some speakers explicitly stigmatized [ʌ] realizations of items like *pull* and *push*, while others, in so far as they used an [ʌ] realization for reading them on a word list, apparently considered forms like [pʌl] and [pʌʃ] to be 'correct'. Overall, [ʌ] realizations were particularly frequent in the Clonard, especially among the older women and even in careful styles.

When we turn to the younger generation, the picture changes radically, as can be seen from Figure 4. What this diagram reflects is a process of lexical diffusion, whereby items which alternate between [ʌ] and [ʉ] realizations are gradually stabilising in the /ʉ/ set. But the few items which continue to alternate have assumed very considerable sociolinguistic significance, the [ʌ] realizations being perceived as strongly symbolic of Belfast working class
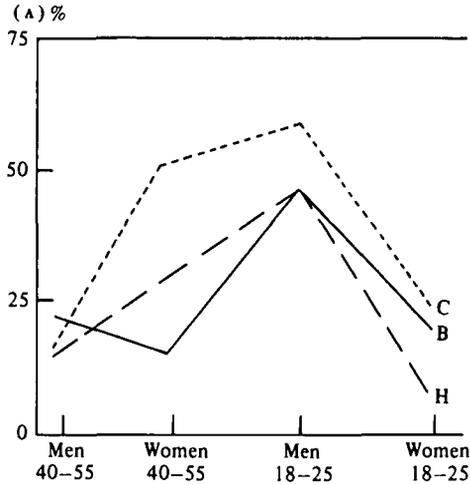
Figure 4
Distribution of the (*pull*) variable (% of [ʌ] variants are shown) by age, sex and area
in inner city Belfast.

language and culture. As such, they are consistently used by young men very much more than by young women, as Figure 4 shows.

The puzzle is of course how young people living in the closed communities of Ballymacarrett, Clonard and Hammer, whose contact with others outside their areas has been only of a very tenuous kind, have come to reach cross-community consensus on the social value to be assigned to the two variants of the (*pull*) variable. Paradoxically their parents, who formed friendships much more freely across sectarian and community boundaries (until the beginning of the civil disorders in 1969), still showed considerable variation both in the use and the evaluation of the variable. This variability was apparently in the first place partly a consequence of the different phonologies of various hinterland dialects. Yet, the process of lexical diffusion and the absorption of the (*pull*) variable into the regular socio-linguistic structure of Belfast's urban dialect continued unhindered, apparently unaffected by the inability of the younger generation to contract any strong interpersonal ties across the sectarian divide. For it is these youngsters, and not their parents, who show dramatic agreement on the form which these sociolinguistic patterns should take.

Although there is still a great deal to explain about the changing distribution of a complex phono-lexical set like (*pull*), the question of how city-wide consensus on its use and evaluation was reached by the younger speakers does not now seem puzzling. Like the diffusion pattern of /a/ backing, the (*pull*) problem dissolves if we accept that weak ties are the normal channel for diffusion of innovations.

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Having discussed these details of change and diffusion in present-day Belfast, we turn in the next section to the place of weak ties in long-term language change.

7. WEAK TIES AND LANGUAGE CHANGE: A MACRO-LEVEL EXAMPLE

It is well known that in the course of history some languages have changed more radically than others. In the Indo-European family, certain languages, such as Lithuanian, are acknowledged to be highly conservative, whereas others (e.g. English, Dutch, French, Portuguese) have diverged very markedly from their ancestral forms. Furthermore, in the history of certain languages there have been periods of rapid change and periods of slow change. A comparison of the social and cultural conditions obtaining in periods of slow and rapid change should cast light on the social motivation of changes.

Many arguments have been adduced to account for large scale linguistic changes; for example, substratum theories and accounts of lexical, syntactic and phonological borrowing. Cultural factors have also been discussed, such as language contact following conquest and settlement of alien speakers. In recent decades much attention has been paid to pidginization and creolization (Todd, 1974), and pidgin languages are of course the paradigmatic case of linguistic instability; they can change very rapidly. As arguments based on substratum, conquest, etc., are not uniformly applicable to all situations, it may be that a more general condition (in line with the argument of this paper) can be proposed, that will encompass these varied situations. This can be stated as follows:

LINGUISTIC CHANGE IS SLOW TO THE EXTENT THAT THE RELEVANT POPULATIONS ARE WELL ESTABLISHED AND BOUND BY STRONG TIES, WHEREAS IT IS RAPID TO THE EXTENT THAT WEAK TIES EXIST IN POPULATIONS.

We can seek support for this hypothesis by comparing two languages that have changed at very different rates.

Amongst the Germanic languages, Icelandic and English provide a sharp contrast in rate of change and degree of variation. Whereas English has changed radically since the twelfth century and has at all recoverable periods exhibited gross dialectal variation, Icelandic has altered little since the thirteenth century and reportedly shows very little dialectal variation. Icelandic maintains a full inflexional system for case, number, gender, person, tense and mood; phonological change has been slight, involving two mergers of low functional yield and very minor consonant changes; phonetic changes include diphthongization of long vowels and some allophonic changes in consonants and vowels, but it is not clear how far these had already progressed in the Middle Ages (some fifteenth-century spellings already indicate diphthongization of certain long vowels presumably some time after

the changes had occurred). Change in English, on the other hand, is quite radical – amounting to a typological change from a highly inflected to a weakly inflected language. There are also many phonological changes, word-order changes and partial relexification from Romance and Classical sources (for a brief history see J. Milroy, 1984a).

Notice that the geographical isolation of Icelandic (although relevant) cannot be a sufficient explanation for its long-term conservatism. If geographical isolation were the most important factor, we should expect the dialects of Icelandic to have diverged considerably. Iceland is comparable in size with Britain, but the centre of the country is glaciated, and settlements are scattered around the coastal areas. The climate and terrain are such that in the Middle Ages little communication was possible in the winter months (conventionally October to April). According to the Icelandic sagas, the journey to the main assembly at Thingvellir could take weeks. In *Hrafnkels Saga*, the hero's journey from eastern Iceland to the west is described, and the writer comments:

Súðr ór Fljótsdal eru sjautján dagleiðir á Þingvöll
(South from Fljótsdal it is a seventeen day journey to Thingvellir).

Hrafnkel's rival, Sámr, had an even longer journey:

Ok fórsk honum því seinna, at hann átti lengra leið
(And his journey was so much slower in that he had a longer route).

A theory of change based mainly on the separation of communities would surely predict that varieties would diverge rapidly in these conditions. Our hypothesis on the other hand predicts that if widely separated communities maintain the same linguistic forms, ties between them must in some sense be strong, and evidence from the Icelandic family sagas (*c.* 1200–1300) seems to bear this out.

Iceland was colonized in the late ninth and tenth centuries by independently minded Norwegians, some of whom had settled in the Orkneys, Shetlands and Hebrides prior to their emigration to Iceland. There was little social stratification in the Icelandic Commonwealth: there was no aristocracy, and the feudal system had no effect until after the annexation of Iceland by the Norwegian crown in the late thirteenth century. Although Christianity was accepted officially in 1000, the temporal power of the Church appears to have been less than elsewhere. In Icelandic writings, the early missionaries are represented as thugs, and the status of priests seems for some time to have been hardly better than that of farm-servants. In short, institutional power seems in general to have been weak enough to allow informal kinds of social organization to flourish.

The thin population was widely distributed, but an early form of quasi-democratic government evolved. The country was divided into districts, and, in these, assemblies were held at which attempts were made to settle disputes

and pronounce judgment on wrong-doers. Every year, the national assembly (the *Althing*) was held at Thingvellir, near Reykjavík, and people would travel very long distances to this. Accounts in the sagas suggest that this institutional superstructure was not very successful in settling legal disputes, and it was certainly unable to carry out punishments. In order to get redress for offences, people were in practice wholly dependent on the support of their families and friends and those who had obligations to them. It was very important, in the absence of strong institutional power, that strong ties should be maintained with those who might help in a time of need.

The assemblies were, in practice, a means of maintaining strong ties across long distances, and the sagas further show the great importance that was attached to personal identity, kin and friendship. When a new character is introduced by the saga-writer, a paragraph or more is typically devoted to naming his parents and grandparents (and sometimes distant ancestors), his brothers and sisters, his wife and family (and sometimes other relatives). When a stranger appears in the story, he is often questioned about his name, his home, his relatives and his status. When Sámr, in *Hrafnkels Saga*, meets a stranger (who may be able to assist in a law-suit), he asks his name, whether or not he is a local leader (*goðorðsmaðr*) or farmer (*bóndi*), who his brothers are, and so on. The stranger's replies give more information than the modern reader might think necessary. In *Hrafnkels Saga*, the stranger tells Sámr that his brother's name is Þormóðr, that Þormóðr lives at Garðar on Álptanes and that he is married to Þórdís, who is the daughter of Þórólfr, son of Skalla-Grím, from Borg. This kind of exchange of information is typical of the saga; it is also typical of communities that depend on maintaining strong network links. Similar exchanges, the purpose of which is to declare identity, political affiliation and personal relationships, were reported by informants in the Belfast project (L. Milroy, 1980: 55); these informants were attached to strong territorially based social networks.

The conservatism of Icelandic and the relative lack of variation in that language may therefore be attributed largely to the great practical importance attached to maintaining strongly established kin and friendship networks over long distances and through many generations. As in the low-status communities described by Lomnitz (1977) and discussed by L. Milroy (1980: 70 ff), the patterns of exchange and obligation imposed by such network structures ensures practical support in time of need. Such a social structure (based on informal links) could flourish in medieval Iceland because of the inability of pan-European institutions (the Church and the feudal system) to establish their power fully. One of the results of this informal social structure is the imposition of linguistic norms on its members (in common with other norms). Hence the failure of the language to exhibit much change or variation, despite the difficulties of distance and terrain.

The history of English, which is dramatically different from that of Icelandic, can hardly be unaffected by population history. In early times, there

is a history of repeated incursions. Danish settlers in Eastern England in the ninth and tenth centuries found Old English (Anglo-Saxon) well established, whereas the contemporary Norwegian settlers in Iceland found an uninhabited country. The numerous Scandinavian place-names of Yorkshire, Lincolnshire and elsewhere strongly suggest that Danish-speaking communities survived in these areas for some time. If so, the ties contracted between the Danes and the English could not, for social and linguistic reasons, have been strong in the first place. The communication that must have taken place in the course of trade and farming seems to have been carried on in an Anglo-Danish contact language. This is indicated by the nature of the language that emerges in the Middle English texts of these eastern areas (e.g. *The Peterborough Chronicle*, 1137) which is an Anglo-Saxon-based language with gross inflexional loss, absence of grammatical gender, and partial reflexification from Danish and Norman French. On the other hand, the English of the West Midlands around 1200 – an area largely unaffected by the Danes – provides a startling contrast. The *Ancrene Wisse*, for example, is morphologically conservative (in that gender and case inflexions are largely retained), and Danish loanwords are very rare. Thus, we appear to have relatively rapid change in areas where pre-existing strong networks are disrupted and where influence through weak ties is made possible: on the other hand we have a conservative language in areas of the West Midlands where Anglo-Saxon institutions remained more stable, and where neither Danish nor Norman influence was initially strong.

The success of the Norman Conquest imposed a tight and organised administration on much of the country; rule was more centralized, and class divisions more fully institutionalized by the feudal aristocracy. While Iceland remained a yeoman democracy, England acquired an institutional system of social stratification.

One of the effects of stratification is the creation of social distance between sectors of the population. Two developments in English may be a general consequence of social distance and weak ties. The first is the character of relexification from Norman French. There is a rapid development of English/French synonyms of the type *child/infant, love/charity, board/table, stool/chair*: the French synonyms tend at first to be limited to more formal social contexts. The second development is the use of the polite pronoun of address, which was marked for status and social distance: it was used asymmetrically and non-reciprocally by inferiors to superiors. Brown and Gilman (1972) estimate that the non-reciprocal polite plural pronoun entered most European vernaculars between 1100 and 1300, with French very advanced in this respect. In Icelandic, this development is relatively late. It is unknown in the sagas of the Icelanders (*c.* 1200–1300) for use between Icelanders, although Icelandic adventurers (around 1300) are occasionally represented as addressing some European monarch with the polite pronoun.

It is not until chivalric sagas on non-Icelandic themes appear in the fourteenth century that the non-reciprocal polite pronoun becomes reasonably common in literature (often translated). As far as we are aware, there is no indication that, at this date, native Icelanders used it amongst themselves.

A final development in England that tended to encourage the break-up of strong ties and the development of weak ties was the rise in the importance and population of London. London became the seat of the Court, the main commercial city and the centre of the wealthiest part of the country. Immigration to London (Ekwall, 1956; Strang, 1970: 214 f.) was from many areas, but largely from the East Midlands (resulting in a gradual change in the dialect from southern to East Midlands). The rapid inflexional loss that diffused throughout the ME period can be seen, not only as a result of the influence of weakly inflected (E. Midland) dialects on strongly inflected ones, but as a product in London of the contact situation itself, in which 'mergers expand at the expense of distinctions' (Herzog, quoted in Labov, 1972: 300).

In thirteenth- and fourteenth-century Iceland, there were no such developments. Icelanders in search of their fortune had no large town to settle in; they tended to go abroad for a time and then return to their rural homes in Iceland. In such conditions, strong networks remained to a large extent intact.

Thus, the contrast between English and Icelandic seems to be an exemplar of the contrast between social conditions that encourage weak ties and those that encourage strong ties. Rapid changes in English seem to have depended on the existence of individuals and groups who were socially and geographically mobile and whose strong network ties were weakened or broken up by this mobility. A high degree of social distance seems to have resulted. Icelandic society, on the other hand, depended in earlier centuries on the strong networks typical of rural life. Hence, despite the difficulties of climate and terrain, social networks proved to be a cohesive force, not only in maintaining social norms, but also in maintaining the norms of language.

We have discussed the case of Icelandic and English in order to support the generalization stated on p. 375 above that 'linguistic change is slow to the extent that the relevant populations are well established and bound by strong ties, whereas it is rapid to the extent that weak ties exist in populations'. Cases of conquest and colonization are taken as relevant types of weak-tie situations for the reason that rapid change is often associated with such cases. Nigel Vincent (personal communication) draws our attention to a possible Romance analogue. Sardinian is generally regarded as the most conservative of the Romance languages on a number of counts, and this state of affairs can plausibly be correlated with the fact that after the period of Romanization (3rd century B.C.), such incursions and occupations as there were had only a marginal effect on the social organization of the inhabitants of the island, and even then only in peripheral areas (see Blasco Ferrer, 1984). Sicily, by

contrast, has a long history of conquest and colonization by Greeks, Normans, Lombards and Arabs, and linguistically Sicilian displays a good deal of innovation and stratification (see Varvaro, 1981).

However, our generalization is intended to encompass *any* situation where contacts between people lead to the establishment of many weak ties. It therefore includes, in principle, situations where warlike incursions are not of major importance. Two further broad and overlapping types of contact spring to mind. One is the peaceful in-migration of populations who speak other languages or dialects. This might help to account for change in the maritime colonial languages of Western Europe (as against those of the interior), as metropolitan centres are characterized by some ethnic and social diversity; this is also clearly relevant to rapid change in large post-Industrial Revolution cities, in which much of the in-migration from the hinterland is by speakers of different dialects of the same language. The second type is sustained commercial and cultural contact (which leads in extreme cases not only to simplification but to 'language death'). These types of contact would seem to be relevant to cases like Danish (an old established maritime and colonial language closely related to Icelandic, but which has undergone rapid change); the history of that country has been characterized by quarrels with neighbouring states, but also by sustained commercial and cultural contact with these states. Therefore, we do not consider incursion and conquest to be a necessary condition in itself for rapid linguistic change. The correct generalization must account more broadly for the spread of speaker innovations through weak ties.

8. CONCLUSION

We have here presented a model designed to explain why linguistic change seems commonly to take place in some social conditions but not in others. Specifically, we have tried to show as explicitly as possible that innovations are normally transmitted from one group to another by persons who have weak ties with both groups. Further, at the macro-level, it is suggested that in situations of mobility or social instability, where the proportion of weak links in a community is consequently high, linguistic change is likely to be rapid. Social groups who characteristically contract many weak ties – and in Western society these could consist of persons who belong neither to the highest nor to the lowest social groups – are likely to be closely implicated in the large scale diffusion of linguistic innovations.

These claims are supported by empirical observations. For example, it has been noted that innovations seem to hop from one centre of population to another, along main lines of communication such as roads and railways (Trudgill, 1983: Chapter 3). This is to be expected if we assume first that they are carried by persons from community A who have weak ties with those in community B, and second that ties contracted in these contexts are likely to

be numerous. Our arguments here also fit in with Labov's finding that the locus of change is always at some central point in the social hierarchy where, we have suggested, ties are weak. For this reason, an account based on weak ties seems to be at a higher level of generality than one based on class or status.

Nor does the evaluative notion of PRESTIGE (overt or covert) have a central part to play in the model presented here. Labov is correct in his observation that linguistic innovations may diffuse both upwards and downwards through the social hierarchy; some appear to originate with high and some with low status groups. Conversely, a comparison of the diffusion mechanisms and distributional patterns of /a/ and /ɛ/ in Ulster shows that elements originating from the same (rural) dialect can take on, apparently arbitrarily, entirely different social values in their new urban context.

We assume (although any discussion is beyond the scope of this paper) that perceptual and acoustic factors, as well as a range of more general linguistic constraints, will sharply limit the class of possible innovations (cf. Weinreich *et al.*, 1968: 100; Labov, 1982: 27; Comrie, 1981: 195). But within the limits set by this larger class of constraints, the notion of prestige does seem to be important in explaining why one particular linguistic element is a realistic candidate for innovation while others are not. We have suggested that the working class of East Belfast, who formed a kind of labour aristocracy, were particularly strongly associated with the Ulster Scots hinterland from which the contemporary urban /a/ and /ɛ/ changes have originated. This association helps explain why these phonological elements and not, for example, others associated with mid-Ulster dialects, have been successfully introduced and diffused. But since this topic also lies beyond our scope here, we simply note, with Tarde, that we need to learn why, if a hundred innovations are conceived simultaneously, ten will spread while ninety will be forgotten (1903: 140).

It has also been necessary to distinguish sharply between INNOVATION (which is the act of a speaker or speakers) and CHANGE, which is the reflex of a successful innovation in the language system. Present day sociolinguistics (although sensitive to social phenomena) is in fact strongly oriented to a 'system' approach and has often not made a sufficiently sharp distinction between the linguistic behaviour of speakers and the effect of that behaviour on the language system.

Finally, by making a further distinction between the INNOVATORS of a linguistic change and the EARLY ADOPTERS, we have suggested a principled reason for the difficulty experienced in observing the introduction of an innovation into a community. This may be seen as the earliest stage of a linguistic change – at least from the point of view of the community which is adopting it. Weinreich *et al.* have described this actuation of a change as 'the very heart of the matter'. However, since innovators tend to be marginal individuals at the edges of networks who diffuse innovation *via* weak ties with others, the persons whom investigators actually identify as being

strongly associated with a change are most probably the more socially central early adopters.

It is important to note the limitations of the claims presented here. We are attempting to shed light on the actuation of a linguistic change, noting that there is not necessarily a one-to-one relationship between even a successful speaker innovation and the change in the language system which reflects it. A single innovation may trigger off a series of changes in a chain shift which can then best be explained by examining the internal organisational principles underlying the language system. It is assumed that an appropriately explanatory account of language change must supplement the model presented here in at least two important ways.

First, it must specify the psycholinguistic and linguistic constraints which limit the class of candidates for innovation. Second, it must account for the regular and orderly manner in which successful innovations are diffused throughout the system, so that eventually they are perceived as instances of linguistic change.

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