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Phonetic change over a lifetime in the media

Speech in the media is increasingly exploited in phonetic studies, as it constitutes unprecedented amounts of data easily accessible to researchers. In this contribution, we exemplify how speech in the media can be used to advance our understanding of phonetic change over the lifespan, an issue long hampered by data scarcity. We present longitudinal studies on three public figures – Queen Elizabeth II, Alistair Cooke, and Michaëlle Jean – in which recordings of single individuals over several decades were analyzed to explore the extent of phonetic flexibility during adulthood. Focusing on vowels, these studies showed that change tends to be gradual, non-linear, selective, and conditioned by social factors such as sound changes in progress in the community, geographic mobility, and speaker-specific life events. Speech in the media can contribute valuable data to a wide range of phonetic studies, provided that some caution is exercised when selecting and analyzing materials to avoid common pitfalls.

Keywords: speech in the media, public figures, phonetic change, longitudinal, social factors.

1. *Introduction*

This contribution is concerned with how speech in the media can be and has been utilized to examine issues in phonetic sciences for which the short time spans typically covered by traditional speech resources are a limitation. Our focus is on phonetic changes which may occur during adult life, but which are not due to the physiological effects of age. We first describe in § 2 a relatively recent paradigm shift in phonetics, wherein adulthood used to be considered a period of stability until longitudinal work questioned this assumption, thereby giving rise to a new generation of longitudinal studies. The concept of speech in the media as the object of phonetic investigation is then framed in § 3, with several examples of recent longitudinal studies which have exploited this type of speech materials. We cover three series of such studies in § 4 on Queen Elizabeth II (§ 4.1), Alistair Cooke (§ 4.2) and Michaëlle Jean (§ 4.3). We discuss the theoretical implications of these three cases in § 5, after which we broaden the discussion to the opportunities offered by speech in the media for phonetic studies, as well as basic precautions to take when using this type of resource.

2. *Speech over the lifespan*

Speech is known to change over the course of an individual's life. The study of child language acquisition, in particular, is concerned with how speech evolves from

cooing and babbling to full proficiency as children develop their cognitive and motor skills (Chung, Kong, Edwards, Weismer, Fourakis & Hwang, 2012; Clark, 2009; Lee, Potamianos & Narayanan, 1999). Physiological changes occurring during childhood and adolescence, but also much later in life, sometimes due to illness, can have an effect on some speech parameters such as the fundamental frequency (Linville, 2001; Markova, Richler, Pangelinan, Schwartz, Leonard, Perron, Pike, Veillette, Chakravarty, Pausova & Paus, 2016; Perry, Ohde & Ashmead, 2001). Social factors can contribute to some other changes within the individual. The life stage of adolescence is well known for the “vernacular peak” and related phenomenon of age grading (Eckert, 1997; Kirkham, Moore, 2013; Labov, 2001).

In contrast, healthy active adulthood has long been considered a period of linguistic stability (Chambers, 2009; Eckert, 1997; Pichler, Wagner & Hesson, 2018), partly due to the influential “critical period hypothesis” (Lenneberg, 1967) which suggested that major changes were unlikely after puberty. However, an emerging body of longitudinal studies have more recently questioned this assumption. In a benchmark study, Sankoff, Blondeau (2007) investigated longitudinally variants of /r/ in the “Montreal project”, a large corpus of sociolinguistic interviews with French-speaking Montrealers which included 120 participants in 1971, 60 of whom were recorded a second time in 1984, and 12 a third time in 1995 (Sankoff, 2018; Sankoff, Cedergren, 1971; Thibault, Vincent, 1990; Vincent, Laforest & Martel, 1995). One of the main findings of Sankoff, Blondeau (2007) was that many adult participants produced a higher rate of dorsal variants [ʁ]/[R] in 1984 than in 1971, in line with a change in progress in Montreal French, where the apical variant [r] was rapidly replaced by [ʁ]/[R]. This type of work fueled an interest for the hitherto poorly understood phonetic flexibility of adult speakers, which seemed greater than previously assumed (e.g. Gerstenberg, Voeste, 2015; Buchstaller, Wagner, 2018; Beaman, Buchstaller, 2021).

However, an obstacle to this endeavor has been the scarcity of longitudinal corpora such as the Montreal project (Hazan, 2017; Sankoff, 2018). This is because of difficulties in keeping prolonged contact with participants, who may move away, fall ill, decide to withdraw; limited financial resources; research teams changing focus; insufficient quality of older recordings; etc. (Gerstenberg, Voeste, 2015; Young, Powers & Bell, 2006). We focus in this paper on a solution adopted by various researchers to overcome this issue: using speech in the media.

3. *Speech in the media*

In the context of this contribution, “speech in the media” as the object of phonetic studies refers to pre-recorded or live speech delivered by a public figure to their audience (Goffman, 1981). Public figures include journalists, actors, musicians, politicians, royalty, athletes, and people from various other professions who engage with an audience on a regular basis. Nowadays, the speech of such public figures is regularly recorded, at known time stamps, and is often made available on open

digital platforms (e.g. national broadcasters, YouTube and other social media). In addition, more or less detailed biographic information about these individuals is usually disclosed. All this makes speech in the media well suited for investigating the extent of phonetic flexibility during adulthood, first because of the availability of large quantities of recorded speech materials from unique individuals over potentially very long time periods. Second, the relative weight of various external factors on speech across the lifespan can also be addressed thanks to details of the speakers' professional and personal lives being known.

Indeed, recent years have seen a spurt in longitudinal studies of public figures' speech which have examined a variety of parameters and phenomena, e.g. vowels, consonants, suprasegmental features, style shifting, second dialect acquisition and bilingualism. To name but a few, these include studies on Muhammad Ali (Berisha, Liss, Huston, Wisler, Jiao & Eig, 2017), Piero Angela (Giannini, Pettorino, 2009), David Attenborough (MacKenzie, 2017), Queen Beatrix (Quené, 2013), Dagmar Berghoff (Reubold, Harrington, 2018), Noam Chomsky (Kwon, 2018), Alistair Cooke (Reubold, Harrington, 2015), Queen Elizabeth II (Harrington, Palethorpe & Watson, 2000a), Ruth Bader Ginsburg (Shapp, LaFave & Singler, 2014), Stefanie Graf (de Leeuw, 2019), Michaëlle Jean (Riverin-Coutlée, Harrington, 2022), Helmut Kohl (Braun, Friebe, 2009), Margaret Lockwood (Reubold, Harrington & Kleber, 2010), Jennifer Lopez (Bauernfeind, 2020), Ed Miliband (Kirkham, Moore, 2016), Barack and Michelle Obama (D'Onofrio, Stecker, 2022; Holliday, 2017), King Rama IX (Yang, Pittayaporn, Kirby & Jitwiriyant, 2021), Oprah Winfrey (Hay, Jannedy & Mendoza-Denton, 1999) and Fareed Zakaria (Sharma, 2018).

The following section presents in a more detailed manner longitudinal studies on three of the aforementioned public figures: Queen Elizabeth II, Alistair Cooke and Michaëlle Jean. These studies were conducted by the authors and their collaborators, and have in common that they are all concerned with changes in vowel quality over several decades of the speakers' lives. By means of acoustic analyses of speech in the media, these studies address the issue of the extent of phonetic flexibility during adulthood. They also consider the influence of external factors such as sound change in progress in the community, geographic mobility, and important milestones in an individual's life.

4. Longitudinal studies of three public figures

4.1 Queen Elizabeth II

The first series of case studies we present focused on the late Queen Elizabeth II (1926-2022). Each year of her reign, the Queen delivered a 5-minute Christmas message to the UK and Commonwealth, totaling 70 broadcasts (1952-2021) by the same speaker, to the same audience, on relatively similar topics, even using the same words (e.g. "I wish you all [...] a very happy Christmas"). The first few broadcasts were on radio only, then televised starting in 1957, but always in good recording conditions for the time. While some of these are nowadays available on public

platforms such as YouTube, to carry out the studies described hereafter, Harrington and collaborators obtained recordings of the Queen's Christmas broadcasts from the BBC, with permission from Buckingham Palace.

Broadly speaking, the Queen's pronunciation could be described as an upper-class version of the Received Pronunciation (RP) of British English, RP being a variety of English typically associated with speakers of the BBC and people with higher levels of education more generally (Roach, 2004). Given that many RP features changed over the 20th century, Harrington et al. (2000a; 2000b) raised the question of whether the Queen's pronunciation changed over her lifetime as well. They first analyzed stressed monophthongs in broadcasts from three decades: the 1950s (with broadcasts from 1952, 1954 and 1957), the 1960s (1967, 1968 and 1972) and the 1980s (1983, 1985 and 1988) (Harrington et al., 2000b). To compare the Queen's vowels with those of mainstream RP (that typically characterized a more middle class accent), the same analysis was made of vowels produced by five female BBC broadcasters recorded in the 1980s.

The results showed changes in either F1, F2, or both, for most of the Queen's vowels, and usually in the direction of the BBC control group. Changes were generally larger between the 1950s and 1960s than between the 1960s and 1980s. Two vowels in particular changed substantially: /u/ was fronted and /æ/ was lowered. The results from other acoustic studies of vowels on the effects of aging (e.g. Reubold et al., 2010; Reubold, Harrington, 2018) suggested that these two specific changes found in the Queen's speech could not be attributed to the physiological maturation of the vocal tract. With increasing age, the fundamental frequency of female speakers tends to decrease, as well as non-low vowels' F1 frequency; whereas /u/-fronting involves a higher F2 and /æ/-lowering a higher F1. In addition, both /u/-fronting and /æ/-lowering were changes observed in RP over the 20th century (Bauer, 1985). The Queen's speech was thus likely influenced by phonetic changes taking place in the community. Given that the role of royalty in society is arguably more to safeguard traditions and institutions (including the so-called Queen's English; see Harrington et al., 2000a; 2000b) than to be avant-garde, the finding that the Queen's pronunciation changed along with that of her subjects made a strong case for seriously considering lifespan change in phonetic studies. Moreover, Harrington et al. (2000b) argued that the concept of apparent time (Cukor-Avila, Bailey, 2013), widely used to study language change and which is based on the assumption that adult speech is stable (Eckert, 1997), probably underestimated the rate of change within a community (see also Labov, 1994).

The results additionally showed that lifespan change was not necessarily linear: while some changes were observed over the two decades separating the 1960s and 1980s, these were smaller than the changes observed in the one decade separating the 1950s from the 1960s (see also Bowie, 2015). Moreover, while the Queen's /u/ fronted and /æ/ lowered, and generally *tended* towards those of the BBC control group, they only tended towards, without attaining the positions of the BBC control group. The Queen's participation in sound change appeared only partial, with vowel

qualities neither quite like those produced by the Queen in the 1950s, nor those of the 1980s' RP (Harrington et al., 2000b). Both trends suggest that lifespan change is more gradual than categorical, i.e. vowels could acquire intermediate qualities after decade-long drifts.

To summarize, studies of the Queen's Christmas broadcasts provided evidence that adults retained some phonetic flexibility across the lifespan. Even speakers expected to be relatively conservative may come to adopt innovative variants in the context of a change in progress in the community. In addition to their theoretical implications (e.g., relative to the apparent time concept), these studies opened up new questions about the potentially non-categorical nature of sound change and non-linearity of individual trajectories.

4.2 Alistair Cooke

The second public figure covered in this section is Alistair Cooke, a journalist and radio broadcaster born in 1908 near Manchester, UK. In 1937, Cooke moved to the USA, where he lived until his death in 2004, at the age of 95 years old. He is best known for *Letter from America*, a weekly 15-minute radio show broadcast by the BBC in which he presented to a (mostly) British audience topics related to American society, culture, politics and latest news. *Letter from America* is the longest-running radio program with the same single presenter (1946-2004 without interruption), making it extremely rich longitudinal speech data, now available in full on the BBC website. An official biography of Alistair Cooke was also published (Clarke, 2000).

After a first analysis of the effects of age on Cooke's fundamental and formant frequencies (not summarized here; see Reubold et al., 2010), the influence of geographic relocation on his vowels was addressed in Reubold, Harrington (2015). For this purpose, the authors selected broadcasts of *Letter from America* from 1951, 1960, 1970, 1981, 1993 and 2004 (ages 42 to 95), in which they measured the first two formants of stressed monophthongs. They found phonetic changes over time in the quality of the BATH, THOUGHT, LOT and DRESS vowels, which differ between RP and American English (see Wells, 1982). For THOUGHT, LOT and DRESS, Cooke progressively changed from an American pronunciation in the 1950s-to-1970s to RP by 2004. For BATH, the change was more abrupt: from an American quality in 1970, it had shifted to RP by 1981. In other words, the more time Cooke spent in the USA, the less American his BATH, THOUGHT, LOT and DRESS vowels were. On the other hand, other vowels differing between RP and American English never qualified as American, i.e. the FORCE, NORTH, NURSE and START vowels remained non-rhotic as in RP over the entire dataset, resulting in a hybrid pronunciation during the 1950s to 1970s (Munro, Derwing & Flege, 1999; Nycz, 2015; Siegel, 2010).

In a follow-up study, Reubold, Harrington (2018) added to the radio corpus described above an interview conducted in 1934, when Alistair Cooke was 25 years old and still living in the UK. The analysis of this additional recording showed that

Cooke then spoke a variety of English that qualified as RP, which confirmed that his American BATH, THOUGHT, LOT and DRESS vowels of the 1950s-to-1970s were acquired after moving to the USA. Moreover, Reubold, Harrington (2018) suggested that RP was probably the speaker's second dialect, adopted as a young adult when he left the north of England to study at Cambridge. To further analyze the apparently abrupt shift in Cooke's BATH vowel, Reubold, Harrington (2018) examined 14 additional broadcasts of *Letter from America* from the years 1975 to 1977. Over this short time frame, when the speaker was aged 66 to 68 years old, the fronted American variant [æ] backed into the RP variant [ɑ:]. The change was gradual, but took place over a much shorter period of time than those of the THOUGHT, LOT and DRESS vowels. As for why this accent reversal happened at this particular time, Reubold, Harrington (2015; 2018) pointed out that it coincided with a period of disillusion for Cooke. His initial enthusiasm about his host country (he rapidly became an American citizen, married an American and started a family, traveled the country for work) faded with the difficult political climate of the mid-1970s perhaps leading to a projection of himself as an outsider (Clarke, 2000). Cooke was also in contact with a greater diversity of Americans in earlier years, when he traveled the country, than in later years.

To summarize, these longitudinal studies of Alistair Cooke's vowels revealed the maintenance of great phonetic flexibility during his life. A reversal of some phonetic changes was also observed, with his pronunciation following the path: Northern British English > RP > American English > RP. Changes in vowel quality were mostly gradual, although they occurred over different time periods across vowels, and did not affect Cooke's entire vowel system. Finally, external factors contributed to explain these shifts: geographic mobility, but also speaker-specific events.

4.3 Michaëlle Jean

The third public speaker we are concerned with is Michaëlle Jean, a Canadian journalist and diplomat born in Haiti in 1957. Jean moved from Haiti to Quebec with her family at the age of 11 years old, and was brought up speaking French and Creole. Her career as a public speaker started in 1988 when she became a journalist for Canada's national French-speaking broadcaster Radio-Canada. As will be detailed below, Jean's professional occupations changed several times after 1988, but she always remained a public figure whose speech was regularly recorded. This allowed us to investigate longitudinally the influence of these career shifts on her pronunciation. For this purpose, a five-hour corpus spanning three decades of Jean's public career (1989-2022) was collated from various open sources such as YouTube and the Radio-Canada archives, totaling 65 recordings varying between 18 seconds and 29 minutes in length.

Riverin-Coutlée, Harrington (2022; in press) started from the hypothesis that since much of adult life revolves around work, turning points in an individual's career could influence the way they speak (Eckert, 1997; Pichler et al., 2018; Wirtz, Pickl, 2025). Jean was a particularly interesting case to explore this further, first

because she had many career changes at well-defined points in time: she was a journalist in Quebec from 1988 until 2005; she was governor general of Canada from 2005 until 2010; she was UNESCO's special envoy to Haiti from 2010 until 2014; she was secretary general of the international organization La Francophonie from 2014 until 2018; and since 2019, she has been promoting and sponsoring social causes through her foundation, and is regularly invited to speak at public forums. Second, these stages of Jean's career had linguistic relevance: as secretary general of La Francophonie, she acted as the global representative of 321 million French speakers from 93 states and countries (Organisation internationale de la francophonie, 2025), while as a journalist, her francophone identity was arguably less enhanced and the audience she typically engaged with was less international, i.e. mostly composed of Quebecers. This raised the question of whether Jean would produce more features of Quebec French as a journalist than as secretary general of La Francophonie.

In an acoustic analysis of the high vowels /i y u/, which in Quebec French split into tense [i y u] and lax [ɪ ʏ ʊ] variants depending on the consonantal context (Sigouin, Arnaud, 2014), Riverin-Coutlée, Harrington (2022) found that Jean produced this phonetic feature during her time as a journalist in Quebec, but progressively suppressed it by the time she became secretary general of La Francophonie. After 2019, a reversal of this trend was observed. In a follow-up study, Riverin-Coutlée, Harrington (in press) examined other features, among which the phonological difference in Quebec French between the FAITE and FÊTE vowels, where the former is a short monophthongal /ɛ/ and the latter is a long diphthongal /æ:/ (Riverin-Coutlée, Roy, 2022). Contrary to the tense-lax split of /i y u/, this feature exhibited stability over Jean's career. Part of these results confirmed that changes in a person's professional life could have an effect on the way they spoke; integrating analyses of career changes into the sociolinguistic toolkit (Wirtz, Pickl, 2025) could therefore benefit a field which already had a tradition of examining variation across social classes largely defined relative to people's income and occupation (Ash, 2002; Labov, 2001). On the other hand, the results revealed constraints on Jean's flexibility: while phonetic variants (or allophones) merged and unmerged, a phonemic contrast showed stability.

Jean's speech also presented some differences with Quebec French described in other studies. During her years as a journalist, she produced tense and lax variants of /i y u/ which were not as acoustically distinct as those found in the community (Sigouin, Arnaud, 2014). Moreover, the contrast between FAITE and FÊTE was realized through length, not the vowels' mono- or diphthongal quality. One possible explanation for this was that Jean only partially adopted Quebec French after having spent the first 11 years of her life in Haiti (Munro et al., 1999; Nycz, 2015; Siegel, 2010). Alternatively, this could reflect a normative style designed for mass media (Chalier, 2021; Reinke, Ostiguy, 2016). Whichever the explanation, these studies revealed the presence of intermediate variants in Jean's speech, e.g. her not-so-distinct and further progressively merging tense and lax vowels. In addition,

at all points in time, her pronunciation was hybrid: not entirely typical of Quebec French during her years as a journalist due to the monophthongal quality of *FÊTE*, but not completely devoid of Quebec French features as secretary general of La Francophonie given the long duration of *FÊTE*.

To summarize, these longitudinal studies of Michaëlle Jean's vowels suggested that career may influence speech across the lifespan. They also uncovered some possible limitations to Jean's flexibility, i.e. a phonological contrast did not change, contrary to a phonetic feature. As with the Queen, intermediate variants were produced; as with Cooke, a reversal of a change occurred and a hybrid pronunciation was observed.

5. Discussion and conclusions

The purpose of this paper was to exemplify how speech in the media can be exploited as research materials in (socio)phonetics. Speech in the media has been shown to be a valuable resource for taking a lifespan perspective on phonetic changes occurring during adulthood, a period of life previously assumed to be largely stable. The longitudinal studies of three public figures – Queen Elizabeth II, Alistair Cooke and Michaëlle Jean – covered in § 4 brought together acoustic analyses of vowels taken from corpora spanning multiple decades with social factors to better understand adults' phonetic flexibility. While at first sight generalizations that can be made from these exceptional speakers may appear limited, the events which seem to have influenced their phonetic trajectories are likely to be experienced by many people, e.g. sound change in progress in the community, geographic relocation and career changes. The theoretical and methodological implications of these studies are thus manifold, as discussed below.

A noteworthy finding from these studies, as well as from other longitudinal work (see Bowie, Yaeger-Dror, 2015 for a review), is that adults change their pronunciation over the lifespan. As mentioned in § 2, this was not a given in earlier literature, where speech was assumed to be stable after puberty (Eckert, 1997). This finding exposes a paradox surrounding apparent time, a methodological tool frequently used to investigate language change, where speakers of two generations are compared; if the older generation's speech characteristics differ from those of the younger generation, it is assumed that a change has occurred (Cukor-Avila, Bailey, 2013; Labov, 1994). However, it seems that older speakers' phonetic characteristics may be influenced by the very change examined. As Harrington et al. (2000b) suggested, apparent time comparisons could underestimate the rate at which change sweeps through a speech community, because the older generation may not have remained entirely stable since puberty and may, to a certain extent, participate in the change, as observed with the Queen. While apparent time remains a useful tool, its outcome should be interpreted with caution and ideally complemented with longitudinal data, because as argued by Sankoff (2018: 43), "[in] studying language change, nothing can replace real time". The finding that adult speech can change also has an impact for dialectology

(Chambers, Trudgill, 1998), where older, non-mobile speakers have typically been prioritized because their conservative speech characteristics offered a window on a previous state of the language (e.g. Poplack, St-Amand, 2007). However, in light of the research summarized here, which suggests that life events of a more modest magnitude than geographic relocation may influence adult speech (Reubold, Harrington, 2018; Riverin-Coutlée, Harrington, 2022), it cannot be assumed that the phonetic characteristics of an 80-year-old person in 2025 are exactly those of that same 20-year-old person in 1965. As succinctly noted by Pichler et al. (2018: 2), older speakers are not “homogeneous diachronic data repositories”.

The studies summarized in § 4 also contribute to defining the extent of adults’ phonetic flexibility. First, there is evidence that change is gradual. The Queen was found to participate in two phonetic changes in progress in RP, i.e. /u/-fronting and /æ/-lowering, but the variants she produced in the 1980s were still different from those of RP speakers. In an analysis of more recent Christmas broadcasts, Harrington, Reubold (2021) measured a small reversal in these changes in /u/ and /æ/ after the 1980s, but not to the extent that they were back to their 1950s’ qualities. Acoustic changes measured in Cooke’s speech also involved intermediate vowel qualities. For THOUGHT, LOT and DRESS, the change from American English to RP between the 1970s and 2000s was slow and gradual; for BATH, change occurred more rapidly between 1975 and 1977, but it was still not categorical. The /i y u/ vowels analyzed over Jean’s career were found to be split between tense and lax variants when she was a journalist (1988-2005), merged during her time as secretary general of La Francophonie (2014-2018), but were at intermediate degrees of split during the other periods examined (2005-2010, 2010-2014 and 2019-2022). Perhaps some other speech features are more prone to categoricity than vowel quality; for example, in Sankoff, Blondeau’s (2007) study on Montreal French, it is not the case that there is a continuum of variants between the innovative dorso-uvular fricative [ɣ] and conservative apico-alveolar trill [r]. Nonetheless, Sankoff, Blondeau (2007) calculated non-categorical *rates* of production of these two variants. We thus conclude from these various observations that phonetic change over the lifespan seems more gradual than categorical.

Furthermore, the studies summarized in § 4 showed that change during adulthood may lead to a hybrid pronunciation. During the period where the quality of Cooke’s BATH, THOUGHT, LOT and DRESS vowels was closer to American English, his FORCE, NORTH, NURSE and START vowels were non-rhotic as in RP. Nycz (2015: 470) mentioned that adults moving to a new geographic area and adopting a second dialect often did so “à la carte”, that is, picking up on some features but not others, as with Cooke (see also Evans, Iverson, 2007). Given that Michaëlle Jean spent the first years of her life in Haiti and then moved to Quebec at the age of 11 years old, this may be a possible explanation for why she only partially produced Quebec French features during her years as a journalist (i.e., why the tense-lax split of /i y u/ was less distinct than that found in the community, and why FAITE-FÊTE were distinguished via length but not quality). Taken together, all these studies suggest that although adults

retain some phonetic flexibility, the types of changes may be limited. In particular, phonological contrasts may be more resistant to change than phonetic differences: this could explain why Jean's phonetic tense-lax split merged and unmerged while the phonological length difference between FAITE-FÊTE remained stable over her whole career. Kwon (2018) also observed that Noam Chomsky tended to exhibit phonetic change but phonological stability across time.

Another important finding is that a reversal of previously observed changes happened for all of the Queen, Cooke and Jean. As mentioned above, Harrington, Reubold (2021) found less fronted /u/ and less lowered /æ/ in Christmas broadcasts from the 1990s to 2010s, compared to those of the 1980s. Some of the vowels of American English which Cooke adopted after moving to the USA reverted to RP after the 1970s (Reubold, Harrington, 2018). The merged tense and lax high vowels of Jean slightly unmerged in the last stage of her career (Riverin-Coutlée, Harrington, 2022). A similar trend was reported by Shapp et al. (2014) for Ruth Bader Ginsburg, who reverted to producing more non-standard variants of New York City English in the 2000s than she did in the 1970s. MacKenzie (2017) observed an increase in intervocalic /r/-tapping in David Attenborough's later narrations, whereas the tapped variant was produced less and less in the speech community (Hughes, Trudgill & Watt, 2012). While social factors may at least partly explain some of these reversals, as hypothesized for Cooke and Jean (see also Pichler et al., 2018), Harrington, Reubold (2021) connected this recurring tendency to exemplar theory and the cognitive processing of speech. According to exemplar theory, listeners memorize speech with extensive amounts of phonetic and non-linguistic detail (Drager, Kirtley, 2016; Foulkes, Docherty, 2006; Johnson, 1997; Pierrehumbert, 2016; *inter alia*). The new exemplars which listeners keep memorizing over the course of their lives have an impact on their phonological representations and speech productions (e.g. Harrington, Kleber, Reubold, Schiel & Stevens, 2018; Hay, Drager & Warren, 2010), which in certain cases may cause phonetic change, for example when moving to a new dialect area (Nycz, 2013). However, declining cognitive functions with aging perhaps mean that the memorization of new exemplars is less robust later than earlier in life, and therefore, that older exemplars influence to a greater extent older speakers' speech representations and productions (Harrington, Reubold, 2021; see also Pichler et al., 2018).

Harrington, Reubold's (2021) interpretation of the Queen's longitudinal data relative to cognitive processes reflects that speech in the media offers scope for more research than that covered in this paper, which was concerned with phonetic changes in vowels and their connection to a few social factors. Diversifying the pool of languages represented in this line of research is an important step towards understanding lifespan stability and change for other linguistic features, for example tones, as investigated by Yang et al. (2021) in Thai-speaking King Rama IX. Studies of speech in the media may also help uncover influential social factors that are not necessarily part of standard variationist studies, for instance political affiliation (Hall-Lew, Coppock & Starr, 2010). Moreover, because it potentially covers very

long time periods that are difficult to match in the laboratory, speech in the media is a precious resource for documenting the effects on speech of physiological changes due to aging. In an analysis of recordings of Piero Angela's broadcasts 40 years apart, Giannini, Pettorino (2009) observed numerous age-related changes, e.g. a slower speech rate, longer segments and pauses, a larger vowel space, a reduced distinction between stressed and unstressed syllables, a higher fundamental frequency, etc. Beyond healthy aging, speech in the media can occasionally be used to investigate the effects of certain pathologies. For instance, capitalizing on decades of recordings of Muhammad Ali, Berisha et al. (2017) found symptoms typical of hypokinetic dysarthria (Duffy, 2020) up to seven years before he was diagnosed with Parkinson's disease. This has important clinical implications in suggesting that practitioners could make use of speech to diagnose Parkinson's disease earlier in some patients, provided that changes belonging to healthy versus unhealthy aging are well defined, which longitudinal studies on speech in the media can contribute to.

Despite its many possibilities, longitudinal materials can also be confounded with so many different factors. For example, professional speakers with voice training may cope differently with physiological changes normally affecting speech in older age, as suggested for Margaret Lockwood (Reubold et al., 2010) and Dagmar Berghoff (Reubold, Harrington, 2018), whose non-low vowels' F1 did not follow the same downward trend as that observed in aging speakers without voice training. In addition, over the years, public figures are inevitably recorded with various equipment in different settings, which can affect acoustic measurements in different ways (e.g. Calder, Wheeler, 2022; Zhang, Jepson, Lohfink & Arvaniti, 2021). Such variation can sometimes be controlled for with statistical modeling, for instance by introducing random effects per recording (Lee, Nelder & Pawitan, 2006). Similarly, since some public figures such as Ed Miliband (Kirkham, Moore, 2016), Oprah Winfrey (Hay et al., 1999) or Fareed Zakaria (Sharma, 2018) have been found to alter their speech when speaking to different crowds, thus, audience and interlocutor effects should be controlled for, even if these are not the main concern of a given study. Provided that such basic precautions are taken, we suggest, in light of the research summarized in this paper, that speech in the media can be a valuable resource to advance our understanding of outstanding questions in phonetics (e.g. Kendall, Phrao, Stuart-Smith & Vaughn, 2023).

Acknowledgements

We would like to thank the organizers of AISV 2024 for their invitation and warm welcome to Torino, as well as the audience for thoughtful discussions. We acknowledge the financial support of the following organizations at various stages of research and writing: Fonds de recherche du Québec – Société et culture (<https://doi.org/10.69777/270174>), Deutsche Forschungsgemeinschaft (520195671).

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