4. CHARACTERISTICS OF INCIPIENT AMERICAN RAISING AND LIFESPAN CHANGE: FOCUS ON FORT WAYNE

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American raising refers to the recent emergence of /aʊ/-raising before voiceless consonants without concomitant /aʊ/-raising by a generation born around 1990 in communities in the United States that either did not traditionally have raising or where the characteristics of the younger generation of raisers are different from that of an older generation. American Raising is distinct from canonical Canadian Raising, wherein both /aʊ/ and /aʊ/ are raised before voiceless consonants as well as before t-flaps. The rise of American Raising in geographically distinct regions—a phenomenon detailed in several chapters within this volume—provides an opportunity to both explore long-standing questions and pose new ones. What are the characteristics of incipient raising? What patterns are found in a community undergoing a change in progress? How does /aʊ/-raising, whether transparent or opaque, emerge in a community where it was not previously witnessed?

Two communities where American Raising has emerged recently in the younger population are Fort Wayne, Indiana, and the area around Kansas City, Missouri. In Berkson, Davis, and Strickler (2017) and Davis, Berkson, and Strickler (2020), we document the emergence of incipient /aʊ/-raising in the Fort Wayne area. Those works report the presence of some Fort Wayne speakers who have transparent /aʊ/-raising, meaning a pattern wherein raising occurs before surface-voiceless sounds but fails to occur before t-flaps. As detailed in Davis, Berkson, and Strickler (2020), all documented varieties of Canadian Raising, including previously documented American versions of it as found in the Inland North, have opaque raising: diphthongs are raised before voiceless consonants and before underlyingly voiceless (but phonetically voiced) t-flaps, as in writing, but not before underlyingly (and surface) voiced d-flaps, as in riding (see, e.g., Vance 1987; Dailey-O’Cain 1997). Strelluf (2018) documents the emergence of /aʊ/-raising in the Kansas City area by examining the vowel system of speakers born in different decades and finds that perceptible /aʊ/-raising before voiceless consonants is present only with the younger generation of speak-
ers, those born around 1990 and after. Strelluf did not address the issue of raising before t-flaps.

An important issue that we briefly discuss here and return to in the penultimate section is the matter of how /aI/-raising emerges in a community where it was not previously witnessed. Two recent works address this issue. Kodner and Richter (2020), invoking the Tolerance Principle (Yang 2016), crucially allude to dialect contact as the ultimate source of /aI/-raising, focusing on our initial Fort Wayne study of Berkson, Davis, and Strickler (2017). Kodner and Richter argue that the presence of transparent /aI/-raising in Fort Wayne is best explained as a matter of dialect contact in the context of child language acquisition, whereby children in the Fort Wayne area are exposed both to speakers of the nonraising north Midland dialect of the Fort Wayne area and to speakers of the geographically proximate Inland North dialect, which has opaque raising. Following the logic of Yang (2016), the authors argue that exposure to competing /aI/ forms from the two dialects allows some children to posit a grammar with transparent raising that is not part of any of the input grammars. In general, Kodner and Richter (2020, 62) maintain that dialect contact is a much more likely source of the present-day expansion of American /aI/-raising than “spontaneously repeated phonetic incrementation and phonologization.” On the other hand, Strelluf (2018) documents the emergence of /aI/-raising in a perceptually salient manner with the generation born around 1990 in the Kansas City area in which dialect contact plays no role. Strelluf shows that those residents born in the 1950s displayed virtually no F1 difference (i.e., vowel height difference) between the nuclei of the diphthongs in the words write and ride but that each subsequent generation showed a small F1 difference compared to the previous generation; that is, those born in the 1970s showed a larger F1 difference than those born in the 1960s, and those born in the 1980s showed a larger F1 difference than those born in the 1970s. For those born in the 1990s, the F1 difference between the raised diphthong in write and the diphthong in ride exceeds 60 Hz, the threshold of perceptual saliency proposed by Labov, Ash, and Boberg (2006). Starting with this generation, then, the diphthong in write is perceptually distinct from the diphthong in ride. In such a scenario, as documented by Strelluf, perceptually distinct /aI/-raising can emerge in a community without dialect contact playing a significant role.1

In this chapter, based on our Fort Wayne data, we will maintain that transparent /aI/-raising is a characteristic of incipient /aI/-raising. By incipient /aI/-raising, we mean a dialect where most of the raisers are younger speakers. These raisers constitute the first generation of speakers in a community to display perceptually distinct raising, differentiating the raised diphthong before voiceless consonants, as in write [rʌɪt], from the non-
raised [aɪ] in other environments, as in ride [raɪd] or tie [taɪ]. Building on our previous work on Fort Wayne (Berkson, Davis, and Strickler 2017; Davis, Berkson, and Strickler 2020), we will first present the characteristics of incipient American Raising and then argue that the older speakers in the community (born before 1970) who unexpectedly display the American Raising pattern most likely did not have the raising pattern when they were younger but rather show lifespan change in the sense of Sankoff (2019). We base this argument on the fact that the acoustic pattern of raising shown by older raisers differs from that of younger speakers, which we interpret as suggestive of lifespan change or accommodation rather than reflecting a deeper system. This implies that older speakers who display lifespan change reflecting a phonological change in progress may not evidence the same acoustic characteristics of younger speakers who have exhibited that feature from a young age.

The remainder of this chapter is organized as follows. In the next section we provide the details of our Fort Wayne study, summarizing the findings from Berkson, Davis, and Strickler (2017) and Davis, Berkson, and Strickler (2020). Here we focus on the presence of four patterns of /aɪ/-raising within the community, ranging from no raising among older speakers to canonical (i.e., Canadian-like) opaque /aɪ/-raising among some younger speakers with two patterns in between, including transparent raising. Following that we argue, based on a range of evidence, that Fort Wayne represents an incipient variety of /aɪ/-raising. We then address the issue of lifespan change. As noted, some of our older Fort Wayne consultants (i.e., those born before 1970) unexpectedly display raising. We show that all such speakers have an acoustic pattern distinct from that of younger speakers, thus suggesting lifespan change rather than having raising from a young age. The penultimate section considers the issue of just how /aɪ/-raising, whether transparent or opaque, can emerge in a community like the Fort Wayne area, where it was not previously witnessed. We conclude by summarizing and briefly mentioning some unaddressed issues.

**PATTERNS OF /aɪ/-RAISING IN FORT WAYNE**

In this section, we provide an overview of four patterns of /aɪ/-raising ranging from no raising to canonical opaque raising that are currently found in the Fort Wayne, Indiana, speech community. This discussion, based partly on Berkson, Davis, and Strickler (2017) and Davis, Berkson, and Strickler (2020), considers data from monosyllabic word forms, such as write, and ride, as well as bisyllabic forms where /aɪ/ occurs before a flap, as in writing and riding. In Davis, Berkson, and Strickler (2020), we further examined
bisyllabic word forms such as *Nike* and *cyber*, in which the /au/ diphthong occurred before consonants other than a flap. These word types were not considered in Berkson, Davis, and Strickler (2017), but they provide for a more nuanced understanding of the four patterns reported in the original study.

In Berkson, Davis, and Strickler (2017), we investigated /au/-raising in and around Fort Wayne, Indiana, motivated by a casual observation that college students from that region had begun to display /au/-raising within the past decade or so. The goal was to document an incipient /au/-raising dialect in light of the work by Fruehwald (2016), who in his study on /au/-raising in the Philadelphia Neighborhood Corpus (Labov and Rosenfelder 2011) maintained that “[t]here is, in fact, no detectable period where the pattern of /ay/-raising aligned with what would be predicted on purely phonetic grounds. The conclusion I draw is that the period of purely phonetic conditioning either was too brief to be identified or was nonexistent” (404). Fruehwald based his observation on the realization that once a Philadelphia speaker displayed raising before surface voiceless sounds, as in *write*, they also had raising before underlyingly voiceless but surface voiced *t*-flaps, as in *writing*. What this means is that the transparent pattern of /au/-raising in which raising occurs in *write* but not in *writing* (i.e., the so-called Dialect B pattern harking back to Joos 1942) is not acoustically documented in the Philadelphia Neighborhood Corpus.

In fact, to our knowledge, the transparent pattern had not been acoustically documented in any /au/-raising variety until we verified its occurrence in Fort Wayne (Berkson, Davis, and Strickler 2017), based on data from 27 talkers (17 female, 10 male) who at the time of recording (2016 and early 2017) ranged in age from 19 to 78 years old. Rather than conducting sociolinguistic interviews, we had speakers read a word list. Speakers produced three repetitions of a 93-item word list that contained 37 /au/ targets. These included: monosyllabic words (e.g., *lice*, *bike*, *write* vs. *buy*, *lies*, *ride*); bisyllabic trochaic words (e.g., *writing*, *citing*, *Nike*, *bison* vs. *riding*, *spider*, *cyber*, *tiger*); and trisyllabic words with primary stress on the second syllable, meaning that the voiceless sound following the diphthong of interest was not foot-internal (e.g., *citation*, *psychotic*, *Titanic*). The latter group is of interest because raising is reported not to occur in these words in established varieties of raising (e.g., Chambers 1973), and thus such words have played a role in the discussion concerning the prosodic environment in which Canadian Raising occurs (e.g., Vance 1987; Chambers 1989; Pater 2014). As it turns out, these trisyllabic items do exhibit raising for many of the talkers in our Fort Wayne sample, as outlined more thoroughly below.

Berkson, Davis, and Strickler (2017) document four patterns of /au/-raising among their Fort Wayne talkers, and these patterns can be placed
on a continuum from no raising to phonological raising. Those who displayed no raising were referred to as pattern 0 talkers, while those who displayed opaque phonological raising were referred to as pattern 3 talkers. These pattern 3 talkers raise in monosyllables before a voiceless consonant and before t-flaps—that is, they raise in both *write* and *writing*—consistent with canonical opaque /ai/-raising as found in mature varieties. We were also able to document two incipient patterns: speakers with the most incipient pattern of behavior, referred to as pattern 1, had raising in words like *citation*, *titanic*, and *psychotic* but not in any other words, although monosyllables like *write* often showed offglide peripheralization, which can be seen as a precursor to raising (Moreton and Thomas 2007). Finally, talkers with what we referred to as pattern 2 showed raising before voiceless consonants, as in *write*, but not before t-flaps; thus, there was no raising in *writing*. Pattern 2 is of interest because it seems to instantiate the elusive transparent phonetic raising (Dialect B) discussed by Joos (1942) for Toronto area public school students, but never documented, and whose occurrence has been questioned by Canadian phonologists (see especially Kaye 1990).

Below we consider sample data for a representative speaker of each pattern, starting with a pattern 0 speaker, who has no raising (figure 4.1a), followed by a pattern 3 speaker, who has opaque (phonological) raising (figure 4.1b). F1 is plotted on an inverted y-axis so that raised vowels are higher in the plots. The time points along the x-axis represent the time-normalized F1 track, with time point 1 representing the mean F1 value at the 10% mark in the vowel, time point 2 representing the 20% mark, and

**Figure 4.1**
The Ends of the Spectrum: Average Duration and Time-Normalized F1 of /ai/ in *write*, *writing*, *riding*, and *ride*

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**a. Pattern 0: No Raising**

(|wnov24d, female, age 48)

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**b. Pattern 3: Phonological Raising**

(|mjan22a, male, age 19)
so forth. F1 tracks, averaged across the speaker’s three repetitions of each word, are for the diphthongs in the minimal set *write-writing-riding-ride*. The metric adopted for determining whether a diphthong is acoustically raised is the one established by Labov, Ash, and Boberg (2006) and used regularly since (e.g., Rankinen 2014; Nycz 2016; Strelluf 2018)—namely, a difference of ≥60 Hz in F1 height of diphthong nuclei. Thus, the diphthong in *write* is considered raised if the F1 value at nucleus midpoint—approximately the 30% mark of a time-normalized vowel, or time point 3 on the graphs that follow, which falls squarely within the /a/- portion of the diphthong—deviates by ≥60 Hz from that of the diphthong in *ride*. Likewise, the diphthong in *writing* is raised if the F1 value at the nucleus midpoint deviates by ≥60 Hz from that of the diphthong in *riding*. Mean duration of the diphthong for each item is also shown via inset bar graphs. The expectation is that diphthongs will be longer before voiced consonants than before voiceless ones, at least in monosyllables (see Davis and Summers 1989). We include both F1 trajectories and duration information because, as will be seen, we contend that both factors contribute to the onset of raising in a formerly nonraising dialect.

Figure 4.1a, which displays lack of raising (pattern 0) for a 48-year-old female talker, reveals that the diphthong in *ride* is consistently longest, as expected, while durational differences in preflap diphthongs are minimal. Diphthongs pattern together with regards to F1 height. No items show raising. For the pattern 3 talker shown in figure 4.1b, a 19-year-old male talker, the vowel in *ride* is longer than that in *write* and the difference extends into the preflap context such that the diphthong in *riding* is longer than the one in *writing*. With regards to F1 height, the raised diphthongs in *write* and *writing* pattern together, as do the diphthongs in *ride* and *riding*.

Figure 4.1 clearly illustrates the acoustic difference between patterns 0 and 3 speakers, those with no raising and those with phonological raising (pattern 3). The difference is evident not only in terms of F1 height but also in terms of vowel length. In our data, pattern 0 speakers in general show minimal, nonrobust duration differences in the flapping environment.

While figure 4.1 exemplifies the extreme edges of the /aI/-raising continuum found among Fort Wayne talkers, with speakers who exemplify patterns 0 and 3, Berkson, Davis, and Strickler (2017) and Davis, Berkson, and Strickler (2020) document two other patterns that occupy positions between the two edges: patterns 1 and 2. As mentioned above, pattern 1 speakers displayed the most incipient pattern of behavior, with raising before voiceless consonants in words like *citation, titanic*, and *psychotic* but not in any other words. Also of note is the fact that these speakers typically show offglide peripheralization before voiceless consonants in monosyl-
lables, which can be seen as a precursor to raising (Moreton and Thomas 2007). Pattern 2 speakers instantiate the elusive Dialect B pattern of transparent raising noted by Joos (1942) but never subsequently documented. For pattern 2 talkers, /aI/ is raised before voiceless consonants, as in *write*, but not before *t*-flaps; thus, there is no raising in *writing*.

Pattern 2 is illustrated in figure 4.2 with data from a 20-year-old female talker. Therein, at time point 3, we see that the nucleus of the diphthong in *write* is raised in comparison to *ride*. There is essentially no difference between the height of the diphthong in the words *writing* and *riding*, while there is a robust length distinction between the diphthongs in *ride* and *write*. The diphthongs in *riding* and *writing*, meanwhile, do show a length difference, but it is somewhat less robust. This pattern—that is, diminished length differences in the preflap diphthongs—is displayed by some pattern 2 talkers, while others display no length distinction in *riding* and *writing*. We will return to this point in a later section.

Figure 4.2 is of interest because it clearly illustrates the Dialect B pattern of no raising before *t*-flaps. Pattern 2 was further clarified in Davis, Berkson, and Strickler (2020), which found that most pattern 2 talkers do not raise in any bisyllabic trochaic word; thus, there is no raising in words like *Nike* and *bison* in addition to *writing*. As such, pattern 2 is not simply phonetic, for raising is not triggered by any following voiceless consonant. Rather, raising for most pattern 2 talkers is conditioned both by the voic-
ing of the following consonant and by additional factors, such as number of syllables and duration. Moreover, raw duration is not the crucial factor. The preflap diphthongs in figure 4.2 are both shorter and lower than the diphthong in \textit{write}, which is supportive of the prefortis clipping analysis of raising along the lines of Bermúdez-Otero (2014, 2017).

Figure 4.3 shows examples of two pattern 1 speakers, who raise only in words like \textit{citation}, \textit{titanic}, and \textit{psychotic}, where the triggering voiceless consonant is at the beginning of a syllable with primary stress. For these speakers, we can see that the diphthongs in the quadruplet \textit{write-ride-writing-riding} are not substantially different in terms of height at vowel nucleus, though both speakers show offglide peripheralization in \textit{write}. For both, however, the diphthong in \textit{titanic} is highest. This observation holds not only for time point 3 but for the most of the diphthong nucleus. These raised diphthongs are quite short and may reflect some degree of undershoot—their trajectories are less dynamic than those of the other diphthongs. We nevertheless consider them to be a crucial ingredient in incipient raising, as they expand the F1 space occupied by the nuclei of /aI/ diphthongs. Noteworthy in figure 4.3 is that the younger speaker shows a somewhat robust length difference between \textit{writing} and \textit{riding}, while the older male talker shown in 4.3b does not have such a difference. Having illustrated the four basic patterns of raising that can be found in Fort Wayne, ranging on a continuum from no raising (pattern 0) to opaque abstract raising (pattern 3), we argue in the next section that /aI/-raising in Fort Wayne is incipient, having only arisen with a generation born around 1990.

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure4.3.png}
\caption{Pattern 1, Preincipient Raising: Average Duration and Time-Normalized F1 of /aI/ in \textit{write}, \textit{writing}, \textit{ride}, \textit{riding}, and \textit{titanic}}
\end{figure}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure4.3b.png}
\caption{Pattern 1, Preincipient Raising: Average Duration and Time-Normalized F1 of /aI/ in \textit{write}, \textit{writing}, \textit{ride}, \textit{riding}, and \textit{titanic}}
\end{figure}
WHY FORT WAYNE /aɪ/-RAISING IS INCipient

We now expand on the fourth section of Davis, Berkson, and Strickler (2020), maintaining that our Fort Wayne /aɪ/-raising data truly represents an incipient raising variety, in contrast with the more mature raising varieties discussed in the previous literature. Similar to Joos (1942), we find transparent /aɪ/-raising, which seems uncharacteristic of mature varieties.

While the original motivation for our study was the casual observation that college students at Indiana University hailing from the Fort Wayne area seemed to display /aɪ/-raising only within the past 10–15 years, aspects of the data themselves—rather than our intuition that this sound change is relatively new—are most suggestive of the incipient nature of Fort Wayne /aɪ/-raising. These include a lack of extension to noncanonical environments; presence of transparent raisers (i.e., those who raise before voiceless consonants but not before t-flaps); absence of raising in any bisyllabic trochaic words; and unexpected raising across foot boundaries, as in Titanic.

First, unlike data reported for /aɪ/-raising in Canada (e.g., Kaye 2012; Pater 2014), upstate New York (Vance 1987), Vermont (Roberts 2007), the Chicago area (Kilbury 1983; Hualde, Luchkina, and Eager 2017), Philadelphia (Fruehwald 2016), Ann Arbor, Michigan (Dailey-O’Cain 2007), and the Mississippi dialect described by Moreton (2016), our Fort Wayne talkers, as documented in Davis, Berkson, and Strickler (2020), do not show clear evidence of extension of raised /aɪ/-variants to exceptional environments that include words like spider, tiger, and fire. While all of the above studies report extensions of raising in one or more of these environments, none of our Fort Wayne /aɪ/-raisers show clear extension. Most noteworthy is the lack of raising in spider. Fruehwald (2013, 114–15) observes that the only words in the Philadelphia Neighborhood Corpus in which there are multiple instances of /aɪ/-raising in an unexpected environment (i.e., not before a voiceless consonant or before a t-flap) are spider and Snyder. Through the longitudinal data that the Philadelphia corpus provides, Fruehwald concludes that raising in spider and Snyder started 20–30 years after prevoiceless raising began. The diphthongs in spider and Snyder are consistently low (i.e., not as raised as in writing) in all of the Fort Wayne raisers of our Davis, Berkson, and Strickler (2020) study. That we have found no evidence of systematic raising in these items in our Fort Wayne data is consistent with the claim that it is an incipient variety.

The second observation that argues for Fort Wayne /aɪ/-raising being incipient is the presence of transparent raising, where /aɪ/-raising occurs before voiceless consonants but fails to occur before t-flaps (pattern 2). This is important in light of Joos (1942), which is the only other study to observe transparent raising, although the pattern was not acoustically
documented. A later generation of Canadian phonologists have either noted the loss of transparent raising altogether or have implicitly questioned the accuracy of Joos’s original observation. For example, Chambers (1973, 122) was able to write regarding Joos’s (1942) article: “in the three intervening decades Dialect B [i.e., transparent raising] has disappeared and Dialect A [i.e., opaque raising before t-flaps] is ubiquitous throughout heartland Canada.” Along similar lines, Kaye (1990, 262) comments on the fact that while much phonological discussion has been fueled by Joos’s description of Dialect B, evidence corroborating its existence has proven elusive: “All that remains of Dialect B is a single datum: Joos’ transcription of the word ‘typewriter’. […] Whatever happened to Dialect B?” Based on our Fort Wayne data from Davis, Berkson, and Strickler (2020), we were able to reach an understanding concerning what happened to the so-called Dialect B, which lacks raising before t-flaps. We argue that the presence of transparent raising within a community is just an indicator of an incipient variety and that speakers who display transparent raising today will most likely start raising before t-flaps in the future, especially if they remain in a location where /al/-raising is present. In answering Kaye’s (1990) question as to whatever happened to Dialect B, then, we conclude that nothing actually happened to it; the Dialect B pattern evolved into the robustly documented opaque phonological raising pattern.

What should be mentioned here and what was not directly discussed in Davis, Berkson, and Strickler (2020) is that the lack of raising before t-flaps implies that there should not be extensions of /al/-raising to exceptional environments, such as to words like spider and tiger. After all, how can one have raising before a flap in spider, where there is no evidence as to the underlying form of the flap in that word (as /t/ or /d/), when there is no raising in writer? Raising in items like writer should precede any extension into items like spider, given that there is clear evidence in writer that the underlying form is voiceless /t/ because of write. Raising in spider therefore implies that there is raising in writer. Extensions must be based on something. The same logic would hold for the possible extension of /al/-raising to items like tiger. Exceptional raising in such environments would only come after there is raising before flaps (as in writer) so that there are extensions to other voiced environments. In this regard, it is interesting to note that Joos (1942) specifically commented on the lack of extension of /al/-raising to exceptional environments even among Toronto public school students who had raising before t-flaps. Concerning such speakers Joos (1942, 143) comments, “it need not be long before we hear high diphthongs before /b, g/ also, in contrast with low diphthongs.” This suggests that such extensions had not yet occurred at the time of Joos’s writing. This is consistent with the incipient nature of Canadian /al/-raising at the time of Joos’s (1942) article.
and is consistent with Fruehwald’s (2013) conclusion discussed above that raising in exceptional environments begin 20–30 years after prevoiceless raising begins. We can conclude that both the lack of /ai/-raising in exceptional environments and the presence of transparent raising among our Fort Wayne area talkers truly reflect an incipient pattern of /ai/-raising.

A third reason that Fort Wayne /ai/-raising is incipient concerns our finding from Davis, Berkson, and Strickler (2020) that many of the pattern 2 raisers who do not raise before t-flaps do not raise in any bisyllabic trochaic word; thus, such speakers not only show no raising in words like writing and citing, but they also show no raising in words like Nike and bison. Moreover, we also found pattern 3 speakers who raise before t-flaps, as in writing and citing, but fail to raise before voiceless consonants in words like Nike and bison. This is quite different from what is found in more mature varieties to the extent that they are discussed in the literature. Typically raising occurs in these environments (e.g., Chambers 1973, 1989; Moreton 2016), a fact that has generated discussion as to whether the raising rule should be syllable-based, where the /k/ in a word like Nike is ambisyllabic (e.g., Pater 2014), or foot-based (harking back to Kiparsky 1979), where raising only occurs when /ai/ and the following voiceless phoneme are in the same metrical foot. Chambers (1989, 86) maintains that Canadian Raising only became entrenched (in the Toronto area) in the 1930s and that Joos’s observing of the lack of raising before t-flaps represents a stage that had disappeared some 30 years later. Thus, the lack of extension of raising to bisyllabic trochaic words, such as Nike and bison, and before t-flaps, as in writing, can best be understood as a characteristic of incipient raising that is not found in mature varieties.

A fourth reason that we believe that /ai/-raising in the Fort Wayne area is truly incipient is the observation we discussed in Berkson, Davis, and Strickler (2017) that all of our /ai/-raisers have raised variants in words like citation, psychotic, and Titanic, where the voiceless consonant following the diphthong is not foot-internal. Moreover, as discussed in the second section of this chapter, there are some Fort Wayne talkers who display raising in only these words (pattern 1). This pattern can be considered surprising in light of the fact that in studies that report on these words (e.g., Chambers 1973, 1989 for Canada; Vance 1987 for upstate New York; Daily-O’Cain 1997 for Ann Arbor; Moreton 2016 for a Mississippi dialect), raising is blocked in this environment and occurs only when /ai/ and the following voiceless phoneme are foot-internal. In other words, raising does not occur before a voiceless consonant that is at the beginning of the syllable with primary stress. Building upon our suggestion in Berkson, Davis, and Strickler (2017), we posit that the foot-internal environment arises with a subsequent (nonincipient) generation of /ai/-raisers. This is based on the observation
from the L1 phonological acquisition literature on English that children often impose foot-based constraints on the distribution of allophony as part of the acquisition process (e.g., Inkelas and Rose 2007; Davis 2010; Rose and Inkelas 2011). The implication is that the foot-based constraint on /aI/-raising is a characteristic of more mature varieties of raising, whereby children hear instances of both raised /aI/ and nonraised /aI/ from the individual adults and older children around them and then posit a foot-based analysis on its allophonic distribution, which may not have been part of the adult grammar. This foot-based view is consistent with Chambers’s contention that Canadian Raising only became entrenched in the 1930s, so that Joos’s (1942) article on raising among Toronto area public school students, many of whom did not raise before the /t/-flap in *typewriter*, reflects a first generation of raisers. The foot-based analysis comes with a subsequent generation who impose a foot-based constraint on the distribution of the [aI-aI] allophony, thus resulting in raising in trochaic words like *Nike* and *bison*, but also the lack of raising in words like *citation, psychotic*, and *Titanic*, where the diphthong /aI/ is not in the same foot as the immediately following voiceless consonant. Consequently, the fact that Fort Wayne /aI/-raising is not metrically conditioned is utterly consistent with its incipient nature.

**INCIPIENT /aI/-RAISING AND LIFESPAN CHANGE**

In the previous section we presented four arguments that Fort Wayne /aI/-raising is incipient. The arguments come from the data that we have collected and are supportive of the casual observation of the first author that college-aged students from the Fort Wayne area were not raising in the 1990s unlike such Fort Wayne college-aged students of this past decade. If Fort Wayne represents an incipient /aI/-raising dialect with raising starting with a generation born around 1990, then we would not expect anyone over 40 years of age to show raising. (We say 40 years of age to account for the possibility of some earlier raisers born in the 1980s.) In table 4.1, we show the continuum of Fort Wayne /aI/-raising uncovered in Berkson, Davis, and Strickler (2017) and discussed in this chapter that ranges from no raising (pattern 0) to the phonological pattern of opaque raising (pattern 3), with the transparent raising of pattern 2 and the truly incipient pattern 1 raising, where raising only occurs in words like *titanic* and *psychotic*, occupying the middle of the continuum. All 27 speakers are reported here, broken down by gender as reported in Davis, Berkson, and Strickler (2020). We do not discuss here the apparent gender differences, though briefly mention them in the conclusion.

As seen in table 4.1, 17 of the 27 talkers exhibit pattern 2 or pattern 3 raising. To be clear, we want to emphasize that we do not suggest that the
patterns of /aI/-raising shown above constitute a developmental path. An individual speaker might pass through “stages” before arriving at pattern 3 phonological raising (i.e., raising before voiceless consonants and t-flaps), but “stages” can be skipped and the phonological raising pattern can occur from the very beginning once a speaker starts raising; that is, a pattern 3 talker does not have to go through a pattern 2 stage. We base this on the observation that some Fort Wayne speakers of pattern 0 and pattern 1, who do not show raising in monosyllables, nonetheless have offglide peripheralization before voiceless consonants and before t-flaps; additionally, some pattern 1 speakers have vowel length differences before flaps, with shorter vowels before t-flaps than before d-flaps. The vowel length difference in the flapping environment is characteristic of all pattern 3 raisers, but not all pattern 2 raisers. We hypothesize that if a pattern 1 speaker with pre-flap duration differences starts to raise, they might do so in a phonological manner before voiceless consonants and t-flaps without ever going through the more phonetic stage in which there is no raising before t-flaps. As a hypothetical example, consider the young 20-year-old pattern 1 speaker shown in figure 4.3a above. Even though she is a pattern 1 speaker with no raising in monosyllables or before t-flaps, she shows offglide peripheralization in write and a shorter vowel before t-flaps than before d-flaps. If such a speaker were to start raising (perhaps due to social factors), she would most likely do so in a manner that reflects pattern 3. In this way, we agree with Fruehwald (2016) that /aI/-raising can be phonological (opaque) from its initial occurrence in a dialect; however, as we document from the Fort Wayne data, it does not have to be.

Now given our claim that Fort Wayne represents an incipient /aI/-raising dialect, which started with a first generation of /aI/-raisers born around 1990, we would certainly not expect anyone over 40 years of age to show raising of the pattern 2 or pattern 3 type. First, as noted above, we say 40 years of age to account for the possibility of some early first-generation raisers born in the 1980s. Second, we exclude pattern 1 raisers as instantiating an incipient raising dialect, given the possibility that pattern 1 raising can

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<th>Pattern 0</th>
<th>Pattern 1</th>
<th>Pattern 2</th>
<th>Pattern 3</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(no raising)</td>
<td>(raising only in titanic-like words)</td>
<td>(raising in monosyllables, flaps pattern together, transparent raising)</td>
<td>(phonological opaque raising; raising in write and in writing)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3</td>
<td>7</td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 4.1 Distribution of 27 Talkers from Davis, Berkson, and Strickler (2020) across the Raising Continuum.
exist in communities that do not show pattern 2 and pattern 3 raising. A main characteristic of pattern 1 /aI/-raising is raising in words like *titanic*, *citation*, and *psychotic*. However, this could be understood as vowel under-shoot given that the diphthong /aI/ tends to be extremely short in these words. The shortness of the /aI/ leaves little time for the low vowel position of the diphthongal nucleus to be reached, resulting in a lower F1 (i.e., a higher nucleus). Thus, the presence of a raised nucleus in words like *titanic*, *citation*, and *psychotic* on its own does not constitute an incipient raising dialect—such a pattern may be instantiated in many dialects of English where raising is not incipient. However, the combination of this pattern with off-glide peripheralization and occurring in tandem with pattern 2 raising would. Perhaps pattern 1 is best characterized as preincipient /aI/-raising. Its existence in a community may help set the stage for American Raising to emerge. With this in mind, in table 4.2 we again show the distribution of the 27 Fort Wayne talkers from table 4.1, this time indicating the age of each individual. Recall that our expectation is that there should be no pattern 2 or pattern 3 speaker over the age of 40.

The distribution in table 2 largely supports the expectation that /aI/-raising is found primarily among younger speakers. Twelve of the 15 talkers under the age of 40 display /aI/-raising, while the three who do not show /aI/-raising group together in pattern 1. On the other hand, 7 of the 12 talkers over 40 years of age show no /aI/-raising; 3 of these 7 talkers are pattern 0 speakers, and the other 4 are pattern 1 speakers that we can classify as preincipient. Acoustic charts for representative pattern 0 and pattern 1 speakers were shown in figures 4.1a and 4.3 above. It is interesting to note that all younger nonraisers fall into pattern 1, which we label as preincipient. If we consider the 20-year-old female displayed in figure 4.3a, she has all the characteristics of a raiser with offglide peripheralization and fairly robust length difference depending on whether the diphthong is before a t-flap or d-flap, but there is no raising. This speaker displays features consistent with raising, without the actual lowered F1. It may be that raising is an undesirable index for that speaker, so she chooses not to raise. Her display is quite different from the older 49-year-old male pattern 1 raiser shown in figure 4.3b, who has no vowel length difference before flaps and negligible

<table>
<thead>
<tr>
<th>Pattern 0 (no raising)</th>
<th>Pattern 1 (raising only in titanic-like words)</th>
<th>Pattern 2 (raising in monosyllables, flaps pattern together)</th>
<th>Pattern 3 (phonological opaque raising)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>67, 21, 24, 44, 49, 57</td>
<td>21, 30</td>
<td>19, 52</td>
</tr>
<tr>
<td>Female</td>
<td>48, 49</td>
<td>20, 78</td>
<td>19, 20, 27, 31, 53, 54, 60</td>
</tr>
</tbody>
</table>
offglide peripheralization before the voiceless consonant in *write*. Both are pattern 1 speakers, though, since they raise only in words like *titanic*. What this shows is that while two speakers may be classified in the same pattern, there could in fact be pattern-internal age-related differences. This issue of age-related differences will become important in understanding the five older talkers in table 4.2 who display either pattern 2 or pattern 3 raising, contrary to the expectation that talkers over 40 should not raise under the view maintained here that Fort Wayne is an area witnessing incipient */aI/-raising where the first generation of */aI/-raisers were born around 1990 or slightly before.

**LIFESPAN CHANGE**

The presence of three older pattern 2 speakers and two older pattern 3 speakers, all born before 1970, as */aI/-raisers is unexpected on the view that */aI/-raising only began to be manifested in the Fort Wayne area with a generation born around 1990 or slightly before. Our contention is that these five older speakers have undergone lifespan change in the sense of Sankoff (2019) and did not have childhood acquisition of */aI/-raising. First, we base this on an informal observation that */aI/-raising is a feature that is fairly easy to accommodate to or to adopt even as an adult. Second, and more importantly, the acoustic characteristics of older raisers are quite distinct from those of the younger raisers grouped in the same pattern. This suggests that older raisers are adapting a raising strategy and that raising is not something that can be seen as a long-standing feature of their speech reflecting childhood acquisition. Before detailing this, we will first review the work on Sankoff (2019) on language change across a lifespan since it is of direct relevance to our understanding of the older Fort Wayne raisers.

Sankoff (2019) argues that when there is a historically new language change in progress within a community there are three possible trajectory types for older speakers whose period of childhood acquisition predates the new change in progress. First, there can be speaker stability in the face of language change, the first trajectory type. Under speaker stability, older speakers retain their childhood acquisition pattern despite the fact that the change is ongoing among the younger cohorts growing up behind them. While Sankoff (2019) illustrates this trajectory with an auxiliary selection example from Montreal French, we could illustrate this with our Fort Wayne pattern 0 speakers, all of whom are older and show no */aI/-raising despite the fact that younger speakers display it. A second trajectory of lifespan change posited by Sankoff (2019) is retrograde lifespan change, where older speakers become even more entrenched in a pattern that changes
contra the direction of the community. While Sankoff (2019) demonstrates this with a verbal morphology example from Montreal French, we could illustrate this with a hypothetical Fort Wayne area nonraiser who displays pattern 1 preincipient raising where raising only occurs in words like *citation*, *psychotic*, and *Titanic* during the formative years, but then becomes more conservative across the lifespan manifesting pattern 0 raising, a retrograde change since it is in the opposite direction of the community change in progress toward more raising. A third trajectory of lifespan change documented by Sankoff for Montreal French is when older speakers change in the direction of younger speakers; that is, they change in the direction of the community change in progress, adopting the new variant used by (most) younger speakers. Sankoff illustrates this trajectory through a longitudinal study (Sankoff and Blondeau 2007) of the pronunciation change in Montreal French from the traditional apical rhotic to a dorsal rhotic. The study documented that some of the same Montreal French speakers who mainly used the apical rhotic in the 1970s were using the dorsal rhotic in the 1980s. This rapid change from apical rhotic to dorsal rhotic was being led by adolescents, and the lifespan change exhibited by many older speakers reflects a change in the direction of the community change in progress. It is our contention that the five speakers over 40-years-old in our Fort Wayne area study who show pattern 2 or pattern 3 raising manifest this third trajectory, namely, a lifespan change in the direction of the community change in progress led by younger speakers.

An important issue that arises in the study of lifespan change is: How can one tell if a speaker has undergone a lifespan change (say in the direction of the community change-in-progress) if one does not have longitudinal data on that speaker over a decade or more? Sankoff’s Montreal corpus data is valuable in that it contains interviews with some of the same speakers over different decades so that individual language change can be tracked in real time. But what if one does not have real-time data for the same speakers across decades? Can a lifespan change in the direction of the community change in progress be determined nonetheless? We would maintain that it is indeed possible with a phonetic or phonological change if the acoustic pattern manifested by older speakers who have undergone the lifespan change in the direction of the community change in progress differs from that of the younger cohort who has childhood acquisition of that change. We explore this in our Fort Wayne data by first comparing the two older pattern 3 speakers to the younger pattern 3 cohort and then comparing the older pattern 2 speakers to their younger cohort.

Table 4.2 above shows the ages of our eight pattern 3 talkers. Five of the eight are among our youngest speakers, with an age range of 19–21. Two of the speakers, a 52-year-old male and a 47-year-old female, are over
40 years of age and thus unexpectedly show raising. Our claim is that the two older pattern 3 speakers manifest a lifespan change, meaning that their /al/-raising does not reflect childhood acquisition. We base this claim on the fact that the acoustic pattern of raising they exhibit is very different than what is seen in the younger speakers. Consider figure 4.4, which shows the write-ride-writing-riding data for the two older speakers. These figures are interesting because what they show is that /al/-raising is done in a contrastive sense. For both these speakers, /al/ is raised in write compared to ride, and /al/ is raised in writing as compared to riding. However, the /al/ in write and the /al/ in writing do not pattern together with respect to their F1 value. If anything, in both these speakers the F1 in riding and the F1 in write pattern together in having the most similar F1 value at time points 3 and 4. This is quite different from all the younger (19–21) pattern 3 speakers. As shown in figure 4.5 for two representative speakers, younger pattern 3 talkers have a bimodal distribution in vowel height where the /al/ in write and writing pattern together in that they are raised above the diphthongs in ride and riding. Note that figure 4.5a is the same as figure 4.1b, repeated here for convenience.

The acoustics of the younger pattern 3 speakers in figure 4.5 are strikingly different than those of the older speakers in that the two raising environments (voiceless consonant and t-flap) pattern together. Also, the acoustic difference between the raising environment and the nonraising environment is more robust. We would maintain that figure 4.5 represents what pattern 3 raising looks like when the raising reflects childhood acquisition of pattern 3. None of the younger raisers has the acoustic pattern

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**Figure 4.4**

Older Pattern 3 Talkers: Average Duration and Time-Normalized F1 of /al/ in write, writing, riding, and ride

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<thead>
<tr>
<th></th>
<th>write</th>
<th>writing</th>
<th>ride</th>
<th>riding</th>
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<tr>
<td>10</td>
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</tbody>
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shown in figure 4.4, where the voiceless stop and d-flap pattern together in terms of their F1 frequency. We would contend that figure 4.4 represents raising as a lifespan change, not childhood acquisition: *write* sounds raised when compared to *ride*, while *writing* sounds raised when compared to *riding*, but the raising is not part of a robust system that would come from childhood acquisition.

Given the discussion above, it is now interesting to consider the 35-year-old female pattern 3 raiser. This person was born in the early 1980s and seems to be somewhat outside of the range of childhood raisers given that most of our raisers were born in the 1990s or shortly before that. Because of the acoustic difference between the older pattern 3 raisers in figure 4.4 and the younger pattern 3 raisers in figure 4.5 we can accurately place the 35-year-old raiser with one of these groups. Consider figure 4.6, which shows the quadruplet *write-ride-writing-riding* for this speaker. The robustness of the raising in figure 4.6 is striking: *write* and *writing* pattern together as being very raised compared to *ride* and *riding*, which both have low diphthongs. This speaker also shows a robust length distinction, more so than our other pattern 3 raisers, where the vowels are quite short before the phonologically voiceless consonants. Duration data for these items and comparative disyllabic trochees are included in figure 4.6. These data lead us to conclude that the 35-year-old female is the oldest of the childhood raisers in our study, a claim that is supported by the observation that she is the only one of our consultants who shows distinct raising in *spider* as compared to *rider*. This is also shown in figure 4.6, where F1 tracks for *spider* and *fire* have been superimposed over the familiar *write-ride-writing-riding* quadruplet.

### Figure 4.5
Younger Pattern 3 Talkers: Average Duration and Time-Normalized F1 of /əʊ/ in *write*, *writing*, *riding*, and *ride*
Note that while we interpret the data in figure 4.6 as evidence of extension, the raising in spider is not as robust as the raising in writing. For this talker, as is true for all of the Fort Wayne data we have analyzed thus far, there is no raising in fire. Considering the data represented in figures 4.4–4.6, we conclude that the two pattern 3 raisers who are over 40 have undergone lifespan change in the trajectory of the community change in progress, while the 35-year-old raiser is our oldest pattern 3 childhood raiser.

Having shown that pattern 3 raisers who are over 40 years of age are acoustically distinct from the younger raisers, we now turn to our older pattern 2 raisers. We contend that they are also acoustically distinct from the younger pattern 2 raisers, though the acoustic differences are not as robust. Recall from table 4.2 above that the six younger pattern 2 raisers have an age range from 19–30, while the three older speakers who show pattern 2 raising range from 53–60 years of age. Figure 4.7 shows the quadruplet write-ride-writing-riding for the three older speakers. These three older pattern 2 raisers are very similar to one another in that the raising in write compared to ride, while exceeding the 60 Hz threshold for perceptual raising, is in fact not very robust. Also of note is the fact that for the speakers in figures 4.7b and 4.7c, who show no preflap length distinction (i.e., where the duration of /aI/ is essentially identical in writing and riding), the preflap diphthongs tend to pattern with the prevoiced diphthong in ride. The younger pattern 2 raisers, in contrast, show a different acoustic pattern (figure 4.8).

The diagrams of the younger speakers in figure 4.8 differ from the older speakers in several ways. First, the F1 difference between the diph-
thongs in *write* and *ride* is very robust for all the younger pattern 2 speakers, greatly exceeding the 60-Hz threshold. Second, for the younger speakers, while there is no vowel height difference in the /aI/ diphthong when before a *t*-flap or *d*-flap, there are other differences in the flapping environment that distinguish them from the older pattern 2 raisers. This includes a more consistent duration distinction in the diphthongs, with /aI/ longer before the *d*-flap than before the *t*-flap. Also, for none of the younger pattern 2 speakers does the preflap /aI/ pattern with the lowest variant of the diphthong, that in *ride*, as it does for the older pattern 2 speakers (figures 4.7b and 4.7c). Rather, for the younger pattern 2 raisers, preflap diphthongs pattern together and are either similar to the /aI/ diphthong before the voiceless consonant in *write* (e.g., figure 4.8b) or are categorically distinct from the
monosyllabic forms like *write* and *ride* (e.g., figures 4.8a and 4.8c). We thus conclude that the three pattern 2 raisers who are over 40 have an acoustic pattern of /ai/-raising that is consistent with lifespan language change in the trajectory of the community change in progress. Consequently, we maintain that /ai/-raising in the Fort Wayne area is incipient with a first generation of speakers born around 1990 or slightly before. The presence of some speakers with /ai/-raising born before 1970, which is unexpected on the incipient view of Fort Wayne /ai/-raising, can be explained through the lens of lifespan change, as older speakers in a community can change in the direction of the community change in progress as put forward in Sankoff (2019). What is interesting about the Fort Wayne case that we discuss here is that while we do not have real-time data on the older speakers across the
decades, we can infer from the acoustic pattern of their raising, which is distinct from the acoustic pattern of that of younger speakers, that raising was not part of their childhood acquisition but reflects lifespan language change.

HOW /at/-RAISING EMERGES

In the introductory section of this chapter, we discussed the matter of how /at/-raising emerges in a community where it was not previously witnessed, referencing studies by Kodner and Richter (2020) and by Strelluf (2018). We now discuss, with reference to these two studies, how /at/-raising emerges in a community like Fort Wayne that had historically lacked it. A discussion of these two studies will help us understand how the elusive Dialect B pattern of transparent raising can emerge in an incipient raising community when it is not characteristic of any mature /at/-raising variety. We will put forward the view, following Bermúdez-Otero (2014), that incipient /at/-raising is sensitive to the duration of the preconsonantal diphthong, targeting shorter or “clipped” diphthongs. This targeting is based not on absolute duration but on the categorical status of the vowel, such that the /at/ before a voiceless consonant in a monosyllable will be targeted for raising since it is shorter than the /at/ before a voiced consonant in a monosyllable, and an /at/ before a t-flap will be targeted for incipient raising only if it is shorter than an /at/ before a d-flap. This predicts that first-generation incipient raising would not occur before a t-flap if a vowel length distinction is not made in the flapping environment in the dialect in question, even if raising occurs in monosyllables; such an occurrence results in the elusive Dialect B transparent raising. This view of the emergence of transparent raising is quite different from the proposal of Kodner and Richter (2020), which we first discuss.

Kodner and Richter (2020) crucially reference dialect contact as the ultimate source of /at/-raising, focusing on our initial Fort Wayne study of Berkson, Davis, and Strickler (2017). While Fort Wayne can probably be best described as a North Midlands dialect, which traditionally lacks both /at/-raising and the Northern Cities Vowel Shift, it is geographically proximate to the Inland North region, where both these features have been attested across generations, as studies like that of Dailey-O’Cain (1997) have shown for Ann Arbor, Michigan. Inland North /at/-raising displays the canonical opaque phonological raising variety where /at/ is raised before voiceless consonants and t-flaps. Under the Tolerance Principle (Yang 2016), for /at/-raising to be acquired by children, forms with /at/-raising need to be part of the input to child speech, at least at a certain percentage. Kodner and
Richter (2020) take the strong position that dialect contact is crucial for /ai/-raising to be acquired in areas that did not previously witness it. Moreover, focusing on the emergence of the rare transparent /ai/-raising in Fort Wayne as originally documented in Berkson, Davis, and Strickler (2017), Kodner and Richter maintain that the occurrence of transparent /ai/-raising in Fort Wayne is best explained as a matter of dialect contact in the context of child language acquisition whereby children in the Fort Wayne area are exposed to speakers of the nonraising north Midland dialect of the Fort Wayne area as well as to speakers of the geographically proximate Inland North dialect with opaque raising. Following the logic of Yang’s (2016) Tolerance Principle, the exposure of competing /ai/ forms from the two dialects allows some children to posit a grammar with transparent raising that is not part of any of the input grammars. Not all children will do this, and it depends on the frequency with which they hear words from different speakers where there is no raising before t-flaps and where there is raising before voiceless consonants. According to Kodner and Richter, under certain scenarios, a child could posit a grammar with transparent /ai/-raising that is not part of anyone’s input grammar. (We refer the reader to Kodner and Richter 2020 for the technical computational details.) In general, Kodner and Richter (2020, 62) maintain that dialect contact is a much more likely source of the present-day expansion of (American) /ai/-raising than “spontaneously repeated phonetic incrementation and phonologization.”

In seeking to understand the pattern found in Fort Wayne, we are somewhat skeptical of the role of dialect contact in the emergence of transparent (Dialect B) /ai/-raising. First, many of the Fort Wayne area participants of our study live in the rural areas around Fort Wayne and not in the more urban area of Fort Wayne itself. The rural areas are less likely to have the kind of meaningful or regular contact with Inland North speakers that would provide the needed input for early childhood acquisition. Second, Kodner and Richter (2020) make a crucial assumption for their account that even among nonraisers who do not distinguish /ai/ before t-flaps and d-flaps based on F1 differences, they nonetheless make a clear perceptual difference based on vowel length that allow young children to figure out the correct underlying form of a phonetic flap. Here we quote them at length:

Although in a non-raising grammar words like writer-rider in which /ai/ precedes an alveolar flap are pronounced with the same vowel quality and similar flap realization, they are reliably pronounced with a vowel length difference reflecting the voicing of the following underlying stop. Therefore, flapped /t/-/d/ word pairs have distinct pronunciations in both raising and non-raising grammars, allowing children to recover underlying stop voicing for words pronounced with flaps. The vowel length information regarding underlying stop voicing must be cognitively available
to learners fairly early, as it is already systematic in productions before 24 months; even before children are entirely competent with flap articulation itself, they reproduce the adult pattern of shortening before underlyingly voiceless flaps (Rimac and Smith 1984, Ko 2007). This observation may also call into question the actual opacity of /aI/-raising. [63]

However, this scenario, which provides the backdrop for Kodner and Richter’s account for the emergence of raising in Fort Wayne (be it opaque raising or transparent raising), is at odds with an important aspect of our acoustic data: the presence of many older speakers who have neither an F1 difference nor a vowel length different in the pair *writing-riding*. This is clearly seen by data shown previously, such as that in figure 4.1a for a 48-year-old pattern 0 speaker, figure 4.3b for a 49-year-old pattern 1 speaker, figure 4.7b for a 60-year-old pattern 2 speaker, and figure 4.7c for a 53-year-old pattern 2 speaker. In fact, 8 of our 12 Fort Wayne talkers who are over 40 years of age have no length or F1 difference in the /aI/-diphthong in the flapping environment; thus, the difference between *writing* and *riding* is neutralized, unlike what was found in the studies cited by Kodner and Richter (2020). What this shows is that the lack of a distinction in vowel length and F1 height before *t*-flaps and *d*-flaps is a feature of the Fort Wayne area North Midlands speech. From our perspective, this is rather critical for the understanding of how the Dialect B pattern of transparent raising emerges. Here we again reference the view of Bermúdez-Otero (2014) that the key phonetic precursor of /aI/-raising is prefortis clipping, that is, the shortening of vowels before voiceless consonants and usually before *t*-flaps. In other words, incipient /aI/-raising is sensitive to the duration of the preconsonantal diphthong targeting shorter or “clipped” diphthongs but based on the categorical status of the vowel (and not absolute duration) such that the /aI/ before a voiceless consonant in a monosyllable will be targeted for raising since it is shorter than the /aI/ before a voiced consonant in a monosyllable, and an /aI/ before a *t*-flap will be targeted for incipient raising only if it is shorter than an /aI/ before a *d*-flap. In applying the role of vowel duration to our Fort Wayne /aI/-raising data, we note that all our Fort Wayne area speakers—regardless of pattern—have a much shorter vowel in *write* than in *ride*, as shown in all figures contained herein. This is expected, since it is a robust characteristic of American English, generally. But, as discussed here, the North Midland Fort Wayne area dialect does not traditionally distinguish vowel length before flaps. For our more conservative speakers, and in general for older speakers, the duration of /aI/ in *writing* and *riding* differs minimally if at all. This implies that if /aI/-raising emerges as an incipient feature affecting the “clipped” vowels, it will do so in a Dialect B like manner, where raising will occur in *write* but not in *writ-*
ing because in the latter form the diphthong is not shortened in comparison to riding. We conjecture that this is what happened in the Fort Wayne area when /aI/-raising first emerged. Following Bermúdez-Otero, incipient raising was phonetically based on the shortness of the vowel, resulting in a Dialect B transparent pattern of raising because the dialectal area did not traditionally distinguish diphthongal length in writing and riding. For many incipient raisers, raising occurs in write because the vowel is short or clipped compared to ride, but raising does not occur before a t-flap since there is no preflap length difference. Thus, on our view, the emergence of the Dialect B pattern of transparent raising by a first generation of raisers is just a consequence of the lack of vowel length differences in the flapping environment by many Fort Wayne area speakers.

Given this view, we can compare incipient /aI/-raising in Fort Wayne with /aI/-raising in Philadelphia, where Dialect B transparent raising is never witnessed (Fruehwald 2013, 2016). We can surmise that /aI/-raising in Philadelphia never witnessed transparent raising because preraising speakers most likely distinguished vowel length in the flapping environments, so that when raising began to take hold it affected /aI/ before voiceless consonants as well as before t-flaps. We suspect that the Dialect B pattern of transparent raising is so rarely attested because in dialects that are affected by raising they are more likely to have a length distinction in the flapping environments. (Along these lines, it is interesting to note that all our Fort Wayne pattern 3 raisers do have a vowel length distinction in the flapping environment, so they could very well have displayed opaque raising from the onset.) Consequently, contrary to Kodner and Richter (2020), we would maintain that transparent raising does not need the input of a mature raising dialect to emerge.

While we have explained above how incipient /aI/-raising as it emerged in Fort Wayne can exhibit the Dialect B transparent pattern of raising, we still need to account for the initiation of perceptual raising (be it transparent or opaque) in an area that did not previously have it, especially if we maintain that dialect contact need not play a meaningful role. Here we follow Strelluf (2018), who shows how /aI/-raising can be innovated in a perceptually salient manner in an area where it was historically absent and where dialect contact plays no role. Strelluf investigated vowels in the Kansas City area, where, like in Fort Wayne, perceptually salient /aI/-raising has emerged with a generation born around 1990. Kansas City has no history of /aI/-raising and is not adjacent to a dialect known to have /aI/-raising. Strelluf shows that Kansas City area residents born in the 1950s display virtually no F1 difference (i.e., vowel height difference) in the nucleus of the diphthongs in words like write and ride but that each subsequent generation showed a small F1 difference compared to the previous generation, such
that those born in the 1970s showed a larger F1 difference than those born in the 1960s, and those born in the 1980s showed a larger F1 difference than those born in the 1970s. Those born in the 1990s show an F1 difference of more than 60 Hz between the raised diphthong in *write* and the diphthong in *ride*, thus reaching Labov, Ash, and Boberg’s (2006) threshold whereby the diphthong in *write* is perceptually distinct from the diphthong in *ride*. We term this gradual increase in the F1 difference between prevoiced and prevoiceless diphthongs the Strelluf Effect. Consequently, under the scenario documented by Strelluf (2018), perceptually distinct */au/-raising can emerge in a community without dialect contact playing a significant role. It is quite possible that a similar situation (i.e., the Strelluf Effect) holds in the Fort Wayne area, given that perceptual */au/-raising seems to have only emerged among the generation born in the 1990s but not much before that. We say this despite the presence in our data of older raisers showing both pattern 2 and pattern 3 raising, but as discussed in the previous section, they raise in a way that is distinct from the younger raisers of the same pattern suggesting lifespan change. We suspect that there are two factors that may make lifespan change more likely for certain older speakers rather than others. First, most of our older raisers have much contact with younger speakers, being employed in K–12 education and other occupations wherein they interact with youth on a regular basis. Second, for perceptual raising to occur as part of a lifespan change, we think it is possible that the older lifespan raisers already had a slightly higher */au/-diphthong before voiceless consonants than before voiced ones, though not originally to a degree that was perceptually salient. Such a difference would be consistent with what Strelluf found among his Kansas City area speakers born before 1990, who exhibited slight raising that was not perceptually salient. Our data does include some older pattern 1 speakers for whom */au/* is slightly higher before voiceless consonants, though not in a way that reaches the perceptual threshold. Such speakers could be more likely to undergo lifespan change, especially if they interact regularly with younger raisers. Consequently, we believe that the emergence of */au/-raising in the Fort Wayne area does not crucially entail dialect contact and most likely instantiates the Strelluf Effect.

As a final matter, as we argued in Davis, Berkson, and Strickler (2020), Dialect B transparent raising where */au/-raising occurs before voiceless consonants but not before t-flaps is an incipient pattern only. As noted by Chambers (1973) for canonical Canadian Raising, Dialect B talkers observed by Joos (1942) could not be found 30 years later in the same locale. Transparent raising may be best understood as an incipient pattern that is phonetically based where raising affects shortened diphthongs as discussed earlier in this section. However, once incipient raising manifests, over time the first
generation of raisers may become more phonological, raising before t-flaps even if they do not display a robust length difference; also, morphology may play a role so that a word form like writing may display raising in uniformity with the word form write of the same lexeme. Subsequent generations who grow up hearing the [ai-ə] allophony from the adults and older children around them may impose a metrical constraint on the distribution of the [ai-ə] allophony, as was discussed previously, and thus acquire—or innovate—a system characteristic of mature varieties of raising.

CONCLUSION

In this chapter we first reviewed and illustrated the four patterns of /aI/-raising found within the Fort Wayne area community, ranging from no raising among older speakers to phonological opaque /aI/-raising. We also illustrated the two incipient patterns in the middle of the /aI/-raising continuum, including the rarely documented transparent raising where raising occurs before voiceless consonant but not before t-flaps. We then presented a number of arguments that Fort Wayne area /aI/-raising, be it transparent or opaque, is incipient to a first generation of perceptible /aI/-raisers born around 1990 or shortly before. Next we addressed the presence of some raisers in our data who were born before 1970, which is unexpected given the view that /aI/-raising is incipient. We showed that older raisers have undergone lifespan change based on the observation that their acoustic characteristics of /aI/-raising differs meaningfully from the younger generation of raisers. Following this discussion, we argued that the key to understanding why the Dialect B transparent raising pattern is common among first-generation raisers in the Fort Wayne area is the observation that many older speakers in the Fort Wayne area have no vowel length difference in the flapping environment. Such speakers show no vowel length difference in the pair writing-riding, although all speakers show a vowel length difference in the pair write-ride. If raising is sensitive to the shortness of the vowel, as maintained by Bermúdez-Otero (2014), then transparent raising can emerge since the shorter vowel of write will be raised (in comparison to ride), but no raising will occur in writing since the /aI/-diphthong in that word is not short in comparison to riding. The rarity of Dialect B transparent raising can be ascribed to the observation that most varieties of American English manifest a vowel length difference in the flapping environment, at least those varieties that may be susceptible to raising. Since many traditional speakers in the Fort Wayne area do not show a vowel length difference in the flapping environment, then when raising emerges, it emerges as the Dialect B transparent pattern.
Finally, there are a number of issues that we do not address in this chapter that are in need of further study. First and foremost is the question of what /aɪ/-raising indexes. This is a complicated question. Most telling in our data is the presence of a 20-year-old female pattern 1 nonraiser, shown in figure 4.3a, who has all the characteristics that go with raising (e.g., prefortis clipping, offglide peripheralization) but does not actually raise. It is as if she is deciding not to participate in raising, although she could. Our data also reveal a gender difference, in that more female talkers than male talkers participate in raising. What explains this? We do not believe that Fort Wayne area /aɪ/-raising is akin to what has been discussed for Philadelphia /aɪ/-raising in various works by Fruehwald (2013, 2016), where /aɪ/-raising indexes a local White urban identity. Rather, we suspect that, similar to Rankinen’s (2014) study on Upper Michigan, /aɪ/-raising indexes an outward orientation, perhaps what we can term “aspirational nonrootedness,” the antithesis of the concept of rootedness as developed in Reed (2020) and earlier works. Nonrootedness implies a desire not to associate with a perceived traditional orientation of a community that one grows up in even if one remains physically present in that community. We suspect that this notion of aspirational nonrootedness may be what American Raising is indexing in different parts of the country among the generation born around 1990. At present this is merely a hypothesis, one that needs to be examined in future work.

A different issue that we do not address is a question raised in the first section of this chapter: why does diphthong raising emerge at different times and in different places throughout the English-speaking world? As briefly mentioned early in the chapter, Kodner and Richter (2020, 62) use this observation to maintain their dialect contact perspective of the spread of American /aɪ/-raising, since it seems reasonable that dialect contact would be a much more likely source of the present-day expansion of /aɪ/-raising than “spontaneously repeated phonetic incrementation and phonologization.” However, we are not so sure of this. Raising has been documented in different parts of the English-speaking world across different time periods (Moreton 2021 [this volume]). We suspect that it is something inherent about the English language itself that leads to the possibility that there can be “spontaneously repeated phonetic incrementation and phonologization.” A most likely candidate is the presence of the typologically exaggerated vowel-length differential that is found in the voicing environment, whereby vowels are shorter before voiceless consonants—sometimes dramatically so. Consider the durational differences found in the diphthongs produced by the 49-year-old pattern 1 talker shown in figure 4.3b (74 ms in titanic, 189 ms in write, 313 ms in ride). While it is common for there
to be slight vowel length differences, such that vowels are longer before voiced consonants and shorter before voiceless consonants, the magnitude of the difference in English is unusual. The fact that the exaggerated vowel-length difference is very uncommon typologically could help explain why the phenomenon of /aI/-raising itself is typologically uncommon. It may be the magnitude of the vowel length difference that is the necessary phonetic underpinning for /aI/-raising and thus the phenomenon that could lead to /aI/-raising being spontaneously repeated and phonologized in different parts of the English-speaking world and at different time periods. We leave these issues for future research.

NOTES

1. We suspect that a similar situation holds in the Fort Wayne area, given that /aI/-raising seems to have only emerged among the generation born in the 1990s but not much before that. The larger question—namely, why does diphthong raising emerge at different times and different places throughout the English speaking world whereas it does not seem to be common among typologically diverse languages?—remains open, though we have some thoughts on this issue that we mention in the conclusion.

2. Speakers were recorded on a Marantz PMD661 solid state audio recorder with an Electro Voice Cobalt 9 microphone, either on the Indiana University Bloomington campus (where recordings were conducted in a WhisperRoom sound-attenuated booth) or in the area around Fort Wayne (where recordings were conducted in quiet rooms, often in the homes of participants).

3. We use the ≥60 Hz at nucleus midpoint metric in keeping with other scholars who study the phenomenon of raising and observe that raising in the nucleus occurs only in the more advanced stages of (incipient) raising. Our developing intuitions, however, are that this metric fails to capture relevant dynamic formant information, such as overall F1 and F2 trajectories. See Thomas and Mielke (2021 [this volume]) for more on this topic.

REFERENCES


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