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So-called "sloppy speech" is a frequent subject of criticism in broadcast and electronic news media. In particular, phonetic reductions are accused of compromising comprehension. This paper presents the results of an experimental self-sampling study (9015 participants) that examines the effects of reductions in scripted news speak. Overall, the results show that reductions have limited effects on comprehension. However, abstract, complex and ambiguous linguistic conditions seem to involve an efficient word recognition that is slightly hindered by reduced pronunciation. There are no correlations with sex, geographic region or length of education, whereas age seems to play a partial, though inconclusive, role.

Introduction

"Since I've become a central banker, I've learned to mumble with great incoherence … If I seem unduly clear to you, you must have misunderstood what I said," Alan Greenspan, former chairman of the US Federal Reserve, said in a speech to Congress in 1987 (Crystal and Crystal 2000, 152). To him mumbling seemed an advantage. In comparison, news anchors and reporters in broadcast and electronic media are likely less interested in being misunderstood by the public. Instead, they want to "safeguard accuracy and clarity" (Cotter 2010, 195), which includes speaking in a manner that is easily comprehensible with "clear diction" (Mills 2004, 218). The news audience seems very attentive to this issue as well. According to Crystal (2013, 254), the most common of all types of complaints to the BBC concerns pronunciation. In particular, phonetic reductions such as *libry* for *library* annoy viewers and listeners (254). In fact, *The BBC News Style Guide* advocates a distinct pronunciation by warning against words that may lead to phonetically reduced "mispronunciation". Examples include *Febbery* for *February*, *joolry* for *jewelry*, and *serkertry* for *secretary* (Allen 2003, 64).

Mumbling in the media is a recurring topic in other countries as well. In Germany, for instance, public service broadcasters ARD and ZDF have set forth a series of initiatives to deal with comprehension issues, including those caused by *genuschelter* (slurred) and *gemurmelter* (muttered) pronunciation (Eberhard et al. 2014, 7). Another prominent case is Denmark, where the present study has been fielded. Recurrent complaints about the lack of clear pronunciation have led the largest Danish broadcaster, DR, to conclude that poor pronunciation is the single most important problem concerning the language

usage of journalists (Dohrmann 2008). Researchers as well have been warning against the increasing "mumbling" in Danish media, some postulating—based on media excerpts of reduced words—that phonetic reduction leads to severe comprehension problems (Skyum-Nielsen 2008). Accordingly, the language policy at DR now explicitly instructs journalists to be meticulous when articulating (Kristiansen 2009, 3). These normative policy instructions, however, are guided by assumptions rather than empiric studies, which beg the question: What are the actual and perceived effects of phonetic reductions in broadcast and online news speak?

The relevance of this question has two main perspectives. First, it must be considered a significant societal as well as commercial problem if (some) listeners or viewers cannot understand (some of) what news readers are saying because of an unbefitting pronunciation praxis. Parts of the audience are then kept out of the public information loop and—from a practical business perspective—they are lost as potential media consumers.

Second, the pronunciation of journalists, in all likelihood, influences the way people *perceive* "proper" pronunciation.[1] In this respect pronunciation policies and praxis based on mere assumptions may impact the general societal conception of "proper" pronunciation on dubious grounds.

Literature Review

In spite of such significant practical aspects, the effects of phonetic reduction in broadcasting and electronic online media have attracted limited attention in communication studies. Instead, the reception agenda seems to be concentrated on macro-level comprehension and recall issues concerning cognitive topics such as schemata, frames and scripts (for a general review, see Schaap 2009, 32–33). Phonetic micro-analysis has been used primarily in descriptive sociolinguistic approaches to, and conversation analysis of, broadcast and online journalism with other research agendas (Zelizer 2004, 121–123). Yet, there is no shortage of normative guidelines on how journalists *should* enunciate (Mills 2004; Utterback, Cupp, and Freedman 2010), the apparent lack of empirical evidence notwithstanding. Here, we touch upon a sensitive issue within journalism where language practices are often guided by tradition and normative attitudes. This approach should be critically questioned, though, not least because it may risk leading to a language praxis that—although broadly accepted by journalists as norm—is far from being appropriate and effective in the eyes (and ears!) of the public. As documented by Snoeijer, de Vreese, and Semetko (2002), established and popular journalistic practices, such as live cross-talk, do not necessarily enhance comprehension and appreciation by news audiences.

Turning to language usage outside of the media, phonetic studies have shown that reductions seldom lead to low or no comprehension in general. On the contrary, even radical reductions such as *wnyu* for *wouldn't you* have been documented to be intelligible for native English speakers, if the phrase is part of a full context (Ernestus and Warner 2011, 257). In general, previous studies have found that context is *the* predominant factor concerning the intelligibility of phonetic reduction in common language use. In a Dutch setting, Ernestus, Baayen, and Schreuder (2002) found that young, normal-hearing listeners recognized 52 per cent of highly reduced word forms in isolated position, compared with 70 per cent in limited context position, and 92 per cent in full context position. Other experiments have substantiated that reduced forms are recognized more slowly than non-reduced forms, when heard in isolation (Ernestus and Baayen 2007; Janse 2004; Janse,

Nooteboom, and Quené 2007). Furthermore, a recent study on syllable reduction in Danish showed that reduced words are intelligible during both slow and quick speech rates, with 85.2–88.8 per cent intelligibility scores (Schüppert et al. 2012).

These results are not surprising given that phonetic reduction is a highly frequent—and historically ongoing—phenomenon in a wide range of languages, including, but not limited to, Germanic languages such as English and Danish (for further examples, including phonetic reductions in French, Finnish and Japanese, see Ernestus and Warner 2011). For instance, Johnson's (2004) acoustic corpus study of conversational American English showed that over 60 per cent of the analysed words deviated from their canonical form by at least one phone, and 28 per cent by two or more phones. In addition, a diachronic phono-acoustic study by Thøgersen (2011) has documented that syllable boundaries in scripted radio news speak in Denmark have become less distinct than they used to be, which is an indication of increasing phonetic reduction in formal journalistic news registers on the radio.

Although the mentioned studies conclude that phonetic reductions seem to cause limited comprehension issues, they are not necessarily applicable to broadcasting and electronic media. Most importantly, media audiences are not directly exposed to the acoustic speech signals as in normal language use, but by way of electronic mediation (radio, television, computer, phone, tablet). In addition, news readers cannot rely on any *immediate* feedback from the audience because they are not face to face. In other words, news readers do not know if they are being understood, and are forced to adjust their pronunciation accordingly. Thus, news reading is not identical to regular talk in interaction, and hence the need for further studies.

Likewise, the possible influences of sex, education and age have yet to be scrutinized in depth, with the exception of age-related hearing loss in general language usage. Regarding the latter, Janse and Ernestus (2011) have found that high-frequency hearing loss hinders the interpretation not only of a word's acoustic properties, but also of the adjacent context, which in turn makes acoustic information more important for people with impaired hearing.

Another significant subject is the relationship between actual and perceived difficulty in comprehending phonetically reduced words. A fairly recent survey of audience attitudes towards the language use in Danish public service channel DR (Thøgersen 2013) showed that—contrary to popular belief—the audience (predominately) finds the news speak on DR *easy* to hear and understand. This finding raises the question of how actual and perceived comprehension of news speak are related.

All in all, previous studies have given important insights into the general effects of phonetic reduction on word comprehension. Our experiment expands these studies by focusing on scripted news speak as a specific type of one-way communication that aims for immediate comprehension in a mixed mass audience. In addition, our study looks at how different types of phonetic reductions in Danish under different phonological, morphological, lexical, syntactical and semantic conditions may lead to different types of comprehension issues in different audiences.

Theory

Though reductions are a frequent phenomenon in Danish and other Germanic languages, they are not randomly occurring. As pointed out by Schachtenhaufen (2013,

170–171), phonological structures might be more or less inclined to reductions; this includes segmental factors as well as phonological context, position of the segment in the syllable, and position of the syllable in the sentence.[2] In a journalistic context, different registers and genres provide more or less room for reductions as well. Formal registers in scripted news speak are—presumably—less inclined to frequent reductions in comparison to more informal registers such as "couch interviews" in current affairs programmes. It should be noted, though, that recent trends in Danish broadcasting seek to replace formal language usage with registers that makes use of (imitated) spontaneity and mimics more casual talk-in-interaction (Kristiansen 2012).

Reductions across word boundaries are particularly interesting, because they can lead to vowel strings without apparent syllabic boundaries, for instance: (*Th)ere are ar(guments worth listening to*). In other words, reductions in some instances lead to phrases with limited phonetic cues as to when a syllable starts and stops, possibly resulting in limited segmentability, i.e. segregation of words into morphemes and phonemes. In addition, other comprehension issues may arise due to homophonic similarity, i.e. identical pronunciation of different words or phrases. For instance, the reduced form of *we enter* may sound phonetically similar to *winter* due to assimilation (i.e. when a sound merges with another sound), and such reductions may, possibly, confuse listeners depending on the contextual clues.

In Danish, the lack of clear syllable boundaries is chiefly due to the progression of consonant vocalization and schwa-assimilation, a condition in which the neutral phoneme schwa [ə] disappears, and the syllabicity is either lost or transferred to bordering sonorant sounds, e.g. *harmony* [ˈhɑmǝni] → *harmny* [ˈhɑmni]. As illustrated, schwa-assimilation is also found in English—and other Germanic languages.

In addition, extra-phonological factors play an important role as well. According to Schachtenhaufen (2013), content words introduced for the first time in a dialogue are typically (hyper)distinctly pronounced, while repeated forms are prone to reduction. The effect of repetition is also mentioned by Pluymaekers, Ernestus, and Baayen (2005), who pointed to textual predictability as well as overall information redundancy as significant triggers for reduction. Correspondingly, predictability acts as part of the pivot for the *Probabilistic Reduction Hypothesis*, set forth by Jurafsky et al. (2000), according to which words are more likely reduced when they are predictable and probable.

Hypothesis and Research Questions

Based on the findings of previous studies,

H1: We expect phonetic reductions to have limited influence on comprehension[3] in scripted news speak.

Deviations may occur, though, due the electronic mediation, different audience segments and different types of linguistic conditions. This leads to our primary research questions:

RQ1: To what extent do phonetic reductions under different linguistic conditions lead to limited comprehension in scripted news speak?

RQ2: For whom do phonetic reductions under different linguistic conditions lead to limited comprehension in scripted news speak?

Although the majority of the participants are expected to understand reduced forms, they may find it difficult to do so. If that is the case, it could be a sign that the participants have to strain their hearing and/or concentration when discerning the acoustic information, or it could be a sign that they are annoyed by the reduced forms, finding them improper or sloppy. Hence, our third research question:

> **RQ3:** What is the relationship between actual and perceived difficulty in comprehending phonetically reduced words?

More specifically, we wish to test a series of reductions under basic as well as complex linguistic conditions. By doing so we expand the scope of the study to include complex parsing that presupposes efficient word recognition, an important aspect that, to the best of our knowledge, has not been studied in detail before. Furthermore, we focus on reductions *within* words as well as *across* words in addition to the syllabic position of the reduced phone(s). By doing so, we are able to test vowel clusters that are suspected of causing segregation issues.

Design

Method

The experiment has been designed as a self-sampling multiple-choice survey with soundbites embedded on a news website for scientific news, videnskab.dk. The site was only used as a host, and the participants were predominantly invited via other channels. The survey was online for six months between 2013 and 2014. During this time, 9649 participants completed the test. After removing participants not living or residing in mainland Denmark (excluding e.g. the Faroe Islands and Sweden), we are left with 9015 respondents. The average age of participants was 42 years (SD = 16.53; population average: 41 years), 37 per cent lived in Greater Copenhagen (Region Hovedstaden; actual population: 31 per cent), 51 per cent were female (actual population: 50 per cent) and 64 per cent reported one to four years of higher education.

Stimuli

The test includes 17 sound bites, each containing one or two test words in one unit of meaning (= one or two full sentences) in order to minimize the influence of memory on the results. In a set-up like this, all test words must be considered new information with limited predictability which, according to the cited previous studies, is normally inclined to *distinct* pronunciation. Consequently, the design mimics a situation in which the listeners have very limited context for comprehension. Reduced pronunciation should thus be expected to cause more comprehension issues compared to a more extensive context.

All sound bites were recorded in two variants by a Danish, 50-year-old, male radio journalist, who speaks with a slight regional (East Jutland) accent. In the first variant, the journalist was instructed to use a hyper-distinct pronunciation close to the written version of the words. In the second version, he was instructed to speak naturally with phonetic reductions. Furthermore, he was instructed to keep volume, speech rate and intonation as constant as possible in all versions.

In the survey, the sound bites were preceded by a set of questions regarding background variables (sex, age, geographic region and education) and each sound bite was succeeded by a question and a set of multiple-choice answers. All answer options—with the exception of one test unit—shared phonetic similarities (either in syllable pattern or core phoneme) with the tested words and had a semantic meaning that fitted the co-text. This approach was chosen in order to prevent participants from guessing test words based on partial phonetic recognition or semantic exclusion. As an appendage to each question, the participants were asked to assess whether or not the unit was easy to understand (yes/no). The participants were *not* informed that some sentences had a reduced pronunciation while others did not. Consequently, they were asked to assess the perceived comprehension of the unit, *not* the pronunciation of the words, making it a partially masked test.

Tested Conditions

The tested words and phrases all contain unstressed syllables that are reduced in accordance with general phonetic tendencies for reduction (see Note 2) and in accordance with excerpted examples of reduction types in Danish news media (Skyum-Nielsen 2008). In total, they comprise four groups covering the phonetic conditions we wish to test:

Reductions within words:
1. Schwa-reduction in final position after the stressed syllable.
2. Reduced syllable preceding the stressed syllable.

Reductions across words:

1. Vowel clusters.
2. Homophonic similarity.

Table 1 presents all tested words and phrases. Reduced syllables are marked by parenthesis. For full test units, phonetic notation (International Phonetic Alphabet) and answer options, see Appendix A.

As depicted in Table 1, some units include one test word/phrase, while others include two. The participants were asked only one question per unit regarding one test word/phrase. To do this, we coded the survey software to divide the participants randomly into four tracks with different, random combinations of units and answer options. The individual participant only heard the unit in one variant (either reduced or non-reduced) and only once. By randomly assigning participants to either a reduced or non-reduced version of the same unit, we make use of an experimental design, commonly applied in political communication and political science research (Laustsen, Slothuus, and Hopmann 2014).

In each of the four groups, one of the units has been constructed in a more complex way:

☐ Group 1, unit 5 contains a syntactically ambiguous nominal phrase.
☐ Group 2, unit 10 contains two lexically abstract test words.
☐ Group 3, unit 11 contains a negation with an ambiguous scope.
☐ Group 4, unit 17 contains two phrases with different semantic content, but phonetic similarity in the reduced versions.

TABLE 1

Tested words and phrases arranged in groups according to phonetic settings (parentheses denote the reductions)

	Group I (schwa-reduction in final syllable)					Group II (reduced syllable preceding stressed syllable)				
Unit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Test word A	*hund(e)n*	*knald(e)*	*komm (e)*	*gav(e)*	*vas(e)*	*probl(e)matisk*	*pæd(a)gogerne*	*frik(a)dellerne*	*fot(o)graferet*	*instrum(en)tal*
	"the dog"	"spark"	"come"	"gift"	"vase"	"problematic"	"the child and youth workers"	"the meatballs"	"photographed"	"instrumental"
Test word B	–	–	–	–	–	*journ(a) listerne*	*amb(u)lancen*	*an(a)lysen*	*lok(o)motivet*	*min(i) malistisk*
	–	–	–	–	–	"the journalists"	"the ambulance"	"the analysis"	"the locomotive"	"minimalistic"

	Group III (reduction across word boundaries)				Group IV (homophonic reductions)		
Unit	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Test phrase A	*de(t er) ik (ke) al(le)*	*de (er) al (le)*	*(i) Italien*	*hår(de år) ov(re) i Aalborg*	*høj(re) og*	*høj(ere) oppe*	*hedd(er) Erna*
	"it is not **all**"	"they are all"	"in Italy"	"hard years in **Aalborg**"	"right and"	"higher up"	"her name is Erna"
Test phrase B	*de(t er) ik (ke) al(le)*	*hjem(me) mens*	–	*hår(de år) ov(re) i Aalborg*	–	–	*hedd(er) Anna*
	"it is **not** all"	"home while"	–	"**hard years** in Aalborg"	–	–	"her name is Anna"

A lower degree of comprehension and a higher degree of perceived difficulty is expected for all of these units in both the reduced and non-reduced pronunciation. Each unit will be covered and analysed as a part of the result exposition in the following section.

Results

Comprehension

We begin the analyses of our data by examining the general influence of reduction on comprehension.[4] The results are depicted in Figure 1, showing the share of correct answers, i.e. correct recognition. The four tested groups are marked by the central line (1 on the *y*-axis) with groups 1–4 represented from left to right. In the case of units containing two test words or phrases, the first word/phrase is positioned above the middle line (Version A) and the second below (Version B). Overall, the participants have given correct answers with some noticeable fluctuations, especially in the second group of reduction, i.e. reduced syllables preceding stressed syllables.

As expected, phonetic reductions result in limited comprehension issues, generally speaking. However, reductions do in some instances (e.g. units 8, 9 and 10) lead to a reduction of up to 10–20 percentage points in comprehension, and the deviations are worth scrutinizing.

The first condition (schwa-reduction in the final syllable position) did not result in any significantly reduced comprehension with the exception of test word A in unit 5. This single deviation is in all probability caused by the embedded syntactic ambiguity:

> På kasernen havde man købt en vase ([ˈvæːsə] versus [ˈvæːs(ː)]) til alle i bestyrelsen, som nu er væk

> "At the barracks they had bought a vase for everyone on the board, which is now gone"

The pronoun *som* ("which") may refer to the adjacent nominal head *bestyrelsen* ("the board"), but it may also refer to the more distant nominal head *vase* ("vase"). Consequently,
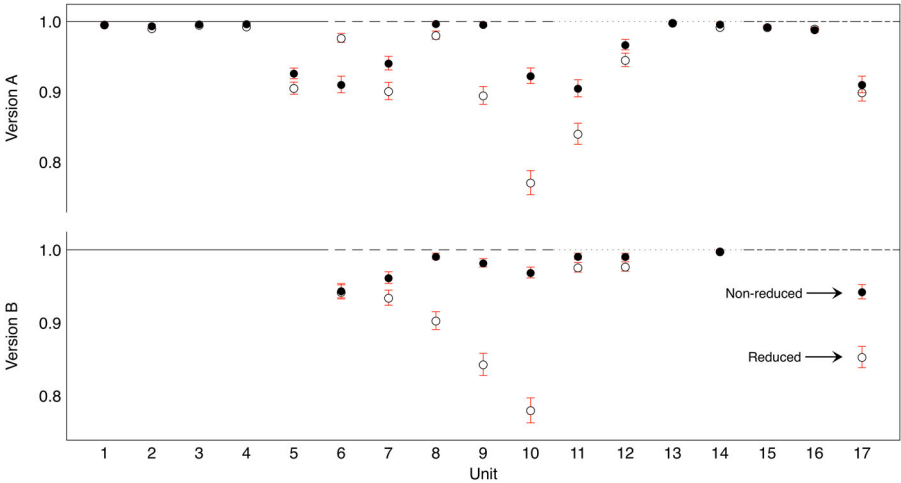

FIGURE 1
Correct word/phrase identification measured in parts (95 per cent confidence intervals)

it is uncertain if the board *or* the vase is gone, though the participants do not necessarily perceive both of these options while parsing the syntax. In this case, however, "the board" is not an answer option, which may have forced some or several of the participants to syntactically reanalyse the sentence. Regardless, the proper identification involves word integration across a longer distance leading to a higher syntactic complexity (Gibson 1998). In other words, the results indicate that non-reduced pronunciation in this instance delivers a more salient cue for word recognition.

Contrary to the first test group, the second phonetic setting (initial reduction before stressed syllable) shows several noticeable findings. In one instance, however (unit 6, test word 1), the result is conspicuously irregular. In contrast to all of the other results, the non-reduced pronunciation is significantly more difficult to comprehend than the reduced form. Linguistically, it is unclear why.

The other test results in this second group show that reductions before the stressed syllable cause the most prominent comprehension issues. In particular, longer words (four or more syllables) show more wide-ranging comprehension gaps between the reduced and non-reduced forms, especially if the words are abstract. Such an effect is prominent in unit 10 that contain two abstract content words (adjectives): *minimalistisk* ("minimalistic") and *instrumental* ("instrumental").

Test group 3 (reduction between words) is noteworthy with regards to unit 11 that contains a negated assertive: Det er ikke alle, der er bange for ulvene i Jylland ("Not everybody is afraid of the wolves in Jutland"). In this case, Question A (Who is not afraid of the wolves in Jutland?) leads to a noteworthy difference between the reduced and non-reduced version. This is probably caused by the scope of the negation in Question A which is semantically ambiguous when given the answer options: *alle* ("everybody"), *nogle* ("some") and *mange* ("many"). In other words, the participants might, rightfully, be in doubt whether it is *all*, *some* or *many* who are not afraid of the wolves in Jutland, although only the word "all" (coded as the right answer) is present in the tested unit. However, it seems that the non-reduced pronunciation of "alle" ("everybody") works as a more salient cue for word recognition in this case, limiting the ambiguous choices.

The results in the fourth and last group (homophonic similarity) confirm that complex semantic parsing is, in some instances, aided by non-reduced pronunciation. In the case of unit 17, the two test phrases sound quite similar in their reduced forms: *hedder Erna* [ˈheðɐ ˈæg̊na] ("called Erna") and *hedder Anna* [ˈheðɐˈana] ("called Anna"). Yet, there are limited differences in the comprehension of *Erna* (Question A) in the reduced and non-reduced version, while Anna (Question B) causes considerably more problems in the reduced form. A probable explanation might be that Erna is the name of a woman in the first sentence, while in the second sentence, Anna is the name of a dog, which is somewhat unusual in a Danish setting.

To sum up, in general, phonetic reductions result in limited comprehension issues, the most prominent exception being reductions in syllables preceding the stressed syllable. In addition, ambiguity, complexity and abstraction appear to enhance the need for distinct phonetic cues in word recognition.

Assessed Difficulty

In a next step, we take a closer look at the participants' assessment of perceived difficulties in comprehending the units. Figure 2 shows the relationship between being
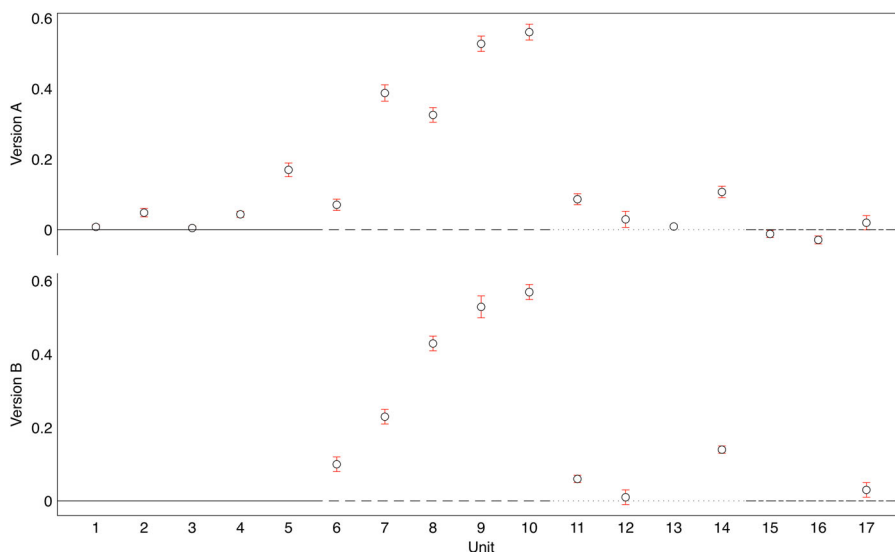
FIGURE 2
The relationship between reduced pronunciation and perceived difficulty (95 per cent confidence intervals)

exposed to reduced pronunciation and assessing that the unit was difficult to understand. The percentages depict the differences between the perceived difficulty of non-reduced and reduced pronunciation. For example, the average probability that a participant assessed unit 2 as difficult is 5 per cent higher if the participant hears it in reduced form instead of non-reduced form.

It is evident that the assessed difficulty roughly correlates with the actual level of difficulty (as shown in Figure 1). There are, however, some interesting minor deviations, especially in group 4. It is particularly noteworthy that unit 14 is assessed as being significantly harder to understand in the reduced form. This might be caused by a vowel cluster that merges five similar vowels into one string:

De studerende havde nogle meget hårde år ovre ([ˈhɒːˀ ˈɒˀ ˈɒwʁʌˀ] versus [ˈhɒːɒˀˈɒː]) i Aalborg

"The students had some very tough years in Aalborg [a Danish city]"

The participants had no trouble discerning the words in either version (see Figure 1), but they perceived the reduced version as somewhat harder to comprehend than the non-reduced version. In this case, the participants may have reacted to the lack of distinct syllable boundaries and rated the phrase as difficult, even though they understood it just fine. In short, the participants assessed reduced pronunciation as harder to understand than non-reduced pronunciation.

Furthermore, the level of assessed difficulty goes hand in hand with the level of actual difficulty. Respondents who found the sentences difficult to understand have ~17 per cent less probability of comprehending the test words/phrases (controlling for whether exposed to reduced or non-reduced pronunciation).

Background Variables

Lastly, we examine the background variables sex, age, area of residence and education. We will take a closer look at each of them in turn, while controlling for the other background variables (held constant at their mean).

The results show no noteworthy differences with regards to sex. Nor are there any substantially notable geographic differences between participants living in Greater Copenhagen—the source of standardized Danish pronunciation—and those living elsewhere in mainland Denmark.

Figure 3 shows age differences in relation to the comprehension of reduced (dotted central line) and non-reduced (continuous central line) pronunciation. At a first glance, it seems as if age is a deciding factor, and that the level of difficulty correlates with ageing, i.e. the older you are, the more difficult it is to understand reduced forms. Though this relationship is found in nearly all groups, it is also evident that this applies for the non-reduced form as well, in several instances. In other words, it seems that the older you are, the more difficult it is to comprehend the units regardless of pronunciation praxis, or perhaps more probable: the more difficult it is to hear and/or remember a short string of words in a test like this.

Finally, in Figure 4 we see that the length of education has a weak tendency to enhance comprehension. However, generally, this relationship is found in both the reduced and non-reduced versions, just at different levels in some cases.

In short, our analyses of demographic background variables have not pointed at particular patterns. Given that comprehension was high in general, as shown in Figure 1, it does not come as a surprise that we found minor differences across groups of demographics. The comprehension of reduced words is not determined by sex, geographic region or length of education. Age seems to play some role, but the method and set-up in this experiment cannot help us determine if the results on this point are influenced by age-related hearing and/or short-term memory loss.
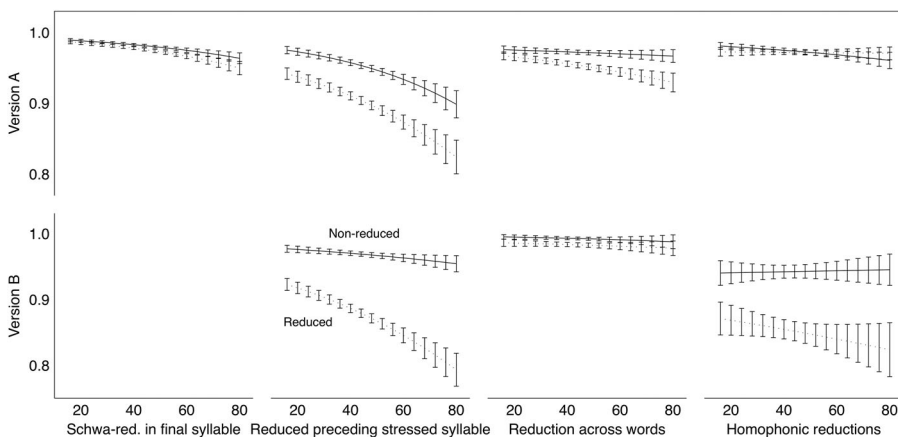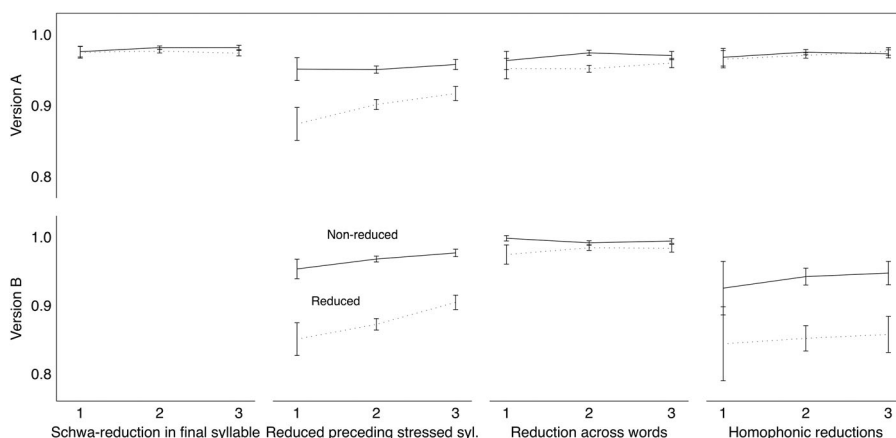

FIGURE 3
Correct word/phrase identification by age (controlling for sex, geographic region and education; 95 per cent confidence intervals)

FIGURE 4

Correct word/phrase identification by length of education (controlling for sex, age and geographic region; 95 per cent confidence intervals); 1 = one year or less; 2 = between one and four years; 3 = five years or more

Discussion

The experiment presented in this paper has provided new insights into the actual and perceived comprehension of reduced pronunciation in scripted news speak. On the basis of the results, we may conclude that—generally speaking—reduced pronunciation in scripted news speak leads to limited comprehension issues, and that the perceived difficulty correlates with the actual difficulties in comprehending reduced words.

Importantly, though, different phonetic parameters as well as different lexical, syntactic and semantic conditions can have an effect on the comprehension of reduced pronunciation. In this matter, the results indicate that reduced syllables *preceding* the stressed syllable lead to lower comprehension compared with reductions *succeeding* the stressed syllable. Furthermore, salient phonetic cues in non-reduced forms seem to aid slightly the comprehension of abstract lexemes and the parsing of ambiguous and complex syntax and semantics. In other words, abstractness, complexity and ambiguity seem to involve and presuppose a quick and effective word recognition that may be slightly hindered by reduced pronunciation. Another noteworthy finding is the limited issues in comprehending vowel clusters with no clear syllabic boundaries. Although assessed as slightly more difficult to comprehend in the reduced form, few participants had trouble comprehending them.

In sum, this study has supported and expanded previous findings on the comprehension of reduced pronunciation in other communicative settings. In particular, the study has highlighted a series of noteworthy phonetic, lexical, syntactic and semantic constraints on the comprehension of reduction. Functional conditions now call for attention, but this we must leave for future research.

A series of possible sources of errors must also be discussed. First of all, it can be debated whether the fabricated stimuli replicate the conditions of actual news speak. The conditions of the experiment have called for comparable sound bites (reduced versus non-reduced pronunciation) in matching settings that are very rarely, if ever, seen

in real-life journalism, i.e. the same news speaker pronouncing the same words in reduced and non-reduced form in the same context. Secondly, the chosen online self-sampling experimental test has cleared the way for a large participant population, but it has also led to uncontrolled conditions, including issues with varying volume levels in loudspeakers/headphones, surrounding noise, external interference during the test and representativeness of the sample—though these external factors will be equally distributed across conditions given the experimental nature of our analysis. In addition, the multiple-choice answers in the test may have tempted some participants to random guessing. On the other hand, both the large number of participants and the fact that we made use of an experimental design with random assignment increases our confidence in the validity and generalizability of our findings. Thirdly, the phonetic kinship between Danish, English and other Germanic languages—and in turn the shared tendencies for reductions—makes it probable as well that the results are comparable with languages with shared phonetic resemblances.

Concerning the criticism of reduced pronunciation in the media, our findings seem to suggest that the easiest solution is to instruct—or keep on instructing—journalists to pronounce in a distinct fashion all the time. This way comprehension issues are kept to a minimum. However, insisting on a *constant* level of distinct pronunciation quickly collides with the post-1960s public service tradition of addressing news topics in a way people can identify with (Leitner 1980, 88; Hannisdal 2007, 38), including speaking the way ordinary people do—which is most often characterized by frequent reductions. In addition, as straightforward as it may sound for journalists to speak in a distinct manner, it is very difficult to determine *how* such a pronunciation praxis should actually sound and be implemented. The typically proposed solution is to elevate a particular conception of distinct standard accent (Received Pronunciation) to canonical status. This approach, however, quickly results in an argumentative circle, considering that Received Pronunciation is often thought of as equivalent to how journalists at broadcasters speak (Hannisdal 2007, 22). Thus, if journalists are instructed to pronounce according to Received Pronunciation, they are, in effect, being told to speak as they are speaking, which is criticized for not being distinct enough.

The results of our experiments incite a more nuanced way of looking at pronunciation. Journalists need not enunciate in full phonetic forms *all the time* when reading news manuscripts. On the contrary, the reduced forms of common everyday interaction may be applied frequently without the risk of being improperly or not understood.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

NOTES

1. Although the influence of mass media on linguistic performance has been debated (Labov 2001), there seems to be common consensus on the idea that broadcasting, among other influences, "promote[s] a consciousness of the standard and maintain[s] its position" (Milroy and Milroy 1999, 25).
2. Based on a comprehensive corpus study of colloquial Danish, Schachtenhaufen (2013) sets up four phonological tendencies for phonetic reduction: (1) consonants are more likely

reduced between vowels than between a vowel and a consonant, (2) two syllable nuclei without consonants are very likely compressed to a single nucleus, (3) consonants are reduced more frequently and to a greater degree if they are placed after the nucleus instead of preceding it, (4) unstressed syllables are reduced more frequently and to a greater degree compared with stressed syllables (Schachtenhaufen 2013, 172).

3.   When using the term "comprehension" in this paper with regards to phonetic reduction, we do not mean lexical comprehension, but word recognition based on phonological, morphological, syntactic and semantic parsing.

4.   The results reported are computed with Stata. The reported proportions and confidence intervals are computed using Stata's commands for proportions (Figure 1), logistic regression and marginal effects (remaining figures) with robust standard errors. A preliminary processing of the test results (with fewer participants and with the exclusion of data from background variables and the perceived comprehension test) has been published in Danish (Ejstrup and Blom 2015).

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Appendix A

Tested Units, Words and Pronunciation Variants

Group I.   1) Det var ikke tilladt at tage **hunden** ([ˈhunˀən] versus [ˈhunˀn]) med ind i forhallen
"You are not allowed to bring **the dog** into the hall"
Q. Hvad måtte man ikke tage med ind: hunden, huen, manden, ved ikke
"What were you not supposed to bring: the dog, the hat, the man, do not know"
2) Det nytår oplevede vi, at fyrværkeriet kom til at **knalde** ([ˈknaldə] versus [ˈknalː]) i lang tid
"That New Year's Eve we saw the fireworks **spark** for a long time"
Q. Til nytår oplevede vi, fyrværkeriet kom til at: knalde, falde, knitre, ved ikke
"That New Year we saw that the fireworks: sparked, fell, crackled, do not know"
3) Musikeren fortalte, at han ikke kunne **komme** ([ˈkʌmə] versus [ˈkʌmː]) til festen
"The musician told that he could not make it to the party"
Q. Musikeren fortalte, at han ikke kunne: komme, tromme, tomle, ved ikke
"The musician told that he could not: make it, drum, hitch a lift, do not know"
4) Udenrigsministeren var godt klar over, at den **gave** ([ˈgæːvə] versus [ˈgæːʊ(ː)]) ville blive meget dyr
"The Foreign Minister realized that this **gift** would be very expensive"
Q. Hvad ville blive dyrt: en gave, en have, en galla, ved ikke
"What would be expensive: a garden, a gift, a gala, do not know"
5) På kasernen havde man købt en **vase** ([ˈvæːsə] versus [ˈvæːs(ː)]) til alle i bestyrelsen, som nu er væk
"At the barracks they had bought a vase for everyone on the board, which is now gone"

Q. Hvad er væk: en vase, en fustage, en base, ved ikke

"What is gone: a vase, a cask, a base, do not know"

Group II. 6) På mødet var det **problematisk** ([pʁobleˈmæˀtisg] versus [pʁoblˈmæˀtisg]), at **journalisterne** (ɕoʁnaˈlisdɐnə] versus [ɕonˈlisdɐnə]) ikke havde sagt noget om ulykken

"At the meeting it was **problematic** that the **journalists** had not said anything about the accident"

Qa. At journalisterne ikke sagde noget var: problematisk, dramatisk, provokerende, ved ikke

"That the journalists didn't say anything was: problematic, dramatic, provocative, do not know"

Qb. Hvem havde ikke sagt noget om ulykken: journalisterne, populisterne, juristerne, ved ikke

"Who hadn't said anything about the accident: the journalists, the populists, the lawyers, do not know"

7) Kvinden forklarede, at **pædagogerne** ([pɛdaˈgoˀɐnə] versus [pɛdˈgoˀɐnə]) allerede havde ringet til politiet, inden **ambulancen** ([ɑmbuˈlɑŋsən] versus [ɑmbˈlɑŋs(ə)n]) kom

"The woman explained that **the child and youth workers** had already called the police before **the ambulance** arrived"

Qa. Hvem havde ringet til politiet: pædagogerne, sociologerne, pædiaterne, ved ikke

"Who had called the police: the child and youth workers, the sociologists, the paediatricians, do not know"

Qb. Hvad kom, efter at der var ringet til politiet: ambulancen, kondolencen, assistancen, ved ikke

"What arrived after the call was made to the police: the ambulance, condolence, assistance, do not know"

8) Opskriften på **frikadellerne** ([fʁɛgæˈdɛlɐnə] versus [fʁɛgˈdɛlɐnə]), blev lagt på nettet sammen med analysen ([anaˈlyːsən] versus [anˈlyːs(ə)n]) af bakterieindholdet

"The recipe for **the meat balls** was put on the web with **the analysis** of the bacteria content"

Qa. Hvilken opskrift blev lagt på nettet: frikadellerne, karamellerne, frikasséen, ved ikke

"Which recipe was put on the web: the meat balls, the caramels, the fricassee, do not know"

Qb. Opskriften blev lagt på nettet sammen med: analysen, dialysen, analogien, ved ikke

"The recipe was put on the web with: the analysis, the dialysis, the analogy, do not know"

9) Tolderen havde **fotograferet** ([fotogʁɑˈfeˀʁɐð] versus [fodgʁɑˈfeˀðː]), **lokomotivet** ([logomoˈtiˀvəð] *versus* [logmoˈtiʊˀð]) flere gange i løbet af sommeren

"The customs officer photographed the locomotive several times during that summer"

Qa. Hvad var lokomotivet blevet: fotograferet, kalligraferet, folieret, ved ikke

"What happened to the locomotive: it was photographed, ornamented, foiled, do not know"

Qb. Hvad var der på billedet: lokomotivet, regulativet, lokoføreren, ved ikke

"What was in the picture: a locomotive, the regulation, the engine driver, do not know"

10) Musikken var instrumental ([ensdʁumɛnˈtæˀl] versus [ensdʁumːˈtæˀl]) og alt for **minimalistisk** ([minimaˈlisdisg] versus [minːmaˈlisdisg]) til Udkantsdanmark

"The music was instrumental and way too minimalistic for the outskirts of Denmark"

Qa. Musikken var: instrumental, fundamental, instrueret, ved ikke

"The music was: instrumental, fundamental, instructed, do not know"

Qb. Musikken var alt for: minimalistisk, fundamentalistisk, avantgardistisk, ved ikke

"The music was way too: minimalistic, fundamentalist, avant-garde, do not know"

Group III.   11) **Det er ikke alle** (de æɡ̊ ˈegəˀ ˈalə] versus [ˈdeˈgalː]), der er blevet bange for ulvene i Jylland

"**Not all** are afraid of the wolves in Jutland"

Qa. Hvem er ikke blevet bange for ulvene: alle, mange, nogle, ved ikke

"Who are not afraid of the wolves: everybody, many, some, do not know"

Qb. Er alle blevet bange for ulvene i Jylland: nej, ja, ved ikke

"Is everybody afraid of the wolves in Jutland: no, yes, do not know"

12) Det er bekræftet, at **de er alle sammen** ([diˀ æɡ̊ ˈaləˌsɑmˀən] versus [diːˈalsɑmˀ]) blevet **hjemme, mens** ([ˈjɛmə ˈmɛnˀs] versus [ˈjɛmːˈɛnˀs]) snestormen raser

"It has been confirmed that **they have all stayed at home** while the snow storm raged"

Qa. Hvem er blevet hjemme: de, vi, I, ved ikke

"Who stayed at home: they, we, you, do not know"

Qb: Hvor har de været, mens snestormen raser: hjemme, inde, i Jelling, ved ikke

"Where have they been while the snow storm raged: at home, inside, in Jelling, do not know"

13) Familien havde boet **i Italien** ([i ˀ iˈtæˀliən] versus [iˈtæˀljən]), i ni år

"The family lived **in Italy** for almost nine years"

Qa. Hvor havde familien boet: i Italien, i Indien, i Izmir, ved ikke

"Where did the family live: in Italy, in India, in Izmir, do not know"

14) De studerende havde nogle meget **hårde år ovre i Aalborg** ([ˈhɒː ˀ ˈɒˀ ˈɒwʁʌ ˀ i ˀ ˈʌlbɒˀ] versus [ˈhɒːɒˀˈɒːiˈʌlbɒˀ])

"The students had some **very tough years in Aalborg**"

Qa. Hvor havde de studerende nogle hårde år: i Aalborg, i Aarhus, i Aabenraa, ved ikke

"Where did the students have some very tough years: Aalborg, Aarhus, Aabenraa, do not know"

Qb. Hvad havde de studerende i Aalborg: hårde år, håbløse kår, sjove år, ved ikke

"What did the students have in Aalborg: hard years, desperate conditions, funny years, do not know"

Group IV.   15) Længere nede ad vejen svingede en bil til **højre og** ([ˈhʌjɐ ˀ ɒw] versus [ˈhɶjɐʌ]) blev væk

"Further down the road a car turned **right and** was gone"

Q. I hvilken retning kørte bilen: til højre, højere op, til højfjelds, ved ikke

In what direction did the car go: right, higher up, up the mountains, do not know

16. Præsten boede **højere oppe** ([ˈhʌjɐɐ ˀ ˈʌbə] versus [ˈhʌjɐˈʌb]), i bygningen end skolelæreren

"The priest resided **higher up** the building than the teacher"

Q. Hvor boede præsten: højere oppe, oppe og til højre, oppe på højen, ved ikke

"Where did the priest reside: higher up, up and to the right, up the hill, do not know"

17. Skuespilleren på tredje **hedder Erna** ([heðɐ ˀ ˈæɐ̯na] versus [heðɐˈæɐ̯na]), og hunden **hedder Anna** ([heðɐ ˀ ˈana] versus [ˈheðɐˈana])

"The actor on the third floor is named Erna, and the dog is named Anna"

Qa. Hvad hedder skuespilleren: Erna, Anna, Ena, ved ikke

"What is the name of the actor: Erna, Anna, Ena, do not know"

Qb. Hvad hedder hunden: Anna, Erna, Ena, ved ikke

"What is the name of the dog: Anna, Erna, Ena, do not know"