Equilibrium Theory applied to Top End Australian languages

Author

Paul Black

CAESL

Charles Darwin University

Darwin, NT 0909

paul.black@cdu.edu.au

http://www.ehs.cdu.edu.au/esl/staff/pblack/pblack

Abstract

Dixon's equilibrium theory of lexical diffusion has been criticised on various grounds, but in the absence of certain knowledge of the prehistory of Australian languages it is virtually impossible to disprove. At the same time, it provides the basis for drawing inferences about linguistic prehistory that can be diametrically opposed to those based on widely accepted tradition. Whereas more traditional theory takes the relatively great linguistic divergence among northern and north western Australian languages to imply a long period of linguistic stability, the present paper shows how Dixon's theory would imply that there has been considerable population movements throughout this area in recent millennia. This raises the question of whether any supporting evidence for such movement might be found, whether from archaeology or oral tradition.

Keywords

Australian languages, Dixon, Equilibrium Theory, Lexicostatistics, Prehistory.

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From his work on north Queensland languages that began in the 1960s, Dixon (1970, 1972: 331-7) proposed a model of language change that was quite different from the widely accepted position of the time. This evolved into a model of 'punctuated equilibrium' in Dixon's (1997, 2002: 20-35) more recent writings. This model has been severely criticised on a variety of grounds (e.g. Black 1997, Harvey 1997, Alpher & Nash 1999, Koch 2004: 48-57, Evans 2005), but there is no way to actually disprove it because it relates to aspects of prehistory that can never be known for sure. Perhaps it will ultimately be judged in terms of the extent to which it seems to provide useful insights and inferences that more traditional theories do not.

Some prehistorical inferences have been made from the model by Dixon (e.g. 2002: 659-86) himself. The purpose of the present paper is simply to consider what his model would imply about the prehistories of languages in the 'Top End' of the Northern Territory, so that others may perhaps be able to compare these inferences with evidence from other fields, such as human genetics and archaeology. It will be shown that Dixon's model suggests considerable prehistorical migration in this area, although this does not seem to be supported by other types of evidence currently available. Before considering the evidence on Top End languages, however, I'll attempt to clarify the similarities and differences between Dixon's model and more traditional views.

The Two Models of Linguistic Change

Both Dixon's and the more traditional model acknowledge that languages diverge from common ancestors through a hierarchy of language splits, but also that languages in contact can gain similarities though adopting words and sometimes even aspects of grammar from each other. The difference between the two models is in the relative importance accorded these two trends. The traditional view is that similarities gained through language contact are rarely extensive enough to obscure the tree-like relationships of divergence among languages. For example, even the massive adoption of French, Latin and Greek words by English, of Spanish and English words by Filipino, and of Chinese and now English words by Japanese has not been found to interfere with studying the historical development of these languages from earlier genetic ancestors. In part this has been because the adopted forms tend to be found in less basic areas of vocabulary.

Dixon's model differs in that it places far more emphasis on convergence through contact. Believing that Australian languages do not have core vocabulary that is relatively unlikely to be copied or borrowed (Dixon 2002: 21), Dixon goes so far to propose that in such cases 'two contiguous languages are likely — given sufficient time — to achieve an "equilibrium level" of around 50 per cent shared vocabulary' (p. 27). By 'about 50 per cent' Dixon would accept a range of about 40% to 60% (p. 29).

While Dixon (2002: 33-4) also allows for the same tree-like divergence as the traditional model, he considers this to be a much rarer occurrence, which would only happen under such special circumstances as environmental change, material innovation, the development of 'aggressive tendencies', or territorial expansion. Such a punctuation might last only a few hundred or a few thousand years to interrupt an equilibrium situation that could endure for tens of thousands of years (p. 32).

Dixon's model allows inferences to be made about the prehistorical relations between a pair of languages on the basis of shared vocabulary. On the one hand languages can diverge, but those which remain contiguous should not normally continue to diverge past the 40% to 60% equilibrium level. There seems to be no reason why this would not continue to apply to contiguous languages even in a period of punctuation, even as non-continuous languages diverged past the equilibrium level, but Dixon (2002) does not deal with that matter explicitly. On the other hand, when languages that share less than 40% vocabulary come into contact, their shared vocabulary begins to increase towards the 40% to 60% equilibrium level. This should be true for both unrelated languages and for related languages which have diverged past the equilibrium level because they have not been in contact.

While languages must be in contact of some sort to share vocabulary, in a very stable situation, of course, shared vocabulary could eventually pass through chains of adjacent pairs of languages so that even non-adjacent pairs would increase in similarity to some extent. In addition, the fact that two languages are currently not contiguous need not imply that they could not have been in the recent past. However, the prehistorical inferences can most obviously be drawn for adjacent languages. Thus Dixon (2002: 29-30) claims that if two contiguous languages share:

(1)   more than 60% vocabulary, 'they are likely to be closely genetically related, in a low-level subgroup' (p. 29);

(2)   about 40% to 60% vocabulary, they may or may not be closely genetically related (p. 30); and

(3)   less than 40% vocabulary, 'it is most likely that they are not closely genetically related' (p. 29). To the extent that they are related at all, presumably they could not have been in contact while diverging past the equilibrium level.

Inferences about Top End Prehistory

Northern and north western Australia are well known as areas of greatest indigenous linguistic diversity on the continent. Dixon's model and the traditional one provide the basis for drawing quite different prehistoric inferences on the basis of this diversity.

As Harvey (1997) has pointed out for Top End languages, traditionally this diversity is interpreted as an indication of relatively great time depth, that is, that these languages have been diverging for greater periods of time than the seemingly less diverse languages once spoken across the remainder of continental Australia. To the extent that most Australian languages are believed to be descendants of a common Proto-Australian ancestor, furthermore, migration theory (e.g. Dyen 1956, Diebold 1960) would take this diversity to suggest that Proto-Australian

was spoken somewhere in northern or north western Australia. This in turn could make some sense if Proto-Australian were itself descended from a language that had entered this area of Australia from somewhere to the north, whether by land that connected Australia to New Guinea some 50,000 years ago, or by a series of sea voyages that would have been relatively short at that time, as between Bali and the Kimberley (see Dixon 2002: 8-9). Few would expect proto-Australian itself to be of such great antiquity, however.

The traditional model does not imply that the languages have not been spreading or moving geographically, and occasional evidence of geographically discontinuous groups, such as the putative grouping of Barkly and Yirrim (or Jaminjungan) languages (e.g. Chadwick 1967), does suggest some prehistoric migration. However, the traditional model need not imply movements in the languages once they have diverged from common ancestors. Except to the extent we find clear reasons for believing otherwise, we are free to believe that language locations have been fairly stable since the periods of expansion that brought them to their current positions.

Dixon's model, on the other hand, does imply movement whenever continuous languages share less than the equilibrium level of 40% to 60%. That is, normally a pair of contiguous languages can have less than 40% shared vocabulary only if they have not be in contact long enough for the equilibrium level to be reached. To the extent such low percentages are commonly found between languages in the Top End of the Northern Territory, there must have been considerable prehistorical movement.

Let's consider an actual example. Map 1, on the following page, follows Evans (2003: 204) in showing the languages on the west coast of the Top End, in an area from northwest of present day Darwin as far south as Wadeye (or Port Keats). These include the so-called 'Daly Family' languages (and some subvarieties) for which lexicostatistical percentages based on a 200-item wordlist are available from Tryon (1974: xiv; also in Black 1997: 65). Lexicostatistical percentages for the remaining varieties were calculated by Black (2000) on the basis of a 73-item word list — not a very substantial study, but enough to give 'ball-park' figures adequate for the present discussion. Where the percentage shared by an adjacent pair of varieties (or the highest percentage shared by their respective subvarieties) falls below the 40% to 60% equilibrium level, it is shown on the border between the two languages. Dotted borders show where the shared percentages were greater than 40%. Common lexicostatistical approaches take the relative levels of percentages as indicative of subgrouping (see Black 1997: 62-67 for the so-called 'Daly Family' languages), but since Dixon's model would not, questions of subgrouping will not be considered here.

Keep in mind that the percentages cannot be regarded as precise. As a rule of thumb, two percentages based on a 200-item word list would have to differ by about ten percentage points to be considered significantly different, while those based on the shorter word list would need to differ by some fifteen to twenty percentage points. Another source of uncertainty is the fact that Dixon's model suggests that languages sharing less than about 40% related vocabulary (thus less than the equilibrium level) could not always have been adjacent, but the specific percentage can only suggest the maximum period of recent adjacency, not the minimum. For example, two languages sharing 25% vocabulary may have shared virtually none when they first became adjacent, and thus would have been adjacent long enough to have borrowed all 25%. Alternatively, however, they may be related languages which had become separated and which already shared 25% when they became adjacent again more recently.
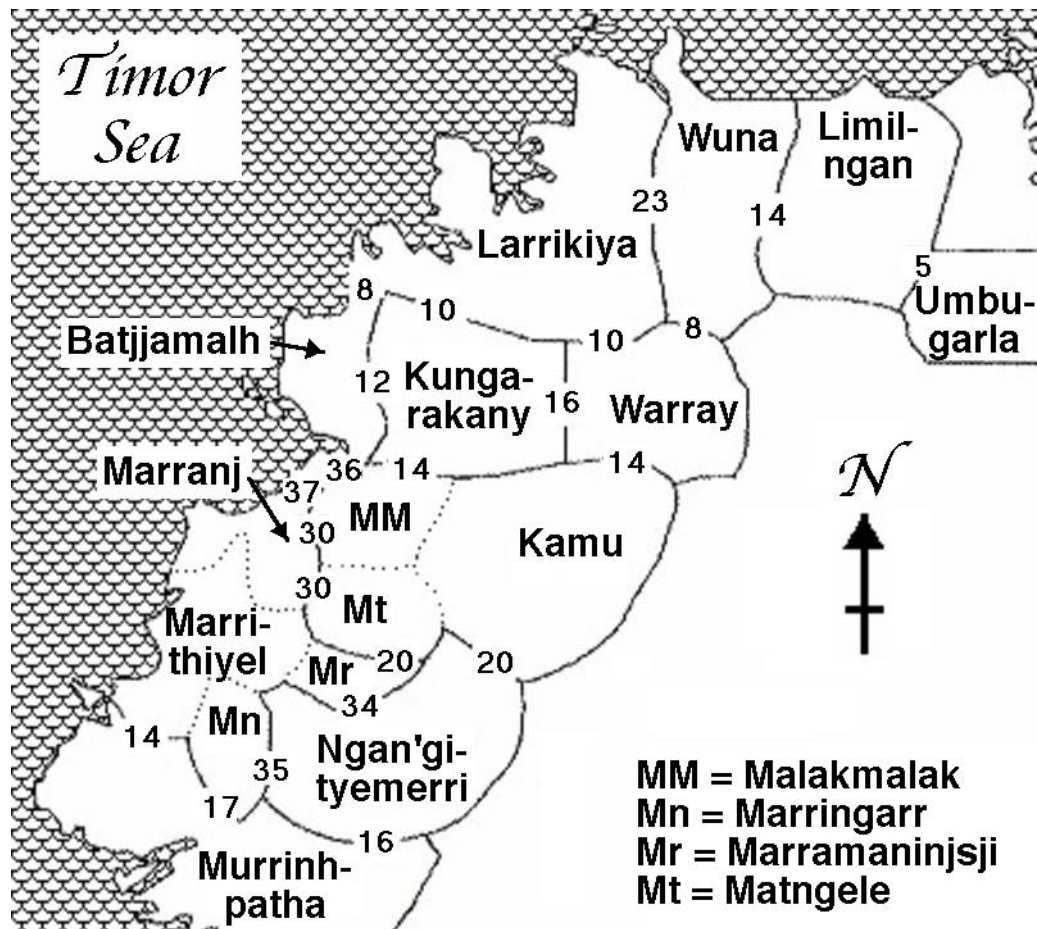
Map 1. Highest percentages between more divergent language groups in the area between present-day Darwin and Wardeye (Port Keats).

From Map 1 you can see that there are eleven languages or sets of languages that share less than 40% with all of their neighbours on the map, and there is no reason to expect them to share more with the languages not shown to the east. Accordingly, in terms of Dixon's model none of the eleven that are currently adjacent could always have been adjacent, so many must have moved into their recent locations from somewhere else.

As noted above, we can't be sure that the higher percentages reflect earlier moves followed by longer periods of adjacency, but from Dixon's model the lower percentages should suggest relatively short periods of adjacency. The lowest percentages on Map 1 are the 5% to 10% that separate Larrikiya, Wuna and Limilngan from their neighbours to the south and east. We might account for this by taking Umbugarla to be one of the most recent arrivals, with Kungarakany and Warray perhaps not being much earlier, since the latter two share no more than 16% with each other and 14% with their neighbours. Limilngan could also seem to be a relatively early arrival. On the other hand, while we can't be sure that the 23% between Wuna and Larrikiya is significantly higher, it is high enough to raise the possibility that these two languages have been

adjacent somewhat longer than the others, and thus perhaps in this location when their neighbours arrived.

On the southern end of the area one might take Murrinhpatha to have arrived relatively recently to explain why it shares only 14% to 17% with the languages to the north. This would be in spite of the fact that I. Green (2003) has described extensive and striking similarities between the verbals systems of Murrinhpatha and the neighbouring Ngan'gityemerri that solidly establish their genetic relatedness, possibly even as members of the same subgroup of Australian languages.

The languages not mentioned thus far are those of Tryon's (1974) so-called 'Daly Family'. These divide into four sets that share percentages below the equilibrium level, at 20% to 37%, and thus Dixon's model again suggests that they also have not always been adjacent, although they may have been adjacent longer than the languages discussed above. Ultimately, however, at least two of these four groups must have moved in from somewhere else.

While Dixon's model thus suggests that many of the eleven languages or groups shown in Map 1 must have moved into their recent locations from elsewhere, it is not clear where they might have come from. We might hope to find that at least some of these languages would also be found to share moderately high percentages with more distant varieties, suggesting that they had come from being adjacent to those varieties at some earlier time, but in fact there seems to be no evidence of this. Indeed, the percentages I have seen between more distant varieties tend to be much lower, generally below 10% and often below 5% even for languages in the same general area. It would seem that either the languages they were previously adjacent to have died off without a trace, or else the attested languages have tended to keep moving, not necessarily continuously, but not staying long enough in a single place for them to have built up enough shared vocabulary with their neighbours for this to remain apparent today.

While Map 1 shows only the western edge of the Top End, there would seem to be many similar patterns of language relationship across the rest of it. In the Maningrida area, for example, R. Green (2003: 369) found that Na-kara shares only 16% and 24% with Burarra and Gurr-goni respectively, and that Ndébbana shares only 13% to 22% with those three, even though these languages may well form a genetic group. Dixon (2002: 665) seems open to the possibility that they could form such a group, but in that case his equilibrium model would seem to imply that they must have come back together after some period of separation or expansion that allowed their shared percentages to have dropped below the equilibrium level. Again, however, there seems to be no evidence to suggest where they might have spent that period of separation, or why they fell back together after some sort of an expansion that would have limited their mutual contact and the sharing of vocabulary.

It thus seems that if Dixon's model is valid for the Top End of Australia, then this area must have long been one of considerable population movement, possibly with the disappearance of many earlier groups. Over a short term, such as over the past several hundred years, the movement may hardly be noticeable, but if we could 'fast forward' through the past few millennia we should see a picture of writhing turmoil.

Discussion

In this paper I have tried to use Dixon's equilibrium model to draw general implications about the prehistory of the languages of the Australia's Top End. As someone who has never accepted this model myself, I may of course have misapplied it, but in that case I can hope that proponents of the model will point out where I have gone wrong, and thus enlighten us further about how the model is actually meant to work. For example, could the Top End situation have arisen through a period of punctuation — seemingly quite a long period, considering the lowness of the percentages involved? If so, how has this kept adjacent languages from adopting more vocabulary from each other than they generally seem to have done, and why has this extended punctuation occurred in the Top End but apparently nowhere near to the same extent elsewhere in Australia?

Alternatively, if I have drawn the correct inferences from Dixon's model, then we might hope that the extensive population movements in the Top End have left other traces that we could find to support it, such as evidence in oral tradition as well as physical evidence of various sorts. The evidence from human genetics does not seem particularly promising, if White (1997: 70) is correct in taking the greater genetic diversity of the Top End, as compared to Central Australia, to suggest relative stability. Some other types of linguistic evidence also seems difficult to reconcile with extensive population movement. For example, Black (2000) found that Larrikiya shared a number of areal features with various nearby languages, suggesting that these languages had been in the general area long enough for these similarities to develop. These included the existence of a central vowel (sometimes written *oe*), an unusual initial consonant cluster *gw*, a phonetically prestopped lateral *dl*, the way body part terms can take noun class affixes indicating possessor, the lack of distinctive dual pronouns other than that for the first person inclusive (i.e. 'you and me'), and the formation of the word for 'three' by combining the words for 'two' and 'one'.

The evidence I've seen thus seems to suggests that population movements in the Top End were far less than Dixon's model would suggest, and quite in accord with more traditional views instead. Still, it would be interesting to see if evidence for extensive prehistorical population movement in the Top End could be found. Some existing evidence could perhaps deserve reexamination in the light of a hypothesis of extensive movement. For example, White (1997: 72) took the wide range and predictability of food resources in the Top End to suggest relative stability, with the need to protect such resources as one reason for the development of less permeable language boundaries, and hence less sharing of vocabulary. Alternatively, however, one could perhaps view the richness of the resources as reasons for extensive and long term migration, competition and conflict among population groups.

Regrettably, until this matter can be thoroughly resolved the uncertainty has practical consequences in relation to land claims and native title. Whereas the more traditional model is compatible with considerable long term stability in such areas as the Top End, Dixon's model can be used to argue that there was relatively little stability in traditional locations within the past few millennia. While many of us see various reasons for not accepting Dixon's model, the fact that it has been maintained for some thirty years by a leading figure in the Australian linguistic community makes it very difficult to ignore.

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