Connected Speech Strategies at Word Boundaries: Taps and Glottal Stops in RP

Ana M. Sánchez-Leira

University of Murcia
anamaria.sanchez17@um.es

ABSTRACT

This study examines the different connected speech strategies at word boundaries in potential t-tapping cases in a non-rhotic variety of English. A number of interviews from a talk show broadcast on BBC One were analysed auditorily and acoustically for the occurrence of potential t-tapping contexts at word boundaries. The results indicate that t-tapping is not very frequent in spontaneous speech at word junctures. The results also show that t-tapping is favoured over the production of glottal stops, whilst word-final /t, d/ are more frequent than tap productions.

Keywords: t-tapping, glottal stops, word boundaries, connected speech

1. INTRODUCTION

Connected speech phenomena refer to modifications in the pronunciation of phonological units during the speech chain [1]. Phonological modifications may be subject to the linguistic context, speech rate or register. Speech perception concerns the interaction between incoming and stored information [4]. [12] suggested that pronunciation is strongly determined by either habit or mental storage of words rather than speed rate or formality.

T-tapping is one of the many reduction processes that has been considered to be a naturally and phonetically motivated sound change [7]. From an articulatory perspective, t-tapping may be considered a natural type of sound change since it might be derived from the common tendency of articulatory ease [7]. T-tapping could also be considered a phonetically motivated process given the principle of lexical diffusion [13] since t-tapping affects high-frequency words first [7].

The connected speech phenomenon of t-tapping implies the pronunciation of an intervocalic /t, d/ as a voiced tap realisation instead of a plosive consonant. It can occur in three different phonetic contexts: within words, word-internally at morpheme boundaries and externally across word boundaries (e.g. *pretty, pudding, I don't*).

Glottal stops refer to a type of laryngeal strategy whereby a complete or partial obstruction of the airflow occurs at the glottis [2, 10]. When a plosive is replaced with a glottal stop, this type of articulation is usually referred to as t-glottaling or glottal replacement (e.g. *get it*) [2].

2. WORD BOUNDARIES STRATEGIES IN CONNECTED SPEECH: THE CASE OF T-TAPPING

While t-tapping and t-glottaling have long been observed and described in the specialised literature, t-tapping remains scarcely investigated in non-rhotic accents of English, such as RP, where it may function as a competing variant to avoid the negative connotations associated to the glottal stop [2].

As a case in point, most studies in the field have investigated and described t-tapping in rhotic varieties of English [3, 5, 6, 11, 15] as well as in non-rhotic varieties in the southern hemisphere [8, 14]. However, few empirical studies have focused on the production of taps across accents in the British Isles remains scarcely investigated [2, 7].

The findings obtained from these studies indicated that taps were highly frequent and were the preferred allophonic variant of medial /t/ over glottal stops in American English [11, 14, 17].

Concerning t-tapping and t-glottaling, some of the studies found that glottalised variants seemed to be competing with tap productions in intervocalic final position in Australian English [14].

Some empirical studies addressed the acoustics of taps, which were characterised for being acoustically short [17], whilst other studies accounted for the distribution of allophonic variants of /t/ [5].

The production t-tapping has generally been correlated to linguistic factors such as morpheme boundaries, as it has been claimed to be more frequent in morphologically simple words, usage-based factors such as highly frequent lexical representations and as lexical frequency, since its rate of occurrence was higher in high-frequency words and high-frequency phrases [3, 11, 15]. However, phonetic factors such as stress and vowel quality may also condition its variability [6, 15].

Sociolinguistic factors were also considered to play a crucial role in the ratio of production of t-tapping in some varieties of English, such as Australian English, where younger speakers exhibited the highest production of t-tapping over t-glottaling [14].

In New Zealand English, t-tapping production followed similar trends to the factors affecting its variation in other varieties of English, such as American or Australian English. For instance, empirical studies revealed that t-tapping use has increased over time and it affected high-frequency words first [8].

Empirical studies on RP found that young speakers exhibited an increasing use of taps because of the introduction of phonological innovations from non-standard variants in younger generations of RP speakers. In [2], 317 out of 5,248 tokens that have been analysed corresponded to tap realisations in the following phonological environments: word-final prevocalically, word-medial intervocalically and word-medial before syllabic /l/ contexts, which were found to occur principally in informal speech while they rarely occur in formal speech. This study on RP revealed that the highest influence of production for taps are medium-frequency words, and high-frequency items containing /t/ in word-medial position. Lexical frequency did not have any impact on word-final position /t/ in potential t-tapping sites [2]. In terms of sociolinguistic factors, age, gender and socioeconomic factors played a role in affecting t-tapping variation. Adults' utterances contained more instances of taps (i.e. 8.1%) in comparison to teenagers' utterances (i.e. 4.2%), whereas men tended to produce more taps (i.e. 7.1%) than women (i.e. 4.8%). The production of taps in [2] was also analysed concerning the type of school of the participants. The highest rates of production corresponded to boarding school speakers (i.e. 9.6%), followed by comprehensive school speakers (i.e. 5.1%) while the lowest rates corresponded to private non-boarding school speakers (i.e. 3.5%).

T-tapping was analysed both within words and across word boundaries in the speech of RP television newsreaders in [7]. The findings revealed that the voiceless plosive was the most frequent realisation of /t/ in intervocalic environments (i.e. 64.8%) and t-tapping occurred more frequently (i.e. 35.2%), which suggested that t-tapping may be considered a well-established variant in RP.

In [7], variation was mostly linked to gender since males used taps more than females with an average percentage frequency of 42.5% and 26.4%, respectively. Linguistic factors, such as word position, affected the production of t-tapping considerably. 66.9% of the tokens were produced word-finally whereas 17.5% corresponded to word-medial [7]. Usage-based factors found in this study were in line with previous research since t-tapping was found to affect mainly monosyllabic function words, frequent phrases and common content words. The analysis of phonetic factors in [7] revealed that t-tapping was equally produced across word boundaries when followed by stressed and unstressed syllables; however, it was less frequent after a stressed syllable than after an unstressed syllable. Regarding t-tapping within words, it was frequently found between a stressed syllable and an unstressed syllable.

The findings obtained in the studies mentioned earlier indicate, in general terms, that taps were frequent at word boundaries in all the varieties of English under investigation, even in RP; however, little is known about speakers' preferred strategies in connected speech when t-tapping is not applied.

Given that little empirical research on t-tapping in connected speech in RP has been conducted, and that variability on the frequency of its competing variant (i.e. t-glottaling) when taps are not used remains scarcely investigated in RP, the present study addresses the variability of potential t-tapping contexts at word boundaries in connected speech in RP.

The principal objective of this paper addresses the following research questions: a) what is the status of t-tapping in connected speech in RP?; and b) is t-tapping favoured over laryngeal strategies (i.e. glottal stops)?

Based on previous studies, it is hypothesised that a) t-tapping will be frequent in connected speech in RP; and b) t-tapping will be favoured over t-glottaling.

3. METHODOLOGY

3.1. Data

The interviews analysed for this study have been extracted from The Andrew Marr Show, a talk show broadcast in the United Kingdom from 2005 to 2021. The guests who normally appear are one senior member of the UK Cabinet, a representative member of the Opposition, and sometimes, famous non-political guests as well (e.g. well-known journalists). The interviews were always conducted in the same programme set and following the same turn-taking method, which enables maintaining consistency for data collection and analysis.

The analysis focuses on the non-rhotic variety of English known as RP, as represented in UK political figures' speech.

Even though in traditional studies of linguistic variation sociolinguistic interviews are the most common practice for collecting data, using speech from a TV programme seems to be a more practical and better-suited method for observing contemporary pronunciation [9; 7]. However, significant drawbacks are found. One of the major disadvantages is the

irregularity of the speakers' appearances and the differences in interview duration (i.e. neither all the speakers appear the same number of times nor all the interviews last the same amount of time).

The speech of six UK political figures, three males and three females, was analysed from 29 interviews corresponding to the years 2010-2013, due to the transcriptions of the interviews are not available until 2010. The duration of the interviews is from 07:17 for the shortest one to 29:06 for the longest one. The text analysed amounts to ca. 74,600 words (excluding interview titles, headings, and other written-down specifications that are not part of the dialogue).

3.2. Procedure

The procedure involved two stages: 1) identification of the potential orthographic contexts where t-tapping may occur at word boundaries; and 2) auditory and acoustic analysis of the potential contexts identified.

To conduct the orthographic search for potential cases of t-tapping, specific orthographic contexts were explored through the word search tool available in Adobe Acrobat Reader. The searches for potential spelling contexts across word boundaries comprised the combination of the letters <t>, <tt>, <d> and <dd> preceded and followed by vowels, with a space in-between to check word boundaries.

All of the spelling searches were done taking into consideration orthographic pauses (e.g. , and .), paying attention to whether they were real phonetic pauses or not.

Despite decisions were carefully made regarding the presence or absence of instances of the connected speech phenomena described earlier, auditory analysis of the data was occasionally considered to be unsatisfactory and spectrographic software was used for acoustic clarification.

To achieve a significant amount of data, a threshold of 300 tokens per speaker was established, resulting in 1,800 tokens being analysed.

3. RESULTS AND DISCUSSION

The results obtained from the analysis show that in a compiled corpus of approximately 74,600 words, 526 cases of t-tapping have been identified out of 1,800 potential cases. This, therefore, corresponds to 29.22% of corpus tokens, whereas 1,274 of the potential cases where t-tapping was not produced correspond to 70.78% of the corpus (see Figure 1 below).
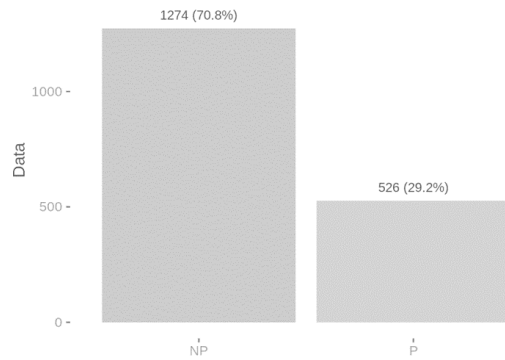
Figure 1: Rates of produced and non-produced cases for t-tapping.

The ratio of production of glottal stops when t-tapping is not applied has also been explored to determine how frequently a glottal stop production is produced in potential t-tapping contexts.

As Figure 2 shows, the quantified results indicate that out of the 1,800 potential cases, 410 are produced as taps in <t> contexts (22.78%), whilst 116 tokens are produced as taps in <d> contexts (6.44%), which yields 29.22% of the overall tap production. The results also indicate that t-tapping is favoured over glottal stop productions in /t/ contexts, which occur in 14.7% of the potential cases when t-tapping is not produced. The ratio of production of word-final /t, d/ corresponds to 63.3% of the overall potential cases where t-tapping or glottal stop are not applied.
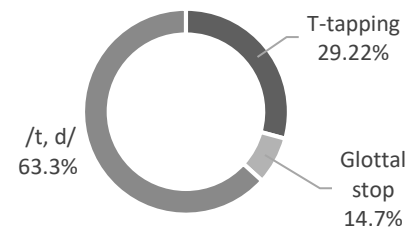
Figure 2: T-tapping strategies at word boundaries.

Since t-tapping is not categorical, two strategies are used in contexts in which the production of t-tapping s avoided: glottal stop [ʔ] and word-final /t, d/.

As Figure 2 above indicates, the analysis reveals that word-final /t, d/ are invariably more favoured over the glottal stop production. Furthermore, the findings also indicate that tap rates vary between /d/ and /t/ contexts. Tap rates for /t/ contexts are higher than for /d/ contexts. One possible explanation might be that glottal stops are an alternate variant of /t/ that RP speakers tend to avoid.

As to whether tap rate varies in terms of gender, the quantified results indicate that the tokens produced by females are slightly lower in comparison to the cases produced by males. As Table 1 shows, the

difference in the production of t-tapping between females and males amounts to 6%.

Gender	Males	%	Females	%
n	290	32.20	236	26.20

Table 1: Overall t-tapping cases by gender.

Concerning the production for t-tapping divided by gender, the tap rate by speaker reveals some patterns. As Table 2 shows, the three female speakers and only one male speaker have a consistent production of t-tapping between 20% and 30%, whilst the other two male speakers have a production of t-tapping above 35%.

Speaker	n	%
Male 1	108	36.00
Female 1	67	22.33
Male 2	67	22.33
Female 2	80	26.67
Male 3	115	38.33
Female 3	89	29.67

Table 2: Overall t-tapping cases by speaker.

These findings support previous research in which male speakers produced more tap variants than female speakers, which might be in relation to female speakers using more standard variants.

The findings obtained in the analysis revealed that the production of t-tapping in spontaneous speech in RP is not very frequent, since the percentage of production is low. The quantified data indicate that t-tapping is not fully established in contemporary pronunciations of RP speakers, as it is produced in less than 50% of the cases. However, a rate of production of 29.22% is high considering the relative formality of the TV programme, and it may mainly be linked to the social status represented by the interviewees, together with the fact that t-tapping is not generally considered a common RP feature.

This low percentage of production seems to refute the statement that its usage could be a representative feature of a casual style of speech [16] and it is in line with previous studies on RP [7] and on AusEng [14] but in contrast to studies on young RP speakers [2].

The findings on the production of t-glottaling also reveal that the traditional alveolar plosives in word-final position are favoured over the production of t-tapping and glottal stops across word boundaries in RP.

The low percentage of production for t-glottaling is related to the negative social connotations associated to the glottal stop variant.

Even though [7] pointed out that several interpretations of the phenomenon suggested its spreading in British English accents, the analysis indicates that t-tapping is a case of a recent development rather than a case of stable variation in contemporary RP. T-tapping has been long associated to sociolinguistic factors such as male speakers, working-class speakers, and with younger speakers [7], which explains t-tapping's low ratio of production in the data. In line with previous studies on RP [7], these findings, therefore, reveal that t-tapping can be considered to be well-established in contemporary RP, and thus, not limited to non-standard accents of English.

4. CONCLUSION

This study has focused on the rate of production of t-tapping in spontaneous speech across word boundaries in contemporary RP and the strategies that speakers use when t-tapping is not applied. Given the data obtained, it is clear that t-tapping still represents an ongoing development in the phonological inventory of RP speakers. Despite the overall production is low, several factors such as the relative formality of the speech situation and the social factors associated to the phenomenon may have conditioned its variability. The findings also reveal differences between the strategies speakers favour in potential t-tapping contexts. In most cases, RP speakers favour word-final /t, d/ pronunciations over both t-tapping production and glottal stops, which represent an extremely low percentage of production in the data.

The present findings represent another step to the understanding of the phenomenon of t-tapping across word boundaries in RP; however, the study has certain limitations that should be acknowledged. Some clear limitations are the number of speakers, tokens and a wider time span. Future research should include more speakers, more potential cases and more years of study, which would result in more potential cases per speaker, with more inter and intra speaker variability in a wider diachronic perspective.

Despite the limitations, this study has tried to contribute to the growing empirical body of data. It shows that t-tapping occurs across word boundaries in spontaneous speech in contemporary RP speakers, although traditional word-final /t, d/ pronunciation is preferred. It also shows that RP speakers favour t-tapping production, which can be described as spreading into RP phonological inventory, over glottal stops. The findings also reveal that alveolar plosives are the common pronunciation in potential t-tapping contexts and that t-tapping is more frequently used than in glottal stops in the same contexts.

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