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Change and Variation in the Trondheim Dialect

A study of variation and change of wh-words, diphthongs, apocope and palatalisation in the Trondheim dialect among young adult speakers.

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Master's thesis in Theoretical Linguistics LIN-3990 May 2022

Acknowledgements

First and foremost, I would like to extend my greatest gratitude to my supervisors Björn Lundquist and Nathan J. Young for providing guidance throughout the project. I appreciate that they supported me in the process of writing this thesis, even at the points where the project seemed overwhelming. Additionally, I am grateful for the enthusiasm and interest regarding the subject of this study as it made it easier to believe that it was meaningful to investigate the topic.

I would also like to express my gratitude to Maud Westendorp and Paulina Lyskawa who helped me through the different steps of processing the data, without their help this would not have been possible. I would also like to thank Terje Lohndal for providing help with borrowing rooms at NTNU, without the help, it would have been difficult to find suitable rooms to conduct the experiment.

I must also thank those who participated in the experiment, without their willingness to participate in the experiment, this study would simply not have been possible.

Finally, I would like to thank my family and friends who have had to endure my (seemingly) endless monologues about the thesis. I am grateful for those who have been willing to listen regardless of whether it interested them or not; the support has aided me through the process of writing the thesis. Additionally, I appreciate the help I have received from my friends when I have struggled with parts of the work which was outside my skillset, it reduced the stress considerably.

As a final note, I am in the process of changing my name and therefore I have submitted this thesis with the name I am using, Mikko, rather than the name I currently have, Anniken, at the time of writing.

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1 Introduction

Trøndersk Norwegian is one of the major dialect groups of the Norwegian language. Among the dialects which belong to this group, the Trondheim urban dialect is the variant with the most speakers. The Trondheim dialect is spoken in one of the largest cities in Norway, Trondheim. Recently, the Trondheim dialect has been observed to be in the process of change, and this change has been interpreted as a process of levelling with Standard Eastern Norwegian, the dialect spoken in the capital region of Norway. In this paper, the Trondheim dialect is investigated to achieve a clearer understanding of how the potential levelling in the dialect is manifesting itself in the speech of young adult speakers.

Following earlier claims made regarding possible ongoing change in the dialect, the point of departure for this thesis is the hypothesis that the Trondheim dialect is currently undergoing a process of levelling with Standard Eastern Norwegian in which traditional traits and characteristics are abandoned or changed in favour of the forms present in Standard Eastern Norwegian. The hypothesis is investigated through four characteristics: Wh-words, diphthongs, apocope, and finally, palatalisation of sonorant coronal consonants. If the Trondheim dialect is levelling with Standard Eastern Norwegian, wh-words which traditionally have *k*-forms in the dialect, should be produced with *hv*-forms found in Standard Eastern Norwegian. Further, the diphthongs in the Trondheim dialect are described as narrow, i.e., the onset and offset of the diphthongs are proximate to each other, this characteristic is different from the diphthongs present in Standard Eastern Norwegian. Diphthongs are investigated through optional diphthongs, whether they are produced or not, and the perception of the produced diphthongs. Apocope and palatalisation are frequently considered defining characteristics of Trøndersk Norwegian, and the presence, or perhaps absence, of these are investigated in this study. Palatalisation of sonorant coronals is analysed with Centre of Gravity-values measured from two windows of 30ms from the start of the phoneme and 30ms from the middle, to observe the movement of the consonants. If the Trondheim dialect is levelling with Standard Eastern Norwegian, these four characteristics are expected to change in the direction of what is observed in Standard Eastern Norwegian. The hypotheses are found in the list below.

I. Are the traditional *k*-forms of wh-words substituted in favour of the *hv*-forms found in Standard Eastern Norwegian?
II. Are optional diphthongs produced, and if they are, are they still perceived as narrow to the same degree as described in earlier literature?

III. Is there ongoing loss of apocope, i.e., do younger people still produce words with apocope when they are expected to?

IV. Is there ongoing loss of palatalisation of coronal consonants, or ongoing *depalatalisation*? Are words which traditionally are palatalised in the Trondheim dialect still produced with palatalisation?

The thesis is structured as follows. The background and literature review are found in chapter 2; in this chapter the Norwegian language and the relevant dialects are described, followed by elaboration on palatalisation, and finally linguistic change. In chapter 3, the methodology is presented, this consists of a description of how the data was collected, i.e., the experiment, and how the data was analysed. This is followed by the presentation of the data in chapter 4. The discussion follows in chapter 5. This chapter is followed by the conclusion.

2 Background

In this chapter, the Norwegian language is first presented followed by descriptions by the relevant dialects, Standard Eastern Norwegian, Trøndersk Norwegian, and the Trondheim urban dialect. This is followed by descriptions of topics relevant for the four research questions presented in the previous chapter. Wh-words; the phoneme inventory in Norwegian which includes descriptions of diphthongs; syllable stress, vowel balance and apocope; palatalisation and palatals; linguistic change; and finally, prestige and saliency.

2.1 The Norwegian Language

Norwegian is generally held to be a language without an official spoken standard variety. Despite this, a variety spoken in Oslo, specifically Oslo West, is often perceived as the unofficial spoken standard variety of Norwegian, this is a dialect which is perceived as closest to the dominant orthographic standard, Bokmål (Kerswill, 2016; Kristoffersen, 2000; Stausland Johnsen, 2015). Although Norwegian lack an official standard, there are two official and equal orthographic standards, namely Bokmål and Nynorsk.

Figure 1 Map showing the four major dialect areas of Norway (Husby, 2010).

The Norwegian language is generally separated into two major subgroups, West Norwegian and East Norwegian (Hanssen, 2010; Kristoffersen, 2000; Natvig, 2018; Skjekkeland, 2005). These two are further split, most often into two subgroups each; West Norwegian is generally split into Western Norwegian and Northern Norwegian, while East Norwegian is split into Eastern Norwegian and Trøndersk (sometimes Trøndsk) Norwegian (Hanssen, 2010; Kristoffersen, 2000; Mæhlum & Røyneland, 2012; Natvig, 2018; Skjekkeland, 2005). Some choose to split West Norwegian into three, including Southern Norwegian at the same level as Western and Northern Norwegian, however, generally this dialect group is found as a subgroup of Western Norwegian (see e.g., Hanssen 2010, Mæhlum and Røyneland 2012). Some of the fundamental characteristics which are significant in the separation of Norwegian into the two major groups introduced in the preceding section are phonological. Principles of *Jamvekt*, referred to in English as vowel balance (see Natvig 2018), are frequently brought up as perhaps the most significant factor deciding which of the groups a local variety traditionally belongs to (Dalen et al., 2008; Hanssen, 2010; Mæhlum & Røyneland, 2012; Natvig, 2018; Skjekkeland, 2005).Traditionally in dialects with vowel balance, namely the East Norwegian dialects, disyllabic words with short vowels have obligatorily had equal weight on the nuclei of the syllables, this is explained more thoroughly later (Hanssen, 2010; Natvig, 2018; Skjekkeland, 2005).

The other phonological feature which functions as a crucial characteristic in the determination of the relation between the Norwegian dialects is pitch accents, this is a phonological only observed in a few European languages (Skjekkeland, 2005). West Norwegian dialects are observed to have high tone, i.e., words with tonal accent 1 is produced with a high tone on the nucleus of the stressed syllable, East Norwegian dialects, on the other hand, produce words with tonal accent 1 with a low tone on the nucleus of the stressed syllable (Hanssen, 2010; Kristoffersen, 2000; Skjekkeland, 2005). Detailed descriptions of West Norwegian are outside the scope of this paper, characteristics of West Norwegian which are not found in Trøndersk Norwegian will not be explored further.

2.1.1 Standard Eastern Norwegian

Standard Eastern Norwegian, or Urban East Norwegian (abbreviated in the literature as UEN), is the dialect of Eastern Norwegian spoken in the capital region of Norway. This variety is henceforth referred to as SEN or Standard Eastern Norwegian, note, however, that descriptions of Standard Eastern Norwegian and UEN do not necessarily completely overlap in the literature, but this detail is not significant for the present paper. SEN and other Eastern

Norwegian varieties are quite extensively described in the literature, more so than the other dialects of Norwegian. SEN is generally held to be significant in ongoing changes observed in the Norwegian language, and it is assumed to be the dialect which the Trondheim dialect is levelling with.

As of December 2021, 50.9% of the population of Norway lives in the Eastern Norway region (Thorsnæs, 2021). The population in densest in the capital region, which suggests that a significant portion of the native speakers of Norwegian likely speak SEN, or a dialect closely related. Standard Eastern Norwegian is the most prominent variety of Norwegian; it is rather dominant in traditional medias like TV and radio (Hårstad, 2010; Kristoffersen, 2000). SEN is considered to be close to Bokmål orthography both in form and lexicon (Hårstad, 2010; Kerswill, 2016; Kristoffersen, 2000).

2.1.2 Trøndersk Norwegian

Trøndersk Norwegian, henceforth abbreviated as TN, is a dialect group in Norwegian which is spoken in Trøndelag County, Nordmøre, Eikesdalen and Ytre Hustad in Romsdalen, Kvikne and Elgåa in Innlandet County and parts of Bindal in Nordland County, in addition to Frostviken in Jämtland, Sweden (Dalen et al. 2008, p. 18). In addition to this area, there are dialect continuums to the north, west (or rather, southwest), south, and east (Sweden) (Dalen et al., 2008). Approximately 40% of the inhabitants of the region *Midt-Norge*, Central Norway, resides in the major city, Trondheim (Hårstad, 2010).

Mæhlum and Røyneland (2012) splits TN into three by separating the urban Trondheim dialect from the two other subgroups, however, generally TN is first split into two larger group based on principles of vowel balance (Dalen et al., 2008). East Trøndersk is spoken in the inner areas of the dialect area and has what Dalen et al. (2008) describes as (nearly) complete vowel balance, which results in full assimilation of the vowels in vowel balance words. This is exemplified with the infinite verb <å være> ‘to be’ which is either realised as <å vårrå> or <å varra>, and <veke> ‘week’ realised as <vukku>, <vokko> or <våkkå> (Dalen et al., 2008). West Trøndersk is spoken in the outer areas on the coast, and is generally held to have partly assimilation, which results in å være becoming <å værra> and <veke> to <vækka> (Dalen et al., 2008). The Trondheim Urban Dialect differs slightly from the geographical pattern, as well as the pattern in general, and this is explored further later. In addition to this East/West divide of the dialect, the groups can be further divided (see Skjekkeland 2005, Dalen et al. 2008,

Hanssen 2010, Mæhlum and Røyneland 2012 for elaborations as it is outside the scope of this paper).

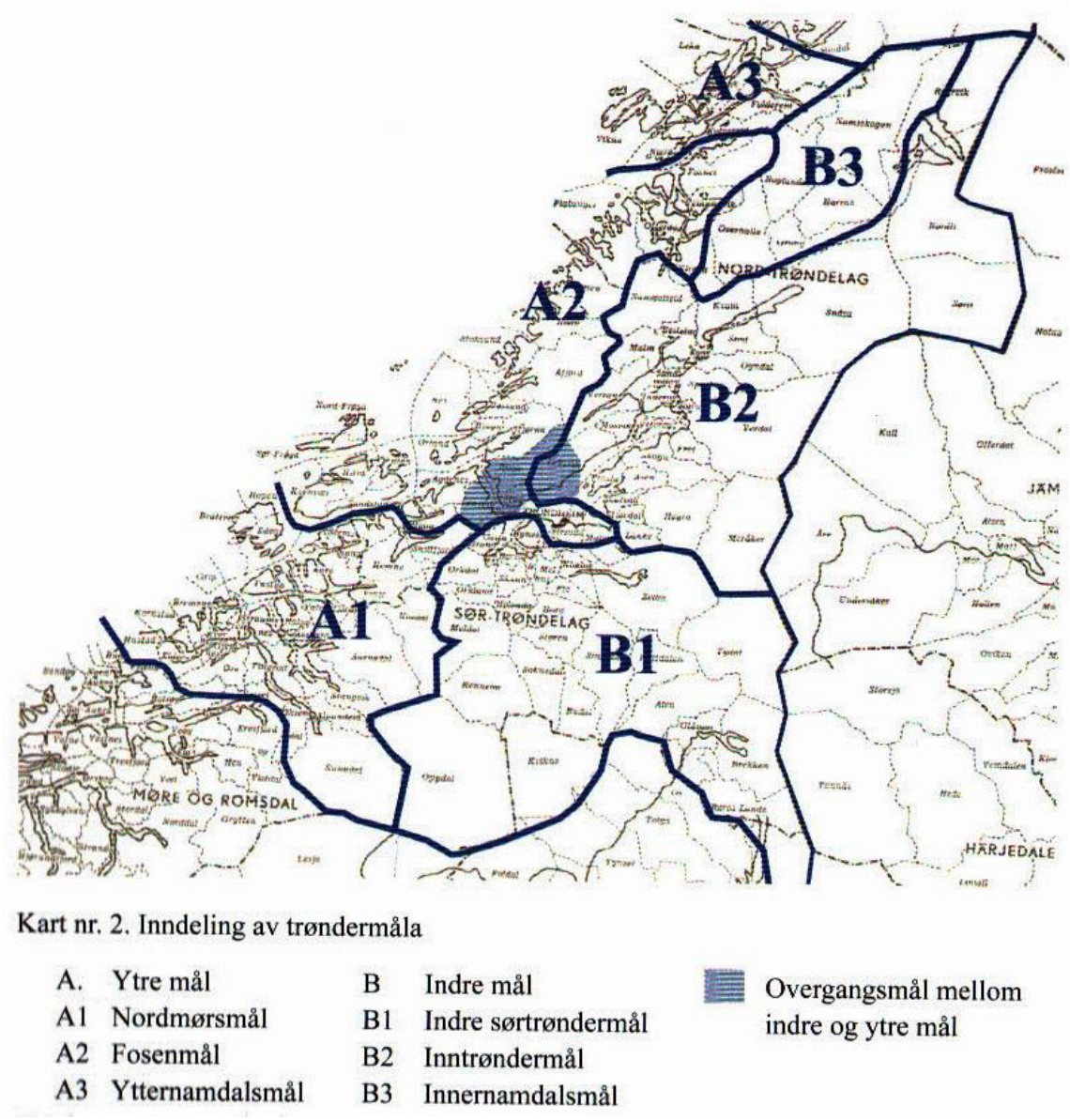

Figure 2 Map showing the subdivisions of TN from Dalen et al. (2008, p. 28). A denotes the West Trøndersk dialects, B denotes the East Trøndersk dialects. The coloured area is the transition area between West and East Trøndersk dialects.

2.1.3 Trondheim Dialect

The city and municipality of Trondheim has been split in various ways over time, but administratively today, Trondheim is split into four: East, West, North, and South (Hårstad, 2010). Hårstad (2010) observes that the differences between the four parts of the city is less sharp than what is the case for the East/West-divide described in Oslo. He adds that Trondheim is better described as *et lappeteppe* "a patchwork quilt", or a mosaic, with a bit of everything spread across the city (Hårstad 2010, p. 34). Despite this, it is possible to observe some general patterns, such as that the southern parts of the city have a higher density of people in poverty,

while people living in East Trondheim and around Midtbyen has a higher educational level (Hårstad, 2010).

The Trondheim Urban Dialect is reported to have differed from the other dialects in the region for as long as centuries, the dialect notably belongs to the Western Trøndersk dialect branch rather than the Eastern which is should geographically belong to (Dalen et al., 2008; Hårstad, 2010). Earlier, it was established that the principles of vowel balance aid in grouping Norwegian dialects together, and based on these principles the Trondheim dialect belongs to the Western branch as it traditionally only have partly assimilation on vowel balance words (Dalen et al., 2008).

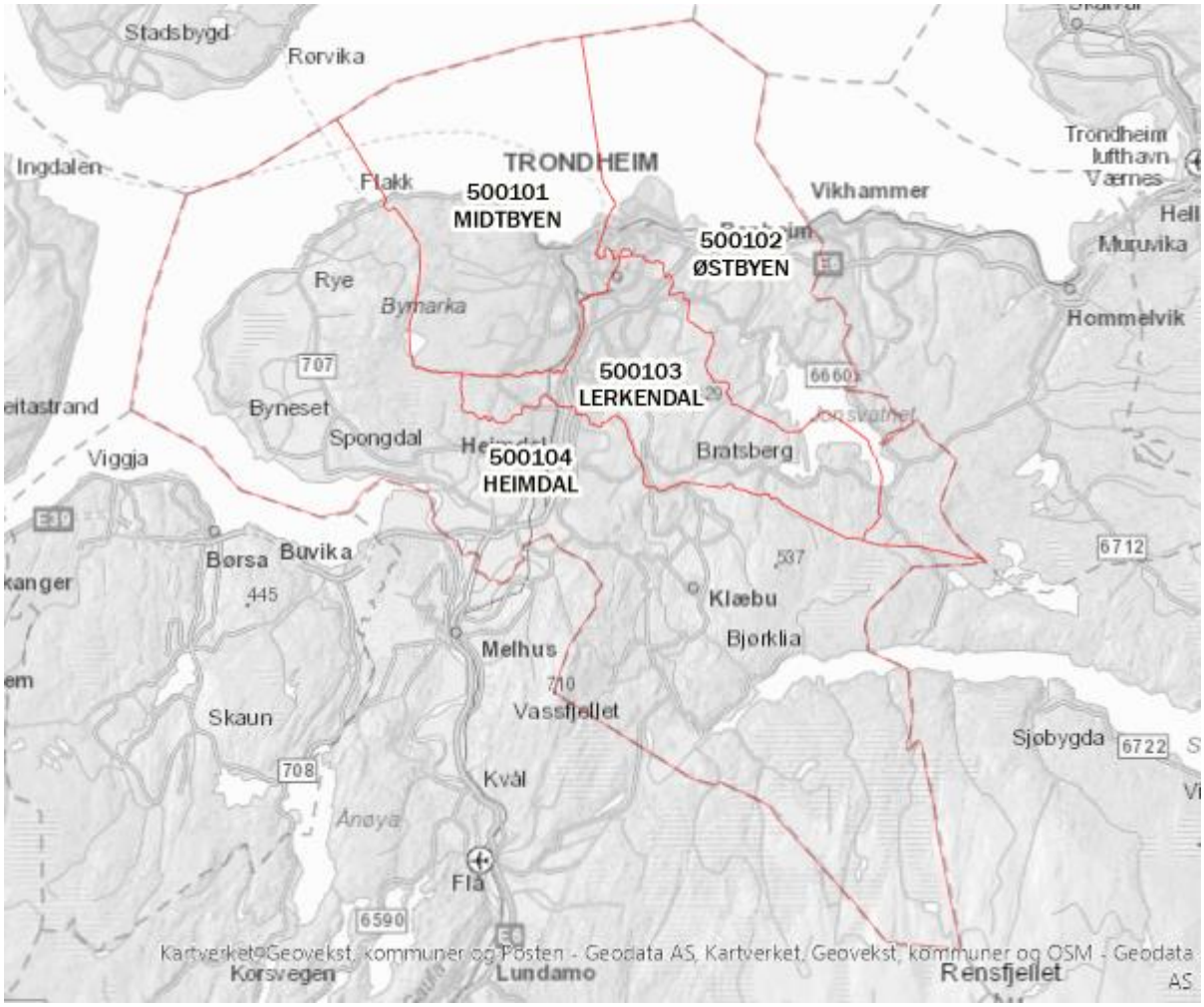

Figure 3 Map of Trondheim Municipality including the four divisions of Trondheim (Kartverket, n.d.). (Heimdal is the name for South, Lerkendal is East, Midtbyen is West, and Østbyen is North).

Hårstad (2010) conducted a study around the late 00s in which people living in Trondheim could report on what they themselves believe they say and do with regards to their dialect. Based on the data he collected, he found relatively few, although periodically striking, differences between speakers from the city centre area and the outskirts, more rural parts, of

Trondheim (Hårstad 2010). Dalen et al. (2008) notes that the idea of what the dialects are supposed to be like remains strong among speakers, thus there may be some interference between reality and the ideal. The pattern Hårstad (2010) observed was that the areas proximate to the city centre have speakers which generally use more standard near forms, while the traditional forms of the local dialect are more prevalent in more rural parts of Trondheim. Hårstad (2010) observes that his informants largely have dialects between the two extremes, and there were no clear geographical differences in the distribution of the *fine* (literally 'pretty'), Bokmål near, and *brede* (literally 'broad'), more traditional TN, variants.

2.1.4 Attitudes to Norwegian Dialects

The various dialects of Norwegian are intended to be treated equally, however; some dialects appear to have higher prestige than others. Stausland Johnsen (2015) notes that linguists have assumed that the variety with the highest prestige is the conservative Bokmål-near variety spoken in the Western parts of the capital, Oslo. Ongoing changes in Norwegian have been assumed to be caused by the other dialects evolving to become more similar to the high prestige variety (Stausland Johnsen, 2015). However, Stausland Johnsen (2015) observes that multiple studies conducted in the Oslo region indicate that speakers have markedly negative attitudes towards this perceived high prestige variety of Eastern Norwegian, while the lower prestige variant from Oslo are generally perceived more positively. Stausland Johnsen (2015) argues that it is the characteristics of the Eastern Oslo variety that are spreading outside Oslo, while the Western Oslo variety is spreading within Oslo. This is similar to what has been observed in Denmark (Stausland Johnsen, 2015).

As for attitudes towards TN, the dialect group is frequently observed to be described as ugly, and even vulgar (Dalen et al., 2008; Scholtz, 2009; Vanvik, 1966). Hårstad (2010) observes that his informants, although some of them were noted to be quite proud of their dialect, described the dialect as "lame" and "ugly" when it was spoken on TV, as most of them found Eastern Norwegian to be more suitable in the medium as it is more common. Attitudes to other varieties of Norwegian is outside the scope of this paper.

2.2 Wh-words (Research Question I)

Wh-words in Norwegian can be produced in a multitude of different ways, in this subsection the traditional forms of wh-words in Standard Eastern Norwegian and Trøndersk Norwegian (including the Trondheim dialect) is introduced. Prior to the presentation of the data on question words, it is necessary to already establish what *hv*-forms and *k*-forms are. *Hv*-forms are wh-

words which begin with *hv*- in Bokmål orthography, generally produced with /v-/, and this is the form found in (Standard) Eastern Norwegian. *Hv*-forms include as follows: <hva> 'what', <hvem> 'who', <hvilke/hvilken/hvilket> 'which', <hvor> 'where', <hvordan> 'how', and <hvorfor> 'why'. *K*-forms, on the other hand, are the dialectal forms of these question words, and are as follows: <ka> 'what', <kem> 'who', <kor> 'where', <kordan> 'how', <koffor/korfor> 'why', and although it is not strictly speaking a *k*-form of a wh-word, it is the equivalent of a wh-word and is therefore included in the study, namely <koss/kosse/kossen> 'which' or 'how'. 'Why' is not included in this study as it did not appear in any of the sentences in the experiment.

2.2.1 Standard Eastern Norwegian

Wh-words in Standard Eastern Norwegian are generally produced with *hv*-forms and are thus similar to Bokmål orthography. The question words included in this study are in Standard Eastern Norwegian generally produced as /ʋɑː/ <hva> 'what' /ʋem/ <hvem> 'who', /ʋilk_/ (where _ indicates the various ways this wh-word can be completed based on grammatical gender and number, only the first consonant is important here) <hvilke(-n/-t/-Ø)> 'which', /ʋʊɖɑn/ <hvordan> 'how', and /ʋʊɾ/ <hvor> 'where'. However, <hvordan> 'how' may be produced as either /vʊɖan/ or <åssen> /ʊsɳ/ (Vangsnes, 2008). The two forms of <hvordan> are observed to be differently distributed based on where in the Oslo region the speakers are from, with the *hv*-version being the most frequent in Oslo West, while <åssen> is more frequent in what Vangsnes (2008) refer to as "The Rest of Oslo" which includes Oslo East and Asker and Bærum.

2.2.2 TN and The Trondheim Dialect

The traditional form of wh-words in TN dialects are *k*-forms (Hårstad, 2010). The wh-words traditionally present in TN are as follows: /kɑː/ <hva> 'what', /kæm/ <hvem> 'who', /kʊs/ /kʊsɳ/ <hvordan/hvilke(-n/-t/-Ø)> 'how/which' but also /kʊɖɑn/ <hvordan> 'how', /kʊɾ/ <hvor> 'where' (Hårstad, 2010). Hårstad (2010) notes that not all wh-words have k-forms, but for this paper, this is not relevant as the wh-words investigated are <hva, hvem, hvordan, hvilke(-n/-t/-Ø), hvor>.

In his 2010 study of the Trondheim dialect, Hårstad found variation on wh-words among his informants. The informants had, however, mostly retained the traditional *k*-forms associated with the dialect. However, he observed some ongoing change in which a selection of words

was produced with *hv*-forms, notably <hver/hvert> ‘every’ and observations of these forms on <hvor> ‘where’ and <hva> ‘what’ (Hårstad, 2010).

2.3 Phoneme Inventory in Norwegian (Research Questions II-IV)

The phoneme inventory presented in this subsection is based on descriptions of Standard Eastern Norwegian, as this is the variety which is the most extensively described in Norwegian. Kristoffersen (2000) remains the most extensive phonological description of Norwegian, and the description is based on what Kristoffersen refers to as Urban East Norwegian, the variety spoken in the Oslo area.

The full consonant inventory of SEN is found in table 1 below. Rather than wholly following Kristoffersen (2000), the inventory follows IPA conventions in the names of place of articulation. Note, however, that some columns and rows are excluded, as only those which contains consonants observed in SEN are included. Moreover, three columns which are separate in IPA is merged into one column here, namely dental/alveolar/postalveolar. The inclusion of postalveolar does not follow Kristoffersen (2000), this is included in the table to include the disputed postalveolar fricative /ʃ/ which is occasionally used in descriptions of Norwegian phonology. The phoneme inventory largely applies to General Norwegian as well, i.e., the phonemes found in Standard Eastern Norwegian are also mostly present in other dialects of Norwegian, with some exceptions (see Natvig 2018). General Norwegian may be considered a baseline for describing Norwegian, the phonemes present in this constructed variety of Norwegian should be present in all Norwegian dialects. More recent phonological descriptions of Norwegian are generally based on Kristoffersen (2000), and often focus on SEN, although other varieties of Norwegian have gotten more attention lately.

The phonemes presented in the table are widely agreed upon, except for the retroflex consonants which cause some disputes in the field (Gram Simonsen & Moen, 2004; Johnsen, 2012; Kristoffersen, 2000; Moen et al., 2011; Papazian, 2002; Simonsen et al., 2008). The disagreement lies in the degree of retroflexion of the proposed Norwegian retroflexes, rather than in a disagreement on the presence of these retroflex-like sounds. The table illustrates that there is a distinction between alveolar and retroflex consonants. Moen and Simonsen (2011) mention that Kristoffersen (2000) is notable in his exception to the type of labelling they follow, i.e., referring to the retroflex-like consonants as retroflexes.

In Norwegian dialects with palatalisation, the palatal column has traditionally contained [c ɟ ɲ ʎ], i.e., the palatalised coronals /t d n l/ (Scholtz, 2009; Vanvik, 1966). A more extensive description of palatalisation is forthcoming.

(1) SEN Consonant Inventory

	Bilabial	Labio-dental	Dental/Alveolar/ Postalveolar	Retroflex	Palatal	Velar	Glottal
Plosive	p b		t d	ʈ ɖ		k g	
Nasal	m		n	ɳ		ŋ	
Tap/Flap			ɾ	ɽ			
Fricative		f	s ʃ*	ʂ	ç		h
Approximant		ʋ			j		
Lateral Approximant			l	ɭ			

Table 1 Consonant Inventory (Association & Staff, 1999; Kristoffersen, 2000; Natvig, 2018)

SEN is argued to have a set of retroflex phonemes, and a process referred to as the Retroflex Rule (Johnsen, 2012; Moen et al., 2011). The Retroflex Rule is a sandhi process in which a consonant chain containing an alveolar preceded by the taps /ɾ, ɽ/ are merged to a retroflex, e.g., /ɾn/ to [ɳ] in /bɑɾn/ to [bɑɳ] 'child' (Johnsen, 2012; Moen et al., 2011). This process may also occur across word boundaries, such as /hɑɾ spist/ → [hɑ ʂpist] (Johnsen, 2012; Moen et al., 2011). Curiously, Stausland Johnsen (2012) found that the sandhi process was obligatory for all alveolars preceded by a tap, except /s/ based on observations of his informants is optional.

Simonsen and Moen (2008, 2011) conducted experiments with use of electropalatography (EPG) and electromagnetic articulography (EMG) in attempt to observe retroflexion in Norwegian (Moen et al., 2011; Simonsen et al., 2008). They had a handful of participants which all spoke SEN. In the 2008 study, they found that across the informants, the retroflex plosives were in general more posterior than their alveolar counterparts. In their 2011 study, they found across their four informants that there was variation, two informants produced retroflexes in the alveolar region, while the two remaining produced it in the postalveolar region (Moen, Simonsen et al. 2011). They observe that there were similarities between the plosive retroflexes and the fricative retroflex with regards to apicality and degree of variation across the informants. Overall, retroflex sounds were found to be produced further back than their non-retroflex counterparts, even in the informants which produced their retroflexes further front (Moen, Simonsen et al. 2011).

Recent literature focusing on change in Norwegian explores the proposed merger between the palatal fricative and the retroflex (or postalveolar) fricative (see e.g., Dalbakken 1996, Scholtz 2009, Jacobsen 2015, van Dommelen 2019, Palombella 2020). It is worth noting here that some literature discuss a merge between the retroflex and postalveolar fricatives (Jacobsen, 2015; Scholtz, 2009). In literature from before the mid-00s, the convention in Norwegian appears to have been referring to the fricative produced further back than the dental/alveolar /s/ and further front than the palatal /ç/ with the postalveolar symbol (see Moen et al., 2004 as an example here), while this convention appears to have changed sometime around the 2010s, with newer literature referring to the sounds which traditionally was labelled postalveolar as retroflex.

Standard Eastern Norwegian is often described as having nine pairs of monophthongs, contrasting between long and short (Kristoffersen, 2000; Natvig, 2018). Some linguists choose to describe SEN with 18 vowels, but Kristoffersen (2000) argues that it is more accurate to describe the vowel inventory with nine pairs rather than 18 unique vowels. Vowel length is contrastive in Norwegian (Kristoffersen, 2000; Natvig, 2018; Skjekkeland, 2005). Vowels in unstressed syllables, most frequently /e/, is realised as [ə], this is only considered as an allophone in Norwegian (Kristoffersen, 2000). The nine vowel pairs are found in the example below.

(2) SEN Vowels

Long: /iː, yː, ʉː, uː, eː, øː, oː, æː, ɑː/

Short: /ɪ, ʏ, ʉ, ʊ, ɛ, œ, ɔ, æ, ɑ/

(Kristoffersen, 2000, p. 13; Natvig, 2018, p. 27).

Which symbols are used for the short vowels seem to vary in the literature, Kristoffersen (2000) uses the same symbols for long and short vowels, while Natvig (2018) uses the symbols in the example above.

2.3.1 Diphthongs in Standard Eastern Norwegian

The number of diphthongs in Standard Eastern Norwegian vary in the literature. Kristoffersen (2000) introduces a set of six diphthongs, three of these are labelled as common, and the remaining three are labelled as marginal. The latter group is limited in use, often restricted to loanwords (Kristoffersen, 2000). Natvig (2018), on the other hand, operates with five diphthongs, although this is a description of "General Norwegian". Some linguists operate with three diphthongs, only describing the common ones which appear in less restricted contexts (Hanssen, 2010). The common diphthongs in Norwegian are <au, ei, øy> (Hanssen, 2010;

Kristoffersen, 2000; Natvig, 2018). The phonetic transcription of these diphthongs varies, Kristoffersen (2000) and Natvig (2018) opt to use the glide /j/, while Hanssen (2010) refers to the diphthongs by use of <i>, note that the descriptions in Hanssen (2010) are not fully phonetic. Below are the phonetic transcriptions of the diphthongs following Kristoffersen (2000), Natvig (2018) and Hanssen (2010).

(3) SEN Common diphthongs

<au> /æv, æw/

<ei> /æɪ, æj/

<øy> /œɪ, œj/

2.3.2 Diphthongs in Trøndersk Norwegian

The dialects of TN which have diphthongs, generally have the same three diphthongs as those found in SEN, with some difference in how they are produced. Unlike in SEN, <ei> is commonly produced as [ei/ej], <au> as [øʉ/æʉ], and <øy> as [øy/øj] (Hanssen, 2010; Hårstad, 2010; Vanvik, 1966). Dalen et al. (2008) notes that there is a tendency in Germanic languages to simplify diphthongs, and this tendency is also observed in TN. Danish and most of Swedish dialects, and southern areas of Trøndelag, have all undergone a process of monophthongisation, i.e., reduction and loss of diphthongs (Hanssen, 2010; Vanvik, 1966). During monophthongisation, the diphthongs <ei, øy, au> are reduced to <e, ø, ø> (Hanssen, 2010). The diphthong <au> appears to be the most stable of the three, thus it is usually the final diphthong to remain in the case of monophthongisation (Dalen et al., 2008; Hanssen, 2010).

2.3.3 Diphthongs in the Trondheim Dialect

The diphthongs of the urban dialect are generally described as tight, with place of diphthong onset and offset markedly proximate to each other (Dalen et al., 2008). Hårstad (2010) provides some examples of diphthong use which is a characteristic of the urban dialect, namely the conjugation of the verbs in the examples below. I have constructed the examples below myself, as I am a native speaker of the dialect. Notice the apocope in both the infinite and present tenses. Less conservative forms of Bokmål allow the conjugation of past tense with diphthong.

(4) Examples of verbs with diphthongs in past tense

a. *Bryte* ‘to break’

Trondheim: *å bryt – bryt – brøyt*

Bokmål: *å bryte – bryter – brøt/brøyt*

b. *Skyte* ‘to shoot’
   Trondheim: *å skyt – skyt – skøyt*
   Bokmål: *å skyte – skyter – skjøt/skøyt*
c. *Krype* ‘to crawl’
   Trondheim: *å kryp – kryp – krøyp*
   Bokmål: *å krype – kryper – krøp/krøyp*

Hårstad (2010) states that the monophthongisation only occurs in words which are generally produced with monophthongs in Standard Eastern Norwegian, suggesting that any loss of diphthong may be a result of a structural merge between the Trondheim urban dialect and Standard Eastern Norwegian, rather than an exclusive process of monophthongisation (Hårstad 2010, p. 192). Presently, speakers mix between diphthong and monophthong forms, some might use monophthongs more frequently than others, thus being further into the change than others.

2.4 Syllable Stress, Vowel Balance and Apocope (Research Question III)

Vowel balance is a principle which contains *overvektsord*, (stress) overweight words, and *jamvektsord*, vowel balance words. Words belonging to the first group mentioned are words which have a stress heavy first syllable which over time has undergone weakening, or in some cases complete loss, of the unstressed vowel of the ultimate syllable (Dalen et al., 2008). Apocope is held to relate to vowel balance and syllable weight, as words which traditionally underwent a process of change to get vowel balance forms did not undergo apocope. Apocope is, however, traditionally expected on words which would be stress overweight without some reduction to the word final vowel.

2.4.1 Standard Eastern Norwegian

In Eastern Norwegian, the final vowel in traditional stress overweight words has been weakened, e.g., *gryta* > *gryte* ‘(cooking pot’, sometimes, the weakening of the final vowel results in a schwa (Dalen et al., 2008). The vowel balance words are linked to disyllabic words which contained a short vowel in the root syllable and equal stress on both syllables in Old Norse (Dalen et al., 2008; Skjekkeland, 2005). The vowel of the ultimate syllable in these words has retained its (unweakened) quality (Dalen et al., 2008).

Vowel balance words undergo a process referred to as *jamning* in Norwegian literature, this can be translated as *vowel equalling* or *vowel levelling.* This is a regressive assimilation process in which the vowels of the two syllables become more similar (Dalen et al., 2008; Hanssen,

2010; Skjekkeland, 2005). The result of this assimilation process is either full assimilation or partly assimilation. Today, there are few if any traces of this process in the capital region, and in the Eastern Norwegian region, some dialects proximate to Trøndelag county has this effect in Eastern Norwegian (Dalen et al., 2008). Examples of what vowel balance forms may look like are exemplified earlier in this chapter in the description of TN in 2.1.2.

2.4.2 Trøndersk Norwegian

The difference between TN and SEN is that TN dialects use apocope to follow the vowel balance rule, rather than simply weakening the vowel. Apocope is generally found on disyllabic words which in SEN receives tone accent 2, and the deletion of the syllable final vowel have traditionally resulted in a circumflex tone on the remaining vowel (Dalen et al., 2008; Skjekkeland, 2005). Skjekkeland (2005) claims that the circumflex tone is gradually disappearing from TN. Details regarding the circumflex tone is outside the scope of this paper.

Apocope is a process which is widespread in TN and Northern Norwegian. In principle, all word final vowels can undergo apocope in Norwegian (Hanssen, 2010). In TN, the vowel balance rule restricts the application of apocope as words which formerly had vowel balance traditionally do not delete the final vowel (Dalen et al., 2008; Hanssen, 2010). While many Norwegian dialects, including Standard Eastern Norwegian, traditionally solved stress overweight by weakening the vowel, TN generally apply apocope to solve the problem. Apocope is thus closely related to syllable stress and vowel balance. The word groups which are according to Dalen et al. (2008) the most important with regards to apocope are as follows: infinite forms of verbs, past tense of weak *-e* verbs, and finally, indefinite forms of weak feminine nouns.

From a geographical point of view, the most widespread forms of apocope are apocope of infinite verbs, present and past tense of weak verbs (Hanssen, 2010). According to Dalen et al. (2008), the most stable feature of TN might be apocope of infinite verbs. Apocope of nouns, on the other hand, is subject to more variation across the variants of the dialect (Hanssen, 2010). The Eastern branch of TN uses more apocope forms than what is observed in dialects of the Western branch, and it is most frequently used in the northern and central areas of the geographical region of the Eastern branch (Hanssen, 2010). Apocope of weak feminine nouns, e.g., <ei kåpe> > *ei kåp* ‘a coat’, are more widespread than apocope of weak masculine nouns, e.g., <en okse> > *en oks* ‘a bull’, these are restricted to the Eastern areas of the dialect area (Hanssen, 2010).

2.4.3 Apocope in the Trondheim Dialect

There is a strong tendency of apocope in the urban dialect, which includes a use of apocope forms of words which traditionally should not have apocope following principles of vowel balance (Dalen et al., 2008). Infinite verbs are observed to have apocope regardless of traditional syllable weights (Hårstad, 2010). Dalen et al. (2008) state that the process is not completed, and at the time of publishing, what is most common is a mix between forms with apocope and vowel balance forms, although this may have changed in more recent years. Hårstad (2010, p. 202) asserts that in his data material, young speakers exclusively use apocope forms of infinitives; there are almost no instances of vowel balance forms of these words. Although apocope of verbs is frequent, apocope of other parts of speech, most notably weak feminine nouns, appears to be disappearing (Hårstad 2010, p. 204). According Hårstad (2010, p. 217), adjectives have retained the traditional apocope pattern, i.e., loss of *-e* in comparative forms and when the adjective is used predicatively, e.g., "Dæm e fin" (Transl. 'They are pretty') rather than the Standard Bokmål "De er fine". Hårstad (2010) suggests that the ongoing changes in apocope caused by a structural merge between the Trondheim dialect and SEN.

The instances of loss of apocope are in Hårstad (2010) grouped into two groups. The first group contains infinite verbs which would end in unwanted consonant clusters if the final vowel was deleted, and the second group mostly consists of recent loanwords (Hårstad 2010). Hårstad (2010) theorises that the presence of new loanwords without apocope may suggest that apocope is no longer as active as it traditionally has been. He further mentions that there were instances of words which traditionally have apocope in the dialect being produced without apocope, but he adds that this was rather infrequent in the data (Hårstad 2010, p. 204).

2.5 Palatalisation and Palatals (Research Question IV)

2.5.1 Palatalisation in Norwegian

Although palatalisation of coronals is found in many varieties of Norwegian, geographically spread from north to south, east to west, it is generally a characteristic heavily associated with TN (Dalen et al., 2008; Hanssen, 2010).

2.5.1.1 Trøndersk Norwegian

The degree and use of palatalisation is observed to vary greatly in TN, southern parts of the region, i.e. around Røros and towards the border between Trøndelag and Innlandet, are noted to have more of this process than what is seen in the northern areas, north of Trondheim (Dalen et al., 2008). TN generally palatalise the coronal consonants /l n t d/ preceded by a short vowel,

and the consonant chains /ld, lt, nd, nt/ are also subject to palatalisation (Dalen et al., 2008; Hanssen, 2010; Scholtz, 2009; Vanvik, 1966). The general inventory of palatals in TN are thus /ʎ ɲ c ɟ/ (Scholtz, 2009; Vanvik, 1966). The consonant chains only undergo palatalisation after being subject to assimilation, thus words like <kveld, sand> are first assimilated to /kʋell, sɑnn/ followed by palatalisation resulting in /kʋeʎʎ, sɑɲɲ/. Some dialects in TN are argued to have an voiceless palatal lateral, generally only expected preceding /c/, although the literature provides examples without this (Dalen et al., 2008; Vanvik, 1966). Vanvik (1966) exemplifies this sound with <tatl> [tɑʃ̥] "something weak and poor, weak and clumsy person; do something badly, do something useless".

Palatalisation generally occurs in the offset of stressed syllables, although some southern dialects allow it in the offset of unstressed syllables too (Dalen et al., 2008). Only the nasal /n/ can be palatalised in unstressed contexts (Dalen et al., 2008). The least stable form of palatalisation in Norwegian is argued to be palatalisation of velars, there are some TN dialects which have this, but compared to palatalisation of coronal consonants it is rather uncommon (Dalen et al., 2008; Hanssen, 2010). As velar palatalisation is uncommon in TN, it is not elaborated on further. Dalen et al. (2008) notes that although palatal consonants have historically been a stable feature of TN, palatals have gradually disappeared recently, the degree of palatality is what is becoming weaker.

2.5.1.2 Trondheim Dialect

Palatals in the urban dialect is only found in stressed syllables (Dalen et al., 2008; Hårstad, 2010). Phoneticians have, according to Dalen et al. (2008), observed an ongoing process of loss of palatalisation, especially in Trondheim, where the palatality itself is weakening. Loss of palatals generally results in a substitution with their alveolar counterparts, thus /ɲ/ becomes /n/ and /ʎ/ becomes /l/, and Dalen et al. (2008) claims that the palatal nasal in TN is substituted with a /n:/ (Dalen et al., 2008; Hanssen, 2010). Hårstad (2010, p. 196) found that most of his informants showed tendencies of loss of palatalisation, thus, consonants which traditionally were palatal is realised as something else between palatal and alveolar. Hårstad (2010) suggests that speakers are only gradually losing palatals, not completely losing them in favour of the alveolar counterparts, but rather resorting to something in between palatal and alveolar. This aligns with patterns of linguistic change (Bermúdez-Otero, 2007).

Hårstad (2010) further adds that some of his informants produced sounds which clearly could be perceived as retroflexes. Hanssen (2010) addresses change from palatal to retroflex, and notes that this is an uncommon change, although it is found in the Northern Norwegian Narvik

dialect. In the Narvik dialect, words like <panne> 'pan, forehead' may be pronounced as [pɑɳə] rather than [pɑɲə] and <alle> 'everyone' is pronounced like [ɑlə] and not [ɑʎə] (Hanssen 2010, p. 76). Hårstad (2010, p. 197) uses the symbols /l̩ ɳ ɖ ʈ/ for what he refers to as *depalatalised consonants*, even in the cases where the sound is clearly perceived as retroflex. He adds that these symbols do not refer to the exact same realisations, i.e., a lateral sound described as /l̩/ may be produced in a range of different ways, from the palate and as far front as alveolar (Hårstad, 2010). These symbols are best understood as an attempt to capture the current ongoing change of the palatals in Trondheim (Hårstad, 2010).

Among the consonants which may be palatalised, Hårstad (2010) found palatal /d/, [ɟ], to be least frequent, furthermore, /t/ as [c] was noted to be infrequently palatalised. The most stable palatals in Trondheim are thus [ɲ] and [ʎ], with the nasal being the most stable of the two (Hårstad, 2010). Hårstad (2010, p. 198) observed that speakers could exclusively palatalise /n/, but if they had the palatal lateral in their phoneme inventory, they would also have the nasal. The voiceless palatal lateral [ʎ̥] is assumed to only occur preceding /t/ in the Trondheim dialect, if it remains present today, and in words without /t/, [ʎ̥] is generally substituted with a difference sound (Dalen et al., 2008). In a word such as <litj> 'little', a speaker from Trondheim is expected to produce /liçç/ rather than /liʎ̥ʎ̥/, substituting the voiceless palatal lateral with a palatal fricative (Dalen et al., 2008). Hårstad (2010, p. 196) found that the voiceless palatal lateral is mostly found followed by a plosive stop in the words <alt, alltid, kaldt, holdt>, often with emphasis added. Hårstad (2010) notes that although the voiceless palatal lateral is traditionally considered normal in Trondheim (see Vanvik 1966), this phoneme was rare in his data.

2.5.2 Palatalisation

Until now the terms for palatals and palatalisation have been used about each other due to the nature of the literature on the palatal-like sounds of TN. The term *palatalisation*, however, is in phonological literature used to describe two different, but somewhat similar, phenomenon. One possible use of the term is to refer to the addition of a secondary palatal articulation on a phoneme, while the other possible use is when the primary place of articulation moves in the direction of the palatal region from elsewhere (Spinu et al., 2012; Urbanavičienė, 2019; Zsiga, 2000). The term palatal simply denotes consonants with a palatal place of articulation. Urbanavičienė describes primary palatalisation in a manner which explictly states that the palatal articulation of the consonant is the only possible way to produce the consonant, secondary palatalisation, on the other hand, is described as a variant of articulation of the

consonant (Urbanavičienė, 2019). Secondary palatalisation is cross-linguistically more common on coronal consonants than velars (Spinu et al., 2012). Palatalsiation is not assumed to be possible on any other type of consonant than coronal or velar.

Palatalisation often takes place in environments containing [i j] or other front vowels, although unconditioned palatalisation may also occur (Campbell, 2013). Often, secondary palatalisation is acoustically realised in the second half of the palatalised segment (Zygis & Hamann, 2003). Therefore, the second half of palatalised segments are expected to have higher formant values than what is observed for the non-palatalised counterparts. In phonology, palatalisation is often measured with the F2 values. Later, another method used to analyse palatalisation is presented, namely Centre of Gravity.

2.5.2.1 Formant Values

Formant values provide a method to compare vowels and consonants, such as comparing non-palatalised and palatalised consonants. The values of the formants can furthermore aid in determining what phoneme a sound segment is. Formants are frequency pekas, and the relationship between the locations of the first formant (F1), the second formant (F2), and the third formant (F3) is said to most strongly determine the perceived sound quality (Zsiga 2012, p. 136). Sounds which are produced in the back of the mouth and rounded vowels result in a lowering of F2 values, palatalisation, on the other hand is observed to raise F2 values (Zsiga, 2012). F2 values of alveolar consonants are described as relatively high, located around 1600 and 2000 Hz in general, palatals raise F2, F3 and F4, while retroflexes are observed to lower F3 (Zsiga, 2012). From an acoustic point of view, the formant transitions of palatals are similar to those observed in alveolars (Geng et al., 2005).

Zsiga (2012) and Urbanavičienė (2019) both describes palatals as behaving similar to the vowel [i]; Zsiga (2012) states that the formants of palatals are similar to the formants of [i], and Urbanavičienė (2019) describes the articulation of palatals and the close front vowel as similar. The relation between palatals, palatalisation and the vowel [i] is apparent; in Romanian, surface palatalised consonants are associated with the presence of one of the two homophonous inflectional suffixes consisting of /-i/ (Spinu et al., 2012).

Urbanavičienė (2019) investigated palatalisation in Lithuanian by using four different methods, and concluded that there was not a single distinguishing acoustic feature of the palatalised and non-palatalised consonants which were reliable in all cases. The first method Urbanavičienė (2019) employed was looking at spectral peaks in a Fast Fourier Transform (FFT) spectrum.

Values above 8000 Hz were excluded, as values above this are not considered to be acoustically important due to the lack of human ability to perceive sounds with higher frequencies (Urbanavičienė, 2019). Other approaches she used include looking at the relative intensity calculated by dividing mean intensity (of a fricative or affricate) by the mean inensity of the vowel in its phonetic environment, and F2 loci by using the locusequation formula ($F2_{onset}$ = k * $F2_{middle}$ + c, k and c are consonants) as palatalisaton of consonants when articulating the palatalised consonant F1 becomes somewhat lower, F2 sharply rises and F3 rises a little (Urbanavičienė, 2019). The conclusion Urbanavičienė (2019) reached may suggest that the methods available to investigate palatalisation cannot fully capture the phenomenon.

Iskarous and Kavitskaya (2018) present two different types of palatalisation found in Slavic language. In the first type, palatalisation is, phonetically, argued to be the result of coarticulation of a consonant with a neighbouring high vowel, this description applies to secondary articulation palatalisation (Iskarous & Kavitskaya, 2018). The second type they present results in a change of primary articulation in the vicinity of a front vowel (Iskarous & Kavitskaya, 2018). Palatalised consonants, at least in Slavic languages, are produced with small distance between the front of the hard palate and the front of the tongue dorsum, consonants which are not palatalised are observed to have a mucher larger space between the two (Iskarous & Kavitskaya, 2018). Iskarous and Kavitskaya (2018) observe that the gesture of palatalisation is audible near the vowel of all palatalised consonants. They claim that it is well known that palatalisation causes the F2 values to be high around 2000 Hz and F3 values close to F2 values (Iskarous & Kavitskaya, 2018). The high, front vowel [i] have F2-values close to 3000 Hz (Zsiga 2012, p. 136).

2.5.2.2 Centre of Gravity

Centre of Gravity, which is measured in Hertz, is the mean frequency in a given range as weighted by the intensity values in each frequency bin (Tabain & Butcher, 2015). The given range may, for example, be the burst spectrum of a plosive or windows with a given length as is presented later (Hussain et al., 2015; Malmi, 2019). The Centre of Gravity values observed for palatals are frequently observed to be higher than their alveolar, retroflex, and velar counterparts (Hussain et al., 2015; Tabain & Butcher, 2015).

Centre of Gravity, henceforth COG, values can be used to analyse palatalisation (Hamann & Avelino, 2007; Zygis & Hamann, 2003; Żygis et al., 2015). COG is often used to analyse fricatives, especially sibilants (Hamann & Avelino, 2007; Zygis & Hamann, 2003; Żygis et al., 2015). However, Malmi (2019) includes the coronal consonants /l n t/ as well. Hussain et al.

(2015) used COG as one of the measurements to analyse plosives in Punjabi, while Tabian & Butcher (2015) used COG as one way to measure plosives in Pitjantjatjara; both include alveolars, retroflexes (also argued to be apicals) and palatals in their analyses in the languages. The COG-values are generally calculated by excluding parts of the consonant (Hamann & Avelino, 2007; Zygis & Hamann, 2003). In the literature, it varies what is included in the calculation of COG-values. Zygis and Hamann (2003 excluded 5% of the beginning and end of the consonant, Hamann and Avelino (2007) excluded 10% of both sides of the consonant, while Malmi (2019) calculated COG-values in two windows of 40ms each, the first window was measured from the beginning of the consonant, while the second window was measured for the middle. The exclusion of parts of the consonants are conducted in attempt to avoid overlapping effects from surrounding sounds (Hamann & Avelino, 2007; Malmi, 2019; Zygis & Hamann, 2003).

Malmi (2019) used COG to measure the quality of non-palatalised and palatalised consonants in Estonian, and the data were statistically analysed in a Generalised Linear Mixed Model (GLMM). The dependant variables were the spectral movement measured from the beginning and from the middle of the consonant, and the independent variables were gender, vowel, and yes or no for whether the consonant had palatalisation (Malmi, 2019). The data used in the study was transcribed with a forced alignment software, and manually corrected when needed (Malmi, 2019). Palatalised /l/ in contexts with /ɑ/ were observed to decrease from above 600 Hz to below 600 Hz for females and decrease sharply from above 550 Hz to below 450 Hz for males (Malmi, 2019). The values on non-palatalised /l/ in /ɑ/ contexts for females showed a quite level change from right below 600 at start to slightly closer to 600 Hz at the middle, for males there was a decrease from below 550 Hz to below 450 Hz. The values for palatalised /n/ and non-palatalised /n/ exhibit a pattern in both genders where the Hz values are located between around 260 Hz to 360 Hz. Females have relatively level values in the start and middle values of palatalised /n/ in /ɑ/ contexts and a decline from around 360 Hz to approximately 330 Hz for the non-palatalised /n/ (Malmi, 2019). For males, palatalised /n/ had overall lover Hz values than non-palatalised /n/, both had decreases from the start to the middle window (Malmi, 2019).

2.5.3 Alveolopalatal Consonants

Recasens (2013) argues in favour of adding a new consonant group, namely the alveolopalatals. The evidence he presents to strengthen his proposal includes data from several languages from multiple language families, including Hungarian, Icelandic, Japanese, Spanish and Warlpiri,

among others. The results from the survey suggest, according Recasens, that there is a need for an alveolopatal place of articulation in the IPA chart as the alveolopalatal place of articulation was across the languages surveyed primarily or highly frequently the preferred place (Recasens, 2013). The alveolopalatal place of articulation occurred far more often than the purely palatal place of articulation (Recasens, 2013).

Recasens (2013) did not observe that any of the languages surveyed appeared to have a phonemic difference between palatal and alveolopalatal consonants. Keating and Lahiri (1993) described the alveolopalatal place of articulation as an area on the back half of the alveolar region plus the front half of the palatal region. The palatal place of articulation consists of the backer part of the hard palate (Keating & Lahiri, 1993). The major difference they assume between alveolopalatals and palatals is the amount of rising of the tongue body behind the constriction (Keating & Lahiri, 1993). Palatals generally have a more extensive tongue raising than the alveolopalatals, although the tip of the tongue is more consistently behind the lower teeth (Keating & Lahiri, 1993).

2.6 Linguistic Change

Change typically begin with variation (Campbell, 2013). During a transitional phase of variation, there are multiple ways of saying the same thing or pronouncing the same word (Bermúdez-Otero, 2007; Campbell, 2013). Linguistic change is often approached sociolinguistically, as sociolinguistics is, as Campbell (2013) puts it, "extremely relevant to understanding how and why languages change". Sociolinguistic studies have found that phonological change generally occurs over time, with an increased frequency of use of the innovative form in successive generations of speakers (Bermúdez-Otero, 2007). Thus, over time, the innovative form gradually gain tranction among younger generations.

Variation in a language are observed to potentially be conditioned by social characteristics including age, gender, social status, etc. (Campbell, 2013). In the present paper, the causes behind the possible changes are not thoroughly investigated as the assumption for the ongoing trends in the Norwegian language is a dialect levelling in which other dialects structurally change to become more similar to Standard Eastern Norwegian, which is presently considered the dialect of the focal area. Campbell (2013, p. 191) defines focal area as the "zone of prestige from which innovations spread outwards". Dialect levelling is a mechanism which causes the reduction or attrition of marked variants, i.e., forms which are different from the form used by

the majority or the speakers of the prestige variant in which the dialect is levelling with (Kerswill et al., 2003).

Exemplar Theory may be employed as a model to explain phonological change and variation, as it is argued to, among other things, explain how linguistic information is stored in the lexicon and how high-frequency words are observed to behave differently from words with lower frequency (Pierrehumbert, 2001). The potential difference in the patterns for high-frequency words compared to words of lower frequency is an interesting point for the forthcoming discussion.

2.6.1 Ongoing Change in Norwegian

Recently, one ongoing change in Norwegian has been extensively described and researched, namely the merger between two voiceless fricatives which are generally described as the palatal fricative [ç] and the retroflex fricative [ʂ] (Dalbakken, 1996; Jacobsen, 2015; Kristoffersen, 2000; Palombella, 2020; Scholtz, 2009; van Dommelen, 2019). In some literature, the latter is described as the post-alveolar fricative [ʃ], and some even discuss a merger between [ʃ] and [ʂ] (Dalbakken, 1996; Jacobsen, 2015; Scholtz, 2009). However, [ʃ] and [ʂ] may be two different ways to refer to the same sound; linguists appear to over time have changed from referring to <skj> as the post-alveolar [ʃ] to the retroflex [ʂ] (compare Gram Simonsen & Moen (2004) and Moen et al. (2011)). The observed merger is interesting as it is a palatal consonant gradually losing its palatal characteristics which results in a more fronted, lower sound which is generally treated as a retroflex. Hanssen (2010) assumes that palatalisation will gradually disappear from the language. This claim is supported by recent studies and descriptions of the language which suggest ongoing change, and in some cases loss of these consonants (Hårstad, 2010; Røyneland, 2009).

2.6.2 Gender and Ongoing Change in the Trondheim Dialect

Recent studies of the urban dialect have focused on the ongoing merge between the palatal and retroflex fricatives in Norwegian. The details of this are outside the scope of the paper, but the general trends found is that the change is happening in the dialect (Dalbakken, 1996; Hårstad, 2010; Jacobsen, 2015; Palombella, 2020; Scholtz, 2009). Notably, there are also some who claim that there is no conclusive evidence on the ongoing merge (van Dommelen, 2019). Interestingly, Dalbakken (1996) found in her study that the merge was more frequent in her male informants than the female informants, which she notes is the reverse pattern of what is generally found elsewhere in Norwegian dialects.

Hårstad (2010) brings up the difference between male and female speakers in Trondheim, mentioning that in Fintoft and Mjaavatn (1980), they found evidence suggesting that there is a significant difference between the genders. However, Hårstad (2010) reported that he could not find any potent differences between the informants in his study which depended solely on their gender. The 1980 study reported that the younger, female informants spoke more similarly to the male informants, i.e., speaking the traditional Trondheim dialect, compared to the older females (Fintoft & Mjaavatn, 1980). Thus, there may have been an ongoing change which have erased the differences between female and male speakers in Trondheim over the past decades.

2.7 Prestige and Saliency

Increased formality is in sociolinguistic studies observed to result in a decrease in the usage of stigmatised forms and an increase in use of prestige forms (Labov, 2001). This is especially prominent among members of middle socioeconomic class (Labov, 2001). In the present study, however, factors such as socioeconomic status is excluded, and this point is not elaborated on further. Despite this, formality is important to take into consideration as it may explain why prestigious forms – such as Standard Eastern Norwegian features – might appear in the production of speakers if they are expected to produce what Labov (2001) referred to as stigmatised forms.

Labov (2001) discusses a principle referred to as "the principle of uniform evaluation" with regards to variation in the Philadelphia dialect. This principle holds that a regularly stratified linguistic variable is evaluated in a uniform manner by the speech community (Labov, 2001). The observation made in Labov (2001) with regards to this principle was that the informants generally evaluated the linguistic variables examined in the same way regardless of factors such as gender, socioeconomic status, and age. This was observed to also apply even in the cases where the variables were not recognised consciously (Labov, 2001). While the Principle of Uniform Evaluations concerns perception, it is matched in production in the fact that all speakers in a community tend to target the same prestige forms.

Salience may be used as an explanatory factor in language change, and it is often applied in studies of dialect levelling. Features which are salient in a language, or a dialect, are subject to variation and change, and thus, salience may be applied as a factor to explain why some features and characteristics of a given dialect are more prone to change while others are more stable (Kerswill & Williams, 2002). According to Kerswill and Williams (2002), a feature or a characteristic may be considered salient if there are multiple factors involved, and there must

be both language-internal and extra-linguistic factors. Extra-linguistic factors relate to factors outside the language system itself, these may include perceived prestige and other social factors.

According to Trudgill (1986), one of the factors which suggests that a feature or variable may be salient is if there exists a prestige variant which is reflected in the standard orthography of the language, e.g., <hvilke> in Bokmål orthography versus [kʊs] in the Trondheim dialect. Moreover, if the variants are drastically different phonetically, at least one of the variants may be salient (Trudgill, 1986). Saliency, thus, appears to be somewhat connected to prestige; less prestigious, possibly marked, forms are more salient than forms which more closely correspond to the high prestige forms often reflected by orthography and the spoken standard variety.

3 Methodology

The hypothesis of the present study is that the Trondheim dialect currently undergo a process of levelling with Standard Eastern Norwegian which results in loss of traditional traits and characteristics being abandoned or changed in favour of the linguistic system of Standard Eastern Norwegian. This is hypothesis is tested by checking the possible presence and general status of the four characteristics *k*-forms on wh-words, narrow diphthongs, apocope, and palatalisation among ten young adult speakers who reported that they speak the local dialect. The four research questions presented in the Introduction are repeated below.

I. Are the traditional *k*-forms of wh-words substituted in favour of the *hv*-forms found in Standard Eastern Norwegian?
II. Are optional diphthongs produced, and if they are, are they still perceived as narrow to the same degree as described in earlier literature?
III. Is there ongoing loss of apocope, i.e., do younger people still produce words with apocope when they are expected to?
IV. Is there ongoing loss of palatalisation, or ongoing *depalatalisation*? Are words which traditionally are palatalised in the Trondheim dialect still produced with palatalisation?

The data was collected through an experiment consisting of two parts, the data was later transcribed before being run through a forced aligner trained on Scandinavian languages. Following this, the data for the four characteristics was collected from the dataset. The study was approved by NSD (Norwegian centre for research data).[1] The informants are first presented, followed by a description of the experiment used to collect the data. The final part of this chapter covers the steps made to process and retrieve the relevant data for the study.

3.1 The Informants

The participants of the study were recruited by use of my personal network. At the time of recording, all informants were between 21 and 24 years old (born between 1996 and 2000). All participants reported to be native speakers of Norwegian. Originally, twelve people participated in the study. Ten out of the twelve informants were included for further analysis. Of the ten informants included in the study, nine are females. This is not expected to have significant impact on the results as earlier literature has indicated that the difference between how females and males from Trondheim talk is relatively small.

[1] Reference number 126888.

The participants were informed about the experiment following the GDPR data protection law and the criteria from NSD. They were able to give consent to participating and consent to the recordings being stored for future work separately. The ten participants who were included all gave consent to have the recordings stored for future use. To preserve the anonymity of the informants, the part of the municipality they are from is not excluded, but there is a geographical spread of where they grew up; some of the participants grew up in more rural areas, i.e., further away from the city centre, while others grew up in more urban areas. No participants from the area which was recently merged with Trondheim municipality was recruited to the study.

3.1.1 Presentation of the Informants

Participant 1 is a 23-year-old female who grew up in Trondheim. She has lived in Northern Norway for about 4 years. Her parents are from Trondheim and Western Norway.

Participant 4 is a 23-year-old male who has exclusively lived in Trondheim. Both of his parents are from Trondheim.

Participant 5 is a 24-year-old female who has lived in Trondheim for most of her life, she lived one year in Eastern Norway. Her parents are from Trøndelag.

Participant 6 is a 24-year-old female who lived one year in Western Norway as an adult, otherwise she has lived in Trondheim. Both her parents are from the Trondheim/Trøndelag-region.

Participant 7 is a 21-year-old female who has exclusively lived in Trondheim. Her parents are from Trondheim and a Nordic country.

Participant 8 is a 21-year-old female who has only lived in Trondheim. Her parents are from Trøndelag and Western/Central Norway.

Participant 9 is a 23-year-old female who has exclusively lived in Trondheim. Her parents are from Trøndelag and Eastern Norway.

Participant 10 is a 22-year-old female. Aside from living one year in Bergen, she has only lived in Trondheim. Her parents are from Northern Norway and Trøndelag.

Participant 11 is a 23-year-old female. She lived one year abroad but has otherwise only lived in Trondheim. Both parents are from Trondheim.

Participant 12 is a 23-year-old female who has only lived in Trondheim. Her parents are from Trøndelag and Northern Norway.

3.2 The Experiment

The data was collected by use of a slightly altered version of the experiment in Lundquist et al. (2020). The original experiment focused on syntactic variation in Tromsø Norwegian. The sentence manipulation paradigm from Lundquist et al. (2020) was used in this experiment, although there are some differences in parts of the experiment, which I elaborate on below in 3.1.2. The experiment used consists of two parts, one part where the participants read out loud and produce a sentence based on the sentence they read, and the second part where they produce a sentence based on what the experimenter said out loud.

The sentences which were used in the study consists of sentences from the original Lundquist et al. (2020) experiment, modified sentences from the original experiment, and sentenced which were constructed specifically for this study. The experiment contains 60 sentences that the informants read out loud, and 120 produce sentences, in total 180 sentences per participant. The experiment was set up in OpenSesame (Mathôt et al., 2012). The order of the items presented to the participants were randomised, following Lundquist et al. (2020). Randomising is a useful tool to avoid that the same environments occur after each other in a way which might cause the participant to overthink some aspect of the language that they may be aware of. The data collected from the experiment is separated into three, following their elicitation modes. The first, which is referred to as 'Read', is the part of the experiment where the participant reads a sentence out loud. 'Produce' is the label used on the sentences which are produced in the same part of the experiment as 'Read', but these are the sentences which the participants restructure following the format of the experiment. Finally, 'Spoken' refers to the sentences which the participants produce in the second part of the experiment, where the input they receive is spoken by the experimenter. The first part of the experiment is described below in 3.1.1, followed by the description of the second part in 3.1.2.

The experiment was recorded with a Zoom H2n Handy Recorder using the stereo setting. The recordings were conducted at UiT campus Tromsø and NTNU Trondheim around December 2021 and January 2022.

The material collected in this study is uploaded to the Nordic Word order Database, the informants are coded as M01-M12.[2]

[2] Link to the database: https://tekstlab.uio.no/nwd.

3.2.1 Part I: Read and Produce

In the first part of the experiment, each participant was instructed to read a sentence which appeared in front of them on a computer screen out loud in a way which comes natural to them. Comparable to what Lundquist et al. (2020) reported, some participants asked whether they were supposed to read out loud in "Bokmål" or their dialect, they were told they should do what they felt was right for them. As will be seen subsequently in this paper, one of the included participants consistently read the sentences out loud in a Bokmål near way. There were four test items in a practice round at the beginning of the experiment to check if the participants had understood the instructions given. The instructions given to the participants may in some cases have been unclear, which contributed to two of the participants being excluded from further analysis.

The sentences that the participants read out loud were written in what is describes as 'conservative Bokmål', which is a version of the orthography which exclude the grammatical feminine forms, and *a*-forms of verbs (Lundquist et al., 2020). Below is an example of how a sentence appeared on the screen for the participant.

(5) (Jostein:)	Jeg	kommer	aldri	for sent	på jobb.
	I	*come*	*never*	*too late*	*on work*
	'I am never too late for work'.				

The sentence above is the background sentence which feeds the participants with the elements they need to construct the target sentence (Lundquist et al., 2020). The name in the brackets indicates to the participant that this is the speaker of the sentence. After the participant has finished reading a background sentence out loud, the experimenter presses a button to trigger the next part, which is exemplified below. The background sentence remains visible for the participant, and a new line appears beneath it which consists of the name of the speaker of the sentence followed by either *sa at …* 'said that …' or *spurte om …* 'asked (if) …'.

(6) (Jostein:) Jeg kommer aldri for sent på jobb.
Jostein sa at …

The participant is at this point expected to produce the target sentence seen below.

(7)	*Jostein sa at han …*	aldri	kommer	for	sent	på jobb.
	Jostein said that he … never		*comes*	*too*	*late*	*on work.*
	'Jostein said that he is never too late for work.'					

The experiment is claimed to be intuitive, most of the participants in Lundquist et al. (2020) got into a steady rhythm already after completing the first practice item. This was not the experience from this study, several of the participants were confused during the first few test items, but the confusion was mostly solved by the end of the test round. However, the informants did get into a steady rhythm and the sentences were generally produced in a fluent manner. Some of the informants produced sentences where they failed to change pronouns, but only one informant did it often, in these cases, they produced the sentence with first-person pronoun instead of the pronoun that was expected in the target sentence. Reading errors, such as <sportsbutikken> 'the sport (equipment) store' rather than <spillbutikken> 'the (video) game store' and the names Are or Ane in place of Arne, were generally ignored.

Each trial of the read and produce part of the experiment followed the sequence from Lundquist et al. (2020), described below:

i. Background sentence appears on the computer screen, white font on black background (1000ms);
ii. A beep sound (300 ms) followed by sentence changing colour from white to red to indicate to the participant that they are to read the sentence out loud;
iii. Experimenter touching a button to trigger the beginning of the new sentence to appear in white font underneath the background sentence (which remains visible throughout);
iv. A beep sound (300 ms) which again is followed by the sentence changing colour to red to prompt the participant to finish the sentence.
(Lundquist et al., 2020).

The timing of the experiment is intended to get the participants into a steady rhythm to attempt to hinder that participants plan their produce outputs in advance (Lundquist et al., 2020). Additionally, it aids in the following segmentation of the sentences.

3.2.2 Part II: Listen and Produce

The second part of the experiment differed more from the experiment in Lundquist et al. (2020). In their experiment, the second part were conducted months after the first part, and for each trial, there were two participants and two experimenters who were local dialect speakers to mimic a more casual dialogue and to create a more relaxed setting for the participants (Lundquist et al., 2020). Due to the Covid-19 pandemic, and scheduling challenges, there were only one participant per recording session. The background sentences in this experiment were

spoken out loud by the experimenter, who is a native speaker of Norwegian from Trondheim. This time, the participants only produced the target sentences. Furthermore, there were not much time between each part of the experiment, but there was always a break between the two sessions in attempt to make it less likely that the participants remembered the sentences from the first part.

The second trial was also set up in OpenSesame, with the same sentences, although they were slightly modified from Bokmål to the local dialect. Some words were substituted in favour of a more frequent synonym, e.g., <håndkleet> was substituted by <hånddukken> 'the towel'. As there was only one participant and one experimenter present per trial, the format of the produce sentences was slightly altered in attempt to make it more natural. Thus, rather than producing a sentence with "Name said that/asked if …" from the first part, the format was *Du sa at/Du spurte om…* "You said that/asked if …". The participants struggled less with the second part of the experiment, rarely using different pronouns from the target sentences. However, sometimes the sentences had to be repeated as they sometimes could not hear what the experimenter said or forgot it mid-sentence.

The format of the second part of the experiment is illustrated below. The first sentence is the background sentence produced by the experimenter, written in dialect rather than standard orthography. The second sentence, following the beep sound, is the target sentence produced by the participant.

(8) Kan du hent ballen før den trille ut i vannet?
can you fetch the ball before it rolls out in the water?
'Can you get the ball before it rolls in the water?'

Beep sound (300 ms)

Du spurt om æ kunn hent ballen før den trilla ut i vannet.
You asked if I could fetch the ball before it rolled out in the water.
'You asked if I could get the ball before it rolled out in the water.'

Only the experimenter viewed the screen during the spoken part of the experiment, there should therefore not be any direct interference from Bokmål in the second part of the experiment, unlike the first part.

3.3 Processing the data

Following several steps which are presented here, the segmented metrics were collected in a spreadsheet which was used to create datasets for wh-words, diphthongs and apocope. Palatalisation was analysed with a different method, which is described later. The characteristics examined in this study, excluding palatalisation, was coded for which informant produced the observation, in which format (Read, Produce, Spoken) the observation was made, and what Bokmål word the observations correspond with. Furthermore, some additional information applies to each of the three characteristics, this is covered later. The datasets were analysed in the open-source software RStudio. Palatalisation was examined with F2-values and COG-values, the COG-values were manually collected in Praat and later analysed in R. In this subchapter, the details surrounding the characteristics analysed is presented.

3.3.1 Sound Files, Transcription and Forced Alignment

Following the conclusion of the experiment, the recordings of the participants underwent several steps to retrieve the relevant data used in this study. The sound files from the experiment were converted from stereo to mono in Praat (Boersma & Van Heuven, 2001). Prior to the initial transcriptions, the recordings were segmented on sentence level with help from time stamp information collected with OpenSesame during the experiment. Each beep and the times between the beeps helped in locating the sentences. The two recordings per informant were further segmented in more detail on sentence level in ELAN; the beeps were removed when possible, and long breaks were omitted from the sentence segment (Borovanský et al., 1998). Furthermore, if an informant repeated the complete sentence without overlap with previous attempts, the most syntactically accurate and complete sentence were selected, with the remaining attempts omitted if possible.

The recordings were transcribed sentence for sentence in ELAN as the software allows the user to listen to the same segment on repeat, and it is possible to quickly move on to another segment without spending time locating it. Every sentence segment was transcribed multiple times and checked to ensure that no words were omitted from the transcriptions. Initially, the sentences were transcribed in a hybrid between phonetic transcription and dialect, but this was later abandoned in favour of a hybrid between standard Bokmål orthography and dialect as the latter would be more appropriate for the subsequent forced alignment. In the final transcriptions, dialectal conventions are followed rather than following orthographic standards, i.e., words produced with apocope were transcribed with apocope, if the informant used dialect forms of pronouns, they were transcribed dialectally, and wh-words with *k*-forms were written as they

were perceived. For each informant there were 60 triplets of sentences, i.e., 60 sentences per elicitation mode (Read, Produce, Spoken); 1800 sentences were transcribed in total.

After the completion of the initial transcription of the sentences, the files of the transcriptions and their corresponding sound files were paired and run through a forced aligner based on the Montreal Forced Aligner which has been trained on Scandinavian languages which automatically segmented the transcriptions (Young, 2019). The forced aligner used in this study is mostly familiar with the Eastern Norwegian dialects, and this influence which phonemes were selected for the phonetic transcription of the words (Young, 2019). The automatic segmentation was done on word and phoneme level. By using a forced aligner to segment the words and phonemes, the manual labour on each transcription is reduced (Young & McGarrah, 2021). The automatically segmented data was run through the Washington script.

The accuracy of the segmentation varied across the participants; some were more accurate than others. Notably, phonemes which traditionally may be palatalised seemed to have been a challenge for the forced aligner. Only some words were manually corrected following the automatic segmentation as the inaccuracies were determined not affect the collection of data on wh-words, apocope and diphthongs. In the dictionary for Norwegian, the diphthongs are represented following what is most widespread in Eastern Norwegian dialects, thus, the phonetic transcription of the recordings here apply different diphthongs from what is heard. Furthermore, the phoneme inventory of the forced aligner does not include entries for palatals which are not present in Eastern Norwegian dialect, such as /c ɟ ɲ ʎ/. Any effects the inaccuracies may have had on the analysis of palatalisation were avoided as the potentially palatalised phonemes were manually segmented in later stages.

3.3.2 Wh-words

In addition to coding wh-words for speaker, observed word, orthographic form of the word in Bokmål and format, wh-words were coded for whether the observation was a *k*-form or a *hv*-forms. This coding revealed that there was one observation of a word with *kv*-form, which was not expected and should be considered an outlier. This is further covered in the next chapter.

3.3.3 Diphthongs

Word containing optional diphthongs were analysed following what they were initially transcribed as; this is not an optimal way to analyse diphthongs, however, given the limited time and resources, it was not possible to conduct a thorough analysis of the individual diphthongs. This is further discussed later in this paper. Instead, five words with optional

diphthongs were manually selected and coded from each participant. Every observation of the selected words was included, given that they met the requirements, i.e., the word being produced either with a monophthong or diphthong – synonyms and other forms of the words were excluded. The five selected words were <bløt> 'wet', optionally produced with the <au> diphthong, [øʉ] in the Trondheim dialect, <skjøt> 'shot' for the <øy>-diphthong which is optionally produced either as as /ʃøt/ or /ʃøyt/, <sent, lete, ble> 'late, (to) search, became' for <ei>.

In the written part of the experiment, the word which was used for 'wet' in the sentences was <våt> rather than <bløt> as <våt> is perceived as more appropriate for Bokmål. This choice is supported by the frequency of the word in the Bokmål corpora in *Frequency lists for Norwegian spoken and written language,* where <våt> appears within the 10000 most frequent words in Bokmål, while <bløt> and <blaut> do not.

Words with diphthongs were coded with which of the three common diphthongs <ei, au, øy> the word optionally had, and whether the observed form was produced with the optional diphthong, indicated by Y for 'Yes' and N for 'No', in addition to informant, observed word, orthographic form, and format.

3.3.4 Apocope

The additional information which was included in the coding of the observed words with apocope was part of speech. Only words which were observed to have apocope was included, thus, observations of the same words without apocope are not included, nor are words which were not observed with apocope at all. Thus, the coded information on words with apocope is speaker, format, observed word, orthographic form, and part of speech.

3.3.5 Palatalisation

First, the F1 and F2-values at the 50% point for /l/ and /n/ were collected in a spreadsheet, this included all words which were assumed to have potential palatalisation. The data of Participant 4 was separated from the nine other informants as he was initially judged to not have palatalisation; the median values for nine of the informants were compared to the median values of Participant 4. A t-test was applied to this data material to check if the difference between the nine informants were statistically significant. The median for all informants except Participant 4 were interpreted as patterns suggesting palatalisation, as the F2-values were higher than what was observed for Participant 4. The further analysis of Centre of Gravity suggests that the informants could have been grouped differently in the F1 and F2-analysis.

Palatalisation on sonorant coronals were analysed with Centre of Gravity values manually extracted in Praat. The method used to extract the relevant phonemes meant that the phonemes had to be manually segmented, as every automatically aligned word was extracted to the objects window without the phoneme tier. This should counter the inaccuracy observed on the automatic segmentation unless the forced aligner failed to accurately place the word boundaries. Eight words were selected for this analysis, and each of these were collected from all three formats (Read, Produce, Spoken) for all informants, in total 24 items per participant, in total 240 items. The eight words were <alltid, alt, anna, Anne, en, enn, hente, Island>, two of these eight words are expected not to trigger palatalisation, namely <Anne, en>. Unfortunately, it proved difficult to find observations of /l/ in non-palatalisation contexts which were clearly perceived as alveolar as these words were frequently observed to be produced with the retroflex flap [ɽ]. Despite this, two words with potential palatalisation on /l/ were included in the analysis, as the production of this phoneme was considered unexpected during the transcription of the data.

The method used to analyse COG in this study follows the study in Malmi (2019), in which coronal palatals were analysed in two windows of 40ms from the start of the phoneme and 40ms from the middle of the phoneme, with no overlap. In this study, the windows were reduced to 30ms in attempt to include observations of all eight words across the formats for every participant as the phonemes in focus were frequently observed to be shorter than 80ms. Additionally, it was attempted to avoid overlap with preceding vowels. The two 30ms windows were added to the Objects window in Praat, where they were analysed as spectra. The retrieval of the COG-values was done by selecting Query followed by Get centre of gravity. The power selected was 1.0. The COG values were collected in a spreadsheet, and the data in the spreadsheet was analysed in R.

4 Analysis

This chapter is structured as follows. Question words, or rather, wh-words, are presented first. This is followed by a subchapter presenting the optional diphthongs. The third topic that is presented is apocope, while the data regarding palatalisation concludes the chapter. As the data is collected from only ten participants, the data for each participant will be briefly covered.

The figures 4-7 and 9-11 which are presented in this chapter are interpreted as follows. The figures are bar plots which show the relation between two of the factors in the data set. The bars are proportional, i.e., they show the percentages of the total observation of what is presented on the y-axis per factor presented on the x-axis. Thus, if the factors on the y-axis are *k, kv, hv* and the x-axis shows the informants, the bars in the chart show the proportion of the total productions of wh-words per informant which belong to the three forms of wh-words presented in the data. Moreover, the width of the bars indicates how many of the total observations are coded as belonging to, in the example, each informant. If the bar for Participant 12 is wider than the bar for Participant 10, it means that Participant 12 accounts for a larger number of observations in total than what is the case for Participant 10. If the bars are equal in width, it indicates that, for example, the informants had the same or a similar number of observations overall.

4.1 Wh-words

The data was manually coded as the choice to have a transcription which was a combination of Bokmål and dialect spelling, one of the wh-words, namely <hva> written as <va>, became indistinguishable with the past tense <var> written dialectally as <va>. Additionally, it is worth noting that the informants were presented with <hva slags> 'which/what kind' in the Bokmål sentences and some participants produced *k*-forms of 'which' here, in the data this was coded either with <hvordan> 'how' or <hvilke/hvilken/hvilket> 'which' depending on what was most suitable when the sentence was changed to Bokmål orthography. Note that *k*-form on the question words for 'which' always refers to <koss/kosse/kossen>, while *k*-form on 'how' may refer to either <kordan> or <koss/kosse/kossen>, as the latter has a different distribution than the (Standard) Eastern Norwegian counterparts. 'Which' is in the data produced in six different ways, as this is a wh-word which depends on the grammatical gender and number of the noun.

Table 2 below shows a summary of the data on wh-words. The participants produced between 50 and 60 wh-words each. Only question words which in Bokmål orthography are spelt with *hv-* are included. The table reveals that *k*-forms, i.e., the question words produced with dialectal

forms beginning with *k*- are the most frequent in the data, followed by the Bokmål-near *hv*-. *Kv*-forms were only observed once but it is nevertheless included as it is an acceptable way to produce wh-words in Norwegian, speakers from Western Norway in particular produces question words with this form. *Kv*- may be considered an outlier, however, it is nevertheless included in the presentation of the data as it should not interfere with the analysis. The Bokmål column contains the seven wh-words that each observation was coded as, i.e., what each observation corresponds to in standard orthography; the equivalent of <hvilken> in the Trondheim dialect was coded as that, although, as previously mentioned, it is not strictly speaking a *k*-form of a wh-word, but rather a cognate. The column titled 'Word' contains the observed productions, i.e., what forms were observed on the words. Note here that the *hv*-forms are written with *v*- rather than *hv*-. Thus, the wh-word which is most frequent in the data is the *k*-form of 'where'. Further, the table shows that the most frequently observed production of 'which' is the Standard Eastern Norwegian/Bokmål form <hvilke>.

Participant		Format		Word		hv-/k-/kv-		Bokmål	
Participant7	58	Read	191	kor	119	hv	207	hvem	31
Participant6	56	Produce	171	ka	71	k	336	hvilken	20
Participant12	56	Spoken	176	vor	61	kv	1	hvilke	81
Participant1	55			vilke	48			hvilket	23
Participant5	54			kordan	47			hvordan	108
Participant4	54			koss	46			hva	101
(Other)	211			(Other)	152			hvor	180

Table 2 Summary of wh-words in the data.

Figure 4 below is a bar plot which illustrates the distribution of the three forms, *hv*-, *k*-, *kv*-, in the data. Each bar represents one participant, and every bar is 100% of the observations per participant. The darkest grey is the observation of *kv*-, while the lightest grey is *hv*-forms.

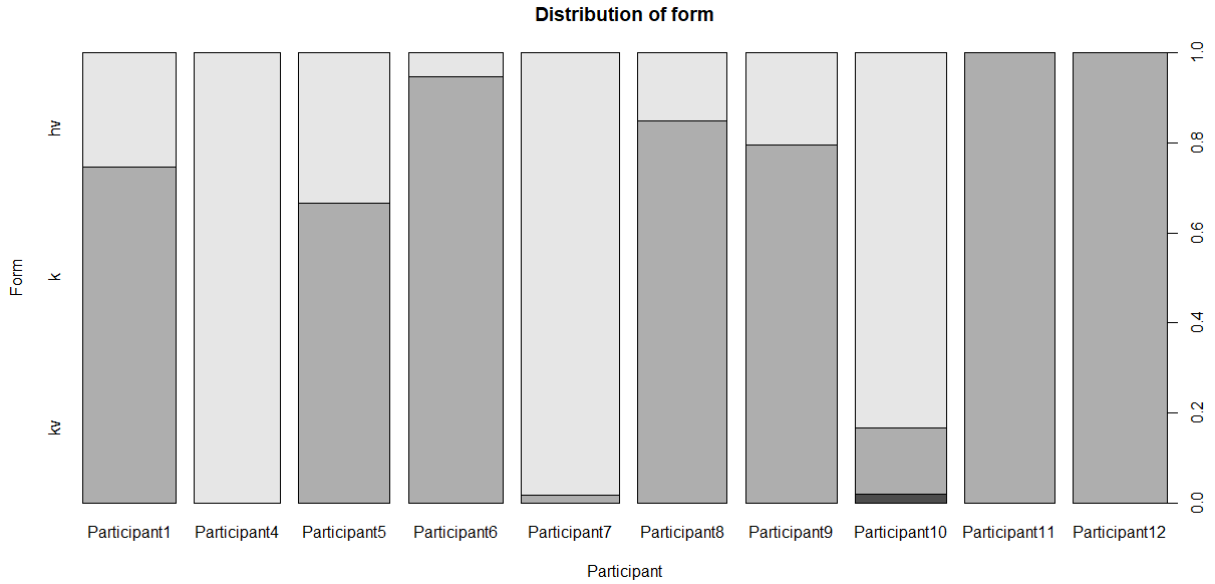

Figure 4: Plot of the distribution of form on wh-words for all participants.

The figure above shows that three of the ten informants only produced wh-words which belonged to one form. Participant 11 and Participant 12 exclusively produced *k*-forms, while Participant 4 only produced *hv*-forms. Furthermore, Participant 6 and Participant 7 clearly favoured one form over the other. The bar shows that Participant 6 had less than 10% *hv*-forms, thus she produced less than five wh-words which did not have the traditionally expected *k*-forms. Participant 7, on the other hand, had one sole observation of a wh-word produced with a *k*-form. Thus, Participant 7 is paired with Participant 4 here, while Participant 6 belongs to the same group as participants 11 and 12. The five remaining informants had more variation between *hv*- and *k*-forms. Figure 4 shows that the remaining four of the five remaining participants have around 20% variation, while the variation for Participant 5 is closer to 40% than 20%. In the format Read, Participant 5 read all sentences out loud in a manner best described as Bokmål near, almost mimicking Standard Eastern Norwegian. Participant 10 is the only informant of these five with >10% variation who prefers *hv*-forms over *k*-forms.

Figure 5 shows the distribution of the forms of the wh-words based on the three formats, Read, Produce, and Spoken, including all ten informants. Spoken is the produce-sentence from the second part of the experiment, where the sentences were spoken by an experimenter who spoke the local dialect, and thus, there should be no interference from standard orthography on Spoken.

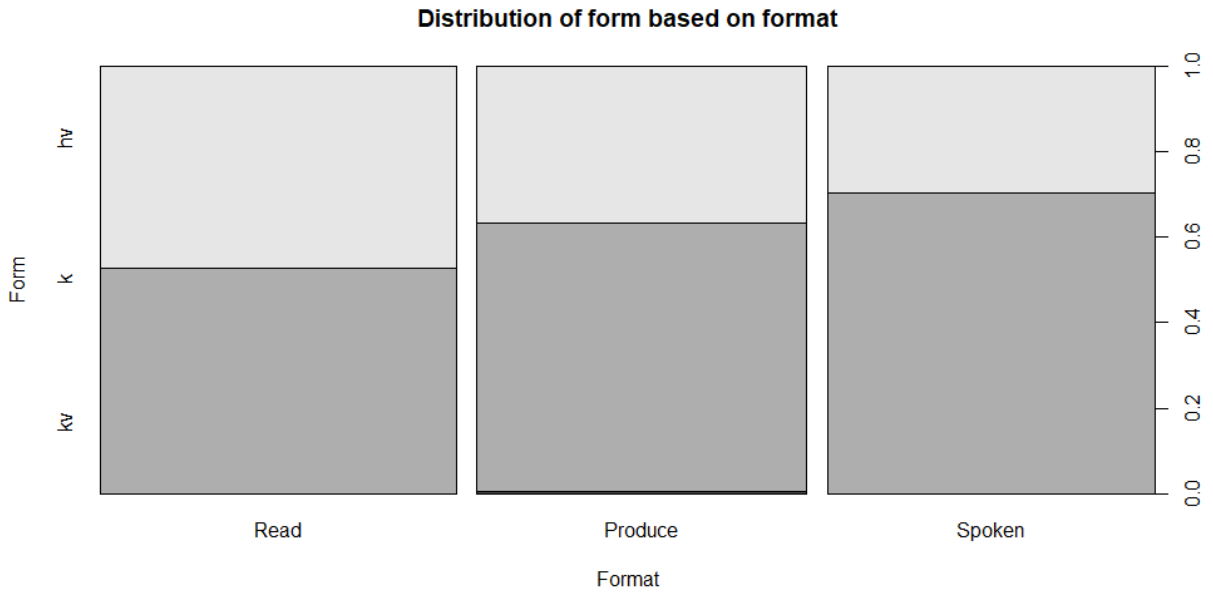

Figure 5 Plot illustrating distribution of form based on format, wh-words including all informants.

The bar plot in figure 5 illustrates that the distribution of the wh-words is quite even across the three formats of the experiment as each bar appears to have the same width. Further, *hv*-forms and *k*-forms are quite evenly distributed on Read, while *k*-forms becomes gradually more favoured the further removed the sentence is from standard orthography. In Produce, the informants were still able to read the sentence in conservative Bokmål. *K*-forms appear about 70% of the time in Spoken, and between 60 and 70% of the time on Produce. The outlier *kv*-occurred in Produce. Pearson's Chi-squared test reports a p-value of <0.01 (p-value = 0.006541) for form and format. The p-value for word (spelt with Bokmål orthography) and form is <0.01 (p-value =1.994e-05).

Figures 6 and 7 use a subset of the data, only the observations from the informants who produced more than 10% of their non-preferred form were included. Thus, the informants included in these figures are 1, 5, 8, 9 and 10. Figure 6 shows the distribution of the *hv*-, *k*- and *kv*-forms in the same manner as figure 5 above. The p-value of form and format for the subset of the data is <0.01 (p-value = 0.003106). Similar to figure 5, the distribution of form is even in Read. *K*-forms dominate more in Spoken for the subset than what was the case when all informants were included.

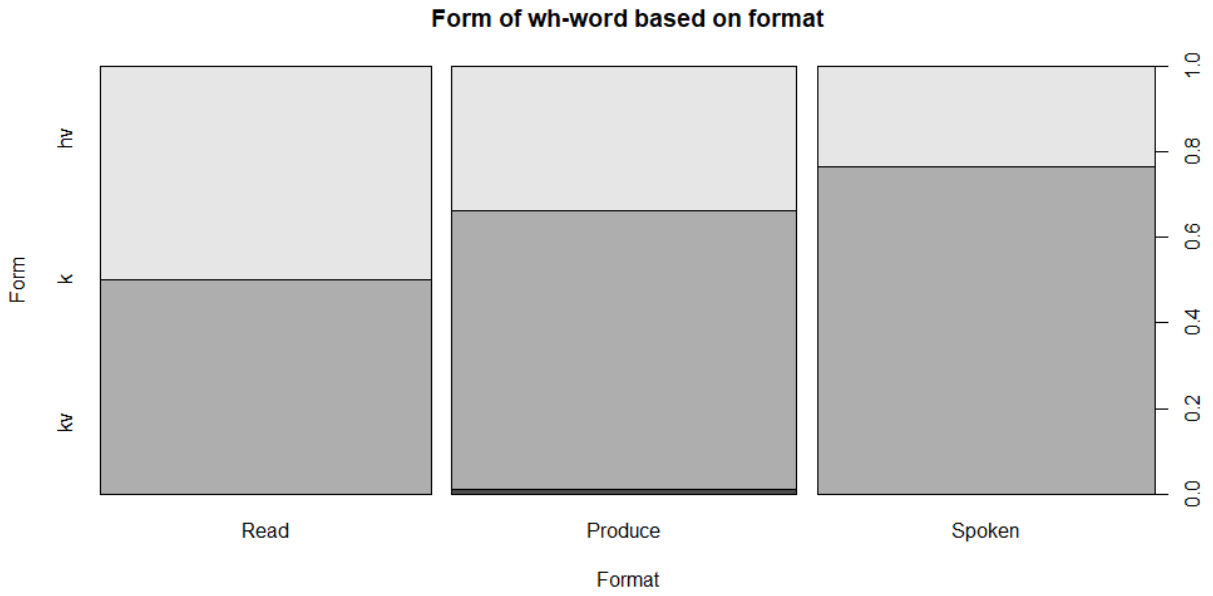

Figure 6 Plot of the distribution of form on wh-words across the three formats.

Both figure 5 and figure 6 may be caused by influence of prestige. It is possible that the informants produced the more prestigious *hv*-forms in Read due to influence from the input Bokmål sentences. The sentences were presented to the informants in conservative Bokmål, which may have resulted in an overall more formal setting than what might have been the case if the sentences were written in a more informal register. This is further addressed in the discussion.

In figure 7, the three Bokmål forms of 'which' are merged into "hvilke/n/t" to simplify the illustration of the data. The merge causes 'which' to be the second most frequent wh-word in the data, seen by the width of the bars in the bar plot below. The p-value of form and standard orthographic form with 'which' merged into one is <0.01 (p-value = 2.398e-11 according Pearson's Chi-squared test). The bar plot reveals that the subset of the informants who had the most variation prefer the *hv*-forms of 'which', while the other wh-words are generally produced with *k*-forms.

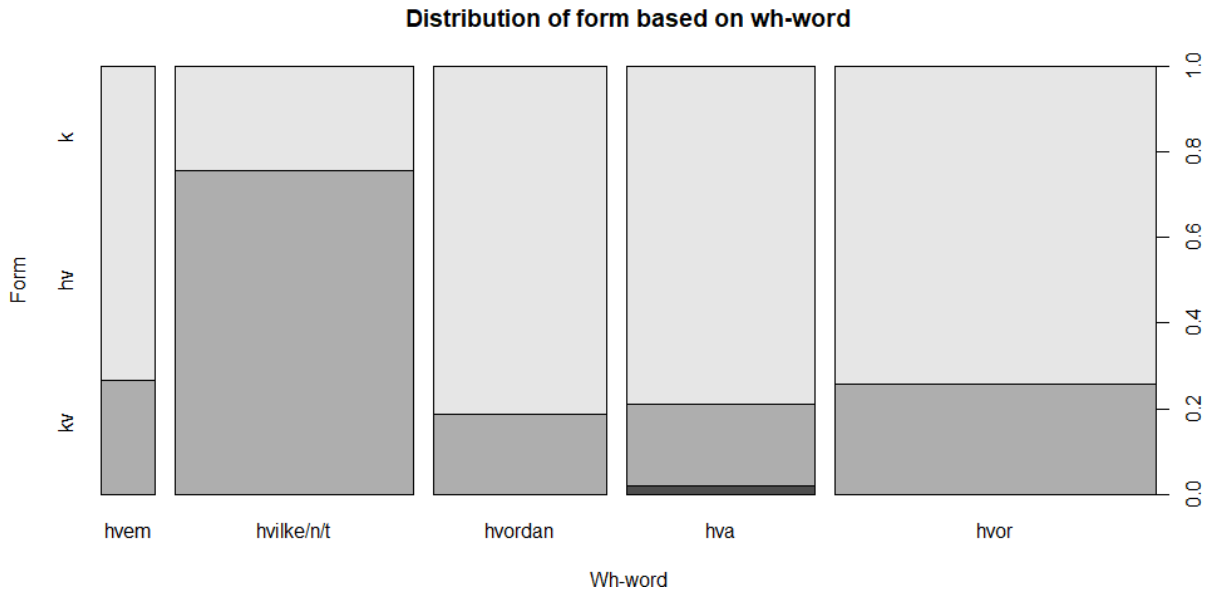

Figure 7 Plot of the distribution of form based on wh-words, 'which' merged into one bar.

In addition to the previous figures which illustrate the different distribution of the two possible forms of the wh-words, the table and figure below illustrates the total observations of each wh-word in their orthographic form (Bokmål). The table shows the number of observations of each word across the forms, and the final row shows the total amount of observations per word.

	hvem	hvilken	hvilke	hvilket	hvordan	hva	hvor
k	20	6	33	9	78	71	119
hv	11	14	48	14	30	29	61
kv	0	0	0	0	0	1	0
Total	31	20	81	23	108	101	180

Table 3 Detailed number of all observations of each wh-word including the forms present in the data.

The figure below shows the total amount of observations per word, in ascending order. The plot illustrates that the three forms of <hvilke> are observed fewer times than all but one word in the dataset, namely <hvem>. However, as becomes clear in the forthcoming table 4, <hvem> is generally more frequent in the Norwegian language, both in written and spoken forms. These points are relevant for the forthcoming discussion regarding word frequency as a way to explain the variation observed in the data set.

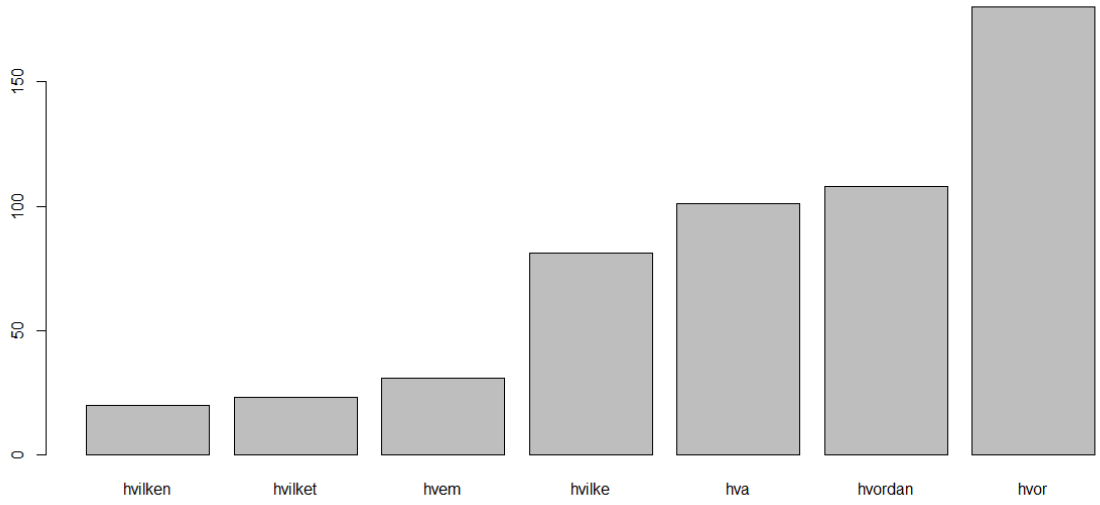

Figure 8 Bar plot showing the total amount of observations of wh-words in ascending order.

The frequency of the wh-words included in this study does not say anything regarding the frequency overall of the words, as all the productions were made based on written and auditory input rather than spontaneous speech; the relatively low amount of <hvem> in this data is not considered representative for the frequency of the word in spontaneous speech. The figure above is merely included to better visualise the collected data.

The table below shows the frequency rank of the wh-words examined in this study in the NoTa-corpus and the Oslo-corpus (Bokmål), in addition, the average frequency is included for comparison. According to the data retrieved from the *Frequency lists for Norwegian spoken and written language*, the three forms of <hvilke> are the least frequent wh-words of the ones surveyed here in Norwegian in both spoken and written. The frequency of these words is relevant for the forthcoming discussion, as the frequency of the words may serve as an explanation as to why the forms of <hvilke> appears to be the most prone to variation of change among the words examined.

	Frequency in NoTa	Frequency in Bokmål	Mean Frequency Rank
hva	47	94	70.5
hvem	251	365	308
hvilke	1417	425	921
hvilken	579	523	551
hvilket	1247	1338	1292.5
hvor	55	88	71.5
hvordan	164	180	172

Table 4 Frequency rank of the relevant wh-words in two Norwegian corpora, NoTa is the spoken corpus, while Bokmål is the written corpus in Bokmål orthography, frequency data for Nynorsk was not included here.

By including the mean frequency, <hva> emerges as the most frequent word in average in the two corpora surveyed, closely followed by <hvor>. The three least frequent words are all forms of <hvilke>, and one of the forms are not within the top 1000 most frequent words in any of the corpora. Frequency is discussed further later.

4.2 Diphthongs

The data of the diphthongs presented in this subchapter is not capable of appropriately capturing the difference between the common diphthongs <au, ei, øy> in Standard Eastern Norwegian and the Trondheim dialect. The diphthongs produced by the participants were all perceived as narrower than the diphthongs described by Kristoffersen (2000) for UEN and the description of diphthongs in Standard Eastern Norwegian. Only optional diphthongs are included in the analysis, i.e., diphthongs which can be dropped regardless of dialect. Thus, words such as <leilighet> 'apartment' is not included as it would be marked if it were produced as /lelihet/. Because of limited time, the F1 and F2 values of the diphthongs were not measured, and therefore it is only possible to comment on the production and perception of the observed diphthongs. This is further addressed in the next chapter.

The dataset containing the diphthongs are summarised in the table below. In this context, the column named 'Word' refers to the five words with optional diphthongs which were included for analysis. Diphthong Y/N refers to whether the optional diphthong was determined to be produced, Y indicates 'Yes', and N indicates 'No'. Note that some of the words with optional diphthongs were in some cases substituted with a synonym, conjugated in a different tense, or with a different form of the verb. <Våt> 'wet' was frequently produced in favour of the more dialectal <bløt/blaut> 'wet', <skjøt> 'shot' was sometimes produced in a different tense as <skyt> '(to) shoot/shoots', and <ble> was frequently produced as <vart> by the more traditional speakers of the dialect. These points are discussed later in this paper.

Participant		Format		Word		Produced Word		Possible Diphthong		Diphthong Y/N	
Participant5	36	Read	107	bløt	45	ble	80	ei	239	Y	181
Participant9	36	Produce	98	skjøt	30	seint	70	au	45	N	131
Participant1	35	Spoken	109	ble	87	blaut	44	øy	30		
Participant4	33			lete	60	leit	43				
Participant10	33			sent	92	sent	22				
Participant6	31					skøyt	19				
(Other)	110					(Other)	36				

Table 5 Summary of optional diphthongs.

Figure 9 below is a bar plot which illustrates the production of optional diphthongs across the ten informants. Two of the bars are unlabelled; the first unlabelled bar is Participant 8, and the second unlabelled bar is Participant 12. It is noteworthy that both these informants exhibited a preference for <vart> as the form of <ble>, which appears to have resulted in a low number of observations overall for them. Participant 12 appears to frequently produce optional diphthongs, while Participant 4 and Participant 10 exhibit a preference of not producing these. Participants 1, 5, 7 and 9 have a rather high degree of variation, while the remaining informants exhibit a preference of producing the words with the optional diphthongs. On informant level, the results regarding optional diphthongs and wh-words look similar; there are some exceptions, notably Participant 7 who here aligns with the informants with more variation, but overall, informants who does not produce optional diphthongs often appear to overlap with the informants who produce *hv*-forms rather than *k*-forms. This is especially clear on the two extremes of the spectrum, the informants who exhibited a strong preference for the traditional wh-words are the same as those who produce optional diphthongs frequently, and those who had a strong preference for the arguably more prestigious wh-words do not.

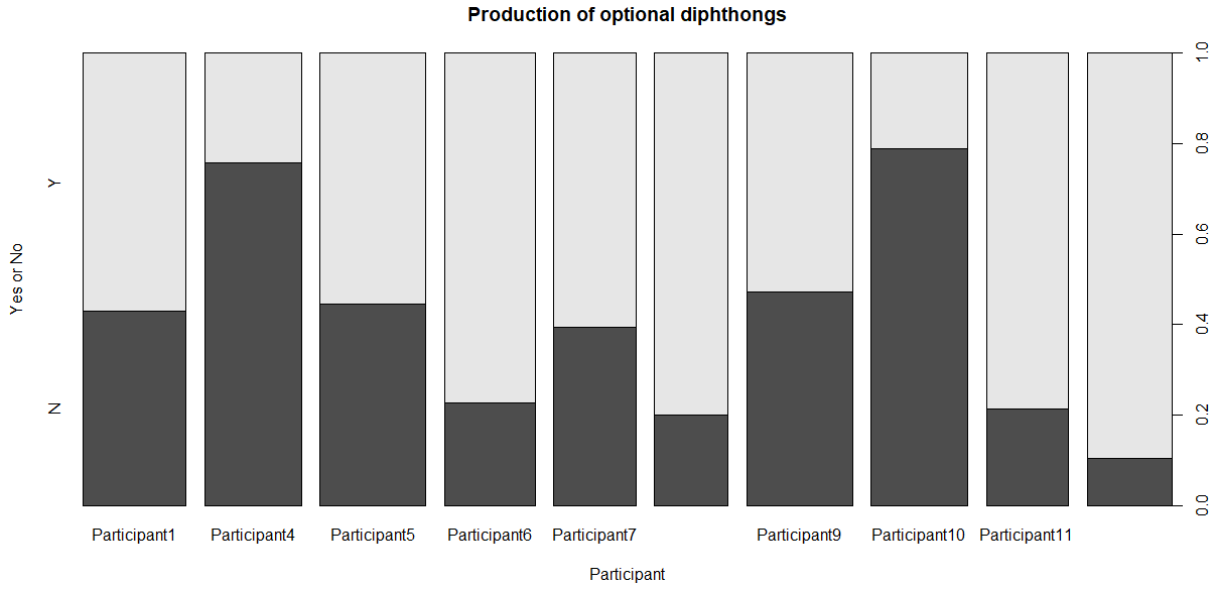

Figure 9 Bar plot illustrating the production of optional diphthongs.

Figure 10 shows the production rates of optional diphthongs across the elicitation modes. In Read, around 60% of the observations of the five words examined is without the optional diphthongs. The bar plot below suggests that the further removed the informants are from the Bokmål forms, the more frequently optional diphthongs appear in the words. In Produce, the words without diphthongs only accounted for 20% of the total observations. The trend in the figure below is striking; the more prestigious forms are more frequently produced in Read and

Produce, while the more dialectal forms dominate in Spoken. The p-value of format and production of optional diphthongs is p = 8.517e-10.

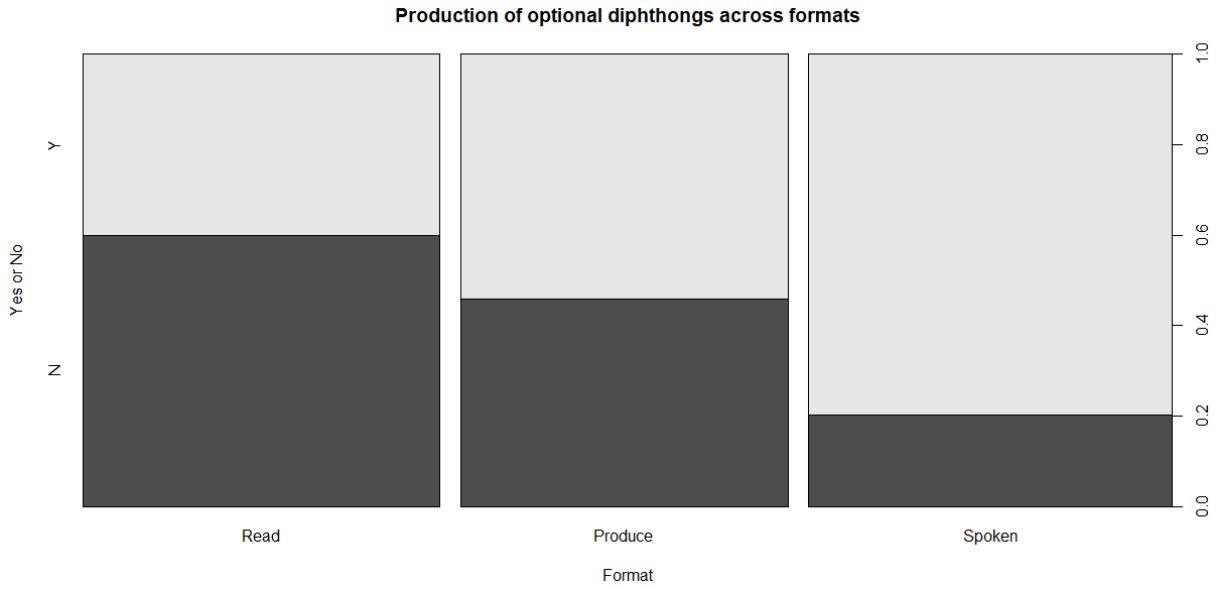

Figure 10 Production of optional diphthongs across elicitation modes, all informants included.

The final figure which is used to illustrate the data collected for diphthongs is figure 11. The bar plot below illustrates the production rates of optional diphthongs for each of the five words included in the analysis. Two of the five words stands out; there is a strong preference for the diphthong form of <bløt>, which in the bar plot is written as <bloet>; <ble> was produced without a diphthong more than 90% of the time. The remaining three words indicate a preference for the diphthong forms of the words, although the preference for the diphthong form is not as pronounced on <skjøt> and <lete> as is seen on <sent>.

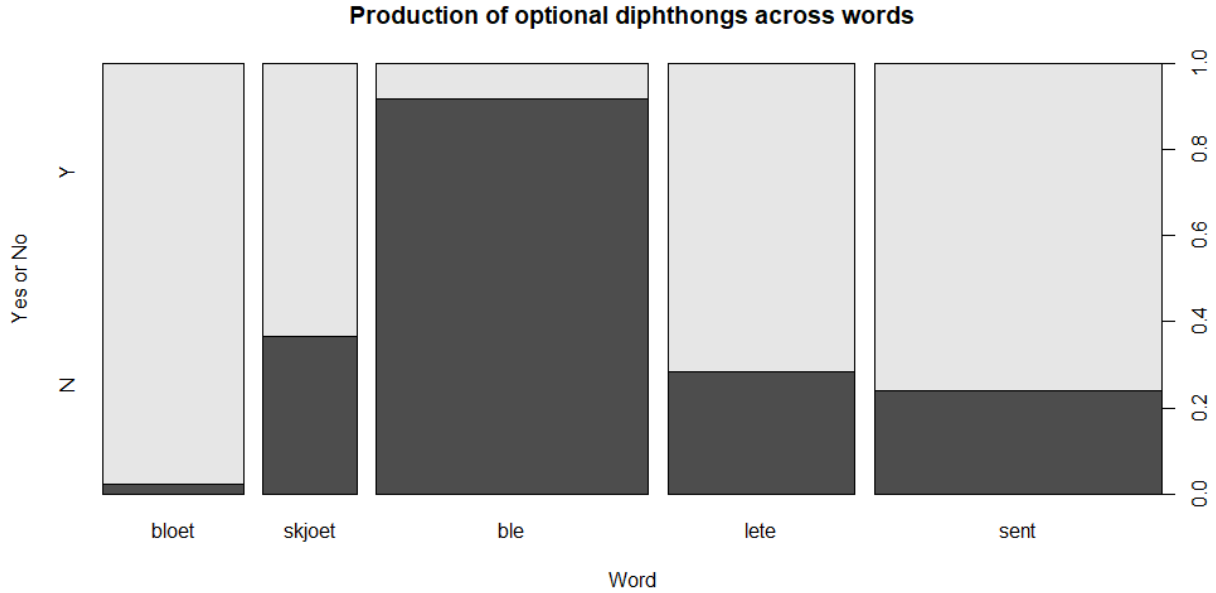

Figure 11 Production of optional diphthongs across the words included in the analysis, all informants included.

The diphthongs produced by the informants, most notably <au>, were, as stated in the perceived as narrower than the diphthongs found in Standard Eastern Norwegian, i.e., they are still perceived as narrow in the same way as the diphthongs of the dialect has been previously described as. The <au> diphthong was always produced in a manner which was perceived as [øʉ], which is the pronunciation expected following the earlier descriptions of the Trondheim dialect, as well as following Hanssen (2010), rather than the [æw] diphthong in Eastern Norwegian dialects such as Standard Eastern Norwegian. Furthermore, in some cases, during the transcription, it was difficult to determine whether the informant had produced a monophthong or a diphthong. This was often the case for <sent>, the manner some of the informants produced this word made it challenging to determine whether they produced it with a diphthong, or whether there was something akin to palatalisation occurring on the /n/, here it was determined that it was more likely a diphthong than palatalisation.

Here, it is worth adding that Hårstad (2010) observed that the distribution of diphthongs in the Trondheim dialect generally aligns with the distribution in Standard Eastern Norwegian, thus, the presence or absence of diphthongs cannot alone reveal whether ongoing change in diphthongs is the result of levelling with Standard Eastern Norwegian, or if there is a different process in the Trondheim dialect which is separate from any change which may be present on diphthongs in Standard Eastern Norwegian.

4.3 Apocope

As established in the background chapter, apocope is one of the defining characteristics which spearates the TN dialects from the Eastern Norwegian dialects. In this subchapter, the data on apocope in presented. Only observations of apocope is included in the dataset, thus, productions of the same words without apocope is not included. No separation between stressed and unstressed tokens were made, i.e., it was not coded whether the words with apocope carried sentential stress, e.g. stressed <mine> versus unstressed <mine>. Furthermore, in the coding, there is no distrinction between words produced with apocope followed by a vowel and words with apocope which are not followed by a vowel. This was not included as it is resource-intensive work, and the resources required to do this were unavailable.

The table below is a summary of the data of words produced with apocope. Part of speech is included here, and the six categories here is adjectives (ADJ), adjectives or adverbs (ADJ/ADV), adverbs (ADV), determiners which here also contains the possessive pronouns <mine>, <dine> and <sine> ‘mine, your(s), their(s)’, nouns (N), and finally verbs (V).

ADJ/ADV contains words which may be classified as both adjectives and adverbs, and here it contains <mye> ‘much’, which with apocope is produced as /my/.

Participant 12 produced the most words which were determined to have apocope, with 192 observations in total. It does not show up in the table or figures below, but Participant 12 was the only informan who was observed to produce singular nouns with apocope, namely <kake> in the words <kjøttkake> and <fiksekake>. These words were produced as /çøt.kɑk/ and /fesk.kɑk/. The informant who produced the second most words with apocope is Participant 1, with 160. The Participant-column show that there is variation in how much apocope each informant produced, although the four informants with the least observations of apocope are excluded from the summary. The part of speech which is most frequently observed in the data is verbs, with 1086 observations in total, 506 of these is the same verb, <spurt> (in Bokmål orthography <spurte>) ‘asked’. 202 instances of apocope were found on nouns. The word column contains two nouns, both of which are plural definite forms of masculine nouns, namely /ʋottɑn/ <vottene> ‘the mittens’ and /nøklɑn/ (<noeklan> in the table) <nøklene> ‘the keys’. Plural definites of nouns are treated as apocope as both standard orthographies of Norwegian lists the plural definite forms of nouns with *-ene/-ane.*

Participant		Format		Word		Part of Speech	
Participant12	192	Read	295	spurt	506	ADJ	59
Participant1	160	Produce	596	kjoept	109	ADJ/ADV	77
Participant8	156	Spoken	618	vottan	87	ADV	57
Participant11	151			my	77	DET	28
Participant9	149			noeklan	58	N	202
Participant6	148			sell	58	V	1086
(Other)	553			(Other)	614		

Table 6 Summary of apocope.

In table 7 below, the observations of apocope per informant is presented, rather than including every word, the table shows what part of speech the observed word with apocope was determined to belong to. In Appendix B, a table with the observations of each word is included. Participant 5 is the informant with the fewest observations of apocope in total, this is explained by her production in Read, evident in the forthcoming table 6.

	ADJ	ADJ/ADV	ADV	DET	N	V
Participant1	4	9	8	0	21	118
Participant4	7	2	1	0	21	111
Participant5	4	6	3	0	15	94
Participant6	5	7	9	2	21	104
Participant7	5	9	7	0	18	103
Participant8	7	9	8	1	21	110
Participant9	6	9	2	9	19	113
Participant10	2	8	3	9	21	113
Participant11	5	9	7	1	21	108
Participant12	14	9	9	24	24	112

Table 7 Observations of apocope.

Table 8 shows the distribution of words with apocope across the three formats, it is evident that the informants produced a larger number of words in total with apocope in Produce and Spoken than was the case in Read, regardless of how they read the sentences out loud. The informants are rather even in their production of apocope, although Participant 12 stands out as she produced words with apocope more than the remaining nine informants. Notably, she is observed to produce apocope forms of words coded as determiners and as adjectives. She is not unique in producing adjectives with apocope, but the data shows that she applies apocope to adjectives more frequently than the other informants. Similarly, there are informants who produced some determiners with apocope, but no one to the same extent as Participant 12. This may indicate that apocope of determiners and adjectives is less stable than apocope on the other parts of speech measured, which could relate to saliency or, perhaps, frequency.

	Read	Produce	Spoken
Participant1	35	63	62
Participant4	27	55	60
Participant5	0	59	63
Participant6	33	58	57
Participant7	26	54	62
Participant8	35	61	60
Participant9	30	60	59
Participant10	31	55	61
Participant11	31	60	60
Participant12	47	71	74

Table 8 Apocope observed in each format.

Table 9 reveals why the number of observations of apocope increases in Produce and Spoken compared to Read. While most parts of speech are quite evenly distributed across the three

formats, this is not the case for verbs; the observations of verbs with apocope increases by almost 300 in Produce and Spoken compared to the observations in Read. Furthermore, table 8 shows that there are more observations of determiners with apocope than what is the case for the two other formats. This may be caused by the experimenter consistently producing the possessive pronouns without apocope, although this cannot explain why there are fewer observations of apocope in produce. Additionally, the rationale behind the experiment used in this study is that in the presence of input cues of standardised forms, the speakers may produce the standardised forms as reflected in the orthography, despite the possible conflict between that form and the dialect form. This relates to Trudgill (1986) as the forms present in the orthography is held to be the prestigious forms of the language, which could lead to the dialect forms being salient if it is the case that the dialect forms are considerably different from the prestigious forms.

	ADJ	ADJ/ADV	ADV	DET	N	V
Read	15	23	14	12	61	170
Produce	19	27	17	8	69	456
Spoken	25	27	26	8	72	460

Table 9 Apocope observed in the three formats.

4.4 Palatalisation

Preliminarily, before manually adjusting the automatic segmentation, a t-test was conducted on the F1 and the F2-values at the 50% point on the possibly palatalised phoneme produced by the informants. In the t-test, the values of all informants excluding Participant 4 were combined, and the median for this were used in the t-test. The median value for all relevant productions of Participant 4 was the other value used in the t-test. The phoneme tested with the t-test was /l/ in the following words: <alt, alltid, aldri, ball, ballen, triller, selger, selge> with the possible variations in the non-phonetic transcriptions included. The median F1 at 50% for all informants excluding Participant 4 was 486.013263 and the median for Participant 4 was 516.509212. The p-value reported by the t-test was 0.002423545. The median F2-value at 50% for all but Participant 4 was 1326.04635, while the median was 1114.09436. The reported p-value here was 4.06877E-10. Thus, according to these results, there are some significant differences here. The values of Participant 4 were used as the values expected without palatalisation, as he was assumed to be the informant with the least tendencies of palatalisation following the transcription.

As the forthcoming figures show, however, the informants could have been grouped differently in this test. Participant 10, most notably, should have been included in the group which was

used to check the formant values for informants without palatalisation, especially as her patterns are noticeably different from the other informants.

During the transcription of the recordings, the observation was that few informants exhibited tendencies of palatalising the coronal stops /t d/, therefore, only the sonorant coronals /l n/ are included in the analysis as these were determined to be the most stable coronal consonants with possible palatalisation in the dialect following Hårstad (2010). A subset of eight words with and without possible palatalisation was included, two of the eight words were expected to not exhibit palatalisation. The eight words initially selected for COG-analysis are <alltid, alt, anna, Anne, en, enn, hente, Island>, <Anne, en> were expected to be environments in which /n/ was not palatalised. Due to apocope, <hente> is produced as /hent/ by most of the informants, excluding Participant 5 in Read. Only words with possible palatalisation on /l/ were included in the analysis as it proved difficult to find observations of /l/ where it was expected to be produced as alveolar. The x-axis on figures 12-14 shows the two 30ms windows the COG-values were collected from, the first 30ms attempting to avoid overlap between the preceding vowel and the segment measured, and the 30ms window from the middle of the segment. The y-axis on the figures show frequency measured in Hertz (Hz), the lowest is slightly below 2000 Hz, while the highest value included is close to 4000 Hz. Rather than selecting a percentage of the phoneme which is most common when analysing COG values in phonology, this study follows Malmi (2019) in using set windows, as the study in Malmi (2019) includes the two phonemes analysed in this present study.

The graph below in figure 12 shows the mean COG-values for the eight words. Two words stand out as they on average have the sharpest increase from the start to the middle window, <alltid> and <Island>, these words have a mean increase of approximately 600 Hz across the ten participants and the three formats. The phoneme measured for <alltid> is /l/, while for <Island> it is /n/. Another word with a sharp increase is <alt>. The three words in environments with /e/, <en, enn, hente>, exhibit unexpected patterns as <en> was expected to decrease from the start to the middle window, while <enn> was expected to have an increase as it is a word which is expected to have palatalisation. The third word, <hente>, exhibits the expected pattern in palatalisation contexts, however, as the two other words with /e/-environments behave unexpectedly, these words are excluded from the graphs in figures 13 and 14 further below. The two words that are closest to a minimal pair are <Anne> and <anna>, the first of the pair is expected not to be palatalised although the consonant length could potentially trigger palatalisation in TN. Another pair that is close to a minimal pair is <en> and <enn>, it is the

vowel quality that separates them, <en> is produced with a long vowel, while <enn> is produced with a short vowel. The first of the two pairs behave as expected with regards to palatalisation, the word which contains a possible palatalised /n/ have higher COG-values at the middle window compared to the word without an expected palatalised /n/. The other pair, <en> and <enn>, behaves opposite to what is expected. The word without a potential palatalised /n/, <en>, having higher COG-values at the middle window compared to its potential palatalised counterpart <enn>.

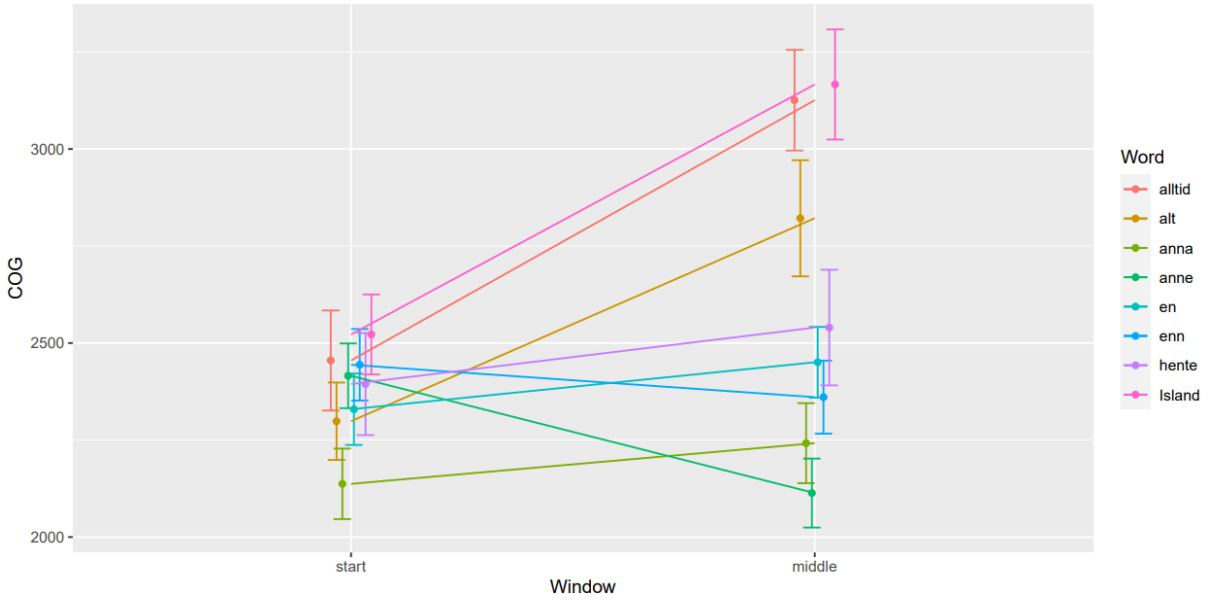

Figure 12 Graph illustrating the change in COG-values from the first 30ms and the 30ms from the middle of the phoneme per word included.

The remaining phonemes have the expected patterns based on their environments; the COG of /n/ in <Anne> is lower in the middle window than in the start window, the other words increase from the start to the middle window. Figure 12 further shows that the word which had the lowest mean COG in Hz in the first window is <anna>, while the word with the highest mean is <Island>.

The graphs in figure 13 show the difference between the mean COG-values for all informants across the three formats Read, Produce and Spoken. Only environments where the sonorants /l n/ are preceded by the open, back vowel [ɑ] are included here. The mean COG-values of /n/ in environments which are not expected to trigger palatalisation, indicated by the blue lines, decrease in the middle window compared to the start window in Read and Spoken. In Produce, however, the difference between the windows is somewhat level, with a slight increase from the start to the middle. For /n/ in environments which traditionally are expected to trigger palatalisation the COG-values increased across the three formats. Although the mean COG

increased in all, there is variation between the formats. The increase in Read appears to be slightly sharper than the increase observed in Produce, while the increase is the sharpest in Spoken, where it on average increased around 750 Hz.

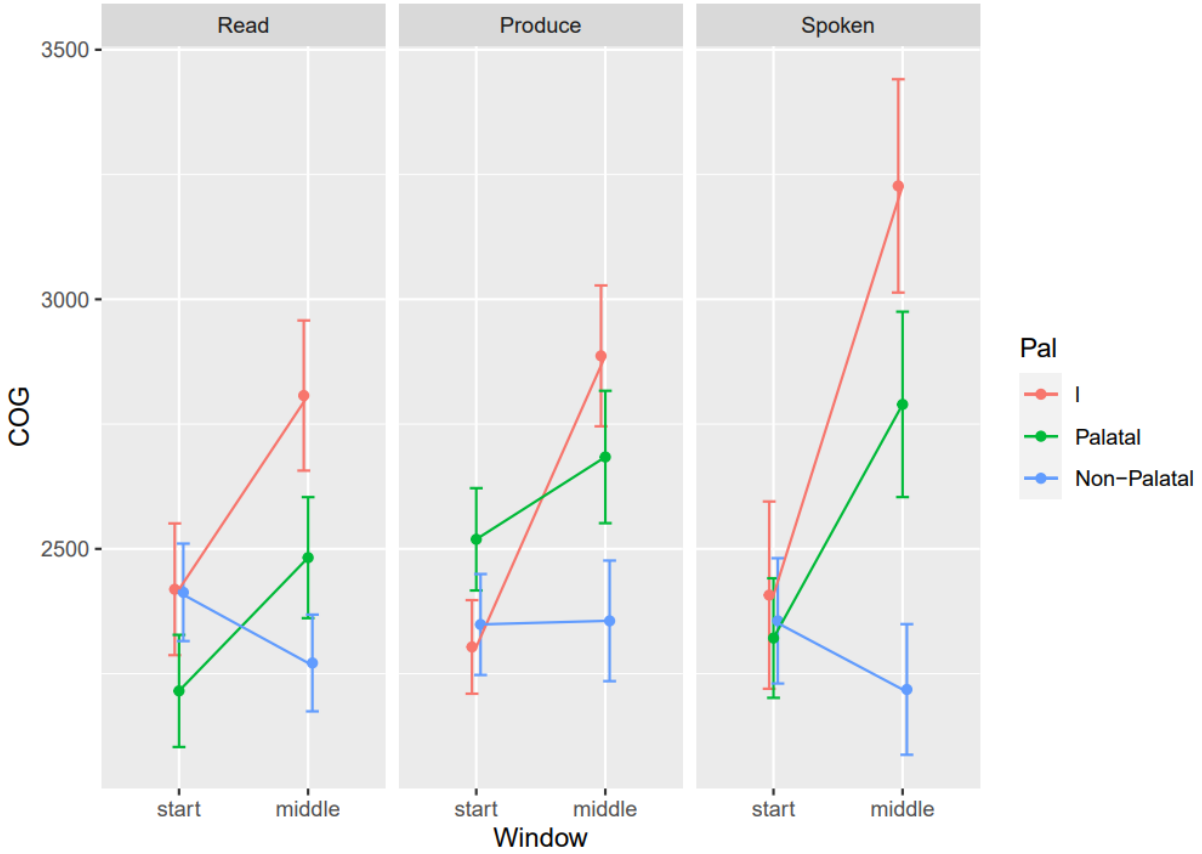

Figure 13 Graph illustrating the change in COG-values from the first 30ms and the 30ms from the middle of the phoneme. <l> in the graph is the /l/ in the words <alt, alltid>. The line for palatal includes the observations of /n/ in palatalisation contexts, and finally, the non-palatal includes observations of /n/ in non-palatalisation contexts, i.e., <Anne>.

The graph in figure 14 below uses the same data as figure 18, but rather than present it per format, it is presented per informant. Across the ten informants, /n/ in non-palatal contexts is what exhibits the most variation. For participants 1 and 7, the difference between the windows is quite level, while slightly decreasing. The decrease between the two windows for Participant 5 is slightly steeper than what is observed for participants 1 and 7. Participant 6 have an even steeper decrease between the windows. The sharpest decreases on /n/ which was expected not to be palatalised are found in the graphs for participants 4, 9 and 12. The mean COG-values measured for the remaining three participants increased in the middle window compared to the start window. The increase observed in the graphs for participants 8, 10 and 11 is slight compared the other movements seen in the graphs. Participant 10 have the highest increase on /n/ in non-palatalised contexts, estimated to be slightly below 225 Hz.

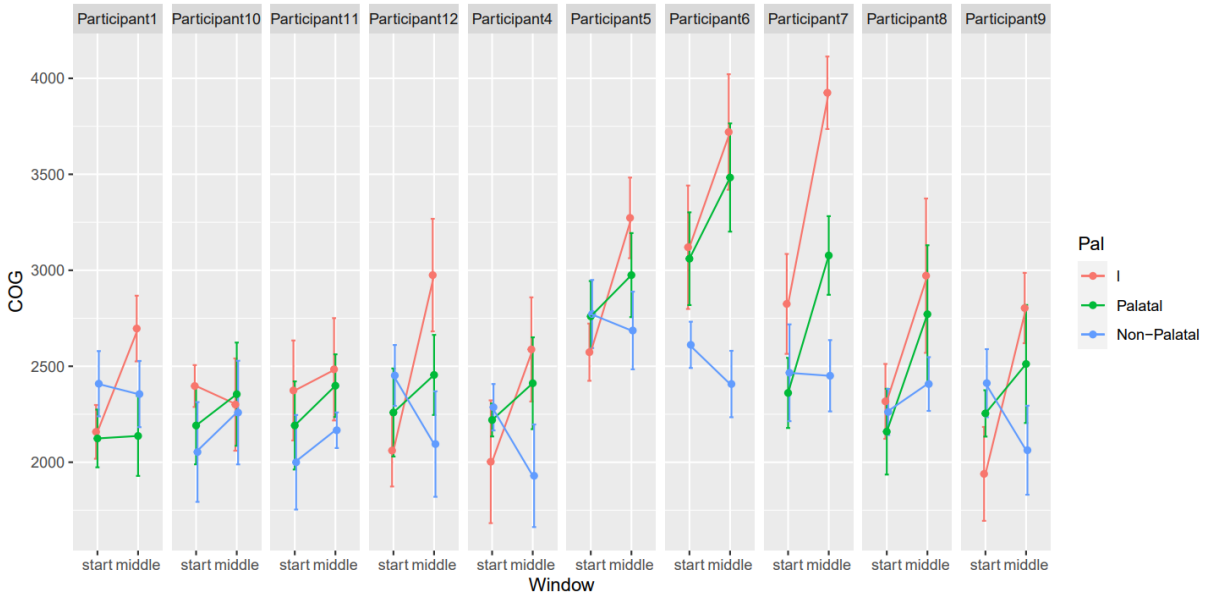

Figure 14 Graph illustrating the change in COG-values from the first 30ms and the 30ms from the middle of the phoneme on informant level.

As for /l n/ in contexts which are triggered to palatalisation in the Trondheim dialect, all informants but Participant 10 exhibit a pattern where the mean COG-values are higher in the middle window than what is the case for the start window. The graph illustrating the values measured for Participant 10 shows a similar increase on /n/ regardless of environment, although the /n/ in non-palatalisation contexts have a slightly larger increase than the /n/ in palatalisation contexts. Further, /l/ in contexts with possible palatalisation, i.e., before /t/, show a decrease in the middle window compared to the start window, which is unique in the graph, as all other informants exhibits patterns where mean COG-values increase in the middle window.

Participant 1 have rather level changes on /n/ regardless of what the context is expected to trigger, the increase in the middle window compared to the start window on /n/ in palatalisation contexts is less than 50 Hz. There is a rather sharp increase on /l/ in the middle window, around 500 Hz. However, Participant 1, as Participant 10, are considered not to have palatalisation, although it is possible that Participant 1 have some slight tendencies in specific environments. Participant 4 was initially judged to not have palatalisation, and in general be among the informants who spoke the closest to Standard Eastern Norwegian. The graph, however, suggest that he has some slight tendencies on palatalisation. Similar to Participant 1, /l/ produced by Participant 4 increased with about 500 Hz in the middle window compared to the start window. Furthermore, /n/ in palatalisation contexts increased with about 200 Hz.

During the transcription, participants 11 and 12 were initially judged to have palatalisation, with Participant 12 being judged to be the informant who spoke the most traditionally, she was even perceived to palatalise coronal stops. Participant 12 slightly increased /n/ in palatalisation

contexts with around 225 Hz, while /l/ had the sharpest increase from right above 2000 Hz to right below 3000 Hz. Participant 11 frequently produced phonemes which were perceived as retroflex in palatalisation contexts, this was also observed for Participant 9, although not as frequent as was the case for Participant 11. Participant 11 is one of two informants who was observed to increase COG in the middle window regardless of whether palatalisation was expected. The increase seen on /l/ and /n/ in palatalisation contexts in the graphs for Participant 11 is quite similar, no more than up to 200 Hz increase from the start to the middle, with the biggest increase seen on /n/ in palatalisation contexts. The graph for Participant 8 shows a sharp increase for /n/ in palatalisation contexts and /l/. In palatalisation contexts, /n/ increased with approximately 500 Hz on average, while /l/ increased from around 2250 Hz to right below 3000 Hz.

In palatalisation contexts, the mean COG-values measured from Participant 9 on /n/ increase with 225 Hz. The sharpest increase of the possible two phonemes with possible palatalisation is seen on /l/, which increases with more than 750 Hz in the middle window compared to the start window. The remaining three informants all had higher mean COG-values on the start window compared to the seven other informants, with the mean start windows located around 2500 Hz and higher. In the previous subchapters, Participant 7 has generally been grouped together with participants 4 and 10, but this is not the case for palatalisation. In palatalisation contexts, the mean COG-value of /n/ increased with approximately 500 Hz, while /l/ increased with more than 1000 Hz on average. Participant 5 show a more moderate increase of /n/ and /l/ in palatalisation contexts, /n/ increased with about 225 Hz and /l/ with about 750 Hz. Finally, Participant 6 has an increase of around 500 Hz on /n/ and around 650 Hz on /l/ on average.

5 Discussion

In this present study, the hypothesis is that the Trondheim dialect is currently undergoing a process of levelling with Standard Eastern Norwegian which results in a loss of traditional traits and characteristics, where they are either completely changed in favour of the linguistic forms in Standard Eastern Norwegian or changed towards form which are closer to these.

5.1 Cline of Formality and Standard Eastern Norwegian forms

The figures which were presented in the previous chapter suggest what can be labelled as a cline of formality. The pattern observed is that across the three elicitation modes, the further removed the informant is from the Bokmål orthography, the more frequent is the production of the characteristics associated with the traditional Trondheim dialect. The input the informants received in Read can be understood as quite formal, as the text presented on the screen was written in conservative Bokmål. Given the relative proximity between the Bokmål orthography and Standard Eastern Norwegian, forms produced influenced by Bokmål orthography is by default closer to the forms which are also present in Standard Eastern Norwegian. Given the format of the experiment, formality may be an underlying factor regardless of elicitation mode. It is widely held that it is difficult to conduct linguistic experiments which do not cause the informants to be conscious about their production, however, as seen in the previous chapter, the degree of consciousness can be argued to decrease throughout the experiment. Returning to the example regarding production of feminine definite morphemes on masculine nouns, the informants who produced this did not change their mind after producing the possibly stigmatised form which is present in the dialect in Spoken, this only occurred in Read and Produce. Potential confounds are further covered later.

It was established earlier in this paper that the dialects spoken in the Oslo region, although especially within Oslo, is by linguistics generally held to be more prestigious in Norwegian. However, there is some dispute regarding the exact variety of the Oslo dialect which has the highest prestige. The pattern observed in the data ratifies that the forms which are present in the variety which has been referred to as Standard Eastern Norwegian are perceived as the most prestigious, at least by the informants who participated in the study. To some degree, this claim is supported by the higher frequency of forms associated with Standard Eastern Norwegian and Bokmål orthography in Read compared to the other elicitation modes. However, it is also possible that the higher production of the prestigious forms in Read is caused by the input they receive in Read, as all words were presented to them with the prestigious forms. Nevertheless,

formality might be a factor as the informants may initially have perceived the situation to be more formal at the start of the experiment, as several informants produced sentences which were even closer to SEN and Bokmål at the start of the experiment compared to later, within the first part. Thus, if formality is a factor which influence their production, it appears that with higher (perceived) formality, the informants produce the forms they either consciously or subconsciously perceive as more prestigious, rather than producing the traditional forms associated with their dialect. This tendency was, additionally, observed across all four characteristics examined. That is, the informants were observed to more frequently produce forms closer to orthographic and perceived spoken standards for all four characteristics in the elicitation mode which is considered to be the most formal of the three. Moreover, the relatively high degree of variation in Produce further support this, as the decrease in the perceived formality in Produce compared to Read is not as pronounced as the comparison between Spoken and Read. Thus, the data collected in Produce may be taken as an intermediate level between Read and Spoken.

Here it is noteworthy that the informants were frequently observed to produce forms which were closer to Standard Eastern Norwegian, or as they put it themselves "read in Bokmål", at the beginning of the first part of the experiment. As the informants became more familiar and comfortable with the format of the experiment, this tendency gradually became less prominent, i.e., a higher production of forms considered prestigious were observed early in the experiment compared to what was seen as the experiment moved along for several of the informants. This further suggests that formality and prestige are significant factors determining which forms the informants produce. Additionally, this serves to further strengthen the claim regarding which forms are perceived as prestigious, as the informants might have approached the sentences differently earlier in the experiment, with a higher degree of formality than what they did as they became more comfortable. Furthermore, Participant 5 opted to read all sentences out loud in a way which has earlier been referred to as Bokmål near, i.e., in the Read part of the experiment she consistently produced the more prestigious forms associated with Bokmål orthography, rather than producing the sentence in her own dialect. This stylistic choice further supports that formality results in higher production rates of prestigious forms, as reading sentences written in conservative Bokmål in the setting of an experiment is undoubtedly more formal than casual speech among friends.

During the experiment, several informants were observed to immediately correct themselves following the production of forms which may be perceived as stigmatised. Although this is not

examined in the study, this was observed in cases where an informant produced the masculine noun <bilen> 'the car' with the definite singular morpheme associated with feminine nouns, namely *-a*. Upon producing this marked form, the informant immediately corrected herself to use the prestigious form present in orthography and Standard Eastern Norwegian. This was observed multiple times, which suggest some awareness regarding the possible saliency of this form. Interestingly, when the experimenter produced the same word in the second part of the experiment with the feminine definite morpheme, several informants, including the informant who repeatedly corrected herself, produced the same form as the input received from the experimenter, without correcting themselves following the production.

One point that was brought up in the presentation of the diphthongs in the data was synonyms. The choice of word may suggest that some words are perceived as more correct, or rather, prestigious, than others, particularly if they appear more frequently in utterances made with a higher degree of formality attached. In this study, the notable example is the choice between the synonyms <bløt> and <våt> 'wet'. In the first part of the experiment, the informants were exclusively presented with the latter word as it was judged to be more in line with conservative Bokmål, although both words are accepted. Additionally, <våt> was judged to be the word a speaker of Standard Eastern Norwegian would produce, while <bløt> was judged to be the word speakers of the Trondheim dialect would prefer to use. These judgements were done by the author of the paper, a native speaker of the Trondheim dialect. In Spoken, the informants exclusively received <bløt> as the input word. Thus, any productions of <bløt> in Read and Produce were because the informant chose to substitute the word, either consciously or subconsciously, while productions of <våt> in Spoken is the opposite. One informant was observed to exclusively produce <våt>, while the remaining informants were perceived to prefer <bløt>. The choice between these synonyms can be argued to relate to prestige as <våt> is, presently, considered to be the more prestigious of the two. As this was not thoroughly investigated, the discussion regarding choice of synonym words is not entertained further.

Interestingly, the data presented in the previous chapter regarding the phonological process of palatalisation shows the same pattern as the three other characteristics. The production of palatalisation and diphthongs are arguably more subconscious than what is the case for wh-words and apocope. However, as diphthongs were only discretely covered, it is difficult to say something reliable regarding the difference in the quality of these across the formats. Palatalisation, on the other hand, was analysed with a method that provides comparable data across the three elicitation modes. The data suggests that the production of possibly palatalised

phonemes is different in Read compared to Spoken, and this has in this study been interpreted as a lower degree of palatalisation in Read compared to Spoken, although there is not any reliable data to compare this with to ensure that the data is interpreted correctly. The perception of these phonemes, however, support this as the phonemes which were possibly palatalised was frequently observed with a more pronounced palatal quality to them in Spoken compared to what was the case in Read. It thus appears probable that the informants overall had less tendencies of palatalisation in the productions which are influenced by a higher degree of formality and, arguably, more influence from the prestigious forms. The informants are expected to be at least somewhat familiar with what traits are generally associated with the dialect they speak; therefore, they are expected to have some degree of awareness regarding palatalisation, at least the presence versus absence of this in the Trondheim dialect compared to the perceived, although unofficial, standard variety of spoken Norwegian.

Saliency is another point which is worth exploring further. Some of the words which were included in the data appear to me more prone to variation than other words; this may make them more prone to change than what is the case for the words with less variation. Two words which stand out in their respective datasets are <ble> and <hvilke>. The variation observed for <ble> is not as clear in the data presented, given the exclusion of <vart> in the data set (see Appendix A for this variation). The potential saliency of the words may also relate to frequency, which is covered more extensively in the subsequent section. The variation observed on <ble> is, however, not assumed to exclusively relate to frequency; instead, it may be the result of saliency of the more traditional <vart> of the dialect, considering how different this word is from the prestigious forms as reflected in standard Bokmål orthography.

The equivalent of <hvilke> in the Trondheim dialect, and the other forms associated with the word, can be argued to be salient as well, and thus prone to change. Similar to what was discussed above, the traditional form of the word is strikingly different from the prestigious form present in the orthography. Additionally, the *k*-form of <hvilke> may be employed differently than what is possible for <hvilke> as it may also be used for <hvordan>. These points regarding the *k*-form of <hvilke> may support a claim that they are salient, and therefore more prone to change. It does not necessarily relate to stigma connected to the *k*-form, but perhaps it rather relates to the perceived prestige of the *hv*-forms combined with the distance between the forms. The difference between the other wh-words which were investigated almost exclusively relate to whether the word begins with /k/ or /ʋ/, although it is worth adding that there is a vowel difference between <hvem> in the forms, as the traditional form in the

Trondheim dialect is pronounced with /æ/ rather than /e/. The difference overall, though, between the wh-words are rather small compared to the difference between /ʋilkə/ and /kʊs/.

5.2 Word Frequency

The variation observed in the data may potentially be caused by word frequency, or to some degree influenced by it. That is, words with high frequency are expected to be less prone to variation and change than words with lower frequency. Above, the possible saliency of <ble> and <hvilke> was briefly discussed. The variation in the production of both words may possibly relate to the frequency of the words, this especially relates to <hvilke>. This is discussed in further detail in the forthcoming paragraphs.

Here, <hvilke> is sometimes used in a metonymy sense, i.e., it refers to all forms of the wh-word. The frequency table presented earlier indicates that among the surveyed words, <hvilke> is less frequent in both spoken and written Norwegian according to corpora data. In the *Frequency lists for Norwegian spoken and written language*, <hvilke> is the only wh-word which is not present in the top 500 most frequent words in Norwegian, furthermore, some of its forms are not within the top 1000 most frequent words. The remaining words are all well within the top 500, some of them are even in the top 100 most frequent words. The least frequent word which does not belong to the <hvilke>-group is <hvem>. The mean frequency rank included in the table places <hvem> as the 308th most frequent word in the two corpora, while the most frequent form of <hvilke> is 551st, more than 200 places behind. Moreover, the remaining forms of <hvilke> is ranked around 1000th on average.

<Hvilke> was as established the wh-word which was most frequently produced with its more prestigious *hv*-form rather than the traditional *k*-form. The frequency rates of the wh-words clearly shows that the forms of <hvilke> is by far the least frequent of the surveyed words, which in turn may indicate that frequency is a significant factor in explaining why it appears to be more prone to change than what is observed for the other words. Frequency may be a crucial factor here, as it is generally assumed that high frequency words are stored differently from lower frequency words; high frequency words are assumed to likely be stored in its fixed form, i.e., the form that a given speaker naturally produce. A high frequency word such as <hva> may be expected to be stored as the form the speaker produces, for the majority of the informants here it is thus stored as /kɑ/ while it for a few of them is stored as /ʋɑ/. A word with a lower frequency, however, may be stored as grammatical mapping rather than a fixed form, which gives rise to more variation. Thus, the speaker may store the low frequency word as <hvilke>,

which allows for additional information, or variables, such as /ʊilkə/ and /kʊs/. Moreover, <hvilke> is the only word among the examined wh-words which can be considered to have multiple possible forms within both forms, which arguably increases the likelihood that the word is stored as a grammatical mapping rather than a fixed form. Overall, the informants were observed to have a multitude of different ways to produce the different forms of <hvilke>, I return to this later.

The preferred form of <ble> may be explained by frequency in a similar way as <hvilke> above. Alongside the two accepted forms in Bokmål orthography, the speakers of the Trondheim dialect may produce /ʊɑʈ/, which may arguably be more salient than the other options. The data included in this study only concerns the two forms of <ble> which relates to diphthongs and monophthongs, but the third option is nevertheless worth mentioning as it concerns the overall high degree of variation present in the data. Regarding the frequency rates of <ble>, the monophthongal form is in the Bokmål corpus the 33rd most frequent word overall, while the diphthongal <blei> is the 2913th most frequent; the difference between the frequency rank of the two forms is striking. In the spoken NoTa-corpus, the difference is not as extreme; <ble> is the 95th most frequent word, while <blei> is the 226th. The pattern is obvious, <ble> is overall more frequent, which may explain why the informants strongly favoured this form. If the third option is included, this adds more variation between the options, although <ble> overall remains the most dominant. This likely relates to the previous discussion regarding prestige, as <ble> is arguably overall perceived as a more prestigious form than /ʊɑʈ/.

Word frequency may also, to some degree, provide an explanation as to why some of the words appear to exhibit patterns of ongoing loss of apocope, while apocope remains relatively stable on other words. Although the data presented in the previous chapter exclusively contain the observations of words *with* apocope, the absence of observations of certain words with apocope is interesting as it reveals that some types of words appear to be prone to loss of apocope to a larger degree than others. Notably adverbs, adjectives, and determiners. One adverb was consistently produced with apocope across all informants, namely [my] ‘much’, an adverb with a similar meaning, <mange> ‘many’ was, however, seldom observed with apocope. In the Bokmål corpus, <mye> is the 111th most frequent word, while <mange> is the 73rd most frequent – however, in the NoTa-corpus, the roles are reversed as <mye> is the 49th most frequent, while mange is the 85th most frequent. As the NoTa-corpus operates with observations of spoken language, while the Bokmål corpus operates with written language, it appears that

<mye> is the more frequent of the two in speech. This may explain why the word have retained apocope, while <mange> appears to be losing this feature.

The variation and potential ongoing loss of apocope in the dialect cannot be explained by frequency. <Større> 'bigger' was only produced with its apocope form by one of the informants, and this word is in the *Frequency lists for Norwegian spoken and written language* the 171st most frequent word in the Bokmål corpus. Meanwhile, <våte>, which was by the informants who opted for this word rather than the synonym <bløte>, was consistently produced with apocope, and this word is only the 7173rd most frequent word in the same corpus. <Bløte> does not appear within the top 10000 words in Bokmål, and this word was also consistently produced with apocope. Thus, while frequency-based explanations for the variation observed can be applied to wh-words in the dialect, it is not with the collected data possible to explain the potential loss of apocope with frequency alone, therefore it is expected to be caused by some other factor, e.g., saliency and prestige.

5.3 High Degree of Variation

Evident from the data, there is a high degree of variation across the informants who participated in the study. Moreover, there is much variation within each characteristic examined. It is not possible to neatly group the informants into two groups, where the first group contains the traditional speakers, and the second group contains the speakers of a more levelled variety of the dialect. An informant who was observed to be quite traditional in one of the characteristics, might in a different characteristic produce words which are deemed closer to the more prestigious form of the word.

The first characteristic examined was wh-words. Most of the informants alternated between *hv*- and *k*-forms, while three exclusively produced only one form. Among the informants, three of them appeared to prefer the Standard Eastern Norwegian/Bokmål-near *hv*-forms; three preferred the traditional *k*-forms. The remaining informants had varying degrees of alternation between the two forms. Among the speakers with variation who appear to have preferred the traditional form, the overall observation was that the word which is the furthest away from the form present in Bokmål and Standard Eastern Norwegian was frequently produced with *hv*-forms. This may be caused by levelling; the most marked word is substituted in favour of a less marked word. Additionally, some informants produced <kordan> which could be considered a compromise between traditional dialect forms and the more standard form as it retains the *k*-production, while also being closer to <hvordan> than what is the case for the more traditional

<koss/kossen>. <Hvilken> which is the word which was not prone to change cannot be produced with a *k*-form, **kvilken* and **kilken* are not found in the Norwegian language.

The trend which is observed in the data collected is that the *k*-forms of wh-words appear to become unstable, especially on the words which are the furthest away from the standardised way to write the words orthographically; *hv*-forms appear to gain traction among young adult speakers of the Trondheim dialect. Some of the informants already exhibit a full transition from the traditional form to the forms present in Bokmål orthography. Moreover, all but two informants produced *hv*-forms at least once. Whether this is because of influence from Bokmål orthographic forms in Read, or an ongoing change is not immediately clear, and is best investigated further with recordings of spontaneous speech in a more natural setting. It is possible that some informants altered their speech because of the unnaturalness of the situation of the experiment. This is to some degree supported by the observation of an increase of observations of the *k*-forms in Spoken, and to some degree Produce, compared to the proportions reported in Read. However, it does not fully explain the pattern, as some informants produced *hv*-forms regardless of the form of the input, and the presence of informants who clearly favour the *hv*-forms across the formats cannot be explained fully by influence of Bokmål in the first part of the experiment.

Even the traditional Trondheim forms were subject to variation, most notably <koss>. The informants who produced this word had some variation in how the word was produced. Participant 12 was observed to produce this wh-word with an /s/-sound which resembled the retroflex fricative [ʂ] rather than the alveolar [s] in <kossen> [kʊʂn̩]. Sometimes, the /s/ in the various forms of <koss> were perceived as the postalveolar [ʃ], generally in the <kossen> form [kʊʃn̩]. <Kossen> was also observed to be pronounced with the alveolar [kʊsn̩]. <Koss>, however, was generally pronounced as [kʊs]. <Kosse> [kʊsə] was only produced by Participant 6. Furthermore, [kʊɖɑn] was produced by some of the informants, which is closer to the forms expected in Standard Eastern Norwegian while retaining some of the markedness signalling that the speaker speaks a different dialect. One informant who produced this was Participant 8, although it was also produced by several other informants.

The variation observed on diphthongs were exclusively regarding production and non-production of optional diphthongs, the perception of them aligns with what has previously been described for the dialect, namely that they are narrow in the sense that the onset and offset of the diphthongs are proximate. Future works on diphthongs in the dialect should examine the F1- and F2-values of the diphthongs, rather than focus on the presence or absence of them as

this is arguably more informative regarding possible ongoing levelling with Standard Eastern Norwegian.

Apocope appears to remain one of the more stable characteristics of the dialect, however, it is nevertheless subject to some degree of variation which must be addressed. Naturally, the data presented in this paper is influenced by the productions of Participant 5, as she consistently read the sentences similar to what is expected of a speaker of Standard Eastern Norwegian. That aside, there is nevertheless variation observed on apocope. Weak feminine nouns were only observed produced with apocope of one of the informants, moreover, apocope forms of possessive pronouns were generally rare, although several informants produced some observations of this. The low number of possessive pronouns without apocope may be caused by reasons beyond the scope of this paper, but some of them are addressed later in this chapter. However, most of the informants appear to be stable in the production of apocope, thus, they are generally consistent on which words are produced with apocope on which words are not. Adjectives and adverbs were arguably the parts of speech which were subject to the largest degree of variation, this variation may be change on lexeme level rather than caused by change in the parts of speech. This was addressed earlier regarding word frequency. Only one informant consistently produced adjectives and adverbs with apocope when it was expected, the remaining nine informants had varying degrees of production of these words with apocope. The overall variation observed, however, supports a theory of ongoing loss of apocope; it suggests that apocope is not stable as words which are expected to have apocope is produced without it. Apocope is, as established, not present in Standard Eastern Norwegian; it is one feature which has traditionally been used to separate Eastern Norwegian dialects from Trøndersk Norwegian dialects.

In future studies, it may be interesting to observe what the trend among younger generation appears to be regarding apocope, including younger children, given the observation of tendencies of variation in young adults. If it is the case that there is ongoing change, the expectation for even younger speakers would be an observed increase of loss of apocope on other parts of speech, such as verbs and plural definite forms on nouns.

The most extensively investigated characteristic of the Trondheim dialect in this study is palatalisation. There was a high degree of variation on palatalisation, which includes the production of sounds which were clearly perceived as retroflex. Two of the informants, Participant 9 and Participant 11, were observed to rather frequently produce retroflex-like phonemes in palatalisation contexts. This phenomenon was especially prevalent on /n/ in

environments with a preceding /ɑ/ such as /vɑn/ ‘water’ produced as [vɑɳ] and /hɑn/ ‘he’ produced as [hɑɳ]. This follows what Hårstad (2010) reported for some of his informants, namely that retroflexes appear in contexts where palatal, or palatalised, consonants are expected. The claim made by Hanssen (2010) regarding the normalcy, or rather, how unusual, the change from palatalised consonants to retroflexes seem to be weakened, as it appears to presently be observed in the Trondheim dialect too, and not exclusive to the Narvik variety of Northern Norwegian. Earlier studies which have employed COG-values as a method to compare alveolar, retroflex, and palatal consonants have found that the values measured on these are not identical. Tabian and Butcher (2015) observed that retroflexes have lower COG-values, palatals have higher COG-values, while alveolars are located somewhere between the two. Thus, the observations of retroflex-like sounds in palatalisation environments might have influenced the data.

The phonemes which were produced in palatalisation contexts were seldom perceived as clearly alveolar, simultaneously, they were seldom perceived as clearly palatal. Thus, these phonemes may be produced somewhere between the alveoli and the hard palate. Palatalisation in the dialect is in the literature generally held to undergo a process in which the palatality is becoming weaker, furthermore, claims have been made that there is an ongoing process of depalatalisation in the dialect. This is supported by the material collected in this study; there are still tendencies of palatalisation across several of the informants, but the perception of the palatality of these palatalised phonemes is generally weaker than what is assumed to have been present in the dialect formerly. Some of the informants pronounced consonants in palatalisation contexts in a manner which was perceived as retroflex; this was also observed in earlier studies conducted in the Trondheim dialect spoken by younger speakers.

There are trends of ongoing depalatalisation observed in the production of the informants, exactly what sounds were produced by the informants who are judged to have some type of palatalisation retained is difficult to determine, and it is thus fathomable that Hårstad (2010) choice to add *ad hoc* symbols to refer to depalatalised consonants in the dialect which was something between alveolar and palatal. In general, the continuum between the hard palate and the teeth (or rather, alveolar ridge) appears to be subject to disagreement in the field of phonology; it appears that it is challenging to reliably determine what sound speakers produce. It may be the case that the production of depalatalised consonants is perceived as the sounds Recasens (2013) label as alveolopalatal. The sounds may possibly also be perceived as postalveolar. The impression during transcription was that it was challenging to determine what

sounds the speakers produced, as the sounds were not clearly perceived as palatal or alveolar. Compared to Participant 12, who was clearly perceived as producing palatalised consonants as palatal, the remaining informants clearly indicate an ongoing process of depalatalisation evident by ongoing withering of the palatality of the production of the formerly palatalised consonants.

5.4 Potential Confounds

There are multiple potential confounds which may have influenced the data in some way, these are addressed in this subsection. The confounds which are addressed are speech rates, stress, coding, the experimenter, and potential loss of the feminine gender.

In the study, speech rates were not taken into consideration for any of the characteristics investigated. Although speech rate is a potential confound, taking this into account in the study would have increased the workload significantly. The only characteristic which is not expected to potentially be influenced by speech rate is wh-words, as there are no immediately obvious reasons as to why this type of word would be affected by it as it is not expected to relate to phonology. The remaining three characteristics, however, can all potentially be affected by this.

Speech rates may affect apocope as unstressed vowels are prone to weakening or deletion in fast, continuous speech. This type of deletion of vowels is not the same as the traditional process of apocope in the dialect. It may be the case that some words were included as observations of apocope, while they in reality were the result of speech rate. Moreover, the surrounding environment may influence apocope, in that the final vowel of a word may be weakened or deleted if the following word begins with a vowel. Some of the informants were observed to say <kjører ikke> as [çøɾɪkə] rather than [çøɾə ɪkə]. This was not included in the data as it was judged to be a different process than the traditional apocope; however, it is nevertheless possible that similar processes were included as this was not actively taken into consideration when the data was coded. If this had been taken into consideration, it is however possible that the result would have been false negatives, i.e., the exclusion of observations of apocope which are caused by the traditional apocope in the dialect.

Some of the informants spoke rapidly at times, which potentially obscured the transcription. For some of the informants, it was difficult determining exactly what they had produced, this might have caused some words to be transcribed with apocope while they were not produced with it, or vice versa. Moreover, this could influence the perception of the diphthongs. Some degree of monophthongisation is to be expected in fast speech; thus, it is possible that some

diphthongs were incorrectly perceived as monophthongs when they were diphthongs. I return to this later in this subsection as it related to the choice of discrete coding on the diphthongs.

Finally, speech rates could potentially affect palatalisation as well. If the speaker routinely weakens all phonemes produced in continuous speech, it is possible that it could influence the production of the phonemes in palatalisation contexts – especially as palatalisation contexts in the Trondheim dialect is traditionally held to be dependent on the length of the preceding vowel, and the relative length of the palatalised phoneme. If the phoneme which may undergo palatalisation is shortened, it is expected to be less prone to palatalisation as this generally only occurs on longer consonants. As indicated earlier in this thesis, it was not possible to find the desired phonemes which were at least 80ms in length for the analysis of palatalisation, the phonemes included were generally around 60 to 70ms – although some of them were longer than 100ms, but this was a rarity in the data. Fast speech may have influenced the length of the phonemes, which in turn caused it to be more challenging to find phonemes produced by all informants that were of an appropriate length. Additionally, a general weakening of the phonemes could potentially result in a weakening of the palatality of the palatalised consonants.

The final point regarding speech rates is that in some cases, the informants were too quick to start producing the sentence following the beep. This resulted in an overlap between speech and beep several times, thus, it was not possible to fully exclude the beep from the sentences the informants produced. The overlap between the speech and beep sometimes posed a minor challenge for the forced aligner used, as the overlapping sound was automatically transcribed as noise rather than the actual production of the informants. Additionally, this issue sometimes resulted in the entire sentence being incorrectly segmented. However, this is not expected to have influenced the analysis of the study, as the analysed sounds were manually segmented.

Stress, specifically sentential stress, was not coded alongside the data. This is a possible confound as stress could potentially block apocope; there is a difference between stressed and unstressed use of the possessive pronouns, for example. If the informants applied sentential stress on possessive pronouns, i.e., applying emphasis on the word, it could explain the relatively low number of observations of possessive pronouns with apocope. Future studies of apocope in the Trondheim dialect should take this point into consideration, as it could potentially reveal whether apocope on possessive pronouns are gradually disappearing from the dialect. Considering the point made earlier regarding adjectives, <mine, dine, sine> with apocope is perhaps not as salient as apocope on the adjective <større>, as the words exist

without the final vowel, although used in different grammatical contexts, in Norwegian orthography.

Another potential confound regarding diphthongs is the discrete coding on diphthongs rather than use of F1 and F2 measurements. This method cannot be considered reliable in determining the quality of the diphthongs, nor can it dependably determine whether the sound is a monophthong or a diphthong, due to perception issues. This point is supported by issues encountered during the initial transcription of the recordings, as it was difficult in some cases to fully determine if a vowel was a diphthong or a monophthong. One notable instance of this is in the production of the word <sent> as the environment of /nt/ may, as established in the background chapter, trigger palatalisation in some dialects of Norwegian, including the Trondheim dialect. As evident from the data, the most common production of <sent> among these informants was with a diphthong. However, in some cases it was difficult to fully determine if the vowel was indeed a diphthong, or if the /i/-like sound in the production of the word was an instance of palatalisation. This issue might have been better resolved by employing F1 and F2 measurements near end of the vowel segment. Moreover, by opting for discrete coding on diphthongs, valuable information regarding the diphthongs is not included in the analysis. This includes a more thorough description of the nature of diphthongs in the Trondheim dialect, especially as they are, both traditionally and based on the perception in this study, described as different from the diphthongs present in Standard Eastern Norwegian. Some diphthongs may have been incorrectly labelled as monophthong, or vice-versa.

Aside from what has already been covered regarding the choice of methods to analyse the data, it is possible that it would have been more informative to focus on formant values on palatalisation following what is most widespread in the field of phonology, although it is not cutting-edge to look at the behaviour of palatalised phonemes compared to other phonemes. As there is, at least to the knowledge of the author, no comparable studies previously conducted on palatalisation in Norwegian dialects, it is difficult to determine exactly what the overall trend is. F2 and F3 values could possibly have been easier to compare with other studies as it is a more widespread method, and the expected values for palatalised versus non-palatalised phonemes are more clearly defined.

The sound quality of the recordings varied across the speakers. In addition to this, there were some background noises on most of them, which included faint talking in the background and generalised noise. It should not influence the data too much, especially as only one of the four characteristics was analysed beyond purely counting observations. Nevertheless, it is possible

that background noise has influenced the data on palatalisation to some degree, as some of the noises were rather continuously presented. Moreover, the varying quality of the recordings include that some of the informants talked what is best described as quietly, thus, in some cases it was necessary to adjust the volume a lot to be able to hear what the informant said. The final point regarding the sound quality is that one of the two channels on the device used to pick up sound was slightly weaker than the other; if the channel which was weaker was closest to the informant, it may have resulted in lower overall quality of the recorded sound.

Another potential confound is the experimenter, i.e., the person who said the sentences out loud in the second part of the experiment. The experimenter belongs to the same age group as the informants who participated, and therefore it is possible that the dialect of the experimenter is affected by the same ongoing changes in the dialect as the informants. Notable possible interferences include that the experimenter did not produce apocope on weak feminine nouns, nor on possessive pronouns. Moreover, the experimenter deliberately alternated between <blei> and <vart>, which may provide an explanation as to why some informants produced <vart> in Spoken. Although this was not included in the present study, the experimenter deliberately alternated between /bila/ and /biln/ to test if this would influence the production of the informants; several of the informants were observed to produce the marked /bila/ in Spoken, but it is also worth noting that several informants were observed to produce this singular form in the other elicitation modes as well, although some of them immediately corrected themselves.

It may have been better to have a more traditional speaker as the experimenter, although this might have influenced the informants as well, either by causing them to speak more traditional than what they otherwise do, or the opposite to mark distance from the experimenter. In his 2015 study, Stausland Johnsen observed that speakers in the Oslo-region altered their speech either to mark distance or closeness to others. Thus, it is expected that it would have been impossible to have an experimenter that would not have influenced the speakers in any way. Regardless, potential influence from the speech of the experimenter must be taken into account as it may have influenced the speakers.

In this study, it was not taken into account any possible ongoing loss of feminine gender of nouns. As previously established, weak feminine nouns undergo apocope in the traditional Trondheim dialect. However, several of the informants were observed to produce masculine articles on words which are traditionally feminine in the dialect, e.g., <ei and> ‘a duck’ becomes <en and> ‘a duck’. Few informants were observed to produce nouns which clearly could be categorised as feminine, and a categorical loss of the feminine gender may directly result in

loss of apocope on weak feminine nouns, as there are no longer any feminine nouns present in the system. Because this was not coded or included in the analysis, it is not possible with the present material to conclude what the potential cause of the ongoing loss of apocope on feminine nouns is. Participant 12 was the sole informant to produce observations of apocope on weak feminine nouns, but she exclusively produced it on compounds containing the weak noun <en/ei kake> ‘a cake’, namely <kjøttkake> ‘meat cake’ (similar to Danish fricadels) and <fiskekake> ‘fish cake’. Although there were few words in the data which could potentially be weak feminine nouns, words such as <skjorte> ‘shirt’ and <klokke> ‘clock’ are among the words which could have been produced with apocope.

6 Conclusion

The aim of this study was to answer the hypothesis repeated one final time; the Trondheim dialect is currently undergoing a process of levelling with Standard Eastern Norwegian in which traditional traits and characteristics are abandoned or changed in favour of the forms present in Standard Eastern Norwegian. The hypothesis was approached by the use of four research questions which focused on four characteristics of the dialect, namely wh-words with *k*-forms, narrow diphthongs, apocope, and finally palatalisation.

In order to answer this hypothesis, speakers of the Trondheim dialect were recruited to participate in a study to gather new material to use to check the status of four traits and characteristics associated with the dialect. The ten informants included in the study were all in their early 20s, i.e., born around the turn of the millennium. Unfortunately, only one male was included in the study, but this was assumed based on previous studies conducted in the dialect to not significantly impact the data. The informants participated in an experiment to gather the relevant data to approach the hypothesis.

The experiment used to collect the data was based on an experiment earlier conducted in the Northern Norwegian Tromsø dialect, and it was initially based on retrieving information regarding syntactic structure. The format of the experiment was only slightly modified. In the experiment, the informants read 30 sentences out loud which were presented in conservative Bokmål orthography. The task was then to say the sentence again, in the form of "X said that Y" where X is the speaker of the sentence, and Y is the sentence they were presented in Bokmål. In the second part of the experiment, the same 30 sentences were spoken out loud by an experimenter who is a speaker of the local dialect, and the task was to say the sentence in the form of "You (the experimenter) said that Y".

In total, the informants produced 90 sentences each. The sentences contained several words which were assumed to contain palatalisation contexts, contexts with optional diphthongs, words which obligatorily undergo apocope in the dialect, and wh-words. The data from the experiment was transcribed, and the relevant words and constructions were manually collected from the data. A total of 1800 sentences were transcribed and analysed carefully with respect to the four characteristics investigated in the study. Although the data can be argued to be limited, the material used is nevertheless substantial considering factors such as limited resources and time.

The data retrieved from the material was analysed in Praat, R, and RStudio. The analysis revealed that there is much variation in the form of wh-words among the informants in the study, some have retained the traditional *k*-forms, while others have fully transitioned to the *hv*-forms of Bokmål and Standard Eastern Norwegian. Most of the informants had variation between the two forms; and the wh-word which stood out was <hvilken> (with other forms) 'which', and this word is traditionally produced as <koss> (with other forms) in the Trondheim dialect; this is the wh-word which is the most different in the Trondheim dialect compared to the standard based on Bokmål orthography. The data suggests that diphthongs remain perceived as narrower than the ones present in Standard Eastern Norwegian, although the use of optional diphthongs cannot assert whether there is ongoing levelling or not, as both forms are allowed in Standard Eastern Norwegian too. Apocope was revealed to remain stable on some parts of speech, and a selection of words, but the trend observed across the informants is an ongoing loss of traditional apocope.

Another traditional characteristic of the Trondheim dialect that was observed to undergo some type of loss was palatalisation. Several of the informants have retained some type of palatalisation, but the perception of the traditionally palatalised consonants suggests an ongoing process of depalatalisation, as the palatality of the sounds were perceived as weaker. The sounds produced in palatalisation contexts were generally not perceived as either alveolar or palatal, but rather something between the two. Some informants were also observed to produce sounds which were clearly perceived as retroflex in palatalisation contexts. COG-values were manually retrieved in Praat from two windows, first 30ms and 30ms from the middle of the segment, for a selection of words with and without possible palatalisation to analyse the behaviour of the sounds. Given the lack of comparable data, and the limited observations of relevant comparable sounds, this could merely reveal that there is some difference between the sounds in palatalisation and non-palatalisation contexts. This should be more extensively applied in future studies, with a larger dataset, to more reliably check if this method provides meaningful results.

The general trends observed on the four characteristics across the elicitation modes indicate that there is a trend in the direction of Standard Eastern Norwegian in more careful speech, which in turn may suggest that dialect levelling is impending. The observations made in Read perceived as more careful speech compared to Produce and Spoken, as the informants were seemingly less preoccupied with ensuring that their production was accurate in the two other formats. In Read, and to a lesser degree Produce, the informants produced forms associated with Standard Eastern Norwegian more frequently than what was generally the case in Spoken.

Traditional characteristics of the dialect appears to be weakening, and the forms present in Standard Eastern Norwegian appears to gain traction among young adults speaking the Trondheim dialect, such as the presence of *hv*-forms and the decrease of use of *k*-forms on wh-words. The limited data used in this study however cannot reliably assert whether this is the overall trend in the age group included, it is possible that the informants who participated in the experiment are not representative of the age group. The variation observed among the few informants in this study, however, do indicate that there is a lot of variation between speakers belonging to the same age group. Thus, what may be expected from a larger group of informants would potentially be even more variation, unless the informants included in the study perfectly represent all variation present in the dialect, which is, naturally, highly unlikely. The presence of this much variation does, however, indicate that there is some type of change which is underway in the dialect. A potential factor which could be worth investigating further later is saliency, as this was briefly discussed as a potential explanation as to why some words retain traditional characteristics to a larger extent than others.

Future studies on the Trondheim dialect are advised to have a larger group of informants, ideally informants of different age groups to obtain a clearer picture of what is traditional in the dialect, what the newly added innovations are, and what Standard Eastern Norwegian traits and characteristics which were not traditionally present in the dialect but has gradually entered the dialect the past decades. Older informants should be assumed to speakers of more a more traditional Trondheim dialect, while younger informants than those included in the present study should, in the case of dialect levelling, be assumed to have an even higher degree of variation between traditional forms and forms from Standard Eastern Norwegian. If it is the case that the forms which are Bokmål-near, or close to the production observed in Standard Eastern Norwegian, are more prevalent among younger segments of the Trondheim dialect speakers, this would further support the hypothesis that the dialect is levelling with Standard Eastern Norwegian.

Furthermore, future studies would possibly benefit from collecting data by use of methods which trigger more natural speech than the experiment used in this study. This is because the results from this study may have been influenced by Bokmål orthography as much of the input the informants were exposed to were presented in conservative Bokmål orthography, which may in turn have resulted in productions which are perceived as close to Standard Eastern Norwegian, which the informants may not have produced in natural speech. Additionally, the setting of the experiment may have caused some informants to be more conscious about the

way they speech, so they may have produced forms which they assumed they were expected to produce – either producing more observations of Bokmål near forms, or the opposite – speaking more markedly the local dialect. One possible way to collect more natural speech would be to have informants who already know each other and give them questions or statements which they are to discuss among themselves without experimenters present in the room.

Future studies of palatalisation in Norwegian dialects are advised to have a larger set of words with phonemes which are potentially palatalised and words with the same phonemes but not expected to undergo palatalisation. This would allow a more comprehensive analysis in which it is possibly to compare the behaviour of non-palatalised and palatalised consonants more reliably in the language. Additionally, more extensive studies of palatalisation in Norwegian should consider to compare several Norwegian dialects to check if there is any possible variation in the palatality and the behaviour of palatalisation in the dialects; especially as the Trondheim dialect is observed to have a loss of degree of palatalisation, and dialects which are not expected to undergo the same depalatalisation context could provide more information about how palatalisation in Norwegian has traditionally behaved. Finally, palatalisation in Norwegian should be studied by applying methods which can aid in determining where the place of articulation is located for Norwegian speakers who has some type of palatalisation process actively present in their dialect, such as use of EMG, EPG or other tools which enables measure of tongue movement during speech.

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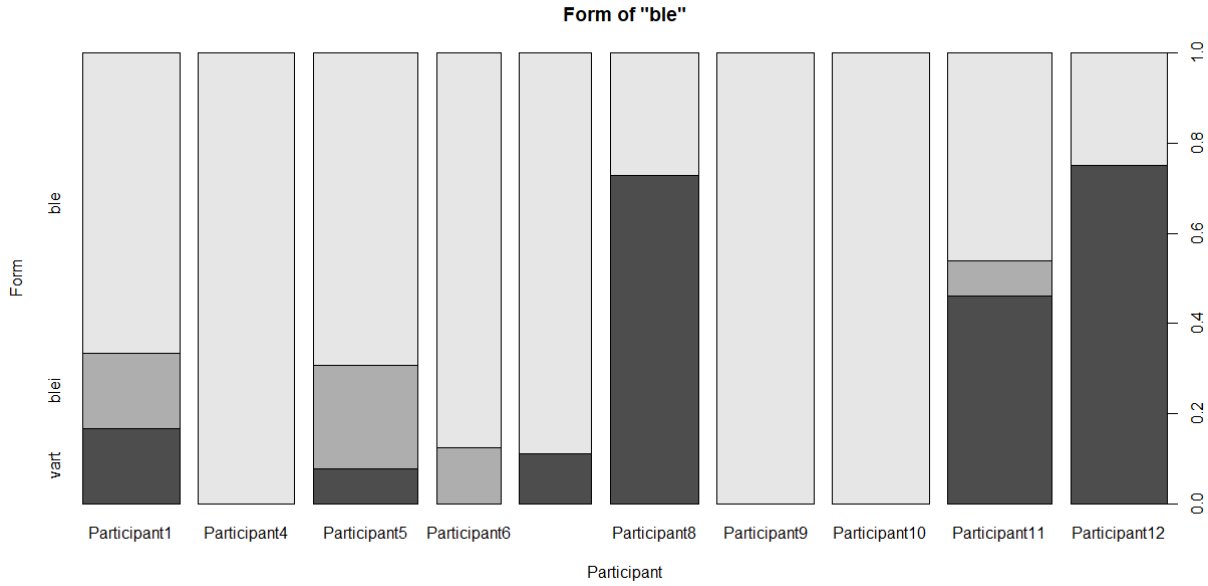
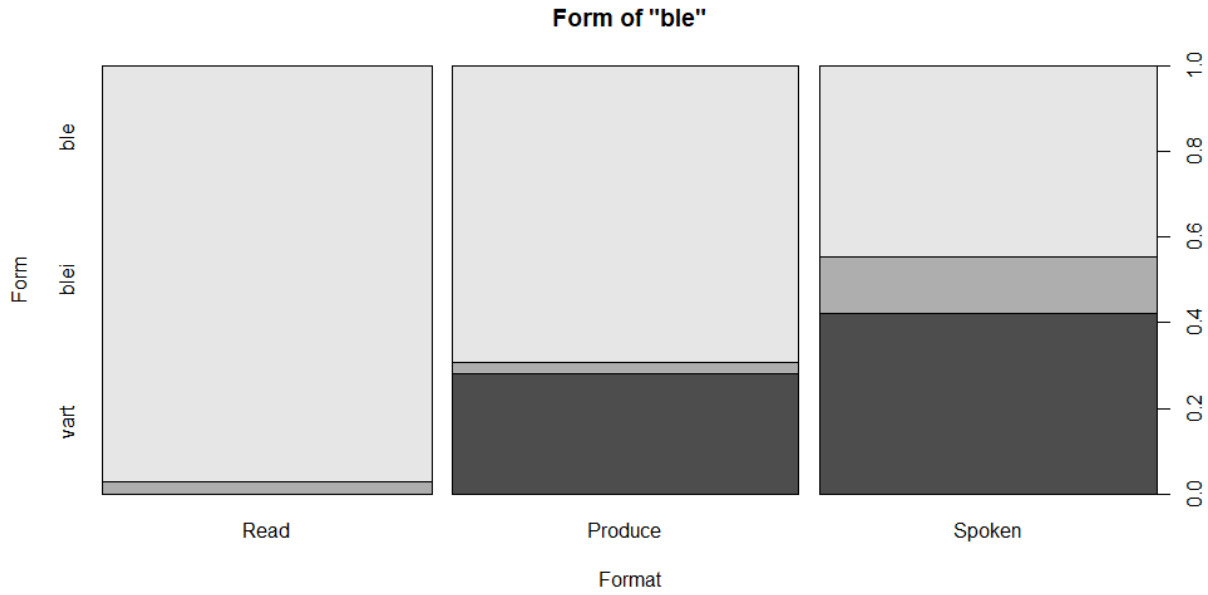
Appendix A

This appendix contains the figures illustrating the distribution between the three possible forms of ‘became’ produced by the informants in this study. The first figure illustrates the distribution between the three options per informant, while the second figure illustrates the observations of all informants across the three elicitation modes. The second figure suggests that the informants target the perceived prestige form in the most formal of the modes, while the possibly salient form gradually becomes more prevalent in the two other elicitation modes as the input is further removed from the prestige forms present in the orthography.





Appendix B

The table in this appendix shows the observation of each word which was coded as produced with apocope across the three elicitation modes. It clearly shows that some words are consistently produced with apocope; this is most prominent on verbs, <hent> is a good example as it the observations across the formats suggest that the word only appears once per format per informant (one less observation of the word in Read as Participant 5 produced it without apocope). This table also reveals that the most prominent word, by quite a margin, is <spurte>, note that this word does not appear a single time in Read.

	Read	Produce	Spoken
ber	0	1	1
beskytt	9	10	10
blaut	5	9	18
bløt	0	0	1
din	0	0	2
drekk	0	1	0
drikk	9	8	9
feskkak	0	0	1
forsøv	0	1	0
førsøv	1	3	4
gjor	9	10	10
glemt	1	0	3
hadd	11	19	12
hent	9	10	10
hjem	14	17	26
kjøpt	34	37	38
kjøttkak	0	0	1
konn	0	0	1
kunn	0	4	6
legg	9	8	10
leit	10	13	20
let	8	7	0
lurt	0	9	7
måkan	7	7	2
mang	5	5	4
måsan	2	1	7
min	2	1	0
my	23	27	27
nøklan	18	20	20
ongan	9	10	10
sell	18	20	20
sett	19	14	19

sin	5	2	2
snødd	0	2	0
spelt	0	0	1
spilt	9	9	8
spurt	0	253	253
stør	2	2	2
tjent	14	18	19
våt	8	7	3
vottan	25	31	31