

MODERN GEOLINGUISTIC TENETS AND THE DIFFUSION OF LINGUISTIC INNOVATIONS IN LATE MIDDLE ENGLISH

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ABSTRACT

In this paper we intend to reconstruct some of the geographical aspects that may have contributed to the diffusion of linguistic innovations from London to the rest of the country in the late Middle English period. We accept the geolinguistic tenet that interpersonal communicative contacts between potential adopters are basic in the diffusion of linguistic innovations and that these are (and possibly were) remarkably facilitated in urban centres. Particularly three factors are of paramount importance in the study of the spatial diffusion of linguistic innovations: a) the population density of the areas involved and its distribution; b) the physical distance between them; and c) the distance or similarity of the linguistic systems peculiar to each area. We believe that the demographic evidence afforded by the *Poll tax returns* of the 14th century, combined with the specific analysis of geographical communications in late medieval England, may allow us to establish a hypothetical 'gravity model', in the geolinguistic sense, and to speculate on the interurban courses followed by linguistic innovations from London throughout the rest of the country.

1. Introduction: Standardisation and geography

Recent approaches to the subject of standardisation tend to question the assumption that a single ancestor underlies the development of standard English. Instead, it is widely acknowledged, in accordance with variationist methodology, that the process comprises the "selection" and "acceptance" or "diffusion" of features from a range of social and regional varieties – including those which, according to Samuels (1963, 1972: 165-170), were promoted to the status of incipient standard norms at different localities from the late thirteenth century. As a result, the standardisation of English is no longer seen as a "linear, unidirectional development", but as "a set of processes which occur in a set of social spaces, developing at different rates in different registers, in different idiolects..." (Wright 2000: 6; see also: Wright 1996; Hope 2000: 51). As regards the "acceptance" or "diffusion" of historical standard norms, the conclusions of recent sociolinguistic studies on the

spread of linguistic innovations over the social space have proved to be quite useful. In this way, several studies have correlated graphemic, morphological and syntactic characteristics of late Middle and early Modern standard Englishes with the reconstructed pyramid of social ranks and networks in these periods. This process has been related to mobile individuals from the middle echelons of society who could have established loose-knit networks in largely populated towns, like London and Calais (Nevalainen and Raumolin-Brunberg 1996; Rissanen 2000; Conde Silvestre and Hernández Campoy, *fc.*). Concerning the spatial diffusion of incipient standard variants, the proposals of human geography and geolinguistics may also be considered in connection with historical stages of language development. As Britain has stated “[t]he analysis of spatiality is critically important if we wish to fully understand the processes involved ... in the diffusion of linguistic innovations” (1991: 251-252), and this tenet, in our opinion, should hold for both present and past states.

Parallels between the historical conditions in medieval and early renaissance Europe and those of modern underdeveloped countries are often drawn. This procedure is sometimes adopted in historical geography, which may underestimate the demographic and functional roles of urban nuclei in earlier periods, in view of the existence of demographic distances between a limited number of relatively large concentrations of people and a scattered, more or less even, distribution of population in the country. If this is so, the process of “epidemic” or “contagion” diffusion, traditionally represented by the wave model, may have been more widespread in earlier times than nowadays, so that linguistic innovations in late Middle English or early Modern English would have radiated from a focal area and reached physically nearby locations before those at greater distances. Nevertheless, the few studies on the geographical diffusion of innovations in earlier periods of the history of English do not wholly support this perspective. Though intuitively, Samuels, for instance, had already stated in 1972 that even if “gradual changes best apply to areas where the population is distributed evenly ... in the case of changes leading to a regional or national standard those natural expectations may not be fulfilled” (1972: 90). Samuels’ intuition has been supported by some research which attempts to diversify standardisation into various processes of “supralocalisation”, involving linguistic features of different regional and social origins. The perspectivism granted by the adoption of this vantage point allows experts to appreciate diverse changes taking place in particular regions and localities at any given time and eventually helps them to trace the spread of certain features from the area of origin to other ones (Nevalainen 2000: 329-330). For instance, Nevalainen and Raumolin-Brunberg have reconstructed the geographical diffusion from the late 15th century to the 17th of some morphological characteristics from the north of England. Among other variables, they track the spread southwards of the verbal form *are* (vs. *be*),

the third person singular present indicative *-es* (vs. *-eth*) and the relative *the which* (vs. *which*) across a number of texts from East Anglia, London and the Court included in the Corpus of Early English Correspondence for the period 1460-1680. They conclude that *are* reached East Anglia earlier than London, whence it finally extended to the Court, following the expected pattern of regular wave-like diffusion (Nevalainen 2000: 348). However, Londoners seem to have accepted *-es* and *the which* earlier than East Anglians in a kind of “dialect hopping process” that may be related to geographical factors like demography, patterns of migration, etc. (Nevalainen 2000: 347-350; Nevalainen and Raumolin and Brunberg 2000: 305-322)¹.

It seems that population geography may have played a role in the spatial diffusion of English linguistic innovations during the Middle Ages and the Renaissance and that a hierarchical model of diffusion, typical of modern urban societies, might have coexisted in these periods with the expected wave-like model. One reason for this assumption is that interpersonal contacts between potential adopters are basic for linguistic diffusion and these are (and possibly were) remarkably facilitated in urban centres, which, to quote Nevalainen and Raumolin-Brunberg, “are instrumental in promoting dialect mixture and in spreading linguistic innovations” (2000: 299). As a result, the historical diffusion of linguistic innovations would have been not only a question of physical distance, like the wave-model proposes, but also, like modern geolinguistics assumes, aspects like population size and its spatial distribution (concentration and dispersion), as well as the demographic and functional roles of urban centres and their respective interaction (communication networking), may help to understand why two given localities in the past shared or not certain linguistic features, or why a given innovation appeared and spread to a centre *C* from a centre *B* rather than from centre *A* (Hernández Campoy 1999a: 149-150; 1999b: 7-11)².

2. Objectives

In this paper we intend to reconstruct some of the geographical aspects that may have contributed to a hypothetical hierarchical diffusion of innovations in the late Middle English period. We believe that the reconstruction of demographic

¹ In addition to epidemic and hierarchical diffusion, geolinguists have also seen other models at work in contemporary situations. Bailey *et al.* have detected a model of contrahierarchical diffusion in Oklahoma, where some innovations spread from rural to urban communities (1993: 371-373), while Horvarth and Horvarth have traced a pattern which combines contagion and hierarchy in the case of some features of Australian English which “gain a foothold in both town and country in one particular region before diffusing to other regions” (1997; quoted from Britain 2002: 625).

² On geolinguistics, its theoretical tenets and applications, see also Callary (1975), Trudgill (1974, 1983, 1986), Larmouth (1981), Gerritsen (1988) and Britain (2002), among others.

evidence from the late 14th century combined with the analysis of communications in late medieval England may allow us to establish a hypothetical “gravity model”, in the geolinguistic sense, and help to theorize on the interurban courses followed by linguistic features emanated from London – one of the most innovative areas in late Middle English – to the rest of the country. Our aim is basically speculative since, at this stage, we do not intend to correlate the model with linguistic evidence; however, we expect that it draws our attention to the demographic and functional importance of some urban centres in this period and, by doing this, we may establish the background for a comparison with the relationship between geography and language in the later history of English.

The process whereby late Middle English innovations were diffused from London to the rest of the country is related to the importance of this city in the late Middle Ages. London became a centre for the exportation of corn, wool and textiles, within a large international network that spread into the Netherlands and the North Sea, to such an extent that commerce, manufactures and national wealth started to be concentrated in the area (Keene 2000: 99; see also: Beier and Finley (eds.) 1985; Nevalainen and Raumolin-Brunberg 1989: 106). Additionally, the progressive centralization of the state and the “extensive authority of the Crown as the source of justice, peace and economic regulation” (Keene 2000: 99) contributed to the functional relevance of London throughout the rest of the country. Such prosperity is reflected in demography: population raised from around 35,000 people and a population density of 56.2 sq/mile in 1377, when London was still part of the county of Middlesex, to nearly 80,000 in 1545 (86.7 sq/mile) when the metropolitan area of London had annexed Westminster and Southwark-Lambeth (Russell 1948: 285). It is well-known that the increase in population was due to the attraction of a growing immigration from all over the country, and specially from the north: people in temporal business, like political, legal or financial errands, and “betterment migrants” in search of social advancement, were attracted to the metropolis. This population mixture created a fluid social structure that favoured the consolidation and diffusion of certain language changes (Conde Silvestre and Hernández Campoy, *fc.*). The role of London as a focus of English identity and civilization, and, in the words of Keene, as “an engine of communication and exchange”, confirm the function of this city as a source of “ideas and information [which were] distributed ... across an increasingly extensive, complex and varied field” (2000: 111).

Assuming that innovations from London may have diffused either evenly, in a wave-like epidemic fashion, or hierarchically, we will explore in this paper the second possibility and will adopt modern geolinguistic tenets to reconstruct the diffusion of innovations along a hierarchy of provincial centres.

3. Geolinguistic tenets and the diffusion of linguistic innovations in late Middle English

Following the common geolinguistic procedure (Trudgill 1974; Callary 1975; Gerritsen and Jansen 1980; Hernández-Campoy 1999a, 1999b) the geographical space of late medieval England has been divided into nine large cells, or grids, as Map 1 shows, which correspond to traditionally accepted Middle English dialect areas: London, East Anglia (EA), the South-East (SE), the South-West (SW), the South-East Midlands (SEM), the North-East Midlands (NEM), the South-West Midlands (SWM), the North-West Midlands (NWM) and the North (N) (see: Moore, Meech and Whitehall 1935; Fernández 1982: 590).

Map 1. Middle English dialect areas



From a geolinguistic perspective, three factors are of paramount importance in the study of the spatial diffusion of linguistic innovations: a) the population density of the areas involved and its distribution, b) the geographical distance between them, and c) the distance or similarity of the linguistic systems peculiar to each area.

Regarding **population density** and its distribution, it is widely known that innovations are more likely to arise in large, heavily populated areas that have historically been powerful socioeconomic and cultural centres, and to spread out from there to other moderately sized cities falling under the area of influence of the larger focal centre, thence to towns, until they ultimately and gradually reach the smallest and most sparsely populated villages, even though they are quite close to the original focal area. Therefore, population density should be taken as an important ingredient in the study of spatial diffusion, if only because of the obvious tenet that the larger the population of an urban centre is, the higher the probability that an individual from elsewhere may establish interpersonal contact with a speaker from that city (Trudgill 1986: 40; 1992: 76). Consequently, for the purposes of this study the reconstruction of historical population data is crucial.

Information about the population of late medieval England can be gathered from a variety of sources; unfortunately none of them is as accurate as *Domesday Book* is for the 11th and 12th centuries. In addition to local records, like *manorial extents* and *inquisitions post mortem*, which tend to be poor after the Black Death and only contain information about the upper layers of society, most reliable data can be drawn from the *poll tax returns* of the 14th century and from the *Chantry surveys* that started to be compiled in the late 15th. The *returns* were lists of the lay individual tax payers who contributed to the state revenue needed for the Hundred Years' War and, despite the fact that taxes were collected from the clergy on a different regional basis, they afford a more detailed information than the *surveys*, which were only gathered in the smaller parishes (Darby 1936: 231; Russell 1948: 90; Reynolds 1977: 142). Historical geographers have divided this period into three distinct phases (see Table 1): a) a period of increasing demography throughout Europe up to 1348, when the population of England, despite famines, harvest failures and cattle epidemics, may have reached 3,700,000 people – at a low estimate; b) a sharp decline between 1348-1430, due to the high incidence of mortality resulting from successive strokes of the Black Death, so that the population of England was possibly reduced to 2,100,000 by the late 14th century; c) after 1430 a slow increase in population is acknowledged, to the extent that by 1470 the figures for England started to rise again for the first time since the Black Death and approximated 2,300,000, they rose to 3,220,000 in 1554 and 4,080,000 in 1690 (Russell 1948: 235; Samarkin 1976: 92-98; Coleman 1977: 112; Coleman and Salt 1992).

Table 1. The population of England, 14th-17th centuries

1348-1430	2,100,000
1430-1475	2,300,000
c. 1550	3,220,000
c. 1690	4,080,000

Even though these figures are mere estimates, and for some scholars low ones (see: Campbell 1990), it is clear that they reflect a very acute period of demographic decline in the late English Middle Ages. Nevertheless, most historical geographers agree that this situation was accompanied by the economic prosperity of towns. The transformation of England's economy from wool to cloth production entailed an expansion of trade in some areas and favoured rural migration, so that those towns which were "well placed to take advantage of the surge in demand for English cloth in the mid 14th century recovered population levels fairly rapidly following the Black Death" (Kermode 2000: 444). In a sense, the situation of late medieval England is one "of urban vigour amid demographic decline" (Unwin 1990: 132), which lends itself to the geolinguistic analysis we intend to undertake.

Exact figures on the distribution of medieval England's population are impossible to discern; nevertheless historical geographers have attempted to estimate the rough population of counties, towns and boroughs on the evidence afforded by the *poll tax returns* (especially for the years 1377 and 1381). For the purposes of our study we rely on the calculations made by Russell (1948), who assumed that 1000 payers of poll tax in one locality corresponded roughly to 1500-2000 inhabitants. The relevant figures may be lower than the real ones, in view of the possibility that certain groups, like "free miners", evaded the tax, and others, like the clergy, were taxed on a different regional basis (Darby 1936: 231). Table 2 includes the population data for counties in each of the nine ME dialect areas, for towns with a population over 1,500 people and gives additional details on demographic density, which is also displayed on Map 2 (p. 156).³

³ The same procedure has recently been followed by Keene (2000: 102), and by Galloway in the research project on "Market networks in the London region, c. 1400". In the absence of returns for 1377, these historians have calculated figures for Scarborough on the basis of the 1480 tax payers listed in the 1381 returns (c. 2200-2900 inhabitants). Towns like Chester, St. Albans, Reading, Romney and Sandwich are assumed by Galloway and Russell to have had no less than 1000 poll-tax payers, which roughly corresponds to c. 1500-2000 people. The towns situated in the immediate neighbourhood of London, Westminster and Southwark, are not considered in this study, since a) within a few decades they would have been subsumed into the metropolitan area, and b) 14th century innovations from the city would reach them earlier than other places, in case they are not the actual source of the innovation themselves (as may often have been the case of 15th century Westminster).

Table 2. The population of England in the late 14th century (Russell 1948)

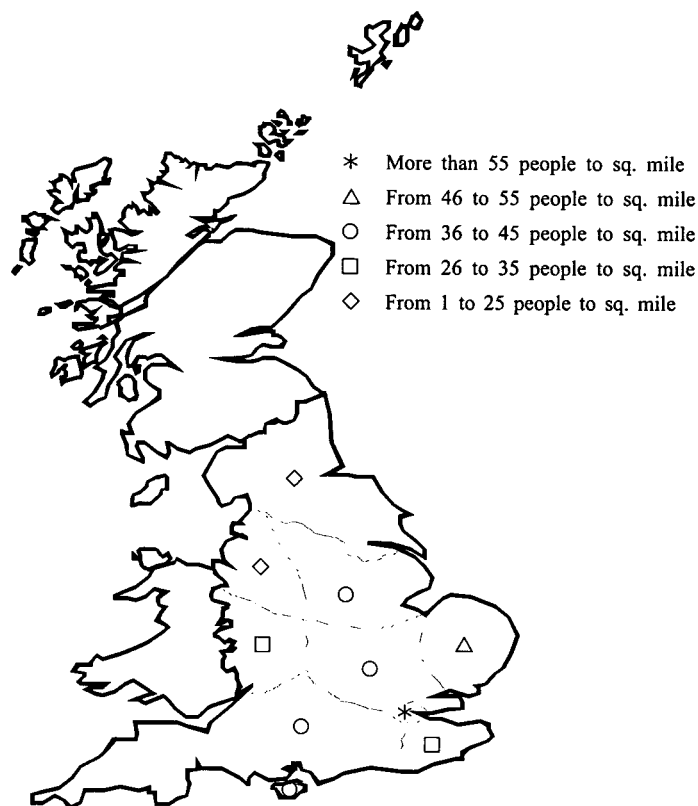
Area	County	Population	Density	Town	Population	
<i>London</i>	Middlesex	51,835	56.2	London	34,971	
	Kent	89,551	48.6	Canterbury Sandwich ⁺ Romney ⁺	3,861 c. 1,500-2,000 c. 1,500-2,000	
<i>South East</i>	Surrey	27,058	34.7	Southwark ⁻	c. 2,400	
	Sussex	54,292	19.8			
	Total	170,901	34.4			
<i>East Anglia</i>	Cambridgeshire	46,461	49	Cambridge	2,853	
				Ely	2,583	
	Essex	76,375	47.3	Colchester	4,432	
	Suffolk	93,843	59.7	Bury St. Edmunds	3,668	
				Ipswich	2,260	
	Norfolk	146,726	65.5	Norwich	5,928	
				Lynn Yarmouth	4,691 2,912	
Total	363,405	55.3				
<i>South West</i>	Berkshire	34,084	42.2	Reading ⁺	c. 1,500-2,000	
	Cornwall	51,411	37.3			
	Devon	78,707	29.1	Exeter Plymouth	2,340 7,256	
	Dorset	51,361	46.6			
	Hampshire	60,849	31.4	Southampton Winchester	1,728 2,160	
	Somerset	84,111	47.6	Wells	1,352	
	Wiltshire	68,742	—	Salisbury	4,839	
	Total	429,265	39			
	<i>South East Midlands</i>	Warwickshire ⁴	27,238	28.3	Coventry	7,226
		Bedfordshire	30,508	63.4		
Buckinghamshire		37,008	48.5			
Hertfordshire		29,962	49.1	St. Albans ⁺	c. 1,500-2,000	
Huntingdonshire		21,243	50.7			
Leicestershire		50,748	58.1	Leicester	3,152	
Northamptonshire		62,553	60.3	Northampton	2,216	
Oxfordshire		41,008	51	Oxford	3,536	
Rutland		8,991	59.1			
Total	309,259	42				

⁴ It is well-known that dialect areas and political boundaries do not necessarily coincide. For instance, Warwickshire and Derbyshire are split in two halves by the reconstructed isoglosses separating, respectively, the South-West Midlands from the South-East Midlands, and the North-West Midlands from the North-East Midlands. This is the reason why the two counties have been included in both areas, and their respective populations have been adjusted depending on a) the extension that belongs to one area or the other and b) the location of the main towns – Coventry on the South-East Midlands and Derby on the North-West Midlands.

<i>North East Midlands</i>	Derbyshire ⁴	21,433	20.28	Derby	1,569
	Lincolnshire	142,678	49.8	Lincoln Boston Stamford	5,354 4,307 1,827
	Nottinghamshire	43,328	48.8	Nottingham Newark	2,170 1,767
Total	228,872	40			
<i>South West Midlands</i>	Warwickshire ⁴	18,158	19		
	Shropshire	40,242	28.5	Shrewsbury Ludlow	3,123 1,758
	Gloucestershire	68,016	46.4	Bristol Gloucester	9,518 3,358
	Herefordshire	25,831	27.9	Hereford	2,854
	Worcestershire	24,148	29.3	Worcester	2,336
Total	221,791	30.2			
<i>North West Midlands</i>	Derbyshire ⁴	14,573	13.52		
	Lancashire	35,820	26.2		
	Staffordshire	33,734	47.6	Lichfield	1,536
	Cheshire		11.5	Chester ⁺	c. 1,500-2,000
	Total	84,127	24.7		
<i>North</i>	Cumberland	18,778	17		
	Northumberland	25,210	17.2	Newcastle	3,970
	Westmoreland	11,084	19.3		
	Yorkshire	196,560	37.2	York Beverley Scarborough* Kingston on Hull	10,872 3,994 c. 3,500 2,336
	Durham		14.2		
	Total	251,632	21		

Within a geolinguistic framework, **physical distance** is closely related to population density and distribution, provided that the influence exerted by two urban centres on each other is directly proportional to their relative population size and inversely proportional to the distance between them. That is, given that face-to-face interaction is crucial in the process of diffusion and adoption of linguistic innovations and that communication is an act that decreases with distance, then the nearest to the source of innovation (or to a centre where it has already been adopted) the potential adopting unit is, the greater the possibility of being adopted will be. Physical distance is a basic geographical component in the analysis of spatial diffusion, if only because of the evident tenet – stated by Trudgill (1992: 76) – that “... people, on average, come into contact most often with people who live closest to them and least often with people who live furthest away”. Distances between towns in medieval England are normally estimated ‘as the crow flies’, that is by drawing a line from place to place, without any consideration of physical obstacles, like forests, mountains, or rivers (Keene 2000). On account of the impossibility of reconstructing the details of medieval England’s physical geography, we believe that the contemporary road distances

Map 2. Population density of Middle English dialect areas (1377)



can be a much more reliable source of information than “the fly of the crow”, provided that the construction of roads often adapts itself to the landscape and to earlier prevalent routes.

3.1. Model 1: Population potential

Both factors, population and distance, are first considered to select the urban nuclei that were the central places or gravity centres in the different cells in which the space of medieval England has been divided – the ME dialect areas. Population and distance are quantified into a formula devised by J. Q. Stewart (1947), which, on the basis of Newton’s laws of gravitation, assumes that the extent of influence exerted by a given settlement on another is directly proportional to its mass, in this case its population size or range, and inversely proportional to the

distance. The population potential exerted by the urban centre P on urban centre i would be defined as follows:

Population Potential Equation

$$PP_i = \sum_{j=1}^n \frac{P_j}{D_{ij}}$$

where P_j is the population of the j th urban centre, D_{ij} is the distance between points i and j , and n is the number of settlements in the system (Hernández-Campoy 1999b: 12-13).

We believe that the urban potential of medieval towns was not only a question of their respective populations, but that other geographical factors, which also contribute to demography, should be considered. At an inter-urban level, not all cities play the same roles, nor have they the same importance, but rather they constitute a hierarchy, both within and across regions, in which demographic, functional and physical distance have a significant influence. Demographic distance is based on the difference in population size that exists amongst the different settlements, while functional distance determines the number of functions and activities provided by the urban centre. In the context of the framework developed by Christaller’s *central place theory* (1966) both factors are inextricably related: the larger a city is, the higher the number of different activities and functions it monopolizes, which, in turn, results in a wider area of influence that embraces other urban centres with a lower centrality (or accessibility) and functional range (see also: Hernández-Campoy, *fc.*). Although these tenets may seem biased towards circumstances prevalent in recent centuries, we understand that they may be applicable to England in the late Middle Ages, provided that the largest towns were economically dependent on their respective hinterlands and, at the same time, offered the nearby boroughs a market outlet for agricultural and manufactured products. On a national scale, the progressive development of an integrated economy promoted a certain amount of commercial interdependence between towns of various sizes, so that the larger the town, the greater was its amount of trade and the greater its sphere of influence, to the point, for instance, that Unwin has claimed that “the structure of the urban economy became increasingly subordinated to the demands of the inhabitants of the capital, London” (1990: 146).

Following these premises, the data obtained from the application of the *population potential* equation have been modulated by taking into account the functions of towns and, especially, their location within the communication network of late medieval England. These circumstances may have contributed to increase the flow of people to some areas and may have favoured the *population potential* of some towns. This practice is followed by Galloway in the research project

on "Market networks in the London region, c. 1400" (see: Keene 2000), where the raw population figures of seaports are doubled so that they reflect the transport advantages that they enjoyed. The same modulation (2) is applied in our study to the *population potential* index of the ports of Sandwich (SE), Romney (SE), Ipswich (EA), Lynn (EA), Yarmouth (EA), Exeter (SW), Plymouth (SW), Southampton (SW), Bristol (SWM), Boston (NEM), Chester (NWM), Newcastle (N), Scarborough (N) and Kingston upon Hull (N).

We believe that other circumstances could also be pondered and that the transport advantages of towns on river banks should also be reflected in their urban potential; in fact, rivers in the late Middle Ages can be assimilated to contemporary railways, at least as regards the transportation of heavy goods, which would often be carried downstream to seaports and loaded in larger vessels for shipment overseas (Darby 1936: 261). Historical geographers make a difference between extensive river networks, which certainly encouraged long-distance trade and functioned as basic routes of transport inter areas, giving their headports commercial power and economic advantage, and smaller rivers which only linked places within nearby counties and favoured the development of some kind of internal trade along their banks (Unwin 1990: 144-145; Kermodé 2000: 446). Accordingly, the *population potential* index of port towns on extensive river networks, the Thames, Severn, Trent/Witham and Ouse, has been modulated by 1.7. This affects Oxford (SEM) and Reading (SW), along the Thames, Shrewsbury (SWM), Worcester (SWM) and Gloucester (SWM), along the Severn, Nottingham (NEM) and Lincoln (NEM) along the Trent and Witham, as well as York (N) on the Ouse. The results for towns located by other river courses have modulated by 1.5. This is the case of: Canterbury in the South-East; Cambridge, Ely, Colchester and Norwich in East Anglia; Salisbury in the South-West; Leicester and Northampton in the South-East Midlands; Derby, Stamford and Newark in the North-East Midlands; Ludlow and Hereford in the South-West Midlands; and Beverley in the North.

In medieval England, goods were also taken from one place to another on horse or cart. Even though the condition of roads was not always appropriate, and water transport was cheaper, the complaints in contemporary records about problems derived from weirs and obstructions in river courses are so common that road transport must often have been preferred (Darby 1936: 260-261). Transportation of goods by road may have been confined to local areas, while river and sea routes were possibly preferred on a national scale. Nevertheless, roads were used for human journeys, so that officials (secular and ecclesiastical), pilgrims, justices and tax collectors, as well as the king, his army and court, and medieval people at large often travelled both along the early Roman roads that still remained intact and along the new highways which were multiplied through the country on account of the growth of towns and trade (Darby 1936:

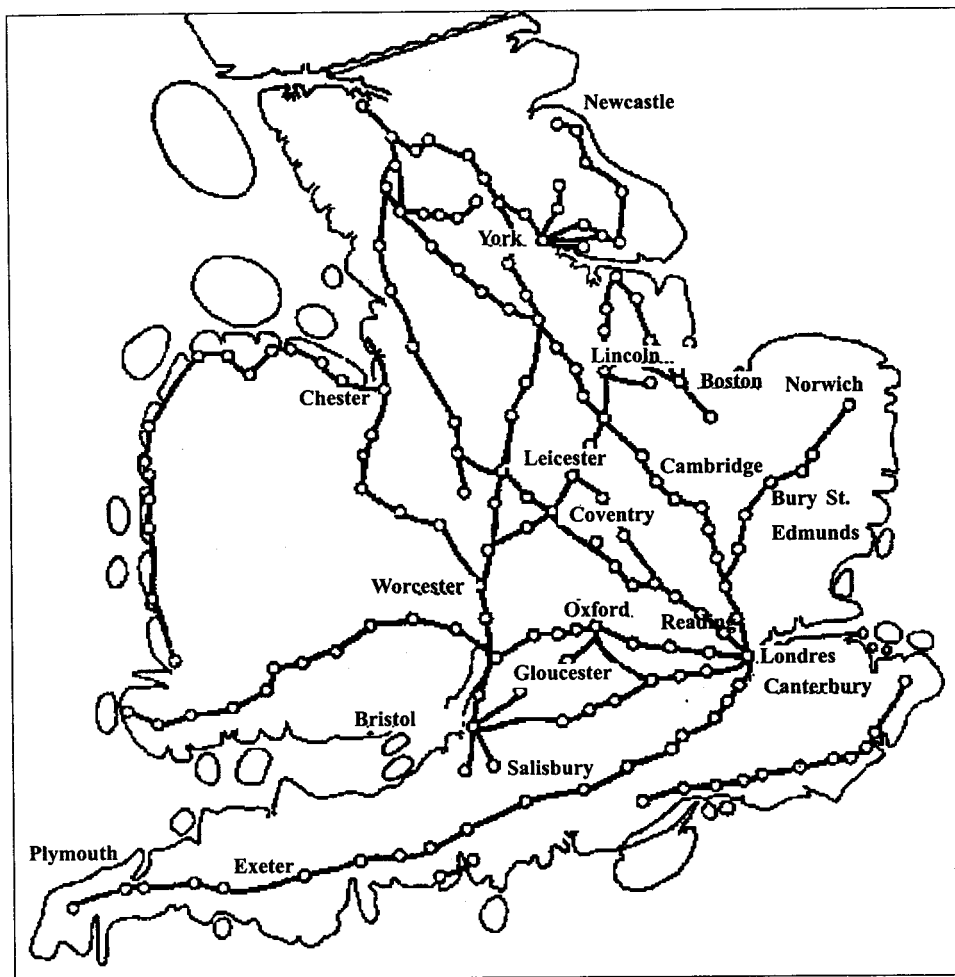
262; Hindle 1982: 193). Historical geographers agree that, despite the perilous and tedious nature of tours, the 14th century saw the development of a complex networks of road communications throughout England; in the words of Stenton:

... with all its defects the road system of medieval England provided alternate routes between many pairs of distant towns, united port and inland market, permitted regular if not always easy communication between the villages of a shire and the county town ... and brought every part of the country within a fortnight's ride of London. In the last resort it proved not inadequate to the requirements of an age of notable economic activity, and it made possible a centralisation of national government to which there was no parallel in western Europe (Stenton: 1936: 21).

We are lucky that an original map from the second half of the 14th century has been preserved: the Gough map, possibly an official compilation for government use drawn c. 1360. Although this map may be an incomplete copy of an earlier one and lacks well-attested routes, like the London-Dover section of Watling Street, the roads linking Southampton to Winchester or York to Newcastle, it reflects a centralized national network radiating from London (Darby 1936: 261-262; Samarkin 1976: 177; Hindle 1982: 196-197). For the purposes of this study we have considered this representation of medieval roads (Map 3, p. 160) and have modulated by 1.6 the *population potential* index of the towns located on the main roads leading to London. Additionally, the results for towns located at important junctions in this network, like Coventry (SEM) and Gloucester (SWM), have been modulated by 2, since the flow of people to these places would have been facilitated and encouraged by their pivotal position. Finally, we believe that the potential of medieval monasteries to attract pilgrims should also be reflected in the data and, accordingly, have modulated the indices of Canterbury (SE), Ely (EA), Bury St Edmunds (EA) and St Albans (SEM) by 1.3. The final results are displayed in Table 3 (p. 161).

These calculations have helped us to select the towns which behaved as gravity centres within each of the areas. The relevance of the local town in medieval times, added to the large extension of some of the dialectal areas involved in this study, as well as the differences in population density between them, have made us choose more than one urban nucleus in some cases. Undoubtedly, **Canterbury**, with a *population potential* index of 18.48, would have been the gravity centre in the South-East: this was an ancient town which was not far from London and attracted pilgrims throughout the late Middle Ages. In East-Anglia, one of the most populated regions, the towns of Norwich, Lynn, Bury St. Edmunds and Canterbury have been selected as gravity centres. London was connected by road to the monastic town of **Bury St. Edmunds** (13.34) and to **Norwich** (20.77), an important market town for cloth manufactures in and around the

Map 3. The Gough Map: Network of roads in 14th century England (based on: Samarkin 1976: 177)



Stour valley, so that both may have acted as catalysts in this part of the region. The rich arable region around the harbour of **Lynn** was also densely populated, as reflected in this town's *population potential index* (10.6); even though it may have been partly isolated by land, on account of the difficulties for road transportation and travelling in the Fens, it was possibly well connected by sea to London, the Low Countries and the North of England, and provided them with corn, salt, malt and ale. Finally, **Cambridge**, with a *population potential index* of 11.47, has also been considered as a gravity centre, particularly because it is situated westwards and far from the main towns of East Anglia, so that it may have functioned as a catalyst on its own.

Table 3. Population potential index

Area	Town	PPI	Sea-port	Primary river	Second. river	Main road	Pilg. route	Total
South-East	Canterbury	4.2			1.5	1.6	1.3	18.48
	Sandwich	2.2	2			1.6		7.92
	Romney	2.0	2					4.00
East Anglia	Cambridge	3.7			1.5	1.6		11.47
	Ely	3.5			1.5		1.3	9.80
	Colchester	5.1			1.5			7.65
	Bury St Edmunds	4.6				1.6	1.3	13.34
	Ipswich	3.2	2					6.40
	Norwich	6.7			1.5	1.6		20.77
	Lynn	5.3	2					10.60
South West	Yarmouth	3.7	2					7.40
	Reading	2.0		1.7		1.6		6.60
	Exeter	2.7	2			1.6		9.72
	Plymouth	7.4	2			1.6		26.64
	Southampton	2.3	2			(1.6)		8.28
	Winchester	2.7				1.6		4.32
	Wells	1.7						1.70
	Salisbury	5.2			1.5	1.6		16.12
	St. Albans	2.0				1.6	1.3	5.80
	Leicester	3.7			1.5	1.6		11.47
South East Midlands	Northampton	2.7			1.5	1.6		8.37
	Oxford	3.8		1.7		1.6		12.54
	Coventry	4.6				2.0		9.20
	Derby	2.0			1.5	1.6		6.20
North East Midlands	Lincoln	5.8		1.7		1.6		19.14
	Boston	4.7	2					9.40
	Stamford	2.2			1.5	1.6		6.82
	Nottingham	2.7		1.7		1.6		8.91
	Newark	2.5			1.5	1.6		7.75
South West Midlands	Shrewsbury	3.4		1.7				5.78
	Ludlow	2.3			1.5			3.45
	Bristol	9.8	2			1.6		35.28
	Gloucester	4.0		1.7		2		14.80
	Hereford	3.4			1.5	1.6		10.54
	Worcester	3.0		1.7		1.6		9.90
North West Midlands	Lichfield	1.7				1.6		2.72
	Chester	1.8	2					3.60
North	Newcastle	4.2	2			(1.6)		15.12
	York	11.3		1.7		1.6		37.29
	Beverley	4.8			1.5			7.20
	Scarborough	4.1	2					8.20
	Kingston upon Hull	3.3	2					6.60

Three towns have been selected as gravity centres in the large area of the South-West. The sea-port of **Plymouth** was undoubtedly the main urban centre in the western extreme, as reflects the *population potential* index (26.64). Additionally, the near port of **Exeter** (9.72) has also been considered. In fact both towns participated in the trade routes that linked Gascony and Brittany to Irish and Welsh ports and were in the coastal route from London-Southampton to Bristol and Chester (Darby 1936: 280). As regards the central parts of the South-West, only **Salisbury** (12.5) has been considered as a gravity centre: it had a relatively large population and became, together with Winchester, an important cloth manufacturing centre. Salisbury was well situated in the middle of a network that connected it to London, to the woolen areas of the Costwolds and to the sea outlet of Southampton; in fact, it is assumed that "apart from the years of the plague, [in Salisbury] there was no pause of development during the Middle Ages" (Reynolds 1977: 157), and this may be the reason for its high *population potential* index (16.12).⁵

The main urban centre in the South-East Midlands was **Oxford** (12.54), a cloth-manufacturing town linked by river and road to London. Both **Coventry** (9.20) and **Leicester** (11.47) have also been selected as gravity centres in this area. Coventry, in particular, one of the five more populated towns, was an important junction which, located in the ancient Roman Watling Street, linked the North and South of England, and became an outlet for the cloth, metal and leather industry in which the town prospered. **Lincoln** (19.14), an important cloth-manufacturing town in the 14th century, was possibly the main gravity centre of the North-East Midlands. Additionally, the sea-port of **Boston** (9.40) may have acted as population catalyst: it was linked by road and river to neighbouring areas, which provided it with wool and lead, and was connected by sea to East Anglia and London.

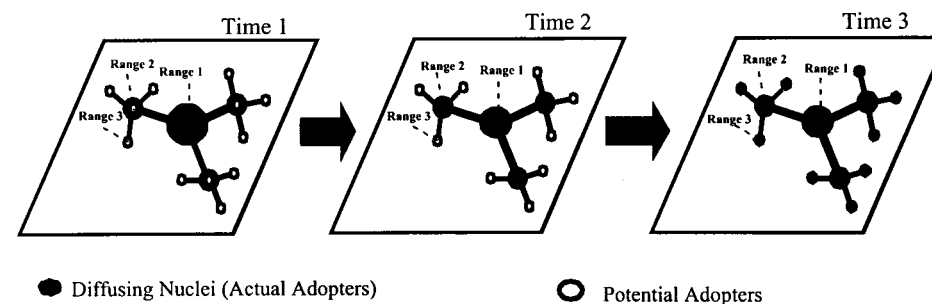
The port of **Bristol** (35.28), the third largest town in England, was clearly the most important centre in the South-West Midlands: in addition to the role of this town in international and national trade (with Ireland, Gascony, Brittany, Wales, etc.), it was the natural outlet and marketing centre for the surrounding hinter-

⁵ It may seem strange that Salisbury reaches higher scores than Southampton in the calculations of this index and that, therefore, the former has been chosen as urban catalyst in this part of the South-West. The reason may be the absence of industrial development at the port of Southampton. While it is true that this was an important harbour placed in the main European trade routes – it was connected to France and the Mediterranean and redistributed products from these areas to Flanders, Northern Europe and to other English ports (Darby 1936: 272-280) – historical geographers agree that it had little industry and was not a prosperous town (Reynolds 1977: 152; Kermode 2000: 448), which may explain the demographic differences with other towns of the area. However, it must be assumed – and this is reflected in the following sections – that Southampton was directly linked by coastal shipping to London, and that innovations from the capital must have often followed this route.

land, which included such wealthy cloth-manufacturing and wool-producing areas as the Mendips and the Costwolds, and from the 14th century developed its own cloth industry (Darby 1936: 284-286; Reynolds 1977: 152). These factors mean that Bristol enjoyed outstanding prosperity and may have behaved as a gravity centre in this part of the country. Although **Gloucester** has a lower *population potential* index (14.80), we have also considered it as a gravity centre in the South-West Midlands. Situated at a strategic point in the river Severn, it was the natural outlet for a hinterland that comprised the Severn valley and the counties of Hereford and Shropshire. Furthermore, it was an important junction on the way from London to other towns of the North- and South-West Midlands or to Wales, and developed an important metal industry of its own, which must have attracted people from the neighbouring districts (Darby 1936: 284-286).

In the scarcely populated North-West Midlands, only the port of **Chester** (3.60) may have attracted people and goods from surrounding settlements and benefited from trade with Irish towns like Dublin or Dorgheda. Finally, **York**, the second largest city, was undoubtedly the main gravity centre of the North, with a population potential index of 37.29. It had been a key military, ecclesiastical and administrative centre for centuries and gained profit from the development of cloth, leather and metal industries, to the point of reaching a peak of prosperity about the end of the 14th century (Reynolds 1977: 155). Together with York, **Newcastle** (15.12) has been selected: it possibly behaved as population catalyst or gravity centre in the furthest northern extreme in connection with economic activities like shipping coal or wool produced north of the river Tees.

Figure 1. Hierarchical structure of diffusion



This hierarchy of urban centres implies (as shown in Figure 1) that, at an intra-regional level, innovations were more likely to reach the selected towns and that later they would have spread out into other inferior nuclei – with a lower *population potential* index, of the same grid. For instance, in East Anglia innovations from London would possibly reach Cambridge (11.47) before Ely (9.80), and Norwich (20.77) before Yarmouth (7.40). In the South-West they would reach

Salisbury (16.12) before Winchester (4.32), and in the South-West Midlands, Bristol (35.28) and Gloucester (14.80) may have received innovations earlier than Worcester (9.90), Shrewsbury (5.78), Hereford (10.54) or Ludlow (3.45).

3.2. Model 2: Interaction and linguistic influence potential

Linguistic contact, which takes place through speakers' interaction in predominantly conversational communicative contexts (spoken language), is inevitably necessary for the transmission of an innovation to occur. As Trudgill (1992: 76) underlines, interpersonal contacts, with face-to-face interaction, between potential adopters will be essential for any process of diffusion. With this in mind, once the main gravity centres for the nine areas have been selected, we intend to establish the interaction potential between them, as a measure of the chances of exposure to communication through personal contacts, so as to gain an insight into the possible ways that innovations from London might have taken in their diffusion throughout late medieval England. For this purpose, geolinguists have traditionally used the *gravity model* equation; it was developed by human geographers and sociologists (Ravenstein 1885; Stewart 1974) to quantify and measure the interaction between different urban centres and to predict the movements of population, goods and information between them. The formula was inspired in Newton's law of gravitation and proposes that the movement or interaction between two cities (M_{ij}) is directly proportional to the product of the population sizes (P_i and P_j) and inversely proportional to the distance between them (D_{ij}) (see: Hernández-Campoy 1999b: 16-17).

Gravity Model Equation

$$M_{ij} = K \frac{P_i \cdot P_j}{D_{ij}^2}$$

Geolinguistics has enriched this model in two directions. Firstly by considering that, in terms of probability, interaction between two urban centres can never be equal if they have different population sizes. On the contrary, as Trudgill assumes, "interaction consists of influence in each direction proportional to population size" (1974: 235). As a result, the formula is modified to include a coda that takes account of the population density of the influencing centre. Thus, the degree of influence exerted and received by the different nuclei can be quantified and a model for the geographical distribution and diffusion of innovations is developed (Hernández-Campoy 1999b: 18).

Influence Potential Equation

$$M_{ij} = K \frac{P_i \cdot P_j}{D_{ij}^2} \cdot \frac{P_i}{P_i + P_j}$$

The total Interaction Potential Index (IPI) of every single urban centre is defined as the addition of its different individual interaction potential indexes, obtained using the gravity model formula, with respect to the rest of centres. For example, the total IPI of Coventry would be:

$$\text{IPI}_{\text{Coventry}} = (\text{Interact.}_{\text{Coventry-London}}) + (\text{Interact.}_{\text{Coventry-Bristol}}) + (\text{Interact.}_{\text{Coventry-York}}) + (\text{Interact.}_{\text{Coventry-Bristol}}) + (\dots) = 4.41$$

The results of these calculations are shown in Table 4, for each locality, and Table 5 for each of the ME dialect areas. In both cases, in addition to the raw figures, percentages are given so as to make their interpretation easier and within commoner referents. For instance, as regards the IPI of Coventry, whose $\sum \text{interaction}_{x-y} = 100\%$, while Interaction_{x-y} of any other two places $\geq 100\%$, the normalised percentage is calculated as:

$$\frac{100 \cdot (\text{Interaction}_{x-y})}{\sum \text{Interaction}_{x-y}} = 8.1\%$$

Table 4. Interaction potential index of the ME urban centres

Rank	Urban Centre	Dialect Area	Interaction raw data	Potential percentage
1	London	Middlesex	11.60	21.3%
2	Coventry	South East Midlands	4.41	8.1%
3	Bristol	South West Midlands	3.81	7.0%
4	K. Lynn	East Anglia	2.99	5.5%
5	Oxford	South East Midlands	2.86	5.3%
6	Leicester	South East Midlands	2.84	5.2%
7	Boston	North East Midlands	2.83	5.2%
8	Cambridge	East Anglia	2.68	5.0%
9	Bury St. Edmonds	East Anglia	2.38	4.4%
10	Lincoln	North East Midlands	2.35	4.3%
11	Norwich	East Anglia	2.30	4.2%
12	York	North	2.23	4.1%
13	Gloucester	South West Midlands	2.15	3.9%
14	Salisbury	South West	1.96	3.6%
15	Canterbury	South East	1.83	3.4%
16	Plymouth	South West	0.99	1.8%
17	Newcastle	North	0.92	1.7%
18	Exeter	South West	0.81	1.5%
19	Chester	North West Midlands	0.29	0.5%

The interpretation of these data (Tables 4 and 5) makes it clear that London was the nucleus showing the highest degree of interaction with the rest of localities. This may mean that inhabitants from this city had greater chances of mobility and contact with speakers from other areas and makes of London the urban

nucleus enjoying the greatest degree of exposure to innovations as well as the greatest chances of adopting and transmitting them outwardly. London is followed by other demographically inferior locations, although the interaction potential of towns like Coventry (8.1%), Bristol (7%), Lynn (5.5%), Oxford (5.3%), Leicester (5.2%), Boston (5.2%) and Cambridge (5%) is also outstanding. Most of these towns, except Bristol and Boston, are located in East Anglia and the South-East Midlands, the most populated areas in the late 14th century (see Maps 2 and 4) and, possibly, those with the greatest flow systems among settlements and the highest exposures to innovations.

Map 4. Interaction Potential Index per ME dialect areas



Table 5. Interaction potential index of the ME dialect areas

Rank	Dialect Area	percentage
1	London	21.3%
2	East Anglia (EA)	19.1%
3	South East Midlands (SEM)	18.6%
4	South West Midlands (SWM)	10.9%
5	South West (SW)	10.9%
6	North East Midlands (NEM)	9.5%
7	North (N)	5.8%
8	South East (SE)	3.4%
9	North West Midlands (NWM)	0.5%

The equation above has also been enriched by geolinguists by taking account of the distance or similarity between the linguistic systems peculiar to each area. Indeed, a linguistic system can have either a restraining (slowing/rejecting) or stimulating (accelerating) effect on the adoption of a given innovation, because the higher or lower compatibility of the innovation in question with the characteristics of the variety receiving it will make the whole process easier or more complicated. Quoting Trudgill's words "... it appears to be psychologically and linguistically easiest to adopt linguistic features from those dialects or accents that most clearly resemble one's own largely, we can assume, because the adjustments that have to be made are smaller" (1974: 235). This principle is contemplated by enlarging the influence potential formula to include a conventional quantification of linguistic similarity (*S*).

Linguistic Influence Equation

$$I_{xy} = S \cdot \frac{P_x \cdot P_i}{(D_{xy})^2} \cdot \frac{P_x}{P_x + P_y}$$

In order to quantify the degree of linguistic similarity between the dialect areas involved in this study, ten phonological and morphological characteristics of late ME dialects have been considered (see Table 6, p.168). In particular we have looked at the OE test vowels which would develop differently in the various areas of the country and especially in the London dialect of the late 14th century: [eo], [æ], [æ:] and [a + nasal] (see: Ekwall 1956; Jakobson 1970). We have also considered the behaviour of the fricative consonant [f] in initial position and some distinctive morphological features: the third person singular feminine personal pronoun (*ho, heo, he, sche, scho*), the *th-* or *h-* forms of third person plural personal pronouns, the present participle ending (*-inge, -ende* or *-ande*), as well as the inflection for the present indicative plural (*-en, -e, -eþ* and *-es*) and for the third singular present indicative (*-eþ, -es*) (see: Moore, Meech and Whitehall 1935; Fernández 1982: 590-592).

Table 6. Phonological and morphological features of the nine dialect areas

	London	SE	EA	SW	SEM	NEM	SWM	NWM	N
OE [eo]	[e:]	[e:]	[e:]	[o:]	[e:]	[e:]	[o:]	[o:]	[e:]
OE [æ]	[a]	[e]	[a]	[e, a]	[a]	[e, a]	[e, a]	[e]	[a]
OE [æ:]	[ε:]	[e:]	[a:]	[ε:]	[ε:, e:]	[ε:, e:]	[ε:, e:]	[ε:, e:]	[ε:, e:]
OE [a+nasal]	[o:]	[o:]	[o:]	[o:]	[o:]	[o:]	[a:]	[a:]	[a:]
Initial [f]	[v]	[v]	[f]	[v]	[f]	[f]	[f, v]	[f]	[f]
Feminine pp	<i>sche</i>	<i>he, ho</i>	<i>sche</i>	<i>ho</i>	<i>sche</i>	<i>scho</i>	<i>heo, ho</i>	<i>heo, ho</i>	<i>scho</i>
Plural pp	<i>th-, h-</i>	<i>h-</i>	<i>th-, h-</i>	<i>h-</i>	<i>th-, h-</i>	<i>th-</i>	<i>h-</i>	<i>h-</i>	<i>th-</i>
Present part	<i>-inge</i>	<i>-inge</i>	<i>-inge</i>	<i>-inge</i>	<i>-inge</i>	<i>-inge</i>	<i>-inge</i>	<i>-inge</i>	<i>-ande</i>
Present pl	<i>-en, -e</i>	<i>-eb</i>	<i>-en</i>	<i>-eb</i>	<i>-en</i>	<i>-en, -es</i>	<i>-eb</i>	<i>-en</i>	<i>-es</i>
3 present sg	<i>-ep</i>	<i>-eb</i>	<i>-ebb</i>	<i>-ebb</i>	<i>-eb</i>	<i>-es</i>	<i>-eb</i>	<i>-es</i>	<i>-es</i>

Table 7. Degree of linguistic similarity amongst the dialect areas

Dialect Area	Main Urban Centres	Linguistic similarity
<i>Middlesex</i>	<i>London</i>	10
<i>South East</i>	<i>Canterbury</i>	5
<i>East Anglia</i>	<i>Cambridge</i>	7.5
	<i>Norwich</i>	7.5
	<i>Bury St Edmunds</i>	7.5
	<i>King's Lynn</i>	7.5
	<i>Exeter</i>	5.5
	<i>Plymouth</i>	5.5
	<i>Salisbury</i>	5.5
<i>South East Midlands</i>	<i>Oxford</i>	8
	<i>Coventry</i>	8
	<i>Leicester</i>	8
<i>North East Midlands</i>	<i>Lincoln</i>	5
	<i>Boston</i>	5
<i>South West Midlands</i>	<i>Bristol</i>	3
	<i>Gloucester</i>	3
<i>North West Midlands</i>	<i>Chester</i>	2
<i>North</i>	<i>York</i>	3
	<i>Newcastle</i>	3

A score of 1, 0.5 or 0 has been given to each of the dialect areas on account of the presence or absence of each of these distinctive features, so that a numerical value ranging from 0 to 10 can conventionally be assumed to express the degree of linguistic similarity. The figures are displayed in Table 7.

Calculations of the influence potential exerted and received by every single urban centre are displayed in Table 8 (p. 166) in percentages. These figures allow us to speculate on how linguistic innovations from London might have spatially diffused throughout the country. It is feasible to construct a pattern which combines the wave-like model with hierarchical diffusion (see Map 5, p. 167). In this sense, linguistic features would have spread more or less evenly to the towns of **Cambridge** (EA), **Oxford** (SEM), **Canterbury** (SE), **Bury St Edmunds** (EA) and **Salisbury** (SW); although it is possible to claim, on account of the population potential index of the different localities in each of these areas, that these gravity centres would have received innovations earlier than other places, despite being nearer to London. The process of wave-like diffusion

would possibly have been prevalent in the case of the ports of the Southwest, so that innovations from London must have reached **Southampton** (not included among the main gravity centres), **Exeter** and **Plymouth** successively. Nevertheless, a process of hierarchical diffusion may have led innovations from London to **Coventry** (SEM). Similarly, **Lynn** (EA) may have been affected before Norwich in view of the former's higher potential for influencing (4.9%) and being influenced (5.9%); the reason was possibly the connection by sea between the ports of Lynn and London. The same hierarchical pattern may have applied to **Bristol** (SWM): as a port-town directly linked to London by sea, innovations from this city may have reached Bristol before other places in the Southwest and the South-West Midlands.

Table 8. Influence potential *exerted/received* by the urban centres

<i>Potential for Influencing</i>		<i>Potential for being Influenced</i>	
1. London	51.2%	Oxford	8%
2. Coventry	9.4%	Cambridge	7.7%
3. Lynn	4.9%	Coventry	7.6%
4. Norwich	4%	Leicester	7.2%
5. Leicester	4.4%	Canterbury	6.7%
6. Bristol	3.2%	Bury St. Edmunds	6.1%
7. Oxford	3.2%	Lynn	5.9%
8. Boston	3.1%	Bristol	5.7%
9. Bury St. Edmunds	3%	Boston	5.3%
10. Lincoln	2.8%	York	5%
11. Cambridge	2.7%	Norwich	4.7%
12. Salisbury	1.8%	Salisbury	4.3%
13. Plymouth	1.5%	Gloucester	4.1%
14. York	1.1%	Lincoln	4%
15. Gloucester	0.9%	London	3.7%
16. Newcastle	0.84%	Exeter	1.6%
17. Canterbury	0.83%	Plymouth	1.3%
18. Exeter	0.5%	Newcastle	1.2%
19. Chester	0.05%	Chester	0.7%

The high potential for influencing of some of these towns, particularly Coventry (9.4%), Lynn (4.9%) and Bristol (3.2%), makes it plausible that innovations from London rebounded from them to neighbouring towns, in a new

Map 5. Patterns of diffusion from London



wave-like pattern of diffusion. Connection by sea may have favoured the diffusion of innovations from Lynn to **Boston** (NEM), and roads may have facilitated their movement from Bristol to the near town of **Gloucester** (SWM) and from Coventry to **Leicester** (SEM). It is possible that innovations reached **Norwich** (EA) either from the port of Lynn, or directly from London and/or Bury St. Edmunds, although in view of the road connection between the last three towns, and the difficulties for transportation in the Fens, we prefer to speculate on the second possibility. Finally, it is harder to trace the routes that linguistic innovations from London followed in their diffusion through the northern counties. While it is clear that **Newcastle** (N) and **Chester** (NWM) would have been the last places to receive them, if they did at all, the low potential for influencing and being influenced of towns like **Lincoln** (NEM) (2.8% and 4%) and **York** (N) (1.1% and 5%), makes it likely that the former received London innovations

from the near port of Boston or from Leicester and that, in a wave-like manner, they finally reached York either from Coventry or from Lincoln.

As regards each dialect area (Table 8 and Figure 2), East Anglia and the South-East Midlands are clearly prone to receiving (being influenced) and dif-fusing (influencing) innovations from London and, therefore, may have been the more innovative areas during the late Middle English period. The South-West Midlands, the North-East Midlands and the South-West follow in the rank, while the North and North-West Midlands lag behind in this particular process. This pattern is not unexpected, since these areas are also arranged in this order as far as population density and proximity to London are concerned (see Map 2). It seems odd that the South-East, even though it is near London, does not reflect high chances of being linguistically influenced by the metropolis; we understand that this may be due to the differences between the dialects peculiar to each area. In fact, although, as Mackenzie (1928) and Ekwall (1956) demonstrated decades ago, both the South-Eastern and South-Western varieties had a direct linguistic influence on the configuration of the early ME London dialect, the later London standard separated progressively from the former to align itself more conclusively with the latter and was further reinforced with features coming from the East Midlands.

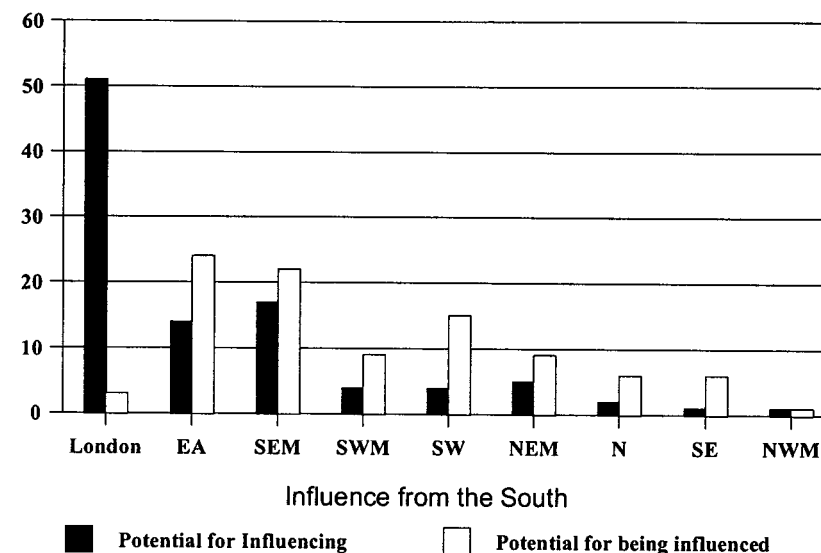
Table 9. Influence potential *exerted/received* by each dialect area

<i>Potential for Influencing</i>		<i>Potential for being Influenced</i>	
1. London (M)	51.2%	East Anglia	24.4%
2. South-East Midlands	17%	South-East Midlands	22.8%
3. East Anglia	14.6%	Southwest	15.5%
4. South-West Midlands	4.1%	South-West Midlands	9.8%
5. North-East Midlands	5.9%	North-East Midlands	9.3%
6. Southwest	4.5%	Southeast	6.7%
7. North	1.94%	North	6.2%
8. Southeast	0.83%	London (M)	3.7%
9. North-West Midlands	0.05%	North-West Midlands	0.7%

4. Conclusion

As a conclusion, we would like to insist on the speculative character of this paper. We have simply accepted the possibility that linguistic innovations in late Middle English did not only diffuse in a epidemic, wave-like manner, but that the growth and development of towns may have favoured a process of hierarchical diffusion. In this process demography and communication networks may

Figure 2. Influence Potential Indexes per ME dialect areas (focal area: London)



have played a vital role. Following these premises, we have considered the population of late medieval England and have attempted to reconstruct a road network that could have linked towns in different parts of the country; we have also pointed to the importance of river transport and coastal shipping as basic means for innovations to diffuse from London, possibly the most innovative area in linguistic terms, to other parts of the country.

The application of geolinguistic models to late Middle English results in a model that combines epidemic and hierarchical diffusion and points to the importance of towns like Coventry (SEM), Bristol (SWM) and Lynn (EA), in addition to London, in the linguistic panorama of late 14th century England. These towns, particularly Coventry, may have been places, like London, where key linguistic processes were taking place at the time and we think it is worthwhile to analyse their contribution to this period of the history of the English language in more detail. Similarly, it would be interesting, as a follow-up, to carry this study along the diachronic axis by comparing these medieval patterns of diffusion with those prevalent in later periods, just as the importance of urban centres and the prestige of local varieties vary from period to period throughout history. For instance, the decline from the late 15th century of some of the towns that figure prominently in this study, like Boston (NEM), Lynn (EA) and Coventry (SEM), is well attested, just as other relatively minor localities, like Exeter, almost dou-

bled in size and may have become important centres as far as the reception of linguistic innovations was concerned.

Finally, it is necessary to emphasize that, even in a non-speculative paper, geolinguistics does not provide us with a complete picture of the complexity behind the diffusion of linguistic innovations. Gravity models may give adequate statistical explanations for the volume, distance and direction of geographical diffusion flows, but they do not reveal factors like the particular social group in which the innovation arose, the profile of the potential adopters and diffusers, the reasons leading speakers to adopt and reject an innovation, etc. (Hernández-Campoy 1999b: 38; see also: Britain 2002: 609-610). Historical sociolinguistics has started to reconstruct these pieces of the jigsaw puzzle and the mutual contribution with geolinguistics is necessary if we wish to illuminate some of these crucial aspects for the history of languages.

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