Vowels and mergers in East Lancashire: the case of north/force and face/goat in the South Asian community

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رَبِّ زِدْنِي عِلْماً

"My Lord, increase me in knowledge."
~ Surah Taha, verse 114, The Holy Quran

Abstract

This thesis explores vowel mergers in the South Asian community of East Lancashire and the social factors affecting these realisations. Possible (non-)mergers *north/force* and *face/goat* are examined for a total of seven speakers by means of a word list reading, and sociolinguistic interviews with all speakers provided data on social factors such as socioeconomic background, social mobility, and identity. Like Standard British English, there is a merge of the lexical sets north and force, following what has been described as the first force merger. However, *face* and *goat* present a non-merger that behaves differently compared to the known northern English standard. Unlike a northern, monophthongised realisation of both vowels, all speakers gravitate towards a more southern, diphthongised realisation of *face. Goat*, however, remains a monophthong for all within this small dataset. The deviation found in the *face* lexical set might be explained through the social factor of social mobility, as all speakers express a desire to rise above the lower to working-class environment they have grown up in. At the same time, if the maintenance of monophthongised *goat* is an indication of loyalty to their identity, an argument can be made for the lacking desire of the younger second-generation British South Asians to give up their distinguishing dialectal features.

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1. Introduction

1.1. Overview

After the second world war, members of the South Asian community migrated to the United Kingdom in order to find better opportunities, reunite with family, or escape unrest in their country of origin. They settled in various places, including the county of Lancashire. Population wise, the towns of Blackburn and Preston are now home to a large community of people of South Asian descent. Despite this significant presence and their contributions to their respective towns and the county as a whole, they are vastly underrepresented in research.

Specifically, little is known about the dialect in the two towns mentioned above, and even less is known about the variations found within the South Asian community. To the extent of this writer's knowledge, no research has presently been conducted into the dialect of South Asians in north-west England. Furthermore, the social factors influencing their respective dialect have not yet been explored. Through an exploration of phonemic vowel realisations and mergers, this research seeks to explore the extent to which the South Asian community might deviate from the northern English dialect found in Lancashire. Not only will this provide the first glimpse into the vowel production of South-Asians living in northern England, but it will also explore which social factors might influence their production.

1.2. Literature review

1.2.1. Mergers

Mergers are a result of language change in which a single or more phonemes move across the vowel space. According to Maguire et al. (2013), a merger can refer to two different things. Firstly, a phonological change in which there is a loss of phonetic differentiation between two or more phonemes. This can happen in multiple ways, as displayed in figure

1 below. There can be a movement from one phonetic space to another and vice versa, but also the movement into an entirely new phonetic space. Secondly, the merger can be a result of language variation. An example given by Maguire et al. (2013) is Scottish English, which has the *foot-goose* merger. This merger does not exist in Scottish English, yet it is not caused by a phonological change. Instead, it was the inability to differentiate between the two phonemes when English became more prominent in Scotland which caused the merger to exist.

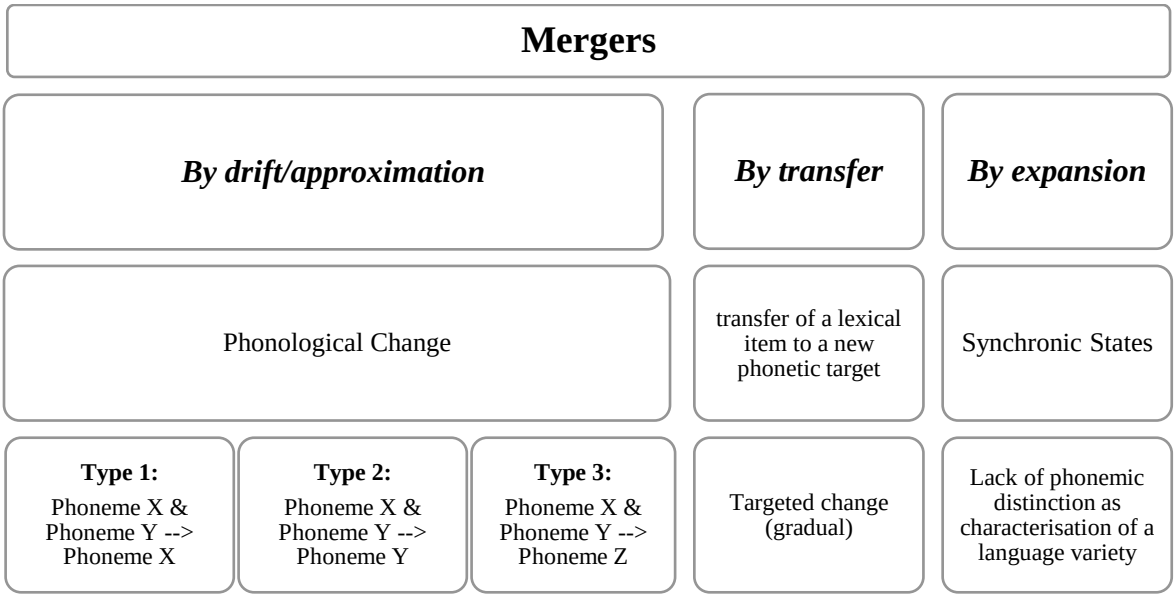

Figure 1. Overview of types of mergers, causes, and realisations based on Labov (1994) and Maguire et al. (2013).

These changes are often expected to be gradual, but they can be abrupt too depending on the type of change leading to a merger. Labov (1994) has described three distinct types of change that can lead to a merger: by *expansion drift/approximation*, and *transfer*. A merger by *expansion* is the sole type of merger to be an abrupt shift. This sudden change is presumed to happen at acquisition, as an abrupt change in production is unlikely to happen throughout the lifespan. When a merge occurs by *expansion*, the space of two formerly used phonemes is now used for a single phoneme. Because of this, speakers with and without the distinction coexist and there is no intermediate stage of the change present. Due to the nature of this merger, there can be neither partial nor near-mergers.

Noteworthy is the fact that the presence of two different realisations can cause problems in perception for some speakers.

Contrastively, a merger by *drift/approximation* is the movement from one phonetic space to another, as shown in figure 1. This is a gradual change that can span between generations and the merge is complete when there is no statistical difference in production between the two phonemes anymore. There are intermediate stages throughout this process. Varying socio-economic classes can have differing speeds at which the change happens. Some might be at the stage of a near-merger, while others have gone through the complete shift.

Lastly, like the merger by *drift/approximation,* a merger by *transfer* is gradual and displays the movement of a lexical item to a new phonetic target. The merge has been completed when all the relevant lexical items are consistently produced with the target phoneme. Where this type of merger further differs from one by *drift*, is the impossibility of a near-merger. As transfer indicates one thing replacing another, a near-merger would not satisfy the conditions of a merger by *transfer*. However, there is the possibility for a partial merger. Throughout the transfer process, only parts of a lexical set may have already transferred to the new phoneme while the rest remains unchanged. This would classify as a partial merger and these can also be the end result of a merge by *transfer*. An example of this can be found in Middle English (ME). ME *meat* /ɛː/ merged with *meet* /eː/, yet some of the words originally belonging to the lexical set *meat* failed to merge and instead became part of the lexical set *mate,* which has happened to words like ‘break’, ‘drain’, and ‘great’ (Maguire et al., 2013).

These different realisations of mergers have been discussed in the literature for over 40 years and have moved from ME examples to contemporary instances of mergers. Explored by the likes of Wells (1982), Watson and Clark (2013), Turton and Baranowski

(2020), Lawson et al. (2013), Maguire et al. (2013), and Baranowski (2013) in the case of British English, mergers have also been investigated in other varieties of English. Warren and Hay (2006) explored mergers in New Zealand, while Dinkin (2016) and Hall-Lew (2013) did so for American English. For all varieties of English, the prominent focus remains on vowels and therefore more specifically phonemes. An example of this can be seen in the case of the *foot-strut* merger in Manchester. Now a distinct feature of Northern English, both *foot* and *strut* are pronounced as [ʊ] (Turton & Baranowski, 2020). Interestingly, the acoustic measures of both vowels do differ slightly, with *strut* vowels being lower compared to *foot* vowels in the vowel space despite being perceived as one and the same. Yet when one moves away from Greater Manchester, most varieties of English maintain a *foot-strut* distinction. This merger can be an example of a merge by *drift*, with a phonological shift. The phoneme [ʌ] moved to the phonological space of [ʊ], merging with the *foot* vowel.

At times, the vowels merge into what can best be described as the middle ground between two distinct vowels. This is described in figure 1 as phoneme X and Y becoming phoneme Z. In the case of the more well-known *nurse-square* merger, there are realisations of a mid-front vowel [ɛː] in Liverpool, while the town of St Helens has a mid-central realisation with [ɜː] (Watson & Clark, 2013). Although the merger is quite common in Northern English, much like the *foot-strut* merger, the possibility for local and individual variation are still present. This indicates that the realisation of mergers is not necessarily consistent, nor are they used by everyone. Social class and stigmatisation of Northern English accents have caused a decline in features that are considered a vital part of Northern English (Turton & Baranowski, 2020). An example of this is the loss of rhoticity in the North of England in favour of a more prestigious English (e.g., non-rhotic) (Wells, 1982), which has been said to be a change led by the younger generations in urban

areas (Leeman et al., 2018). In a running study by Nance and Mahamdi (under review, 2022), rhoticity in contemporary Lancashire was further explored to determine when the onset of this loss started. Based on recordings of speakers born between the 1890s and 1910s, the preliminary results indicate that the loss of rhoticity started in this generation, with rhoticity loss becoming more prevalent the more north one goes in Lancashire. Their preliminary results suggest that while rhoticity was still present in Preston around the 1950s, there was already a decrease of over 40 percent and there is a great likelihood that this percentage has only increased over the course of the previous and current century. If this is in indication of the results of stigmatisation and conformity, there is a likelihood for distinct Northern mergers to be affected as well.

1.2.2. *North-force* merger

The *north-force* merger is often referred to as the *first force merger* with the monophthongisation of /ɔə/ into /ɔː/ (Wells, 1982). *Force* is a historical diphthong /ɔə/ and has almost fully merged with *north* in non-rhotic accents. The latter is particularly noteworthy, as both Blackburn and Preston are two of few remaining towns in north-west England that still have a level of variable rhoticity. Considering this, there is a likelihood for this merger to not have finalised in East Lancashire. However, two things are of note that could influence the state of the merger in East Lancashire. Firstly, rhoticity in North England has been in steady decline and what used to be considered rhotic has almost completely become non-rhotic in the last century (Leeman et al., 2018). Specifically in Preston, preliminary results on rhoticity show that the post-vocalic /r/ has become inconsistent, instead leaning towards variable rhoticity (Nance & Mahamdi, forthcoming). If East Lancashire has indeed become more non-rhotic, a full merge of *north* and *force* becomes a realistic expectation based on the lack of rhoticity alone. On top of that, the distinct and historical realisation of *force* was only found in older speakers in South-West

England with a non-rhotic accent (Wells, 1986). This implies that a *north-force* split is rare and possibly non-existent in East Lancashire based on the existing literature.

1.2.3. *Face-goat* (non-)merger

While the pairing of *north* and *force* is easily explained by their proximity to each other as low back vowels, the pairing of *face* and *goat* might not be as self-explanatory at first glance. *Face* and *goat* are paired together because of their phonetic symmetry (Wormald, 2016). According to Watt (2000), the phonetic symmetry found between *face* and *goat* is bilateral. They are both close-mid vowels, with the differing feature of *face* being a front and *goat* a back vowel. With Wells (1982) being one of few sources on these vowels in Northern English, the knowledge on their realisations in present day North-West England is limited. According to him, *goat* can be realised as a closing-diphthong glide, which creates a realisation close to *face* with [ɜɾ]. However, he notes that the North of England can have a monophthongised realisation for *goat*, namely [oː], which would be a 'mirror image' to monophthongal *face* [eː] (Wells, 1982). The monophthongal realisation of vowels in Northern England is corroborated by more current literature, including works by Strycharczuk et al. (2020), and Baranowski and Turton (2015) who found that in monophthongisation is a persistent feature in the county of Lancashire and throughout the North. This would suggest that East Lancashire might find the case of a non-merger, where the respective realisations of *face* and *goat* are opposites in the vowel chart.

Interestingly, the *face* and *goat* vowels have been investigated amongst the South Asian community in the UK. Specifically, their peripheral and monophthongal realisation of these vowels. Stuart-Smith et al. (2011) explored the realisation of *face* and *goat* for Asian speakers in Glasgow. They found that compared to non-Asian speakers, Asian speakers produced a closer and fronter *face* and *goat*. This is corroborated by Wormald (2016), who confirms that monophthongal realisations of the vowels are prevalent in

many Asian varieties of English spoken in the UK. Combined with the knowledge that the Indian variants of *face* and *goat* also have a monophthongal realisation (Sharma, 2011), it raises the question how much this overlaps with British Asian English.

1.2.4. British Asian English

British Asian English. a dialect of British English, has been associated with the British South Asian community comprising primarily of people with heritage in Pakistan, India, or Bangladesh. This variety of English is often spoken by both first- and second-generation speakers, and can be influenced by their first or heritage language. This can cause differentiation in dialects between generations, as first-generation speakers' first language often becomes the heritage language for second-generation speakers (Kirkham, 2021). The broader variation between British English and British Asian English has been explored for a range of phonetic characteristics. These include t-retroflexion and -glotalling (Sharma & Sankaran, 2011), realisations of onset laterals, as well as the monophthongal realisations of *face* and *goat* vowels (Kirkham & Wormald, 2015; Stuart-Smith et al., 2011; Stuart-Smith et al., 2013; Kirkham, 2017; Kirkham & McCarthy, 2020; Wormald, 2016, as cited in Kirkham and Zara, forthcoming).

Generally, all variants of British Asian English adhere to the above-mentioned characteristics. However, they are adapted in "regionally specific ways" in order to fit into the majority accents of the region (Kirkham and Zara, forthcoming). Because of this, British Asian English is often referred to as a contact variety, displaying the stable, long-term contact between English and South Asian Languages across the UK (Kirkham, 2021). Accompanying this are the plethora of languages that together comprise South Asian Languages as a whole: Punjabi, Urdu, Bangla, Sylheti, and Gujarati to name a few. These languages are most often not mutually intelligible, even though some are spoken in the same country. For this reason, a bilingual speaker of English and Urdu might not have

the same accent features as those speaking English and Kokni[1]. While both Urdu and Kokni are Indo-Aryan languages spoken in India, the manner in which production features transfer to English do not fully align. Presently, to the extent of this writer's knowledge, research on BAE in England has primarily focused on native and/or heritage Punjabi and Sylheti speakers (Kirkham, 2017; Kirkham & McCarthy, 2021; Kirkham & Zara, forthcoming; Sharma, 2011; Sharma & Sankaran, 2011; Wormald, 2016). Furthermore, their research is primarily restricted to South England and the Midlands, with one exception being Blackburn in northern England for the exploration of laterals (Kirkham & Zara, forthcoming). This means that British Asian English vowel production in the context of northwest England is yet to be explored.

1.2.5. East Lancashire and the South Asian community

In the UK, British Asians make up an average of 4,9 to 6,3% of the population depending on the measures used (Kirkham, 2021). Enclosing on the county of Lancashire, this number significantly increases to 14% of Lancashire residents based on the 2011 Census (ONS, 2011). Three towns in Lancashire have the highest population of British Asians, namely Blackburn (28,1%), Pendle (18,8%), and Preston (15,5%). When modifying these numbers to solely include British South Asians[2]., Blackburn averages 25,7% and Preston 13,5%. The migration of South Asians started post Second World War, in a time where labour shortages were significant. Primarily men came over to England from the South Asian diaspora, settling in areas with considerable amounts of industrial labour. Many from Pakistan and India settled in the north, specifically Lancashire, where they worked in mill towns the county is famous for (Peach, 2006).

[1] Also known as Konkani.
[2] The modified data for Pendle were unavailable

1.2.6. Sociolinguistic factors

As briefly mentioned in section 1.2.1, the issue of prestigious language variants has caused the loss of distinct northern dialect features. Wells (1982), Haddican et al. (2013), and Leeman et al. (2018) all described the loss of distinct northern dialect features in favour of more prestigious southern forms. Haddican et al. described it as a northward diffusion in their paper exploring the interaction of social and linguistic constraints on vowel changes in northern England. They found that in York, a city in northeast England, the *face* and *goat* lexical sets are slowly becoming diphthongs as opposed to the monophthongal realisation that is traditionally found in the north. However, they note that the latter is still common among the local working-class.

This finding highlights the external factors for language change and maintenance. Socioeconomic status can influence both sides. The working-class in the case of Haddican et al. (2013) seeks to maintain northern language traditions, where a stronger York identity correlates with a higher degree of monophthongal realisations. The opposite is true for those with a lesser connection to the city. Their realisations overwhelmingly favour a 'prestigious' diphthongised form of the two lexical sets. Their association with the monophthongised pronunciation is mostly negative and to them it strongly correlates with the 'less-educated' lower class. To add to this, Evans et al. (2007) found further evidence of social mobility being a driving factor in the use of language varieties. Participants in their study highlighted that acceptance into a university community or workplace required the standard language variety, as opposed to the British Asian English variant they spoke within their own community. So not only do socioeconomic status and identity play a role in language production, but also social mobility.

Contrarily, only small effects for social factors such as socioeconomic status, formality, social mobility were found in a study conducted by Sharma and Sankaran

(2011). They investigated London Asian English for three different generations. In their study, the effect of gender was strongest in the younger second-generation British Asians. They note that the women of that generation do not favour using the dialect of their ethnic community, instead leaning towards a more standard form of London English in settings that they deem appropriate. Interestingly, they do not make mention of losing their London Asian English dialect. Instead, Sharma and Sankaran see that the women are more capable of limiting these forms to personal circles while deviating from it in professional work settings..

These combined findings of Haddican et al. (2013), Evans et al. (2007), and Sharma and Sankaran (2011) show that the influence of social factors on language production is nuanced, dependent on the environment the population lives in, and specific to the community of interest.

1.3. Research questions

Collectively, the South Asian community in northern England has not yet been given adequate attention in contemporary literature. There is currently little data available on vowel realisations by South Asian speakers in Lancashire, with an even more limited amount on Blackburn and Preston. While general knowledge has been established on the monophthongal realisation of the face/goat lexical sets in northern varieties of British English and some varieties British Asian English, as well as a merged *north/force* lexical set for Standard British English, there is no definitive research as it concerns to British Asian English spoken by the South Asian community in East Lancashire. Furthermore, the relation between vowel realisation and social factors such as socioeconomic status, social mobility, and identity makes for an interesting research scope. Not only can it comment on the culture of this decade, but it can shed light on the ongoing conversation

surrounding ethnicity, language variation, and the use of non-standard language varieties of English. Therefore, this thesis seeks to answer the following questions:

1) How are the *north/force* and *face/goat* vowels realised in East Lancashire by British South Asians?

   1a) Are there instances of a (non-)merger in this community?

2) How do the phonological findings relate to external, social factors?

2. Method

2.1. Research overview

This research aims to examine the production of vowels and their prospective mergers among the South Asian community in East Lancashire, as well as explore the social factors that potentially influence the realisation of these vowels. To broaden the current scope of research, the focus will be on the *north-force* as well as *face-goat* lexical sets. Specifically, their realisation in the South Asian community in Blackburn and Preston, a town and city located in East Lancashire. While there is an indication of what these realisations might be in the north of England, such as a monophthongised *face* and *goat*, as well as a merged *north-force* vowel, the specifics of East Lancashire and the British South Asians living there remain unknown. Furthermore, there is no indication of how their language might be influenced by external forces. As a minority group in a predominantly Caucasian, British county and country, there is reason to explore how external factors such as identity, social mobility, and socio-economic status influence their phonemic realisations.

2.2. Participants

A total of seven speakers were able to participate in this study, which was conducted at Lancaster University, all of whom were included in the final sample (see table 1). All the participants were recruited through Lancaster University's Islamic Society, which has a

high participation rate for students of South Asian descent. Through a recruitment message on their social media page, participants were able to contact the researcher about participation. The recruitment message included the requirements for participation, the context of the study (namely it being linguistic research), as well as the reimbursement participants will receive after participation (see Appendix A). All participants were born and raised in either Preston (two speakers) or Blackburn (5 speakers), which was one of the participation requirements. This was done in order to seek out the most authentic East Lancashire dialect possible that had limited outside influences aside from their heritage.

Participant	date of birth	age	gender
F1B	25-8-2001	20	female
F2B	20-12-2000	21	female
F3B	3-10-2000	21	female
F4B	27-6-1999	22	female
F5B	25-4-1998	24	female
F1P	16-7-2001	20	female
M1P	23-1-1999	23	male

Table 1. Overview of participants. Age reflects age at the time of recording data.

Furthermore, all participants, bar one, have migrant parents from two different generations. The second-generation parents were all born in the north of England, while the first-generation were born India. The exceptional set of parents are both first-generation immigrants, of whom the father was born in Pakistan and the mother in Saudi Arabia (to ethnically Indian parents). This will be taken into account during the assessment of the results. Moreover, the age range was limited between 19 and 25 years old, to ensure all participants were within the same generation. Likewise, all seven participants were university students at the time of recording. None of them moved out of their hometown before the age of 18 and only two out of seven participants moved out of their parental home when starting university. Lastly, all participants identified as Muslim and acknowledged it to be a big part of their everyday life in both social and personal settings.

2.3. Procedure

Prior to the experiments, an ethics application was submitted to the Ethics committee of Lancaster University to obtain permission for data collection. Once this was approved, recruitment messages were sent out with the requirements for participation. Before any of the experiments were conducted, participants were asked to read a participant information sheet (see appendix B). In this, they were informed of the purpose of this study[3], how their data would be managed, as well as what will happen with the results of the study. After this, they were asked to fill in a consent form (see appendix C). as well as a questionnaire (see appendix D). This questionnaire was used to gather information about the participants' age, sex, place of birth, first and second languages, their parents' place of birth as well as their occupation. The latter was included to be able to determine socio-economic status.

Participant	First languages	Place of birth parents (F = Father, M = Mother)	occupation parents
F1B	English, Kokni	F: India, M: Blackburn, England	F: mechanic/factory worker, M: teaching assistant
F2B	English, Urdu	F: Zambia *(ethnically Indian)*, M: Blackburn, England	F: IT management, M: Stay at home mother
F3B	English, Gujrati	F: India, M: Bolton, England	F: Takeaway owner, M: driving instructor
F4B	English, Urdu, Kokni	F: Blackburn, England, M: India	F: Works for council, M: teacher
F5B	Urdu, English	F: Pakistan[4], M: Saudi Arabia *(ethnically Indian)*	F: *unknown,* M: teacher
F1P	English	F: Preston, England, M: India	F: religious education, M: primary school teacher
M1P	English	F: India, M: Preston	F: corner shop owner/office admin, M: Stay at home mother

Table 2. Participants' social metrics, including parental heritage, native languages, and parents' jobs

[3] Data collection was performed during my research internship at Lancaster University. The materials, as well as the data, will simultaneously be used for research into rhoticity in North-West Lancashire. This meant that participants were only made aware of one part of the study (consonants and dialects/accents). Only after the recordings were they told about the purpose of this current study. The research into rhoticity was done in collaboration with Dr Claire Nance of Lancaster University.

[4] The participant's father was born right after the partition of India in what is now current-day Pakistan. He moved to England over 24 years ago and considers his roots to be solely Indian on the basis of his parents' heritage in British India.

After the experiment and interview, participants were given a debrief sheet as well as a ten-pound Amazon voucher as compensation for their time and effort. Compensation was funded by the department of Linguistics and English Language at Lancaster University through the Phonetics Lab research group.

2.4. Instructions

All participants were asked to read a word list, after which a sociolinguistic interview was conducted. The word list reading was specifically chosen to elicit isolated utterances of the token words (for the full word list, see Appendix E). While this is not fully comparable to natural speech and the speakers might feel more pressured into proper, correct pronunciation, it provides an utterance that is not affected by preceding or following words. For this word list reading, each speaker was asked to repeat the list three times. After each round, they were given the chance to have a drink and a short break if desired before resuming the experiment. The repetition of the word list was executed to have three samples per token, creating a buffer in case of a speech error. The participants would get a preview of the word before hearing a beep, after which the recording would start, and the participants were able to read the word on the screen aloud. This was done for all 88 words. There were two trial words (their hometown and name) at the start of the word list reading to get them used to the signals used in the recording software.

At the time of conducting the experiments, a sociolinguistic interview was conducted in order to extract token vowels in the context of more casual speech to compensate for the possibly unnatural speech throughout the word list reading. However, due to time constraints, it was not possible to do so. Instead, the interviews are used for their second purpose, which is the exploration of external, social factors that might influence their speech. The interview was done in a setting that would be most comfortable to the speaker. They had access to refreshments and snacks throughout, and were not restricted

when it came to movement beside the headphone that was connected to the laptop. Each participant was told that the interview was to get to know them, their family and social life, as well as their life as a student. There was no focus on language and the questions (see Appendix F) attempted to steer away from linguistics as much as possible. Lastly, they were explicitly told that they do not have to share information in the case of discomfort and that information may be left out if so desired. This was repeated after the interview as well.

2.5. Materials

For the word list reading, a total of 88 words were collected based on ten vowel types (see Appendix E). These words were partly derived from Wells (1982), who mentions words per vowel type in his book to provide examples of vowel sounds. It should be noted that, due to the year in which Wells comprised these lists, the current day realisations were confirmed with a native speaker of British English[5]. For the purpose of this study, the words pertaining to the *force, north, goat,* and *face* lexical sets are of interest, making the remainder distractor words. Every lexical set of interest has between eight and nine token words present in the word list, providing an average of 25 tokens per vowel type for every speaker. On top of that, within every vowel type there was the aim to take the number of syllables into consideration, as well as word stress and the consonants in coda position of the syllable of interest. Ideally, this would be evenly distributed. However, due to restraints on the type of words, word stress, and the lexical sets, most words are closed and monosyllabic. The final token words are displayed in Table 3 below. The word list was imported into AAA (see section 2.6 Tools below), from which the participants will read the words.

[5] Dr Claire Nance, a Lancashire native, evaluated the word list as well as the subsequent pairing of words with their correct lexical set.

Lexical set	**Number of syllables**			**Consonants**
	1	**2**	**3+**	**Coda-position**
Force	5 (s**o**re, n**o**rm, f**ou**r, l**o**rd, h**o**rn)	3 (c**o**rner, theref**o**re, **o**rbit)	1 (unf**o**rtunately)	9x *Liquid /r/
North	3 (Th**o**r, c**o**rk, ch**o**rd)	3 (ass**o**rt, m**o**rtal, abs**o**rb)	2 (imp**o**rtant, f**o**rtify)	8x *Liquid /r/
Goat	7 (r**oa**d, **oa**th, r**o**gue, h**o**me, **o**wn, **o**ld, th**ou**gh)	-	1 (expl**o**sion)	1x *glide /w/ 1x liquid /l/
Face	7 (c**a**ke, cr**a**ze, **a**ge, f**ai**th, r**ai**d, n**ai**l, b**a**the)	1 (**A**pril)	-	1x liquid /l/
*All speakers are non-rhotic. The possible influence of liquid /r/ in coda-position is therefore negligible.				

Table 3. The lexical sets and their token words present in the word list. This is shown alongside the number of syllables and the type of consonants in coda-position of the syllable containing the token vowel. The analysed vowels are marked in bold and underlined.

The sociolinguistic interview was conducted after finalising the word list readings. The questions, found in appendix F, pertained to four distinct categories: *The Household*, *Social Life, Work and School*, and lastly *Life during the Pandemic*. Attention was drawn to social aspects to both explore sociolinguistic factors as well as make the speakers feel more at ease. This was done to elicit more casual speech, as Labov suggests that knowledge of an interview pertaining to language may cause careful speech instead (2006). Furthermore, the questions found in the appendix were used as a guide for the interviewer, as the aim was to let the speakers lead as much of the conversation as possible. To make the interview flow as natural as possible, the interviewer[6] deviated from the set list of questions when necessary before resuming accordingly. In the case of a less

[6] The writer of this thesis was also the interviewer.

talkative interviewee, the number of questions elicited roughly 30 minutes of speech excluding the time used by the interviewer.

2.6. Tools

All recordings for the purpose of this study were made at Lancaster University's Phonetics Lab. As the lab is equipped with a sound-proof booth, adequate recording tools, and the necessary software, all participants were asked to come to the lab in order for the recordings to be done. The recordings were done with AAA (Articulate Assistant Advanced, 2012), a specialised software that allows for the recording of speech alongside different instruments such as ultrasound, EMA (Electromagnetic articulography), and video imaging. The program displays the token word for the speaker, after which a beep follows. After the beep, the recording starts and the speaker is given the opportunity to read the word aloud. During these recordings, all participants had an ultrasound probe underneath their chin to simultaneously record synchronised images of their tongue movements. The probe was held in place by a head contraption, to which the microphone was simultaneously attached to ensure both a stable image as well as a steady position for the microphone so it never moved further from or nearer to the mouth. AAA automatically synchronised the ultrasound images with the voice recordings. Both the microphone as well as the ultrasound device were connected to the same USBPre2 sound device to facilitate synchronised recordings. The possible implications the ultrasound probe might have on the recordings will be discussed later in this dissertation. Furthermore, due to the limits of this dissertation, the ultrasound data will not be included.

The analysis of the token words was done through Praat (Boersma & Weenink, 2018). All sound files were exported from AAA and aligned with a text file in Praat. The target vowels were manually labelled and with the help of several Praat scripts, relevant

duration and formant measures were extracted into csv-files. Every speaker's csv-file was combined in RStudio (2020) before they were used for analyses.

For the sociolinguistic interviews, the same USBPre2 was used to record speech. However, instead of AAA, Audacity was chosen as there was no need for the use of additional instruments. The gain of the device was adjusted based on the voices of the speakers. Soft voices required a higher gain, while loud voices required a lower one in order to keep the decibels at similar values. All audio recordings were saved under anonymised codes based on the speakers' gender and place of birth, after which they were exported as WAV-files. These audio files were then auditorily transcribed in ELAN, the speech segments being no longer than ten seconds each. Transcribing in ELAN also has the benefit of being able to quickly retrieve quotes from speakers, as well as facilitating the export of text files to be analysed for external, social factors.

2.7. Statistical treatments

With a sample size of seven, statistical treatments such as ANOVAs and t-tests have no grounds and will not provide an accurate representation of the speakers and their data. Because of this, a different method of analyses was used for the word list tokens. Combined, the 639 tokens provided ample data to plot different graphs with. R Scripts to combine the formant measures at three different percentages of all speakers and normalise the data were adapted from work done by Sam Kirkham[7] (Senior lecturer, Lancaster University).

To determine duration of each individual vowel, the average of all combined tokens has been calculated with RStudio. Similarly for formant values, the average F1 and F2 value at 25%, 50%, and 75% are calculated (see Appendix H) and visualised in a trajectory plot. After this, the Euclidean distance was used for a box plot of the formant

[7] Senior lecturer at Lancaster University specialising in phonetics and speech variation. He, among other things, uses computational modelling in his analyses of speech production.

values across the vowel space. Differences in box plot size is used to estimate the difference between lexical sets. For the trajectory plot, all extreme values are taken out of the results to ensure data is not skewed.

Lastly, as women generally have higher formant frequencies compared to men, an extra step needed to be taken into account for the male in the data set. Because the single male could possibly skew the data, his data is normalised with that of the female participants, eradicating the possible influence of gender on the results. This follows the way of vowel normalisation by Adank et al. (2004), who found that Lobanov's z-score transformation effectively removes the effect of gender on the dataset (Lobanov, 1971, as cited in Adank et al., 2004).

3. Results

The purpose of this dissertation is to explore the realisation of the *north/force* and *face/goat* lexical sets by British South Asians in East Lancashire, whether they realise these respective vowel pairs as mergers, and how these findings might relate to loyalty and identity. To answer these questions, participants were interviewed and asked to read a word list containing both target and distractor vowels. Duration and formant values were extracted through Praat for both the natural as well as unnatural speech for each speaker, after which they were analysed by means of RStudio. All values were manually inspected before analysis. Lastly, the interviews were manually transcribed before being analysed for social factors such as socioeconomic status, identity, and the results of the analyses are described below.

3.1. Word List

The data gathered from the word list is based on both duration of the target vowels, as well as their F1 and F2 formant values. These values were extracted at the 25%, 50%, and 75% value to explore the range of the vowels within the vowel space. As this part of the

data contains unnatural speech because of the word list, there is a higher possibility for (hyper-)emphasized vowels that could create longer durations and bigger differences within the F2~F1 space.

3.1.1. Duration

There was no significant difference between either vowel pairs. Notably, *north* and *force* have the most considerable overlap with the smallest differences in minimal, median, and maximum values. This is further highlighted in figures 1 and 2 below. It should be noted that outliers have been removed. As there were three repetitions of each token, it was possible to identify outliers with a shorter or longer duration due to hesitations and errors in reading.

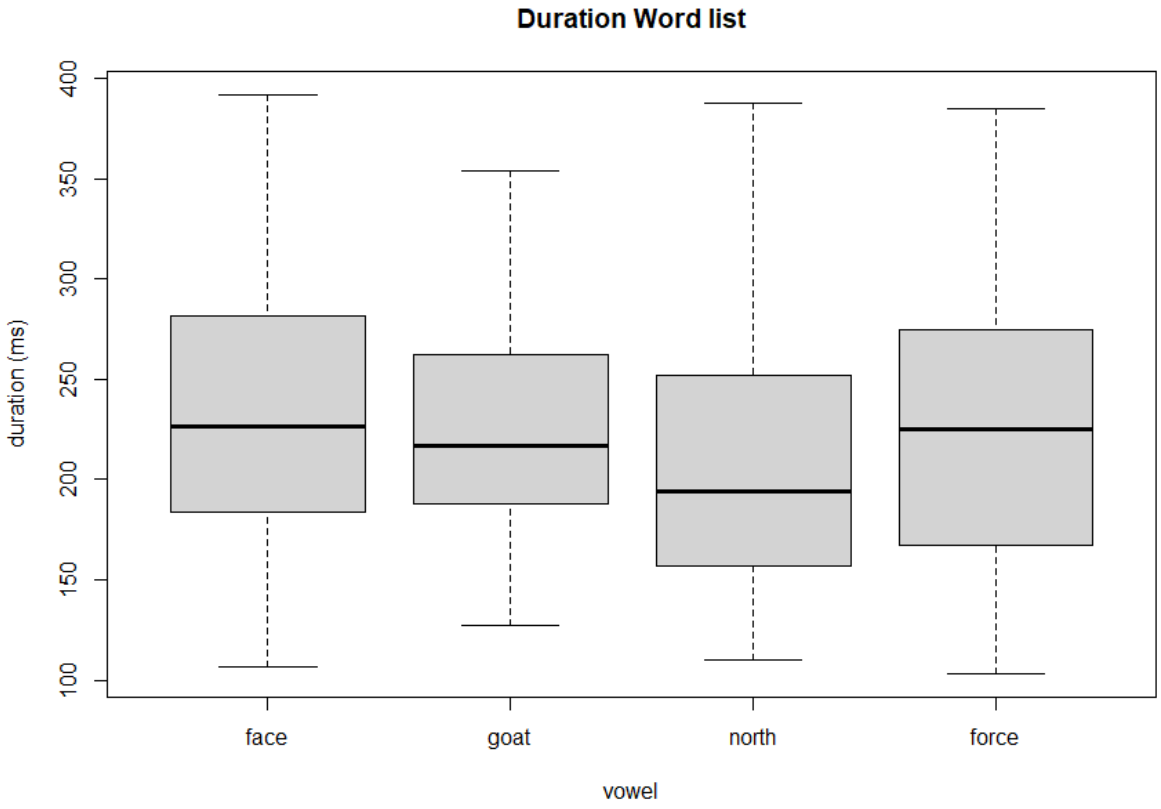

Figure 2. Duration of vowels for all speakers in milliseconds.

	face	*goat*	*north*	*force*
Min	106.580	127.380	109.740	103.290
Lower hinge	180.61	187.070	157.065	170.420
Median	219.28	216.545	194.190	227.220
Upper hinge	276.54	264.510	248.695	274.060
max	391.720	356.730	384.500	403.520

Figure 3. Overview of speakers' duration average in milliseconds per vowel type

3.1.2 Formants

Formant measures provide an indication of where the vowel is located within the vowel space, which is best visualised through the F2~F1 space. In figure 4 below, the Euclidean distance is calculated. This type of measurement may provide a better indication of the variation between vowels, as opposed to separate F1 and F2 differences. Based on figure 4, *north* and *force* appear to be within the same formant range and have no significant difference between them. Noteworthy, however, is the difference between the *face* and *goat* vowel. The bigger the Euclidean distance, meaning a greater shift in the F2~F1 space, the greater the likelihood is for the realisation of a diphthong. When looking at the *goat* vowel in comparison to *face* in figure 4, the former is more likely to be produced as a diphthong overall while the latter appears to remain mostly monophthongal. This combines the realisations for *face* and *goat* in northern England that are found in the current body of research, namely the tendency for northern English dialects to gravitate towards monophthongs together with the possibility for goat to be realised more akin to a diphthong. The outliers, visualised by dots in figure 4, might be due to tokens that contain the liquid /l/ or glide /w/ in coda position (in token words such as *old, own,* and *nail*).

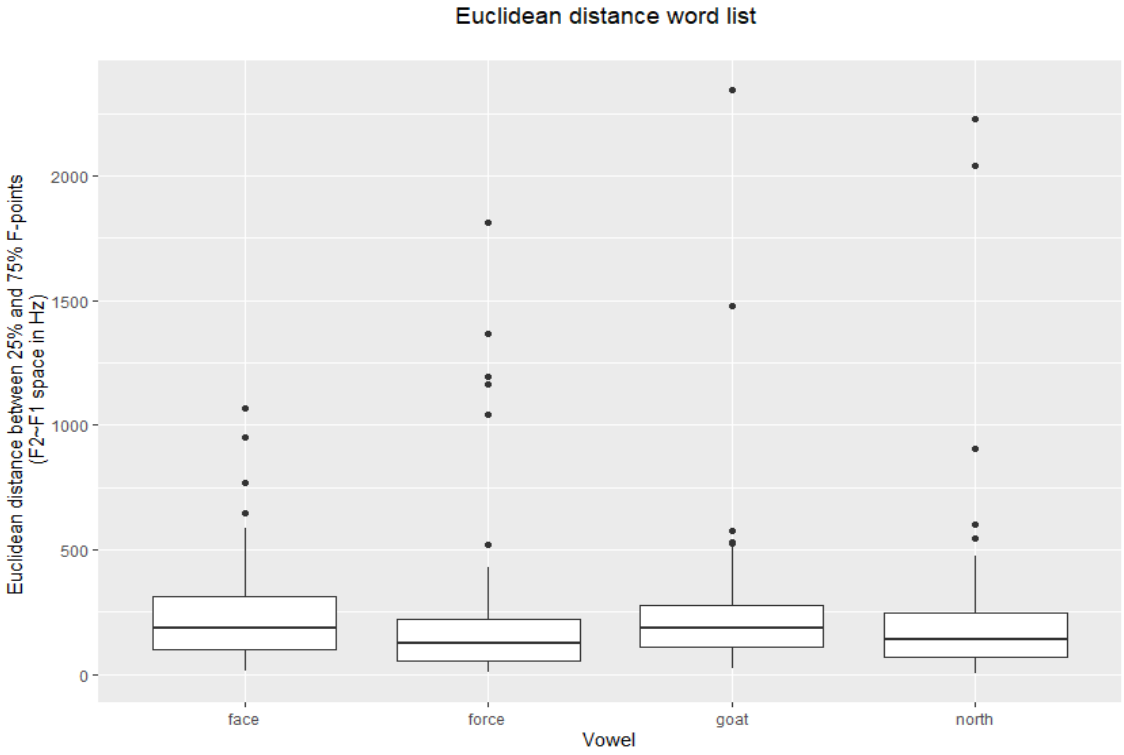

Figure 4. Speakers' Euclidean distances of word list vowel types

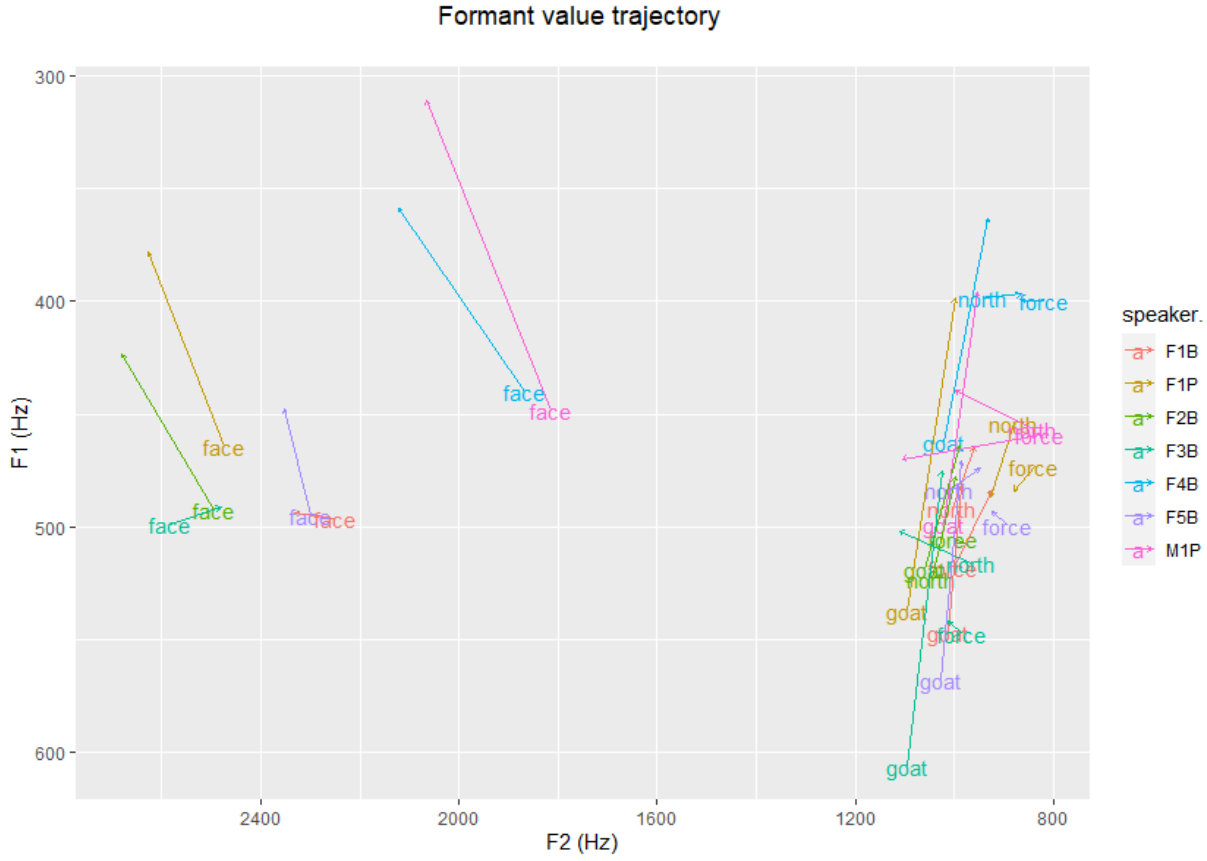

Figure 5. Inverted plot showing the trajectory of vowels across the vowel space using the averaged 25% and 75% formant measures. There values are not normalised.

Figure 5 visualises the position of the vowels within the vowel space. To investigate the overlap between the vowel pairs as well as their realisations, measures were taken of F1 and F2 at 25%, 50%, and 75%. The 25% and 75% were used to calculate the movement of the vowel over the duration of the formant. As seen above, there is clear overlap between *north* and *force*, indicating a full merger for the two close-mid back vowels. While there seems to be an outlier of speaker F4B, who produces these lexical sets as close back vowels, the small difference between them is negligible. For *face* and *goat*, the opposite is true. While *goat* may be classified as an open-mid back vowel, *face* has remained a close-mid front vowel. Here, the exception lies in the *face* outliers that appear to be more central instead of front. As this has happened for a speaker from both Blackburn and Preston, this is not specific to the town and is most likely due to individual variation.

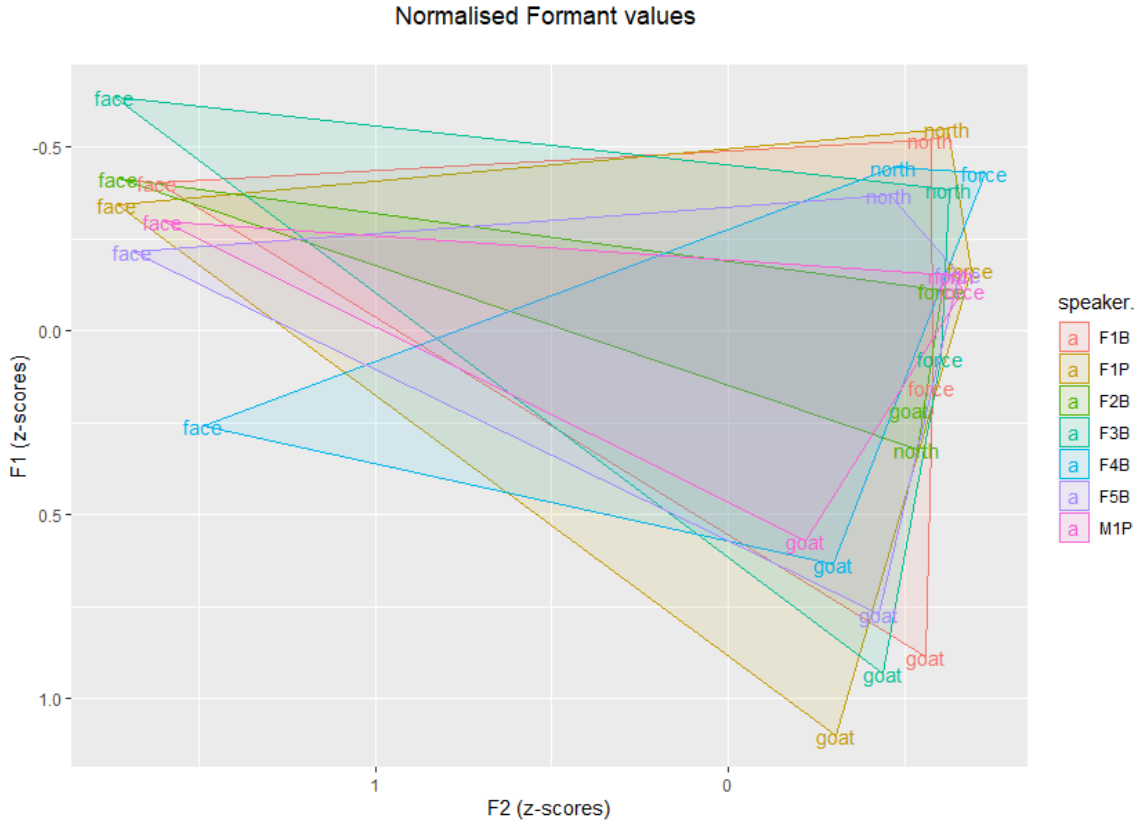

Figure 6. Normalised formant values per speaker with vowel labels. Normalisation is done through Lobanov's method, as per Adank et al. (2004).

To further examine between-speaker variation and analyse vowel production, a polygon plot (see figure 6 above) was made of the normalised F1 and F2 formant values. As per Lobanov's method (Lobanov, 1971, as cited in Adank et al., 2004), these results - are expressed in z-scores. Like in Figure 5, the plot is inverted to mimic the vowel space. Not only does this help visualise the vowels and their respective positions better, for the purpose of this small-scale study it also provides the clearest overview of between-speaker variation. In this sample, there is no significant difference between speakers from Preston and Blackburn as a whole. There are, however, small individual differences that stand out. Speaker F4B has, on the basis of the normalised vowels, a more open production of *face,* while speaker F3B has the most closed realisation. While all have a more diphthongal quality instead of the northern monophthongal characteristic,

3.2. Sociolinguistic interview

To examine the external factors that might influence their speech, the conducted interviews were manually transcribed and analysed. The latter was done for their socioeconomic status, loyalty, and identity, as well as social mobility. While there is no quantitative data accompanying this, it provides valuable insight into the social factors that might play a role in their speech production.

3.2.1. Socioeconomic status

All of the participants, as mentioned in section 2.2, grew up in their hometown of either Blackburn or Preston. Their socioeconomic background can best be described as lower middle- and working-class. Speaker 'F1B' describes in her interview*: "- cause my dad came from India they were quite poor, so they did make the most of what we had, I guess".* Growing up with a lower sense of financial security is prevalent amongst almost all speakers, including speaker 'F1P' who describes finances as "a bit of a struggle for my family". Despite the presence of a first- and second-generation parent in the family, a moderate financial security is only applicable to two speakers.

While those growing up in a moderate to lower socioeconomic status are oftentimes linked to a lowered interest in education, as focus is given to stability and food security instead, all speakers have indicated how highly valued education is in their family. Speaker 'M1P' elaborated on the reason for the high status of education within his family. After describing the work-life balance of his father who used to own a shop in Preston, he

explains why his father in particular wanted him to go into higher education. *"- You get an education for a job and you don't have to sacrifice as much as he did-."*. There is a clear desire to aim for a higher class than the speakers have grown up in, both from the speakers and their surroundings. This type of pressure might result in adapting speech in professional settings, such as university and work, in order to strive and fit in with the bigger local communities. An example of this could be the diphthongisation of *face*, which has been found in this small data set.

3.2.2. Loyalty and identity

All participants went to '*madrasa'*, an Islamic evening school where one is taught Arabic, the Quran, and Islamic teachings. All seven speakers attended Islamic school every weekday, which equals to an average of 15 hours a week. Consequently, there was more contact with their own community than the predominantly white British population of their town, as the frequented mosques were run by British South Asians of a similar creed to that of the speakers. Friend groups were established within this circle as well, creating more loyalty to both heritage and faith.

While there is a strong loyalty to their community and faith, there is a close to equal loyalty to their hometowns. Four out of seven speakers mentioned their desire to continue living in their hometown for the foreseeable future. Speaker 'F1P' elaborated on whether or not she would want to move out of her parental home, saying: *"- even if not at [my parental] home, I'd like to stay in Preston at least. It's just where I've grown up and what I am used, and I'm happy with that.."*. This could explain the result of the *goat* vowel remaining monophthongised, as there is loyalty to standard northern English dialect present in Blackburn and Preston.

3.2.3. Social mobility

As mentioned in section 3.2.1., education has been highly encouraged to all speakers. With this comes their personal desire to aim for a higher education than that of their parents, establishing themselves and their community at large as a significant factor in the development of their city, town, and county. Their undergraduates include medicine, biomedical sciences, political sciences, and English language and literature. On the flipside of having parents wish for a better outcome comes the pressure to succeed and meeting parents' expectations. Speaker 'F4B' describes her family's expectation of her studying medicine, saying everyone wanted her to go to medical school. While she decided on English literature instead, the underlying expectation of going to university remained and even she expresses the sentiment that it will lead to financial security later on. The degree to which this might influence their willingness to adapt their native dialect is unclear, though one could speculate that the pressure to succeed can come at the expense of giving up on a part of your identity.

4. Conclusion

This study seeks to shed light on the realisation of two possible vowel (non-)mergers, namely *north* and *force,* and *face* and *goat*, within the South Asian community in East Lancashire, and how this might relate to loyalty and identity, social mobility, and socioeconomic status. By means of a word list reading and a sociolinguistic interview with seven participants, small-scale data analysis has given results providing novel insights to an under-researched community and their sociolinguistic tendencies. The results indicate that there are no significant differences in duration between the vowel pairs *north* and *force*, as well as *face* and *goat.* Similarly, the Euclidean distance, which measures vowel variation by means of formant values, did not yield a significant result for *north* and *force*. This lack of a distinction coincides with the *north/force* merger found in

both Standard British English as well as northern varieties (Wells, 1982). Tentatively, this paper establishes that *north* and *force* have indeed fully merged in this community. Both vowels have become /ɔː/, straying from the historical diphthong /ɔə/. *Face* and *goat* remain a non-merger, with the vowels being on opposite sides within the vowel space: *face* leaning towards a diphthongised front vowel [eɪ] and *goat* as a monophthongal back vowel [oː]. The monophthongal realisation of *goat* is corroborated by the relatively short Euclidean distance found in the results, as a longer distance correlates with diphthongs, and coincide with the monophthongal realisation of the vowel in Lancashire (Strycharczuk et al., 2020; Baranowski & Turton, 2015). However, the realisation of *face* found in the results goes against that which has been established in existing literature. Like *goat*, *face* has a monophthongal realisation in northern dialects of British English as well as dialects of British Asian English (Sharma, 2011; Stuart-Smith et al., 2011; Wormald, 2016). To find the opposite is noteworthy, but the limited sample size does not make it a strong contrary finding.

As the sample size in this study is small, there is no way to determine the relation between the results and social factors with strong statistical evidence. However, careful considerations can be made with regards to the issue of identity, social mobility, socioeconomic status, and dialect. As all participants are university students with a strong connection to their Islamic faith and South Asian heritage, there is a chance that the production of northern English *goat* is influenced by the subconscious effort to fit into the standard found among their peers. However, the diphthongal realisation of the *face* lexical set can be a result of adapting to the speech of those with a perceived higher socioeconomic status. Like Evans et al. (2007) found, the pressure to conform to a standardised language variety to increase social mobility in a professional setting (e.g., at a university) might have influenced the speakers in this study as well.

In sum, the research questions can be answered as followed. In the South Asian community in East Lancashire, there is an adherence to the *first force merger* described by Wells (1982), where *north/force* are merged and realised as /ɔː/. *Face* and *goat* are a non-merger in this community, though the realisation is not fully aligned with the standard found in northern England. *Face* is realised akin to a diphthong, leaning towards a southern British English /eɪ/ instead of typically northern, monophthongal /e:/. Their *goat* vowel is realised as monophthong /oː/, which is a common feature in northern British English as well as British Asian English. While the maintenance of a monophthongal *goat* vowel, which has been associated with the speech of British Asians, can be seen as a sign of loyalty to ethnic identity, the diphthongal realisation of *face* might imply that social mobility might influence the language variety used by speakers of the South Asian Community. However, these findings are not robust and cannot be said without caution.

4.1. Limitations and future research

The study itself has multiple limitations worth addressing. First and foremost, the sample size of seven, as mentioned above, is small and unsuitable for common statistical treatments such as ANOVAs. This causes the results to be non-conclusive with regards to the general population of South Asians in both Blackburn and Preston. Paired with the small sample size comes the limitation of sex. While vowel normalisation has been used to make the male speaker's data compatible with the female ones, ideally the sample has an even distribution between male and females. That way, sex can be included as a variable to explore language variation. As women are most likely to be at the forefront of linguistic change (Labov, 1994), this variable is an important one to investigate whether dialectal variation is more or less common depending on the sex of the individual. Lastly, it was not feasible to extract tokens from the sociolinguistic interview to evaluate (near-) natural speech due to time constraints. Comparing casual language use to the unnatural

speech from the word list readings, to establish the discrepancies between these two settings, would have been more fruitful. This lack of data leads to the results being skewed towards unnatural speech, therefore not being an accurate representation of the population or their everyday language use.

These results and their possible implications lead to the following questions. When there is loyalty to both heritage and country of residence, how does this affect the dialect of a minority community? When there is a lesser degree of loyalty to the country of residence, to what extent do people from an ethnic minority conform to the dialect of the majority in order to establish a greater likelihood of acceptance and social mobility? Furthermore, does code-switching take place where those of an ethnic minority may actively choose to use the more widely used dialect in certain settings instead of their native one? If so, establishing what motivates this switch can be of significant contribution. Lastly, how much does their vowel production and phonetic realisation differ in a natural versus unnatural setting, and how does this compare to the standard dialect of the area of residence? These questions are left to be answered in the future, with several avenues to expand on the topic of this thesis. For instance, the inclusion of first- and second-generation parents within the analysis can provide a more extensive outlook on language and dialectal change, as well as the social factors influencing them in comparison to their children. Are first- or second-generation immigrants more likely to adhere to a sociolect for a sense of community, or do they gravitate towards the standard dialect of the town or county as a whole?

While no strong conclusions were made on the basis of the results of this study, it has provided an avenue into discovering the unexplored community of South Asians in north-west England. As a demographic that has significantly contributed to the development and

diversity of England, it is important to acknowledge the impact societal factors have had and may continue to have on their English language varieties.

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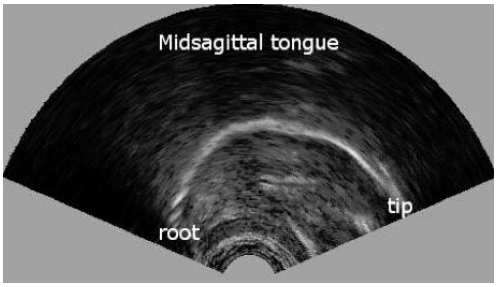
Appendices

Appendix A: Participant Recruitment Flyer

Participants needed for phonetics study

Have you ever wanted to see how your tongue moves when you speak? Or has this question sparked enough curiosity for you to want to find out?



For my phonetic study, I am looking for participants who can serve as speakers. This study looks into dialectal variation and rhoticity in the north Lancashire, and consists of two parts. During the first half, you will get to talk all about you. Growing up in town, family life, your hobbies, your under- or postgrad, ambitions. This part is very informal and although it will be recorded, it is not a test of your knowledge. The second part will be the ultrasound. In the phonetics lab of County South, I will ask you to read a list of words out loud. These words will be recorded and later aligned with your tongue's ultrasound recordings!

Who am I looking for?

- Native speakers of British English
- You and one of your parents were born in Preston, Barrow, or Lancaster
- Between 18 and 25 years old
- No speech impediments
- Someone who has about 2 hours to spare and can come to County South on campus.

What am I able to give in return?

- A 10 pound Amazon voucher for your effort and participation

- An awesome explanation on articulation and tongue movements, including an explanation of your tongue's ultrasound

If you are interested or would like to participate in this study, please contact Malika Mahamdi (m.mahamdi@lancaster.ac.uk). I am happy to answer any questions you might have and am very grateful for your consideration!

Appendix B: Participant Information Sheet

Participant Information Sheet

Variable rhoticity in north Lancashire

For further information about how Lancaster University processes personal data for research purposes and your data rights please visit our webpage: www.lancaster.ac.uk/research/data-protection

My name is Malika Mahamdi, an MA student intern at Lancaster University, and I would like to invite you to take part in a research study about rhoticity in the north of Lancashire. Specifically, rhoticity in Barrow, Preston, and Lancaster.

What is the study about?

The purpose of this study is to examine whether rhoticity is on the decline in north Lancashire and if it is, which areas are losing it and where does rhoticity prevail.

Why have I been invited?

You have been approached because the study requires information from people who are born in either Lancaster, Barrow, or Preston. These towns used to all be part of the same county (Lancashire) and I would like to find out whether rhoticity is still being used today, or whether it has become a part of the past.

Do I have to take part?

No. It's completely up to you to decide whether or not you take part. This is completely voluntary.

What will I be asked to do if I take part?

If you decide you would like to take part, you would be asked to participate in an interview where you will be asked about your life. From your childhood, to jobs, hobbies, and anything you would like to share. This will be recorded and later anonymised so you can't be identified from it. For the second part of the study, you will be asked to read words out loud while an ultrasound is connected to the underside of your chin. This will record your tongue movements while the words you read are recorded by a microphone.

Will my data be Identifiable?

[*Customise this section depending on the type of data you will be collecting. If you intend to use direct quotes from participants, then discuss the steps you will take to protect the anonymity of the participant, but you are not keeping the data 'confidential'. Research data will be anonymised, personal data will be kept confidentially*] The data collected for this study will be stored in a university approved secure cloud storage and only the researchers conducting this study will have access to this data. Personal data will be kept confidentially and in a secure storage space, while the anonymised data might be used during conferences and presentations. This includes the audio recordings and tongue movements. No participant will be identifiable and the ultrasound images will also be anonymous when presented or published. The recorded data will be kept indefinitely.

The files on the computer will be encrypted and the computer itself password protected. The typed version of your interview will be made anonymous by removing any identifying information including

your name. The only information that will be kept is the town you are born in, as this is relevant to the study. Anonymised direct quotations from your interview may be used in the reports or publications from the study, so your name will not be attached to them. All reasonable steps will be taken to protect the anonymity of the participants involved in this project. All your personal data will be confidential and will be kept separately from your interview responses.

What will happen to the results?

The results will be summarised and reported in presentations or presented at academic conferences. It may also be submitted for publication in an academic or professional journal.

Are there any risks?

There are no risks anticipated with participating in this study. The ultrasound positioning might be slightly uncomfortable. However, if you experience any discomfort or distress during or following participation, you are free to withdraw, stop, or request a break.

Are there any benefits to taking part?

Besides the monetary benefit or receiving an Amazon voucher, you will be able to learn something new about your anatomy and the way your tongue works when producing speech. You are also contributing to the field of linguistics, which is rather valuable to those involved in the field.

Questions or concerns?

If you have any questions or concerns about the study, please contact the Malika Mahamdi (m.mahamdi@lancaster.ac.uk) or the head researcher Dr Claire Nance (c.nance@lancaster.ac.uk). Both are based at the Department of Linguistics and English language, County South, Lancaster University.

Thank you for taking the time to read this information sheet.

This study has been reviewed and approved by the Faculty of Arts and Social Sciences and Lancaster's Research Ethics Committee.

Appendix C: Consent Form

CONSENT FORM

Project Title:
Name of Researchers: Claire Nance and Malika Mahamdi
Email: c.nance@lancaster.ac.uk
Please tick each box

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time during my participation in this study and within 2 weeks after I took part in the study, without giving any reason.	☐
3. I understand that short extracts of my anonymised, recorded data may be used in presentations, at conferences, and other academic settings.	☐
4. I understand that any information given by me may be used in future reports, academic articles, publications or presentations by the researcher/s, but my personal information will not be included and all reasonable steps will be taken to protect the anonymity of the participants involved in this project. Anonymised data will be made available to genuine research for re-use (secondary analysis).	☐
5. I understand that my name/my organisation's name will not appear in any reports, articles or presentation without my consent.	☐
6. I understand that any recorded data will be transcribed, and that data will be protected on encrypted devices and kept secure.	☐
7. I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study.	☐
8. I would like to have a sample of my recorded data sent to me over email.	YES/NO
9. I agree to take part in the above study.	☐

_____ _____ _____
Name of Participant Date Signature

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Signature of Researcher /person taking the consent_____ **Date** _____ Day/month/year

One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University

Appendix D: Participant Questionnaire

Participant questionnaire

Name

Date of birth

Gender

Is your gender the same as your sex assigned at birth?

Where are you from?

What is the postcode of the main address where you grew up?

Have you ever lived in another place?

What language(s) did you speak at home growing up?

Where did your parents/step-parents/guardians grow up?

What jobs do your parents/step-parents/guardians do (or did if retired)?

Appendix E: Word list

Harp	**Oath**	**Lord**	Dearly	Air	Cure	**therefore**	**Age**
Smart	Shirt	**own**	Years	Fairly	Lure	Endure	Tier
Mars	Poor	Better	**Old**	Wear	Here	Vinegar	Repair
Learnt	**Thor**	Sister	garner	**Cake**	Clearly	**Assort**	Scared
Surely	Earth	**Horn**	Father	Cursed	**craze**	Impure	Tears
road	**Cork**	**Mortal**	Mere	**Corner**	Plumber	**April**	**Absorb**
Card	**Rogue**	Quarter	**Norm**	Brother	Nursing	**Sore**	**faith**
Clever	**Four**	**Home**	Barely	Persevere	Tour	Third	Ear
Fortify	Arm	Thirty	**explosion**	**Important**	**Worm**	Stricter	**Chord**
Farm	Scarcely	Circus	Earshot	**Though**	Bar	Various	**Nail**
Burp	**Orbit**	Deer	**Unfortunately**	Restart	Bathe	Share	**Raid**

Appendix F: Sociolinguistic Interview Script

Sociolinguistic interview – Questions

(A) The Household

1. How old are you?
2. Where were you born? (Street, town)
3. Where were your parents/parental figures born?
4. Do you have any siblings?
    a. Are you the youngest/oldest/middle child?
5. Did you grow up in (town)?
6. What was your childhood like?
7. Do you remember your favourite childhood game?
    a. If so, what was it? How was it played? What were the rules?
8. Does/did your family have their own rules for certain games?
9. Did you have your own room or was it shared?
10. Did you ever celebrate any special events? If so, which one(s)? (Christmas, birthdays, etc.)
11. Do you currently live with your parents/a parent/a parental figure?
    a. (If they have moved out) What was the best/worst thing about moving out?

(B) Social Life

12. Did you easily make friends growing up?
13. Were you part of a club or group when you were younger?
14. Did/Does your childhood influence who you became/become friends with?
15. Would you consider yourself a social butterfly?
16. Are there any places you enjoy going in your spare time? (Cinema, hikes, restaurants)
17. Have you noticed a difference in your social life since starting university?
18. Have you joined a society at university?
    a. If yes, what made you decide to join?
    b. If yes, how has it impacted your social life?
    c. If not, why did you decide not to join one?
19. How often do you go to social events organised by a society/university/friends?

(C) Work and School

20. When you were a child, did either of your parents work? If so, what did they do?

21. Do any other family members have experience in academics?
    a. (If not), what prompted you to go into academics?
22. Did your parents' profession influence your own academic interests?
23. What was your 6th form experience like?
24. How did you prepare to get into university?
    a. Was this your first choice of university?
    b. Did you ever feel pressure about not getting into university?
25. When starting uni, did you move on campus, to town, or stay with your parents?
    a. What was the deciding factor for your choice?
26. Have you had any part-time jobs? If yes, what was it?
    a. How was the experience?
    b. How many hours would you work (alongside school)?
    c. Did you get on with other employees/your employer?
27. Have you ever taken a gap year (to work/travel/have time to yourself)?
28. What was your dream job when you were younger?
    a. How big of a difference is that compared to what you are studying for now?
29. What are you majoring in?
30. What would your ideal job be after you graduate?

(D) Life During the Pandemic

31. During the pandemic, have you picked up on any hobbies/leisure activities?
32. While in lockdown, have you gotten to know your neighbours better?
33. How did you experience university from home?
34. What is a positive that you have gotten out of the period in lockdown?
35. Which relationships in your life improved throughout the pandemic?
36. If any, is there anything in your daily routine that has changed since the pandemic?
37. What would you have liked the university to do better? (E.g. comments on online course materials, zoom lectures, etc.)

Appendix G: Normalised Acoustic Measurement Results

	speaker.	vowel.	F1_50	F2_50	F1norm	F2norm
1	F1B	face	491.4849	2334.7304	-0.15424894	1.6573933
2	F1B	force	503.9566	949.6598	0.21080766	-0.5732418
3	F1B	goat	513.0261	963.3007	0.47627541	-0.5512733
4	F1B	north	480.2762	916.2816	-0.48233587	-0.6269968
5	F1P	face	410.1438	2583.8220	-0.99191854	1.7454963
6	F1P	force	487.4203	836.8311	0.54821813	-0.6359031
7	F1P	goat	464.7454	1019.4124	0.09630381	-0.3870186
8	F1P	north	473.1794	853.6480	0.26439447	-0.6129794
9	F2B	face	467.4755	2620.8517	-0.50220098	1.7469074
10	F2B	force	492.0380	920.3136	0.07448395	-0.5991510
11	F2B	goat	493.0806	982.1481	0.09896234	-0.5138443
12	F2B	north	502.4715	949.4039	0.31944419	-0.5590181
13	F3B	face	527.6933	2593.0785	-0.12672557	1.7460266
14	F3B	force	543.9750	938.9672	0.16320307	-0.5953341
15	F3B	goat	547.8123	1014.2423	0.23153522	-0.4887837
16	F3B	north	518.6133	944.5075	-0.28841311	-0.5874920
17	F4B	face	391.9898	2021.8262	-0.19853188	1.5445057
18	F4B	force	405.5693	830.2922	0.07438638	-0.5886068
19	F4B	goat	403.4194	934.5802	0.03117814	-0.4019080
20	F4B	north	406.5970	841.0797	0.09504066	-0.5692948
21	F5B	face	460.8442	2389.0294	-0.49545281	1.7504469
22	F5B	force	493.7962	847.6857	0.05778094	-0.6056781
23	F5B	goat	538.2705	973.3476	0.80446300	-0.4135891
24	F5B	north	467.7134	857.0212	-0.38012520	-0.5914077
25	M1P	face	373.4362	1981.8527	-0.97984394	1.6380767
26	M1P	force	445.9286	792.6312	0.37365646	-0.6193461
27	M1P	goat	432.9242	889.5188	0.13085183	-0.4354306
28	M1P	north	448.8729	852.4048	0.42862859	-0.5058817

	speaker.	vowel.	F1_25	F2_25	F1norm	F2norm
1	F1B	face	496.1149	2250.1331	-0.40143491	1.6188408
2	F1B	force	517.9277	1001.8626	0.15419517	-0.5793269
3	F1B	goat	546.6152	1013.8560	0.88494224	-0.5582069
4	F1B	north	491.5298	1004.8168	-0.51822984	-0.5741247
5	F1P	face	464.2716	2473.1200	-0.34070578	1.7329159
6	F1P	force	473.0322	837.5719	-0.16704650	-0.6874003
7	F1P	goat	536.9758	1095.5801	1.10049057	-0.3055947
8	F1P	north	453.8566	880.9789	-0.54716004	-0.6231658
9	F2B	face	492.2961	2493.6311	-0.41406917	1.7276770
10	F2B	force	505.0485	1000.9468	-0.10906867	-0.6047420
11	F2B	goat	518.5745	1059.8469	0.21443563	-0.5127066
12	F2B	north	523.0859	1045.8129	0.32233578	-0.5346357
13	F3B	face	498.7443	2582.1000	-0.63456787	1.7369939
14	F3B	force	547.3762	982.7272	0.07536582	-0.6012667
15	F3B	goat	606.0662	1095.8040	0.93212979	-0.4359500
16	F3B	north	516.0218	966.7542	-0.38234848	-0.6246189
17	F4B	face	439.9259	1868.2495	0.25895365	1.4876010
18	F4B	force	399.4142	818.8272	-0.42685124	-0.7256757
19	F4B	goat	462.1515	1022.8009	0.63520183	-0.2954863
20	F4B	north	398.4884	941.0277	-0.44252304	-0.4679495
21	F5B	face	494.7807	2298.1247	-0.21345849	1.6888553
22	F5B	force	499.2604	892.1512	-0.15302311	-0.6537359
23	F5B	goat	567.5997	1028.6818	0.76893602	-0.4262527
24	F5B	north	483.3891	1009.6249	-0.36714139	-0.4580047
25	M1P	face	448.1720	1813.9056	-0.29532609	1.6021500
26	M1P	force	458.9995	827.5377	-0.10989073	-0.6642951
27	M1P	goat	498.6811	1020.9039	0.56970494	-0.2199844
28	M1P	north	456.6137	840.3595	-0.15075178	-0.6348336

	speaker.	vowel.	F1_75	F2_75	F1norm	F2norm
1	F1B	face	493.9318	2330.3760	0.25987944	1.6386171
2	F1B	force	483.5644	922.7989	0.04834787	-0.6277429
3	F1B	goat	482.3108	985.0799	0.02276911	-0.5274632
4	F1B	north	464.3581	959.3642	-0.34352980	-0.5688685
5	F1P	face	378.0743	2626.5870	-0.97788683	1.7430437
6	F1P	force	483.9458	880.1862	0.72661794	-0.6209838
7	F1P	goat	398.4407	998.4108	-0.64999329	-0.4609483
8	F1P	north	486.8195	928.2350	0.77288234	-0.5559423
9	F2B	face	423.1409	2679.2096	-0.68419938	1.7255424
10	F2B	force	506.8017	979.8640	0.56491561	-0.5643259
11	F2B	goat	463.6665	989.4628	-0.07912329	-0.5513915
12	F2B	north	477.5249	998.4477	0.12779261	-0.5392843
13	F3B	face	491.1746	2480.4061	-0.17726731	1.6629979
14	F3B	force	541.6365	1012.5152	0.54188279	-0.5869032
15	F3B	goat	475.1273	1025.8760	-0.40596217	-0.5664246
16	F3B	north	501.7616	1110.7678	-0.02638866	-0.4363072
17	F4B	face	358.5704	2121.9369	-0.40677210	1.6053867
18	F4B	force	399.3762	864.7403	0.38039544	-0.5807333
19	F4B	goat	363.1946	931.7576	-0.31756870	-0.4641979
20	F4B	north	396.7221	865.7646	0.32919457	-0.5789521
21	F5B	face	447.6888	2353.0213	-0.49623223	1.7219841
22	F5B	force	493.0367	923.4358	0.40670393	-0.5761453
23	F5B	goat	470.8731	984.7173	-0.03460190	-0.4776322
24	F5B	north	474.1314	948.8753	0.03027545	-0.5352500
25	M1P	face	310.9789	2066.3931	-0.90594091	1.2898567
26	M1P	force	469.7479	1105.6877	0.60788531	-0.2764773
27	M1P	goat	395.6701	953.3667	-0.09842951	-0.5248214
28	M1P	north	439.6071	996.8058	0.32049945	-0.4539983