Research in Language

Volume 14 | Issue 1 Article 4

March 2016

The meaning of „nasal grunts" in the NECTE corpus. A preliminary perceptual investigation

Aurélie Chlébowski
Université Paris, aurelie.chlebowski@hotmail.fr

Recommended Citation
Chlébowski, Aurélie (2016) "The meaning of „nasal grunts" in the NECTE corpus. A preliminary perceptual investigation," *Research in Language*: Vol. 14 : Iss. 1 , Article 4.
DOI: 10.1515/rela-2016-0001
Available at: https://digijournals.uni.lodz.pl/rela/vol14/iss1/4

THE MEANING OF "NASAL GRUNTS" IN THE NECTE CORPUS. A PRELIMINARY PERCEPTUAL INVESTIGATION*

AURÉLIE CHLÉBOWSKI
Université Paris VII, Denis Diderot Sorbonne Paris Cité, CLILLAC-ARP (EA3967)
aurelie.chlebowski@hotmail.fr

Abstract
This paper reports a perceptual evaluation of the meanings conveyed by the acoustic components of "nasal grunts" (Chlébowski and Ballier 2015), i.e., non-lexical conversational sounds realised with a nasal feature (e.g. <ehm>, <uhhuh>, <mmhm>). This study follows the experimental investigation conducted by Chlébowski and Ballier (2015) on the acoustic components of such sounds in the PVC project (Milroy et al. 1997), which is part of the NECTE corpus (Allen et al. 2007). In accordance with current claims in the literature, they ascribed meanings to these acoustic features, e.g. fall-rises express that the "speaker implies something" (Wells 2006: 27), and verified their validity through an analysis of the context surrounding the "nasal grunts". Nonetheless, to avoid problems of circularity and ad hoc categories, the present study includes a perceptual evaluation by four participants. To verify the meanings ascribed to the features of "nasal grunts", three native speakers of American English were recorded in short casual conversations and three perception tests were created using these recordings, with Praat software (Boersma and Weenink 2009). The first two tests aim to check whether different acoustic features: 1) are perceived as different when presented in pairs; 2) can be identified by the participants (as falls or rises) in isolation. The last test aim to determine whether each feature bears the same meaning: 1) in isolation, 2) in a given context, or 3) in scripted conversations likely to trigger the meanings ascribed by Chlébowski and Ballier (2015). Results suggest that acoustic components of "nasal grunts" in Geordie English do convey specific attitudinal meanings, and raise the possibility of a perceptual hierarchy of those components.

Keywords: nasal grunts", meaning, perception, features, Geordie

1. Introduction

The present study follows the investigation conducted by Chlébowski and Ballier (2015) on "nasal grunts", *i.e.* "sounds like *uhhuh, mmhm*" (Chlébowski and Ballier, 2015: 54), and discusses the perception of the attitudinal meanings potentially conveyed by the acoustic components of those sounds. As explained

* I would like to thank Nicolas Ballier, Véronique Pouillon, Maëlle Amand and two anonymous RiL referees for their comments on a previous version of this paper. Remaining errors are mine. Special thanks are due to Karen Corrigan for her help at Newcastle and to Hiyon Yoo and Rémi Godement-Berline for their contribution to the perception tests.

by Chlébowski and Ballier (2015), we have borrowed the term "grunt" from Ward (2000) and we similarly define "nasal grunts" as non-lexical conversational sounds which possess a nasal feature. First, their study proposed an experimental classification of the phonetic and prosodic components of 394 occurrences of "nasal grunts" from the *Phonological Variation and Change in Contemporary Spoken English* project (PVC; Milroy *et al.*. 1997) from the *Newcastle Electronic Corpus of Tyneside English* (NECTE corpus; Allen *et al.*. 2007). Then, they ascribed attitudinal meanings, according to the literature, to each of these acoustic components following a "compositional model" (Ward 2006: 55), *e.g.* low-falls would convey an idea of statement. Finally, a lexical-contextual analysis – posited as provisional – aimed at verifying those meanings. Their final conclusions regarding this lexical-contextual analysis can be summed up as follows (Chlébowski 2015): the meanings ascribed to medial glottal stops, medial breathiness and creaky voice, low registers, nasalised vowels and high-rising tones were verified in context. Those ascribed to low-falls were verified and specified, *i.e.* according to context, low-falling tones can suggest agreement, disagreement, or step-back. Those ascribed to low-rises *vs.* low-falls, syllabification and complex tones were ambiguous. And those ascribed to full-back vowels or nasal vowels, consonants and lengths could not be verified in context, which triggered this perceptual study.

The domain of speech perception is currently expanding in every area of linguistics. As to the perception of non-lexical conversational sounds, the works conducted by Blau (1991) and Cenoz (1998) showed that fillers influence the understanding of the message. The study conducted by Schröder et al. (2006) showed that non-lexical conversational sounds could convey emotions. Nonetheless, the perception of this type of sounds is rarely investigated. Therefore, this paper proposes a preliminary perceptual evaluation of the meanings conveyed by the acoustic components of "nasal grunts" listed in the PVC project (Milroy et al. 1997) in order to verify the semantic hypotheses made by Chlébowski and Ballier (2015).

2. Method

This section summarises the methods used to conduct the perceptual evaluations of the attitudinal meanings conveyed by the acoustic features of "nasal grunts", i.e. recording of the stimuli, setting up the tests and conditions of participation to those tests.

The attitudinal meanings ascribed to nasalised vowels (*i.e.* [ɛ] in *ehm*), registers, and flat tones were not tested here. It has been attested that [ɛ], which functions as an equivalent of /ə/ in Geordie English (Chlébowski and Ballier 2015: 55), means that the speaker signals to his/her interlocutor that s/he is experiencing troubles recollecting what s/he wants to say (Corley and Stewart 2008). High register was never used in the PVC files (Milroy et al 1997), *i.e.* the

speaker using a low-register when uttering a "nasal grunt" is always in a vocal comfort zone, while "fear, anxiety, or distress-evoking situations give rise to vocalizations with high fundamental frequency" (Snow and Balog 2002 : 1027). Finally, the investigation of the meaning conveyed by a flat tone, *i.e.* no emotional [or attitudinal] involvement (Crystal 1975), would have been biased by the very meaning conveyed by [m], "given [their] compositional perspective" (Chlébowski and Ballier 2015: 54).

The experiment presented here aims to test separately the meanings conveyed by seven features of "nasal grunts": prosodic contours (*i.e.* low-falls, low-rises, high-rises, rise-falls and fall-rises), presence of medial breathiness, and presence of medial glottal stop, presence of creakiness, syllabification, lengths and nasal vowels *vs.* nasal bilabial consonants. These seven features were subjected similarly to three different tests: 1) discrimination task; 2) identification of the features; and 3) identification of the meanings conveyed by the tested features. There are therefore seven different sets corresponding to each feature under scrutiny for which the three tests have been adapted. Those sets have been performed by the participants in the following order: prosodic contours, creakiness, glottal stops, medial breathiness, syllabification, vowels *vs.* consonants and lengths. It takes around 15 minutes to perform one set.

2.1. Recording the stimuli

Three native speakers of American English (AE) were recorded in an anechoic chamber at Paris VII, Denis Diderot, using Audacity (Team 2012), with a 44.1 kHz sampling rate (16 bits) and a Rode NT1-A cardioid condenser microphone equipped with an anti-pop filter.

Subjects were asked to act out short casual conversations provided by the author. Those conversations will be detailed in section 2.2.3.

Informant 1, a male aged 27, was recorded for the conversations including specific prosodic contours, and Informant 3, a male aged 21, was recorded for the conversations testing all the other acoustic components. Informant 2, a female aged 31, was recorded for all conversations and was also asked to perform the various acoustic features of the "nasal grunts".

The three informants had to act out the scripted conversations, in which informant 2 could produce spontaneous "nasal grunts". Then, she was recorded alone and asked to produce several times the targeted acoustic features summarised in Table 1. Out of those latter productions of "nasal grunts", the ones that fitted the most criteria for the acoustic features listed by Chlébowski and Ballier (2015) were controlled by an experimental acoustic analysis with Praat software (Boersma and Weenink 2009). Only one sound was retained for each feature and was not modified. Finally, those sounds were inserted in the recordings of the conversations instead of the grunts produced spontaneously.

Table 1. Features of "nasal grunts" under scrutiny and their corresponding meanings according to the literature

Tested features	**Posited meanings**	**Prosodic contours**	**"Nasal grunt" duration**	**Syllable template**
Prosodic contours: - Low-fall *vs.* low-rise - High-rise - Rise-fall - Fall-rise	- Statement (Cruttenden 1981) *vs.* concession (Tench 1996) - Questioning (Wells 2006) - Gap-filling (Brazil, *et al.* 1980) - Implication (Wells 2006)	- Low-fall, low-rise - High-rise - Rise-fall - Fall-rise	- 316ms, 283ms - 321ms - 324ms - 323ms	- [m.m], [m.m] - [m] - [m.m] - [m.m]
Creakiness	Speaker is withdrawing from conversation (Ward 2006)	Low-fall	311ms	[m̰]
Medial glottal stop	Speaker is strongly negating the subject (Ward 2006)	Low-fall	316ms	[m.ʔm]
Medial breathiness	Speaker is concerned (Ward 2006)	Low-fall	326ms	[m.hm]
Mono- *vs*. disyllabic grunts	Speaker *vs*. listener position (Ward 2006)	Low-fall Low-fall	307ms 316ms	[m] [m.m]
Vowel *vs*. consonant	Speaker is present *vs.* processing (Chlébowski and Ballier 2015)	Low-fall, low-fall	306ms, 316ms	[Ṽ.Ṽ], [m.m]
Short, medium, long lengths	Reflex, normal, lot of thought (Chlébowski 2015)	Low-fall, low-fall, low-fall	118ms 307ms 817ms	[m] [m] [m]

2.2. Setting up the tests

Following the on-line documentation of the Praat software (Boersma and Weenink 2016) scripts were written for three perception tasks by running a

Multiple Forced Choice listening experiment 6 (MFC 6) where the responses are sound: a discrimination task, an identification of the features, and an identification of the meanings conveyed by those features. For each test, the stimuli were replicated three times and were totally randomised. A blank screen was presented to the participants while the sound was playing, so that they could not choose an answer before the sound was played in its entirety.

2.2.1. Test 1: discrimination of the stimuli

This test aims to determine whether the features under scrutiny will be perceived as different when presented in pairs. Those pairs are only played once and participants cannot replay them. They have to tell if the sounds played in pairs are identical or not by clicking either on the response *YES* or the response *NO*.

Table 2 below summarises the number of stimuli presented to the participants for the discrimination task according to the tested features.

For the feature prosodic contours (*i.e.* set 1), there are five different contours: low-falls, low-rises, fall-rises, rise-falls and high-rises. Since in this test either the same contour or different ones are presented in pairs to the participants there are 45 stimuli for this feature. For the feature lengths (*i.e.* set 7), there are three different lengths tested (see Table 1) and thus, 18 stimuli.

For the feature creakiness (*i.e.* set 2), we could only present to the participants sounds with absence or presence of creakiness. Therefore, the creaky "nasal grunt" is presented along with a distractor: the grunt of normal length (see Table 1) which possesses the same features as the creaky one (*i.e.* one syllable, a low-falling contour, and a normal length) but lacks the creaky feature: so that there are 9 stimuli. The strategy to re-use sounds as distractors is motivated by the fact that the study conducted by Chlébowski and Ballier (2015) is anchored in a "compositional model" and this makes it possible to re-use sounds in order to assess the robustness of the perception of a different feature. On the same basis, there are 9 stimuli for medial glottal stops and medial breathiness (*i.e.* set 3 and 4). The breathy grunt will be presented along with a distractor: the grunt used to test the feature low-fall (*i.e.* two syllables, a low-falling contour, and a normal length). For the same reasons, the grunt with a medial glottal stop will be presented along with the grunt used to test the feature low-fall.

For the feature syllabification (*i.e.* set 5), the grunt used to test the feature low-fall (*i.e.* disyllabic) is confronted to a monosyllabic grunt, so that there are 9 stimuli for this feature. Finally, we also have 9 stimuli for the feature nasal vowels *vs*. bilabial nasal consonants (*i.e.* set 6), where the grunt used to test the feature low-fall (*i.e.* disyllabic bilabial nasal consonants) is confronted to a disyllabic grunt uttered with nasal vowels.

Table 2. Number of stimuli according to the features under scrutiny for the discrimination task

Tested features	Stimuli	Number of stimuli
Prosodic contours, set 1	Low-fall Low-rise Rise-fall Fall-rise High-rise	45
Creakiness, set 2	Creaky grunt *vs.* sound used to test normal length	9
Medial glottal stops, set 3	Grunt with a medial glottal stop *vs.* sound used to test low-falls	9
Medial breathiness, set 4	Grunt with medial breathiness *vs.* sound used to test low-falls	9
Syllabification, set 5	Mono- *vs.* disyllabic grunts	9
Nasal vowels *vs.* bilabial nasal consonants, set 6	Disyllabic grunt uttered with nasal vowels *vs.* sound to test low-falls	9
Lengths, set 7	Monosyllabic grunts of three different lengths	18

2.2.2. Test 2: identification of the features

This test aims to determine whether participants can identify the features under scrutiny. Each sound is played twice and participants cannot replay them.

For the feature prosodic contours, there are five different contours and five corresponding answer buttons (*i.e.* low-fall, low-rise, fall-rise, rise-fall and high-rise), for a total of 15 stimuli. For the feature lengths, there are three different lengths tested and three corresponding answer buttons (*i.e.* short, medium, long) for a total of 9 stimuli.

There are two different sounds presented for the features creakiness, medial breathiness, medial glottal stops, for a total of 6 stimuli for each of those three sets. In those cases, the question will be of the type "*is this sound creaky?"*, and answer buttons will be *YES* and *NO*.

Finally, there are also two different sounds presented for the features syllabification and vowels *vs.* consonants, for a total of 6 stimuli in each of those two sets. Response buttons presented to the participants for the identification of these features are presented in Table 3.

Table 3. Number of stimuli and response buttons presented to the participants according to the features under scrutiny for the identification task

Tested features	Response buttons	Number of stimuli
Prosodic contours	Low-fall Low-rise Rise-fall Fall-rise High-rise	15
Creakiness	YES NO	6
Medial glottal stops	YES NO	6
Medial breathiness	YES NO	6
Syllabification	One syllable Two syllables	6
Vowels *vs.* consonants	Vowel Consonant	6
Lengths	Short Medium Long	9

2.2.3. Test 3: identification of the meanings conveyed by the features

This test is divided into three different sub-tests that present the sounds in different contextual environments and aim to determine whether: 1) participants can identify the meanings ascribed by Chlébowski and Ballier (2015) to the acoustic features of "nasal grunts"; and 2) contextual environment plays a role as to the identification of the meanings potentially conveyed by the features. The meanings ascribed by Chlébowski and Ballier (2015) have been rephrased so that participants could understand them more easily (see Table 4).

In the first sub-test, each feature is isolated from context and played twice. Participants are asked to choose the meaning they may convey. Number of stimuli for each set is the same as in test 2.

In the second sub-test, each feature is presented in a unique potentially ambiguous context provided by the author. This context is expected to be ambiguous because the utterance in (1) is not contextualised by informant 3's reaction to the "nasal grunt". Therefore, many interpretations of the features can be construed. Consequently, a randomised "nasal grunt" corresponding to Informant 2's production, and likely to be understood differently in accordance with the modulation of its acoustic features, is inserted. For instance, for set 1 (*i.e.* prosodic contours), the conversation presented in (1) will be played with a low-falling grunt, then with a low-rising grunt, with a rise-falling grunt, with a fall-rising grunt and with a high-rising grunt. For set 2 (*i.e.* creakiness) this conversation will be played with a creaky grunt and then, with a non-creaky grunt. The number of stimuli for each set is the same as in test 2.

(1)

Informant 3: And then we went to see Anna's mother
Informant 2: Where was it again?
Informant 3: It was in San Francisco
Informant 2: [“nasal grunt”$_i$]

The last sub-test presents the features into contextual environments likely to trigger the meanings ascribed by Chlébowski and Ballier (2015). Since the recordings from the PVC project (Milroy *et al.* 1997) have been performed in the field, they were too noisy to be used as stimuli. The author has written short casual conversations– a protocol “which allows for inter- speaker comparison and yields convenient data for perception tests” (Swerts and Geluykens 1994: 23). Those conversations are based on the lexical and semantic clues found in the PVC files (Milroy *et al.* 1997), which triggered the meanings ascribed by Chlébowski and Ballier (2015). Those clues are summarised and explained in Chlébowski (2015). For instance, (3) replicates the interpretation to be found in (2) from PVC 9 (Milroy *et al.* 1997). In the rewritten equivalent, the repetition of “*The Tower”* by Informant 2 and the explanation that follow are similar to that of “*Probably be”* produced and explained by Informant b in (2), and suggest that the meaning conveyed by the “nasal grunt” is that of a question, *e.g.* “*Can you repeat please?*”

(2)

<u who=”informantPvc09b”> […] or something like that and then what will you do in five years time you'll probably be </u>
<u who=”informantPvc09a”> mm </u>
<u who="informantPvc09b"> probably be <pause/> head of a firm

(PVC 9)

(3)

Informant 1: It was on St Patrick's Day and she was really drunk
Informant 2: Bet she threw up!
Informant 1: Indeed she did! In front of the Tower
Informant 2: [monosyllabic bilabial and high-rising “nasal grunt” of normal length]
Informant 1: The Tower, the bar next to Thomas' home

Consequently, several strategies were used to assign the acoustic components to a given interpretation in a given context.

To disambiguate the meaning of agreement (Chlébowski and Ballier 2015) potentially conveyed by low-falls and that of concession (Cruttenden 1981) potentially conveyed by low-rises, a unique context was invented. Whereas, for the other different prosodic contours a unique context was adapted to each of

their potential meaning, *e.g.* see (3) for high-rising tone and the meaning of question.

For creakiness, where three distinct contexts had been observed in the PVC files (Milroy *et al.*. 1997), three contexts have been invented for monosyllabic bilabial "nasal grunts" with the presence or absence of creakiness, *i.e.* those suggest that the speaker is withdrawing from conversation (Ward 2006) to correct him/herself, to look for a particular word, or to momentarily change the subject of discussion.

The interpretation of the number of syllables requires an alternation of two contexts, one in which informant 2 takes the turn, as in (4), and another one in which she leaves the floor, as in (5). This device allows to see whether the roles of speaker ascribed to monosyllabic grunts, and that of listener, ascribed to disyllabic grunts by Ward (2006) arise from the very syllabification of the grunts or from turns in conversation – an issue raised by Chlébowski (2015).

Two conversations were invented for disyllabic bilabial "nasal grunts" with the presence or absence of a medial glottal stop to verify the meaning potentially conveyed by this feature, *i.e.* these contexts suggest that the speaker is strongly negating the subject under discussion (Ward 2006), see (6) and (7). Two different conversations were needed in order to obtain a sufficient number of stimuli. The same strategy has been used for the meaning potentially conveyed by medial breathiness, *i.e.* speaker is concerned (Ward 2006),

As explained in the introduction, the final conclusion of Chlébowski and Ballier (2015) showed that the meanings they ascribed to vowels *vs.* consonants and lengths could not be verified in context, *i.e.* there were no lexical clues to support their choices (Chlébowski 2015). Therefore, two random conversations have been created to verify the meanings ascribed to vowels *vs.* consonants, *i.e.* speaker is present *vs.* speaker is processing (Chlébowski and Ballier 2015), and two other conversations for the meanings conveyed by the different lengths, *i.e.* reflex, normal production of grunt, lot of thought (Chlébowski 2015), to obtain a sufficient number of stimuli.

(4)

Informant 3: My brother and I used to go to the pub every Sunday you now, to watch football.

Informant 2: [mono- *vs.* disyllabic bilabial and low-falling "nasal grunts" of normal lengths], I remember that, my dad used to go there too

(5)

Informant 3: My brother and I used to go to the pub every Sunday you know, to watch football.

Informant 2: [di- *vs.* monosyllabic bilabial and low-falling "nasal grunts" of normal lengths]

Informant 3: We did that because we didn't have any TV at the time, TVs were expensive.

(6)

Informant 3: Paul was so condescending last night, and his sister oh my god, she was so pathetic…
Informant 2: The blond one?
Informant 3: Yes the blond one! With her black dress that was too small
Informant 2: She's not his sister…
Informant 3: Yes she is!
Informant 2: [disyllabic bilabial and low-falling "nasal grunts" of normal lengths uttered with and without a medial glottal stop] no, she is not. She's his girlfriend.

(7)

Informant 3: Remember Alyson? She was so gorgeous with her marvellous red hair.
Informant 2: [disyllabic bilabial and low-falling "nasal grunts" of normal lengths, uttered with and without a medial glottal stop] she had auburn hair.

Finally, a sixth test has been created in order to show that the right (-hand) context has an influence on the perception of the meanings conveyed by low-falls. Thus, the same sound is played, a low-falling "nasal grunt", but the right context is modified so as to trigger the three different meanings that low-falls may convey, *i.e.* agreement, disagreement, step-back (Chlébowski and Ballier 2015: 55), see (8).

(8)

Informant 1: Elisabeth is going to Australia soon. She will be with her children and all.
She'll probably take them to the zoo, see some animals…
Informant 2: [disyllabic low-falling bilabial "nasal grunt"] she will/ she won't/ I'm not sure about that

When the features are inserted into contexts likely to trigger the meanings ascribed by Chlébowski and Ballier (2015), there are 15 stimuli for prosodic contours, 18 stimuli for creakiness and lengths, 12 stimuli for medial glottal stop, medial breathiness, syllabification and nasal vowels *vs.* bilabial and nasal consonants and 9 stimuli to test the three meanings conveyed by low-falls.

Table 4 exemplifies the response buttons that were presented to the participants according to the tested features and the meanings they potentially convey. Most of the meanings ascribed by Chlébowski and Ballier (2015) to the features were rephrased. For instance, the response "*concedes interlocutor can go on*" was proposed on the screen, instead of "concession".

Table 4. Formulation of the interpretations submitted to the participants

Tested features	Tested meanings	Response buttons
Prosodic contours	Gap-filling (Brazil, *et al.* 1980) Implication (Wells 2006) Questioning (Wells 2006) Statement (Cruttenden 1981). Concession (Tench 1996)	Has grasped new info *vs.* implies something *vs.* is asking a question *vs.* agrees *vs.* concedes interlocutor can go on
Low-fall	Agreement Disagreement Step-back (Chlébowski and Ballier 2015)	Agrees vs. disagrees *vs.* doesn't know
Creakiness	The speaker is withdrawing from conversation (Ward 2006)	Need to withdraw from conversation (e.g. to correct herself, to check her mental map…) *vs.* needs not to withdraw from conversation
Medial glottal stop	The speaker is strongly negating the subject (Ward 2006)	Disagrees a lot *vs.* disagrees a little
Medial breathiness	The speaker is concerned (Ward 2006)	Is concerned by what her interlocutor says (e.g. being supportive…) *vs*. is not concerned
Syllabification	Speaker *vs*. listener positions (Ward 2006)	Wants to take the turn *vs.* doesn't want to take the turn
Nasal vowels *vs*. Bilabial and nasal consonants	The speaker is present for the interlocutor *vs.* processing (Chlébowski and Ballier 2015)	Is fully present in the discussion *vs.* is present, but thinking about something
Length	Short/reflex Long/thought and Medium/normal (Chlébowski 2015)	Is uttered as a reflex *vs.* made her think a lot vs. is normal

2.3. Participants and conditions

Four female natives of British English (BrE), aged from 18 to 22, and undergraduates at Newcastle University (UK) participated in the tests. As there were no headphones in the room, the volume was not controlled. Participants were aware of the aims of the tests; knew that conversations were recorded from AmE; were taught how to run the tests and save the results; were exposed to examples of tests before beginning the real ones; were asked to focus on the "nasal grunts"; had a break of 5 to 10 minutes between each set; had to finish the tests at home in the same conditions; and were given a book token of 10£.

3. Results and tentative explanations

This section summarises the results of the perception tests as to the discrimination of the features when presented in pairs, the identification of those features, and the identification of the meanings they convey when isolated from context, when presented in a non-influential context, and an in contexts likely to trigger the meanings ascribed by Chlébowski and Ballier (2015). An attempt at explaining those results will be presented at the end of this section.

3.1. Discrimination in pairs

Results show that participants easily discriminate whether "nasal grunts" are identical or not, when presented in pairs, i.e. the presence or absence of medial breathiness has been correctly discriminated at 100%, syllabification at 100%, prosodic contours at 97%, presence or absence of medial glottal stop at 97 %, vocalic vs. consonantal grunts at 94%, the three different lengths at 96%, and the presence or absence of creakiness at 86%.

3.2. Identification of the features

Results show that participants easily identify the targeted acoustic features of "nasal grunts" *i.e.* 92% for creakiness, 79% for the presence of medial glottal stop, 75% for medial breathiness, 72% for syllabification, 96% for nasal vowels *vs.* bilabial and nasal consonant, and 94% for the three degree of duration. However, they failed to identify prosodic contours *i.e.* low-falls, low-rises, fall-rises, rise-falls, and high rises have been recognised at only 40%.

3.3. Identification of the meanings conveyed by the acoustic features when "nasal grunts" are isolated from context, in a non-influential context, and in oriented contexts.

Table 5 below presents the results of the identification of the meanings conveyed by the acoustic features of "nasal grunts" according to their presentations, i.e. when isolated from context, when inserted in a non-influential context, and when inserted in appropriate contexts. Participants have confirmed the meanings ascribed by Chlébowski and Ballier (2015), at a rate superior to 65%, to: low-fall, high-rise, long length, fall-rise, and medial glottal stop, when grunts were in isolation; low-fall, medium length, medial glottal stop, short length, high-rise and long length when grunts were inserted in a non-influential context; high-rise, low-fall, fall-rise, rise-fall, long length and medial glottal stop when grunts were inserted in contexts likely to trigger the meanings ascribed by Chlébowski and Ballier (2015).

However, participants have ascribed other meanings than those expected by Chlébowski and Ballier (2015), at a rate superior to 40%, for: syllabification,

creakiness, low-rise, nasal vowels *vs.* bilabial and nasal consonants, rise-fall, short length, medial breathiness, and medium length when grunts were in isolation; syllabification, nasal vowels *vs.* bilabial and nasal consonants, low-rise, medial breathiness, creakiness and fall-rise when grunts were inserted in a non-influential context; syllabification, low-rise, creakiness, nasalvowels *vs.* bilabial and nasal consonants, medial breathiness, medium length, and short length when grunts were inserted in oriented contexts.

It therefore seems that whether "nasal grunts" are presented in context or in isolation does not have an influence on the identification of the meanings conveyed by the tested feature. For instance, the meaning of agreement ascribed to low-falling tone by Chlébowski and Ballier (2015) has been identified in every context.

Table 5. Participants ratings of the interpretations conveyed by the acoustic features according to the type of context (%)

	Participants confirm the ascribed meanings (> 65%, in decreasing order)	**Participants have chosen another meaning than expected (> 40%, in decreasing order)**
Isolated from context	- Low-fall, high-rise (100%) - Long length (83.3%) - Fall-rise, medial glottal stop (75%)	- Syllabification (79.2%) - Creakiness (75%) - Low-rise, nasal vowels *vs*. bilabial and nasal consonants (58.3%) - Rise-fall, short length, and medial breathiness (50%) - Medium length (41.7%)
In a non-influential context	- Low-fall (100%) - Medium length (91.7%) - Medial glottal stop, short length (75%) - High-rise, long length (66.7%)	- Syllabification (83.3%) - Nasal vowels *vs.* bilabial and nasal consonants (62.5%) - Low-rise (58.3%) - Fall-rise, medial breathiness, creakiness (50%)
In contexts likely to trigger the meanings ascribed by Chlébowski and Ballier (2015)	- High-rise (100%) - Low-fall (91.7%) - Fall-rise (83.3%) - Rise-fall, long length (75%) - Medial glottal stop (71.9%)	- Syllabification (62.5%) - Low-rise (58.3%) - Creakiness (52.8%) - Nasal vowels *vs.* bilabial and nasal consonants (52.1%) - Medial breathiness, medium length (50%) - Short length (41.7%)

As for the several meanings that can be conveyed by low-falls, *i.e.* agreement, disagreement and step-back (Chlébowski and Ballier 2015: 55), and in contexts that are likely to trigger those meanings, the meaning close to *yes* has been confirmed at 100% by the participants; the meaning close to *no* at 91.7%; and

the meaning close to *I don't know* at only 50%, along with the meaning close to *no*.

3.4. Tentative explanations

Participants did not ascribe the meaning of concession to low-rising tone in every type of context (see Table 1), instead, they chose that of agreement (see Figure 1, 2, and 3 below), one of the ambiguities that was raised by the work of Chlébowski and Ballier (2015). Therefore, the distinction between agreement (*I agree that*) and concession *(you are right, you can go on talking)* was not made by the participants. Still, the distinction remains difficult to capture.

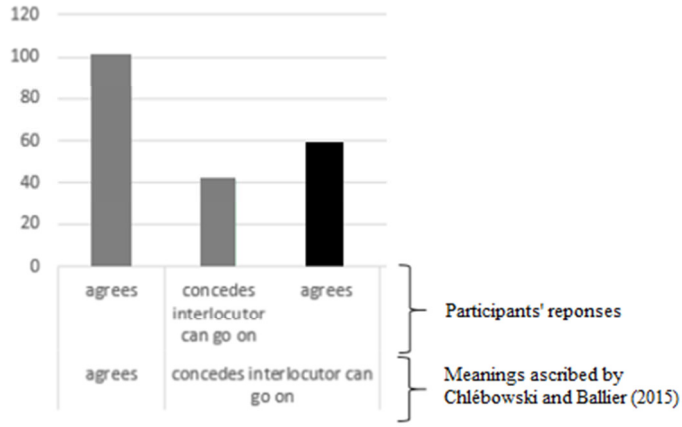

Figure 1. Diagram of mismatches between participants' responses and expected meanings for low-falling tone and low-rising tone in isolation

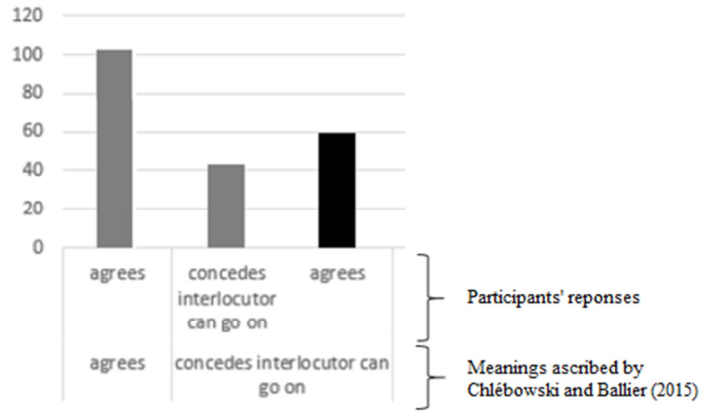

Figure 2. Diagram of mismatches between participants' responses and expected meanings for low-falling tone and low-rising tone when inserted in a non-influential context

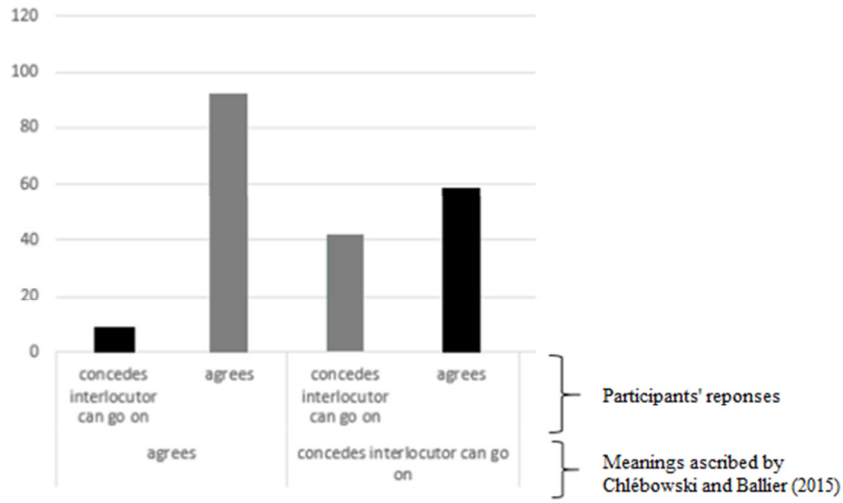

Figure 3. Diagram of mismatches between participants' responses and expected meanings for low-falling tone and low-rising tone when inserted in oriented context

As to the reasons why participants did not ascribe the meaning of *I don't know* that was expected for a low-falling tone in a specific context, it might be due to the formulation of this very context: "*[low-fall] I'm not sure about that",* see (5). In fact, this sentence can either be rephrased as *No, I'm not sure about that,* or *I don't know, I'm not sure about that*. Therefore, the identification of *disagreement* in this context could be justified.

For syllabification, it seems that context has influenced participants. In (3), informant 2 keeps the turn, and in (4) she leaves it. Participants have said that the speaker wishes to take the turn when mono- and disyllabic grunts were in position of (3), and that she wanted to stay in the second channel when both grunts were inserted as in (4). Therefore, meanings here depend on the conversation turns rather than on the features under discussion, *i.e.* syllabification.

4. Conclusion and discussion

Participants have successfully discriminated and identified each acoustic feature – except for the identification of prosodic contours. Moreover, it seems that context has no real influence on the attitudinal meanings conveyed by the features – except for the specification of low-falling tones, and syllabification.

Beyond the types of context, and although the acoustic features of "nasal grunts" perceptually tested in the present paper have been analysed from Geordie English, performed by AE speakers and judged by BrE speakers, participants have confirmed the meanings ascribed to prosodic contours (except that ascribed to low-rising tones), medial glottal stops, and lengths by

Chlébowski and Ballier (2015). Yet, they have chosen unexpected meanings for creakiness, medial breathiness, syllabification, vowels *vs.* consonants and low-rises. These results may suggest the possibility of a perceptual hierarchy of the acoustic features of "nasal grunts" that are likely to be interpreted. For perception, some features might be more robust than others, hence this hypothesis of a hierarchy of perceptual clues.

Mismatches between participants' responses and the meanings ascribed by Chlébowski and Ballier (2015) to half of the features may discredit these authors' intuitions on the semantics of those acoustic features, or this may be due to the fact that some differences in meaning may be too subtle to be rephrased in a simple MCQ setting. It may also well be the case that people never take time to step back and think about the spontaneous non-lexical conversational sounds they produce, and even less about decomposing them into segmental and suprasegmental features. Nonetheless, this paper remains a preliminary investigation of the perception of the meanings conveyed by the acoustic components of "nasal grunts", and therefore, more participants are needed to truly confirm the present results.

Finally, since "nasal grunts" are not consciously produced most of the time, it should be interesting to set-up production tests. Indeed, in a study conducted by Tateishi (2013) on the perception and production of /l/ and /r/ by Japanese, it was found that participants could produce these two different phonemes, but they failed to perceive this distinction.

References

Allen, W., Beal, J., Corrigan, K., Maguire, W., and H. Moisl. 2007. *A linguistic "time-capsule": the Newcastle Electronic Corpus of Tyneside English. Creating and Digitizing Language Corpora.* New York/Basingstoke, Hampshire: Palgrave-Macmillan, 2. Available from: http://research.ncl.ac.uk/necte/index.htm. [Accessed on: 28 April 2016]

Blau, E. K. 1991. *More on Comprehensible Input: The Effect of Pauses and Hesitation Markers on Listening Comprehension*. US Department of Education, University of Puerto Rico, Report-Research.

Boersma, P. and D. Weenink. 2009. *Praat*. [Online]. Available from: http://www.fon.hum.uva.nl/praat/. [Accessed on: 28 April 2016]

Boersma, P. and D. Weenink. 2016. *Multiple Forced Choice listening experiment 6. Responses are sounds. Praat documentation*, University of Amsterdam. Available from: http://www.fon.hum.uva.nl/praat/manual/ExperimentMFC_6__Responses_are_sounds.html. [Accessed on: 28 April 2016]

Brazil, D., Coulthard, M., Johns, C., and C. Johns, C. 1980. *Discourse intonation and language teaching*. London: Longman.

Cenoz, J. 1998. *Pauses and Communication Strategies in Second Language Speech*. US Department of Education, University of the Basque country, Report-Research.

Chlébowski, A. 2015. "Nasal grunts" in the NECTE corpus, an experimental investigation. Unpublished MA thesis. Université Paris VII, Denis Diderot, France.

Chlébowski, A. and N. Ballier. 2015. *"Nasal grunts" in the NECTE corpus – Meaningful interactional sounds.* EPIP Proceedings: 54-58

Corley, M. and O. W. Stewart. 2008. Hesitation disfluencies in spontaneous speech: The meaning of um. Language and Linguistics Compass 2 (4), 589-602

Cruttenden, A. 1981. Falls and rises: meanings and universals. Journal of Linguistics 17, 77–91.

Crystal, D. 1975. *The English Tone of Voice*. London: Edward Ad Arnold.

Milroy, J., Milroy, L. and G. Docherty. 1997. *Phonological variation and change in contemporary spoken British English. Economic and Social Research Council*. Available from: http://research.ncl.ac.uk/necte/index.htm. [Accessed on: 28 April 2016]

Schröder, M., Heylen, D. K. J. and I. Poggi. 2006. Perception of non-verbal emotional listener feedback. In R. Hoffmann and H. Mixdorff (eds.), *Speech Prosody*, 1-4. TUDpress Verlag der Wissenschaften Dresden.

Snow, D. and H. L. Balog. 2002. Do children produce the melody before the words? A review of developmental intonation research. Lingua 122 (12), 1025-1058

Swerts, M. and R. Geluykens. 1994. Prosody as a marker of information flow in spoken discourse. Language and speech 37(1), 21-43.

Tateishi, M. 2013. Effects of the Use of Ultrasound in Production Training on the Perception of English/r/and/l/by Native Japanese Speakers. Doctoral dissertation. University of Calgary

Team, A. 2012. Audacity. Audio editor and recorder. Available from: http://www.audacityteam.org/. [Accessed on: 28 April 2016]

Tench, P. 1996. *The intonation systems of Englis*h. London: Cassel.

Ward, N. G. 2000. Issues in the transcription of English conversational grunts. First (ACL) SIGdial Workshop on Discourse and Dialogue, 29-35.

Ward, N. G. 2006. Non-lexical conversational sounds in American English. *Pragmatics and Cognition* 14 (1), 129-182. Available from: http://digitalcommons.utep.edu/cs_techrep/307. [Accessed on: 28 April 2016]

Wells, J.C. 2006. *English Intonation: An Introduction*. Cambridge: Cambridge University Press.