The Role of Accent in Increasing the Persuasiveness of a Children's Oral Health Intervention

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Abstract

This exploratory study builds on a nationwide children's oral health intervention by testing the persuasiveness of six British accents: Received Pronunciation (RP), Multicultural London English (MLE), Yorkshire English, Dundee English, Irish English and Estuary English. It was hypothesised that there would be a persuasive effect of accent, which differed by British region (Tayside, Newham, Kent). 114 participants completed an implicit measure, answering true or false to 120 audio trivia statements (20 per accent). The task was repeated on paper in less time-pressured conditions, revealing the persuasive effects. In Tayside, Estuary English was more persuasive than MLE. In Newham, MLE was more persuasive than Dundee English, Yorkshire English and RP. In Kent, no persuasive effects were found. Findings are discussed using Gawronski and Bodenhausen's (2006, 2011) Associative-Propositional Evaluation model, and suggest that accent persuasiveness is influenced by a complex interaction between social, media and historical factors. This study contributes to our understanding of implicit cognition in sociolinguistics and the role of accent in attitude change.

Keywords Associative-Propositional Evaluation model, children's oral health, implicit cognition, language attitudes, persuasion

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1 Introduction

In 2004, Pine et al.'s worldwide study revealed that the key predictor of dental caries was not the child's oral-health related behaviour, such as sugar consumption and a lack of toothbrushing, but the parents' perceived weak ability to effectively manage these behaviours. Pine et al. (2016) therefore developed a randomised controlled trial, involving five to seven-year-olds and their families from three British regions: Kent, Newham and Tayside. This trial formed the basis of an intervention called 'Bedtime Brush and Read Together to Sleep' (BBaRTS), which uses a series of children's storybooks that contain behaviour change techniques to improve parents' confidence in managing their child's oral health.

The next phase of the intervention involves drafting each storybook into an animated cartoon with a voice-over. Currently, it is not known how different British accents affect the persuasiveness of the health message. I therefore address the following question: What are the persuasive effects of British accents in each BBaRTS trial area? The research presented here forms part of a larger study on accent persuasiveness (Adams 2019a), but I will report only on the implicit measurement procedure. Results suggest that the persuasive effects of British accents vary by region depending on a complex interaction between historical, social and media factors. The unique nature of this interdisciplinary research positions it as an exploratory study, but the findings are nonetheless highly insightful and highlight the potential of accent in attitude change. They also lay fertile ground for future work in the area of language attitudes, which will allow for the development of more tailored and effective oral health interventions.

2 Background

2.1 Language attitudes in Britain

Kinzler et al. (2010: 586) argue that accent "may provide a critical basis for dividing the world" and should be regarded the fourth most crucial social category after race, age and gender. This assigns great power to accent in communication, which leads to accent stereotyping and discrimination. In Britain, this is particularly commonplace because accent is regarded as "one of the most potent symbols in social existence" (Mugglestone 2007:.40). Similar to stereotype research (Fiske et al. 2002), studies on language attitudes in Britain discovered that accents were typically associated with warmth or competence. Specifically, early research in the 1970s revealed that regional-accented speakers were rated highly along the social attractiveness dimension, but scored less well on the status dimension, and the reverse was true for speakers of Received Pronunciation (RP) (Fishman 1971; Giles 1971). By the early 2000s, the rise of the regional accent had been cemented, the perception of RP as the model of English pronunciation was less widespread, and newer accents flourished, such as Estuary English and Multicultural London English (MLE) (c.f. Cheshire et al. 2008; Cheshire et al. 2011). According to Kerswill (2007), this was driven by increased social mobility in the second half of the 20th century and large-scale immigration leading to new community formations in urban areas. The modern linguistic landscape in Britain therefore paints a complicated picture for the role of accent in persuasion which, surprisingly, is an understudied area of language attitudes research.

The way mainstream media discuss British accents further emphasizes the complexity of accent persuasiveness in this country. Commenting on the role of the media in language attitudes, Grondelaers and Kristiansen (2013: 12) claim that "…modern media have developed into major factors in the cognitive and social psychological processes that shape present-day people's language-related values". Accent is a regular focal point in the British media, but publications express a range of evaluations. For example, RP is simultaneously regarded as "VERY plummy" (Brennan, 2017) and "intelligent" (Marsden 2013), while regional accents are seen as both obstructing social mobility – "Too Northern for TV?" (Griffiths 2017) – and something to be

celebrated: "There's nowt wrong with dialects" (Carey 2016). Not only are there conflicting discourses about different accents, but there are even comments directly addressing the issue of accent discrimination. For example, The Economist published an article scorning the ongoing existence of accent-based stereotypes entitled "The last acceptable prejudice" (R.L.G, 2015). Such meta-commentary serves to show that accent is a very socially sensitive attitude object in Britain, which points to an important methodological consideration. As accent holds a controversial position in British society, giving people time to form thoughtful responses about their attitudes may result in socially desirable answers. Therefore, in order to gain an accurate an insight into accent persuasiveness, automatic responses seem more appropriate because they are more likely to bypass self-presentation concerns (Nosek 2005). This indicates the need for an implicit rather than explicit measurement procedure, which aligns with McKenzie and Carrie (2018:11) who conclude that while overt prejudice is less acceptable in Britain, "deeply embedded, biases against particular communities of speakers persist".

2.2 Persuasion

Persuasion is a highly complex, yet powerful process in which "communicators try to convince other people to change their attitudes or behaviours regarding an issue through the transmission of a message in an atmosphere of free choice" (Perloff 2010:10). The Elaboration Likelihood Model (Cacioppo and Petty 1986) is a highly prominent framework in the persuasion literature. It posits that motivation and ability to process a persuasive message leads us to focus on the arguments, but a lack of motivation and ability leads us to focus on peripheral cues, such as the attractiveness of the source or their accent. One cannot predict the extent to which parents will process the messages in the BBaRTS animated cartoons in a real-world scenario. However, Pine et al.'s (2004) study suggests that they are unlikely to carefully scrutinize the dental messages because they have little knowledge of tooth decay and are susceptible to distraction, due to the presence of their children. As such, parents' ability and motivation to process the dental messages may be low, thus increasing the importance of research on peripheral cues like accent.

The factors that are most relevant for this study are those affecting the persuasiveness of a communicator: credibility; social attractiveness; and authority (Kelman 1958). Several studies have examined the relationship between accent and perceptions of these traits (Adams 2019a, 2019b; DeShields and Kara 2011; Dragojevic et al. 2018; Dubey, Farrell and Ang 2018; Lalwani, Lin and Li 2005; Mai and Hoffman, 2011; Reinares-Lara, Martin-Santana and Muera-Molina 2016), but perhaps most telling is Fuertes et al. (2012) meta-analysis, which found that the effect size for accent on interpersonal judgements was very strong (0.82). The majority of existing research on accent persuasiveness has focused on advertising. For example, Lalwani, Lwin and Li (2005) found that British English outperformed 'Singlish' (Singaporean English), which they argued was because participants rated British English higher for perceived accent similarity than 'Singlish'. Similarly, in a German context, Mai and Hoffman (2011) explored the effect of a salesperson's regional dialect on customer attitudes. Results revealed that evaluations were more positive when the salesperson used a dialect from the same region as the customer. However, research also suggests that a standard accent can be a more effective form of communication, regardless of its similarity to the listener's accent. Reinares-Lara, Martin-Santana and Muera-Molina (2016) explore the relationship between accent and credibility in an advertising context. They compared a standard accent from Madrid (SA) with a local accent from the Canary Islands (LA), and found that the former was perceived as more credible.

Of particular relevance, Dragojevic et al. (2018) conducted a study on the effect of accent and threat label on the acceptance of an oral health message. They found that Kentuckians were more likely to accept the message when presented in standard-accented speech compared with Southern-accented speech, because it elevated perceptions of the speaker's status. Results also revealed that they were more likely to accept a message containing the general term *tooth decay*

compared to *Mountain Dew Mouth* (Appalachian term known in Kentucky referring to tooth damage arising from heavy soda consumption). The term *tooth decay* led to greater message acceptance, which was mediated by perceptions of threat severity. They argue that this is because the term is more general and accessible, thus instances of threat come to mind more easily. Conversely, while *Mountain Dew Mouth* is interchangeable with *tooth decay*, it is more specific and therefore encourages a narrower conception of the typical target. This means that participants found it harder to identify with this threat, and the message was less accepted. Crucially, message acceptance was operationalized as agreement with the message on a 7-item scale. Therefore, despite all this informative research, little is known not only about the persuasiveness of British accents, but about accent persuasiveness from an implicit perspective. Adams (2019b) addressed this gap but the focus was restricted to Tayside, and the theoretical framework was Bassili and Brown's Potentiated Recruitment Framework. As we will see in the next section, Gawronski and Bodenhausen's (2006, 2011) Associative-Propositional Evaluation model offers a sophisticated alternative in light of recent theoretical developments from the social cognition literature.

2.3 Implicit cognition

At the heart of persuasion is attitude. The chosen attitudinal model for this research is the Associative-Propositional Evaluation model (APE) (Gawronski and Bodenhausen 2006, 2011). It is a generalized dual model of attitudes that seeks to explain inconsistencies between explicit and implicit attitudes, but here I will only focus on the latter. The proponents argue that implicit attitudes are affective gut reactions resulting from associative processes. These processes are defined as "the activation of mental associations in memory, which is assumed to be driven by spatiotemporal contiguity between stimuli and the similarity between the features of the input stimuli and available memory representations" (Gawronski and Bodenhausen 2011:61). In other words, when we encounter an attitude object, it activates associations which then determine our affective gut reaction. The associations that are activated depend on the structure of the associations in memory and the input stimuli, i.e. the surrounding context of the attitude object. The same attitude object may therefore activate different associations in memory depending on the configuration of input stimuli. In this way, the model assumes that some degree of memory retrieval is required in attitude formation. It therefore overcomes the criticisms of constructivist accounts of attitudes (c.f. Nayakamkuppam 2018), which argue that even if attitudes are constructed on-the-spot then there must be a degree of retrieval in the process. However, the APE model is also rooted in Rumelhart and McClelland's (1986) connectionist tradition by recognising the influence of the surrounding context in attitude formation. The model is thus more neurally plausible than symbolic accounts, which see attitudes as stored in memory (Smith 1996), and it can account for the observed malleability of implicit attitudes in different contexts (e.g. Wittenbrink, Judd and Park 2004). It should be noted that associative processes are independent of truth-value and are activated regardless of accuracy or personal endorsement.

Social cognition researchers use a wide range of techniques for measuring implicit attitudes, such as the Relational Responding Task (RRT) (De Houwer et al. 2015), the sequential priming task (Fazio et al. 1986), and the Implicit Association Test (IAT) (Greenwald, McGhee and Schwartz 1998). These newer techniques are seen as implicit measures, because the attitude of interest makes participants respond in an automatic fashion (Gawronski and Hahn 2017). According to Bargh (1994), automaticity comprises: (1) *awareness* of a judgement process; (2) *intention* to stop the beginning of a judgement process; (3) *control* to stop the process once it has started; and (4) *efficiency* of attentional resources used in the judgement process. These measurement procedures contrast with traditional language attitude research which uses Lambert et al.'s (1960) Matched Guise Technique (MGT) to elicit implicit attitudes. As the goal of the MGT is not made apparent to participants, it is argued that their evaluations are the result of implicit processes. However, from a social cognition perspective, the attitudes elicited during an

MGT are arguably more explicit. In light of the aforementioned developments, linguists are now following suit and paving the way for an exciting new wave of language attitude research (e.g. Álvarez-Mosquera and Marín-Gutiérrez 2018; Campbell-Kibler 2012; McKenzie and Carrie 2018; Pantos and Perkins 2013; Rosseel, Speelman and Geeraerts 2018). There is only one implicit attitude study in Britain using the IAT (McKenzie and Carrie 2018). The researchers used labels 'Northern English speech' and 'Southern English speech' to elicit attitudes among 90 participants in Northern England. Results revealed a pro-Southern English speech bias, which they claim is driven by the media as well as long-standing political and historical dominance in South England. The current research seeks to build on this work by using audio stimuli and a novel methodology that allows for both the elicitation of implicit attitudes to and persuasive effects of six British accents.

3 Hypothesis

I offer a hypothesis that there will be a persuasive effect of accent, which will differ by trial area. This is based on: (1) the observed role of similarity in accent persuasiveness; (2) discourses in the British media on accent; and (3) the historical dominance of RP, which is more associated with Kent than Newham and Tayside.

4 Material and Methods

The methodology discussed here is as per Adams (2019a, 2019b). The study lasted around one hour and comprised nine tasks, after which participants were debriefed and given £10 for their time. There were 9 tasks in total, but this paper is focusing on task 2, an implicit measurement procedure, and task 9 which complimented task 2 by revealing the persuasive effects of each accent

4.1 Participants

Mirroring the criteria for the BBaRTS trial, I sought to recruit parents from Tayside, Newham and Kent with children aged five to seven. However, to facilitate recruitment, the age range was altered to include children under eight. Initially, the target sample was 150 parents (50 in each area) because this was deemed adequate for statistical analyses. However, 114 parents of children under aged eight participated in total, which inevitably affected the generalizability of the findings (see section 6).

In Tayside, 46 parents took part in the study who were all patients or nurses at a dental hospital in Perth and Dundee. They were recruited with help from a member of staff who organised a suitable timeslot for each parent. In Kent and Newham, 34 parents participated. They were recruited through two primary schools in each area with help from the receptionist who liaised with parents to organise an individual timeslot. Demographic information was collected at the end of the experiment including their location within the trial area, languages spoken at home, the participant's relationship to the child, and their education level (tables 1.1-1.3). The sample was composed of individuals from an array of educational backgrounds and locations in each trial area, with particularly high linguistic heterogeneity in Newham.

Table 1.1. Demographic information for Tayside participants (n = 46)

Region	Language	Relationship	Education
East (24%)	English (93%)	Mother (85%)	Further (43%)
North (72%)	Polish / English (5%)	Father (7%)	Higher (33%)

South (4%)	English / Czech (2%)	Grandparent (4%)	Secondary (24%)
		Aunt (4%)	

Table 1.3. Demographic information for Kent participants (n = 34).

Region	**Language**	**Relationship**	**Education**
North West (41%)	English (94%)	Mother (82%)	Further (47%)
East (41%)	Welsh/English (3%)	Father (15%)	Higher (32%)
North East (12%)	English/Danish (3%)	Grandmother (3%)	Secondary (21%)
South (6%)			

Table 1.2. Demographic information for Newham participants (n = 34)

Region	**Language**	**Relationship**	**Education**
South East (53%)	English (26%)	Mother (88%)	Further (38%)
North East (34%)	English/Bengali (15%)	Father (12%)	Higher (38%)
South West (9%)	English/Tamil (12%)		Secondary (24%)
North West (4%)	English/Albanian (9%)		
	English/Urdu (9%)		
	English/Gujarati (6%)		
	English/Somali (6%)		
	English/Punjabi (6%)		
	Polish (6%)		
	English/Spanish (3%)		
	Romanian (2%)		

4.2 Stimuli

The accents chosen were Dundee English, Estuary English, MLE, Yorkshire English, Irish English and RP. The first three accents were selected because these are spoken in each of the trial areas respectively, Tayside, Kent and Newham, and studies suggest that similarity can influence persuasion (Lalwani, Lwin and Li 2008; Mai and Hoffman 2011). The remaining three accents were selected as previous language attitudes research indicates that they are associated with persuasive traits, such as solidarity and prestige (Coupland and Bishop 2007; Hiraga 2005; Smith and Workman 2008).

A local speaker of each accent was asked to judge the accuracy of a sound clip produced by two female actors. Based on their judgements, the guises were produced by a 21-year-old female actor using a Zoom H2n. She was instructed to record the stimuli with a similar intensity, pitch and personality to control for the strength of the accent. All six guises were then identified blind by three trained linguists who judged these to be comparable. A female was selected as research suggests this would enhance the persuasiveness of the message. Furnham and Schofield (2011) found that women are significantly more likely than men to appear in the home and promote products related to bodily health and food. The BBaRTS stories incorporate health messages relating to oral hygiene and diet, and every story concludes at the main character's home. Therefore, one could argue that a female speaker would match the stereotypes that emerge in the stories and enhance the persuasiveness of the message.

An accent identification task was crucial for confirming the validity of the speech stimuli. Participants listened to three sentences from a matched-guise test (Appendix A), which formed part of the explicit measure in Adams' (2019a, 2019b) wider study. In line with previous accent

identification tasks (McKenzie 2008, 2015), participants were asked to write their response to the question 'where in the United Kingdom do you think the accent is from?' Accuracy was interpreted broadly, but the results confirmed that the participants perceived the guises as intended. Participants in Kent demonstrated the strongest knowledge of the accents and those in Newham showed the weakest. All participants struggled most to identify Yorkshire English, followed by Irish English, which is expected given that both accents are spoken in areas that are far from all three trial locations. Participants in Tayside offered more specific labels for their local accent, Dundee English, whereas Kent and Newham participants gave a more general perception of the accent, such as *Scotland* or *Scottish*. Estuary English was accurately recognised in all three trial areas. Responses were mainly geographical, such as *south coast England* and *surrounding area of London*, but they also alluded to its perceived standardness, for example *Generic English, Standard English, British* and *normal*. Similarly, labels for RP highlight its perception as standard in all three areas, such as *anywhere in the UK, non-descript* and *non-accent*, which one would expect given its long-standing status as a model of English pronunciation (Mugglestone 1997). There were a high number of hostile labels for RP in Tayside, for example *posh* and *private school,* whereas Kent participants displayed more positive associations like *nicely speaking English* and *clear, best Surrey*. Those in Newham made a more fine-grained distinction by labelling RP as an accent from *North* or *Central London*. Conversely, the adolescent multi-ethnolect MLE was strongly associated with East London by all participants, predominantly those in Newham. It was very well recognised across the sample with some referring to the ethnic element of the accent, such as *Afro Caribbean* and *London mixed,* and others highlighting the youth slang associations, for example *Street East London*. I will refer back to these responses throughout the discussion.

4.3 Research instrument

Task 2 was an implicit measurement procedure. Participants had to decide as quickly as possible whether 120 trivia statements (Appendix B), divided into six accents, were true or false, for example *Texas is the largest state in America*. Sentences were selected from online trivia websites and encyclopaedias across a range of topics (e.g. Unkelbach 2007). The statements were not limited to a dental health context because the BBaRTS storybooks contain health messages within stories that cover various themes, such as visiting the supermarket. The 'true'/'false' binary was chosen first because it measures believability which has been equated to the persuasive dimension of credibility (O'Keefe 2002), thus lending itself well to an implicit measurement procedure where automatic responses are required. Second, credibility entails several persuasive traits, including expertise, trustworthiness, and sociability (Hovland, Janis and Kelly 1953; Perloff 2010). This dimension therefore taps into persuasion more directly as compared with measuring the separate associations between an accent and, for example, expertise, trustworthiness, and sociability.

Measuring the association between an accent and the perceived truth-value of a trivia statement sheds light on people's attitudes regarding the credibility of an accent. However, if we recall, persuasion is about change. Therefore, it is only by knowing responses to the same information both with and without an accent, which allows us to measure persuasion. After completing tasks 3-8, participants therefore answered the same trivia statements again in a less pressurised environment, and on paper where there was no potential for accent effect. These written answers acted as a proxy for the participants' prior beliefs to each statement and could thus be compared to their audio responses. The time between these two tasks and the large number of trials reduced the likelihood of memorising their initial responses. For example, if a participant already believed a statement was true, as indicated by their answer on the written form, but they responded 'false' in the audio task when they heard the same statement in Yorkshire English, then this would suggest that Yorkshire English has a dissuasive effect. This is because they previously believed the statement was true, but when they heard the statement in

Yorkshire English, they decided it was false. Table 1.4 displays the two possible persuasive outcomes. To increase the persuasive power of accent, the content was made more ambiguous by presenting half true sentences and half false sentences. All statements were matched for syllable length such that the average length was 11 for both true and false statements.

Table 1.4. Persuasive effects combining prior belief and current belief

Prior belief (written)	Current belief (aural)	Persuasive effect
True	False	Dissuaded
False	True	Persuaded

4.4 Procedure

Participants were seated at a computer screen in a quiet room. They were instructed to decide whether a series of trivia statements were 'true' or 'false' as quickly as possible by responding 'z' for true and '/' for false on a keyboard. 120 trials were presented with 20 statements for each of the six accents, ten were true statements and ten false. As an independent measures design, participants in each area were split into six different groups and each statement was therefore heard in each accent by a different group. Each participant was manually assigned a group at the beginning of the experiment, for example *Texas is the largest state in America*, was heard in Yorkshire English by group one, in Irish English by group two, and so on. After completing tasks 3-8, in less time pressured conditions, participants were given a sheet of paper with the same statements and asked to circle 'true' or 'false'. Table 1.5 shows the experimental layout for one participant, which was randomized at the participant level, block level, and statement level.

Table 1.5. Experimental layout

Per participant	Per block	Per 30 statements	Per 5 statements
120 statements	30 statements	5 Yorkshire statements	2 true
		5 RP statements	2 false
		5 Irish statements	1 true or false
		5 Estuary statements	(alternating)
		5 MLE statements	
		5 Dundee statements	

4.5 Measuring implicitness

I have argued that the task measures accent persuasiveness, but in what way is the task implicit? De Houwer (2006) urges researchers to define 'automatic' and empirically test the functional properties of a measure to ensure its implicitness. It is unlikely that all attitudinal judgments in an experiment are implicit according to Bargh's (1994) four criteria. It is perhaps more realistic that at some moments, some judgments are more implicit than others. Indeed, while my evidence is qualitative, I wish to make the case that the attitudes elicited were the result of largely efficient, unconscious and uncontrollable processes. Perhaps, the main advantage of this design is that it is a fun task which requires participants to play a trivia game in time-restricted conditions. At the beginning of the experiment, many participants said that they were eager to answer the questions correctly. During the task, some participants displayed focused expressions and tense behaviour, perhaps because they had put pressure on themselves to 'do well'. This pressure is not surprising as there is a factually correct answer, which is not the case with other implicit measures such as the IAT. The nature of using trivia statements in a reaction time task therefore arguably distracted them from learning that the real goal of the experiment was to measure their perceived credibility of each accent. Indeed, once debriefed, some participants explained that they did not know this task was related to accent. This suggests that they were unconscious of the influence

that their attitude had on their response. Even if they were aware, the participants' behaviour also indicated that they regretted their response to certain statements, for example some participants expressed their frustration immediately after pressing a key or said things such as "I didn't mean that!" or "Can I go back?" Of course, this may have been because they simply pressed the wrong button, but it also implies that the process of judging the accents was potentially uncontrollable. It must be noted that responding to a proposition does take more time than responding to an association, and may increase the likelihood of reflecting upon, and controlling responses. Although the mean reaction time was 1.19s, this time is, in fact, lower than other measures, such as De Houwer et al.'s (2015) Relational Responding Task, which also uses propositions. Lastly, judging the truth-value of a trivia statement is undoubtedly a cognitively demanding task, and so the process of judging the accents likely took place under predominantly highly efficient conditions, particularly as many parents also had their children with them, which increased the cognitive load.

5 Results and Discussion

5.1 Data analysis

The analysis aimed to test the hypothesis that there was a persuasive effect of accent which varied by area. I examined the interaction between accent and prior belief on current belief in each trial area. Using the *lme4* package in R (Bates et al. 2015), a logistic regression was built with accent and prior belief as fixed-effect predictors and current belief as the outcome. A pairwise comparison explored the significant differences between all six accents. This produced six separate models with the same two predictors and outcome but varying the accent reference level. Post-hoc analyses were computed using the Bonferroni correction, which set the level of significance at 0.01. In total, there were 240 responses per participant, which resulted in a total of 27,360 responses.

5.2 Signal detection theory

The results were analysed using signal detection theory, which is useful for examining decision-making in the presence of uncertainty. Specifically, according to Heeger (2007), it studies our ability to distinguish between the signal (factual information), and the noise (our bias) during the judgement process. Our bias is influenced by external noise, such as bleeps, and, crucially, internal noise, which is neural responses that influence our decisions (Heeger 2007). Here, the noise is the accent and the signal is the statement. By comparing participants' prior belief and current belief to a statement, we can determine how difficult it was for them to tease apart the irrelevant information (accent) from the relevant information (the truth/falsity of the statement). It does this by generating four response options, which are outlined in table 1.6 in the context of this study.

Table 1.6. Response options for signal detection analysis

	Current belief: True	**Current belief: False**
Prior belief: True	Hit	Miss
Prior belief: False	False alarm	Correct rejection

First, this study is interested in the d' score which tells us the strength of the signal relative to the noise (Abdi 2009). A low score indicates that one is sensitive to the accent because it has interfered with their ability to distinguish the noise from the signal. Second, we want to know

when the prior belief and current belief are different ('false alarms' and 'misses'), because it shows that the accent has interfered with the signal such that the person now answers differently. For example, if they already believed a statement was true, but their current response was 'false', then that would be a 'miss' or accent dissuasion, and vice versa.

5.3 Tayside

Table 1.7 shows the d' scores for each accent among Tayside participants. We can see that Estuary English had the highest d' score (d' = 2.06), which means that participants found it easiest to ignore the accent, and focus on the signal, the truth/falsity of the statement. MLE was the lowest (d' = 1.64), which suggests that the participants found it very difficult to ignore the accent and focus on the task at hand when the statement was presented in MLE.

Table 1.7. d' values for signal detection analysis among Tayside participants (n = 46)

	Dundee	**Estuary**	**Irish**	**MLE**	**RP**	**Yorkshire**
d'	1.75	2.06	1.82	1.64	1.90	1.91

Moving our attention to the persuasive effects of each accent, figure 1.1 shows the proportion of 'true'/'false' responses for prior and current beliefs by accent as well as significant differences, which will be discussed further below. The general trend is indicative of a similarity between prior and current beliefs. In other words, despite the large number of trials, and space between the audio and written task, it seems that either the participants largely recalled their initial answers to the questions, or their beliefs had not changed. This can be seen by the large number of 'hits' and 'correct rejections', which is when one's prior and current belief are the same.

However, the graph also suggests that accent did change people's minds. To explore this persuasive effect, one can look at the proportions of 'misses' (accent dissuasion). For example, we can see that the highest proportion of 'misses' was for MLE (21%), whereas Estuary English had the lowest number of 'misses' (13%). This suggests that MLE was the most dissuasive accent and Estuary English was the most persuasive accent. The logistic regression results in table 1.8 show that there is a significant main effect of prior belief on current belief (p = 0.001). There is also a significant interaction between accent and prior belief on current response (p = 0.045). From the regression results in table 1.9, we can see that there is a difference between Estuary English and MLE (p = 0.002). Specifically, there is a negative accent effect of MLE compared with the reference level accent, Estuary English. In other words, in line with the descriptive results, if participants already believed a statement to be true, they were significantly more likely to respond 'false' in the moment if they heard the statement in MLE compared with Estuary English.

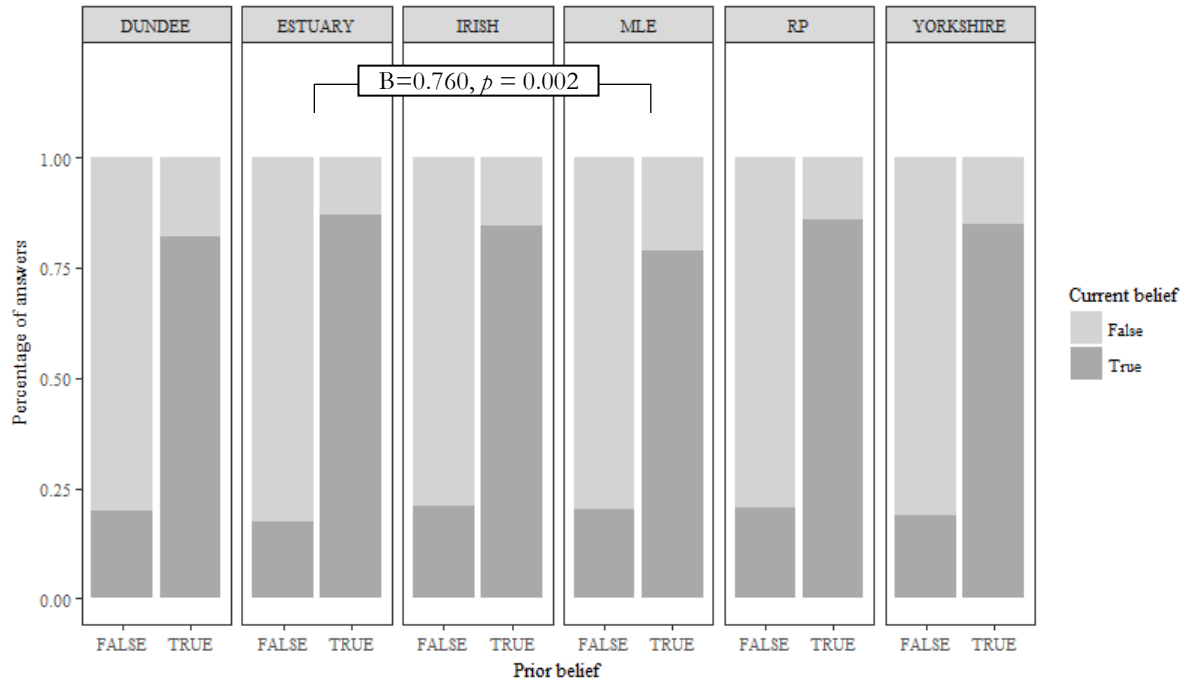

Figure 1.1. Proportion of prior belief responses and current belief responses by accent among Tayside participants (n = 46)

Table 1.8. Logistic regression summary of accent and prior belief on current belief among Tayside participants (*n* = 46)

	df	Deviance	Resid *df*	Resid Dev	*p* -value
Prior belief	1	2455.24	5513	5192.6	0.001
Accent	5	4.48	5513	7647.9	0.483
Prior belief : Accent	5	11.36	5508	5181.3	0.045

Table 1.9. Pairwise comparisons for logistic regression of accent and prior belief on current belief among Tayside participants (*n* = 46) N.B. Negative '-' indicates a positive accent effect compared to reference level accent, i.e. participants are *less* likely to respond 'false', despite prior true belief to a statement. Positive indicates a negative accent effect in comparison to the reference level accent, i.e. *more* likely to respond 'false' despite prior true belief to a statement.

	Reference Level									
	Dundee		**Estuary**		**Irish**		**MLE**		**RP**	
	B	*p*-value	*B*	*p*-value	*B*	*p*-value	*B*	*p*-value	*B*	*p*-value
Dundee										
Estuary	-0.554	0.027								
Irish	-0.117	0.623	0.437	0.084						
MLE	0.206	0.379	0.760	0.002	0.323	0.173				
RP	-0.272	0.269	0.283	0.272	-0.155	0.533	-0.478	0.048		
Yorkshire	-0.273	0.263	0.281	0.273	-0.156	0.526	-0.478	0.046	0.002	0.995

In terms of the APE model, this is an interesting example of how implicit attitudes are formed on the spot. Gawronski and Bodenhausen (2006, 2011) argue that implicit attitudes are

influenced by the existing structure of associations in memory, and the input stimuli. One could argue that MLE was dissuasive, because it activated stronger, more negative associations compared with Estuary English. It is useful to first examine the potential source of both the valence and strength of the associations for each accent. The cultural prominence of MLE in the media is an appropriate starting point. Kerswill (2014) notes that journalists portray MLE as a hindrance to educational achievement and social mobility. They also regularly draw links between 'Jafaican' – the media's label for MLE – and bad behaviour, as well as labelling the multi-ethnolect as 'problematic'. An article in The Scotsman claims: "These days, most East Londoners speak what one 2010 socio-linguistics survey dubbed 'Multicultural London English' – which might explain why so many modern Cockneys sound like they're just back from Jamaica" (McCade 2013). It is crucial to remind ourselves here that such associations are activated regardless of whether they are accurate or inaccurate (Gawronski and Bodenhausen 2006, 2011). Nonetheless, this example from the media and Kerswill's (2014) study shows how MLE may have developed such negative associations. The media also seemingly played a role in the persuasiveness of more standard accents, such as Estuary English. McKenzie and Carrie (2018) found that participants from Northern England displayed positive implicit associations towards Southern English speech. They argue that this is due to the historical and political dominance of South England, as well as British media, which has rendered southern accents, such as RP, and more recently Standard Southern British English, as synonymous with 'standard English', and therefore more prestigious.

Having speculated how such associations became linked to MLE and Estuary English, the accent identification responses go further to suggest that these media representations exist as associations specifically in the participants' memory. Many alluded to the ethnic element of the accent, such as *African* and *Jamaican slang (common).* Additionally, several geographical-based responses, such as *inner London*, indicate an awareness of its connection to populations of lower socioeconomic status. Perhaps most telling of the strength of stereotypes associated with MLE in Tayside is the answer *London innit,* which refers to the discourse-pragmatic innovation used by adolescents with this accent (Pichler 2016). These responses to MLE suggest an understanding of its stigmatization. From this, one can speculate that associations in memory may include *uneducated* or *teenager*, thus leading to a negative reaction. Conversely, approximately a third of participants' answers to the speaker's origin for Estuary English was either *English* or *England*, which indicates a more positive, less aversive association.

It remains to be seen how associations formed and became activated given the large distance between Tayside and London. Montgomery (2012) argues that perceived proximity to a place can be reduced through media exposure. Therefore, it is likely that the media coverage of MLE has rendered it a highly negative and salient British accent to the extent that it reduced the perceived geographical distance between the accent and these participants. As Bodenhausen et al. (2009) observe, automatic bias is the result of spontaneous activation of mental associations that are found in contemporary society. The strong negative associations with MLE also find support in the stereotype literature. Hamilton and Gifford (1976) found that the relationship between negative characteristics and minority group membership is often overestimated. They argue that this is because distinctive information is very accessible, thus making minority groups, like MLE speakers, much more noticeable. Combining this with Fiske's (1980) observation that negative behaviour is more distinctive than positive behaviour, it becomes clear how negative associations were formed and activated in the minds of Tayside participants.

Taken together, as MLE and Estuary English are both London accents, the negative media coverage seems to have placed MLE in contrast to Estuary English. I claim that this is why MLE triggered comparatively stronger affective gut reactions, which not only affected participants' ability to distinguish between the noise and the signal, as indicated by the low d' value (1.64), but it negatively influenced the statement's perceived truth-value. Associations with Estuary English, however, were weaker, as indicated by the high d' value (2.06) and led to a less adverse gut

reaction.

5.4 Newham

Table 1.10 shows the d' scores for each accent among Newham participants. MLE had the highest d' score (1.70), which means that participants found it easiest to ignore the accent, and focus on the signal, the truth/falsity of the statement. The accent with the lowest d' value was Dundee English (d = 1.15), which suggests that participants struggled to ignore this accent and concentrate on the task. Overall, the d scores were lower than those of Tayside participants, which shows that Newham participants were not good at the task and/or found it difficult. This is because a low score shows that they were more sensitive to accent differences.

Table 1.10. d' values for signal detection analysis among Newham participants (n = 34)

	Dundee	**Estuary**	**Irish**	**MLE**	**RP**	**Yorkshire**
d'	1.15	1.50	1.42	1.70	1.32	1.32

Figure 1.2 displays the proportion of prior and current belief responses by accent, as well as the significant differences between the accents. Similar to Tayside, there is a trend for prior and current beliefs to be the same. However**,** drawing our attention to the 'misses', Estuary English and MLE had the lowest proportion (19%) compared with all five other accents. This hints that they had a persuasive effect because if participants believed that a statement was true, they were less likely to respond 'false' when they heard statements in these accents. However, Yorkshire English and Dundee English both revealed a higher proportion of 'misses' (27%, 29%), which suggests that these accents had a dissuasive effect.

Similar to Tayside, table 1.11 reveals a main effect of prior belief on current belief (p = 0.000), and a significant interaction between prior belief and accent on current belief (p = 0.008). Table 1.12 (p.13) displays the pairwise comparisons between all six accents. Again, as per the descriptive findings, it shows that if participants already believed a statement to be true, they were significantly less likely to respond 'false' in the moment if they heard the statement in MLE compared with Dundee English (p = 0.001), RP (p = 0.011) and Yorkshire English (p = 0.011). This is perhaps best visualised in figure 1.2, whereby MLE has a fewer number of 'misses' compared with these three accents.

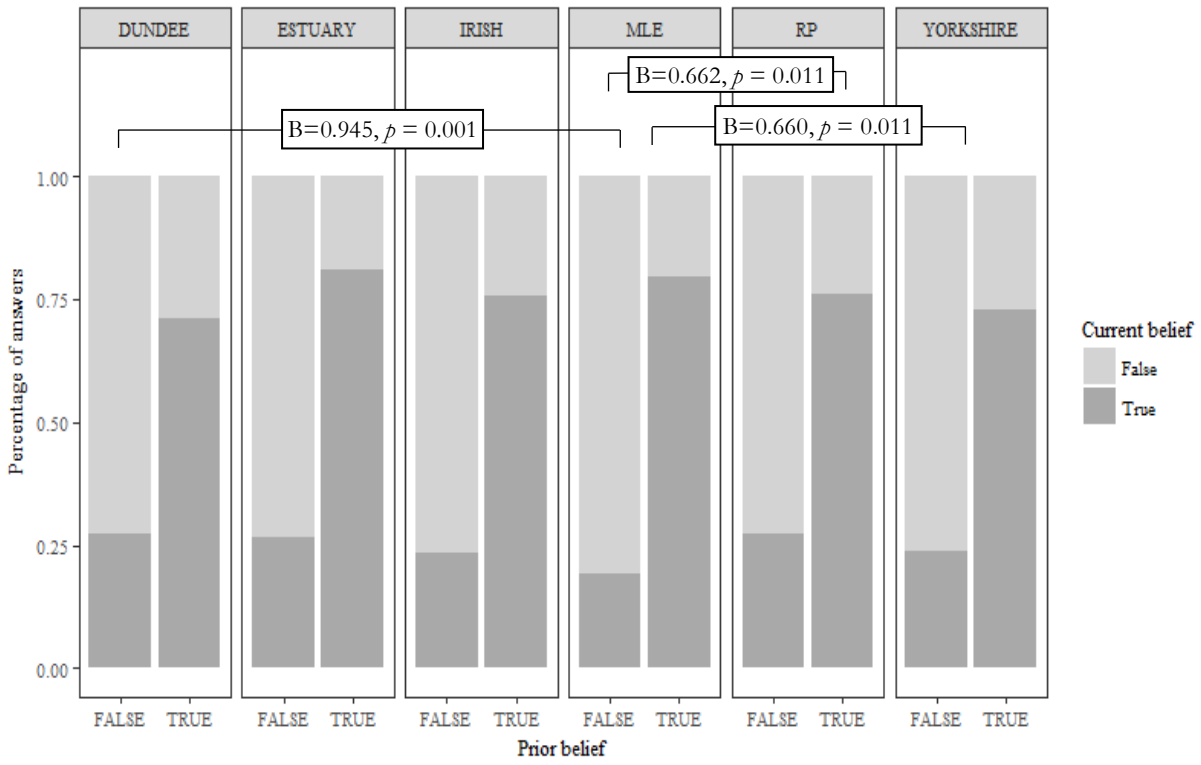

Figure 1.2. Proportion of prior belief responses and current belief responses by accent among Newham participants (n = 34)

Table 1.11. Logistic regression summary of accent and prior belief on current belief among Newham participants (n = 34)

	df	Deviance	Resid. *df*	Resid Dev	*p* -value
Prior belief	1	1135.06	4073	4513.9	0.000
Accent	5	7.04	4074	5649.0	0.217
Prior belief : Accent	5	15.78	4068	4498.2	0.008

Once again, the potential stereotypes activated for these accents help to explain the persuasive and dissuasive effects. Newham participants had a sound understanding of the associations linked to MLE in that their labels for the accent alluded to London, ethnicity, or youth language. In turn, this hints that they may have also been aware of the accent's stigmatization. As such, it remains to be seen why this accent was significantly more persuasive than RP, Yorkshire English and Dundee English. It seems that despite a likely understanding of MLE's strong negative stereotypes, associations were nonetheless weaker and more positive compared with these three accents. This interpretation is supported by the d' values. The d' value for MLE was the highest (1.70), which indicates that the participants found it easiest to ignore the accent and focus on the statement.

Table 1.12. Pairwise comparisons for logistic regression of accent and prior belief on current belief among Newham participants (n = 34). N.B. Negative '-' indicates a positive accent effect compared to reference level accent, i.e. participants are **less** likely to respond 'false', despite prior true belief to a statement. Positive indicates a negative accent effect in comparison to the reference level accent, i.e. **more** likely to respond 'false' despite prior true belief to a statement.

	Reference level									
	Dundee		**Estuary**		**Irish**		**MLE**		**RP**	
	B	*p*-value	*B*	*p*-value	*B*	*p*-value	*B*	*p*-value	*B*	*p*-value
Dundee										

Estuary	-0.590	0.019								
Irish	-0.459	0.064	0.131	0.612						
MLE	-0.945	0.001	-0.356	0.183	-0.487	0.065				
RP	-0.283	0.248	0.307	0.230	0.176	0.486	0.662	0.011		
Yorkshire	-0.285	0.244	0.304	0.233	0.173	0.492	0.660	0.011	-0.002	0.992

Applying the APE model, we can infer that the existing structure of associations quite possibly contains negative stereotypes due to their response labels and media representations of MLE. Yet, the input stimuli – the trivia statements in MLE – must have activated a structure of associations that led to a positive gut reaction to their own accent. One such possible structure is associations of trustworthiness, such as *my accent*. Evidence suggests that perceived similarity fosters feelings of trustworthiness (e.g. Nass and Brave 2005). This raises the question as to why those in Tayside were not persuaded by their own accent, but this is where the importance of addressing each trial area individually is crucial. If we approach the interpretation of their attitudes from a minority group perspective, it becomes easier to explain why Newham participants' associations of similarity counteracted any negative associations. Social Identity Theory (Tajfel and Turner 1979) posits that membership to a group helps to increase self-esteem by favouring the in-group at the expense of the out-group. Along similar lines, Greenberg et al. (2003:323) state that: "Groups provide the individual with the broad consensual support necessary to sustain faith in a meaningful and enduring conception of reality". In other words, group membership offers stability when an individual is struggling to find their place in the world. More specifically, in the context of minority groups, Mehra et al. (1998) found that one is more likely to use a group as a basis for shared understanding if that group is rare in the social context. Participants in Newham may have a heightened reliance on their own group for subjective validation, because they face marginalisation due to their low socioeconomic status, and possible immigrant background. In fact, belonging to a minority group can lead members to feel rejected and distrust members of the majority group (Schmitt et al. 2002). Upon hearing the accent spoken in their area, associations of similarity were activated which increased trust and produced a persuasive accent effect.

We have seen how MLE activated a positive gut reaction through similarity-based associations, but this provides only half the argument. To understand this accent's persuasiveness, we must also explore the relative dissuasiveness of RP, Yorkshire English and Dundee English. Taking the d' scores as a starting point, the lowest scores were for these three accents, which hints that Newham participants have strong associations in memory that interfered with their ability to separate the noise (accent) from the signal (statement). This is probably most simple for RP. While some responses were positive, such as *nice*, *clean*, *proper*, others were negative, including *posh, snobbish*. Therefore, much like MLE, despite an existing structure of positive and negative associations in memory, the input stimuli seemingly elicited associations that led to a negative gut reaction to RP. This is harder to explain for Dundee English and Yorkshire English, as the possible existing structure of associations is not as obvious. For both accents, participants provided geographical labels, albeit at the broader level such as *North* or *Scotland*. One indicator of negative associations is that their ability to identify these accents was weaker compared with RP and MLE. Among participants who did recognise the accent, and even those who incorrectly identified it with responses such as *Newcastle* or *Irish,* it leads to the possibility that they associated the accent with *different*, or *far away*. This positions speakers of these accents firmly in the out-group on the basis of unfamiliarity. It seems that the

strength of such associations were strong and negative enough to interfere with participants' ability to discern the signal from the noise and led to negative gut reactions. In summary, the dissuasiveness of Dundee English and Yorkshire English for reasons of out-group dissimilarity is further supported by the persuasiveness of their own accent for reasons of in-group similarity.

5.5 Kent

The d' analysis in table 1.13 shows the scores for each accent among Kent participants. Similar to Newham, MLE had the highest d' score (2.18), which means that participants found it easiest to ignore the accent, and focus on the signal, the truth/falsity of the statement. The lowest d' scores were for Estuary English (1.98), which suggests that this accent created the most 'noise' and consequently interfered with their ability to respond to the trivia statements. It is also important to note that these d' scores are generally much higher than for Tayside and Newham, with small differences between the accents.

Table 1.13. d' values for signal detection analysis among Kent participants (n = 34)

	Dundee	**Estuary**	**Irish**	**MLE**	**RP**	**Yorkshire**
d'	2.05	1.98	2.02	2.18	2.05	1.96

Figure 1.3 shows the proportion of prior and current belief responses by accent. Contrasting to Newham and Tayside, there is slightly more stability in participants' responses across the accents, but similar to both these areas in that their current beliefs are largely in line with their prior beliefs. From a persuasion perspective, there are not as many differences between the 'misses' compared with Tayside and Newham. The highest number of 'misses,' indicating a dissuasive effect, was for Irish English (16%) and the accent with the lowest number of 'misses', indicating a persuasive effect was for MLE (12%). Therefore, the key observation from this data is that, similar to the d' scores, the differences between the accent effects are smaller in Kent than in Newham and Tayside.

In table 1.14 we see that while there is a significant effect of prior belief on current belief (p = 0.000), there is not a significant interaction between prior belief and accent on current belief like Tayside and Newham. In other words, if an individual already believed a statement was true or false, the accent in which the statement was presented did not influence their current belief. This is supported by the d' scores in that the range is much smaller (0.21), whereas the difference between the highest and lowest d' score was 0.43 in Tayside, and 0.55 in Newham. Moreover, the average d' score across all accents in Kent was higher (2.03), compared with Tayside (1.84) and Newham (1.40), which suggests that participants found it generally easier to separate the noise from the signal, and were less sensitive to accent differences.

At first, this is a surprising result given that their knowledge of the different accents was much better than participants from the other two areas. Their sound ability to identify the accents implies that they may have stronger associations in memory with each accent, which, in turn, leads to greater positive or negative gut reactions. A lack of significance between the accents on an implicit level therefore hints that their automatic associations were possibly being activated, but not influencing their judgments. Research initially argued that when we encounter a certain group member, it is inevitable that our stereotypical mental associations will be activated (e.g. Devine

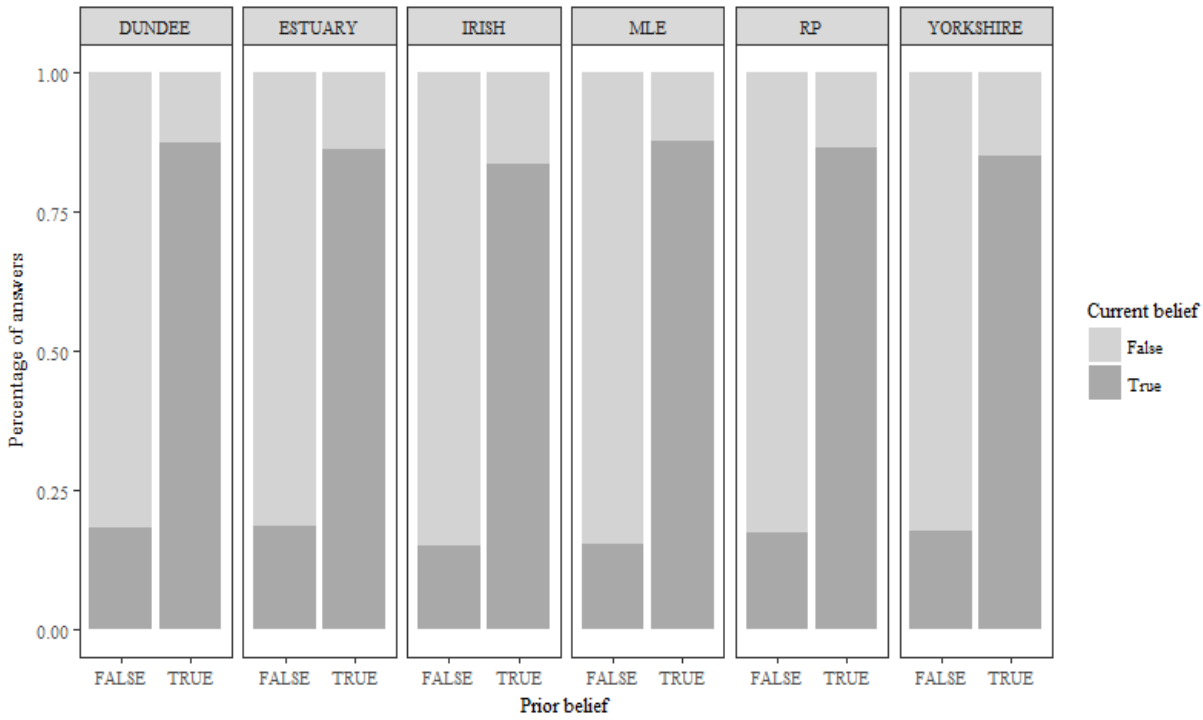

Figure 1.3. Proportion of prior belief responses and current belief responses by accent among Kent participants (n = 34)

Table 1.14. Logistic regression summary of accent and prior belief on current belief among Kent participants (n = 34)

	df	Deviance	Resid. *df*	Resid Dev	*p*-value
Prior belief	1	2133.04	4073	3492.5	0.000
Accent	5	3.21	4074	5625.5	0.667
Prior belief : Accent	5	2.08	4068	349.4	0.838

1989*)*. However, Bodenhausen et al. (2009) discuss the impact of diverse environments on one's ability to suppress biased thoughts. They argue that biased responding can be undermined by increased interpersonal interaction across groups, because it allows the individual to experience counter-stereotypical examples. Along similar lines, according Gaertner et al.'s (1993) Common Ingroup Identity Model, increased intergroup interaction is one cause of recategorisation, which involves shifting the categorical basis upon which one makes judgements to a more self-inclusive category. The process changes an individual's cognitive representation of membership from two groups to one to create more harmonious interpersonal relations. Crucially, the authors found that this effect generalised beyond participants in the immediate contact situation. In other words, attitudes became more favourable to out-group members who were not directly involved. I propose that Kent participants, who possessed higher knowledge of the accents, as evidenced by their responses in the identification task, have encountered more counter-stereotypical examples of out-group members compared with Newham and Tayside participants. Associations were therefore activated but these did not influence their judgement possibly because their lived experience of the accents meant that differences between the groups were not salient enough. This directed their focus to the content of the stimulus rather than to the form, which is why we see a lack of difference in d' values and no persuasive effect of accent. It should be noted that recategorisation can be a voluntary process, and, in such cases, is therefore conscious, controlled, intentional, and inefficient. However, I argue that the judgements elicited were still the result of an automatic process. Recategorisation was a natural result of intergroup interaction rather than participants' attempt to suppress their bias, which then reduced the impact of accent differences

on judgement in time-restricted conditions.

6 Summary

6.1 Limitations

Regarding the generalisability of these findings, the sample comprised individuals from a range of ages, educational backgrounds and locations. However, 114 participants was a smaller size than intended, largely because many parents had to either work or run errands. This means that the sample sizes were unable to capture the effect of more specific social variables, such as social class, ethnicity, age or gender. This should therefore be viewed as an exploratory investigation, but I hope to have shown the complexity of this topic area and urge for more research which examines these nuances given their potential role in accent persuasiveness. This is perhaps even more so the case with East London due to its ethnic and linguistic heterogeneity.

A second point is to what extent one can generalise these findings with regard to the stability of implicit and explicit attitudes. The stability of implicit attitudes is far trickier to determine as Bargh (1994:6) rightly notes: "Any mental representation or mode of thinking that is available in memory for use by the subject can be made accessible in an experiment, but this does not mean that every available mental structure or process is chronically accessible". While this calls into question the relevance of studying implicit attitudes, that is not to say that it is not an insightful and worthwhile endeavour. Linguistic research on implicit attitudes is in its early stages, and until recently, nothing was known about people's more automatic reactions to language. Therefore, even if chronic automaticity effects are not evident from one study, temporally accessible representations are still informing our understanding of attitudes. We are far from establishing a complete picture, but the elusive and powerful nature of our affective gut reactions is precisely why research must be pursued.

6.2 Conclusion

Accent persuasiveness in Britain is a highly complex process influenced by social, media and historical factors. In Tayside, I claim that the persuasive effects were driven by social norms and media influence. In Newham, however, life experiences played a larger role in the persuasion process, which led to greater trust in their own accent. Participants from Kent were least sensitive to accent differences, possibly due to a high exposure of different accents. Therefore, we can only partially accept the hypothesis that there is a persuasive effect of accent, which varies in each trial area.

Very few investigations have been conducted in Britain on accent persuasiveness or implicit cognition in linguistics, but this study presents a promising avenue for further language attitude research. Such potential is particularly the case in Britain where society is extremely susceptible to pronunciation differences. Pine et al.'s (2016) BBaRTS clinical trial has therefore provided an extremely exciting, yet overdue, opportunity to explore how sociolinguistics can address a public health problem through a social psychological lens.

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Appendix

A. Matched-guise test speech stimuli

1. Neutral passage

I think the best way to get from Birmingham University to Cardiff University is to head west toward New Fosse Way. This will lead you to Bristol Road, where you need to continue for about 3 miles. At the roundabout take the 2nd exit onto the M5 to London. After about 60 miles, exit onto the M4 towards South Wales. Continue onto Eastern Avenue and then take the A470 exit towards the City Centre. Merge onto North Road and turn left onto Corbett Road where Cardiff University is situated.

2. Oral health passage

There are several ways you can avoid tooth decay. First you should brush your teeth twice a day for two minutes. Brushing your tongue will also freshen your breath and remove bacteria. Second, flossing helps prevent decay because it gets rid of plaque and food particles which a toothbrush cannot reach. Finally, it is important to avoid sugary food and drinks, and this also benefits your wider health. If you do have sugar, try to limit it to mealtimes rather than as a snack.

B. Trivia statements used for task 2 of the implicit measurement procedure

Please circle whether the following statements are true (T) or false (F)

Melbourne in Australia used to be named Batmania	T	F
Venezuela is named after Venice	T	F
Exodus is the first book of the Old Testament	T	F
Hippos can run faster than horses	T	F
The word goodbye comes from God be with you	T	F
The first remote control took eight seconds to change channels	T	F
In New York it is illegal to imitate an animal	T	F
Baseball originated in England	T	F
Sloths take two weeks to digest their food	T	F
Walt Disney was afraid of rollercoasters	T	F
Jacuzzi is a brand name	T	F
Nutmeg is poisonous if injected	T	F
Five percent of the worlds salt is for pretzels	T	F
An adult skeleton has 106 bones	T	F
Rats cry when they are tickled	T	F
Babies like high pitched singing voices	T	F
Baboons come from Africa and Arabia	T	F
Mexico's most famous beer is Sol	T	F
The Sun is 1000 times larger than Earth	T	F
It takes one minute for brain cells to react to aspirin	T	F

Hot water is heavier than cold	T	F
Pluto was named by an 11-year-old girl	T	F
French fries originated in Belgium	T	F
Pluto takes 248 years to orbit the Sun	T	F
The first text message read Happy New Year's Eve	T	F
There are more than 50 different kinds of kangaroos	T	F
Hippos' sweat turns red when they're upset	T	F
The most popular male dog names are Max and Bailey	T	F
Bono was born Paul David Hewson	T	F
Tokyo is the city most prone to earthquakes	T	F
Humans develop a tail in the womb that dissolves	T	F
The most liked brand on Facebook is Starbucks	T	F
The film Titanic got three Oscars	T	F
Youtube started as a dating website	T	F
Karaoke means empty orchestra in Chinese	T	F
Dolphins sleep with one eye open	T	F
The lightest metal in the world is copper	T	F
Outer space is completely silent	T	F
Eating white chocolate helps eczema	T	F
Einstein failed Maths at school	T	F
India has four different time zones	T	F
It rains diamonds on Saturn	T	F
30 people have been born in Antarctica	T	F
Tom and Jerry were originally called Jasper and Jinx	T	F
The Great Wall of China can be seen from Space	T	F
George Bush and Hugh Hefner share common ancestors	T	F
30% of emails sent are spam	T	F
The majority of the Amazon rainforest is in Colombia	T	F
Ketchup was sold as a medicine in the early 19th century	T	F
Peanuts can be used to make dynamite	T	F
The most popular pin code is 1 2, 3, 4	T	F
The sum of all the numbers on a roulette wheel is 666	T	F
Reno is farther west than Los Angeles	T	F
Vienna has the oldest zoo in the world	T	F
The first Olympics were held in Greece	T	F
Neptune is the equivalent of Greek God Aphrodite	T	F
Elvis Presley's middle name is Aaron	T	F
Babies tend to cry in blue rooms	T	F
Gin is made from potatoes	T	F
Madrid is the noisiest city in the world	T	F
Grapes explode when microwaved	T	F
Issac Newton invented the game chequers	T	F
The world's tallest building is in Dubai	T	F
Grapefruit dehydrates you	T	F
The largest recorded snowflake was 15 inches	T	F
A hurricane can be as high as 50,000 feet	T	F
Woman can read smaller print than men	T	F
Fortune cookies originated in Italy	T	F
The first sport to be filmed was baseball	T	F

Heart attacks occur most often on Mondays	T	F
The Titanic was built in Dublin	T	F
Cats have five eyelids	T	F
Sand is the main component in glass	T	F
25% of British people sleep nude	T	F
Texas is the largest state in America	T	F
M and Ms stands for Mars and Murries	T	F
A Cadburys Crème Egg contains 170 calories	T	F
Italy has 10% of the worlds active volcanoes	T	F
Florence Nightingale invented scissors	T	F
Jerry Springer was born at a tube station in North London	T	F
Milkshakes were originally alcoholic drinks	T	F
A bee is more likely to sting you in rainy weather	T	F
School comes from the Ancient Greek '*skhole*'	T	F
China is the world's largest producer of peanuts	T	F
Whoopi Goldberg's first job was a baker in New York City	T	F
America is home to the first underground	T	F
25% of human bones are located in the spine	T	F
The American flag has 49 stars	T	F
Ciabatta bread was invented in 1500	T	F
Laughter can strengthen the immune system	T	F
You burn more calories sleeping than watching TV	T	F
Captain Morgan was a Welsh pirate	T	F
There are 100 different drink combinations at Starbucks	T	F
45% of the world is left handed.	T	F
Mercury is known as the red planet	T	F
The first mobile phone cost $4000	T	F
Google was launched in 1990	T	F
The giant panda is the national animal of Canada	T	F
Intelligent people have more magnesium in their hair	T	F
Police in India get paid more if they grow moustaches	T	F
It's illegal to chew gum in Singapore	T	F
Popcorn is mostly eaten in Autumn	T	F
Mount Everest grows two inches every year	T	F
Yawning wakes you up	T	F
Antarctica was once as warm as California	T	F
Human blood has more calories than crisps	T	F
A group of crocodiles is called an embarrassment	T	F
Carrots were purple before the 12th century	T	F
In France, an ashtray is considered a deadly weapon	T	F
Humans need food more than they need sleep	T	F
The dot on the letter *'i'* is called a tittle	T	F
Iceland's national animal is the whale	T	F
Tea is the national drink of France	T	F
The first computer mouse was made of metal	T	F
The space between your fingers is called the glabella	T	F
In Spain artists can pay their taxes with artwork	T	F
Babies have more bones than adults	T	F
The Mojito cocktail originated in Argentina	T	F

A shrimp's heart is in its head	T	F
Half your brain is used for vision	T	F