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VARIATION IN VOICED STOP PRENASALIZATION IN GREEK

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Ancient Greek clusters of nasal (N) plus voiceless unaspirated (T) or voiced stop (D) merged to ND in Middle Greek, yielding mainly ND or D in the modern dialects. Impressionistic studies suggest that currently there is stylistic variation between D and ND in the dialects that have developed these reflexes, with ND as the formal variant. Our study reveals that age, not style, is the most important factor in ND/D variation, with speakers under 40 using dramatically fewer ND tokens than older speakers; at the same time NT, a variant which reflects spelling conventions and is possible only across word boundaries, emerges as a careful style marker. This abrupt change of pattern, which coincides with important sociopolitical changes in Greece and the official demise of Katharevousa, the H(igh) variety of Greek diglossia, suggests that a real sound change in progress away from the previous pattern of stable variation may be taking place in Greece.

1. Introduction

Ever since the pioneering work of Labov (1963), it has been recognized that the study of sound change cannot be divorced from a consideration of synchronic variation[1]. Similarly, the social context in which variation occurs must be

1. The research reported here was carried out while the lead author held a Research Fellowship in Linguistics at Wolfson College, Oxford. We would like to thank Wolfson College and the Astor Travel Fund of the University of Oxford for providing the funds for her to visit The Ohio State University where most of the data analysis was carried out. Thanks are also due to Mary Beckman for advice and help in Columbus, Bruce Connell for allowing us to use equipment from the Oxford University Phonetics Laboratory for the recordings in Greece, and the audiences at the Annual Meeting of the LSA (Los Angeles, 1993), and at seminars at Oxford, Reading and Georgetown Universities, for their helpful comments on a preliminary version of this paper. A version of this paper appears in the Ohio State University Working Papers in Linguistics 52 (1999). Correspondence regarding this paper should be addressed to Amalia Arvaniti.

taken into account, for there is a crucial social dimension in the spread and generalization of sound change throughout a speech community.

In this paper, we examine variation in the realization of voiced stops[2] in Modern Greek, and arrive at the conclusion that the ways in which the phonetic variation correlates with various social factors indicate a sound change in progress. We further propose a possible reason for this change in a long established pattern of stable variation, namely that it has been induced by political and concomitant social changes that have taken place in Greece in the past 25 years.

We first present the historical background to the Modern Greek situation, which is important for the assessment of the nature of the variation reported on. We then turn to a sociophonetic study, followed by a discussion of our results.

2. Historical background

Three types of homorganic nasal+stop clusters occurred in Ancient Greek: nasal (N)+voiced stop (D), nasal+voiceless unaspirated stop (T), and nasal+ voiceless aspirated stop (T^h), as summarized in (1a-c):

1. Ancient Greek nasal+ stop clusters:
   a. ND: [mb, nd, ŋg], spelt <μβ, νδ, γγ> respectively
   b. NT: [mp, nt, ŋk], spelt <μπ, ντ, γκ> respectively
   c. NT^h: [mp^h, nt^h, $ŋk^h$,], spelt <μφ, νθ, γχ> respectively.

Relatively early on in the development of Post-Classical Greek, during the Hellenistic period, the aspirated voiceless stops changed to voiceless fricatives even in the clusters with nasals (Browning, 1983: 26-7; Sturtevant, 1940: 83-5); thereafter the original NT^h clusters followed their own path of development more akin to that of N+/s/ clusters (the other nasal+fricative cluster).

The ND and NT clusters, on the other hand, merged to ND (Tonnet, 1993: 40-46). The oral closure of the Ancient Greek voiced stops, which in other environments became voiced fricatives, was maintained after nasals, while the

2. A decision had to be made as to whether we should refer to "voiced stops" or to "nasal+stop clusters." Both terms are phonologically loaded, but we decided to use the term "voiced stop" as it is phonetically accurate, and we do not wish to make any claims in this paper about the phonological status of surface voiced stops in Greek (but see Arvaniti, 1999).

Ancient Greek voiceless unaspirated stops, which otherwise remained stable throughout the language's history, became voiced after nasals. The postnasal voicing of NT clusters was most likely a Byzantine/Middle Greek innovation, beginning around the 6th or 7th centuries and completed by roughly the 10th to 12th centuries AD[3].

Evidence for the merger of NT and ND comes from several sources. Spellings like <πέμμπει> for Ancient Greek <πέμπει> (['pempej]) 'sends' in 7th century papyri (Tonnet, 1993: 45-6) point to a merger: that is, on the assumption that the first <μ> indicates the nasal, the remaining letters, <μπ>, must represent something else, and that cannot be the voiceless stop [p], which would have been spelt simply with the letter <π>, rather than the digraph <μπ>; therefore <μπ> must stand for the voiced stop [b] here. Equally revealing are reverse spellings, understandable in the context of a merger of NT and ND; e.g., <πονδικόν> 'mouse' for etymological <ποντικόν>, or <τσιγκάνα> 'Gypsy-woman' from earlier <αθιγγάνα> (*Tale of the Quadrupeds*, 150, 285 [14th c.]). Finally evidence comes from the use of <NT> spellings in loan words with ND in the source language; e.g., <μαντάτο> 'news' from Latin [mandatum], <Λουμπαρδοί> 'Lombards' (*Chronicle of Morea*, 1012 [13th c.]), or <εμπουκκώνεται> 'crams one's mouth' (Prodromos IV, 73 [12th c.]), a verb derived from the Latin *bucca* 'mouth'.

From this ND outcome in Middle Greek, two major developments are found in Modern Greek dialects (Mirambel, 1959; Newton, 1972): (i) preservation of ND word-internally *and* simplification to D word-initially, and (ii) simplification to D in all positions. Newton (1972: 94) observes that the former outcome is found "throughout the south east [...], most of northern Greece and much of the Peloponnese." The latter outcome is found in "all Cretan, Thracian and eastern Macedonian dialects, as well as those spoken in the islands which belong to the northern complex", and the Ionian islands of Kephalonia, Ithaki and Zakinthos (Newton, 1972: 95)[4]. Thus the two main types of dialect differ according to the presence or absence of a nasal in the outcome of earlier ND in word-internal position. For example, from Ancient Greek <πέντε> ([pente]) 'five' and <άνδρας> ([andras]) 'man', representative modern dialects like Rhodian and Cretan show the outcomes in (2a-b):

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3. The relationship between this innovation and the tendency towards postnasal voicing of dental stops in Greek of the Hellenistic and Roman periods (see Dressler, 1966, and Bubeník, 1989: 239, for data and discussion) is unclear, and irrelevant in any case to the later developments under consideration here.
4. Thus the ND/D division cuts across the traditional geographically based division of dialects into Peloponnesian-Ionian, Northern, Old Athenian, Cretan, and South-Eastern (see Newton, 1972: 13-15).

2.	a.	Rhodian:	['pende]	Cretan:	['pede]
	b.	Rhodian:	['andras]	Cretan:	['adras]

Foreign borrowings with sequences such as [b], [mp] and [mb] followed the same course, though the exact treatment of these sequences "seems to depend partly on the phonological rules operating for inherited worlds and partly on familiarity with the donor language" (Newton, 1972: 121).

Other developments also occurred but to a far lesser extent. For instance, Mirambel (1933) mentions some dialects of Asia Minor which, at least around the turn of the century, had nasals without stops as the outcome of ND: e.g., Cappadocian has [meno] 'enter' from earlier [embeno] (cf. Standard Greek [beno]). Also, in a few dialects, the nasal assimilated completely to the following stop, yielding DD, an outcome "found at least in the Dodecanesian islands of Simi and Kalimnos" (Newton, 1972: 95), and also in parts of Cyprus and Chios (Mirambel, 1933: 164). Despite this variety of reflexes, for the vast majority of dialects over a large area covering the central part of the Greek-speaking world the attested outcomes are either ND or D. Indeed, these two outcomes are the only ones present in the (primarily Peloponnesian and Ionian) dialects that provided the basis for the formation of the modern Athenian dialect on which, in turn, Standard Modern Greek is based (Browning, 1983: 100ff.).

The sound changes discussed so far concern the lexical level, i.e., applied within word boundaries. In addition, stop voicing now applies post-lexically[5], i.e., across word boundaries, although the environments in which it takes place have not yet been given a full description[6]. It is not our intention here to give a full account of the rules of post-lexical stop voicing in Greek. Suffice it to say that it applies at least when certain function words –such as the negative markers /ðen/ and /min/ and all weak object pronouns and articles ending in /n/ (with the *possible* exception of /ton/ GEN, plural, which may trigger only nasal

5. Based on the Neo-Grammarian view of sound change, in which sound changes apply at first without regard for word boundaries, our expectation is that these rules applied post-lexically in Middle Greek too, but there is no firm evidence for this.
6. For instance, Newton (1972: 97) talks about "close syntactic structures" which include, among others "the nasal-final forms of the article before a following noun." He adds, however, that the notion of "close syntactic structure" is not easy to define and gives as an example the fact that the word /an/ 'if' undergoes nasal assimilation in point of articulation to a following voiceless stop, but does not trigger voicing of the stop, as in /an pis/ → [am pis] 'if you-say'. Nespor & Vogel (1986) on the other hand, claim that nasal assimilation and stop voicing are two prosodic rules of Greek which operate optionally (and together) in the Clitic Group prosodic domain, while Malikouti-Drachman & Drachman (1992) account for stop voicing by syllabification rules.

assimilation)– precede a host verb (or noun) beginning with a voiceless stop; e.g.,

3. a. <δεν καπνίζω> /ðen ka'pnizo/ → [ðe(ŋ)ga'pnizo] 'not I-smoke'
   b. <τον τουρίστα > /ton tu'rista/ → [to(n)du'rista] 'the tourist/ACC'
   c. <την πειράζω> /tin pi'razo/ → [ti(m)bi'razo] 'her I-tease'[7]

The post-lexical context presents an added problem, however. In most occurrences, a noun or verb with an initial voiceless stop is not preceded by a word-final nasal that would trigger voicing of the stop. As a result, the voicelessness of the stop is maintained underlyingly and frequently surfaces, e.g., in the nominative singular case (4a), when a verb is followed by a non-pronominal object (4b), and when it is preceded by a pronominal object that does not end in a nasal (4c):

4. a. <ο τουρίστας> [o tu'ristas] 'the tourist/NOM'
   b. <πειράζω την Ελένη> [pi'razo tin e'leni] 'I-tease Helen'
   c. <το καπνίζω> [to ka'pnizo] 'it I-smoke'

Therefore, at all stages of Greek in which post-lexical voicing occurred, there would be synchronic motivation for an underlying voiceless stop in all the words that have ND or D in the post-lexical context for NT developments, because of the morphophonemic alternations between T and ND or D. Thus, at each such stage, synchronic rules would be needed which mirror the sound changes: NT→ ND or NT→ D, depending on the dialect. By extension, it has been argued that all surface voiced stops can be treated as deriving from an underlying NT (among others, Kazazis, 1969; Malikouti-Drachman & Drachman, 1992; Newton, 1972; Warburton, 1970; but see also Joseph and Philippaki-Warburton, 1987: 230-231, for a discussion, and Arvaniti, 1999 for a different perspective). Under such an analysis, there has been phonological stability with these developments for a long time in Greek: at any given stage since Middle Greek, there would be synchronic motivation for a nasal being involved in the derivation of voiced stops, whether or not the voiced stop occurring on the surface was preceded by an overt nasal.

7. In all cases, the nasal assimilates to the stop for place of articulation. Nasal assimilation is a more widespread phenomenon than stop voicing, and as it is not always connected with stop voicing (Newton, 1972), it will not concern us here.

3. Synchronic variation

Although the gross division of Greek dialects into those that have a D and those that have an ND reflex appears to be largely correct, developments in the last few decades suggest that both ND and D dialects exhibit variation in the realization of voiced stops. The D dialects show ND pronunciations as formal style variants (Kazazis, 1968; Newton, 1972), while the ND dialects show a tendency to simplify ND to D word-internally in casual speech (Kazazis, 1976; Newton, 1972).

Indeed, the simplification of ND to D seems quite widespread nowadays in the ND dialects, including Standard Greek as spoken in Athens. As noted, this is not a new phenomenon; as early as 1972, Newton remarks that "in the Peloponnese there do seem to be speakers, particularly among the younger generation, whose speech would place them here [in the D dialects] rather than in group B [the ND dialects]; indeed in Athens itself the nasal is rarely perceptible at least as far as fairly rapid speech is concerned"; and further on, "many speakers in the Peloponnese and northern Greece have a very slight nasal onset [...] and indeed often seem to show fluctuation in the clarity with which the nasal element is articulated" (Newton, 1972: 95).

Earlier than Newton, Householder (1964) had attempted to account for this variation by suggesting that in Greek there are four categories of words: (i) those that fluctuate between D and ND, (ii) those that are pronounced exclusively with ND, (iii) those pronounced exclusively with D, and (iv) those pronounced exclusively with NT. According to Householder the choice of variant depended on the etymological origin of the word; e.g., it seems that category (i) included mainly inherited words, although this is not explicitly mentioned. Householder's conclusion is highly doubtful –linguistically naïve native speakers do not usually know the etymology of words– and probably induced by the fact that his data included many recent loans and were elicited from just four native speakers, who were postgraduate students in the US and hence far from representative and linguistically naïve. Presenting a more balanced view, Mackridge (1990a: 71) remarks: "As the situation appears today, in Athens at least, the absence of the nasal in these cases [words spelt with a nasal+stop digraph] is generalized, even among people with higher education, though it is more widespread among the young, especially the males, and the less well educated [our translation]."

On the other hand, as we noted, ND pronunciations do appear in D dialects as formal variants. This is understandable given that "Standard Modern Greek" is described as one of the ND dialects, and ND has been the pronunciation prescribed by grammarians (see Mackridge, 1990a: 71 for a discussion). The high-

er prestige of ND is probably also related to the influence of spelling: in Modern Greek, voiced stops are written with a nasal element ([mb]/[b] are orthographically <μπ>, [nd]/[d] are <ντ>, and [ŋg]/[g] are <γκ>, or <γγ> word-internally). Furthermore, spelling reflects pronunciation much more in Greek than in other languages with historical orthography.

The influence of spelling is also due to the importance of the written language during over a century of official diglossia in Greece: the so-called "puristic" archaizing H(igh) variety of Greek, *Katharevousa*, was primarily a written language, the use of which was associated with education and power (on the importance of the written language and the prestige of Katharevousa see among others Browning, 1982; Frangoudaki, 1992; Mackridge, 1990b). Thus, the prestige of the written word may well have been reflected in pronouncing words as they are spelt, a trait obviously associated with literacy and education, hence with a formal style of speech. Kazazis (1968) for instance, mentions that a Greek first-year student visiting him in the US pronounced [koli'(m)bo] 'I-swim' as [kolim'po], an utterly unacceptable pronunciation, which Kazazis interprets as the student's attempt to impress him (Kazazis) in his role as professor.

What emerges from the above impressionistic accounts of variation in the pronunciation of voiced stops is that in Standard Greek and many other dialects ND and D are perceived as being stylistically distinct: the observations of Kazazis (1968, 1969), Newton (1972) and Mackridge (1990a) suggest that prenasalized stops are perceived as reflecting a more formal style than oral voiced stops (see also Mikros,1997, for the attitude of the media towards D and ND).

More recent quantitative studies (Charalambopoulos, Arapopoulou, Kokolakis & Kiradzis, 1992; Pagoni, 1989) have attempted to determine some of the social and linguistic correlates of the ND/D variation (henceforth (ND)). Pagoni (1989) recorded 22 middle class informants reading a word list (a mixture of words with voiced stops and distractors) and a short passage which imitated newspaper style. She found that the realization of (ND) depends on age, with older speakers using more ND tokens than younger speakers, on education, with more educated speakers using more ND tokens than less educated ones, and on what she terms "beliefs and attitudes towards life and society" (p. 410), with more conservative speakers using, not surprisingly, more ND tokens. However, Pagoni's sample was, by her own account, rather limited in three ways. First, the data represent a formal style of speech. Second, the sample included only word-internal ND, and so provides no information on the realization of ND in word-initial and post-lexical position. Finally, her speakers formed a closely knit social network of conservative middle-class educated Athenians. Pagoni herself follows Milroy (1987) in accepting that "no claim can

be made that the speech samples collected in this way are representative of the speech of a whole community" (Milroy, 1987: 38, quoted in Pagoni, 1989: 403).

Charalambopoulos *et al.* (1992), on the other hand, provide important information on the linguistic factors that influence (ND) realization, but have little to say on the social factors involved, as their sample of 20 speakers consisted of university students between the ages of 20 and 30, i.e., of educated speakers of the same generation. A second limitation of their study is that it included only casual speech, with all the data being elicited during an informal interview between people who knew each other well, thereby eliminating the possibility of investigating a stylistic dimension to the variation. Third, the speakers were from Thessaloniki and their distinct accent may well have biased the results; our impression as speakers of Greek, as well as that of other Greek linguists[8], is that D is far less prevalent in Thessaloniki than in Athens. Despite these limitations, certain of Charalambopoulos *et al.*'s observations are revealing. Particularly interesting is the comment that data from four older speakers, who were University lecturers, differed dramatically from those of the main body of the research: "The picture here is entirely different with a significantly higher tendency for prenasalization in all contexts, even in word-initial position" [our translation] (p. 296). In contrast, they observe that among the young speakers "the tendency not to prenasalize voiced stops is overwhelming, in contrast to the accepted norm that these sounds are pronounced oral in word-initial position but prenasalized word-internally" [our translation] (p. 295). Finally, they mention that "no important differences between men and women were observed relating to the question of voicing and prenasalization" [our translation] (p. 301).

The evidence from these two studies would suggest that the current situation is merely a continuation of a long period of stable variation (in the sense of Labov, 1981: 184). This view is further supported by (a) the fact that the ND/D variation has a history within Greek of at least several hundred years, perhaps even longer, and (b) the phonological stability of underlying NT, as noted above, resulting from the post-lexical application of the stop-voicing rule. However, there are several reasons why we would like to question this interpretation of the available data. First, we note that in both studies there were no significant differences between the speech of men and women; this lack of difference is thought to be an indication of a sound change that has been completed (Labov, 1990). Second, the age of the speakers emerges as a very important

8. We would like to thank Evangelos Petrounias of the University of Thessaloniki for his observations on this point.

factor both in Pagoni (1989) and in Charalambopoulos *et al.* (1992), indicating that we may be dealing with change in apparent time. Thus, although the results of these two quantitative studies provide valuable insight into the ways the social factors affect the realization of voiced stops, further study of the status of (ND) in Greek seemed necessary, in particular the investigation of whether in fact the current situation represents continued stable variation or a real change in progress altering the nature of the (now unstable) variable (ND).

4. The study

4.1. The sample

Thirty native speakers of Greek, ranging in age from 18 to 71, were recorded in Athens, Greece. The speakers formed a *judgement sample* (see Chambers, 1995: 39ff.), in that they were not chosen randomly but on the basis of their age, gender, and occupation. Although a few of the subjects knew each other, they were not in any way part of the same social network(s), as they lived in different parts of the city, associated with different people and were employed in widely different professions.

The speakers fell into three age groups, from 18 to 30, from 31 to 45 and from 46 to 71[9], each comprising ten speakers, five men and five women. The age groups were chosen so that the same number of years be included in each one of them as far as possible. At the same time, each group corresponded to a different stage in the life of the speakers (cf. Thibault & Vincent, 1990): most of the people in the first age group still lived at home or had just started their own family and career; those in the second group were largely established in their profession and had growing families, while most of those in the third age group had grown up children and the oldest among them were moving towards retirement.

The linguistic background of the subjects was not uniform. Although they all lived in Athens, only nineteen of them had been born and raised there. The rest had been born in other parts of Greece (e.g., Corfu, Thessaly, Siros and Mani) but had lived in Athens most of their lives. In addition, three speakers had studied in Britain, but they had all returned to Greece several years before the recording and had had little contact with English since their return. We believe

9. This last age group appears to span a much wider age range. However, the age of nine of the speakers was between 46 and 60; there was only one speaker who was 71 years old. His speech was not different from that of the other speakers in this age group.

that this lack of uniformity in the linguistic background of the subjects accurately reflects the reality of the situation in Athens: a large percentage of its inhabitants (especially the older ones) are not natives of the city, though they have lived there for decades, while knowledge of foreign languages (particularly English) is a widespread phenomenon.

The subjects were divided into three groups according to their education. Speakers were classed as having primary education if they had completed no more than the nine years of compulsory education; they were considered to have secondary education if they had graduated from secondary school or technical college; speakers who had continued their studies after secondary school (including University students) were considered to have higher education. Unfortunately, our sample was not as evenly divided in this respect as we would have wished; there were twelve subjects with higher education, sixteen with secondary education and two with only primary education (40%, 53.3%, and 6.7% of the sample respectively). The corresponding percentages in the literate subset of the Athenian population within the 20-69 age-span are 23.2%, 47.2% and 29.6% respectively (data derived from the 1991 census, Greek National Statistical Service).

Finally, our speakers were divided into three broad social classes, professionals, white-collar workers and blue-collar workers, on the basis of occupation and income (see Thibault & Vincent, 1990, on the validity of a socio-economic classification of speakers, on the basis of their profession). For the younger speakers who had just finished school or were university students, class was determined on the basis of their parents' occupation and income. For women who did not work outside the home, class was determined on the basis of their family background and situation at the time of the recording. To be sure, these class categories are not as fine grained as those used in some studies (e.g., Trudgill, 1974), but in the context of Greek society, which is not sharply socio-economically stratified and shows relatively high social mobility (see Lytras, 1993; Mouzelis, 1978; Tsoukalas, 1987), we believe that they are adequate for our purposes.

4.2. Materials and procedure

The material used in this study included two speech styles, reading and conversation, and so it is intermediate between the very formal style elicited in Pagoni (1989) and the very informal one elicited in Charalambopoulos *et al.* (1992).

The specific question addressed by this study was not explained to the speakers: they were told that it related to the first author's research in linguistics, but no further details were given prior to the recording. The speakers were asked

first to read a two-page narrative of childhood reminiscences, composed so as to include several instances of the (ND) variable (the original text and an English translation can be found in Appendices I and II respectively). The speakers were asked to read the text twice with a small break in between, a procedure none of them found particularly tiring. They were instructed to have a look at the text and read it as they would at school where it is standard practice to ask pupils to read literature passages aloud. The text was written in informal style in order to encourage the speakers to read in a natural way; most speakers in fact adopted a natural and lively style similar to that described by Laferriere (1979: 607) for her Irish speakers.

The text contained 18 instances of voiced stops in word-initial position, 28 instances of word-internal voiced stops, and 15 instances of post-lexical voiced stops[10] (see Appendices III, IV and V respectively). With the exception of word-internal stops among which alveolars predominated, the stops were roughly equally divided between the three places of articulation, including the two allophones of /g/ ([ɟ] before the front vowels /i/ and /e/, and [g] elsewhere). As can be seen in Appendices III and IV, the corpus included on the one hand both colloquial and learned words, and on the other both words of Greek origin and loans.

An extract from the text is given below in (broad) phonetic transcription (in which target sequences are underlined), and in translation:

> [fisi'ka a'fti ðen 'itan i 'moni fo'ra pu 'vrika to be'la mu ‖ 'imuna skada'l-jariko pe'ði | ce si'xna me 'malonan ‖ mja fo'ra ja pa'raðiɣma | 'epeza stin pla'tia | 'otan 'epjase mja ðina'ti 'bora ‖ a'di na 'trekso sto 'spiti san 'tala pe'ðja | e'ɣo kaθisa capo'lamvana ta bubuni'ta ce ti vro'çi | me apo'telezma na 'jino mu'sciði ‖ to 'ti 'ksilo 'efaɣa ja'fto | ðe 'lejete ‖]
>
> 'Of course this was not the only time I got into trouble. I was a naughty child and was often scolded. One time, for example, I was playing at the [village] square when a heavy rain storm started. Instead of running home, like the other children, I stayed to enjoy the thunder and the rain, getting drenched as a result. I can't begin to describe the thrashing I got for this.'

The reading of the text was followed by approximately 30 minutes of conversation with each speaker. The topic varied depending on their interests and

10. There were in fact other post-lexical voiced stops, some of them across boundaries which, according to Newton (1972) and Nespor & Vogel (1986), should block stop voicing. For the purposes of the present study we included in our data only those clusters which according to all studies can surface as voiced stops, i.e., those that involve one of the following: a definite article followed by its host noun; a personal pronoun followed by its host verb; one of the negative markers, /ðen/ and /min/ followed by its host verb.

background; e.g., the topics included the University entry examination some of the younger speakers had just taken, and the reasons for the telecommunications strike one of the speakers was taking part in. In general the speakers were relaxed and many chose to talk of personal matters (e.g., the recently broken engagement of a son, the illness of an aging father) although not acquainted with the interviewer. Most of the speakers soon forgot the tape recorder completely and some even expressed surprise when it was turned off at the end of the interview, as they had not noticed the point at which the recording had begun.

The recordings took place in reasonably quiet conditions, either in the speaker's or the first author's house. Although every possible precaution was taken to avoid noise, if prolonged noise (such as a telephone ringing or a dog barking) happened to occur during the reading session, the recording was stopped, and when the noise was over, the speaker was asked to repeat a paragraph or a few lines. No such interruption was deemed necessary during the recording of the conversation.

4.3. Measurements and statistical analysis

The reading data were digitized at 16 kHz and wide-band spectrograms of the target sequences were obtained using a Digital Kay-Sonagraph 5500. The data were classified (by the first author) into categories on the basis of the spectrograms and the auditory impression given by each token. In cases of doubt the spectrographic evidence prevailed. Initially, it was decided that seven categories should be used for the classification of the tokens: oral voiced stop (henceforth D), prenasalized voiced stop (ND), nasalized vowel+voiced stop (ṽD), voiceless stop (T), nasal+voiceless stop (NT), nasalized vowel+voiceless stop (ṽT), and voiced fricative (F). These categories were considered necessary in order to capture differences in the phonetic realization of the stops, which were discovered in the process of the acoustic analysis. For example, Charalambopoulos *et al.* (1992) and Pagoni (1989), who base their results solely on auditory transcription, do not make any mention of fricative pronunciations in place of stops (on the limitations of auditory transcription see Kerswill & Wright, 1990).

For the statistical analysis, however, some of the categories into which the tokens were originally classified were pooled. Thus, categories ND and ṽD were both classed as ND, categories NT and ṽT were both classed as NT, and categories D and F were both classed as D. The reason for pooling the realization categories with a nasal element on the basis of the voicing of the stop was that despite differences in phonetic realization, the presence or absence of

nasality appears to be perceived categorically by the speakers. That is, naïve native speakers seem to classify voiced stops as either oral or prenasalized without making any further distinctions relating to the degree of nasality. A similar situation obtains in production: measurements of the nasal portion of the stop closure in part of the present data show that the length of the nasal closure varies widely from token to token even within the data of the same speaker, and does not seem to depend on any of the parameters that affect the presence/absence of nasality itself. Thus, the prenasalized tokens of older speakers (who in general used the ND variant more) do not show longer nasal stretches than those of younger speakers. It is also significant that in previous studies, in which auditory analysis only was used, there is no reference to degrees of nasality, although Pagoni (1989: 408) does have a category for tokens "with a very slight nasal onset i.e., cases that could be attributed to both categories [prenasalized and oral] due to a fluctuation in the clarity with which the nasal element was articulated." Finally, voiced fricatives, (F), were classed with D, because, without training, they were auditorily indistinguishable from oral voiced stops, (D), but auditorily and acoustically distinct from *underlying* voiced fricatives[11].

The transcription of the conversation was done after the reading text had been transcribed and acoustically analyzed. Since the transcriber (the first author) had by then become familiar with the auditory and acoustic properties of the variants, it was possible to transcribe and classify the conversational data on the basis of auditory analysis alone. The relevant tokens from the conversational data were classified in the four main categories mentioned above, ND, D, NT and T. All together 1736 tokens of voiced stops in word-initial (181), word-medial (991) and post-lexical (564) position were recorded, i.e., the conversation with each speaker yielded on average 58 tokens.

The percentage of tokens in each category was calculated separately for each speaker and style, and these percentages, rather than the raw data, were used for the statistical analysis. (The data from the two readings of the text were pooled in each case, as initial tests did not show any differences between the two repetitions.) This procedure yielded twelve dependent variables, which represented the percentages of each of the variants of (ND), in word-initial, word-internal and post-lexical position (4 variants x 3 contexts).

The data were classified according to the following independent variables:

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11. The acoustic analysis of such tokens shows that the difference between the two types of voiced fricatives is probably due to the fact that underlying voiced fricatives have lower amplitude than voiced stops which were pronounced as fricatives. The latter appear to be a pronunciation variant favored by the younger male speakers.

gender (male, female); age (18-30, 31-45 and 46-71); education (primary, secondary, higher); class (professionals, white-collar workers, blue-collar workers); and style of speech (reading, conversation). Originally the data had also been coded for place of articulation, but as preliminary tests showed no effect of this factor on (ND), it was omitted from the main analysis of the data (Pagoni, pers.com., also found similar results for place of articulation). The same holds for the origin of the words (colloquial *vs.* learned, inherited words *vs.* loans) in the reading material. The data were analyzed by multivariate analyses of variance (MANOVA*s*); for significant interactions and factors with more than two levels, such as age, the tests were followed by planned comparisons.

5. Results

The realization of (ND) differed depending on whether (ND) was word-initial, word-internal or post-lexical. Figure 1 shows the percentage of the three main variants, ND, D and NT, in word-initial, word-internal and post-lexical position. (We will not be discussing the results for variant T, as it accounts for less than 1% of the data.) As can be seen in Figure 1, there were far fewer ND tokens in word-initial position than either word-internally or post-lexically, but only a small difference between the word-internal and post-lexical percentages of ND. In contrast, variant D shows considerable reduction from word-initial to word-internal to post-lexical context. This reduction in the use of D is largely due to the fact that NT, which is virtually non-existent in the two lexical contexts, accounts for 10.75% of the tokens post-lexically. Because of these differences between the three contexts for (ND), and in order to make the results clearer, we present the effects of the various sociolinguistic factors separately for word-initial, word-internal and post-lexical (ND).

5.1. Word-initial (ND)

In 97.1% of the cases of (ND) in word-initial position the variable was realized as D, with the rest of the tokens being realized as ND (2.9%). Although the percentage of prenasalized tokens was very low, it is interesting to note that nearly 3% of the tokens did show prenasalization, contrary to impressionistic accounts claiming that word-initial stops are always oral (among others, Newton, 1972). These results are in agreement with those of Charalambopoulos *et al.* (1992) who also found prenasalized word-initial tokens. The results were not affected by age, class, or education, but they were affected by gender (Wilks' λ $(2, 55) = 0.88$, $p < 0.029$). Specifically, in word-initial position women used

more ND tokens than men but only in conversation (the means were 5.25% and 0.55% for women and men respectively; $p < 0.007$). In contrast, men's and women's reading percentages were the same (the means for men and women were 1.5% and 3.34% respectively). This difference is difficult to explain; however, prenasalized stops, especially in word-initial position, may sound somewhat emphatic and "involved", so their highest percentage in the data from female speakers could indicate higher involvement in the conversation; this interpretation is corroborated by the fact that many of these prenasalized word-initial tokens appeared in ejaculations, such as [ba] 'no (I don't think so)' and [bo'ri] 'may be'.

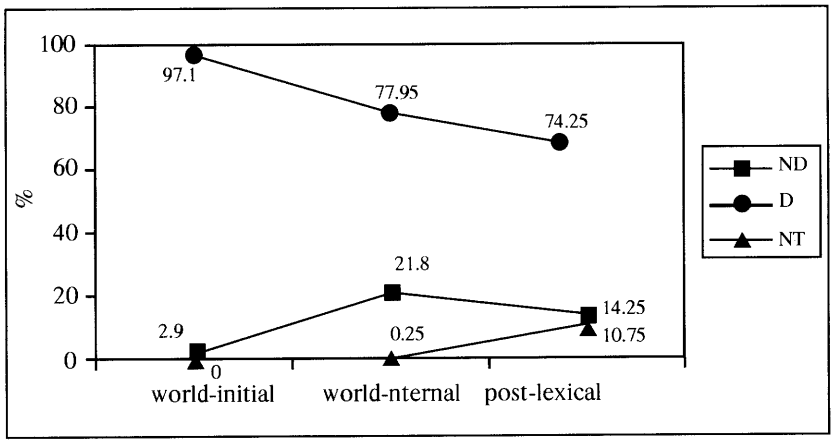

FIGURE 1: Mean percentages of the variants ND, D and NT in word-initial, word-internal and post-lexical position.

5.2. Word-internal (ND)

In the word-internal context the variants ND and D prevailed and together account for 99.85% of the data. The two interacting factors that affected (ND) realization word-internally were age and style.

As can be seen in Figure 2, the speakers in the two youngest age groups exhibited the same pattern, namely a very low percentage of ND tokens and a very high percentage of D tokens in both styles of speech (no differences relating to either age or style were found between the first two groups). In contrast, the speakers in the 46-71 age group used a much higher percentage of ND tokens in both styles, but they also showed a significant difference between reading and conversation: in their data the percentage of the prenasalized tokens increased considerably in reading compared to conversation ($p < 0.04$). The

difference in ND usage between the first two age groups on the one hand and the third group on the other was retained in both styles (for age groups 1 *vs.* 3, $p < 0.001$ for reading, and $p < 0.002$ for conversation; for age groups 2 *vs.* 3, $p < 0.001$ for both reading and conversation). (The same comparisons for the variant D yielded exactly the same results.)

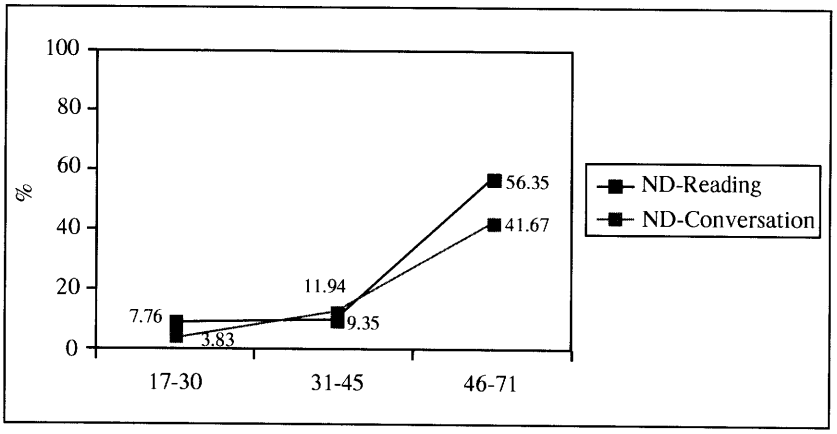

FIGURE 2: Mean percentages of the variant ND in word-internal position, by style and age.

In contrast to age and style, our results did not show any differences related to gender, class, or education (see Table I for a breakdown of the data according to these three factors). Note, however, that the statistical results on education concern only those speakers with secondary and higher education, because of the small number of speakers with only primary education in the sample.

5.3. Post-lexical (ND)

In contrast to the data from word-internal (ND), which showed little sociolinguistic variation (with the exception of the age and style effect), the realization of post-lexical (ND) was influenced by age, style and gender, though not by education or class (results broken down by education and class can be seen in Table II). The affecting factors interacted with one another and influenced each of the three variants, ND, D and NT, differently: while ND and D were affected by age and style, but not by gender, NT was affected primarily by gender and, to a lesser extent, by age and style.

Table I: Mean percentages and standard deviations of the ND and D variants word-internally, according to gender, class and education. (The sum of the ND and D percentages is on occasion slightly less than 100, due to the presence of some T tokens.)

			ND	D
GENDER	Women	Mean	23.71	76.27
		S.D.	22.61	22.62
	Men	Mean	19.92	79.82
		S.D.	27.65	27.56
CLASS	Blue-collar workers	Mean	15.60	84.39
		S.D.	18.62	18.62
	White-collar workers	Mean	21.82	78.02
		S.D.	23.63	23.60
	Professionals	Mean	24.40	75.43
		S.D.	29.18	29.08
EDUCATION	Primary education	Mean	30.48	69.51
		S.D.	22.02	22.02
	Secondary education	Mean	21.46	78.53
		S.D.	23.06	23.61
	Higher education	Mean	20.90	78.80
		S.D.	27.76	27.66

In particular, as shown in Figure 3 (a&b), the ND variant exhibited exactly the same pattern post-lexically as it did word-internally: both men and women in the first two age-groups showed similarly low percentages of ND in both reading and conversational style. In contrast, for the older age group there was an increase in the use of ND in reading ($p < 0.001$) in the data of both the female and the male speakers.

Table II: Mean percentages and standard deviations of the ND, D and NT variants in post-lexical context, according to class and education. (The sum of the ND, D and NT percentages is in some cases slightly more than 100 and in others, slightly less; the former result is due to rounding, the latter to the presence in these cases of some T tokens.)

			ND	D	NT
CLASS	Blue-collar workers	Mean	9.22	79.19	11.24
		S.D.	13.93	29.28	25.17
	White-collar workers	Mean	13.42	72.00	13.21
		S.D.	15.52	26.65	16.13
	Professionals	Mean	16.63	74.61	9.50
		S.D.	24.02	27.80	7.40
EDUCATION	Primary education	Mean	18.73	54.13	27.28
		S.D.	18.70	33.30	36.41
	Secondary education	Mean	15.16	75.15	10.55
		S.D.	13.23	25.66	15.95
	Higher education	Mean	14.19	76.29	9.10
		S.D.	23.35	27.90	8.00

Figure 3 also shows that in the data of the youngest and oldest age groups this similarity of pattern between word-internal and post-lexical (ND) was maintained for the D variant as well: post-lexically the young speakers used D almost exclusively, and the use of D was not affected by gender or style (although women did exhibit a statistically non-significant *trend* for more D in conversation than in reading); the older speakers, on the other hand, showed the expected decrease of D usage in reading ($p < 0.001$), a pattern that was not affected by gender (i.e. both genders showed a D decrease). In the 31-45 year old group, however, the speech of men and women did not have the same pattern: while men's data did not show an effect of style, women's data showed a lower percentage of D tokens in reading than in conversation ($p < 0.003$). Their D percentage in reading was also lower than that of the male speakers ($p < 0.05$); on the other hand, the data of men and women showed no significant differences in D usage in conversation.

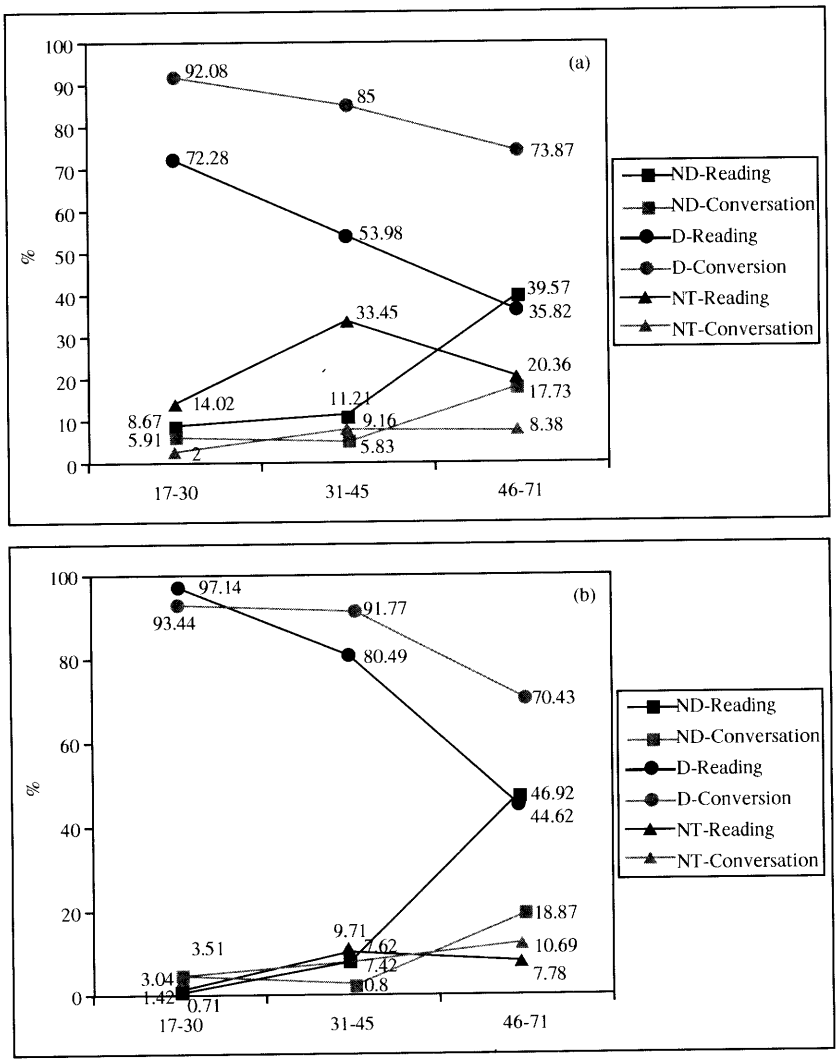

FIGURE 3.: Mean percentages of the variants ND, D and NT in the post-lexical environment, by style and age, separately for female (a) and male speakers (b).

Interestingly, the decrease of D tokens observed in the reading of women in the 31-45 age group, did not affect their usage of the ND variant (which, as we saw, was used equally in both styles), but that of NT, which showed a much higher percentage of tokens among women than among men of this age group ($p < 0.01$). This difference in the use of NT was not observed in the data of the

other two age groups, where NT usage was not affected by either style or gender and was in general lower than that of the women in the middle age group. In short, it appears that women of the 31-45 age group are the most sensitive to the use of NT as a careful style marker, an effect not observed among the older or younger speakers irrespective of gender, or among the men of their age group.

6. Discussion and conclusion

In summary, we saw that the pronunciation of (ND) depended primarily on context and age, and to a lesser extent on style and gender. Our results confirm traditional accounts that word-initial voiced stops are virtually always pronounced oral (but the occasional presence of nasality, also observed by Charalambopoulos *et al.*, 1992, is noteworthy). In addition, in word-internal (ND), variation in the use of the ND and D variants shows a strong correlation with age, with speakers below the age of 45 displaying a dramatic reduction in ND pronunciations when compared with older speakers, while other social factors, such as gender, education and class, did not affect the speakers' choice of variant. Significantly, style did not affect (ND) realization, except in the case of the older speakers, who showed an increase of ND usage in reading.

Finally, we found that the pronunciation of post-lexical (ND) was also affected by age, but that within each age group the variable was affected in different ways by gender and style of speech[12]. In the youngest age group these factors did not influence (ND) realization, and in the majority of cases the variant used was D. In the oldest age group, style affected the choice of variant, resulting in higher ND and lower D percentages in reading than in conversation for both men and women. In the middle age group, on the other hand, women showed an increase of NT in reading compared to conversation; this increase was at the expense of the D variant, while women's percentage of ND pronunciations remained the same in the two styles. Unlike the youngest and oldest age groups, women in the middle group behaved differently from men, whose choice of variant was not influenced by style.

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12. Broadly similar results are reported in a recent quantitative study of prenasalization and stop voicing in the post-lexical context (Mikros, 1995), which is based on data from five families, each of them being considered a minimal social network. Mikros' results, however, are difficult to interpret and compare to ours because he takes the presence of the nasal and the voicing of the stop as two independent markers, so that in his results our ND and D categories are classed together under "voicing", and our NT and ND categories are classed together under "nasalization".

The overwhelming effect of the age factor compared to all other factors suggests that the pattern of stable variation depicted in most traditional grammars and descriptive works (e.g., Mackridge, 1990a, Newton, 1972), in which ND is the formal and D the informal variant, is changing. It appears from our data that ND is no longer a marker of careful speech, and D forms are no longer "stigmatized stereotypes" (Daltas, 1992: 21). On the contrary, our results suggest that prenasalized voiced stops may have actually begun to disappear from Greek, or more accurately, from the speech of the younger speakers of Standard (Athenian) Greek.

This change in the use of ND is apparent in the differing patterns of speakers below 45 and those above 45 years of age. Our results show that older speakers have two variants, ND and D, both word-internally and post-lexically. For these speakers, the prestige of ND is evident in their increased usage of it in reading, a result unique to this age group. In contrast, these older speakers do not use NT as a careful style marker. This should come as no surprise, since the older speakers can use ND, i.e., they can simultaneously apply the stop voicing rule *and* retain the nasal, nasality being for them the key element which conveys the impression of formality and carefulness.

In contrast, the almost complete replacement of ND by D in the speech of the two youngest age groups, (17-30, 31-45), is clear in their word-internal data. The constantly low percentage of ND word-internally, and the concomitant overwhelming use of D, suggests that for them D is no longer an "indication of careless pronunciation" (Mackridge, 1990a: 72) in this environment.

It could of course be argued that the reason why the younger speakers in our sample used D to such an extent is that they adopted a uniformly informal style in both reading and conversation, possibly out of a sense of solidarity with the interviewer, whose age fell at the time of the recording on the boundary of the two younger age groups. There are, however, two problems with this argument.

First, the post-lexical data show that these speakers do use a more formal style in reading. What is significant is that formality is expressed through the use of NT, so that the observed differences between word-internal and post-lexical (ND) relate to the D and NT variants, but leave ND largely unaffected. Our interpretation of this pattern is as follows. As expected, the effects of the sound change are more widespread in the lexical than in the post-lexical environment, and thus D is not fully accepted post-lexically by the younger speakers; since D retains some of its old connotations of carelessness and informality in the post-lexical context, it is to an extent avoided post-lexically. ND on the other hand is no longer a careful style marker and appears to be largely unavailable to these speakers as a possible realization. With ND unavailable, and

D "stigmatized", speakers need another marker for careful style, so they opt for NT, that is they choose not to apply the stop-voicing rule. For instance, one of the speakers, an 18 year old woman, originally read a sequence as [tide'tarti] 'on Wednesday', and after a short hesitation pause repeated it as [tin te'tarti]. It is, however, significant that there are no similar instances of correction of D to ND word-internally. This suggests that neither this speaker nor any other in the younger age groups felt that they were being careless when they were pronouncing D in the word-internal context; there is no evidence that they might have been monitoring that aspect of their linguistic behaviour.

Secondly, even those speakers in the 17-45 span who showed preoccupation with sociolinguistic markers used D pronunciations in overwhelming numbers. A case in point is one of the men in the 30-45 year old group, who talked at great length about the unacceptable accents of newscasters. His concern was focused mainly, though not exclusively, on the use of the stigmatized palatals [ʎ] and [ɲ] before the high vowels /i/ and /e/, instead of the standard alveolars [l] and [n] (e.g., in ['ʎitra] 'ransom' or [ɲi'si] 'island'). He did not, however, mention D among the pronunciations he deemed unacceptable, and indeed his conversational data showed that he used D 98% of the time both word-internally and post-lexically, strongly suggesting that for him D does not belong among the stigmatized markers.

This change of attitude towards D and ND is supported by our further informal observations of D usage even in recent loans, such as [to 'barser] for <τον πάρσερ> 'the parser/ACC' and [ko'bjuter] for <κομπιούτερ> 'computer', by young educated speakers even in the formal context of a linguistics conference presentation. In short, we concur with Mikros (1997) that "prenasalization is a social marker of prestige that is used and appreciated only by the older Greeks[;] in the younger generations it is not used as such[13]" [our translation]. This of course does not mean that some younger speakers are not aware of the prestige of the ND variant, even if they do not always use it in their own spontaneous speech. For instance, at a presentation of this study a graduate student

13. Although the norm seems to be moving in the direction of D, it is fair to say that, for at least a part of the population, foreign language learning *may* reintroduce ND and NT as possibilities, at least in relation to foreign words and recent loans. As Daltas (1992), in an insightful discussion of this phenomenon, remarks "this reversal is promoted [...] by young educated polyglots, and does not necessarily affect the rest of the population who may be quite content with stage 4 [our D] and quite unaware of snooty attitudes toward them on the part of the privileged youth—who, by the way, are far from exhibiting consistent adherence to their conscious linguistic norms with respect to the phenomenon under scrutiny" (p. 21-22). This is exactly what our own observations and examples suggest as well.

expressed his surprise at the high D percentages of his generation, arguing that as an undergraduate at the University of Athens, he and his friends scorned the D variant as a marker of uneducated speech; he was unaware of the fact that he started his comment with ['pados] 'however'.

It is also worth commenting on the gradation of the pattern we observed. The dilemma of which variant to use to express formality affects mostly the women in the 30-45 year old group, less so the women in the 17-30 year old group, and least of all the men of these groups. In other words, NT is more widespread among women, the group that has traditionally been described as being more conservative and sensitive to prestige norms (see among others, Labov, 1972, Trudgill, 1972, and the discussion in Chambers, 1995: 128ff., 221ff.). Men, on the other hand, appear to be in the vanguard of the innovation.

Yet, this alteration of pattern across generations would be relatively unremarkable if it were not for (a) the abruptness of the change, which seems to have taken place within one generation, and (b) the direction of the change, namely the fact that the variant which has emerged as the dominant one is D, the variant that is traditionally thought of as less prestigious. The direction of the change becomes all the more puzzling if one takes into account the high social mobility of Greece, which should normally have made speakers adopt the more prestigious ND variant. It is well known that "the upwardly mobile speakers not only use fewer non-standard variants than the people in the class in which they originated but also use fewer than the people in the class which they are emulating" (Chambers, 1995: 57). This finding is particularly true of working class speakers moving into the lower middle class, and this is precisely the kind of social mobility that characterizes Greek society in the post-Second World War era (see, e.g., Lytras, 1993, and references therein).

We propose that the dramatic age division and the puzzling direction of the sound change that we observed in our data are due to two related factors: (a) the long standing Greek diglossia, and (b) the overwhelming political changes which took place in Greece in the mid-seventies and led, on the one hand, to social changes, and on the other, to the official abolition of diglossia with the demise of Katharevousa in 1976.

First, it must be noted that diglossic communities appear to have certain peculiarities: specifically, sociolinguistic research in Arabic-speaking countries suggests that in cases of diglossia the prestige and standard varieties are not the same, as they are in other linguistic communities. Although the H variety is the prestige one, it is the L(ow) variety of urban centers that plays the part of the standard (Chambers, 1995). This distinction nicely explains the speech patterns of the upwardly mobile in diglossic Arabic-speaking communities: these

speakers cannot master the features of the H variety (due to their lack of schooling), but they can and do master features of the urban vernacular in order to emulate the speech of the class they aspire to.

We would not wish to suggest that exactly the same analysis would apply to the Greek situation, but there are certainly similarities among diglossic communities. Thus, it is possible that the patterns described in older works on (ND), especially those based on samples elicited from highly educated people, such as Householder (1964), conceal part of the reality of the situation in Athens. It is possible that while ND was the prestigious variant linked to Katharevousa, an Athenian L standard with D as its reflex for older ND was emerging among those upwardly mobile strata of society–always considered innovators (Labov, 1980)–that after the war formed what Lytras (1993) terms the "new middle class" (roughly the equivalent of the white-collar workers in this study). Obviously, the phonetic and phonological gap between Katharevousa and Dimotiki was not as great as that between Classical Arabic and the Arabic regional varieties. Moreover, the influence of Katharevousa was all-pervasive (Browning, 1982). In other words, the prestige of Katharevousa was not felt only by highly educated speakers who had to learn to use Katharevousa for their studies and work, but by all urban dwellers who read newspapers, listened to the radio, filled in forms, read notices in public places and felt uneasy about their mastery of the H variety (for a discussion see Browning, 1982, and 1983: 109ff.). This all-pervasive influence of Katharevousa probably accounts for the pattern we observe among the older speakers, irrespective of class or education, namely the roughly equal use of the D and ND variants. Eventually though, D prevailed for socio-political reasons, namely the end of the military government and the subsequent abolition of Katharevousa as Greece's official language.

The age division in our results roughly coincides with this socio-political landmark of Greek history and suggests that both the speakers in the youngest age group, who had little or no contact with Katharevousa, and those in the middle age group, who were educated in Katharevousa but, in their vast majority, rejected it because of its association with the dictatorship, were increasingly less sensitive to the waning prestige of the Katharevousa-linked ND variant. Understandably, the effect is less pronounced among the 31-45 year olds, who may well have rejected Katharevousa, but cannot be expected to be impervious to the prestige of the language in which they were educated[14]. As Brown-

14. Despite frequent changes in linguistic and educational policy in Greece, the use of the two diglossic varieties in school has remained relatively stable in the 20th c. From 1923 to 1967 (with the exception of the period 1935-36), Dimotiki was used as the language of

ing (1983: 109) aptly noted: "On the linguistic level [diglossia] certainly contributes to [...] loading of emotional significance on to the linguistic form, a significance which may be a much more important part of the message than its overt content of information." Hence the speech of this age group is in a state of flux. In contrast, the speech of the youngest group presents a consolidated pattern. In turn, their pattern is clearly different from that of the oldest speakers whose norms, formed during the period of diglossia, cannot be expected to change so easily.

This relationship between linguistic change and "catastrophic social events" is not uncommon, as Clermont & Cedergren (1978), Kemp (1981), Labov (1990), and Laferriere (1979) demonstrate. In the Greek case, after the 1974 fall of the seven-year military junta, a period in which the use of Katharevousa as the official language of administration and education had been reinforced, the newly elected democratic government abolished the official use of Katharevousa in all aspects of public life. This move was in part a reaction to the connection of Katharevousa with the junta, a link which had undermined its former status as the H variant of Greek diglossia. Frangoudaki (1992: 369) for instance, states that "since the 1950s, the use of K Greek [Katharevousa] connotated acceptance of established hierarchies, respect for traditional values, resistance to change, and support of the given order", and goes on to show how this power of Katharevousa was slowly eroded by its increasingly wide use, which was intensified even further during the junta. Through such extensive use, Katharevousa became increasingly understandable to a larger part of the Greek population, an outcome which was facilitated by more widespread access to education. Thus, Frangoudaki continues (1992: 69 ff.), Katharevousa "gradually lost its legitimacy, thus losing its function as a high code", and "after the restoration of parliamentary government (1974), [...] served to identify the speaker with prodictatorship positions."

In short, Katharevousa related norms were rejected because of the connection of the H variant with the military government. The other side of the coin was of course the adoption of Dimotiki (or so-called Dimotiki) forms, a usage that automatically conferred progressive credentials on the speaker; the arguments over the form of the genitive singular of "third-declension" nouns (της

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instruction in the first four years of primary school only. Between 1964 and 1967 both Dimotiki and Katharevousa could be used in education (but obviously attitudes and textbooks did not change overnight). In 1967, and until 1974, the military junta imposed the use of Katharevousa at all grades. Again, the use of Dimotiki in education after 1976 was a slow process that took years to complete. Thus, despite the fluctuations, the speakers who were in their mid-thirties or older at the time of the recording had had all or most of their schooling in Katharevousa.

πτώσης vs. της πτώσεως) are well known, as is the (thankfully short-lived) usage of phonological aberrations such as σχολιό (for σχολείο) in left-wing partisan literature. We contend that ND was among the rejected markers, though not one that attracted the kind of attention "third-declension" nouns did. This attitude towards ND, together with the former diglossic situation, which had possibly given rise to a D standard, and Greece's high social mobility, which brought D –the "new middle class" variant– to the fore, can explain the current minimal social stratification of the variable and the abrupt and unusual change of the observed pattern.

To conclude, in the case of Greek voiced stops, a changing social environment–i.e., political changes together with changes in the nature of Greek diglossia–seems to have given rise to linguistic change as opposed to merely adding to the already existing stylistically conditioned variation.

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APPENDIX I: The reading text in Greek

Όταν ήμουνα μικρή για καλοκαιρινές διακοπές πηγαίναμε στο χωριό της μάνας μου που βρίσκεται στον Όλυμπο. Περνούσαμε πολύ ωραία, ιδιαίτερα εγώ που αγαπούσα τη ζωή κοντά στη φύση. Θυμάμαι, για παράδειγμα, ότι μια απ' τις μεγαλύτερες χαρές μου ήταν ν' ακούω τη νύχτα την κραυγή του γκιώνη, και να με ξυπνάει το πρωί η φασαρία από τις κότες, τις χήνες και τις φραγκόκοτες της γιαγιάς μου.

Ο παππούς μου δεν ήταν αγρότης αλλά έμπορος, κι έτσι δεν είχαν γη, εκτός από ένα αμπέλι, κι από ζώα είχαν μόνο πουλερικά κι ένα άλογο, την Τετάρτη, που την έβγαλαν έτσι γιατί είχε γεννηθεί Τετάρτη. Ο παππούς μου μ' άφηνε καμιά φορά να την καβαλικεύω, αλλά πάντα κρατούσε αυτός τα γκέμια για σιγουριά. Τι σιγουριά δηλαδή; Με το 'να χέρι κρατούδε τα γκέμια και με τ' άλλο το μπαστούνι του. Με θεωρούσε όμως μικρή και δεν μου είχε εμπιστοσύνη.

Το ίδιο με πρόσεχαν κι όταν πήγαινα να παίξω. Κοντά στο σπίτι ήταν ένας βαθύς γκρεμός και πάντα μας φώναζαν όταν πλησιάζαμε κατά κει. Εγώ παρ' όλ' αυτά πήγαινα συχνά για να βλέπω τους γύφτους που έστηναν εκεί κοντά τα τσαντίρια τους. Ιδιαίτερα μ' άρεσε να παρακολουθώ τις γύφτισσες να χορεύουν, ενώ οι άντρες τους καθισμένοι στον ίσκιο των γύρω δέντρων έπαιζαν τα ντέφια τους. Τους ντρεπόμουνα όμως και δεν τους μιλούσα. Καθόμουν σε μιαν άκρη και τους κοιτούσα μόνο. Μια μέρα μ' έπιασε να τους κοιτάω η μάνα μου και βρήκα το μπελά μου. "Νταραβέρια με γύφτους δεν θέλω. Τ' ακούς;" έλεγε και ξανάλεγε. Δεν ξέρω τι την πείραξε τόσο, γιατί γενικά δεν είχε ρατσιστικές ιδέες.

Φυσικά αυτή δεν ήταν η μόνη φορά που βρήκα το μπελά μου. Ήμουνα σκανταλιάρικο παιδί και συχνά με μάλωναν. Μια φορά για παράδειγμα έπαιζα στην πλατεία όταν έπιασε μια δυνατή μπόρα. Αντί να τρέξω στο σπίτι σαν τ' άλλα παιδιά, εγώ κάθισα κι απολάμβανα τα μπουμπουνητά και τη βροχή με αποτέλεσμα να γίνω μουσκίδι. Το τι ξύλο έφαγα γι' αυτό δεν λέγεται.

Το άλλο που έκανε τη μάνα μου έξω φρενών ήταν το ότι δεν έτρωγα σαλάτα. "Μα να είμαστε στο χωριό, να έχουμε ντόπια, φρέσκα λαχανικά κι αυτό το τέρας να μην θέλει ν' αγγίξει τ' αγγούρι και τη ντομάτα; Δεν μ' αρέσουν, λέει. Μα είναι δυνατόν;" την άκουγα να παραπονιέται στις φίλες της όταν κάθονταν στον κήπο να πιουν καφέ. Μια φορά στεναχωρήθηκα τόσο εξαιτίας αυτών των συζητήσεων με τις φίλες της που κλείστηκα στην ντουλάπα του μπάνιου κι έκαναν ώρες να με βρουν.

Τελικά εξαιτίας των καυγάδων με τη μάνα μου κατέληξα ν' αγαπάω περισσότερο τη γιαγιά μου. Ήταν μια πολύ γλυκιά γυναίκα, μικροκαμωμένη

και με γκρίζα μαλλιά, που υπέφερε αγόγγυστα όλες τις σκανταλιές που σκαρφίζονταν τα εγγόνια της, με πρώτη και καλύτερη εμένα. Μας καλόπιανε όλους και τίποτα δεν την στεναχωρούσε. Τη θυμάμαι πάντα με το χαμόγελο στα χείλη, αντίθετα απ' τον παππού μου που τον θυμάμαι βλοσυρό.

Θυμάμαι ακόμα τον θείο τον Σωτήρη, τον μικρό αδερφό της μάνας μου, που ζούσε στο σπίτι των γονιών του πριν το γάμο του με τη θεία Φωτεινή. Εμάς τ' ανίψια μας αγαπούσε πολύ, μας αγόραζε γλυκά κι έπαιζε συχνά μαζί μας. Αν κι ήταν ψηλός και γεροδεμένος μ' ένα παχύ μουστάκι δεν τον φοβόμασταν καθόλου. Όταν μετά το γάμο του μετακόμισε με τη θεία μου σ' ένα γειτονικό σπίτι, τον βλέπαμε κάπως λιγότερο, αλλά αργότερα, όταν απόχτησαν παιδιά, όλα τα ξαδέρφια κάναμε πολύ καλή παρέα.

Το περίεργο είναι ότι όταν σκέφτομαι το χωριό, τον πατέρα μου δεν τον θυμάμαι καθόλου. Είναι αλήθεια ότι δούλευε πολύ κι ερχόταν μόνο τα Σαββατοκύριακα, αλλά και πάλι καμιά φορά σκέφτομαι ότι θα 'πρεπε να τον θυμάμαι περισσότερο. Κι όμως, το μόνο που μου έχει μείνει απ' τον πατέρα μου είναι το ότι εμάς τα παιδιά δεν μας άφηνε να τον φιλήσουμε. Πάντα έπαιζε μαζί μας, αλλά μας απαγόρευε να τον φιλήσουμε γιατί θεωρούσε τις διαχύσεις (όπως τις έλεγε) κακό παράδειγμα για τα παιδιά. Ήταν λίγο περίεργος ο πατέρας μου σ' αυτό το θέμα και γι' αυτό κανένα απ' τ' αδέρφια δεν νοιώσαμε ποτέ πολύ κοντά του.

Παρά τα όποια μικροπροβλήματα όμως αυτά τα καλοκαίρια στο χωριό τα θυμάμαι και τα νοσταλγώ πολύ και θα 'θελα να μπορούσα να προσφέρω κάτι αντίστοιχο στα δικά μου παιδιά μια μέρα.

APPENDIX II: The translation of the reading text

When I was a child we used to spend our summer vacation in my mum's village which is situated on Mt Olympus. We had a very good time, especially me, for I loved life close to nature. I remember, for example, that one of my greatest joys was to listen at night to the cries of the howler, and to be waken up in the morning by the cackle of my grandmother's hens, geese and guinea fowls.

My grandfather was not a farmer but a tradesman, so the family had no land, except for a vineyard; as for animals, they had only fowl and a horse, Wednesday, named after the day on which she was born. Sometimes my grandfather would let me ride her, but he always held the reins to make sure. What a joke! With one hand he would hold the reins and with the other his walking stick! But he thought I was too young and did not trust me.

The family was equally careful when I went out to play. There was a deep ravine close to our house and we were always scolded when we went near it. Nevertheless, I used to go there often to watch the gypsies who put up their tents in that area. I particularly liked watching the gypsy women dance, while their men, sitting under the shade of the surrounding trees, played their tambourines. But I was too shy to speak to them; I would just sit in a corner and watch them. One day my mum caught me looking at them and I got into trouble. "I won't have you dealing with gypsies. Do you hear?" she said again and again. I don't know what got into her, because in general she did not have racist ideas.

Of course this was not the only time I got into trouble. I was a naughty child and was often scolded. One time, for example, I was playing at the [village] square when a heavy rain storm started. Instead of running home, like the other children, I stayed to enjoy the thunder and the rain, getting drenched as a result. I can't begin to describe the thrashing I got for this.

The other thing that drove my mum crazy was that I did not eat salad. "We are in the countryside, we have local, fresh vegetables, and this monster does not want to touch the cucumbers and tomatoes! 'I don't like them' she says! How is this possible?" I would hear her complain to her friends when they were sitting in the garden having coffee. Once I got so upset because of these conversations with her friends that I hid myself in the bathroom closet and they took hours to find me.

In the end, because of the quarrels with my mum, I ended up loving my grandma more. She was a very sweet woman, small and gray-haired, who put up without complain with all the monkey tricks that her grandchildren, me especially, came up with. She always humored us and nothing could upset her. I

always remember her with a smile on her face, unlike my grandfather who was rather sullen.

I also remember my uncle Sotiris, my mother's youngest brother, who lived in his parents' house before his marriage to aunt Fotini. He loved us, his nephews and nieces, a great deal, bought us sweets and often played with us. Although he was tall and big with a thick moustache we were not afraid of him. After his marriage, when he moved with my aunt to a house nearby, we would see him less often, but later, when they got children, all of us cousins played together.

The funny thing is that when I think about the village, I never remember my father. It is true that he worked hard and came only on weekends, but even so, sometimes I think that I should remember him better. Still, the only thing that I remember from my father is that he did not let us, the children, kiss him. He always played with us, but he forbade us to kiss him, because he thought that such outpourings of feeling (as he put it) was a bad example for children. My father was rather funny in this respect and for this reason none of his children were ever very close to him.

Despite such little problems however I fondly remember those summers in the village and would like to offer something similar to my own children one day.

APPENDIX III: The words with word-initial voiced stop found in the reading text

/b/	***GLOSS***
/ba'stuni/	'walking stick'
/be'la/ (twice)	'trouble/ACC'
/'bora/	'shower'
/bubuni'ta/	'thunder'
/'baɲo/	'bathroom'
/bo'rusa/	'I could'

/d/	
/'defja/	'tambourines'
/dre'pomun/	'I was shy'
/dara'verja/	'contact' (colloq.)
/'dopja/	'native/PL'
/do'mata/	'tomato'
/du'lapa/	'wardrobe'

/g/	
/'ɟoni/	'howler/ACC'
/'ɟemja/ (twice)	'reins'
/gre'mos/	'precipice'
/'griza/	'gray/PL'

APPENDIX IV: The words with word-internal voiced stop found in the reading text

/b/	***GLOSS***
/ˈolibo/	'[Mt] Olympus/ACC'
/ˈeboros/	'merchant'
/aˈbeli/	'vineyard'
/ebistoˈsini/	'trust'
/bubuniˈta/	'thunder/PL'

/d/	
/koˈda/ (four times)	'close'
/ˈpada/ (four times)	'always'
/tsaˈdirja/	'gypsy tents'
/ˈadres/	'men'
/ˈðedron/	'trees/GEN/PL'
/skadaˈljariko/	'naughty'
/aˈði/	'instead'
/ˈkaθodan/	'they were sitting'
/skadaˈljes/	'monkey tricks'
/skarˈfizodan/	'they came up with'
/aˈdiθeta/	'in contrast'
/aˈdistixo/	'equivalent'

/g/	
/fraˈgokotes/	'guinea fowls'
/aˈɟiksi/	'to touch/SUBJ'
/aˈguri/	'cucumber'
/aˈɣoɟista/	'without complaining'
/eˈgonja/	'grandchildren'

APPENDIX V: The (putative) post-lexical voiced stops found in the reading text (The relevant sequences are underlined)

/b/	***GLOSS***
/tin 'pirakse/	'it bothered her'
/stin pla'ʦia/	'at the square'
/ton pa'pu/	'the grandfather/ACC'
/ton pa'tera/ (twice)	'the father/ACC'

/d/	
/tin te'tarti/	'on Wednesday/ACC'
/ðen tus mi'lusa/	'I didn't talk to them'
/ðen ti stenaxo'ruse/	'it didn't use to upset her'
/ðen ton fo'vomastan/	'we were not afraid of him'
/ðen ton fi'lusame/	'we did not use to kiss him'

/g/	
/tin kra'vɟi/	'the cry/ACC'
/tin kavali'cevo/	'I mount it [the horse]'
/ðen 'ksero/	'I don't know'
/ston 'cipo/	'in the garden'
/ton kav'ɣaðon/	'the quarrels/GEN/PL'

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GLOSSOLOGIA 11-12 (2000) 229-256

ETHIC DATIVE: SYNTAX AND AFFECT*

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This paper investigates how affect is morphologically represented in language through the ethic dative (genitive) in MG. We have examined previous accounts within traditional grammar (Tzartzanos 1946) and the GB framework (Catsimali 1989) and have concluded that this construction can be satisfactorily explained only by applying theories which recognize that syntactic phenomena are closely interrelated with semantico-pragmatic ones. In that direction we adopt Janda's (1989, 1993) schematic representation and apply a cognitive linguistic approach. In examining ditransitivity and affect, we show that there is socio-cultural pressure exerted on syntactic structures. Specifically, we argue that this construction exhibits the relatively high value placed on interpersonal involvement, as well as an orientation towards positive politeness in the specific linguistic community. We conclude that the genitive-dative in MG depends on the interaction of three cognitive domains, i.e., (i) agentivity, (ii) possession, and (iii) affectedness of the recipient, all of which are graded.

1. Introduction: language and affect

The motivation for this paper stemmed from our interest in how affect is morphosyntactically represented in language, an issue given insufficient attention in current linguistic analyses; in our view, this is probably because English, which is the most widely analysed language, exhibits little overlap between the system of language and that of affect. Unsurprisingly, Talmy (1997: 10) isolates only four categories of closed class forms indicating affect in English and observes that "the low rank [of affect] militates against grammaticization". One of the few linguistic categories which Talmy (ibid.) identifies as indicating affect in English is traditionally called "ethic dative" or "dative of interest", although he chooses to call it "the undergoer construction", e.g. *my plants all died on me.*

Indo-European (IE) languages other than English as well as non-IE ones

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have been shown to involve a more systematic incorporation of emotive/affective material in overt linguistic categories both lexical and syntactic. These languages include Albanian, Bulgarian (Katsanis and Dinas 1986), Czech, French, German, Greek, Russian, Spanish (Wierzbicka 1981, Janda 1989) and Japanese (see Ono 1988, Kuno and Kaburaki 1977). Compare the following examples of IE dative and corresponding Japanese passive constructions from Ono (ibid. 36-37).

JAPANESE

1. Watasi {wa/ga} Taroo ni ude no hone o or - are-ta.
   'I' TOP NOM Taro DAT arm GEN bone ACC break-PASS-PRET
   'I got the arm broken by Taro.'

GERMAN

2. (i) Er hat mir den Arm gebrochen. 'He broke my arm.'
   (ii) (a) Der Arm wurde mir gebrochen. 'My arm was broken.'
   (b) Mir wurde der Arm gebrochen. 'My arm was broken.'

FRENCH

3. Il m'a cassé le bras. 'He broke my arm.'

GREEK

4. Μου έσπασε το χέρι. 'He/She broke my arm.'

JAPANESE

5. Watasi {wa/ga} kodomo ni nak-are-ta.
   'I' TOP NOM child DAT cry-PASS-PRET
   'My child cried (and I was negatively affected by it.)'

POLISH

6. Dziecko mi pacze.
   Child 1.SG. DAT cries
   'My child is crying, I'm negatively affected by it.'

GREEK

7. Μου κλαίει το παιδί μου. 'My child is crying me-GEN'

Ethic dative in particular has received a lot of attention in classical IE struc-