

[!] WHAT'S THE NAME OF IT? [!] : PHONETIC CLICKS IN WORD SEARCH STRATEGIES IN GLASGOW

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ABSTRACT

Clicks are phonemically rare, non-pulmonic stop sounds [10]. They have also been reported as nonverbal features but few studies have identified English clicks' phonetic form and functions [22, 15]. Despite the vast pragmatic literature on word search, knowledge of the phonetic form of word search clicks is mostly anecdotal.

This paper reports results from an ongoing sociophonetic study, using a combination of Conversation Analysis to identify word searches [2] and narrow auditory transcription with visual spectral information in Praat to analyse clicks. In 8 hours of conversations of 16 Glaswegian speakers, we found 125 word searches, 55 with a click. Phonetically, clicks were oral, mainly dental in articulation, often alongside a particle (e.g. *uh/um*), and tended not to occur with creakiness or inbreaths. Mixed effects logistic regression analysis further suggests the greatest predictor of a click in a word search is the presence of a particle.

Keywords: non-pulmonic, clicks, sociophonetics, interactional linguistics, Conversation Analysis

1. INTRODUCTION

Clicks are typologically rare, non-pulmonic, stop sounds found as phonemes in some Southern and Western African Languages, e.g. !Xhosa, Zulu, Sandawe, !Xóǝ [10]. Phonemic clicks range from bilabial to lateral place of articulation, with the most common being dental. The prevalence of dental clicks results in a range of fine-grained articulation, e.g. with more tongue protrusion, closer to the alveolar ridge, etc.

Clicks also function as non-lexical discourse features in many languages, including Cantonese, German, French, and English [14, 4, 12, 15]. However, there are few studies on click usage in English and very little is known about their phonetic form and function. Even less is known about how social factors might constrain this interactional variable in English.

2. CLICKS IN ENGLISH

To our knowledge, there are only five systematic studies of clicks in English (beyond numerous observations in descriptions of English, e.g. [9, 10, 8, 21]). In a forensic study from 2013, Gold et al. [5] investigated the rate at which speakers produce clicks in order to discern whether or not clicks could be used as a forensic discriminant. They observed 454 clicks in 100 speakers (=499 minutes of speech), and concluded that clicks were not frequent enough to be used as a discriminant.

A small-scale sociophonetic study of regional variation of clicks in Scottish English [13], found 451 clicks in 9 speakers, speaking 3 dialects of Scottish English. Click usage varied substantially by individual speaker, but also seemed to interact with dialect and speech style. In terms of function, clicks were used most to index a new sequence and indicate word search.

Two studies have implemented a full Conversational Analysis (CA) approach to clicks, through close analysis of how clicks function in English talk, alongside phonetically-detailed descriptions of click production. Wright [22] examined telephone data of both British and American English speakers for clicks which occur at the closing down of one sequence of talk before the beginning of the next one, or New Sequence Indexing (NSI) clicks. Phonetically, NSI clicks were produced with a full range of articulation (e.g. bilabial to lateral), and primarily orally rather than with any collocated nasal material. They also often occurred alongside particles such as *uh* or *um*, and contained some lexical material which was creaky in quality. Turn-initial clicks usually occurred with an in-breath.

Ogden's study on the functions of clicks in talk-in-interaction [15] mirror these findings and add that clicks can occur in isolation or as part of multiple clicks (either double or more). This study also presented the range of functions clicks can perform. In addition to indexing a new sequence, click functions can be divided into two functional categories: stance-displaying

and sequence-managing. Stance-displaying clicks employ the formula [click] + [response token] to mark disapproval, sympathy, agreement, appreciation and more. Sequence-managing clicks can index a new sequence, mark incipient speakership (shift of one speaker to another), indicate backchannel, initiate self-repair, hold the floor during a turn, and mark word search. Many of these actions are theorised and classified in pragmatic literature (e.g. [19]), but the role of clicks within them remains unstudied.

Most recently, Pillion's [16] sociophonetic study examined clicks and percussives, sounds made by the audible separation of the articulators, and gender variation in speech preparation strategies in American English. Pillion analysed 38 speakers in hour-long interviews and found that, once percussives were removed, women clicked more frequently than men.

This paper returns to Scottish English, and reports results from a larger ongoing sociophonetic study into the role of social factors in the form and function of clicks in Glaswegian conversational speech. Here we focus on clicks in word search sequences.

2.1. Word Search

A broad definition of word search is the action of searching for a word while speaking [7]. This is marked by several features and usually manifests in some indication of trouble or disfluency in speech which is later resolved; see examples in Fragments 1, 2.

Fragment 1: Word search with two lateral clicks

FY1: Jonah has [B] || || Asperg-
 a- [a-aaaaasperger's]
 FY2: [Asperger's]
 There you go (.) Words.

Fragment 2: Word search with three palatal clicks

MY2: When was it? It was u::h [ʃ] [ʃ] [ʃ] .hhh
 oh god I can't even mind

Word search is often studied from a psycholinguistic perspective, where it is seen as difficulty in accessing lexical material or lexical processing, e.g. tip of the tongue syndrome [3, 18]. In this study we concentrate not on lexical access, but rather the way in which word searches

are constructed in interactions, and so we use Conversation Analysis methods to identify word search. Word search construction is well-established in the CA literature [2, 7, 6, 17], which examines the action in context. Word search is one way speakers deal with issues that can arise in interaction (e.g. forgetting a word). The speaker may identify a problem, or signal that there is one to come, and performs the act of searching (usually with turn-holding indicators and hesitation markers, such as the bilabial trill in Fragment 1 or the u::h in Fragment 2), while the problem is ongoing. Typical verbal clues that can indicate an ongoing word search include: long pauses; particles e.g. *uh*, *um* (Fragment 2); repetition or elongation of sounds (e.g. lengthened /a:/ in "Asperger's" in Fragment 1); creak; and cut off syntax ("Jonah has-" in Fragment 1) [2, 6, 7]. This is followed by a resolution [17] through overt references to the word search itself ("Oh god I can't even mind" in Fragment 2), referring to listener expertise ("When was it?" in Fragment 2), or a co-construction where the listener offers the word that the speaker is struggling with ("Asperger's" in Fragment 1).

3. METHOD

This paper presents results from the analysis of eight hours of casual dyadic conversations between 16 speakers from the city of Glasgow, in the Central Belt of Scotland. The sample is stratified by both age and gender, with 4 male and 4 female younger speakers, aged 17-24, and 4 male and 4 older female speakers, aged 48-60 (the full sociophonetic corpus consists of recordings from 50 speakers). Audio-visual recordings were made in a sound studio with the researcher present to avoid one speaker dominating the interaction. Participants were asked to complain about whatever they chose, with some prompts provided if necessary, in order to elicit stance-displaying clicks which occur less commonly than sequence-managing ones [15, 13].

All clicks were identified and analysed using narrow auditory transcription, with reference to visual spectral information in Praat [1]. Following the practice of Wright [22], Ogden [15], and word search literature [2, 7, 6, 17], clicks in word searches were coded for oral production, number of clicks, creaky collocated material, inbreath, pauses longer than 0.3 seconds, the presence of a particle, and place of articulation. The place of articulation was determined auditorily (e.g. [22, 15]) and could be bilabial; labiodental, with the top teeth creating suction against the bottom lip; labiodental with

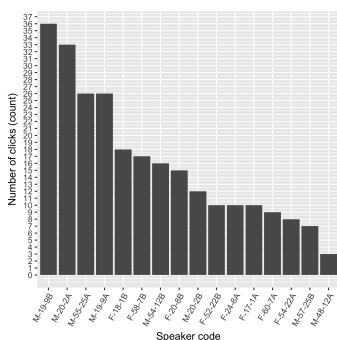
bilabial articulation followed by dental articulation; dental; alveolar; palatal; or lateral. For this study, the new category of bilabial-dental coarticulated was added, where participants seemed to be maintaining suction between both lips while producing a dental click, releasing both closures at the same time.

Each word search sequence was identified using criteria listed in Section 2.1. All word search sequences which did not have a “resolution” as described in Section 2.1 were excluded from the data to prevent uncertainty. Word searches were also coded for the same phonetic information as click-containing sequences, detailed earlier in this section. All statistical analysis was carried out in R [20]. Descriptive statistics were used for click collocates and a mixed effects logistic regression was carried out using the `lme4()` package to investigate the difference in word searches with and without a click. The dependent variable was click presence; the independent variables were particle, inbreath, creak, and pause. Speaker was coded as a random factor.

4. RESULTS

We first considered the overall number of clicks by speaker in the conversations as a whole. Out of 8 hours of recordings of 16 speakers, we found 256 clicks performing 22 different functions, including marking incipient speakership, indexing a new sequence, showing disapproval, backchanneling, marking word search, etc. Click rate varied greatly by individual speaker, ranging from one speaker producing only 3 clicks, to another producing as many as 36 (see Fig. 1). This contrasts with [13] where 451 clicks were found per 9 hours of speech.

Figure 1: Number of clicks by speaker

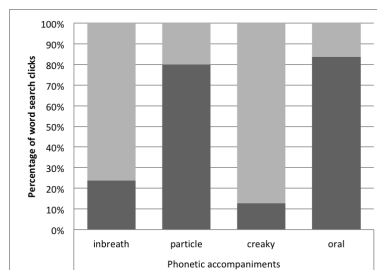


4.1. The phonetics of word search clicks

The data provided 125 instances of word search sequences. Of these, 55 were constructed with a

click. Five clicks were produced as multiples (one set of two and one set of three).

Figure 2: Percentage of phonetic accompaniments for word search clicks



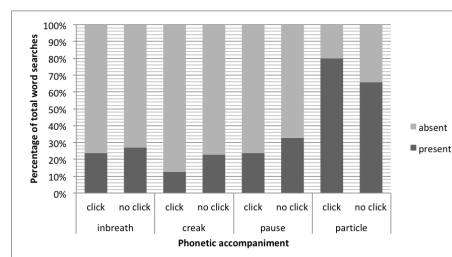
The phonetic accompaniments to word search clicks are shown in Fig. 2. Out of 55 clicks, 24% were produced with an inbreath ($n=13$) and 80% were produced with a particle ($n=44$). Only 13% had collocated creaky material ($n=7$) and 84% were produced orally ($n=46$).

Word search clicks were found to have the following places of articulation: bilabial-dental coarticulated, labiodental separate-articulation, dental, alveolar, palatal, and lateral. The most common place of articulation was dental, accounting for 44% of the total clicks ($n=24$). The next most common place of articulation was bilabial-dental coarticulated, accounting for 23% of the total clicks ($n=11$). All other places of articulation showed fewer than 4 tokens each.

4.2. Word searches with and without clicks

In order to investigate whether word searches constructed with a click ($n=55$) might be different from those without ($n=70$), we considered all word searches, irrespective of the presence of a click, in terms of the factors mentioned in Section 2.1 and 3. Word searches contained some inbreaths (26%), pauses (29%), and creak (18%); 72% of word searches contained particles.

Figure 3: Percentage of phonetic accompaniments for all word searches



In Figure 3, the data are arranged by word

searches with and without a click by phonetic accompaniment. Each pair of bars shows the total number of word searches with the darker grey showing the percentage of phonetic accompaniments present in word searches with and without a click (e.g. inbreath/no inbreath, creak/no creak, etc.).

Word searches with and without clicks had similar distributions for the additional presence of inbreath, creak, and pauses. This was further confirmed by the results of the logistic regression, which were not significant for these factors. However, the difference between word searches with and without a click with regards to the presence of a particle varied. 80% of word search sequences containing a click also had a particle (n=44/55), while 67% word searches without a click had a particle (n=46/70). This result is only marginally significant in the logistic regression (Odds ratio (95% confidence interval) = 2.09 (0.91, 4.76), $p = 0.08$), probably because of the relatively small amount of data. It does suggest that use of a particle could be indicative of click presence in a word search.

4.3. Word search clicks and social factors

Our sample of speakers was stratified by age and gender (see Sec. 3). Given Pillion's [16] recent results showing higher click frequency in male speakers for stance-displaying clicks, we examined the role of social factors for click rates in word search here (see 1).

Table 1: Word search clicks by gender and age

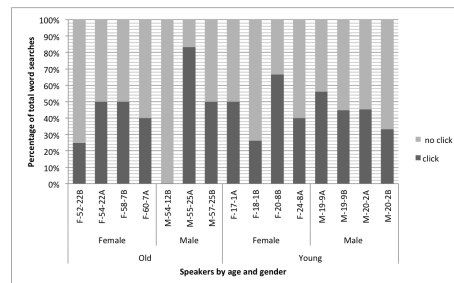
	Female	Male
Older	45% [n=9]	56% [n=9]
Younger	33% [n=11]	46% [n=26]

The percentage of clicks in word searches seems to be distributed according to gender and age. Younger female speakers produced the fewest clicks in word searches (33%), while older male speakers constructed 56% of their word searches with a click. Note that one older male speaker is excluded from the analysis due to producing no word searches.

Whilst consideration of social factors at the level of the group suggests an interaction of age and gender in click usage, inspecting individual speaker variation presents a different perspective. Figure 4 shows word search click percentage by individual speaker. It is immediately clear that use of clicks is largely determined by individual speaker. One older male speaker, M-54-12B, does not click at all, while speaker M-55-25A produces proportionally

more word search clicks than any other speaker. Our second most-frequent clicker is F-20-8B, a member of the lowest average click users, the younger female group.

Figure 4: Word searches with/without clicks by speaker



5. DISCUSSION AND CONCLUSION

This study of clicks used to construct word search in Glasgow English confirms some of the patterns observed by Wright and Ogden [22, 15]. Clicks were produced orally, across the full range of place of articulation, and most were dental, as studies of phonemic clicks have observed [11]. Clicks mainly occurred alone, but could occur as multiples [15]. These word search clicks did not often occur with an inbreath, unlike Wright [22]. This might relate to function; Wright's study was largely focussed on New Sequence Indexing clicks. Clicks were sometimes produced with creaky material [15].

Clicks were used in 44% of the 125 word searches occurring in the data. No clear relationship between clicks and the presence of an inbreath, pause, or creak emerges for word search clicks. However, these initial results suggest that when speakers construct word searches with particles, they may also use a click. This relationship between particle presence and click production in word searches will be investigated in the full sample of 50 speakers in future work.

Finally, viewing the stratified sample as a whole, the presence of a click seemed to be constrained by gender and age, since older male speakers produced the highest number of word searches with a click. This result might seem contra Pillion [16]. However, examining click frequency by speaker shows substantial individual variation much like [13]. As this study progresses and more observations are added, further insight into individual variation in click use may well be valuable for forensic studies as Gold et al. [5] had anticipated.

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