

# VARIATION IN FRENCH INTERLANGUAGE: A LONGITUDINAL STUDY OF SOCIOLINGUISTIC COMPETENCE.

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**1. INTRODUCTION.** This article will demonstrate the benefits of longitudinal studies of second language acquisition within the variationist framework. Much interesting work is now being carried out on the acquisition of second languages from within the variationist paradigm. However there has been, to date, virtually no variationist studies of the same speaker or group of speakers over time. Variation work sees linguistic change over time as a central focus of inquiry. As Sankoff (1988) says: 'Change virtually always requires a transitional period, often very lengthy, of variability, competition among structures, and divergence within the speech community'. So it would seem that variation in the speech of learners over time could be an interesting line of inquiry in understanding the process of acquisition. It has been shown that the learner undergoes much the same process as the community in replacing one form with another. There have been some variationist studies of second language learners at different levels of proficiency, (see Young 1990) which do indeed give us insights into the development of the learners' usage, but so far no quantitative study of the same learners over time. This quantitative longitudinal study of the progress of learners aims to give a detailed picture of the acquisition of the native speech community grammar. It uses data from Hiberno English learners of French. In particular the study demonstrates how variable use of language by learners reveals their gradual acquisition of sociolinguistic competence.

Frequently, the aim of the L2 learner is to be able to function, as much as possible, as a member of a speech community. Being a member of a speech community implies an intimate knowledge of the dialect of that community. In Labov's approach to sociolinguistics, the speech community is built on a shared grammar and shared norms, and a member of a speech community can be seen as one who recognises dialectal elements for that specific community where an outsider does not. Therefore, the L2 learner, who wishes to integrate into the second language community, must also learn about sociolinguistic community speech norms in the target language.

When living in the foreign speech community, the learner tries to approximate the input provided by that community. This accommodation takes place not only in relation to the linguistic structures of the L2, but also to the sociolinguistic norms of the native speech community. As a matter of fact, as well as the acquisition of syntactic and morphological rules, integration into a speech community depends upon a knowledge of sociolinguistic factors: sociocultural norms, pragmatic considerations and a sensitivity to sociolinguistic variation in the L2. The acquisition of the grammar of the spontaneous speech of the native speakers and of the sociolinguistic norms of the community by the second language learner would seem to be a valid focus of inquiry in the general study of communicative competence in a second language.

Variation in IL has been represented as being on two axes, vertical and horizontal (Corder 1981, Ellis 1985, Young 1988, Adamson 1988, Adamson and Regan 1991). Progress along the vertical axis can be seen as progress along the developmental line in the acquisition of native structures of the language whereas progress along the horizontal axis is seen as the acquisition of sociolinguistic competence or the acquisition of dialect differences. Young (1988) argues that learners must progress along the vertical continuum before they can progress along the horizontal continuum. For instance, the English speaking learner of French in expressing negation may use two forms variably at an early stage: \**je ne vois* (non-target) or *Je ne vois pas*, (target), or choose between two non target forms. Since horizontal variation involves two target forms, it happens later when the speaker will say variably: *je vois pas* or *je ne vois pas*. These are simply, in Labov's terms, just two ways of saying the same thing. When the learner is making progress along the horizontal continuum, they are making progress in the acquisition of sociolinguistic competence. Every 'normal' member of the native speech community has a variable system according to which they know how to choose between the two or more target like forms. For the learner to be 'normal' also, he or she must acquire the details of the variability present in the native speaker system. They have to learn the variable system of the native speaker.

To study the horizontal continuum or the acquisition of sociolinguistic competence, it seems most useful, then, to focus on advanced learners, and particularly on their acquisition of a structure which has clearly been already acquired. In this way, by studying an item in the Interlanguage which has been acquired developmentally, one can distinguish the two axes - vertical and horizontal. Negation in French is such an appropriate item. Advanced speakers produce target-like structures most if not all of the time. The advanced learners in this study know the prescriptive structural rule for forming negation (by using the two particles *ne* and *pas*), but they have not yet acquired a native-like competence in its variable surface realisation in production. They do not yet have the constraints on variation that natives have. If, for instance, at a later stage, they show usage of only the second particle *pas*, this would indicate that they are adopting sociolinguistic norms.

**2. NEGATION IN FRENCH.** The deletion of *ne* was the variable chosen as a means of studying the acquisition of sociolinguistic norms in French as a second language. In spoken French, *ne* is deleted variably to a great or lesser extent by all members of French-speaking communities throughout the world. *ne* deletion appears to be a highly sensitive sociolinguistic variable and a powerful indicator of formality, issues of power and solidarity, style, register and so on. It has a network of relationships with sociolinguistic factors such as age, sex and social class. It often co-occurs with other such sociolinguistically sensitive variables in French as the variable use of *tu* as opposed to *vous*, or *on* as opposed to *vous* and *nous*.

In modern French, *ne* is the first of two particles which form negation and comes between subject clitic and the following constituent (ex. *Je ne vois pas*). The negative is formed by the proclitic, *ne*, and a marker of general negation, *pas*. The second particle can be a pronoun, adverb or a reinforcer of some kind. As well as *pas*, one also finds *plus*, *jamais*, *rien*, *point*, *personne*. The second particles had a positive semantic value in Old French, (*pas* meant a step, *goutte* a drop, *personne* a person), but these lexemes were emptied of their semantic content over time. Nyrop (1930) sees them as being used in negative expressions and so acquiring a negative value instead.<sup>1</sup>

Ashby (1981) notes that the grammaticalisation of a second marker of general negation is an innovation in French, and that in the other Romance languages, Latin *non* and its descendants are only sporadically reinforced. This strengthening of the negative is common to many languages, but only became common in French from the 17th century on, whereafter it

began to be seen as obligatory. The grammaticalisation of *pas* resulted in *ne* being, in fact, redundant.

Throughout the history of the language, there has been a shifting from one particle to the other, and between the use of one only or both negative particles. Latin *non* became Old and Middle French *ne*, with *pas* optionally, which became *ne* with obligatory *pas* in Classical French and in contemporary French. French today uses formally *ne.. pas*, and informally, simply *pas*. It seems possible (see Harris 1988, Kayne 1975, Ashby 1976 and 1981), that French today is undergoing a process of cliticisation, whereby the loss of *ne* between subject and finite verb is leading to a fusing of clitic pronoun and verb into one form consisting of prefix and stem. *Je* would be fused to *vois*.

**3. VARIABILITY IN FRENCH NEGATION.** *Ne* is variably deleted throughout the contemporary French speaking world in all varieties of the language. The rates of deletion vary from 98% in Montreal French (Sankoff and Vincent 1977), 99% in the Ottawa Hull corpus (Poplack, personal communication), to 44.1% in Parisian upper middle French (Ashby 1976). Ashby notes 'Recent studies have shown that the retention or deletion of *ne* is not free.' Ashby's study (1976) of Malécot's Paris corpus shows that deletion in Paris is conditioned by grammatical, stylistic and social factors. His Tours study (1981) shows similar conditioning. Sankoff and Vincent (1977) show that the very few tokens of *ne* which were found in their corpus correlated with stylistic register and topic. It is possible to interpret the variable behaviour of *ne* deletion in native speaker French in two ways. In the first case, as outlined above, a strong case can be made for seeing the variable behaviour of *ne* deletion as a change in progress, wherein the clitic subject is becoming part of the verb stem. In support of this, apparent time shows the requisite age grading (young people delete more than older ones in the French of France), and sex differentiation, as Ashby (1981) shows (women delete more than men)<sup>2</sup>.

However, an equally strong case has been made for *ne* deletion as a stable sociolinguistic variable (Blanche Benveniste 1985). This variable is seen as one which has been around for a long time and which, because of its symbolic value, is likely to be retained in its variable state. They find that *ne* is maintained as a syntactic and stylistic resource, available to the speakers of Montreal French for their use as they find appropriate (Sankoff and Vincent 1980). Whether it is a change in progress in French or a stable sociolinguistic variable, it seems to be a productive item in sociolinguistic terms. One of the questions of this study is whether non native speakers, when they are actually exposed to it, understand the significance of the variable socially and whether they learn to exploit it for integrative purposes of the sort proposed by Gardner's model (1985).

**4. NE DELETION IN NON-NATIVE SPEAKER FRENCH.** The behaviour of non-native speakers in relation to variation in French negation has so far been little studied. A small number of general studies of negation in French Interlanguage have been carried out. (Trévisé and Noyau 1984, Lightbown and d'Angljan 1985, Regan 1990). But quantitative studies of French Interlanguage are particularly few. Two quantitative cross sectional studies have looked at *ne* deletion in learner French. Dewaele (1993) studied the omission rates of *ne* in informal and formal styles in the Interlanguage of advanced Dutch learners, who learnt French in Holland, mainly in the classroom. He found that the variation between formal and informal was limited and that the degree of omission was much lower to that of native French speakers. In general, he concludes the variable rule used by natives is used by non-natives, but to a lesser degree. He found that style made a difference. As he had predicted, there was less omission of *ne* in the formal style, but there was also less than in native speech. He also finds

that the use the speaker makes of French influences the use of *ne*. Those speakers who limited themselves to the language learnt in the classroom, were limited to the formal register learnt in the classroom and mostly retained the *ne*.

Devaluy's study of Anglophone and Francophone behaviour in relation to *ne* deletion in the French of Montreal shows that while infrequent, the use of the complete negative in spoken French is maintained in the community. The study looked at differences in task and found that both Anglophone and Francophone speakers when reading aloud from a text produce 90% of negatives with *ne* as they appear in the text. In an interview however, the Francophones omit *ne* 99% of the time. The rates of the Anglophones were different, but they did reproduce the variation pattern of negation of the Francophone speakers. There is a concordance of patterns of variation in negation among Francophones and Anglophones.

**5. A LONGITUDINAL VARIATION STUDY OF INTERLANGUAGE.** The Labovian variationist model of language is expressly a dynamic one and accounts for variation and change over time in native speech in the community. It seems likely then that such a model would also account for variation and change in the development of a learner's second language. Research which indicates this is Adamson's (1988), Preston's (1989), Young's (1990) and Bayley's (1991).

As already noted, a longitudinal, quantitative study of Interlanguage has not yet appeared, (although two studies are currently looking at this area). Young's 1991 study of 's' plural marking in Chinese learners of English included a comparison of low and high proficiency learners. He found that the weight of certain factors shifted according to the degree of proficiency. Phonological environment was an important contributing factor in the marking of plural in the early learners, but was not in the speech of the intermediate and advanced learners. Though the data was cross-sectional – different speakers were involved in the 2 stages – it indicated developmental phases in the acquisition of English morphology, and is probably the closest to a quantitative study of SLA dealing with longitudinal data that we have so far. The present study aims to show that though the full data set for the learners of French gives a general picture of their grammar, it is the 2 separate data sets which reveal details of the changes which take place over time in the acquisition process. It gives us a close up picture in quantitative terms of exactly which changes take place and the degree of change which occurs.

**6. DESIGN OF THE STUDY.** The aim of the present study then, was to be properly longitudinal, and to provide explicit data on variation in development. Data from the same learners at two different times was gathered. A separate factor group contained two factors: Time 1 and Time 2. The relative importance of each stage of development was estimated. The data set was analysed in three ways: (a) using just the Time 1 data, (b) using just the Time 2 data, and (c) all the data together. The data represents the linguistic development over two years, a period which included a nine month stay in a Francophone country.

**6.1 METHOD.** A multivariate analysis of the data was carried out using Goldvarb Version 2, a variable rule application for the Macintosh. A p value greater than .50 indicates that the factor favours the production of the variable- *ne* deletion - whereas a p value less than .50 indicates that the factor disfavors it. For this longitudinal study of learners of French, the aim was to compare the probabilities from the Time 1 and the Time 2 data and to see if and which reweightings of these probability figures took place. The resulting figures would reflect developmental trends in the language of the speakers.

For the Varbrul analysis, one first specifies the factors which are believed to constrain the variation. Following Ashby (1976, 1991) and Sankoff and Vincent (1980) for native speech

variation in relation to *ne* and my own observations of the Interlanguage of Irish speakers, the following linguistic factor groups were proposed: Style, Verb Tense, Following Phonological environment, Preceding Phonological Environment, Syntactic Structure of the Verb, Clause type, Following Adverb, Subject of Verb, Presence of Object Clitic between *ne* and *pas*, and Lexicalisation. These factor groups were divided into constituent factors. Table 1 shows the factor groups with their constituent factors and examples of each factor with tokens taken from the corpus. Column 1 shows the factor groups and Column 2 shows the factors that make up each group.

Style	
Monitored	
Casual	
Following Phonological Segment	
vowel	‘je n'ai aucune idée (I have no idea)
consonant	‘elle ne travaille plus’(She doesn’t work any more)
Preceding Phonological Segment	
vowel	‘je n'allais pas’ (I didn’t go’
consonant	‘elle ne va pas en France’(She doesn’t go to France)
Syntactic Structure of the verb	
modal	‘elle ne pouvait pas trouver’(She couldn’t find)
auxiliary	‘j'ai entendu rien d'elle’ (I havn’t heard anything from her)
copula	‘c'est pas moi’ (Its not me)
main	‘j'aimais pas’ (I didn’t like)
Time of Interview	
Time 1	prior to French visit
Time 2	after return from France
Clause Type	
main	‘je dis rien contre elle’ ( I’m not saying against her)
subordinate	‘tout est bien s'il n'y a rien’ (Everything is ok if theres no damage)
Subject	
Pronoun	‘je pourrais pas’ (I wasn’t able)
full noun phrase	‘les gens n'étaient pas contents’ (People weren’t happy about it)
Presence of Object clitic	
Absence	‘je ne travaillais pas’ (I wasn’t working )
Presence	‘je ne l'aimais pas’ (I didn’t like him)
Lexicalisation	
not a formula	‘je ne voudrais pas sourire’ (I didn’t want to smile)
lexicalised phrase	‘il n'y a pas’, ‘je sais pas’, ‘il ne faut pas’ (There isn’t, I don’t know)

## Individual

1. Catherine (C)
2. Donna (D)
3. Joy (J)
4. Judy (U)
5. Miles (M)
6. Nora (N)
7. Sally (S)

Table 1: Factor Groups and Factors

**6.2 SUBJECTS.** The subjects for the study of *ne* deletion in non-native French were seven advanced learners. They were Irish university students who were studying French as one of two subjects for their BA degree. They had all studied French for five years at secondary school. Several had had short stays in France (two weeks to a month on average) but none had lived there for any longer period. Most of them were studying a second European language and all had studied Irish from the age of four or five. They were all about the same age and were mainly middle class. Only one out of the seven was male. This gender imbalance reflects the general proportion of males and females taking French as a subject, but obviously prevents any reliable conclusions being drawn regarding gender and second language learning. Another factor common to these speakers was that they had been selected as motivated students, on the basis of grades and evaluations, to take part in a year abroad programme. Most of them reported an interest in eventually working in and living in a French speaking country.

**6.3 DATA ELICITATION.** Two sociolinguistic interviews of forty five minutes to an hour long for each speaker, were tape-recorded by myself. The speakers, students in the department where I taught, knew me to be a member of faculty, but were not students in courses I taught<sup>3</sup>. Prior to the study, I was not acquainted with them but, over the period of the study, a certain friendship was established. In their use of language, then, over this time, it is possible that the increased intimacy led to a slight decrease in formality.

The first interview took place, just before the students were about to leave for their year in France. The second was a year later, on their return. The interviews were carried out according to the principles set out by Labov (1984) and developed at the University of Pennsylvania. In general, the standard question modules were used, but adapted to the experience of the Irish speakers. Topics included ‘danger of death’, ‘childhood’, ‘dating’, ‘crime’, but also included ‘au-pair experiences in France’, ‘student summer work abroad’ and ‘dangers of the *cit  universitaire*’ (the French ‘dorm’). The interviews were carried out in a university office, but the topics mitigated against the formality of the situation (the interviewer had near native speech and used a spontaneous if slightly careful style). On the whole, it seemed that their use of language with me as interviewer was relatively spontaneous. This is borne out by ‘channel cues’, as Labov describes them, of laughter and rapid speech rate.

The speakers chosen had already studied French in a classroom setting for at least six years (five in school and one at university), and had already ‘acquired’ negation, that is, they had learnt the prescriptive grammar rule for the negative (Most of the speakers when asked after the last interview, what they had learnt about negation, quoted the grammar book rule of ‘*ne* before the verb and *pas* after it.’). The only task left to them to accomplish in relation to negation was the acquisition of some sort of native-like behaviour in relation to the dialect of the speech community. A central question was whether acquisition of this particular

competence was related to native speaker input during the stay in France. A slight complicating factor is that even though the students learnt the prescriptive rule for negation in the class room, they also used in the class room certain authentic materials which might lead them to a passive or even subconscious awareness of native tendencies to delete. In addition, some of them had been to France and though the visits were mostly short, it is possible that they might also have had contact with native like behaviour in relation to *ne* deletion.

**6.4 PROCEDURES OF DATA ANALYSIS.** The interviews were transcribed using the methods developed by Claire Blanche Benveniste at the University of Aix-en-Provence (Blanche-Benveniste C. and Jeanjean C. 1987)<sup>4</sup>. Every token of negative in the data was recorded and coded in a string which formed input into the Varbrul program. A total of 766 tokens of negation were fed into the programme for the ‘all data’ set, that is from the two interviews for each speaker. For the first data set (Time 1) there were 370 tokens and for the second (Time 2) there were 396. Tokens in a phonologically ambiguous environment were omitted. Examples of this are cases where [n] is preceded by the subject clitic *on* and followed by a vowel: *on n'était pas bien payé*. However, cases such as *on ne faisait pas les mêmes cours*, where the presence of the vowel eliminated the ambiguity, were retained<sup>5</sup>. Also omitted were frozen forms such as *pas mal*, *pas maintenant*, *pas du tout*.

The production of *ne* in the data represents a choice on the part of the speaker. A model for the choice which governs the outcome was postulated as a variable rule. The underlying form of the negation is *ne ..pas*, which is variably changed to *0...pas*. The data were coded as broadly as possible initially and later, factors were discarded or combined with other similar ones, if, for instance, there were too few tokens, and also for theoretically motivated reasons..

Questions to be addressed in the analysis of this data were: Is there a different constraint ordering in the ‘before’ data and the ‘after’ data? For example, if unmonitored style deletes more than casual before, and still deleted more than casual afterwards, we can say the constraint ordering remains the same. If there is a difference, it would suggest that there is a change in the grammar of the speakers. Are there factor groups or factors which make a difference in the ‘before’ data which might not afterwards? Or is the constraint ordering the same but the rate different? The general overall aim of the study was to get access to the detail of the grammar of the speakers and to describe in detail the changes resulting from contact with natives.

**7. RESULTS.** Table 2 displays the results of the final Varbrul 2 run for the combined data, that is the two sets, 1 and 2. Examples of tokens taken from the corpus are provided, with translations. These phrases are not always target-like, but are given as they appeared in the data. They have been translated taking the context into account. This gives a general picture of the grammar of the L2 speakers in relation to negation. In order to obtain the most parsimonious model of variation possible, each factor group in each data set was tested for significance. Individual factors within factor groups containing more than two factors were also tested for significance by comparing log likelihoods of runs with and without the factor. With the exception of ‘syntactic structure of the verb’, the following factor groups were significant for the combined Time 1 and Time 2 data.

Style		
	Monitored	.40
	Casual	.61

**Comment:** In order to obtain the most parsimonious model of variation possible, each factor group in each data set was tested for significance. Individual factors within factor groups containing more than two factors were also tested for significance by comparing log likelihoods of runs with and without the factor.

**Comment:** There was interaction between copula in the factor group ‘Syntactic structure of the verb’ and the factor group ‘Following phonological environment’; this was due to the large number of tokens which were *c'est pas ça* (where the copula always involved a following vowel). To take this into account, there two varbrul runs, with first one factor group excluded and then the other.

Following Phonological Segment		
vowel	.36	‘je n'ai aucune idée
consonant	.62	‘elle ne travaille plus’
Preceding Phonological Segment		
vowel	.70	‘je n'allais pas’
consonant	.15	‘elle ne va pas en France’
Syntactic Structure of the verb		
modal	.59	‘elle ne pouvait pas trouver’
auxilliary	.40	‘j'ai entendu rien d'elle’
copula	.49	‘c'est pas moi’
main	.51	‘j'aimais pas’
Time of Interview		
Time 1	.27	
Time 2	.72	
Clause Type		
main	.52	‘je dis rien contre elle’
subordinate	.32	‘tout est bien s'il n'y a rien’
Subject		
Pronoun	.54	‘je pourrais pas’
full noun phrase	.07	‘les gens n'étaient pas contents’
Presence of Object clitic		
Absence	.52	‘je ne travaillais pas’
Presence	.27	‘je ne l'aimais pas’
Lexicalisation		
not a formula	.38	‘je ne voudrais pas sourire’
lexicalised phrase	.71	‘je sais pas’, ‘il n'y a pas’
Individual		
1. Catherine (C)	.23	
2. Donna (D)	.09	
3. Joy (J)	.21	
4. Judy (U)	.89	
5. Miles (M)	.38	
6. Nora (N)	.60	
7. Sally (S)	.54	

Table 2: Varbrul results for all data

**7.1 THE GENERAL TRENDS FROM TIME 1 TO TIME 2.** The ‘all data’ set contains a factor group containing two factors: Before and After. This shows the probabilities of deletion rates from before the period spent in France and afterwards. There is a dramatic rise in the rate of *ne* deletion. The probability figure (p) for the rate of deletion in Time 1 before the period spent in France is .27 and after this period .72.

It appears from the Varbrul weights in the combined data, that the rate of *ne* deletion has increased. The results of the two separate data sets, Time 1 and Time 2, also show a generalisation and strengthening of the rule which was already in place in Time 1. For the figures in almost every factor the range is greater in Time 2, which shows that the rule is strengthening and the native grammar is taking hold.

The tokens were coded as broadly as possible initially, and later some factors were collapsed. In all cases, the collapsed data was tested for any change in significance. As far as

possible during the collapsing process, the same factors were maintained in analysing the two data sets, so that comparisons could be drawn most appropriately. In one or two cases this was not possible, due to an insufficient number of tokens.

The following tables show the results of the final runs for the 2 stages compared. The groups shown in the following tables were found to have a significant effect on variation. The effects of the individual factors within these factor groups will be discussed here.

**7.2 STYLE.** Table 3 depicts a variable rule analysis of the contribution of style to the probability that *ne* will be deleted according to whether monitored or casual style is used. The analysis shows that style has a very strong effect on *ne* deletion, with casual style strongly favouring deletion and monitored style disfavouring deletion ('unmonitored' in the original data set was collapsed with 'casual'). In addition, there is virtually no change in the constraint ordering from Time 1 to Time 2. It seems as if the speakers understand, even before the prolonged stay in France, the native speaker pragmatic norms in relation to negation; which is 'when you are being formal in French, you retain *ne*, and alternatively in casual speech, you delete.' The non natives are showing a similar pattern to that of the natives, as shown in Ashby (1981).<sup>6</sup> Ashby's figures show rates of retention of *ne* in the speech of natives. For Ashby's native speakers, stylistic factors have an effect: *ne* appeared more in formal (the first half of the interview) than in casual speech (the second half of the conversation). Ashby designates the first half of his interview as producing formal or monitored style. For formal style the retention rate is .53 whereas for informal style, it is .48. Sankoff and Vincent (1980) found a strong effect for style in French Canadian speech; they found that *ne* appears in contexts where speakers are aware of their own speech. Topics referred to here were: language, instruction, discipline and religion. So it seems that the non-natives have the same general pattern of *ne* deletion as natives.

Time of development	Monitored	Casual
Time 1	.37	.61
Time 2	.44	.59

Table 3. The contribution of Style to *ne* deletion

During the period abroad, this rule, already 'acquired', in the sense that Krashen uses it, (it is not taught formally in the classroom), maintains itself. The learners' hypothesis that you delete less in formal style is confirmed by the input from the speech community. However, the speakers now delete more in monitored style in Time 2 than they did in Time 1. In monitored style the deletion rate increased from .37 in Time 1, to .44 in Time 2. It may be that, even though they now have a very strong rule which says, 'delete more in monitored than casual style', at the same time, they have learnt that it is a good and a native-like thing to delete *ne*, and that for this reason they delete more overall -even in monitored style. Monitoring for them seems to imply producing what they perceive as native-like behaviour.

A possible explanation for the non-natives deleting more than natives is that they are overgeneralising. In general, intermediate learners use rules which are not sensitive to nuances of context, as we see from child language data on forms like 'goed' 'sheepses' and so on. Karmiloff-Smith's study of the acquisition of articles by French children shows very clearly this as the second of three clearly defined stages.<sup>7</sup> These more advanced speakers are much further on and well on the way to approaching the native speaker usage, but are still not quite as sensitive to nuances of context as the natives.

**7.3 LEXICALISATION.** Whether a phrase is lexicalised or not has a strong constraining effect on the deletion of *ne*. Factor c, (formulaic phrases) contains *ce n'est pas*, *il ne faut pas*, and *il n'y a pas*, which have been collapsed with *je ne sais pas*. These lexicalised phrases strongly favour deletion. Non lexicalised phrases disfavour deletion. (The non formulaic phrases show the neutral pattern for deletion given general syntactic and phonological constraints, whereas the formulaic phrases are lexically specified). As with practically all of the factor groups, this rule strengthens during the stay in the native speech community. The non natives are showing similar behaviour to the native speakers here also. Ashby (1981) reports the following figures for his Tours native speakers: 'not a formula' has a probability figure of .74 for the retention of *ne* and for lexicalised phrases: *je ne sais pas* .44, and *ce n'est pas* .27, *il ne faut pas* .36. In fact, the non-natives, after their stay in the native community, have a more pronounced rule than the natives. *Ne* deletion in lexicalised phrases is showing a tendency to be overgeneralised as happened with the factor group style.

Time of development	Factor A (non-formula)	Factor C (formula)
Time 1	.38	.75
Time 2	.28	.80

Table 4. The contribution of Lexicalisation to *ne* deletion.

It may be that the enthusiasm with which the learners adopt the native speaker norm here is due in part to the fact that they learn these frequent expressions as unanalysed chunks. Wong-Fillmore (1979) points out that in second language acquisition the learner finds it easier to learn a small number of frozen forms than to apply a productive rule. In addition, as Ashby points out, [ epa ] for *je ne sais pas* and [ sepa ] for *ce n'est pas* are popularly recognised stereotypes for *ne* deletion. A frequency of input hypothesis would also help to account for the behaviour of the non natives. They have understood this particular popular stereotype and during the period in France, in their effort to accommodate to natives, they use it at even higher rates than natives do. The use of lexicalised phrases by the learner will be discussed further later.

**7.4 SUBJECT.** It is clear that subject is a very powerful but stable effect for the non-native speakers. Like many of the other factor groups, it strengthens after the visit to France. Like the other factor groups also, the constraint ordering is similar to that of native speakers. Ashby finds an exact replication in 1981 of his 1976 data for native speaker subjects. In 1981, he finds that the figure for the retention of *ne* in full noun phrases is .72, for non-clitic pronouns .43, and for clitic pronouns .36, a pattern broadly similar to the pattern for the non-natives. Ashby points out that in native speaker French, the low retention rates of *ne* with clitic subjects is related to the fact that the subject clitics of French are not noun phrases but constituents of the verb phrase. He sees them as being in the process of becoming bound to the verb as inflectors of person and number. And as clitic and verb become more bound, *ne* 'which can only occur between them, may be progressively squeezed out' (Ashby 1981: 681). It seems indeed plausible that the effect of the preceding pronoun is to delete *ne*, both for reasons of historical tendencies to reduction and fast speech reduction. It looks as if the non native speakers are also affected by this preference for prosodic reduction: where the subject tends to contract to the verb, the presence of *ne* prevents it, and so it is preferentially deleted.

	Pronoun	Full NP
Time 1	.53	.17
Time 2	.55	.03

Table 5. The contribution of Subject to *ne* deletion

**7.5 FOLLOWING SEGMENT.** Vowel disfavours deletion slightly. This is in the expected direction. It follows the universal preference for cv structure in phonology. It has also been noted in native French speech, for instance in Acadian French. So once again the learners have the same constraint hierarchies as the native speakers. Once again, the effect of the following segment becomes stronger after the period in France.

	Vowel	Consonant
Time 1	.47	.53
Time 2	.29	.68

Table 6. The contribution of Following segment to *ne* deletion (Manner)

The alveolar favouring effect becomes weaker, after the stay in France.

	Alveolor	Non alveolar
Time 1	.76	.41
Time 2	.45	.52

Table 7. The contribution of Following segment to *ne* deletion (Place)

**7.6 SYNTACTIC STRUCTURE OF THE VERB.** Deletion is favoured by copula and disfavoured by the main verb. Auxiliaries and modals play the same syntactic role in Romance languages, and these show a neutral effect. The figures for auxiliaries and modals are generally similar to those for native speakers. However the native speakers in Ashby's study retain *ne* more in auxiliaries (.63) and (.54) and modals (.52) than in main verbs (.40). The nonnatives here do the opposite. In this factor group, unlike the others, the constraint ordering for the nonnative speakers is different from the native one.

	Copula (c)	Main Vb (p)	Aux (a)	Modal (m)
Time 1	.64	.47	.49	.42
Time 2	.49	.51	.40	.59

Table 8. The contribution of Verb to *ne* deletion

**7.7 THE CONTRIBUTION OF AN OBJECT CLITIC TO *NE* DELETION.** In Time 1, it appears that the presence or absence of an object clitic does bear on the deletion of *ne*. The speakers are more likely to retain *ne* in an utterance such as *je ne le vois pas* than in *je vois pas le chien*. Where there is an object clitic present, the probability figure for deletion is .37 and where there is none, it is .51. Unfortunately, in data set 2, there was not sufficient data to draw any firm conclusions (the probability figure for deletion where an object clitic is present is .21 and where there is none, it is .53). It is interesting that in Ashby's 1976 corpus of native

speaker French, the presence or absence of an object clitic had little effect on the presence of *ne*. The negative particle was only slightly less probable where an object clitic was present than when there was none. The constraint ordering is however the same for natives (Ashby 1976) as for the non-natives of the present study. The difference between the natives and nonnatives here can be explained by fact that given the more complex word order issue where an object clitic is present, the nonnative may be monitoring and therefore tend to retain *ne* more.

**7.8 CLAUSE TYPE.** The factor group clause type turned out not to be significant. This was most probably due to the fact that there were not enough tokens of subordinate clause. So it was not possible to draw conclusions about the effect of this factor. However, in a previous run the figures for the tokens which were present were interesting. The effect of clause type was very strong. In Time 1, main clause had a probability of deletion of .51 and subordinate clause of .39. In Time 2, main clause deleted .53 and subordinate .28. So not only is the non-native rule similar to the native (the figures for Ashby's native subjects were .30 retention for main clause and .60 retention for subordinate clause) but in the case of the non natives, it strengthens during the stay in the native speech community. Yet again we see a perceptible strengthening of the rule through contact with the native speakers.

**7.9 INDIVIDUAL.** There is a lot of variation between individuals. It would appear that the deletion rates of those who previously had had spent little or no time in France prior to the study increased the most. By the same token, one individual who had previously spend considerable time in France, and had little contact with natives during the year in France, deleted less than before. It appears that the amount of contact with natives is important for the learner, in the acquisition of community norms. Individual variation has been explored in greater detail in Regan (forthcoming).

## 8. DISCUSSION

**8.1 NE DELETION AND MONITORING.** The fact that the learners seem to overgeneralise in their use of *ne* deletion, may relate to the way in which they monitor. Labov (1972), in his New York study, showed that monitoring produces prestige forms in native speaker speech. Dickerson (1975) and Schmidt (1980) show that second language learners also seem to use more 'correct' or target-like forms when they monitor. Tarone (1985), who shows style shifting correlating with task, suggests: 'The more careful style ... may contain more target language forms. The more casual style may contain structures.. which occur in pidgins, in early child language acquisition, and early untutored second-language acquisition.' Adamson and Regan (1991) find 'when L2 speakers monitor, they produce a higher percentage of target language forms, just as when native speakers monitor, they produce a higher percentage of prestige forms.'

In the case of the nonnative speakers in this study, the issue is not target like forms in the sense of correct structures, but rather the issue of how the nonnative speakers relates to the native prestige norms. The non-native speakers in the present study are displaying two apparently contradictory forms of behaviour in relation to prestige norms. In the first instance they are doing as natives do and using the prestige form more when they monitor than when they are using casual speech. But in the second instance, they are also approximating another target, the one they perceive to be native-like, which, in this case, is the non-prestige form. So paradoxically, where the non natives, given contact with the native speech community, continue to apply the native speaker behaviour which uses the prestige form in monitored more than casual style, they also, after the stay in France, delete more *ne* in monitored style. This seems to be analogous to the 'covert' prestige described by Trudgill (1974) for native

speech. Adamson and Regan (1991) reported a case of second language learners using high rates of non-prestige forms in monitored style in order to accommodate to a covertly prestigious native speaker form.

There are various explanations possible for the use of non prestige norms by non natives. As was suggested earlier, the learners may be overgeneralising somewhat. It may also be related to the issue of covert prestige evoked earlier. These speakers-students who are young and radical, develop a resistance to the prestige norm during contact with native French students who, as your radical people themselves, would presumably have the highest deletion rates in the community. So the non natives then do not reproduce the prestige variant either. They affirm the non prestige norm and reject the prestige norm, like Labov's street gangs.<sup>8</sup> Another possibility (difficult to quantify due to lack of data), is simply the fact that the speakers may not have come into contact with many speakers of the prestige norm during the time in France. The likelihood is that the students would have some input from university lecturers, but this contact would obviously have been limited and more time would have been spent with French students of their own age. A final possibility is that the diachronic process of *ne* weakening and deletion in France has progressed even further than the point at which Ashby found it fifteen years ago. It is very possible that people are deleting at much higher rates now than they did in the Tours study.

**8.2 LEXICALISATION.** The range for the figures reported in the Varbrul analysis for the factor group Lexicalisation is wide, indicating that this is a significant factor in relation to *ne* deletion. This is indeed very similar to native speaker behaviour in relation to lexicalised phrases. However as earlier indicated, the nonnatives have a tendency to overgeneralise somewhat their use of lexicalised phrases. This overgeneralisation may have something to tell us about the learners' use of these phrases, and indeed about how they learn. Nattinger and DeCarrico (1992) describe how these phrases are used by learners. It seems clear that all learners make use of them in certain contexts. Recent research in relation to unanalysed chunks suggests that where early thinking on second language learning saw these unanalysed chunks as rather peripheral to the main body of language, actually 'this formulaic speech (is) at the very center of language acquisition and ... basic to the rule-forming processes which follow' (Nattinger and DeCarrico 1992: xv). In this way, L1 learners first use just a few of these basic phrases and gradually analyse them into their components which then are available for use in other utterances and so the learners gradually discover the regular rules of syntax. Other researchers with different perspectives seem to also find evidence for this mechanism in language learning. Klein and Purdue (1990) sees a functional perspective as explanatory in acquisition theory. They indicate that while learning rules for reference, through pronoun acquisition, for example, the learner, as she is learning noun phrases as chunks, is also learning pronouns and eventually other areas of grammar such as word order, for instance. In terms of language teaching and learning, Hakuta (1974: ) sees the use of prefabricated chunks as important for motivation, as they permit learners to express functions which they are yet unable to construct from their linguistic system, but just store them like large lexical items. These chunks enable to learner to express functions early on in their use of the L2 which otherwise they would have to be frustrated in doing with a consequent demotivating effect. The speakers in the present study have made widespread use of these chunks of language for two reasons. The first is the universal one of all language learners which they presumably have passed through earlier on, where they use unanalysed chunks for the acquisition of syntax. The second use of these chunks, demonstrated by this study, is for the important benefits they yield in terms of their symbolic value for integration into the native speech community. From a functionalist perspective, the overuse of lexicalised phrases

might be seen as being productive, not as a structural device but rather for its efficiency in modelling elements of the native community dialect for purposes of accommodation to the community. So the use of these lexicalised phrases indicates something both about the way learners process information in the early stages of learning and also how they use this information in their output. In the case of these learners, the overuse of these lexicalised chunks seems to act as a sort of short hand for sounding like a native.

**9. CONCLUSION.** In second language acquisition studies, there has been continual speculation about the role of variation at different stages of acquisition. This tends however to remain at the level of general claims based on speculation, supposition and hypothesis. Detailed empirical data is lacking. This study shows that there are indeed benefits to carrying out a longitudinal quantitative study of second language acquisition. By running the two different data sets from the two different times – Time 1 and Time 2 – during the learning process, we are able to get a picture of the way the grammar of the learner changes over time.

The results reported here provide evidence for the acquisition over time of sociolinguistic competence in second language learners. A detailed quantitative analysis of the data provides a sensitive instrument for charting the progress over two years of the evolution of a particular sociolinguistic variable in the speakers' language use. The analysis shows several things about the learners' speech in relation to *ne* deletion in French during this period of their acquisition. It also gives us information about the effect of being in the native speech community on learner use of language.

The most striking findings are:

- the rate of *ne* deletion increases dramatically between Time 1 and Time 2
- the rule strengthens for the different factor groups from Time 1 to Time 2
- the constraint ordering remains the same
- the constraint ordering is generally the same as for the natives, but becomes even more similar to them for Time 2.

There is a dramatic increase in the rate of *ne* deletion on contact with native speakers. It seems clear that living for an extended period in the native speaker community does something to the learners' usage which classroom input does not. It shows that the rule for *ne* deletion, a highly sensitive sociolinguistic variable in native speech, is present in French Interlanguage. It also shows that it is similar to the native speaker rule with regard to those variables which influence its production—that is the constraint hierarchies are the same as those for native speech. During the period in France, the rule strengthens and becomes more pronounced. The span for the figures gets greater from Time 1 to Time 2 in most cases. In addition, the constraint ordering becomes even more like the native one. The native grammar is taking hold. In fact, due to this type of analysis, we have here a close-up shot, as it were, of the detail of the learner's grammar in its evolution at this point in their development. We see evidence of the learner acquiring the details of the native speaker variable system over time in a way which would not have been possible with a cross sectional study.

The fact that the constraint ordering seems to remain similar for most of the factor groups is interesting. While the rate of deletion has more than doubled, the linguistic factors which condition this deletion remain the same. Young (1990), for instance, found that the constraint ordering changed, from the low proficiency speakers to the more proficient. It would appear that the advanced learners in the present study do not change in any major way their mastery

of the structures of the second language but rather their sociolinguistic knowledge. They are now at the point of acquiring the vernacular grammar of the native speech community. They have come to understand the symbolic power of *ne* for the native French speaking community, and have adopted its use with great vigour, as part of their acculturation process. These findings concur with previous work in relation to learning in the naturalistic setting (Krashen and Seliger 1976 and Guntermann 1992), which shows that advanced learners in the native speech community do not show significant development in structural items, but clearly improve in other ways.

Finally, the results reported here are based on a relatively small number of tokens, and a much larger sample would need to be analysed to confirm these results. The patterns and trends indicated in this relatively small study need to be confirmed in the future by other larger longitudinal and cross-linguistic studies. However, the study begins to explore the acquisition over time of sociolinguistic competence by second language learners. We have evidence for the learner acquiring the details of variability which exist in the native variable system.

## REFERENCES

- ADAMSON, HUGH DOUGLAS. 1988. Variation theory and second language acquisition. Washington, DC: Georgetown University Press.
- . 1990. Prototype schemas, variation theory, and the structural syllabus. *Iral* 28:1-25.
- . 1989. Variable rules as prototype schemas. *Variation in Second Language Acquisition: Psycholinguistic Issues*, ed. by S. Gass, C. Madden, D. Preston, and L. Selinker. Clevedon, England: Multilingual Matters.
- ADAMSON, HUGH DOUGLAS, and VERA REGAN. 1991. The acquisition of community speech norms by Asian immigrants learning English as a second language. *Studies in Second Language Acquisition* 13.1-22.
- ASHBY, WILLIAM J. 1976. The loss of the negative morpheme, 'ne', in Parisian French. *Lingua* 39.119-137.
- . 1981. The loss of the negative particle 'ne' in French: a syntactic change in progress. *Language* 57(3).674-687.
- BAYLEY, ROBERT. 1991. *Variation Theory and Second Language Learning: Linguistic and Social Constraints on Interlanguage Tense Marking*. Ph.D. thesis, Stanford University.
- BLANCHE-BENVENISTE CLAIRE. 1985. Coexistence de deux usages de la syntaxe du français parlé. *Contacts de langues: Discours oral*, ed. by J.-C. Bouvier, 201-214. Aix-en-Provence: Université de Provence.
- BLANCHE-BENVENISTE CLAIRE, and JEANJEAN COLETTE. 1978. *Le Français Parlé: Transcription et Edition* Didier Erudition.
- CORDER, S.P. 1981. Formal simplicity and functional simplification. *New dimensions in second language acquisition research*, ed. by R. Anderson, 146-152. Rowley, MA: Newbury House.
- DEWAELE, JEAN-MARC. 1992. L'Omission du *ne* dans deux styles oraux d'interlangue française. *Interface. Journal of Applied Linguistics* 7(1).3-17
- DAVELUY, MICHELLE. 1993. Linguistic participation of anglophones and suburbanites in the Montréal French community. Paper presented at NWAVE 22 Ottawa.
- . 1993. Ne ne disparaîtra-t-il pas en français parlé à Montréal? Je sais pas. Paper presented at Association Canadienne Française pour l'Avancement des Sciences. Ottawa.
- DICKERSON, LONNA. 1975. The learners interlanguage as a system of variable rules. *TESOL Quarterly* 9.401-407.
- GAATONE, DAVID. 1971. *Etude descriptive du système de la négation en français contemporain*. Genève: Librairie Droz.
- GARDNER, R.C. 1985. *Social psychology and second language learning: The role of attitudes and motivations*. London: Edward Arnold.

- GILES, HOWARD, and P. F. POWESLAND. 1975. Speech style and social evaluation. London: Academic Press.
- GILES HOWARD, and NIKOLAS COUPLAND. 1991. Language : Contexts and consequences. Buckingham: Open University Press.
- GUNTERMANN, GAIL. 1992. An analysis of Interlanguage Development over time: Part 1, por and para. *Hispania* 75.177-187 .
- GUY, GREGORY R. 1993. The quantitative analysis of linguistic variation. American dialect research, ed. by D. Preston. Amsterdam: Benjamins.
- 1988 Advanced Varbrul analysis. Linguistic change and contact, ed by K. Ferrara, et al, 124-136. (Texas Linguistics Forum, Vol 30) Austin: University of Texas, Dept. of Linguistics.
- KARMILOFF-SMITH, A. 1986. Some fundamental aspects of language development after age 5. Language acquisition, ed. by P. Fletcher and M. Garman. Cambridge: Cambridge University Press.
- KRASHEN, STEPHEN AND H. SELIGER. 1976. The role of formal and informal environments in second language learning: a pilot study. *International Journal of Psycholinguistics* 3.15-20
- LABOV, WILLIAM. 1972. Sociolinguistic Patterns. Philadelphia: University of Pennsylvania Press.
- 1984. Field methods of the project on linguistic change and variation. Language in use: Readings in sociolinguistics, ed. by J. Baugh and J. Sherzer, 28-53. Englewood Cliffs, NJ: Prentice Hall.
- NATTINGER, JAMES R., and J.S. DECARRICO. 1992. Lexical Phrases and Language Teaching. Oxford: Oxford University Press.
- NYROP K. 1930. Grammaire historique de la langue française. Tome sixième. Copenhagen: Gyldendalske Boghandel Nordisk Forlag.
- PRESTON, DENNIS. 1989. Sociolinguistics and second language acquisition. Oxford: Blackwell.
- REGAN, VERA. 1990. Sociolinguistics and Second Language Acquisition: a variationist perspective. *Teanga: Journal of the Irish Association for Applied Linguistics* 10.
- forthcoming. The Acquisition of sociolinguistic native speech norms: effects of a year abroad on L2 learners of French. *The Linguistic Impact of Study Aboard*, ed. by B. Freed. Amsterdam/Philadelphia: John Benhamins Publishing Co.
- SANKOFF, GILLIAN, and DIANNE VINCENT. 1977. L'emploi productif de `ne' dans le français parlé de Montréal. *Le français moderne* 45(3).243-256.
- 1980. The Productive Use of `ne' in Spoken Montreal French. *The Social Life of Language*. 295-310.
- TARONE, ELAINE. 1985. Variability in interlanguage use: A study of style shifting in morphology and syntax. *Language Learning* 35.373-403.

- TRÉVISE, ANNE, and C. NOYAU. 1984. Adult Spanish Speakers and the Acquisition of French Negation Forms: Individual Variation and Linguistic Awareness. *Second Languages: A Cross-Linguistic Perspective*, ed. by R. Andersen, 165-189. Rowley: Newbury House.
- TRUDGILL, PETER. 1974. *The social differentiation of English in Norwich*. Cambridge: Cambridge University Press.
- WONG-FILLMORE, LILLI. 1979. Individual differences in second language acquisition. Individual differences in language ability and language behaviour, ed. by C.J. D. Kempler, and William S.-Y. Wang, 203-228. New York: Academic Press.
- YOUNG, RICHARD. 1988. Variation and the interlanguage hypothesis. *Studies in Second Language Acquisition* 10.281-302
- 1991. *Variation in Interlanguage Morphology*. New York: Peter Lang.

**Comment:** Varbrul runs: all data (1991 plus 1992 data, pre and post year in France)

INPUT .47

2 (Style)

. monitored .39

. casual .60

. unmonitored .94

4 (Following phonological segment)

. 9 (vowel) .35

. 3 (consonant) .63

6 (Preceding segment)

. vowel .66

. consonant .21

8 (syntactic structure of verb)

. copula .67

. principal verb .45

. aux .49

. modal .39

9 (before and after stay in France)

. 2 (after) .74

. 1 (before) .25

10 (clause type)

. main .52

. subordinate .31

12 (subject)

. pronoun .54

. full noun phrase .06

13 (presence of object clitic)

. 0 (absence) .52

. 1 (presence) .27

14 (lexicalisation of the phrase)

. c (je ne sais pas) .81

. a (not a formula) .36

. b (il n'y a pas) .11

15 (individual)

. 1 .18

. 2 .08

. 3 .20

. 4 .90

. 5 .36

. 6 .61

. 7 .57

LOG LIKELIHOOD = -300.738

1991 data

INPUT .21

\*\* indicates factor group that is not significant, but included for purposes of comparison.

2) m = .37 c = .61

4)\*\* 9 = .40 3 = .59 \*\* (sig at approx .08; 3 d.f., 3.046 L.L.)

5) 0 = .41 1 = .75

6) v = .70 c = .15

8)\*\* c = .66 p = .47 a = .54 m = .34 \*

12) p = .53 f = .11

14) c = .75 a = .38 (b was .00, recoded into c)

15) 1 = .01 4 = .90 5 = .29 6 = .83 7 = .65

LOG LIKELIHOOD = -134.157

1992 data

INPUT .70

---

<sup>1</sup> For a full discussion of *ne* deletion see Gaatone, (1971) and Shankoff and Vincent (1977).

<sup>2</sup> Although Sankoff and Vincent (1980) show that in Canadian French no age grading exists.

<sup>3</sup> Except for two in the last year of the study where they were part of an informal oral French class.

<sup>4</sup> Thanks to Maria Browne for her help in transcribing some of this data.

<sup>5</sup> For a fuller discussion of such cases see Sankoff and Vincent, 1980.

<sup>6</sup> While Ashby's factor groups were not exactly similar to those in the present study, it is possible to make comparisons.

<sup>7</sup> I am grateful to Young, personal communication, for discussion on overgeneralisation.

<sup>8</sup> I am indebted to Young, personal communication for discussion on this theme.

Varbrul runs: all data (1991 plus 1992 data, pre and post year in France)

INPUT .47

2 (Style)

monitored .39

casual .60

unmonitored .94

4 (Following phonological segment)

9 (vowel) .35

3 (consonant) .63

6 (Preceding segment)

vowel .66

consonant .21

8 (syntactic structure of verb)

copula .67

principal verb .45

aux .49

modal .39

9 (before and after stay in France)

2 (after) .74

1 (before) .25

10 (clause type)

main .52

subordinate .31

12 (subject)

pronoun .54

full noun phrase .06

13 (presence of object clitic)

0 (absence) .52

1 (presence) .27

14 (lexicalisation of the phrase)

c (je ne sais pas) .81

a (not a formula) .36

b (il n'y a pas) .11

15 (individual)

1 .18

2 .08

3 .20

4 .90

5 .36

6 .61

7 .57

LOG LIKELIHOOD = -300.738

1991 data

INPUT .21

\*\* indicates factor group that is not significant, but included for purposes of comparison.

2)  $m = .37$   $c = .61$

4)\*\*  $9 = .40$   $3 = .59$  \*\* (sig at approx .08; 3 d.f., 3.046 L.L.)

5)  $0 = .41$   $1 = .75$

6)  $v = .70$   $c = .15$

8)\*\*  $c = .66$   $p = .47$   $a = .54$   $m = .34$  \*

12)  $p = .53$   $f = .11$

14)  $c = .75$   $a = .38$  (b was .00, recoded into c)

15)  $1 = .01$   $4 = .90$   $5 = .29$   $6 = .83$   $7 = .65$

LOG LIKELIHOOD = -134.157

1992 data

INPUT .70

2)  $m = .43$   $c = .60$

4)  $9 = .30$   $3 = .68$

5)\*\*  $0 = .52$   $1 = .44$  \*

6)  $v = .61$   $c = .27$

8)  $c = .71$   $p = .37$   $a = .46$   $m = .58$

12)  $p = .56$   $f = .01$

14)  $c = .87$   $a = .28$   $b = .11$

15)  $2 = .26$   $1 = .23$   $3 = .38$   $4 = .94$   $5 = .50$   $6 = .42$   $7 = .39$

LOG LIKELIHOOD = -144.791