

What the /fʌk/? An acoustic-pragmatic analysis of implicated meaning in a scene from *The Wire*

Erica Gold and Dan McIntyre
University of Huddersfield

1.0 Introduction

At the heart of pragmatic theory is the notion that what speakers mean goes beyond the semantic content of their utterances. However, one problem for mainstream pragmatic theories of implicated meaning is that they rarely take enough account of the phonetic aspects of utterances. Grice himself acknowledges that ‘tone of voice’ (1975: 53) may be important in determining the pragmatic meaning of an utterance, but arguably underplays its significance. So too do most neo-Gricean accounts. What we argue in this chapter is that theories of implicated meaning can be augmented significantly by proper consideration of the phonetic qualities of utterances. Specifically, we argue that acoustic phenomena, which are amenable to objective description and analysis, play a key role in pragmatic interpretation, and that taking account of them can enhance traditional pragmatic analysis. We demonstrate this through a case study of a scene from the acclaimed TV drama, *The Wire*.

One possible reason why pragmatics has failed to take sufficient account of the phonetic aspects of utterances is that most pragmatic analyses are of written texts rather than naturally-occurring speech. That is, in most cases, the object of study for pragmaticians is either an orthographic transcript of speech or an invented written example. This focus on written language is certainly the case when it comes to the pragmatic analysis of literature (see, for example, the constituent chapters of Chapman and Clark 2014), for the obvious reason that literature prototypically exists in written form. But performance is a key aspect of much contemporary drama so one might reasonably ask why pragmatic analyses of plays or films rarely consider the phonetic level of language. The reason for this is methodological. In the 1980s, pragmatics transformed the stylistic study of dramatic texts by offering a principled means of analysing the interpersonal relationships between characters (see, for example, the pioneering work of Burton 1980, Short 1981 and Bennison 1993). However, the focus was very much on the text rather than performance since, as Short (1981) points out, texts are stable to an extent that performances are not. That is, each performance of a play is likely to vary, if only slightly, from those that precede it. The text, on the other hand, remains unchanged, meaning that stylistic analyses of a play text (which may result in varied interpretations of that text) are open to falsification in a way that stylistic analyses of ephemeral performances are not. For this reason, most stylisticians of drama focus on the analysis of text rather than performance (a notable exception is Furlong 2014, who recognises the interpretative importance of performance but does not, in our view, address the methodological conundrum that Short 1981 raises).

The methodological clarity of Short’s (1981) position, however, can be called into question in the case of films, which do constitute stable objects of study since they are not ephemeral like theatre performances. This opens up the possibility of studying dramatic performance using stylistic methods (see, for example, Simpson and Montgomery 1995, McIntyre 2008 and Piazza 2011), and of using a particular dramatic performance as a test case for demonstrating the value of supplementing pragmatic analysis with acoustic methods. Additionally, what we argue in this chapter is that there are cases when it is fundamentally necessary for pragmatic-stylistic analysis of a dramatic text to be augmented by analysis of aspects of performance. These are cases where a text analysis alone cannot fully reveal the pragmatic meaning (i.e. the

additional propositional content not literally stated) that utterances in the text can give rise to. A case in point is the text that underpins the performance we analyse in this chapter. This is a scene from season 1 of HBO's critically-acclaimed crime drama, *The Wire*¹. Detectives Jimmy McNulty and William 'Bunk' Moreland are investigating old homicide cases, including the murder of a young woman shot dead in her apartment. McNulty and Moreland visit the scene of the crime to try and figure out exactly how the woman was killed. What makes the scene unusual dramatically is that, engrossed in their investigation, the two detectives communicate other using only the word *fuck* and its variants (e.g. *motherfucker*, *fuckity fuck*, etc.). Sometimes they are clearly talking to each other; sometimes it would appear that they are simply thinking out loud. And sometimes there is a degree of uncertainty about the communicative status of their utterances. Nonetheless, somehow, using only this limited vocabulary, McNulty and Moreland are able to express a wide variety of emotions, ranging from disbelief to frustration to realisation. Moreover, in so doing they convey to the viewer unstated propositional content, as well as the general implicature that theirs is a very close working relationship and that both are highly competent detectives.

Our consideration of the phonetic aspects of dramatic performance fits the recent agenda within stylistics of aiming to take more account of the multimodal nature of texts. However, while advances have been made in the study of non-linguistic aspects of textual meaning, such as typography and visual design generally (see, for instance, Kress and van Leeuwen 2006 and Nørgaard 2009), the multimodality of drama remains under-researched. Indeed, multimodal stylistics rarely takes account of phonetics and in those instances where it does, it tends to concentrate on suprasegmental aspects such as intonation or rhythm. A similar situation exists in phonetic-pragmatic analyses of naturally-occurring speech (see, for example, Ogden 2006), where the segmental aspects of speech are typically ignored.

Our aims in this chapter are (i) to demonstrate the value of acoustic phonetics to the analysis of dramatic performance, (ii) to show how acoustic phonetics can augment pragmatic-stylistic analysis in accounting for the creation of meaning, and (iii) by so doing, to fill a gap in the current pragmatics literature with regard to the importance of phonetics to pragmatic interpretation. We begin by identifying some limitations of pragmatic approaches to implicated meaning, and then move on to outline the methods we employed in our analysis of the scene from *The Wire*. We then present the results of our acoustic analysis before moving on to consider the implications of this for explaining how listeners are likely to infer meaning from the character dialogue in the scene in question. Finally, we consider the implications of our analysis for pragmatic theories of implicature, as well as related applications for our research.

2.0 Implicated meaning

The scene from *The Wire* includes prime examples of meaning being implicated. That is, in their verbal and non-verbal responses to each other, the characters Moreland and McNulty clearly understand each other to be conveying meaning beyond simple expletives. Consequently, we might initially look to Gricean (Grice 1975) and neo-Gricean theory (e.g. Levinson 2000, Horn 2004) to provide insights into how such conversational implicatures are being conveyed. However, applying these approaches in isolation to pragmatic meaning turns out to be of limited value for the scene in question. Consider this exchange:

¹ *The Wire* was first broadcast between 2002 and 2008 on the US cable network HBO. The scene that we analyse in this chapter is from episode 4 of season 1 and is available on YouTube at <http://tinyurl.com/cdzkfof>

[Context: Moreland and McNulty are looking at a photograph of the murder victim which shows the extent of her injuries.]

Moreland Aw fuck.
McNulty Motherfucker.

Moreland's utterance would seem to express revulsion while McNulty's might be interpreted as an expression of his outrage towards the murderer. In this respect, at the level of what is said, both utterances flout the Gricean maxim of manner (neither character is expressing themselves as clearly as they might) and quantity (neither character is being as informative as is required for the hearer to be confident about their intended meaning). However, it is not clear what is to stop us from deriving implicatures to the effect that, say, Moreland is frustrated at being given this particular assignment and McNulty is angry at Moreland. This is also the case at other points in the dialogue when the characters use the same lexical item (*fuck*) and pragmatic strategy (flouting the maxim of manner) to convey different implicatures, as in the following example:

[Context: Moreland is laying out photographs of the victim on the apartment floor.]

Moreland Fuck.

The issue here is not the indeterminacy of implicature, which is acknowledged by Grice (1975: 40), but the problem of calculating the particularized conversational implicature that arises in each case. According to Grice, it should be possible at least in principle to calculate the steps by which an implicature is derived from what is said. Indeterminacy is a component of the Co-operative Principle (Grice 1975: 40), though as Clark (2013: 162) points out, Grice 'tended to assume far less indeterminacy than would be recognised by most current pragmatic theories with regard to both what is said and what is implicated.' Haugh (2014: 122) makes the further point that indeterminacy and the interpretative issues associated with it have not been adequately discussed in subsequent accounts of implicature. One of the central problems is the question of whether the fact that implicatures can be indeterminate calls into question the inherent calculability of individual implicatures.

Horn's (2004) attempt to rationalise Grice (1975) allows us to explain the characters' linguistic behaviour more clearly though still does not account for the differences in implicature being produced. For instance, in the case of the second example, in line with Horn's (2004) R-Principle ('Say no more than you have to'), Moreland is indicating that 'Fuck' is as much as he needs to say, and therefore that the hearer is licensed to fill in richer meaning, in line with reasonable expectations in context. The issue though is still with how those reasonable expectations are licensed.

What we argue in this chapter is that paying attention to the acoustic properties of speech can provide an insight into the calculability of implicatures, thereby addressing the issue of indeterminacy. The questions related to these issues, that we aim to answer in our analysis, are:

1. Given the indeterminacy of implicature, how do we calculate the particularised conversational implicatures that arise from Moreland and McNulty's utterances?

2. How do we identify the various potential meanings of the expletive *fuck* and its variants?

What would seem to be the case in our example from *The Wire* is that performance is to some extent dictating meaning. This points to the importance of a broader intradisciplinary approach to the analysis of pragmatic meaning than is often taken, specifically one which takes account of the phonetic features of the utterance in question. Pragmatic approaches that do not consider phonetics may still be intradisciplinary, of course; consider, for example, the use of analytical frameworks from stylistics in pragmatic analyses. Our point is that such intradisciplinaryity needs to be broadened to include analytical insights from phonetics. The importance of this is increasingly being recognised in pragmatics. In their analysis of the functional effects of impoliteness in discourse, for instance, Culpeper et al. (2003) demonstrate the important role of prosody (i.e. intonation, loudness, speed and voice quality) in impolite exchanges, showing, for example that the force of a speech act is related to its pitch contour. Their study, though, concentrates entirely on suprasegmental features. By contrast, research that examines the segmental features of speech often stops short of examining the pragmatic significance of these. Gobl and Ní Chasaide (2003), for instance, report on a study of how voice quality can impact on the communication of emotion, mood and attitude, though the pragmatic significance of these emotions is left unexplored. Watt et al. (2013) make the connection between acoustics and pragmatics by investigating what they call ‘the phonetics of threat’, though they do not investigate the acoustic properties of the phonetic cues they identify. Instead, they test the extent to which listeners are able to assign threat ratings to an innocuously worded statement (such as ‘I know where you live’) uttered in four different languages. Despite its lack of focus on the specific acoustic properties of threats, Watt et al.’s (2013) study shares with ours the aim of integrating acoustic and pragmatic analysis; Watt et al. essentially propose that the phonetic values that listeners ascribe to the act of threatening increase our ability to identify cases in which an otherwise innocuous statement might plausibly generate a threatening implicature.

What Culpeper et al.’s (2003) and Watt et al.’s (2013) studies show is that identifying pragmatic functions of speech can be improved substantially by drawing on insights from phonetics. Our focus in the next section is on what acoustic phonetics particularly can contribute to a pragmatic account of the variable meanings of iterations of *fuck* in the scene from *The Wire*.

3.0 Combining pragmatic and acoustic analytical methods

Given the intradisciplinary nature of this research, the methodology is divided into three parts. The first section (3.1) details the pragmatic analysis undertaken, while the second section (3.2) presents the acoustic-phonetic methodology employed to measure *fuck* productions. Finally, in order to bring both analyses together, the statistics used to assess the relationship between production and meaning are explained (3.3).

3.1 Pragmatic analysis

We began by developing a categorisation scheme for recording the various functions of the *fuck* productions in the scene. (We should be clear that the phonetic realisations of the *fuck* variants are, of course, the result of choices on the part of the actors portraying the characters). To do this we drew on corpus-based and discourse analytic research into uses of the word *fuck*. In this respect, our pragmatic analysis in this section derives

from quantitative and qualitative accounts of usage rather than (neo-)Gricean accounts of implicature.

The most comprehensive study of *fuck* is that by McEnery and Xiao (2004), who examine its usage in the British National Corpus of 100m words of English from the 1990s. They focus on how the non-linguistic variables of age, gender, social class, education, domain, speech, writing, level and reception influence people's use of the word *fuck*, demonstrating, for instance, that the people who swear most are those from the lower and higher socio-economic classes. The importance of McEnery and Xiao's (2004) study for our research lies in the classification scheme they propose based on their observations of the functions of *fuck* in their data. They observe nine different uses for the word. In their data it occurs as a general expletive (e.g. *Oh fuck!*) and a cursing expletive (e.g. *You fuck!*). It can have destinational usage (e.g. *fuck off*) or be used literally (e.g. *He fucked her*). It can be used as an emphatic intensifier (e.g. *fucking great!*) or can act as a pronominal (e.g. *fat as fuck*). And it can occur in a set phrase such as *fuck all*. (McEnery and Xiao's ninth category is a catch-all group for when there is insufficient context to classify the use as belonging to one of the previous eight categories).

This interest in function is also shared by Murphy (2009). In her study of the lemma *fuck* in spoken Irish English she finds that *fucking* is the dominant form in her corpus and that it 'adds force to the emotion being communicated and also communicates a certain attitude, which can be both positive and negative' (Murphy 2009: 46). What is difficult to work out, however, is how hearers are able to determine whether *fuck* is being used positively or negatively (this again points to the necessity of phonetic analysis). Daly et al. (2004) approach this issue by studying the contextual function of expletives in face threatening acts among workers in a New Zealand soap factory. They note that one particular function of *fuck* is as a positive politeness strategy for the expression of solidarity between co-workers.

These studies indicate the range of pragmatic functions that *fuck* has and its capacity to express a wide variety of attitudes and emotions, as well as a range of propositional meanings. Our next step was to synthesise the classification systems outlined in McEnery and Xiao (2004) and Murphy (2009) in order to generate a manageable system for initially categorising the *fuck* productions in the scene from *The Wire*. Our purpose in developing a categorisation system (as opposed to relying solely on our intuitive responses to the scene) was in order to generate a limited set of non-linguistic variables that would allow us to test for relationships between these and the acoustic measurements of the *fuck* variants. An intuitive, free-response to the text would not have enabled us to carry out the kind of controlled experiment that we describe below. It would, of course, be possible in future work to assess the robustness of the categories we developed by testing these against the intuitions of other readers/viewers.

Since Murphy's (2009) system does not capture the broad range of functions identified by McEnery and Xiao (2004), and McEnery and Xiao's system was too wide-ranging for the limited amount of data we had, we took the decision to produce a refined categorisation system rather than simply adopt an existing scheme. By subsuming some of McEnery and Xiao's (2004) categories, and by integrating Daly et al.'s (2004) and Murphy's (2009) insights into the face-threatening function of *fuck*, we developed five categories. These are as follows (each category is followed by an example from the scene we analyse):

1. *Disbelief*: i.e. inability to accept the facts/situation. [Context: Detective examines bullet found embedded in a fridge door; disbelief inferable via number of investigative dead ends before finally hitting on answer] *Fuck me*
2. *Insult*: intention to damage positive face. [Context: Detective examines photos of dead woman and insults killer; insult inferable as a result of previous speaker's utterance and impossibility that utterance could refer to victim] *Motherfucker*
3. *Functional*: used to modify the following word or to express pain. [Context: Detective hurts thumb on tape measure] *Fuck*
4. *Surprise/realization*: [Context: Detective grasps what direction of travel the bullet must have followed; surprise inferable as a result of gaze direction and camera close-ups] *Motherfuck*
5. *Idiomatic*: i.e. fixed phrase. [Context: Detective identifies location of bullet] *Fuckin A*

Having developed this scheme, we then independently assigned each of the *fuck* productions in the scene to one of these categories. The above exemplars of the categories make clear some of the contextual cues that we were responding to (e.g. the effects of camera angles). In effect, this was an exercise in trying to identify possible triggers for calculating implicatures, before going on to test whether the acoustic properties of *fuck* productions are also likely to have a bearing on categorisation. It is important to note at this stage that the purpose of assigning productions to categories was in order to later test whether there was any relationship between the categorisation of the *fucks* and our acoustic measurements of vowel duration. In assigning productions to categories we were not at this stage claiming that the categories themselves necessarily provided the most accurate means of classifying our data. Indeed, on the basis of our statistical analysis, we claim that the above categorisation system could be refined in response to the way our data clusters. Having categorised the data according to perceived function, we then moved on to the acoustic phase of the analysis.

3.2 Acoustic analysis

The entire conversation/scene between Moreland and McNulty lasts around three minutes, and this investigation uses all the audio data available in the scene. To start, the speech was transcribed orthographically in a TextGrid using Praat (Boersma and Weenink, 2016). Utterances were then attributed to each of the detectives in separate tiers of the TextGrid using the audio as well as visual signal. There were a total of 37 *fuck* productions (i.e. variations of *fuck*), and they were produced evenly between the characters. Detective Moreland had 18 *fuck* iterations, while Detective Jimmy McNulty produced 19. The counts of *fuck* variations for both detectives can be found below in Table 1.

Table 1: Number of token productions per variant in *The Wire* scene

Fuck Variant	Number of Productions
fuck ²	29
fucker	1
fuckin	1
fucking	1
fuckity	1
motherfuck	2
motherfucker	2

As shown in Table 1 above, there were a range of *fuck* variants produced in the scene. This resulted in variations of phonetic segments present across the productions. However, all 37 productions shared two common phonetic segments: /f ʌ/. These are the first two sounds of *fuck* <fu>. We decided only to analyse only the vowel /ʌ/, as in the word <strut> or <duck>, as it was acoustically difficult to delimit the boundaries for all the /f/ productions given background noise and the recording quality.

Every vowel was segmented in a single tier of a TextGrid in Praat. Average midpoint measurements were taken for F1~F3 as well as the duration of each vowel. The beginning of the vowel was marked as the onset of periodicity measured at the zero-crossing, and the end of the vowel was marked at the zero-crossing for the final periodic cycle. The analysis did not include fundamental frequency measurements as a large portion of tokens were very short in duration and did not include enough measureable glottal pulses. All formant measurements and durations were then extracted and analysed in Excel.

In addition to the raw data being extracted, differences in the physical dimensions of Moreland’s and McNulty’s vocal tracts were accounted for through vowel normalization. This was done for statistical purposes, so that differences in vocal tract shape would not influence the results. F1 and F2 were normalized across tokens in NORM using a script implementation (Thomas and Kendall, 2007) of Nearey’s (1977) intrinsic vowel normalization technique which uses the F3 values from each speaker. Vowel duration, however, was not normalized across the two speakers and was instead kept in its raw form.

3.3 Statistical analysis

After the acoustic and pragmatic data were collected, statistical testing was undertaken to consider any relationships that might exist between the acoustic measurements (how something was said) and the pragmatic classification (what was meant). A Multinomial Logistic Regression was run in *R* (using the ‘nnet’ package; Ripley and Venables 2016) for the normalized F1 and F2 data along with vowel duration against the pragmatic classifications. Multinomial Logistic Regression was chosen as the data set consisted of a discrete dependent variable (pragmatic categories) and we wanted to see if these pragmatic classifications could be explained by any of the continuous, independent acoustic variables (F1, F2, or duration).

² Four tokens were included in this category that did not have stop closures following the vowels present in the acoustic spectrogram.

4.0 Results

The following sections provide the results of the analysis. Like the methodology, the results are divided into three sections: the pragmatic and acoustic results, followed by the statistical results for the two analyses in combination.

4.1 Pragmatic results

The outcome of our classification exercise was as follows:

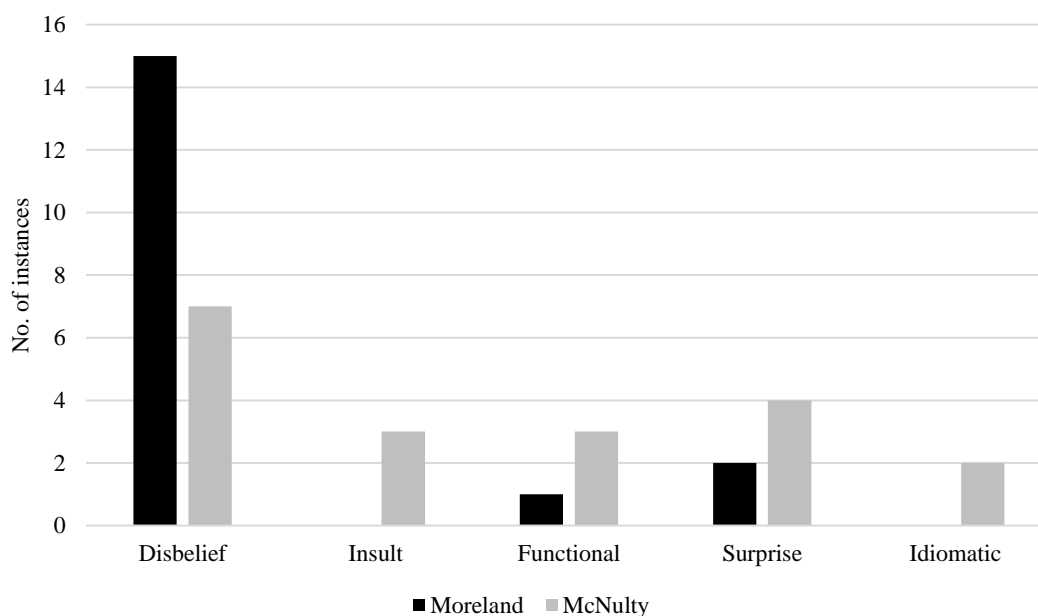


Figure 1: Types of fuck productions across speakers

As indicated in Figure 1, our intuitive reactions to the scene were that the most common function of the *fuck* productions was to express disbelief. The second most common function was the expression of surprise/realisation, though one of the issues we encountered with our classification system is the degree of potential overlap between categories. Disbelief, for instance, can be difficult to distinguish from surprise, and it was in the attributing of productions to these two categories that we found we disagreed with each other most.

4.2 Acoustic results

This section provides an overview of the acoustic measurements for all 37 tokens. For clarity, the formant results have been separated from the duration results, with formant results presented first followed by duration.

4.2.1 Formant results

Table 2 below provides a breakdown of the acoustic measurements of interest (F1, F2, and duration) by speaker.

Table 2: Summary of vowel formants for both speakers

Speaker	F1 Range (Hz)	F1 Mean (Hz)	F2 Range (Hz)	F2 Mean (Hz)
Moreland	510.1 - 806.0	607.0	1088.8 - 1415.2	1262.2
McNulty	457.7 - 818.3	651.4	1126.9 - 1451.7	1216.2

Table 2 above shows that the majority of the vowels for each speaker overlap in vowel quality (in terms of F1 and F2). This is an indication that even before normalizing the vowels (to account for individual vocal tract differences) vowel quality may not be significantly contributing to a change in functional classification. If the vowel quality was to deviate significantly for *fuck*, then the production would no longer sound like the expected production of *fuck* – i.e. /fʌk/. For example, if the F1s were to increase we might hear some tokens more like /fak/, which contains the vowel like in <father>. Alternatively, if the F2 were to increase dramatically, we may end up with a production like /fek/, which contains the vowel like in <dress>. However, the formant measurements do not appear to present these more deviant productions of the intended /ʌ/.

Figure 2 below further illustrates the clustering and overlap of tokens produced by both speakers.

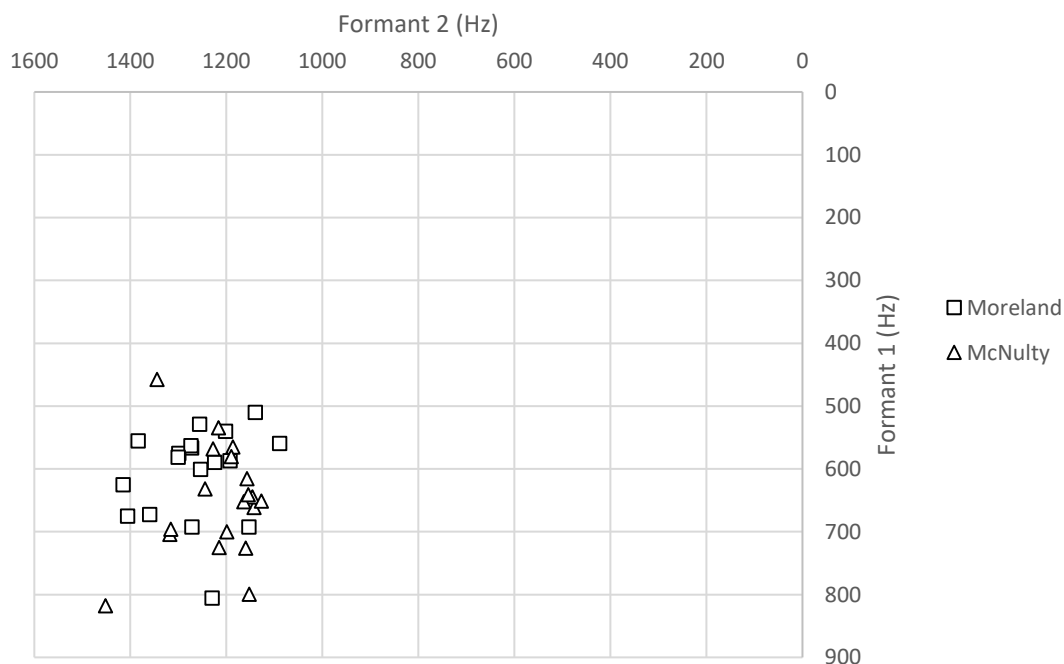


Figure 2: Vowel formant plot of F1 and F2 values of /ʌ/ for both speakers

Figure 2 above provides a visual illustration of the vowel quality produced across both speakers for /ʌ/. Although the vowels are all clustered relatively together, Detective Moreland has a tendency to produce a slightly higher and more fronted /ʌ/ than Detective McNulty. However, again, neither speaker shows obvious visual clustering of individual tokens, which would indicate that vowel quality in /ʌ/ was in some way related to meaning.

We can consider this in more detail by looking at a single speaker as an example, and highlighting all the tokens for a single functional classification to see whether they cluster either in terms of their F1, F2, or both.

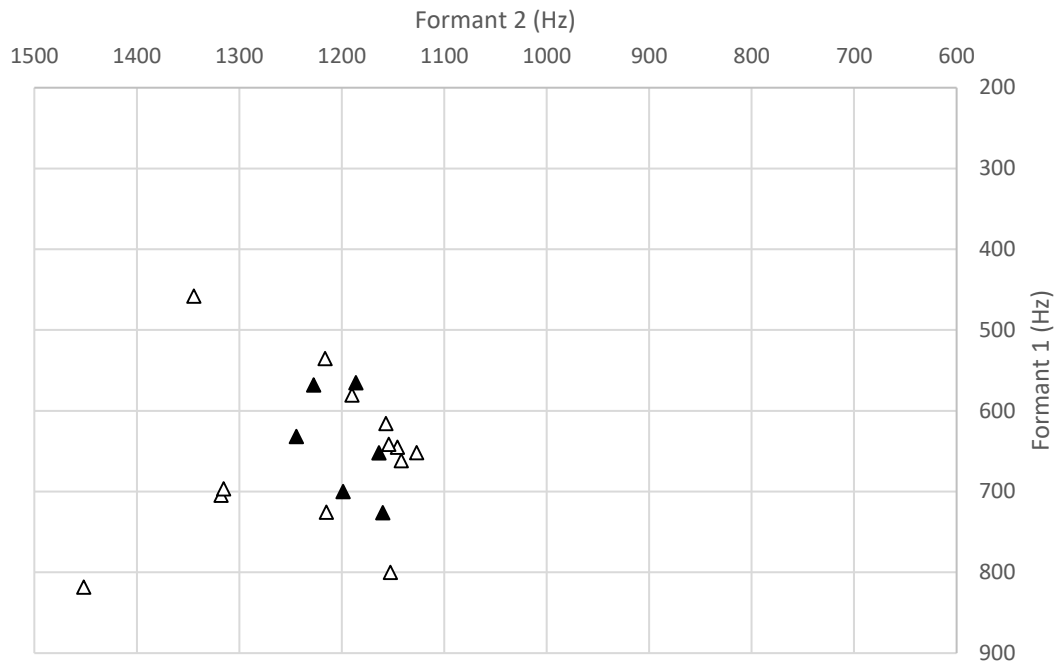


Figure 3: Vowel formant plot of F1 and F2 values of /ʌ/ for Detective McNulty

Figure 3 above is similar to Figure 2, however, it only contains the tokens produced by a single speaker, Detective McNulty. Five triangles are solid black and represent all of Detective McNulty’s tokens classified as ‘disbelief’. To argue that vowel quality and categorical meanings of the work *fuck* are related, we would expect to see very similar F1s and F2s measurements that were not shared by the *fuck* tokens in the other four pragmatic categories. Given the data presented in Figure 3, the tokens are restricted to a certain region of the vowel plot; however, there are a number of additional tokens that are also amongst the spread of ‘disbelief’ tokens. Therefore, in this example of ‘disbelief’ in Detective McNulty, the raw data does not appear to suggest a relationship between pragmatic function and vowel quality. This will be checked again, statistically, for all pragmatic categories in Section 4.3 below.

4.2.2 Duration Results

Table 3 below provides an overview of vowel durations across all 37 tokens, including the range in durations produced as well as the mean duration for each of the speakers.

Table 3: Summary of vowel durations for both speakers

Speaker	Duration Range (sec)	Mean Duration (sec)
Moreland	0.150 - 0.348	0.168
McNulty	0.030 - 0.182	0.093

As reported in Table 3, Detective Moreland has a longer mean vowel duration across the tokens he produced, while Detective McNulty has a lower mean duration and small

duration range. Box plots have been produced for duration across the five pragmatic categories, and are presented in Figure 4 below.

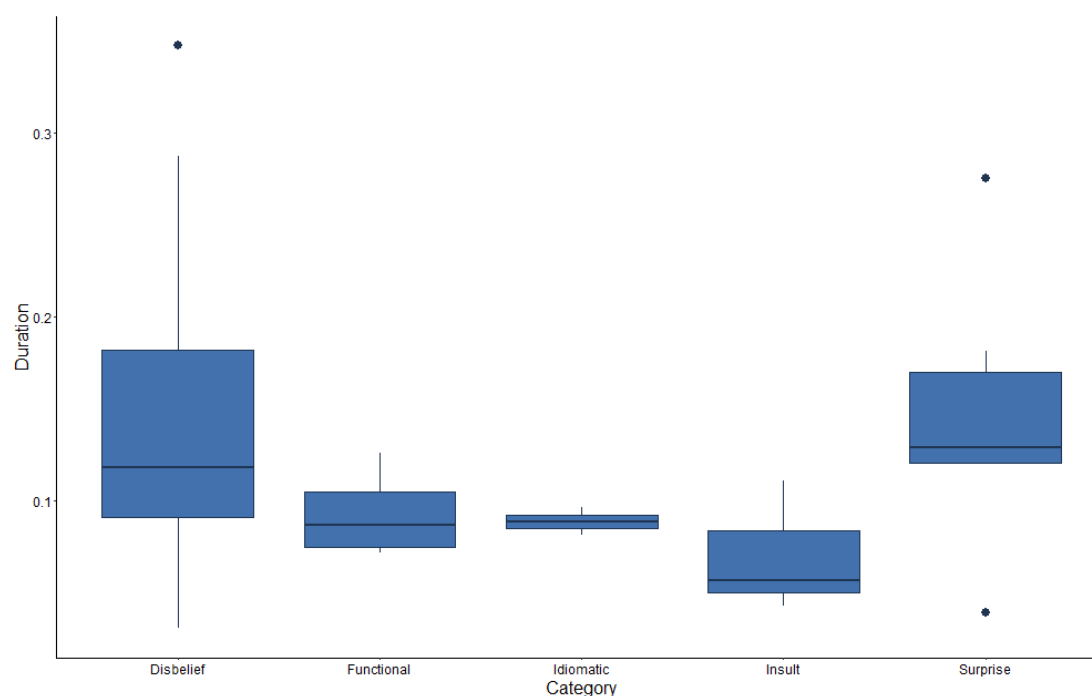


Figure 4: Box plot of /ʌ/ durations by pragmatic category for both speakers

The box plots presented in Figure 4 above place the five pragmatic categories (as defined in Section 3.1) on the x-axis. The y-axis represents the duration (in seconds) of /ʌ/ tokens. Unlike vowel formants, Figure 3 suggests that pragmatic function may be explained by vowel duration. The ‘disbelief’ and ‘surprise’ categories contain the tokens with the longest vowel durations as well as the longest median vowel duration. The ‘functional’, ‘idiomatic’, and ‘insult’ categories have the shortest median vowel durations. There are, however, a few tokens from the ‘disbelief’ and a single token from ‘surprise’ that also have shorter vowel durations. Despite these tokens, the overall trend is for *fuck* productions indicating ‘disbelief’ or ‘surprise’ to contain longer vowel durations, while ‘functional’, ‘idiomatic’, and ‘insult’ related *fucks* contain shorter vowel productions.

During the pragmatic analysis (see Section 3.1), the assignment of individual tokens to either the ‘disbelief’ and ‘surprise’ categories was challenging. Though possible to force a decision, the boundary between two such functional categories is not so clear. It is perhaps more appropriate to collapse ‘disbelief’ and ‘surprise’ into a single, more unifying category, such as an ‘unexpected’, simply defined as a production that comes as a result of something unexpected. Such a category would include both disbelief and surprise as they are semantically related to unexpectedness (by virtue of their being hyponyms). It can equally be argued that the three remaining categories – ‘functional’, ‘idiomatic’, and ‘insult’ – are more appropriately grouped into a single pragmatic category of ‘intended’. These three categories are typically produced in an *intended* way such that they serve a purpose in an utterance, that is to modify another word, form part of an idiom or used to threaten positive or negative face (given more data, it would be possible, of course, to separate out these functions into distinct categories). For these reasons, a box plot is presented of the two newly created categories in Figure 5 below.

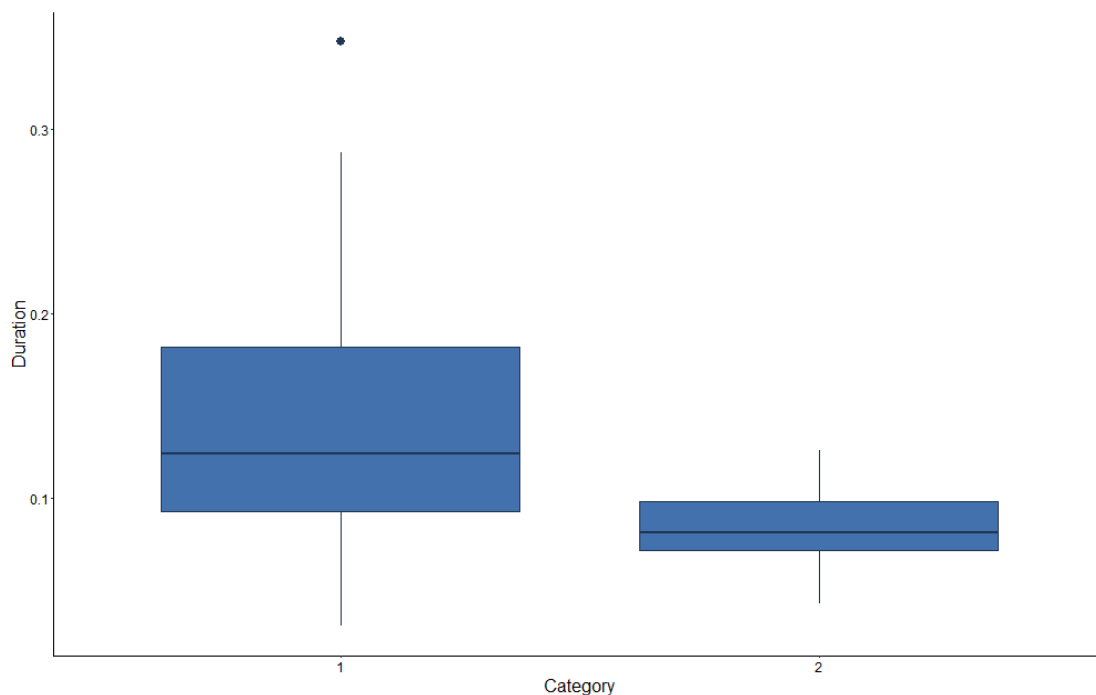


Figure 5: Box plot of /ʌ/ durations across speakers, broken into two pragmatic categories (1) unexpected and (2) intended

The newly categorized box plot presented in Figure 5 illustrates a much more pronounced divide between longer durations being associated with the ‘unexpected’ category and the short vowel durations being associated with the ‘intended’ classifications. These results are examined statistically in the following section.

4.3 Statistical results

This section presents the results of a Multinomial Logistic Regression using the five original pragmatic categories as the dependent variables and vowel formants and duration as the independent variables. As stated in Section 3.2, both formant 1 and 2 were normalized for statistical analysis, and the normalized formant data and non-normalized duration data were used in the statistical model.

While using the acoustic data to try and explain the pragmatic classifications, the Multinomial Logistic Regression displayed the strongest coefficient magnitudes for duration. However, across all acoustic categories, the standard errors are relatively high, which most likely comes as a result of the limited number of tokens available. It is important to point out that the largest pragmatic category was ‘disbelief’, while the smallest category – ‘idiomatic’ – only contained two single tokens. For this reason, it is argued that the statistical analysis only be used to validate what we have already observed through both the vowel formant plots and duration box plots. Out of the three independent variables in question, duration seems to play the biggest role in explaining the pragmatic classification of *fuck* productions.

5.0 Discussion

Our analysis demonstrates the value of segmental, acoustic phonetic analysis in determining the likely pragmatic functions of utterances and the implicatures that arise from them. Although phonetic analysis is on occasion combined with pragmatic analysis, as we have noted, this tends to be at the suprasegmental level (as in Culpeper

et al. 2003 and Ogden 2006). Our analysis highlights the importance of segmental features to meaning. Furthermore, since our results indicate which segmental features associate with which functional categories, our analysis also suggests a mechanism for calculating implicated meaning in cases of indeterminacy, thereby solving a problem with theoretical approaches to this area of pragmatics. For example, in the case of our data, a *fuck* production with a long /ʌ/ duration is more likely to express disbelief than to function as an insult, and this may well place limits on the implicatures that might be reasonably derived from the utterance in question. To this end, we would argue that our acoustic approach can be used to augment Gricean and neo-Gricean accounts of how pragmatic meaning is conveyed. Indeed, we would argue strongly that such approaches need to take account of insights from phonetics, for a number of reasons. Hearers use the full range of linguistic data available to them when interpreting utterances, and this includes information conveyed on the phonetic level. We should, then, be using the full range of linguistic tools available to us as analysts in order to account for speaker meaning. If we do not, we run the risk of ignoring (albeit unintentionally) significant stylistic choices on the part of speakers. Consequently, it would seem negligent not to build phonetics into theoretical frameworks that account for how implicated meaning is generated. We need to consider how things are said just as much as what is said. What this points towards is the importance of broad intradisciplinarity in linguistics and ensuring that boundaries between sub-disciplines (such as phonetics and pragmatics) are seen as fuzzy rather than discrete.

Our analysis is, of course, of ‘literary’ data; that is, a scene from a drama. We would argue that this does not lessen its value to pragmatics generally. Sinclair (2004: 51), for instance, argues strongly for literature being seen as ‘language in use’, and makes the point that any theoretical approach to language must be able to account for language use in literary texts as well as other types of naturally-occurring data. McIntyre and Bousfield (2017) also argue for the value of fiction as a data source, on the grounds that recent multidimensional analyses of fictional and naturally-occurring speech (e.g. Quaglio, 2009) have demonstrated a significant degree of similarity between the two. Literary data such as the scene from *The Wire* provide ideal test cases for experimental pragmatic-acoustic work, since they simulate both the ordinary and the creative elements of everyday conversations (as noted by Carter 2004, for instance). The analysis of language data from fiction has much to contribute to pragmatics and to linguistics generally.

Insights from experimental research on fiction can also be applied real-world problems. For example, our results (and pragmatic-acoustic results more generally) have implications beyond improvements in the analysis of implicated meaning. First, the results may be of interest to speech and language therapists working with individuals who present with pragmatic impairments (e.g. those with autism spectrum disorder [ASD]), who use different techniques to help them understand everyday situations. Second, there is a clear application for such research in the forensic speech science field, where threats and remorse may be called into question in the courtroom. The phonetic-pragmatic work carried out by Watt et al. (2013) and Tompkinson et al. (2016) on threat speech looks at cues in the speech signal that influence a listener’s assessment of threatening utterances. Similarly, the work by Hippey and Gold (2017) considers the ability of lay-listeners to perceive remorse in acted apologies to fictional victims. In these types of forensic research, the pragmatic-acoustic crossover is vital to furthering our understanding of the pivotal role phonetics can play in implicated meaning.

What we hope to have demonstrated in this chapter is the significance of acoustic elements in the interpretation of utterances; and, consequently, the importance of taking account of insights from phonetics in the development of pragmatic theories. At the core of pragmatics is the idea that what speakers mean often goes beyond what their words might be taken literally to convey. In determining the implicatures that arise in such cases, hearers rely on a range of linguistic, paralinguistic and non-linguistic information. As we have shown, acoustic phenomena play a significant role in controlling the functions that particular usages might be taken to have, and the implicatures that arise as a consequence. Our case study of one scene from *The Wire* demonstrates a method for investigating this issue and indicates the potential for using literary data in pragmatic research.

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