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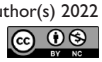

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Range in the Use and Realization of *BIN* in African American English

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Abstract

This paper jointly considers syntactic, semantic, and phonological/phonetic factors in approaching an understanding of *BIN*, a remote past marker in African American English that has been described as "stressed." It brings together data from the Corpus of Regional African American Language (CORAAL) and a production study in a small African American English-speaking community in southwest Louisiana to investigate the use and phonetic realization of *BIN* constructions. Only 20 instances of *BIN* constructions were found in CORAAL. This sparsity was not simply due to a dearth of semantic contexts for *BIN* in the interviews, since 122 instances of semantically equivalent *been* + temporal adverbial variants were also found. These results raise questions about the extent to which *BIN* constructions and *been* + temporal adverbial variants are used in different pragmatic and discourse contexts as well as in different speech styles. The production study elicited *BIN* and past participle *been* constructions in controlled syntactic and semantic environments. The phonetic realization of *BIN* was found to be distributed over the entire utterance rather than localized to *BIN*. *BIN* utterances were distinguished from past participle *been* utterances by having higher ratios of fundamental frequency (F0), intensity, and duration in *BIN*/*been* relative to preceding and following material in the utterance. In both studies, *BIN* utterances were generally realized with a high F0 peak on *BIN* and a reduced F0 range in the post-*BIN* region, with variability in the presence and kinds of F0 movements utterance-initially and utterance-finally, as well as in F0 downtrends in the post-*BIN* region.

Keywords

African American English, aspect, prosody, intonation

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Introduction

This paper brings together different approaches in linguistics in investigating the phonological and phonetic properties of *BIN* in African American English (AAE) that are linked to its semantic and pragmatic interpretation. The marker *BIN*, which has been described as "stressed" (Rickford, 1973, 1975), situates an eventuality or part of it in the far past. The previous research on *BIN* has established that the "stress" on the marker indicates the far past, and the investigation in this paper clarifies what "stress" might refer to and raises further questions about the influence of the utterance surrounding *BIN* on the remote past interpretation. This paper continues the description of tense and aspect properties of *BIN* and how the marker interacts with different types of predicates; it also lays the initial phonetic groundwork necessary to move toward a phonological analysis of the intonation of *BIN* constructions. One topic that is commonly associated with AAE is variation, and the work in this paper provides an opportunity to consider other ways of expressing long-time meaning in AAE and assessing data to determine whether present perfect constructions with temporal adverbials might be considered to be variants of *BIN* constructions. In addition, as noted in work such as Lavandera (1978), the linguistic variable has been used extensively in phonology, and the research in this paper raises questions about the extent to which it makes sense to talk about syntactic/semantic variation in expressing long periods. Along the lines of other research on AAE, this paper leads naturally to questions about the AAE continuum and what speakers' uses of different constructions to convey the far past tell us. Finally, in the consideration of *BIN* and adverbial phrases, this paper also shines the light on possible approaches that speakers who have some familiarity with AAE might take in avoiding features that mark them as speakers of the linguistic variety or as speakers of a stigmatized variety. In effect, the study of *BIN* contributes to the discussion of perceptions of "sounding black" and strategies speakers might use to avoid stereotypical features.

In this paper, African American English (AAE) refers to a linguistic variety spoken by some—not all—African Americans that has set syntactic, morphological, phonological, semantic, pragmatic, and lexical properties that are intertwined with properties of General American English (GAE). More recently there has been a move to use the label African American Language as a means of including all variations of language in African American communities. Owing to overlap between properties of GAE and AAE, speakers of AAE also use features that are associated with GAE. In such cases, AAE speakers are using properties that are also part of GAE; they are not codeswitching into GAE. For instance, in AAE, zero auxiliary forms are acceptable, and in some contexts overt forms are obligatory. As such, when speakers use overt auxiliaries in certain contexts, they are not codeshifting to GAE; they are using variant forms that are also in the AAE grammar. In some situations, however, AAE speakers do code shift between AAE and GAE. Given speakers' varying use of AAE properties owing to regional influences as well as other extralinguistic factors, it is useful to view AAE on a continuum. This avoids assumptions that all speakers are alike and that there is no variation in the linguistic variety. Not only can different speakers be thought of as occupying different places on the continuum, but, also, some speakers might move along the continuum given different situations—even closer to AAE-speaking communities or farther away. (See Baugh, 1983 for more discussion of the continuum.) Even in light of AAE on a continuum, it is still important to note that there are quite likely core structural properties that unify the different subvarieties.

1.1 Background

Three verbal markers have been shown to have similar pronunciations but subtly different meanings in some contexts in some varieties of AAE. In this paper, we use a different orthographic

representation for each marker: *been, bin*, and *BIN*. The marker represented as *been* occurs in contexts in all varieties of American English. The marker *bin*, which is unstressed, also occurs in some different regions and varieties of AAE but not in others. Winford (1998) reports that AAE speakers in Columbus, Ohio, do not accept the marker. Not only is there variation in whether or not the marker actually occurs in some varieties of AAE, but there is also variation in its distribution in varieties of AAE in which it does occur. For instance, Spears (2017) records a number of linguistic environments for *bin.* On the other hand, in the variety of AAE on which this paper is based, *bin*'s occurrence is limited: It occurs mostly preceding the main verb *had* (and some other verbs with past reference). In addition, it has been observed in the speech of older speakers in southwest and northern Louisiana (Green, 2002). Finally, in all of its occurrences, it is unstressed. The question about whether *been* and *bin* are the same markers with different uses is not addressed in this paper, but see Spears (2017) for more discussion related to that issue. *BIN*, known as stressed *been*, has been referred to by a number of labels, such as remote phase, remote past, and remote perfect:

(1) *been: I been to Jamaica five times./I been watching tv./I been a bus monitor before.*
"I have been to Jamaica five times" / "I have been watching TV" / "I have been a bus monitor before"

(2) *bin: I bin had this necklace 'bout fifteen, or sixteen years*. (Green, 2002, p. 58)
"I have had this necklace for fifteen or sixteen years"

(3) *BIN: Bruce BIN in the kitchen*.
"Bruce has been in the kitchen for a long time"

The sentence in (1) is similar to *been* present perfect sentences that occur in other varieties of English: *I've/I have been running*. The difference is that for some AAE speakers, the auxiliary *have* (or the contracted form *'ve*) is not produced in this context, or it is produced variably. Henceforth, we will refer to *been* as it occurs in present perfect contexts as the past participle *been*, abbreviated as $\text{been}_{\text{PPART}}$. A number of factors may influence a speaker's production of "have" (or *'ve*), including the speaker's place(s) on the AAE continuum and inter- and intra-community networks as well as phonological processes that might affect different varieties of English. The marker *bin* does not occur with preverbal auxiliary *have* (or *'ve*) (in the variety on which this research is based), so it also differs from $\text{been}_{\text{PPART}}$ constructions (1) in this way, which occur with main verbs, prepositions, and nouns. In addition to questions about syntactic/semantic and phonological properties of the *been*-types (1, 2, and 3), questions about the extent to which all of these markers occur in speakers' grammars and what social factors influence the occurrence and distribution of these markers remain unanswered. As research with AAE corpora increases (Kendall, 2019), and as more different methods in addition to the sociolinguistic interview are being used to collect data from AAE-speaking communities, we will move closer to answers to these questions.

Previous research on *BIN* has addressed questions about meaning, origin, and perception of the marker. For instance, Labov (1972) characterizes the marker as a remote past perfect marker, and in Rickford (1973, 1975), the earliest extended study of the marker, *BIN* is defined as indicating that the initiation of a process is at a point in the remote past. In addressing questions about the origin of the marker, Rickford (1977), Winford (1993), and Mufwene (1994) suggest that it may be linked to the anterior marker in Guyanese Creole and Gullah. In his work on the origins of AAE, Winford (1998) labels the marker remote perfect *BEEN*, which occurs with stative and nonstative predicates. Winford links *BIN* to American English varieties and creoles by explaining the semantics of the marker as the result of the reanalysis of the continuative perfect *been* under the influence of "an earlier creole past marker *bin*" (p. 128).

Building on the description in Rickford (1975, 1999) in which the label "remote phase" is used to capture *BIN's* function of positioning the "initiation of a process at some point in the remote past" (p. 24), Green (1998) characterizes *BIN* as situating an eventuality or some part of it in the remote past. In this paper, we refer to BIN as a remote past marker to capture its common property in all of its tense-aspect uses, including non-perfect constructions—that of situating some part or all of an eventuality in the far past.[1]

The description of *BIN* presented here builds on that in Green (1998, 2002) but makes one refinement in relation to the use of the resultant state. There is one *BIN*, which combines with different predicates, resulting in two different uses. The uses of *BIN* are labeled simply as a way of conveying the types of meanings that are associated with the marker—not to argue for distinct *BIN's* in AAE. In the previous limited research on *BIN*, Rickford (1975) took a similar approach and labeled uses of *BIN*. In one use, which we label as BIN_{STATE}, *BIN* combines with predicates that refer to an eventuality that started in the remote past and continues to the moment of utterance. BIN_{STATE} captures non-progressive and progressive forms, and further delineation might be unnecessary, but it is useful because it helps to underscore the *BIN* readings that have either been ignored or undetected in previous literature. Constructions in the BIN_{STATE} type are undoubtedly compatible with the present perfect, and, in fact, they can be paraphrased in terms of present perfect "has/have been . . .for a long time," as shown in (4) below. This *BIN* type is delineated into two sub-uses, continuousness ($BIN_{STATE—Continuous}$, abbreviated as $BIN_{STATE-CONT}$) and habitual ($BIN_{STATE—Habitual}$, abbreviated as $BIN_{STATE-HAB}$). The non-habituals constitute the subdivision $BIN_{STATE-CONT}$ and the habituals constitute the subcategory $BIN_{STATE-HAB}$. According to Comrie (1976),

> The feature that is common to habituals, whether or not they are also iterative, is that they describe a situation which is characteristic of an extended period of time, so extended in fact that the situation referred to is viewed not as an incidental property of the moment but, precisely, as a characteristic feature of a whole period. (pp. 27–28)

In the other use, which we label $BIN_{COMPLETE}$ (abbreviated as BIN_{COMP}), *BIN* combines with predicates referring to a complete eventuality in the remote past. The *BIN* uses BIN_{STATE} and $BIN_{COMPLETE}$ are similar to Rickford's function labels Remote Phase Continuative (cf. BIN_{STATE}) and Remote Phase Completive (cf. $BIN_{COMPLETE}$).

The subcategorization of types of states in the BIN_{STATE} category into continuous and habitual is not trivial. When *BIN* combines with progressive verbs, stative verbs, adjectivals (including adjectives and verbs with adjectival readings), adverbs, nouns, and prepositions, the resulting reading is the $BIN_{STATE—Continuous}$ reading (4a).

(4) BIN_{STATE}
  a) $BIN_{STATE—Continuous}$ ($BIN_{STATE-CONT}$)
    i. Bruce BIN running. "Bruce has been running for a long time"
    ii. Bruce BIN knowing/knew the answer. "Bruce has known the answer for a long time"
    iii. Bruce BIN married. "Bruce has been married for a long time"
    iv. That food BIN cooked. "The food has been in its cooked state for a long time"
    v. Bruce BIN in the kitchen. "Bruce has been in the kitchen for a long time"
    vi. Bruce BIN the teacher for that program. "Bruce has been the teacher for that program for a long time"

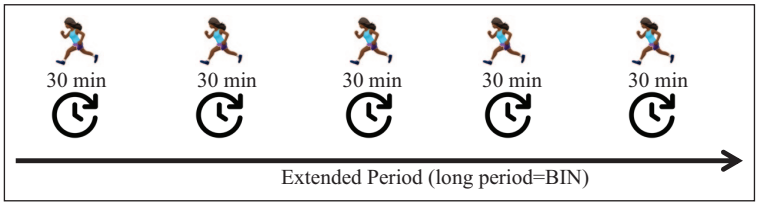
A common characteristic reported in previous descriptions of *BIN* (e.g., Green 1998, 2002; Rickford, 1975) is that there is a restriction on temporal modification such that, although *BIN* refers to a long period, temporal adverbials cannot be used to describe the long period. As such,

the sentence *#Bruce BIN running for 30 minutes* is unacceptable on the reading "Bruce has been running nonstop for a long time, for 30 minutes, in fact." A strategy that can be used to include modification of the long period is a pause right before the modifier "for 30 minutes," so the sentence *Bruce BIN running* **PAUSE** *for 30 minutes* is acceptable, now that the modification is uttered as an afterthought. As noted in Rickford (1973, pp. 14–15), temporal adverbials cannot co-occur with *BIN* as part of a "single sentence intonation pattern" and must be separated from *BIN* by a pause and "falling intonation."

When *BIN* combines with non-stative V-*ing* predicates (4b), another possible reading (in addition to $BIN_{STATE\text{-}CONT}$) is habitual, such that the event expressed by the verb is understood as a habit that began in the distant past.[2]

(4) BIN_{STATE}
(b) $BIN_{STATE—Habitual}$ ($BIN_{STATE\text{-}HAB}$)
Trina *BIN* running.
"For a long time, Trina has had the habit of running"
Literally: Trina started running a long time ago, and she runs from time to time.

One way the habitual constructions differ from the continuous constructions is that the latter allows adverbial modification without a pause before the temporal adverbial, so the sentence *Trina BIN running for 30 minutes* is good; however, the adverbial still cannot modify the long period. As Comrie (1976) notes, iterativity and habituals are not the same, but iterativity is not excluded from habituals. As illustrated in Green (1998, 2002), these *BIN* habituals can be described as iterativity over an extended period—on different occasions. Consider the diagram below:



Each running segment occurs for 30 minutes, and the eventuality is well established, having taken place over a long period. The *BIN* construction that can be uttered given the scenario in the figure is in (4c):

(4) BIN_{STATE}
(c) Trina BIN running for 30 minutes.
"Trina has had the habit of running for 30 minutes for quite some time"

This sentence refers to a situation such that Trina runs for 30-minute segments, and she has been doing this for quite some time. We do not know what the long period is, but we have some idea about what it takes for a habit to be established. The length of the long period might very well be revealed during the conversation, but it cannot occur in the same utterance as the *BIN* construction without a pause. On the other hand, there is no such requirement on the adverbial ("for 30 minutes") in (4c) because it is not describing *BIN* (*BIN* VP); it is only describing the length of the activity running, the 30-minute running segments. The conclusion is that temporal adverbials can occur in *BIN* constructions without a pause; they cannot modify *BIN* or the long period, but they can modify the lower VP structure: Trina [*BIN* [running for 30 minutes]]. Highlighting $BIN_{STATE\text{-}CONT}$ and $BIN_{STATE\text{-}HAB}$ constructions helps to explain why temporal adverbials can occur in some constructions but not others.

The $BIN_{STATE\text{-}CONT}$ and $BIN_{STATE\text{-}HAB}$ perfect uses refer to states that have held for a long time, thus the paraphrase "for a long time." The subtle difference is that $BIN_{STATE\text{-}HAB}$ refers to a habitual state. There is some overlap between these uses and the present participle *been*, and this overlap can be illustrated in AAE and GAE. For instance, consider the Crest commercial in which the tag question is "Forget about the way you've been brushing your teeth" (with a pitch accent on *been*). The sentence means something along the lines of "Forget about the way you've been brushing your teeth up to now." This sentence could also occur in AAE, especially without the auxiliary (*'ve*) for some speakers. In both varieties brushing teeth can be construed as having taken place periodically over a period of time. Nothing in the sentence suggests that the time is particularly long, but it could be construed in that way. On the other hand, in AAE, the sentence *Forget about the way you BIN brushing your teeth* necessarily indicates that the period is long. Pragmatically, the $BIN_{STAT\text{-}HAB}$ reading would be natural, but that is not to say that there are no contexts for the $BIN_{STAT\text{-}CONT}$ reading. Due to the overlap between BIN_{STATE} and $been_{PPART}$ uses, "watering*"* in "Faye been watering the plants" can be construed as having taking place periodically during the past along the same lines as *Faye BIN watering the plants*.[3] The difference is that in the latter the long period is explicitly marked. In some cases, pragmatics and conversational context in which the *BIN* utterance occurs can disambiguate the BIN_{STATE} construction. In other cases, the lexical aspect of the verb determines the BIN_{STATE} use. For instance, the verb *put* would automatically have the $BIN_{STAT\text{-}HAB}$ use in the sentence *I BIN putting my eyeglasses on this table* given that the event of putting someone's glasses in a certain spot takes place in an instant. The $BIN_{STAT\text{-}CONT}$ use indicating that one started to try to put her eyeglasses on the table and is still trying to put them there is anomalous because the putting event is not drawn out; it happens instantaneously.

BIN combines with non-stative verbs generally marked with V-*ed*/-*en* morphology (5) to indicate that the eventuality expressed by the verb is interpreted as having ended in the far past, a long time ago' ($BIN_{COMPLETE}$).[4]

(5) $BIN_{COMPLETE}$ (BIN_{COMP})
Bruce BIN grew out that shirt.
"Bruce grew out of that shirt a long time ago"

In addition, Winford (1998) notes that when the marker occurs with non-stative predicates "it conveys the sense of some event completed in the more or less distant past" (p. 128). It should be noted that the BIN_{COMP} constructions differ from BIN_{STATE} constructions in that they are not always compatible with the perfect. As it turns out, it is possible to use $been_{PPART}$ in BIN_{STATE} environments, such as *Trina BIN running* and *Trina been running for a long time*, but it is not possible to use $been_{PPART}$ in BIN_{COMP} environments. Compare the grammatical *Trina BIN ran* ("Trina ran a long time ago") to **Trina has been run/ran a long time ago*, which is unacceptable in GAE and AAE. The *BIN* construction can be trivially described as indicating that the running event is in its resultant state.

A brief summary should be given about the characterization of *BIN* as a perfect marker. Winford (1998) refers to the marker as a remote perfect although he does not dwell on the label "perfect." Instead, he underscores the historical origin, noting that the marker "represents a type of partial semantic shift, with transfer (retention) of semantic features from the creole past category and incorporation of features of continuative *been*" (Winford, 1998, p. 128). In a more recent study, Spears (2017) spends some time relating *BIN* to the perfect: "BIN's semantic range includes the present perfect and past perfect, but its semantics are not fully equivalent to the English Present Perfect and Past Perfect due to BIN's always expressing remoteness. . ." (p. 160). Spears goes on to note that Remote Perfect

> captures the fact that BIN refers to a situation whose instantiation began a long time ago (in the case of stative predicates) and continues in effect up till the present. In the case of active predicates, the situation occurred a long time ago in the past, and there is posterior time relevance (in the case of the past perfect) or present relevance (in the case of the present perfect). (p. 162)

Given the description in Comrie (1976), *BIN* overlaps with the perfect reading in that a subset of its constructions also indicate "present relevance of some past situation." More specifically the constructions in the BIN_{STATE} class (including the habitual readings) categorically refer to the present relevance, which is captured by its description: started in the far past and continues to hold until the moment of utterance. Some uses of *BIN* are unquestionably compatible with the perfect uses, in particular, perfect of persistent situation. These are the uses that Labov (1972) refers to as the remote present perfect and glosses as "have for a long time"; however, not all of its uses are present perfect. That is to say that not all of its uses link a past situation to the present. For instance, in some of their uses, *BIN* constructions refer exclusively to a past situation without any continuity to the present, as indicated in (6):

(6) Remember when you said you would give Sue that blue dress for her birthday back in 2018? Did you do that?

BIN response: Yeah, I BIN gave her that dress.	"I gave her that dress way back in 2018 (i.e. a long time ago)"
#done response: Yeah, I done gave her that dress.	"I have given her that dress"

The BIN utterance is a better response to the question about an event 3 years ago than the perfect marker *done* (often pronounced as *dən*) in AAE.

Data from auxiliary support also provide some evidence that shows that not all of the uses of *BIN* are perfect or at least not in the most obvious sense. It has been shown in previous research that auxiliary *have* and *ain't* support *BIN* in negation and ellipsis contexts, as in (7):

(7) Auxiliary support for *BIN* in negation and ellipsis
   a. Bruce haven't BIN running; he just started.
   b. Bruce ain't BIN running; he just started.
   "Bruce hasn't been running for a long time; he just started"

Note, also, that the auxiliary *did* (i.e., past *do*) can support *BIN* in "a long time ago" contexts, as in (8):

(8) A: Bruce went ahead and opened his gift a long time ago. Yes, he BIN opened his gift.
   B: I know he didn't!
   #I know he ain't/haven't!

This is a case in which *haven't* and *ain't*, which occur in perfect contexts of present relevance, cannot support *BIN*. Although marked for past, *hadn't* cannot support *BIN* in (8), either.

The preceding example (8) is presented to show that *BIN* is felicitous in the environment referring to a period in the past not including the present. We accept that *BIN* has some present perfect uses; however, not all of its uses are present perfect. It is clear from the literature that a number of researchers who have studied the marker land on calling it a remote perfect marker. In fact, one of the authors of the paper attempted to capture all of the *BIN* readings under a present relevance umbrella, signaling the perfect (Green, 1993), but that account remains unsatisfactory. The description in Klein (1994) in which perfect is defined as topic time after the situation time and perfective as topic time at situation time is useful in helping to present a picture of the *BIN* constructions that

have perfect readings and the ones that do not. A full overview goes beyond the scope of this paper, but see Klein (1994) for a discussion of tense and aspect. The property that is shared by ALL *BIN* constructions is that all or some part of the eventuality expressed by the predicate is in the far past.

In addition to meaning and contexts of *BIN*, some syntactic properties should be noted. *BIN* is negated by *ain't* (and *haven't* for some speakers):

(9) Bruce ain't BIN running; he just started. "Bruce hasn't been running for a long time; he just started running"

The sentence in (9) shows that *BIN* occurs in a position higher than the main verb but lower than the negator *ain't*. If it is assumed that *ain't* is in a higher position in the domain for auxiliaries (AUX), *BIN* can be construed as occurring in a position that is higher than the main verb (or other predicates, such as preposition) but lower than AUX. On the other hand, sentences in which *BIN* takes scope over modals, for example, (10), show that, in some cases, the remote past marker can occur higher than some modals:

(10) Bruce BIN could walk on stilts. "For a long time, Bruce has been able to walk on stilts"[5]

The positions of *BIN* and the modal in (10) are fixed such that *BIN* obligatorily precedes the modal; however, in some modal constructions, *BIN* can occur to the left of (higher than) the modal (11) or to the right of (lower than) the contracted modal (12):

(11) Bruce BIN could'a went to Jamaica. "Bruce could have gone to Jamaica a long time ago"

(12) Bruce could'a BIN went to Jamaica. "Bruce could have gone to Jamaica a long time ago"

The sentences in (13) and (14) are included to show that progressive verb forms cannot occur following the modal complex (*could'a*) presumably because of the selection properties.

(13) *Bruce BIN could'a buying discount shoes.

(14) Bruce could'a BIN buying discount shoes/in Texas. "Bruce could have been buying discount shoes for a long time/Bruce could have been in Texas for a long time"

Finally, *BIN* can occur higher than auxiliary verbs marked for Tense:

(15) A: Bruce is just paying the water bill now on his phone.
B: What! Bruce BIN was supposed to pay the water bill.

The usage and meaning of *BIN* constructions have received some detailed examination, as reviewed in the first part of this section. But the phonological/phonetic characterization of *BIN* has received almost none. Rickford (1973) characterized *BIN* in terms of being "stressed" or receiving "emphatic stress" and Baugh (1983) described this as "phonemic stress." *BIN* has also been described as receiving a "high tone" (Spears, 2017) and being "marked by a high pitch intonational contour" (Weldon, 2019, p. 117). Spears (2017, p. 162) also states that *BIN* is "not always stressed" and that there are varieties of AAE in which "*BIN* always receives high tone (Spears, 2004a), which occurs with stress usually, but not always." To our best knowledge, the only previously published acoustic analyses of *BIN* are Beyer et al. (2015), which provides a quantitative acoustic analysis of *BIN*, and Weldon (2019, 2021), which includes two sample fundamental frequency (F0)

contours (i.e., pitch tracks) of Sound Files 5.1 and 5.2 in Weldon (2021). In shadowing of spoken *BIN* and *been* constructions, Beyer et al. (2015) found that 23 self-identified AAE speakers in Puget Sound, Washington, pronounced *BIN* with relatively longer duration and intensity than *been*. Specifically, they found that in productions of 9 *BIN* versus 9 *been* sentences, the ratios of duration and intensity of *BIN* to duration and intensity over the entire utterance it appeared in were greater than for *been*. While Beyer et al. (2015) did not analyze F0, Weldon (2019) displays sample F0 contours of "She *BIN* told me that" and "She *BIN* married" in Figures 13.1 and 13.2; speaker characteristics are unspecified. Both examples show an utterance-initial high F0, dropping immediately into a small F0 peak on *BIN* (consistent with a high pitch accent on *BIN*), followed immediately by a drop into a low plateau that extends across the remainder of the utterance. The lack of discernible F0 peaks in the post-*BIN* region is consistent with a phonological analysis of deaccenting following *BIN*. Also, the F0 peak on *BIN* in both examples is about half the height of the utterance-initial F0, showing that the F0 peak on *BIN* need not surface with the globally highest F0 peak in the utterance.

While there is a small (but growing) body of work on AAE intonation (Cole et al., 2008; Holliday, 2016, 2019; Jun & Foreman, 1996; Loman, 1975; McLarty, 2011, 2018; Tarone, 1973; Thomas, 2015), to our knowledge, there is no work that situates the pronunciation of *BIN* and *been* within the context of intonational and prosodic phonology beyond Weldon's (2019) remark that *BIN* is "marked by a high pitch intonational contour" (p. 117) and Rickford's (1973, pp. 14–15) remark that temporal adverbials cannot co-occur with *BIN* as part of a "single sentence intonation pattern" and must be separated from *BIN* by a pause and "falling intonation." It isn't even clear what past literature has meant by describing *BIN* as "stressed." Based on Weldon's (2019) sample *BIN* F0 contours, perhaps "stressed" refers to sentential prominence or stress, so *BIN* has been described as "stressed" because it receives a pitch accent. It also isn't clear what Rickford's (1973) claim that a pause must separate *BIN* from temporal adverbials modifying the long period implies about the prosodic structure for such utterances. Could this imply that *BIN* must be separated from the temporal adverbial by a high-level prosodic juncture? If so, what kind of juncture? In fact, Dayton (1996) argues that while pauses can occur between the *BIN* phrase and adverbial, this is not a requirement (p. 750). Dayton does not provide oral recordings of the examples, but it could be that in her examples, there are prosodic junctures of some kind, but ones that do not get realized with pauses.

1.2 Research questions

Both Beyer et al.'s (2015) results and Weldon's (2019, 2021) examples indicate that understanding the sound of *BIN* necessitates analyzing *BIN* within the context of the utterance it is part of, including phrase-level intonational phonology and phonetics. In addition, the effect of intonation on the acceptability of *BIN* constructions with a temporal adverbial underscores the need for jointly considering syntactic/semantic and phonological factors in approaching an understanding of *BIN*. This paper takes that joint perspective and builds on past empirical work on the use of *BIN* in AAE-speaking communities (Rickford, 1973, 1975; Weldon, 2019, 2021) with two interconnected studies: (i) an investigation of the use and production of "been"-types in the publicly available Corpus of Regional African American Language (CORAAL) (Kendall & Farrington, 2020) and (ii) a production experiment of different *BIN*/*been types* in a small-town community of AAE speakers in Southwest Louisiana (SWLAT).

The two studies complement one another in the kind of data they provide: semi-spontaneous sociolinguistic interview data from multiple regions in the United States versus elicitation data in carefully controlled semantic/syntactic/discourse contexts within an isolated, homogeneous

AAE-speaking community (see Section 3.1.1 for more on the community). The large collection of over 140 sociolinguistic interview recordings in CORAAL offered opportunities for us to explore when and how "been"-types surface in the wild—even the chance to discover how been-types are used and produced in ways we might not have thought of previously. However, there is no direct control over how frequently the specific contexts required for different *BIN* types might happen to occur, potentially leading to a risk of a paucity of such contexts (Rickford, 1975, p. 99). In contrast, the SWLAT production experiment allowed us to manipulate the context of utterances directly and precisely to elicit the production of the different *BIN* types and $\text{been}_{\text{PPART}}$ within a single AAE speaker community. The researcher interference involved raises questions about how naturalistic the elicited speech is but allows us to create the specific conditions necessary for teasing apart subtle semantic differences and for making fine-grained phonetic comparisons.

Our first research objective was to characterize range in the use and meaning of *BIN*. For the CORAAL study, this meant determining to what extent *BIN* constructions and their semantically equivalent variants occurred in remote past contexts as well as looking for patterns of use conditioned on the rich demographic information available about the speakers. For the SWLAT study, this meant determining to what extent speakers produced *BIN* and $\text{been}_{\text{PPART}}$ utterances in different contexts, including ones designed to target the different semantic *BIN* types described in (4) and (5). We hypothesized that speakers would produce *BIN* utterances in the *BIN* contexts and $\text{been}_{\text{PPART}}$ ones in the $\text{been}_{\text{PPART}}$ contexts and that the frequency of *BIN* utterance production in "obligatory" *BIN* + modal and $\text{BIN}_{\text{COMPLETE}}$ contexts would be higher than in the other $\textit{BIN}_{\text{STATE}}$ environments.

Our second research objective was to build on Beyer et al. (2015) to phonetically characterize the difference between *BIN* and *been* utterances, and also to lay initial phonetic groundwork for building on previous characterizations of *BIN* receiving a high tone (reviewed in Section 1.1), toward a phonological analysis of the intonation of *BIN* constructions. (See also Clopper & Smiljanic, 2011, sec. 2.4 for a similar approach toward other varieties of American Englishes for which intonational fieldwork is still in initial stages.) While Jun and Foreman (1996) presented a preliminary proposal of a tonal inventory for AAE intonation based on MAE ToBI conventions developed for "Mainstream American English" (Beckman & Elam, 1997; Beckman et al., 2005), we take a different approach to avoid analytic biases of MAE ToBI, which reflects only one particular phonological analysis of American English (Jun, 2022; Ladd, 2022).

Rather, we adopt the more general consensus view of the set of assumptions in Autosegmental-Metrical theoretic approaches to the intonational phonology of varieties of Englishes (Beckman & Pierrehumbert, 1986; Clopper & Smiljanic, 2011; Grabe, 1998; Gussenhoven, 2016; Jun & Foreman, 1996; Ladd, 1996; Pierrehumbert, 1980; Veilleux et al., 2006): (i) tones are arranged in a linear sequence; (ii) phonological structure is organized in a prosodic hierarchical structure with an Intonational Phrase (IntP)[6] root node; (iii) tones can be characterized by how they are phonologically aligned/associated to the prosodic tree: either as pitch accents, which are associated to stressed syllables, or as prosodic boundary tones, which are aligned/associated to prosodic constituents (and some tones could be associated/aligned to both stressed syllables and constituents); (iv) pitch accents and prosodic boundary tones can be diagnosed based on how they phonetically align: pitch accent tones typically align close to a stressed syllable, while prosodic boundary tones typically align close to the edge of a prosodic constituent; and (v) F0 transitions between tones are approximately linearly interpolated, and unless there is a high or low boundary tone at an IntP edge (or an unspecified boundary tone, with F0 determined by a immediately flanking tonal event), then F0 at the IntP edge is expected to be mid-level in the speaker's F0 range.

Under this consensus view—besides the more general question of whether *BIN* and *been* differ in their phonetic realization—a first question to ask is: Can we find acoustic evidence in CORAAL and the SWLAT production data to confirm that the high tone that has been described for *BIN*

arises from a pitch accent? To do so, we would be looking for a clear local F0 peak (by local we mean that the peak need not be the absolutely highest F0 peak in the whole utterance) on *BIN*, cf. the F0 peaks on *BIN* clearly visible in Figures 13.1 and 13.2 of Weldon's (2019) *BIN* examples. In addition, recall the pattern observed in the Weldon's (2019) *BIN* examples of (i) an utterance-initial high F0 and (ii) a lack of discernible F0 peaks in the post-*BIN* region, consistent with a phonological analysis of deaccenting following *BIN*. Based on that observed pattern, another question to ask is about the realization of *BIN* and *been* relative to preceding and following material in the utterance. Is there acoustic evidence from the F0 contour that supports the presence and/or absence of pitch accents and/or prosodic boundary tones preceding or following *BIN*? And a third question is: building on Rickford's (1973) comments about a pause separating *BIN* from adverbials, is there acoustic evidence that speakers choose to produce *BIN* constructions followed by long-time adverbials with a high-level prosodic juncture? (pp. 14–15) The presence of an audible pause is often taken to be a phonetic signature of a prosodic domain edge high up in the prosodic hierarchy, for example, the IntP. As a rule of thumb, pauses have long been used to diagnose IntP boundaries (see, for example, Beckman & Elam, 1997, p. 19; Jun & Fletcher, 2014, pp. 501–502; Selkirk 1978, p. 135, Ladd 1996, pp. 315–317). This suggests that one reasonable interpretation of Rickford's comments is that *BIN* utterances with temporal adverbials must have a high-level prosodic juncture (e.g., an IntP boundary) to separate the temporal adverbial from the prosodic constituent with *BIN*.

Finally, a methodological research question underlying the two studies was comparing how the two methods/data sources helped to develop our understanding of *BIN*. The CORAAL study is presented in Section 2 and the SWLAT production study in Section 3.

2 CORAAL study

2.1 Materials and methods

We used CORAAL to complete a corpus study of *BIN* occurrences in a variety of contexts. The corpus contains speaker conversations from three regions: Washington, DC (DCA, DCB), the rural community of Princeville, NC (PRV), Rochester, NY (ROC), and Atlanta, GA (ATL). The earliest interviews come from the Washington DCA files, which were recorded in 1968 as part of data for Ralph Fasold's study (Fasold, 1972; Kendall et al., 2018a). The 68 speakers cover a wide variety of ages, with dates of birth ranging from 1891 to 1958. The DCB dataset was recorded in 2016 and contained 48 primary speakers. Several speakers were added to this dataset in 2018 (Kendall et al., 2018b). Both datasets from Washington, DC, contained socioeconomic status information. The Princeville dataset contains 16 primary speakers and was recorded in 2004 as a component for the North Carolina Language and Life Project (Rowe, 2005; Rowe et al., 2018). This dataset does not contain information regarding the socioeconomic status of the speakers. Data from Rochester contain 14 primary speakers and were collected in 2017 by Sharese King for her dissertation research (King, 2018; King et al., 2020). Like PRV, this dataset does not contain socioeconomic status information. Finally, the Atlanta dataset has interviews from 13 speakers collected from 2017 to 2018 by Patrick Slay Brooks, a music producer (Farrington et al., 2020). A summary of the distribution of ages and socioeconomic status for speakers in each of the CORAAL datasets is shown below in Table 1.

Through the CORAAL Explorer online interface, there is access to both a sound file and a paired transcription. Specific details about the transcription conventions of CORAAL can be found in their online user guide, and most of the transcription conventions followed those established by the Sociolinguistic Archive and Analysis Project (SLAAP). CORAAL transcriptions were done by undergraduates and checked by a linguistics graduate student; no information is given about

Table 1. Summary of Age and Socioeconomic Information for Speakers in the CORAAL Datasets.

Dataset	Age Group	Lower working class	Upper working class	Middle working class	Total Speakers
ATL	<29	F = 3 M = 5			8
	30–50	F = 3 M = 3			5
DCA	<19	F = 5 M = 8	F = 7 M = 6	F = 6 M = 6	38
	20–29	F = 1 M = 1	F = 0 M = 3	F = 5 M = 3	11
	30–50	F = 2 M = 1	F = 0 M = 3	F = 1 M = 4	11
	51+	F = 0 M = 2	F = 1 M = 1	F = 0 M = 2	6
DCB	<19	F = 3 M = 3	F = 1 M = 1	F = 1 M = 1	10
	20–29	F = 3 M = 3	F = 2 M = 1	F = 1 M = 0	10
	30-50	F = 3 M = 3	F = 2 M = 3	F = 2 M = 2	15
	51+	F = 1 M = 2	F = 5 M = 1	F = 2 M = 2	13
PRV	<29	F = 2 M = 2			4
	30–50	F = 3 M = 2			5
	51+	F = 4 M = 3			7
ROC	<29	F = 3 M = 3			6
	30–50	F = 4 M = 0			4
	51+	F = 2 M = 2			4

whether the transcribers had experience with AAE. The transcriptions represented reduced forms (i.e., *have* reductions such as *musta* and *coulda*) and discourse markers but did not systematically distinguish forms that may appear orthographically synonymous but are linguistically distinct. In particular, there was no orthographic difference between the types of "been"s investigated in this study. With CORAAL's online interface, the user has the ability to search through all the speaker files using specific search terms. The search function also accepts regular expressions to expand search capabilities and capture more complex patterns of interest. The search outputs the matched search item with pre- and post-match context. It also returns the file in which the match was found in with the utterance number, speaker, and start and end turns of the matched result. A search for the orthographic "been" was done using CORAAL's online interface, and each returned instance was classified for been-type. The corpus contained over 140 interviews at the time of this study.

Initial classifications of the different been-types were made by Green, a native speaker of a variety of AAE spoken in Southwest Louisiana. Some classifications were made in collaboration with graduate student Ayana Whitmal, who also has intuitions about AAE. She listened to each been-type construction, including the utterances preceding and following the construction for semantic and discourse context, and labeled it "*BIN*" (for the remote past marker), "$\text{been}_{\text{PPART}}$" (for the past participle form of *be*), or *bin* (for the unstressed marker). If Green perceived that the been-type, and together with the semantic and discourse context, signaled a remote past interpretation, it was labeled "*BIN*." All other been-types in present perfect contexts were classified as the past participle form of *be* ($\text{been}_{\text{PPART}}$). If a $\text{been}_{\text{PPART}}$ token was perceived as prominent, or (rarely) if there was ambiguity between a $\text{been}_{\text{PPART}}$ and a *BIN* classification, then that property of the $\text{been}_{\text{PPART}}$ was also noted. The one unstressed been-type preceding a verb in the past/past participle that did not occur in a present perfect context was labeled "*bin*." Predicate types (e.g., verb, noun, preposition, adverb) following each been-type were recorded. In addition, temporal adverbials that occurred with all been-types were noted. In instances in which Green heard the utterance differently than it was transcribed, she listened to it repeatedly. If she could be certain about the difference, she revised the transcription. If she could not, she did not change the transcription. In most

cases, questions related to whether the participant actually produced the auxiliary *have* or the contracted form *'ve* before "been." Four transcriptions of $been_{PPART}$ constructions with the marker "done" in the ATL database were revised.

To better assess the usage of *BIN* throughout CORAAL, we also collected counts of $been_{PPART}$ and *bin* in addition to the actual *BIN* counts. The $been_{PPART}$ utterances generally contained unstressed perfect "been" and a durative adverbial. If the adverbial explicitly gave a long-time reading but didn't quantify the duration (e.g., "all my life," "always," "for a long time/many years," "a long time ago"), the construction was tagged as "unspecified long time." Given that *BIN* signals an unspecified long period, structures in the unspecified long-time category can be thought of as the true *BIN* variants. That is, "He's been out here for a long time" (DCB_se3_ag_2_f_01) can be taken to be an alternative way of saying "He's *BIN* out here." It should be noted, however, that true variants for BIN_{comp} that include temporal adverbial modifiers would not be captured with the search parameters used in this study. In general, $been_{PPART}$ does not precede V-*ed/-en* in general American English unless it is passive BE (e.g., *The cookies have been eaten*.) In AAE, preceding a V-*ed/-en*, we expect *BIN* or *bin*, so "She been grew out of that" is more than likely "She grew out of that a long time ago." To capture variants of this *BIN*, a search for environments containing "a long time ago" would need to be done. Utterances that contained "Since + [explicit duration]" were tagged as "specified since," and all other utterances that contained an adverbial that gave the explicit duration were tagged as "specified other" (e.g., "for 13 months," "9 days ago"). Instances in which the adverbial was the predicate that immediately followed "been" or which expressed frequency as opposed to duration were not counted. Instances in which the eventuality in the $been_{PPART}$ construction was delimited (e.g., "for just/only 2 years") were also omitted. Full details about the observed *BIN* exemplars, including links to sound files of each utterance, as well as the starting point of the utterance both in the transcript and in the sound file, can be found in the OSF repository, https://www.doi.org/10.17605/OSF.IO/MRQBV.

Recordings of each *BIN* and *bin* example and selected $been_{PPART}$ examples were extracted from CORAAL audio files and segmented into individual utterances in Praat (Boersma & Weenink, 2019) and then segmented into words by hand. Owing to the small number of examples scattered across speakers, as well as the varying quality of the audio signal and the disparate surrounding context around "been" across the examples, we decided not to perform a quantitative, fine-grained statistical analysis to infer aggregate acoustic patterns. Instead, we took the collection of examples as an opportunity to discover representative exemplars showcasing the range of variation across renditions of "been" constructions. The second author, a trained phonetician and prosody specialist, used acoustic properties of the F0 contour, spectrogram, and waveform to code the pre-*BIN* region as having an initial high F0 or not; the *BIN* region as having an F0 peak higher or lower than the pre-*BIN* region; and the post-*BIN* region as either: (i) having no clearly observable F0 peaks, (ii) having an F0 peak on the verb lower than the preceding F0 range (which would be consistent with a downstepped accent on the verb), or (iii) rising to a final mid or high F0. In cases where there was insufficient acoustic information to determine how to code a region (e.g., the region had a very low acoustic amplitude), the region was simply labeled "unclear." In addition, it was noted if there were laryngealized spans outside of *BIN*. The goal of the annotation was not to transcribe intonation using MAE ToBI conventions developed for "Mainstream American English" (Beckman & Elam, 1997; Beckman et al., 2005). Rather, the goal was to document acoustic features or "cues" that could contribute to the percept of contrastive intonational categories (Cole & Shattuck-Hufnagel, 2016). The F0 contours shown in Section 2.2.2 were extracted in Praat using the autocorrelation algorithm, with speaker-specific ceiling and floor values and otherwise default settings. These were then hand-corrected to remove ill-defined F0 points affected by unvoiced regions and segmental perturbation (Gussenhoven, 2004, Ch. 1), and in one case, modified to best represent

perceived low pitch under laryngealization (Figure 4). All extracted audio files, annotated TextGrids, and original and edited F0 contours can be found in the OSF repository.

2.2 Results

Section 2.2.1 presents results on the usage and distribution of "been"-types found in CORAAL. Section 2.2.2 explicates the phonetics of representative utterances of *BIN* found in CORAAL, as well as some sample $been_{PPART}$ utterances.

2.2.1 Remote past "been" examples found in CORAAL: BIN and $been_{ppart}$ + adverbial. The search for the orthographic "been" returned a total of 1,410 results. These results included instances of "been" used by both the speaker and the interviewer. After removing the interviewer productions, a total of 1,210 utterances remained. Of that number, only 20 (1.7%) were determined to be instances of *BIN*. The majority of these 20 instances had VP predicates. Of the *BIN types*, there were 15 coded as $BIN_{STATE\text{-}CONT}$, 4 coded as BIN_{COMP}, and only one was coded as $BIN_{STATE\text{-}HAB}$. Speakers that produced *BIN*s came from diverse backgrounds, with age, education, location, and socioeconomic status spanning across different varieties, though there are no observed *BINs* from the DCA or ROC datasets.

Table 2 presents the subject and predicate of the utterance for each of the *BIN* exemplars found, along with a transcription of the full utterance (sometimes revised from the original by Green, as noted in Section 2.1) and some surrounding dialogue. It also contains demographic information such as age, gender (f for female, and m for male), education level, and socioeconomic status. The speaker code is the unique identification code used in CORAAL for a specific speaker, and the first three letters specify what database the speaker came from. All speakers are native to the location in which they were recorded, except for the Atlanta speaker (ATL_se0_ag2_m_03), who has lived in Atlanta for around 15 years but grew up in New Orleans, LA. A full description of the transcription guidelines can be found in the CORAAL User Manual. The relevant transcription conventions for the examples below are as follows: brackets ([ ]) indicate overlapping speech, names of other people are redacted (e.g., /D-NAME-3/), slashes (/ /) indicate unintelligible speech, < ts > indicates teeth sucking, single dashes (-) indicate restarts, and vertical bars (|) indicate pauses. Some of the transcriptions below have been edited by the writers to more accurately represent auxiliaries and verbal morphology.

While there were only 20 instances of *BIN*, there were many more $been_{PPART}$ instances—a total of 1,125. This excludes 65 tokens that included false starts, inaudible material, or were mistranscribed. 675 $been_{PPART}$ tokens lacked temporal adverbials and this includes 5 instances of "done been" constructions, which we are also treating as perfect-like. Among the 446 $been_{PPART}$ + temporal adverbial constructions, 140 were incompatible with *BIN* semantics, including one token that was doubly modified with both a "never" and an unspecified long time adverbial. The compatible subclass was made of "unspecified long time" cases and specified cases. There were 128 "unspecified long time" cases, including another doubly modified token with an unspecified long time adverbial followed by a specified other adverbial. There were 178 specified utterances. Within the specified subclass, 86 used the "specified since" construction and 92 were marked as "specified other." Across all adverbial categories the type of VP predicate that follows "been" was overwhelmingly progressive (VP-*ing*), though a few were past forms. For the "unspecified long time" category, 3 of 29 VPs were of the VP-*ed*/*en* form. For "specified since," 5 out of 27 were VP-*ed*/*en* forms, and for "specified other," 6 out of 40 were VP-*ed*/*en* forms. Even among the VP-*ed*/*en* forms that were present, many of them were more adjectival in function than true past tense.

Table 2. Description of Each of the *BIN* Exemplars Observed in CORAAL.

Subject	Predicate	Utterance	*BIN* Type	Speaker Code	Gender	Age	Education	SES Group
I	VP (-ed/en)	. . . couple of times.] Since th- Since I had **been** talked to- Since I was talking to the lady. . .	$BIN_{STATE\text{-}CONT}$	DCB_se1_ag1_f_01	f	17	Student -college	Working class
Who've	AdvP/PP	And you got people who've **been** here, who's doing the right thing and just didn't get a good- a good break in life	$BIN_{STATE\text{-}CONT}$	DCB_se1_ag2_f_01	f	28	College	Working class
I	VP (-ed/en)	/D-NAME-3/, through the mentoring.—No I been—| I **been** met—/RD-NAME-2/ like, long time ago	BIN_{COMP}	DCB_se1_ag2_f_02	f	26	Some college	Working class
Melo	VP (-ed/en)	Melo woulda **been** got traded plenty of times in his career.	BIN_{COMP}	DCB_se1_ag2_m_01	m	27	High school	Working class
They	VP (-ed/en)	If this was the NFL—they woulda **been** got rid of Derrick Rose.	BIN_{COMP}					
I	NP	I been—I] **been** this, I've done this.	$BIN_{STATE\text{-}CONT}$					
I	VP (-ing)	You just caught- I **been** thinking about it,—but I've just actually just sat my ass down.	$BIN_{STATE\text{-}CONT}$	DCB_se1_ag3_m_03	m	32	High school	Working class
They	VP (-ing)	[And they] **been** doing it, so niggas get away with certain shit. . .	$BIN_{STATE\text{-}CONT}$	ATL_se0_ag2_m_03	m	31	High school	Not recorded
Niggas	VP (-ing)	[Niggas- niggas- niggas] **been** doing that shit, you feel me. They got a new song with [uh] Gucci Mane	$BIN_{STATE\text{-}CONT}$					
Niggas	VP (-ing)	[like], niggas- niggas **been** doing that shit, bro. DJ Unk, Oomp Camp, you know what I mean. . .	$BIN_{STATE\text{-}CONT}$					
I	VP (-ing)	Like and now, you know what I mean, I **been** banging /RD-NAME-1/, you know what I mean. . .	$BIN_{STATE\text{-}HAB}$					

(Continued)

Table 2. (Continued)

Subject	Predicate	Utterance	*BIN* Type	Speaker Code	Gender	Age	Education	SES Group
He	AdvP/PP	[He **been** on it, yeah.]	$BIN_{STATE\text{-}CONT}$					
They	VP (-ed/en)	[Yeah.]| [nig- yeah, they **been** said that] shit. They **been** rock that shit, they **been** push that shit, bro	BIN_{COMP}					
Niggas	VP (-ing)	Niggas was more-—more wise niggas coulda **been** seeing what /the/ niggas was talking about.	$BIN_{STATE\text{-}CONT}$					
We	VP (-ing)	U Street suffered f-—thirty, forty years.—We coulda **been** doing all of that stuff.	$BIN_{STATE\text{-}CONT}$	DCB_se2_ag4_f_05	f	61	High school	Lower middle class
You've	AdvP/PP	And he's like wow. He said so you've **been** here-—you've **been** around. You've seen the change.	$BIN_{STATE\text{-}CONT}$	DCB_se3_ag4_m_01	m	60	Graduate school	Upper middle class
We	VP (-ing)	Nah- nah- nah- nah- Me and /RD-NAME-1/, we **been** knowing each other.	$BIN_{STATE\text{-}CONT}$	PRV_se0_ag2_m_01	m	32	High school	Not recorded
She	AdjP	[She-] yeah, she **been** dead. My granddaddy, he dead. <ts>—And my grandma . . .	$BIN_{STATE\text{-}CONT}$	PRV_se0_ag2_f_03	f	48	High school	Not recorded
School	AdvP/PP	[Yeah] [this] school **been** here for my um,—youngest sister and brother but I was my mother's oldest child	$BIN_{STATE\text{-}CONT}$	PRV_se0_ag3_f_04	f	76	High school	Not recorded
They	AdjP/ VP (-ed/en)	Mm-mm. They just-—they **been** married but they-—I know they- they husband dead.	$BIN_{STATE\text{-}CONT}$					

2.2.2 The phonetic realization of BIN constructions in CORAAL. Although there were 20 *BIN* utterances, there were 23 prosodic phrases containing *BIN* since two of the *BIN* utterances contained multiple prosodic phrases with *BIN*: three within ATL_se0_ag2_m_03_1, utterance 1162 and two within DCB_se3_ag4_m_01_1, utterance 233 (Figure 4). In the pre-*BIN* region, 6 began with an initial high F0 on a pronoun (e.g., Figures 1 and 4) and 5 had a high F0 peak on a content word preceding *BIN* showing evidence for a pre-*BIN* high pitch accent (Figure 5). Eight of these 11 instances with initial high F0 had an F0 peak on *BIN* lower than F0 in the pre-*BIN* region. The remaining 12 *BIN* instances that did not begin with high F0 in the pre-*BIN* region either began with a lower F0 that rose to the F0 peak on *BIN* (8 in total) or did not have enough segmental material and/or sufficient amplitude preceding *BIN* to assess F0 in the pre-*BIN* region (4 in total, e.g., Figure 2). In the *BIN* and post-*BIN* region, 19/23 showed an F0 peak on *BIN* (evidence of a pitch accent on *BIN*) and no clearly discernible F0 peaks in the post-*BIN* region (evidence of F0 range reduction and potential post-*BIN* deaccenting) and ended with low F0. While the phonetic features are suggestive for potential phonological analyses, the phonological analysis of the contours is outside the scope of this paper.

Three (DCB_se1_ag2_f_01_1, utterance 1603, PRV_se0_ag3_f_03_1, utterance 1348, and DCB_se1_ag1_f_01_1, utterance 1436) ended with non-falling F0 consistent with a phrase-final mid or high boundary tone. While DCB_se1_ag2_f_01_1, utterance 1603 ended with a low F0 inflection point preceding the final high F0, so that there was a clear F0 peak in *BIN*, it was unclear that there was an F0 peak on *BIN* in the other two cases. In PRV_se0_ag3_f_03_1, utterance 1348, "she BIN dead," there is an initial high F0 on *she* and then a mid F0 phrase-finally on *dead*, and *BIN* has an intermediate F0 in between those (consistent with a downstepping pitch accent sequence); in addition, the recording happens to be at low amplitude with significant background noise. It is thus difficult, especially in such a short utterance, to find acoustic evidence for an F0 peak on *BIN*. The other case where the presence of an F0 peak on *BIN* is in question is explicated in the discussion of Figure 5. A single instance showed clear phonetic evidence from the F0 contour of accenting after *BIN*: DCB_se1_ag3_m_03_1 utterance 1370, which had another, lower, F0 peak on the verb immediately following the F0 peak on *BIN*: see Figure 3. Representative F0 contours, waveforms, and spectrograms showcasing the observed range of variability in the realization of *BIN* utterances are shown in Figures 1 to 5, and the one *bin* utterance found is shown in Figure 6.

Figure 1 shows DCB_se1_ag2_m_01_1, utterance 1629, "They woulda *BIN* got rid of Derrick Rose" which is realized with a pattern much like the sample *BIN* F0 contours in Weldon (2019, 2021) of Sound Files 5.1 and 5.2 in Weldon (2021): it begins with a steep falling F0 contour onto *BIN*, which is followed by no other visible F0 peaks. These features of the F0 contour, coupled with the lack of percept of prominence on the pronoun *they* or *woulda* by Green,[7] are consistent with: (i) an initial (super)high boundary tone followed by a (downstepped) high pitch accent on BIN, or no initial boundary tone and a bitonal downstepped high or low pitch accent with a leading high tone on *BIN*, and (ii) reduced F0 range and/or deaccenting in the post-*BIN* region.

As noted in Section 1.1, *BIN* is not expected to co-occur with temporal adverbials modifying the long time period—unless it is separated from the adverbial by an intonational phrase boundary. Just one *BIN* example, DCB_se1_ag2_f_02_1, utterance 1275, occurred with a temporal adverbial and is shown in Figure 2, and it occurred with a silent pause of 293 ms between the phrase with *BIN* and the temporal adverbial.

The one example found where an F0 peak clearly appeared in the post-*BIN* region, DCB_se1_ag3_m_03_1, utterance 1370, is shown in Figure 3. It begins without an initial high F0, rises to a high F0 peak (220 Hz) on *BIN*, drops slightly to a lower F0 peak (207 Hz) on immediately following *thinking*, and then declines to a phrase-final low.

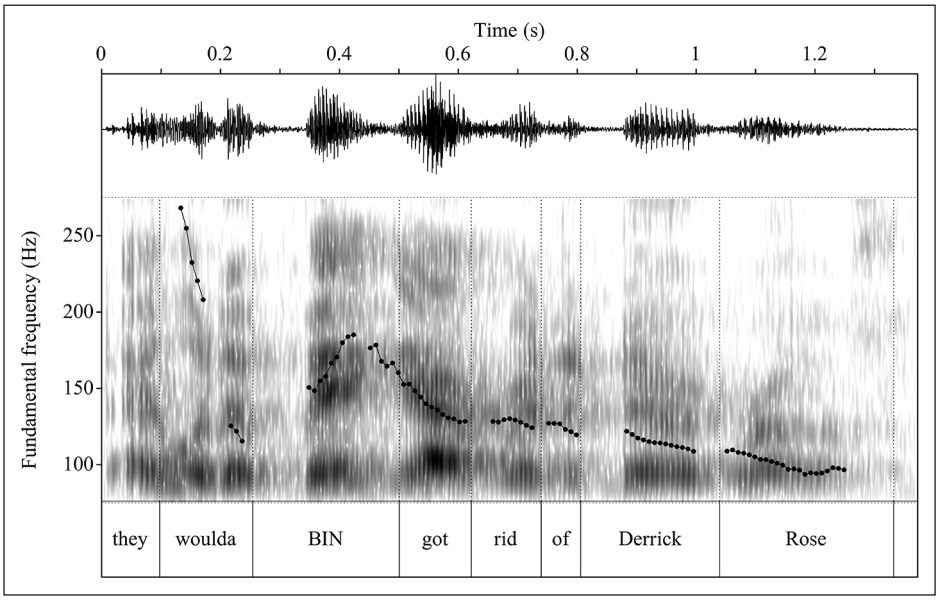


Figure 1. F0 contour, waveform, and spectrogram of DCB_se1_ag2_m_01_1, utterance 1629, showing a *BIN* + VP (-en/ed) construction with acoustic evidence for a high initial F0 followed by a lower (but nevertheless high) F0 peak on *BIN* followed by post-*BIN* F0 range reduction and potentially deaccenting.

Figure 4 shows a series of two *BIN* phrases with different patterns of realization between the phrases. Both have initial high F0 that surface on prosodic phrase-initial *you've* (with a falsetto voice quality especially noticeable in the first *you've*), as well as an absence of F0 inflection points following *BIN* that is consistent with post-*BIN* deaccenting. However, in the first phrase, the F0 peak on *BIN* is much lower than that initial high, while in the second phrase, *BIN* has an F0 peak that is higher than that initial high. The first *BIN* phrase also exemplifies another phonetic pattern we observed among 7/23 *BIN* examples: laryngealization in low F0 regions pre- and/or post-*BIN*. This non-modal voice quality is observable via the widely spaced glottal pulses visible in the waveform and the spectrogram during the utterance of *here*. The presence of widely but regularly spaced glottal pulses (about 48 Hz) is an acoustic signature indicative of vocal fry, in the sense defined in Garellek (2019).

In three cases, the *BIN* phrase did not exhibit a falling F0 to the end of the phrase but ended with a mid to high F0. An intriguing example of this pattern occurs in DCB_se1_ag1_f_01_1, utterance 1436, shown in Figure 5. Following a delayed F0 peak over *I*, F0 rises over *BIN*, but there is no evidence of an F0 peak on *BIN*, because F0 continues to rise to a high-mid phrase-final boundary tone in *talked to*. This particular *BIN* is singular among the ones we found in CORAAL because it is the only one where *BIN* is preceded by an overt, full auxiliary, that is, *had*. The auxiliary must be overt to mark tense as a pluperfect or the preterite *had*. In addition, this *BIN* example is the only one that ends in a disfluency followed by a restart: "Since th- Since I had **been** talked to- Since I was talking to the lady . . ."

Finally, Figure 6 shows the one *bin* example observed (DCB_se3_ag3_m_02_1, utterance 2650). The F0 contour starts high at 123 Hz on *father*, drops to an F0 of 112 Hz on *bin*, and then rises to an F0 of 117 Hz on *told* before declining to a low on *this*. No cases like this—of a higher F0 on an F0 peak on the following verb than in *BIN*—were observed in *BIN* constructions. *BIN*

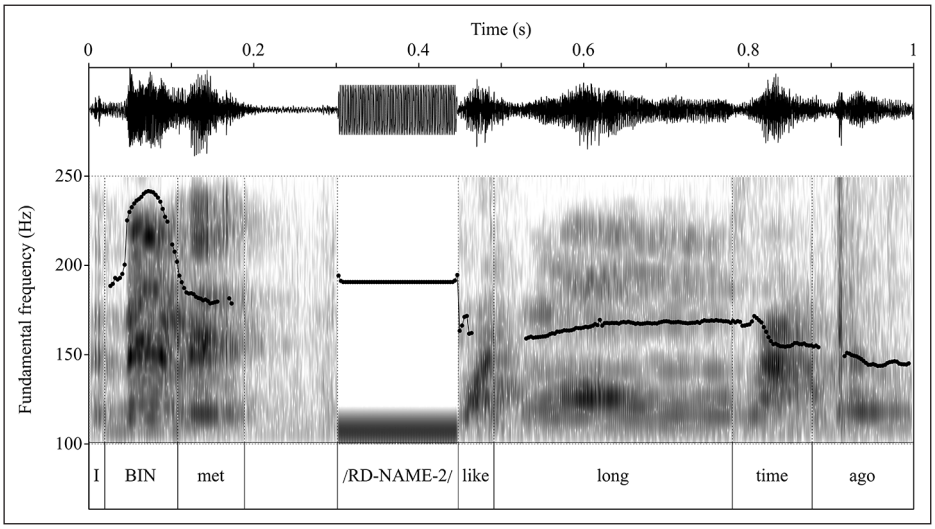


Figure 2. F0 contour, waveform, and spectrogram of DCB_se1_ag2_f_02_1, utterance 1275, showing the one *BIN* construction that was followed by a temporal adverbial. A 293 ms silent pause precedes the adverbial phrase.

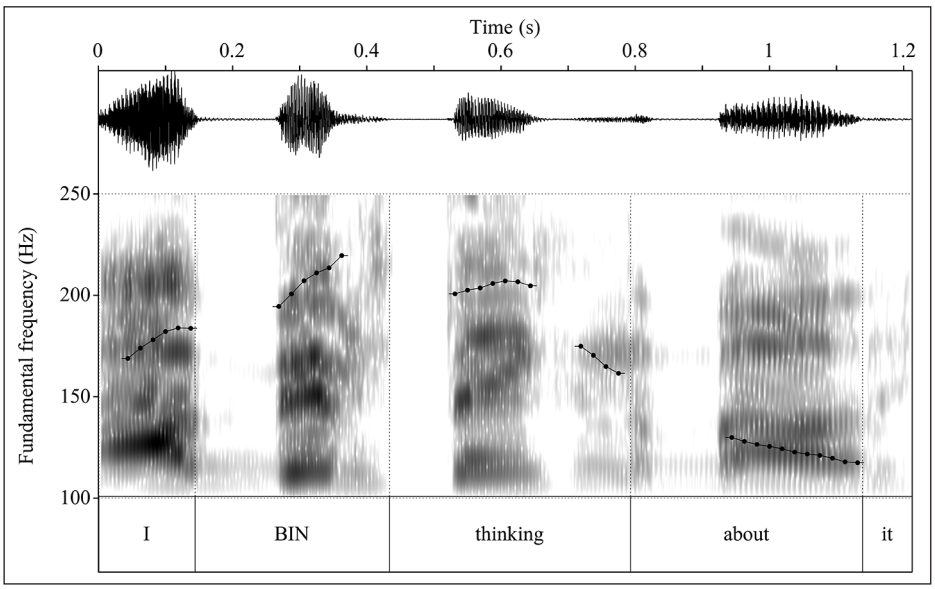


Figure 3. F0 contour, waveform, and spectrogram of DCB_se1_ag3_m_03_1, utterance 1370, showing a $BIN_{STATE\text{-}CONT}$. This is the one example found where *BIN* is clearly followed by another F0 peak (consistent with a pitch accent, e.g., a downstepped high tone) on *thinking*.

constructions with rising F0 in the post-*BIN* region rose until the end of the phrase, consistent with a boundary tone rather than a pitch accent. There is no intervening pause before the following adverbial phrase *a long time ago*.

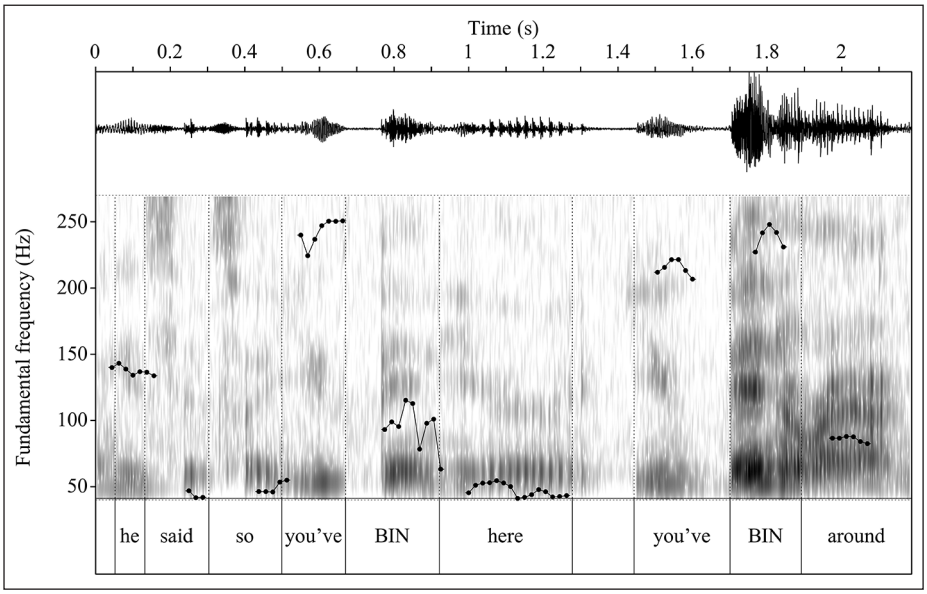


Figure 4. F0 contour, waveform, and spectrogram of DCB_se3_ag4_m_01_1, utterance 233, an utterance with two *BIN* PP constructions, each with a different pattern of phonetic realization. The gray background in the spectrogram is due to a low signal-to-noise ratio in the recording.

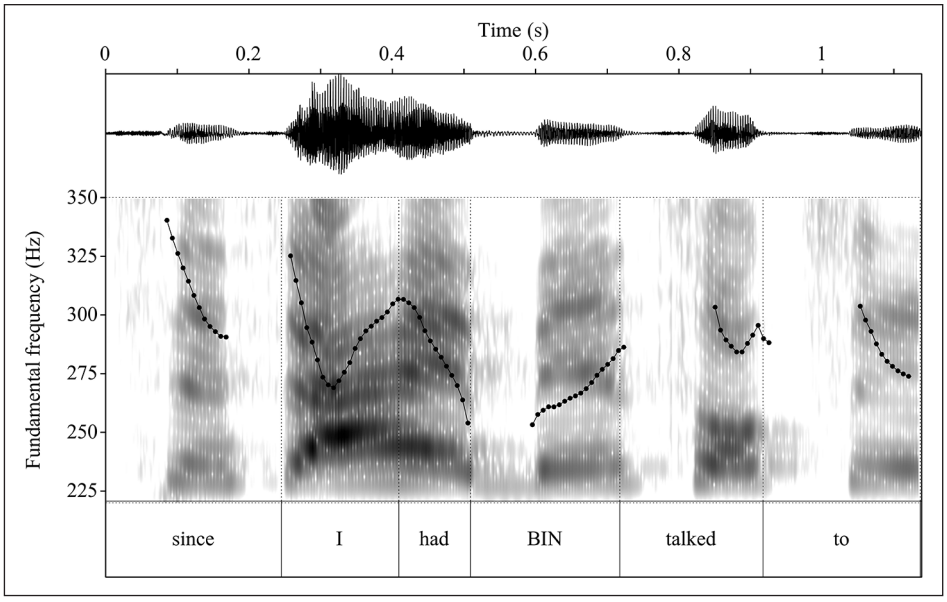


Figure 5. F0 contour of DCB_se1_ag1_f_01_1, utterance 1436, showing a *BIN* VP (-en/ed) construction where it is unclear that there is an F0 peak on *BIN* because *BIN* is preceded by a high pitch accent on "I" and rises to a final high/mid boundary tone. This utterance was incomplete and followed by a disfluent restart.

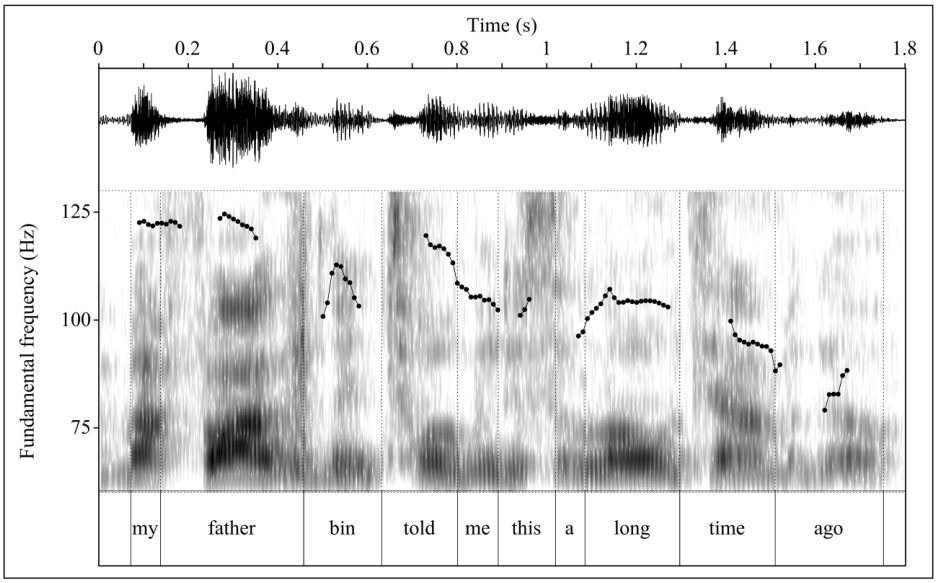


Figure 6. F0 contour of DCB_se3_ag3_m_02_1, utterance 2650, showing a *bin* construction. F0 on *bin* is lower than on the immediately following verb *told*.

A representative example of a been$_{PPART}$ utterance, utterance 402 from DCB_se1_ag2_m_02_1, is shown in Figure 7. The F0 on been$_{PPART}$ is lower than the F0 on immediately preceding *that's* and immediately following *popular* in a way that is consistent with been$_{PPART}$ being unaccented.

In addition to the *BIN* and been$_{PPART}$ utterances, Green also identified at least seven been$_{PPART}$ utterances that she perceived as having a prominent been$_{PPART}$ and at least two utterances that were ambiguous between been$_{PPART}$ and *BIN*. A representative utterance with a prominent been$_{PPART}$ is shown in Figure 8. For Green, despite the auditory prominence of been$_{PPART}$, the temporal adverbial immediately following the *been* ruled out any possibility of a *BIN* percept. Like most of the *BIN* utterances, and characteristic of other utterances identified as having prominent been$_{PPART}$, been$_{PPART}$ shows a high F0 peak while surrounding material is in a much reduced F0 range relative to the been$_{PPART}$. However, this particular example has an additional point of interest in that the F0 peak on been$_{PPART}$ is aligned particularly late, such that there is a clear low F0 region during the vowel in been$_{PPART}$. We did not observe this kind of alignment consistent with a "scooped" pitch accent in *BIN* examples in CORAAL.

The two utterances Green classified as being ambiguous between *BIN* and been$_{PPART}$ demonstrate two distinct sources of ambiguity: syntactic environment and auditory percept. Like DCB_se1_ag3_f_01_1 in Figure 8, the "been" example in utterances 1294 to 1297 in PRV_se0_ag3_F01 had a very high F0 peak on *BIN*/*been* and an adverbial phrase that co-occurred with been: "And < laugh > from—then—through present, I *BIN*/been there." The adverbial, although preposed, led to ambiguity between a *BIN* and been$_{PPART}$ classification of the utterance for Green. Despite the high F0 peak on the *BIN*/*been* token following the preposed adverb, Green found that a been$_{PPART}$ reading is strong in that the *been* phrase can be construed as further explaining not just a long period, but the speaker's consistency of being there throughout the period from then to the moment of speaking. That is, a straight perfect reading, as is associated with been$_{PPART}$ constructions. The source of ambiguity for the other example, PRV_se0_ag2_f_01_1 utterance

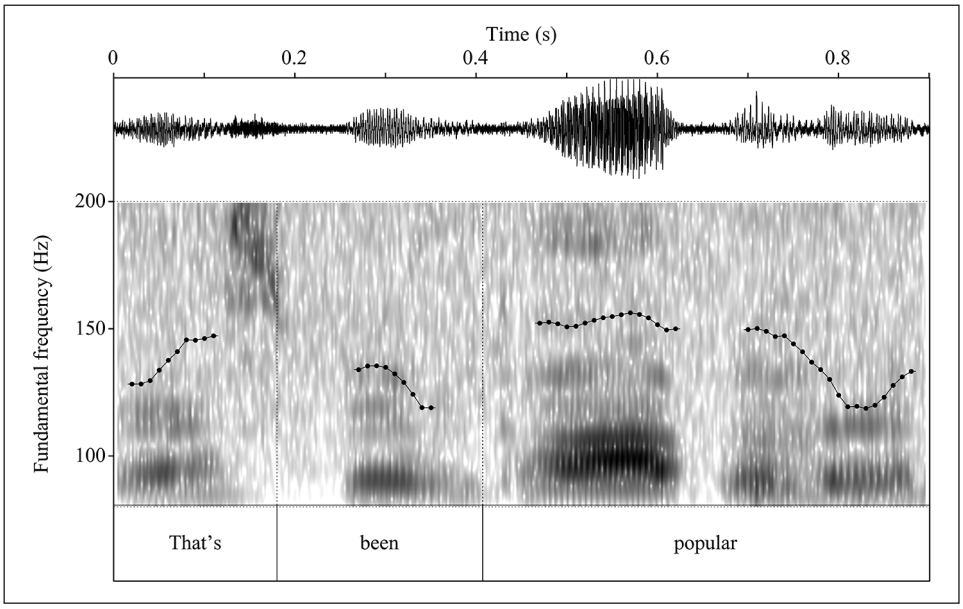


Figure 7. F0 contour of DCB_se1_ag2_m_02_1, utterance 402, showing a representative been$_{PPART}$ utterance. F0 dips low on unaccented been$_{PPART}$ between high F0 on *that's* and *popular*.

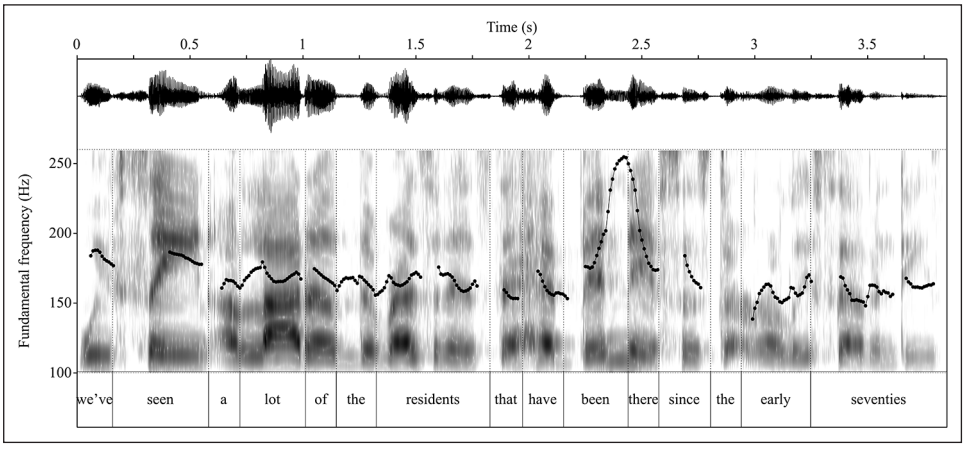


Figure 8. F0 contour of DCB_se1_ag3_f_01_1, utterance 177, showing an example of a been$_{PPART}$ that was perceived as prominent.

1092, was not syntactic but rather the percept of weak prominence on *BIN*/*been*, as shown in Figure 9. It is unclear if there is any F0 peak on *BIN*/*been*, but the whole region surrounding *BIN*/*been* is in a reduced relative F0 range, so relative to other words within that reduced F0 range, *BIN*/been might still have F0 (and other acoustic) properties leading to some prominence. As a point of contrast, note the clear F0 peak on *is* later in the utterance, which is in a much larger F0 range.

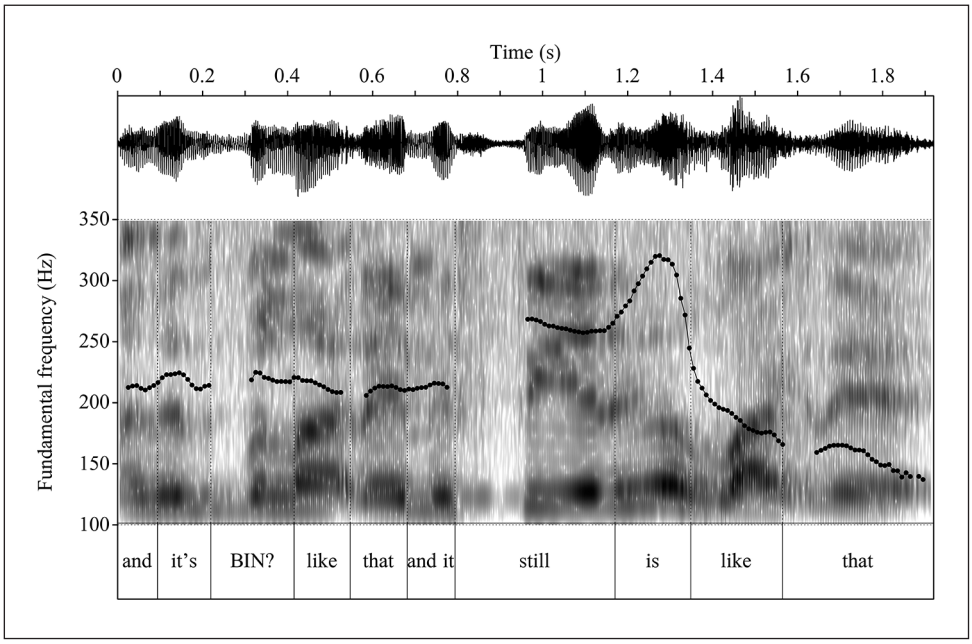


Figure 9. F0 contour of PRV_se0_ag2_f_01_1 utterance 1092, an utterance perceived to be ambiguous between *BIN* and been$_{PPART}$ due to the auditory percept of *BIN/been*.

2.3 Discussion

2.3.1 Been-type distribution in CORAAL. Overall, there does not appear to be any systematic demographic pattern that determines when a speaker will produce a *BIN*. As seen in Table 2, speakers come from different age groups, educational backgrounds, and socioeconomic statuses. While the DCA and ROC databases did not contain any instances of stressed *BIN* it is not clear what this means for the databases where they do appear. This is not to say that a larger pattern is not present, simply it suggests that given the limited sample size, describing an overall demographic pattern is not currently possible.

For *BIN* to be felicitous there must be an established long time context so that the information is explicitly stated or implicit in the context. For instance, long time is explicitly stated in the discourse in Table 3. For the been$_{PPART}$ containing a temporal adverbial, context is needed on an item-by-item basis to determine whether specified time periods are intended to convey long time readings. The examples in Table 3 show that the context surrounding the utterance refers to a long period, so the adverbial conveys a long time reading. Along similar lines, the *BIN* construction also occurs in an environment in which the context establishes a long time reading.

In some cases, it is necessary to rely on discourse context and rhetorical strategies to understand the long-time reference. In the following example, the speaker begins by describing a situation in the past in which LeBron James and Dwyane Wade played professional basketball during the same time period. The speaker rhetorically takes the role of D Wade and establishes that Wade had a history of taking the lead. The speaker (as Wade) responds by saying "I been this" to mean that he's played that role for quite some time—thus *BIN*, as in I *BIN* this.

Utt. #	Speaker code	Onset time	utterance	End time
2026	DCB_se1_ag2_m_01	2,732.4731	Hell yeah. You better remember even when- when Bron Bron played for us D Wade used to be getting his ass.	2736.9038
466		2,740.9230	D Wade don't play no games, he gonna let you know.	2742.6710
2033		2,743.4839	[I **been-** I] **been** this, I've done this.	2745.3639

Table 3. Examples in CORAAL of Long Time Semantic Contexts Compatible with Remote Past been Constructions, Where the "been" Constructions are Realized with *BIN* or $been_{PPART}$ + Adverbial.

"been" types	Preceding Context	"been" utterance	Speaker
$been_{PPART}$ + adverbial	There's so much animosity but my grandmother said it's- that was going on even when she was a kid and she was born in thirty eight	[So she said] it's **been** going on [for] that long.	PRV_se0_ag1_m_01
BIN	U Street suffered f-—thirty, forty years.	We coulda **been** doing all of that stuff.	DCB_se2_ag4_f_05

In the unspecified category, all the adverbials are explicitly long-time. The durative adverbials in this category were varied, but adverbials like "for a long time" were common. Where "for a long time"-type adverbials occur is important. Specifically, when the predicate following $been_{PPART}$ is a VP, certain adverbials co-occur with certain VP forms. Recall that constructions in the unspecified long-time category are treated as true *BIN* variants. An unspecified $been_{PPART}$ + adverbial construction with a progressive VP following "been" goes with a "for a long time"-type adverbial. These are functionally equivalent to the portion of *BIN* uses that line up with perfect uses as discussed in Section 1.1. The VP can also carry past tense morphology as well, as seen with BIN_{COMP} constructions. The semantics of these constructions is not part of the perfect overlap that *BIN* as a whole exhibits. In the case of VPs referring to a complete event in the past, adverbials like "a long time ago" are felicitous. As a result of searching for orthographic "been," we do not have any *BIN*-alternative constructions that make use of "a long time ago"-type adverbials. This is because this class of adverbials is not felicitous with $been_{PPART}$. We know that VP-*en*/*ed* + "a long time ago" is a valid *BIN* alternative because of examples like the one below. It should also be noted that there were 6 VP-*en*/*ed* instances (roughly 29% of *BIN* instances) found in CORAAL, compared to the few found among the *BIN* alternatives (ranging from 10% to 18% of an already small pool).

Utt. #	Speaker code	Onset time	utterance	End time
(1273) 1275 (1277)	DCB_se1_ag2_f_02	1,860.122	(No I been-) I [*BIN*] met (/RD-NAME-2/ like, long time ago.)	1909.368

In the example above, the adverbial "long time ago" follows *BIN*. The adverbial is allowed to follow *BIN* because it is uttered after a pause. This sentence can be paraphrased as "I met / RD-NAME-2/ a long time ago." Past tense VP + "a long time ago"-type adverbials situates the VP event in the remote past and makes no comment about present relevance. Furthermore, environments with past tense VPs like the one above are not compatible with $been_{PPART}$. This explains why there are so few past tense VP examples of "been" + adverbial constructions.

In comparing the unspecified time period tokens, we find 20 tokens of *BIN* and 128 tokens of unspecified temporal adverbial cases. Further research is also needed to determine why speakers prefer to use these *BIN* "variants" in place of *BIN* itself. According to Rickford (1975), AAE tense/aspect markers occur with low frequency in tape-recorded speech. His assessment is that low-frequency occurrence may not only be because "speakers have some awareness of the stigmatized nature of such forms, but also because the semantic conditions which they are normally introduced to express may occur rarely, if at all, in the course of the sociolinguistic interview" (p. 99). If *BIN* constructions and the unspecified adverbial constructions occur in the same environments, one question is whether the stigmatized nature of *BIN* accounts for the twenty occurrences or 13% of the overall unspecified cases compared to the 128 unspecified adverbial variants. We do find overt evidence in the database to reveal that speakers are indeed avoiding stigmatized properties. When discussing her own accent and certain features of her Southern/Rochesterian dialect, one speaker says:

1844	ROC_se0_ag1_f_01	2636.3728	It probably won't come out here cause I'm tryna be proper so you can understand me. . .

Despite the fact that the interview is structured to elicit natural speech, interviewees are still cognizant enough of the setting that it affects their speech. This could also contribute to why *BIN* occurs so much less frequently than "been"+ adverbial does. Along the lines of the *BIN* occurrences, the unspecified long-time adverbials only occur in a subset of the databases, in DCA, DCB, and PRV. Given that the use of *BIN* is also argued to be linked to certain pragmatic and rhetorical contexts, it is also necessary to raise questions about the extent to which such environments are most conducive to *BIN* occurrence in the corpora.

The unspecified adverbial constructions are semantically equivalent to the *BIN* constructions, but it is not always clear how adverbials specifying explicit time periods relate to *BIN* constructions. Without some indication that a time period is intended to refer to a long period, it is not always clear when explicit times actually refer to the distant past or to a long period. That is "five years" might or might not reference a long period. One final observation is that unspecified adverbials occurred in only three of the databases, but the specified adverbials occurred in all of the databases. We speculate that *BIN* production might be limited in the interview setting—not just because the marker might be construed as a stigmatized feature by some speakers, but also because speakers might try to be as informative, cooperative, and specific as possible in answering questions about time periods, such as "How long have you lived in Maryland?." Neither *BIN* nor the unspecified adverbials provide the level of specificity of the explicit temporal adverbs, which also outnumber the unspecified temporal information provided by *BIN* and its alternates. Below are a couple of examples of more direct exchanges in which the interviewer asks for the duration.

Utt. #	Speaker code	Onset time	utterance	End time
465	Interviewer	516.0984	[So] how long have you lived in Southern Maryland?	518.0873
466	DCB_se2_ag3_m_03	518.2566	I been in Southern Maryland	519.7725
468		520.9779	since like two thousand seven I wanna say.	523.8272

155	DCB_se1_ag3_m_01	174.0981	What um- where do you work and how long you been working there?	177.0367
156	DCB_se2_ag3_m_03	178.0858	<ts> Um,	178.9138
158		179.6770	right now I work as a building engineer.	183.2983
160		183.9041	I've been there for seven years.	186.7673

Through analyzing both interviewer cues and the discourse surrounding the "been" + adverbial utterances, we found that very few interviewer cues were directly addressing a question about duration. Of the 86 specified since cases, there were 6 such cues; there were 13 of 92 such cues for specified other cases, and 10 of 128 cues for unspecified long-time cases. That is, the majority of the time, "been" + adverbial is used unprompted.

BIN occurs productively in AAE, so, at first glance, it is surprising that there are relatively few tokens of the marker in the corpus. Instead of expressing long periods by using *BIN*, speakers choose to use *been* + temporal adverb. The only difference between *BIN* and *been* + temporal adverb is that the latter explicitly expresses the time associated with the long period while *BIN* simply conveys that the state or activity expressed by the predicate has held or been in progress for a long time or ended a long time ago according to the speaker's view. That is, the exact amount of time associated with the long period remains unexpressed. Nothing in the data suggests that there has been a change over the years in the meaning of *BIN*. In addition, there are many syntactic and semantic contexts in the corpus for *BIN*, but speakers chose to be explicit about time periods instead of using the remote past marker to make a general point that the event was in the far past or continued for a long time.

One suggestion here is that in the interview setting, the speaker is in the position to talk about the past and give as much information and as many details as possible that will characterize the past event accurately. As such, speakers give information about time as much as possible. A clear case in support of this is the example in Figure 2, in which the speaker uses *BIN* to indicate that the time she met someone is in the far past. Instead of simply using *BIN*, she further modifies the marker with *long time ago*. There is some cost in using a further modification of *BIN* given that the marker does not generally occur with temporal adverbials that modify the length of the long period. In the case of the example in Figure 2, in which the marker does occur with a temporal adverbial, the modifier occurs in a separate IntP. Two goals are achieved: (1) In the interview setting, it is possible to adhere to the goal of providing as much information as possible and (2) by putting the modifier in a separate phonological phrase, it is possible to avoid the clash with *BIN* and the temporal adverbial in the same phrase. The corpus is useful in providing insight into the use of *BIN* and *been* + temporal adverbials in the interview setting. It may be that a number of factors, such as eschewing the use of stigmatized features and intent to be as explicit as possible, conspire to limit *BIN* occurrences.

2.3.2 The phonetic realization of BIN constructions in CORAAL. There were both consistent acoustic properties as well as loci of variability among the *BIN*-containing utterances in CORAAL. *BIN* showed a clear F0 peak in 21/23 cases—acoustic evidence for a high pitch accent. What kind of high pitch accent—with or without a trailing or leading low tone, for instance—we leave to further research. In addition, the post-*BIN* region showed no discernible F0 peaks—evidence for post-*BIN* deaccenting—and ended with low F0 in 20/23 cases. A clear locus of variability was the initial F0 pattern in the pre-*BIN* region. Sometimes the prosodic phrase started from a high F0—potentially from an initial boundary tone or a preceding pitch accent (cf. Jun and Foreman's, 1996, note that "AAE more often has a sentence-initial high tone (%H or H*)" than GAE)—and the majority of these cases showed a pattern like that of the sample F0 contours in Weldon (2019), in which the F0 peak on *BIN* was lower than the F0 in the pre-*BIN* region. Sometimes the prosodic phrase started from a low to mid-range F0, in which case the *BIN* F0 peak was higher than the F0 in the pre-*BIN* region. Two probable loci of variability hinted at were: the presence or absence of an F0 peak consistent with a pitch accent on the word immediately following *BIN* and phrase-final F0 movements in the post-*BIN* region. The one example with a clear post-*BIN* F0 peak, DCB_se1_ag3_m_03_1, utterance 1370, showed an F0 peak on *thinking* that was lower than the

F0 peak on *BIN*, after which no further F0 peaks were discernible (Figure 3). Three examples ended in the post-*BIN* region with a mid to high final F0 consistent with a non-low final boundary tone. And one of these cases, DCB_se1_ag1_f_01_1, utterance 1436 (Figure 5), hinted that *BIN* might in certain contexts appear with a low rather than a high pitch accent. In this utterance 1436, *BIN* is preceded by a high F0 from a preceding pitch accent or boundary tone and then followed by phrase-final high F0. (The unusual realization of *BIN* in that utterance could also be related to the presence of an overt auxiliary immediately preceding *BIN* and/or the disfluent ending.) If the phonological analysis of a low pitch accent on *BIN* is indeed tenable, then the example in Figure 5 could be an instance of an Obligatory Contour Principle effect, like the classic case in Bengali in which an underlying high tone may surface as low when adjacent to another high tone (Hayes & Lahiri, 1991; Khan, 2008, 2014).

The sampling of contexts in which *BIN* happened to appear in CORAAL helped reveal a range of variability in the phonetic realization of *BIN* constructions. What conditions this range of variability remains an issue for further research. However, the different realizations of *BIN* constructions one after the other in DCB_se3_ag4_m_01_1, utterance 233 suggests that some variability occurs within-speaker. Some aspects about the realization of *BIN* constructions could not be addressed by the CORAAL sample. One is how realization (and usage) might vary by the different semantic *BIN*-types. Another is the further characterization of the post-*BIN* region, such as if a low F0 plateau begins immediately following *BIN* (or the verb) or if the F0 gradually declines to the end of the phrase. Most of the CORAAL *BIN* examples had only one or two words in the post-*BIN* region, so these downtrends could not be assessed. There was also only one case of the word immediately following *BIN* being accented, so further data are needed to investigate this possible class of renditions of *BIN* constructions. Similarly, there was only one case of *BIN* co-occurring with a temporal adverbial, so more data are needed to investigate previous claims that *BIN* can only co-occur with a temporal adverbial if there is an intervening pause. In addition, a quantitative, fine-grained acoustic characterization was not possible due to the uncontrolled contexts and small sample size, which also made a systematic comparison between the realizations of *BIN* and $\text{been}_{\text{PPART}}$ utterances difficult (and one we did not attempt here). One important point about *BIN* and $\text{been}_{\text{PPART}}$ already raised by the CORAAL sample, though, is that "stressed *BIN"* is a bit of a misnomer, since $\text{been}_{\text{PPART}}$ can be "stressed" (i.e., perceived as prominent and/or marked with a pitch accent) too. Finally, while there were a few utterances in CORAAL perceived as being ambiguous between *BIN* and $\text{been}_{\text{PPART}}$, there were too few to begin to disentangle what might lead to such an ambiguity. The production experiment described in the following section builds on the CORAAL study and makes advances toward addressing these issues.

3 Southwest Louisiana production experiment

To complement the CORAAL corpus data, we carried out a more narrowly focused, controlled elicitation task in a small town AAE-speaking community in southwest Louisiana.[8] This task allowed us to further investigate the usage and realization of different semantic *BIN* types and been + adverbial constructions, as well as compare fine-grained acoustic measures between *BIN* and non-*BIN*, that is, $\text{been}_{\text{PPART}}$, across the utterance.

3.1 Materials and methods

This section describes the speakers who participated in the production experiment (Sec. 3.1.1), stimulus construction in context of the experimental design (Sec. 3.1.2), the experimental procedure (Sec. 3.1.3), and data analysis (Sec. 3.1.4).

3.1.1 Speakers. Speakers came from a small-town community in southwest Louisiana (SWLAT) in Jefferson Davis Parish. This community has a population of 2,800, which is predominantly European American and 11% African American. The community has been historically segregated by railroad tracks and streets, so African Americans live on one side of the town and non-African Americans on the other with a few exceptions. While residents live in separate areas, the groups are in contact in schools and several small shops. The members of the African American community are predominantly native AAE speakers who share some language patterns with the local European Americans, some of whom identify as Cajun. In fact, the history of the community records that the citizens are a mixture of Acadians, French, and Anglo-Americans, but there is no mention of the citizens of African descent. There is one elementary school (pre-kindergarten–6th) and one high school (7th–12th), which children in the town attend unless they attend one of the Christian schools in the neighboring city. There are also two small grocery stores, a discount store, and a few other businesses, such as convenience stores with fuel stations. The schools and businesses are on the non-African American side of the town. There are two amusement parks in the town, one on the traditionally non-African American side and a smaller one on the traditionally African American side.

Nine speakers—six women and three men between the ages of 25 and 67—participated in this study in August 2019. Their gender, age, education, and employment are given in Table 4. The speakers, who are natives of SWLAT or a neighboring town which is 8 miles north, were recruited to participate in an advertised pilot study "The sound of aspect in African American speech" through a community consultant. In this small-scale pilot study, the goal was to elicit data from adults in the community with the understanding that in a larger *BIN* study, considerable focus should be placed on a more well-rounded participant pool from the perspectives of age and gender as much as possible in the small community. Eight participants grew up and attended elementary school and graduated from high school in the town. The other participant grew up in the neighboring town in which all African Americans in SWLAT attended high school before integration in the 1960s. Six participants spent their entire lives in the community, and the other three participants who attended college or received vocational training grew up in the town but spent a portion of time away from the area before moving back. All of the participants have high school diplomas, and two attended college. One of the participants spent 2 years in college, and the other earned a BS degree in biology and a nursing degree. The latter participant travels between towns and cities in south and north Louisiana. The other participants live and conduct their day-to-day activities in SWLAT.

Table 4. Summary of Demographic Information of Louisiana Speakers Recorded.

Speaker	Gender	Age	Education and employment
la01	F	67	High school
la02	F	66	High school
la04	F	31	High school and vocational training
la05	M	57	High school
la06	M	33	2 years of college in south Louisiana
la07	F	35	High school
la08	F	25	High school
la09	F	67	High school
la10	M	37	BS degree, nursing degree

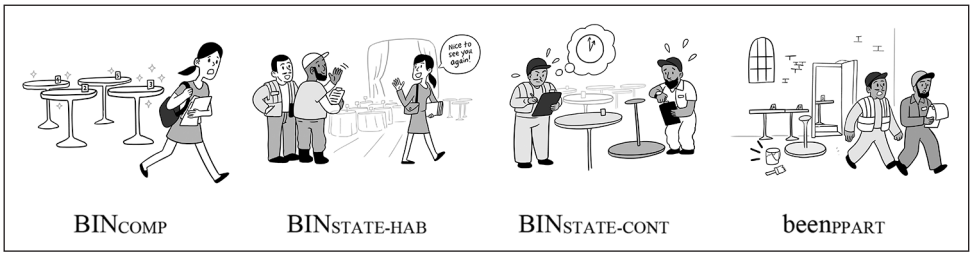


Figure 10. Illustrations for *BIN*/ been$_{PPART}$ + *number-ed/ing* environments that accompanied the auditory prompts given in (16).

3.1.2 Stimuli. In total, there were 71 stimuli with *BIN*/been$_{PPART}$. They consisted of 11 items with *BIN*/ been$_{PPART}$ introducing a VP and 8 items with *BIN*/been$_{PPART}$ introducing a PP. Each VP item was presented in three *BIN* environments (BIN$_{COMP}$, BIN$_{STATE-HAB}$, BIN$_{STATE-CONT}$) and the non-*BIN* been$_{PPART}$ environment. Each PP item was presented in the BIN$_{STATE-CONT}$ environment and the been$_{PPART}$ environment (the other two *BIN* environments are not possible with PPs). In addition, 6 of the VP items were also presented in the *BIN* + modal environment (*BIN could* or *BIN supposed to*, e.g., *Aw, the workers BIN was supposed to remove the chewing gum and old paper*), and 5 in the non-*BIN* been$_{PPART}$ + long time adverbial environment. Items were constructed to have a majority of sonorant sounds to avoid segmental perturbations to the F0 contour. Stress patterns on the target verbs and prepositions were chosen to vary systematically between initial (e.g., *lower, under*) and final stress (e.g., *align, away*) to facilitate future work on intonational phonology beyond the scope of this paper. Although *BIN* occurs with all predicate types, the stimuli were limited to include verbs and prepositions for a more controlled data set, in which the same verb could occur in different *BIN* contexts. Short texts and accompanying illustrations were constructed to set up the appropriate context for each environment. The texts were spoken by the first author (a speaker of the community variety) and recorded for auditory presentation. The full list of stimuli, texts, and illustrations can be found in the OSF repository. Sample texts and illustrations for the item *BIN*/ been$_{PPART}$ + VP *number-ed*/*ing* are shown in (16) and Figure 10.

(16) Target utterance: *The maintenance workers been number-ed/ing those tables*.
   a. BIN$_{COMP}$: The tables are lined up neatly and ready to be cleaned. The maintenance workers really did a good job of putting numbers on all of those tables and getting them ready to be hauled away. Did they just finish? I wanted to catch them before they left the building.
   b. BIN$_{STATE-HAB}$: At the end of every year, they have to take inventory so they know how many tables are in that big reception hall. Those same maintenance workers come every year to count and number them. They didn't just start coming to number the tables.
   c. BIN$_{STATE-CONT}$: The maintenance workers arrived early this morning to get this room ready. They haven't taken a single break and they still have quite a bit of work to do. I see they are working with the tables, putting numbers on them. Did they just start that project?
   d. been$_{PPART}$: The maintenance workers are just leaving the building. They came in to work on the tables—to put numbers on them and get them ready to be painted. We know what they were just doing.
   e. been$_{PPART}$ +long time adverbial: Target utterance: *The maintenance workers been numbering those tables for a long time* (using the BIN$_{STATE-HAB}$ context and illustration)

Fifteen fillers were also constructed, which included grammatical structures of AAE such as existential *it*, tense-aspect marker *done* (*dən*), multiple negatives, negative inversion, and embedded

auxiliary inversion. These were included so we could validate that our task successfully elicited AAE from our speakers.

3.1.3 Procedure. Participants were recorded by the first author in a quiet room within the community with a Shure SM35 head-mounted condenser microphone on a Zoom H5 digital recorder at a 16-bit bit depth with a 44.1 kHz sampling rate. At the beginning of the experiment, the participant was read instructions for the task and completed three practice trials. For each stimulus during the experiment, the participant saw a slide showing the accompanying illustration and listened to the context. (See slides in OSF repository). After the auditorily presented context finished playing, the target sentence to be uttered appeared on the slide for the participant to read. *BIN*/been$_{\text{PPART}}$ was orthographically represented as "been" regardless of whether the context presented a been$_{\text{PPART}}$ or *BIN* environment. If the participant's utterance was disfluent, they were asked to repeat the utterance again. Speakers also sometimes produced more than one repetition of a stimulus without prompting. It was necessary to have participants read written stimuli to ensure that they would produce the exact utterance targeted. This forced them to use the *BIN* constructions of interest for this study rather than, for example, choosing the alternative variant unstressed been$_{\text{PPART}}$ + long time adverbial, and it also controlled for potentially confounding phonological differences within an item set that would affect acoustic measurements.

Stimuli were presented in five blocks of 16–17 stimuli each, where no more than a single stimulus from an item set appeared within a block. Stimuli were pseudorandomized to avoid the same *BIN*/been$_{\text{PPART}}$ environment appearing consecutively within a block. The whole experiment took about 30 minutes.

3.1.4 Analysis. Recordings were segmented into individual utterances in Praat (Boersma & Weenink, 2019). Individual utterances were segmented into words with the Montreal Forced Aligner (McAuliffe et al., 2018) using the pretrained model for English, and then the word boundaries were hand-corrected. Two kinds of analyses were then performed: listener judgments and acoustic analysis. Results were then statistically analyzed.

Each recorded utterance was played together with its accompanying auditory context and illustration for listener judgments by Green and Whitmal. Listener judgments are a standard way to characterize AAE and other varieties of Englishes (Oetting & McDonald, 2002; Wyatt, 1991). Two kinds of judgments were made: (i) the acceptability of the utterance, given the context and (ii) an auditory classification of the PERCEIVED BIN/BEEN TYPE uttered (i.e., if it was a *BIN* or been$_{\text{PPART}}$ utterance). It is a crucial point that the auditory classification was of the entire utterance and not of the *BIN*/been$_{\text{PPART}}$ alone because Green found that the intonational rendition of the post-*BIN*/been$_{\text{PPART}}$ region strongly affected PERCEIVED BIN/BEEN TYPE. ACCEPTABILITY ratings were made on a 3-value scale: good, marginal, unacceptable, with a fourth value "accommodated" added to separate out a special class of utterances, as described below. A "good" rating indicated that an utterance was judged to be unquestionably acceptable given the context; an "unacceptable" rating indicated that an utterance could not be accommodated under any reasonable interpretation of the context the authors could conceive of, and a "marginal" rating (which collapsed the original "ok" and "?" ratings described in Neal et al., 2020) indicated a judgment intermediate between "good" and "unacceptable" due to ambiguity in the auditory percept of the *BIN*/been-type of the utterance. Finally, an "accommodated" rating indicated that the utterance was perceived to have an unexpected *BIN*/been-type (i.e., non-*BIN* in a *BIN* environment or non-been$_{\text{PPART}}$ in a been$_{\text{PPART}}$ environment), but one that could be accommodated under certain reasonable interpretations of the context (although not one intended in the experimental design).

As described in Section 1.1, we expected potential cases of $been_{PPART}$ usage in BIN_{STATE} environments if speakers were choosing not to explicitly mark a long period of time. Thus, for consistency, all utterances perceived to be $been_{PPART}$ in $BIN_{STATE\text{-}HAB}$ and $BIN_{STATE\text{-}CONT}$ environments were labeled as "accommodated." In addition, six $been_{PPART}$ environment items were detected during analysis to have had ambiguous contexts, so perceived non-$been_{PPART}$ utterances for those items were similarly marked with "accommodated" labels (see Section 3.2.2). The PERCEIVED BIN/BEEN TYPE was classified using the same categories as for CORAAL (Section 2.1)—*BIN*, $been_{PPART}$, and ambiguous—auditorily perceived as intermediate between a *BIN* utterance and a $been_{PPART}$ utterance. That is, Green found the utterance would be potentially acceptable in the other environment (e.g., in a *BIN* environment), if it had been uttered in $been_{PPART}$ environment, as well as the one it was produced in. Utterances were also judged for fluency; disfluent utterances were discarded, but sometimes speakers had more than one repetition per stimulus that was kept. Speakers ranged from having 77 to 94 utterances total of the 71 target stimuli.

For fine-grained acoustic analyses, mean F0 and energy (i.e., intensity) measurements were taken over 10 evenly spaced subsections over each word using VoiceSauce (Shue et al., 2011), a program for automated voice analysis. The TANDEM-Straight F0 algorithm was used (Kawahara et al., 2016), with speaker-specific values for F0 floors and ceilings. Listener judgments and acoustic measurements were processed in R (R Core Team, 2018) using dplyr (Wickham et al., 2019), tidyr (Wickham & Henry, 2019), and ggplot2 (Wickham, 2016) packages. Durations were computed for each word, and mean and maximum F0 and energy values over the 10 subsections within a word were also computed. Then, the ratios between these measures over *BIN*/$been_{PPART}$ were computed with respect to the immediately preceding word, immediately following word, and the stretch of all following words not including the immediately following one. Taking ratios within an utterance controlled for local F0 range and speech rate variation across utterances and speakers. Mixed-effects regression models were used for inferential statistics as there were unbalanced numbers of items across speakers and environments. Logistic and linear mixed-effects models were built using lme4 (Bates et al., 2015). All fixed effects were centered and coded with treatment contrasts. Models including fixed effects were compared against null models (which included only random effects) using likelihood ratio tests. Significance was evaluated with an α level of .05; bootstrapped 95% confidence intervals were computed using the confint.merMod() function in the lme4 package, with 500 resamples.

3.2 Results

The results from the SWLAT production task are presented in four parts. Section 3.2.1 concerns task validation, and Section 3.2.2 integrates presentation of the results of perceived *BIN*/*been type* and acceptability ratings. The $been_{PPART}$ + long time adverbial environment results are presented in Section 3.2.3, and then the phonetic realization of *BIN*/$been_{PPART}$ utterances is covered in Section 3.2.4.

3.2.1 Task validation. AAE is a spoken variety with no standard writing conventions, but our task relied on participants reading written English. To assess how well our task elicited natural AAE speech, we examined participants' utterances of the fillers and their utterances of constructions that would be acceptable only with *BIN* utterances (*BIN* + modal, BIN_{COMP}). We found that participants had no difficulty producing AAE structures in the fillers: no speakers produced any unacceptable renditions of fillers. However, Speaker la01 produced only 57% of 21 filler utterances that were rated good, while the rest were judged only marginal. Excluding la01's utterances, the

135 remaining utterances of fillers were all rated good (96%, 129 utterances) or marginal (4%, 6 utterances), and every speaker had 93%–100% of filler utterances rated good and no more than 1 filler judged only to be marginal. Most speakers also produced only utterances perceived to have *BIN* in the obligatory *BIN* + modal and BIN_{COMP} environments. All speakers (including la01) produced only *BIN* renditions in the *BIN* + modal environment. Six of the nine speakers also produced only *BIN* utterances in the BIN_{COMP} environment, and Speaker la02 produced 13/14 *BIN* utterances and one $been_{PPART}$ utterance in the BIN_{COMP} environment rated as unacceptable. Unacceptable utterances in the BIN_{COMP} environment were also produced by Speaker la01 (4/15) and Speaker la09 (5/17). In addition to difficulties with the fillers and BIN_{COMP} environment, Speaker la01 also had the lowest proportion of *BIN*/been utterances rated good across speakers (52.7%) and the highest proportion of accommodated *BIN*/been utterances across speakers (26.4%). Given the consistent indications that Speaker la01 had considerably more difficulty with the experimental task than other speakers, she was excluded from the rest of the analyses.

3.2.2 Distribution of perceived BIN/been type and acceptability ratings across environments. We hypothesized that speakers would produce *BIN* utterances in the *BIN* environments and $been_{PPART}$ utterances in the $been_{PPART}$ environments. Moreover, we hypothesized that speakers would produce *BIN* utterances most frequently in the obligatory *BIN* environments, *BIN* + modal and BIN_{COMP}. Mean percentages across speakers of perceived *BIN*/*been type* in different *BIN*/*been* environments are given in Table 5. As mentioned in Section 3.2, almost all utterances in the obligatory *BIN* environments were perceived as *BIN* utterances—100% of the *BIN* + modal utterances and 94.7 ± 7.1% (1 *SE*) of the BIN_{COMP} utterances. However, only 82.7 ± 8.5% (1 *SE*) of the $BIN_{STATE\text{-}HABIT}$ utterances and 69.7 ± 13.2% of the $BIN_{STATE\text{-}CONT}$ were perceived as *BIN* utterances. Moreover, only 41.1 ± 15.1% (1 *SE*) of the $been_{PPART}$ environment utterances were perceived as $been_{PPART}$ utterances. (The $been_{PPART}$ + long time adverbial environment results are presented in Section 3.2.3.)

These results can be better understood in the context of the distribution of acceptability ratings across environments, as shown in Table 6. Although they elicited a high proportion of $been_{PPART}$ utterances, the $BIN_{STATE\text{-}HABIT}$ and $BIN_{STATE\text{-}CONT}$ environments yielded 0% and 1.2 ± 0.8% (1 *SE*) unacceptable ratings, respectively, because $been_{PPART}$ utterances were accommodated. As described in Section 1.1, $been_{PPART}$ utterances could be accommodated in BIN_{STATE} environments as cases where the long time period was not made explicit but could still be construed. Similarly, while 41% of utterances in the $been_{PPART}$ environment were perceived to be *BIN* utterances, only 23.1 ± 6.1% (1 *SE*) of utterances in this environment were rated unacceptable. This is because Green and Whitmal discovered during listening to productions that there were a handful of $been_{PPART}$ items that could conceivably accommodate *BIN* utterances. Namely, for the items with target words *remind, lower, water, on, near*, and *away*, the auditory prompt or illustration did not completely rule out a long time context. Three speakers produced accommodated *away* utterances, 5 produced *near* and *lower* ones, and 6 *remind, water*, and *on* ones. For instance, for the *near the cabins* $been_{PPART}$ environment item, the illustration could have conceivably been interpreted as supporting a long time context by the speaker if the speaker considered the bear to still be close enough to the cabins to be "near."

Despite the complication of the accommodated cases, regression analyses nevertheless showed that perceived *BIN* was much more likely in *BIN* than non-*BIN* environments, as expected. A logistic mixed-effects model was built with an indicator variable for whether or not PERCEIVED BIN/BEEN TYPE was *BIN* as the dependent variable, ENVIRONMENT (*BIN* vs. non-*BIN*, which included ambiguous cases) as a fixed effect, and by-subject and by-item random slopes for ENVIRONMENT, as well as by-subject and by-item random intercepts. A likelihood ratio test comparing the model described against a null model with only random intercepts supported the inclusion of ENVIRONMENT in the

Table 5. Mean (± 1 *SE*) Percentages of Different Perceived *BIN*/been Types Across Speakers (Excluding Speaker la01) as a Function of BIN/been$_{PPART}$ Environment.

BIN/been$_{PPART}$ environment	Perceived *BIN*/been type		
	BIN	ambiguous	been$_{PPART}$
BIN + modal	100	0	0
BIN$_{COMPLETE}$	94.7 (7.1)	0.7 (1.2)	4.6 (6.0)
BIN$_{STATE\text{-}HABITUAL}$	82.7 (8.5)	5.6 (4.1)	11.7 (10.0)
BIN$_{STATE\text{-}CONT}$	69.7 (13.2)	9.8 (3.3)	20.5 (13.0)
been$_{PPART}$	41.1 (15.1)	15.9 (3.9)	43.0 (13.6)
been$_{PPART}$ + adv.	16.7 (7.8)	45.7 (10.6)	37.5 (12.3)

Table 6. Mean (± 1 *SE*) Percentages of Different Acceptability Rating Categories Across Speakers (Excluding Speaker la01) as a Function of BIN/been$_{PPART}$ Environment. The Category "good + accom." Combines the Good and Accommodated Rating Categories.

BIN/been$_{PPART}$ environment	Acceptability rating category				
	Good	Marginal	Unacceptable	Accom.	good + accom.
BIN + *modal*	100	0	0	0	100
BIN$_{COMPLETE}$	94.7 (4.4)	0.7 (0.7)	4.6 (3.6)	0	94.7 (4.4)
BIN$_{STATE\text{-}HABITUAL}$	86.2 (5.9)	2.0 (1.3)	0	11.7 (6.1)	98.0 (1.3)
BIN$_{STATE\text{-}CONT}$	74.2 (9.1)	3.5 (1.4)	1.2 (0.8)	21.1 (7.9)	95.3 (2.2)
been$_{PPART}$	54.5 (9.2)	5.0 (1.6)	23.1 (6.1)	17.5 (3.8)	71.9 (6.1)
been$_{PPART}$ + adv.	48.4 (11.2)	37.0 (10.4)	14.6 (5.2)	0	48.4 (11.2)

Table 7. Logistic Mixed Effects Model Output for the Effects of *BIN* Versus Non-*BIN* Environments and Obligatory *BIN* Versus Other *BIN* Environments on Whether the Utterance Was Perceived as One With *BIN* or Not.

	β	*SE*	Odds ratio (95% CI)
***BIN* versus non-*BIN* environment**			
Intercept	0.9	0.4	2.4 [1.1, 5.1]
Environment	2.4	0.4	10.8 [5.1, 27.7]
Obligatory *BIN* versus non obligatory *BIN* environment			
Intercept	2.6	0.5	13.5 [5.1, 47.8]
Environment	2.1	0.4	8.2 [3.3, 31.6]

Note. SE: standard error; CI: confidence interval.

model, $\chi^2(5) = 154.5$, $p < .001$. The effect of ENVIRONMENT was significant and the estimated likelihood of a perceived *BIN* utterance was 10.8 times higher in *BIN* than non-*BIN* environments (Table 7). Within VP items, we also checked whether perceived *BIN* was more likely in obligatory *BIN* environments (BIN$_{COMP}$, *BIN* + modal) than in the other, BIN$_{STATE}$ environments. Considering only utterances in *BIN* environments, a logistic mixed-effects model was built with an indicator variable for whether or not PERCEIVED BIN/BEEN TYPE was *BIN* as the dependent variable, ENVIRONMENT (obligatory *BIN* vs. not) as a fixed effect, and a by-subject and by-item random intercepts (the

model did not converge with random slopes). A likelihood ratio test comparing the model described against a null model with only the random intercept supported the inclusion of ENVIRONMENT in the model, $\chi^2(1) = 29.0$, $p = 7.4\text{e-}8$. The effect of ENVIRONMENT was significant and the estimated likelihood of a perceived *BIN* was 8.2 times higher in obligatory *BIN* than other *BIN* environments (Table 7).

3.2.3 Usage and acceptability of BIN/ been$_{PPART}$ utterances in the been$_{PPART}$ + long time adverbial environment. The remaining environment not yet discussed, the been$_{PPART}$ + long time adverbial environment, was expected to elicit been$_{PPART}$ utterances. However, as shown in Table 5, only $37.5 \pm 12.3\%$ (1 *SE*) of utterances in this environment were perceived as been$_{PPART}$ utterances. $16.7 \pm 7.8\%$ were perceived to be *BIN* utterances, and nearly half—$45.7 \pm 10.6\%$ (1 *SE*)—were perceived as ambiguous between the two types of utterances. Five of the 13 utterances perceived to be *BIN* utterances were judged to be "good" because a prosodic juncture intervened between *BIN* and the temporal adverbial (see Section 1.1); the rest were judged unacceptable. 24 of the 29 utterances perceived to be ambiguous between *BIN* and been$_{PPART}$ were rated as "marginal" and the remaining 5 were rated as "good." A number of the utterances perceived as ambiguous were reported by Green as initially sounding like a *BIN* utterance in the early part of the utterance, but then having prosodic properties in the adverbial phrase near the end of the utterance that prompted a reanalysis toward a been$_{PPART}$ percept. A few of the ambiguous utterances were reported as containing a *BIN*/been$_{PPART}$ that seemed intermediary in perceived prominence between a *BIN* and a been$_{PPART}$.

3.2.4 The phonetic realization of BIN utterances in the SWLAT production task. There was a total of 3,416 perceived *BIN* utterances, 1,252 been$_{PPART}$ utterances, and 643 ambiguous utterances elicited from the constructed stimuli in the Louisiana production experiment. Complementing the small, semi-spontaneous sample of CORAAL *BIN* utterances, the much larger sample and controlled manipulations between the *BIN*/been$_{PPART}$ utterances enabled a fine-grained acoustic comparison between the *BIN* and been$_{PPART}$ utterances. Data analyzed here for phonetic analysis included utterances from all speakers and all utterances, including utterances judged unacceptable given the context, for example, utterances perceived as *BIN* constructions were produced in response to a been$_{PPART}$ context were included. What matters for the acoustic analysis is simply whether an utterance was perceived to be a *BIN* utterance, been$_{PPART}$ utterance, or ambiguous between them. For the purposes of an initial acoustic analysis comparing *BIN* and been$_{PPART}$ utterances in the pre-*BIN*/*been* region, over the *BIN*/*been*, and in the post-*BIN*/*been* region, we excluded the ambiguous utterances. We come back to them later on when we follow this acoustic comparison with a presentation of a sample of some representative SWLAT F0 contours.

As described in Section 3.1.4, mean/max F0, mean/max intensity, and duration were measured over each word within an utterance. Then, the ratios of the acoustic measure over *BIN*/been$_{PPART}$ to the acoustic measure over the immediately preceding word, the immediately following word, and all following words not including the immediately following word were taken, within the utterance. Figure 11 shows how these ratios compared between perceived *BIN* and non-*BIN* utterances on average, within an item. For instance, the first point on the left shows the following: On average over the 19 items, within an item (e.g., VP *align*), the ratio of mean F0 over *BIN* to the immediately preceding word in perceived *BIN* utterances was 1.1 ± 0.01 (*SE*) times the ratio of mean F0 over been$_{PPART}$ to the word immediately preceding been$_{PPART}$ in perceived been$_{PPART}$ utterances. All ratios were much greater than 1, indicating that, compared to been$_{PPART}$, *BIN* had higher mean/max F0, mean/max intensity, and duration relative to immediately preceding, immediately following, and all following words not including the immediately following word. Output from linear mixed-effects models with the different measures as dependent variables, PERCEIVED BIN/BEEN TYPE as a

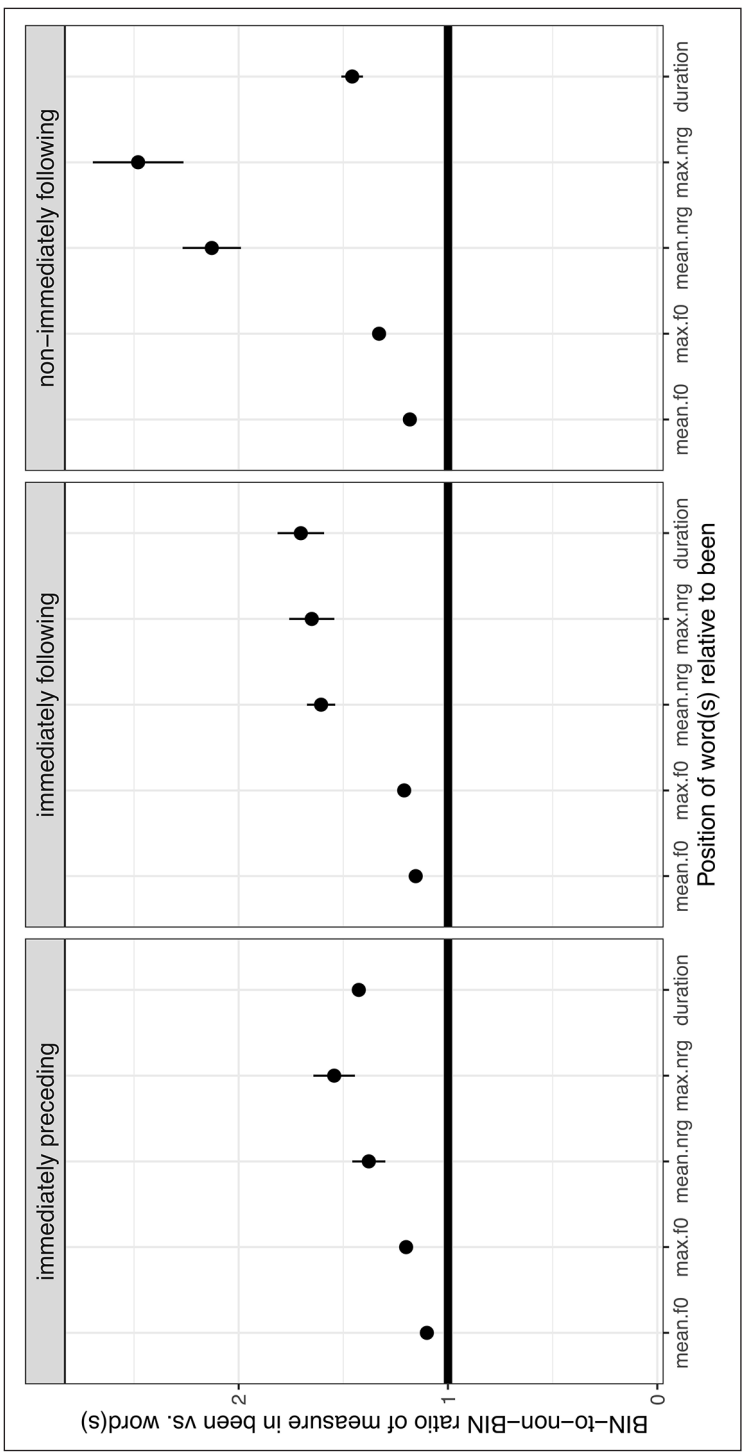


Figure 11. Distribution of within-item ratios of F0, intensity (*"nrg"*), and duration measures in perceived *BIN* versus $been_{PPART}$ utterances for *BIN*/$been_{PPART}$ relative to the immediately preceding and following word and (non-immediately) following words. Points show means over items ($n = 19$) and ranges show ± 1 *SE*. All ratios fall well above the dark line at 1, indicating that all measures were higher in perceived *BIN* than $been_{PPART}$ utterances.

Table 8. Linear Mixed-Effects Model Output for the Effects of Whether the Utterance Was Perceived as *BIN* or Not on Acoustic Measures.

Ratio measure	Region		β, 95% CI	*t* (*SE* (β))	Model comparison
Max F0	Immed. preceding	Intercept	1.00 [0.94, 1.05]	34.6 (0.03)	$\chi^2(1) = 153.8$,
		BIN	0.20 [0.16, 0.22]	13.2 (0.02)	$p < .001$
	Immed. Following	Intercept	1.14 [1.09, 1.20]	39.4 (0.03)	$\chi^2(1) = 185.2$,
		BIN	0.23 [0.20, 0.26]	14.6 (0.02)	$p < .001$
	Non-immed. following	Intercept	1.26 [1.17, 1.36]	26.3 (0.05)	$\chi^2(1) = 562.3$,
		BIN	0.37 [0.34, 0.40]	25.6 (0.01)	$p < .001$
Mean F0	Immed. preceding	Intercept	0.98 [0.94, 1.01]	53.6 (0.02)	$\chi^2(1) = 126.5$
		BIN	0.10 [0.09, 0.12]	11.8 (0.01)	$p < .001$
	Immed. following	Intercept	1.41 [1.07, 1.15]	5.8 (0.2)	$\chi^2(1) = 240.8$,
		BIN	0.71 [0.15, 0.19]	6.0 (0.1)	$p < .001$
	Non-immed. following	Intercept	1.23 [1.17, 1.30]	38.7 (0.03)	$\chi^2(1) = 380.4$,
		BIN	0.21 [0.19, 0.23]	20.5 (0.01)	$p < .001$
Max intensity	Immed. preceding	Intercept	1.41 [0.92, 1.90]	5.8 (0.2)	$\chi^2(1) = 34.9$
		BIN	0.71 [0.48, 0.92]	6.0 (0.1)	$p < .001$
	Immed. following	Intercept	2.25 [1.66, 2.87]	7.9 (0.3)	$\chi^2(1) = 43.3$,
		BIN	0.83 [0.59, 1.07]	6.7 (0.1)	$p < .001$
	Non-immed. following	Intercept	5.82 [3.71, 8.23]	5.0 (1.2)	$\chi^2(1) = 27.4$,
		BIN	3.66 [2.23, 4.91]	5.3 (0.7)	$p < .001$
Mean intensity	Immed. preceding	Intercept	1.14 [0.91, 1.37]	10.5 (0.1)	$\chi^2(1) = 9.1$,
		BIN	0.37 [0.14, 0.60]	3.0 (0.1)	$p = .003$
	Immed. following	Intercept	1.79 [1.30, 2.34]	7.0 (0.3)	$\chi^2(1) = 35.9$,
		BIN	0.55 [0.37, 0.73]	6.1 (0.09)	$p < .001$
	Non-immed. following	Intercept	5.40 [3.30, 7.42]	5.1 (1.1)	$\chi^2(1) = 23.43$,
		BIN	2.79 [1.58, 3.89]	4.9 (0.6)	$p < .001$
Duration	Immed. preceding	Intercept	0.84 [0.73, 0.93]	16.3 (0.05)	$\chi^2(1) = 158.6$,
		BIN	0.27 [0.23, 0.31]	13.4 (0.02)	$p < .001$
	Immed. following	Intercept	1.05 [0.86, 1.24]	9.8 (0.1)	$\chi^2(1) = 71.1$,
		BIN	0.40 [0.31, 0.49]	8.7 (0.05)	$p < .001$
	Non-immed. following	Intercept	1.60 [1.36, 1.81]	13.6 (0.1)	$\chi^2(1) = 43.7$,
		BIN	0.51 [0.35, 0.67]	6.7 (0.08)	$p < .001$

Note. SE: standard error; CI: confidence interval.

fixed effect, and random by-speaker and by-item intercepts (models with random slopes did not converge) is summarized in Table 8. Likelihood ratio tests with a null model with only random intercepts supported the inclusion of PERCEIVED BIN/BEEN TYPE for every acoustic measure. Similarly, the effect of PERCEIVED BIN/BEEN TYPE was significant at the 0.05 level for all measures.

Nine of the 20 CORAAL *BIN* examples had only a single word in the post-*BIN* region, in which case it was not possible to disentangle phrase-final effects from more general downtrend patterns in the post-*BIN* region. Overall, although, it seemed that F0 dropped quickly after *BIN* and settled into a low F0 plateau. Acoustic results for the post-*BIN* region in the larger sample of SWLAT *BIN* utterances—where the post-*BIN* region consisted of a minimum of 3 and up to 10 words—confirmed that in comparison with $\text{been}_{\text{PPART}}$ utterances, the post-*BIN* region had reduced F0, intensity, and duration, not only in the word immediately following *BIN*, but over the longer stretch of the post-*BIN* region. Among the CORAAL *BIN* examples, we also identified an

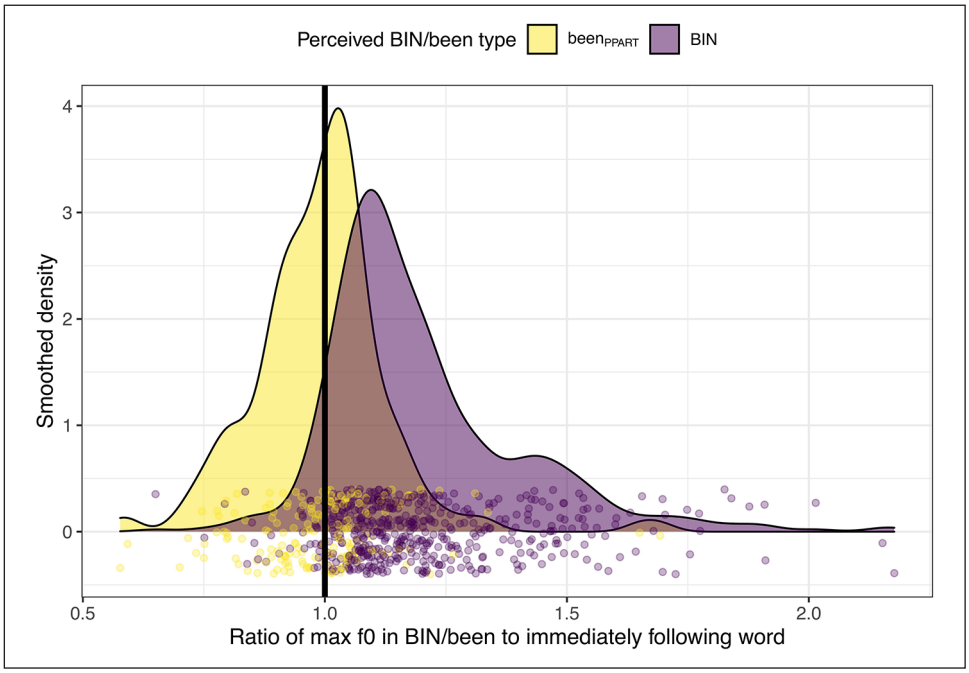


Figure 12. Smoothed density plot comparing the ratio of max F0 in *BIN*/ been$_{PPART}$ to max F0 in the immediately following word in perceived *BIN* versus been$_{PPART}$ utterances. A ratio of 1 (indicated by the black vertical line) indicates that max F0 was the same in both words.

example where F0 in the word immediately following *BIN* stayed high and did not drop to a low plateau (Figure 3). As shown in Figure 12, the distribution of the ratio of maximum F0 in *BIN*/ been$_{PPART}$ to maximum F0 in the immediately following word in the SWLAT utterances shows that relative heights of F0 between *BIN*/been$_{PPART}$ and the immediately following word showed a gradient distribution. The gradient distribution suggests that SWLAT *BIN* utterances did not always immediately have F0 drop to a low F0 plateau after *BIN* and include among them cases such as the CORAAL example in Figure 3. Figure 12 also shows that the vast majority of *BIN* utterances had a higher F0 on *BIN* than the immediately following word—sometimes approximately equally high, sometimes as much as twice as high—while F0 in been$_{PPART}$ utterances often had a lower F0 on *BIN* than in the immediately following word.

What the purely acoustic analysis described in this section thus far cannot capture is variation in the phonological intonational tone choices and how those condition acoustic measures—this analysis aggregates across those phonological choices. An item-by-item intonational phonological analysis of the data is beyond the scope of this paper, but we show some representative F0 contours below, with reference to F0 contours observed in CORAAL.

The contrast between *BIN* and been$_{PPART}$ utterances in the post-*BIN*/been$_{PPART}$ F0 contour can be observed in the representative F0 contours in Figure 13 (perceived *BIN* example) and Figure 14 (perceived been$_{PPART}$ example). As in most of the CORAAL *BIN* examples, the post-*BIN* region shows a flat, low F0 plateau with no clear F0 peaks, or potentially F0 peaks in a very reduced F0 range relative to the F0 of *BIN*. The dramatic F0 range change following *BIN* in Figure 13 is reminiscent of the drop in F0 after initial high F0 on a pronoun observed in a number of CORAAL examples as well as in Weldon (2019). Many CORAAL *BIN* examples also had only one or two

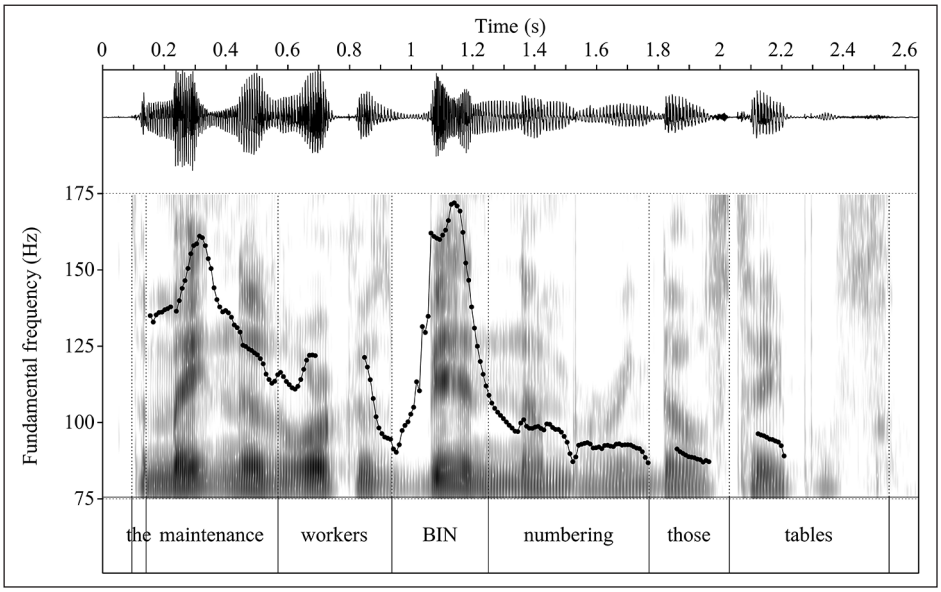


Figure 13. Representative F0 contour of perceived *BIN* in *number* VP item in $BIN_{STATE\text{-}CONT}$ environment from Speaker la05. Note the high F0 peak over *BIN* and the following much reduced F0 range.

syllables in the post-*BIN* region, so F0 trends were difficult to discern. The longer stretch of segmental material in the post-*BIN* region in the SWLAT data clearly shows that the flat, low F0 plateau continues to the end of the utterance. In contrast, the post-$been_{PPART}$ region shows a gradual rise up until a sudden jump to very high F0 peak on the utterance-final word. The very high F0 peak on *table* appears to occur in the initial stressed syllable, which would be consistent with its being the realization of a pitch accent, but further phonological analysis is needed. The *BIN*/$been_{PPART}$ F0 contour comparison also exemplifies the presence of a high, steep F0 peak in *BIN* and the lack of such a peak in $been_{PPART}$.

The SWLAT productions revealed another prosodic parameter that could contribute to a *BIN* percept that we did not observe in the CORAAL examples: via a prosodic juncture immediately preceding *BIN*. Figure 15 shows an example of this from Speaker la08 in a production of the *around his neck* item in the $BIN_{STATE\text{-}CONT}$ environment. Whether or not there is a pitch accent on *BIN* is unclear, but the extreme preboundary lengthening in *chain* and long /b/-closure in *BIN* indicates a prosodic juncture at the left edge of *BIN*. This example also shows F0 movement in the post-*BIN* region; here, a steady F0 rise up to *his*.

For comparison, Figure 16 shows another utterance from the same speaker (Speaker la08) where *BIN*/$been_{PPART}$ is clearly immediately preceded by a prosodic juncture, just like in the Figure 15 utterance perceived as *BIN*. This utterance was perceived to be ambiguous between a *BIN* and a $been_{PPART}$ utterance, rather than a *BIN* utterance, due to utterance-final intonational characteristics. Comparing the ambiguous percept in Figure 16 to the *BIN* percept in Figure 15, we find that one clear difference is that the ambiguous percept shows the same globally highest F0 peak at the end of the utterance that can be also be seen in the Figure 14 utterance that was perceived as $been_{PPART}$.

Another exemplar of an utterance perceived as ambiguous between *BIN* and $been_{PPART}$ is shown in Figure 17. This example is representative of a number of utterances which Green initially

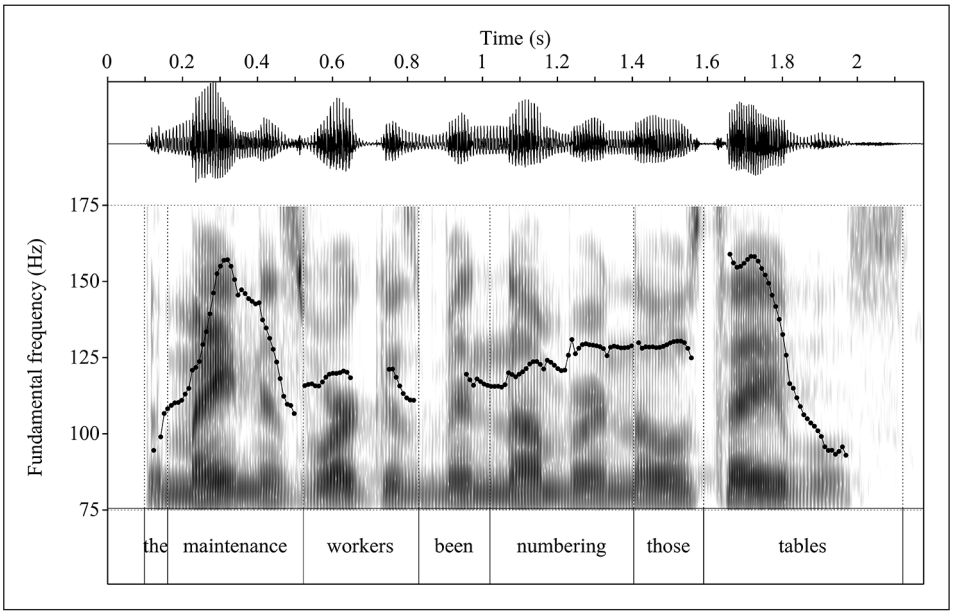


Figure 14. Representative F0 contour of perceived $been_{PPART}$ in *number* VP item in $been_{PPART}$ environment from Speaker la10. Note the lack of a steep F0 peak over *been* and the steady increase in F0 after *been* to an extremely high F0 peak over utterance-final *tables*.

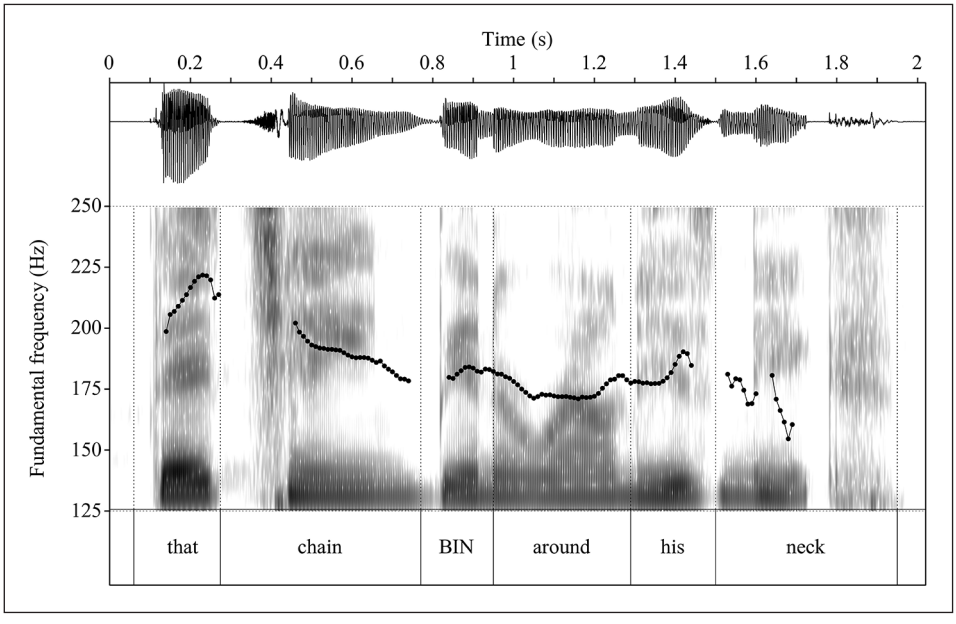


Figure 15. Representative F0 contour of perceived *BIN* in *around his neck* PP item in $BIN_{STATE\text{-}CONT}$ environment from Speaker la08. While it isn't clear that there is an F0 peak on *BIN*, there is a prosodic juncture immediately preceding *BIN*, as is evident from the preboundary lengthening on *chain*.

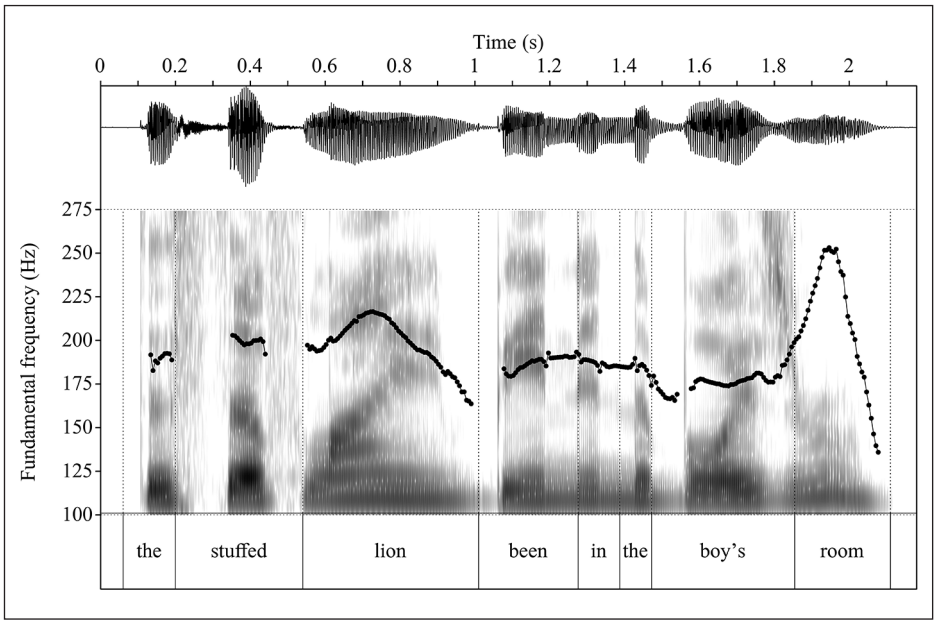


Figure 16. Representative F0 contour of an utterance perceived to be ambiguous between *BIN* and been$_{PPART}$ in the *in the boy's room* PP item in the been$_{PPART}$ environment from Speaker la08. A prosodic juncture at the end of *lion* is visible in the lengthening of *lion* and fall to a low boundary tone. Although there is a small F0 peak on been$_{PPART}$, there is a much bigger one on utterance-final *room*.

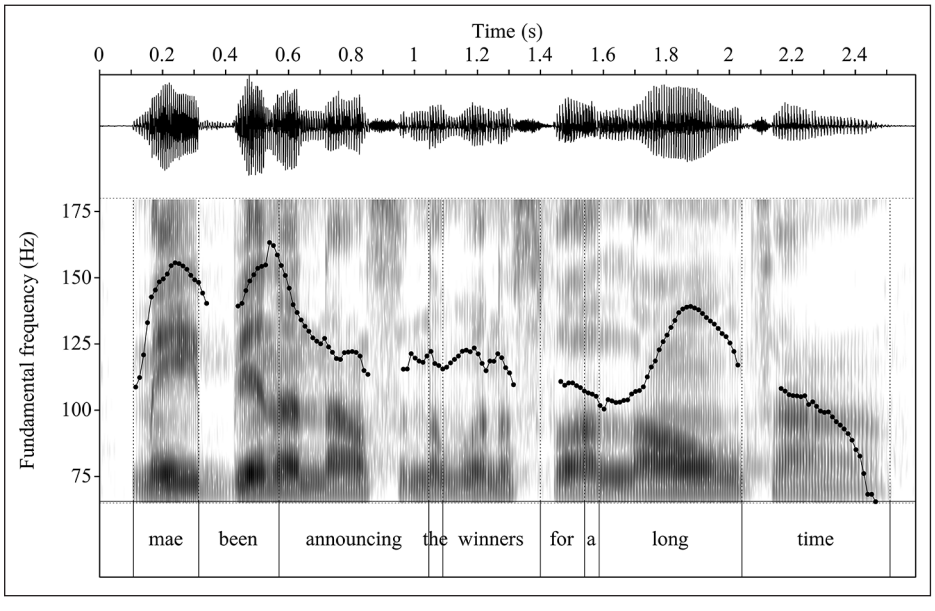


Figure 17. Representative F0 contour of an utterance perceived to be ambiguous between *BIN* and been$_{PPART}$ and rated as marginal acceptable in the *announce* item in the been + long time adverbial environment from Speaker la07. Although there is a low F0 plateau after a high F0 peak on been, there is also a high F0 peak on *long* in the adverbial phrase.

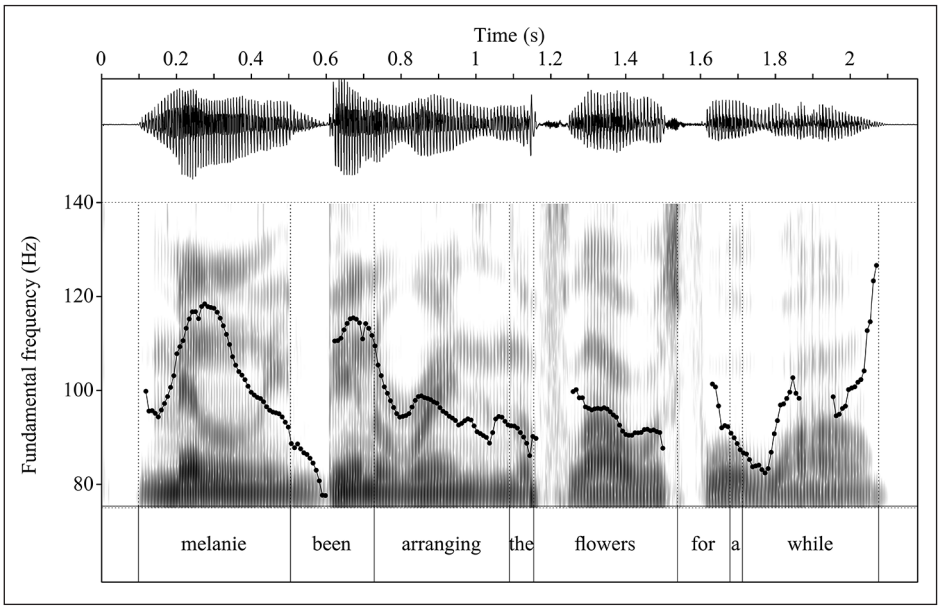


Figure 18. Representative F0 contour of an utterance perceived to be ambiguous between *BIN* and been$_{PPART}$ and rated as "good" in the *arrange* item in the been + long time adverbial environment from Speaker la06. There is a prosodic juncture between *flowers* and the adverbial phrase, but one smaller than one with a pause.

perceived as a *BIN* utterance but then reanalyzed toward a been$_{PPART}$ due to prosodic properties in the adverbial phrase. This reanalysis toward been$_{PPART}$ then allowed for a marginal rather than unacceptable rating, since otherwise we would have *BIN* and a long time adverbial together without an intervening pause. As in the ambiguous utterance in Figure 16, there is a high F0 peak in the post-*BIN*/been region. In Figure 17 it is on *long*, which also has a relatively long duration.

A final representative utterance, also from the been + long time adverbial environment, is shown in Figure 18. Like the utterance in Figure 17, this one also was classified as ambiguous between *BIN* and been$_{PPART}$, but unlike that one, this one was rated with a "good" acceptability rating. Of particular note in this example is the presence of a prosodic juncture between *flowers* and the adverbial phrase, realized via preboundary lengthening in *flowers* and also an F0 reset at the beginning of the adverbial phrase, that is, the downtrend in the F0 contour at the end of *flowers* is broken to start the adverbial phrase (some of the F0 raising is due to perturbation from the preceding voiceless fricatives, but not all). This kind of prosodic juncture—potentially smaller than one with a silent pause, which would typically be considered an IntP juncture—was present in a number of the ambiguous been + long time adverbial cases that were acceptable. This example also shows an utterance-final rising boundary tone.

3.3 Discussion

Overall, results indicated that the production task was successful in eliciting AAE structures, and in particular, *BIN* constructions. Excluding Speaker la01, speakers had no trouble producing the fillers with AAE structures. Regression models indicated that environments designed to elicit *BIN* were 8.2 times more likely to elicit utterances perceived as *BIN* than been$_{PPART}$. Within *BIN* environments

for verbal predicates, speakers were 10.8 times more likely to produce utterances perceived as *BIN* in the obligatory *BIN* + modal and $BIN_{COMPLETE}$ environments than in the BIN_{STATE} environments. However, the SWLAT productions showed an overall bias for *BIN* utterances, even in environments designed to elicit $been_{PPART}$ utterances (41.1% perceived *BIN*s), and the high proportion of perceived $been_{PPART}$ utterances in the BIN_{STATE} environments (11.7% in $BIN_{STATE\text{-}HAB}$, 20.5% in $BIN_{STATE\text{-}CONT}$) was also unexpected. These mismatches between the environments and resulting productions can be in large part traced to pragmatic factors and highlight the importance of pragmatic factors beyond the semantic context in *BIN* usage and comprehension. These pragmatic factors are discussed later in this section and also more extensively in Neal et al. (2020).

The SWLAT productions also provided further information on the realization of *BIN* utterances, building on what we learned from CORAAL. First, it became clear that the cues in the speech signal relevant for identifying a *BIN* utterance are distributed over the entire utterance rather than localized to *BIN*/*been. BIN* utterances were found to be distinguished from $been_{PPART}$ utterances by having higher ratios of F0, intensity, and duration in *BIN*/*been* to the immediately preceding word, immediately following word, and entire span of the post-*BIN*/*been* stretch after the immediately following word. The duration and intensity results show the same pattern as those in Beyer et al. (2015), which did not analyze F0. Ambiguity between *BIN* and $been_{PPART}$ classifications was also associated in many cases with prosodic properties in the post-*BIN*/*been* region: an utterance that was classified as *BIN* up through the pronunciation of *BIN*/*been* could be reanalyzed as a $been_{PPART}$ utterance if a large F0 peak was present in the post-*BIN*/*been* region near the end of the utterance.

Besides drawing attention to the importance of the post-*BIN*/*been* region, the SWLAT data also expanded beyond what we learned from the CORAAL by elucidating the role of prosodic junctures in *BIN* utterances. SWLAT results suggested that the presence of a prosodic juncture immediately preceding *BIN* might contribute to the percept of a *BIN*, presumably as another way to increase the relative prominence of *BIN* besides manipulating the height of the F0 peak on *BIN*. Inserting prosodic junctures as a way to make something prominent within its prosodic domain is common cross-linguistically (Büring, 2010). SWLAT results for been + long time adverbial constructions also suggested a more nuanced view on the unacceptability of *BIN* co-occurring with a long time adverbial without an intervening pause indicative of a large prosodic boundary, that is, the edge of an intonational phrase. Smaller prosodic junctures such as phonological or intermediate phrase boundaries might also lead to acceptability, and these may be correlated with other cues than durational ones, such as F0 reset. Perhaps smaller junctures of this kind were present in Dayton's (1996) examples that she reported as having no pauses.

The SWLAT data also built on the CORAAL data by allowing us to begin to get a sense of the range of variability in *BIN* productions. While a full characterization of the variability will require phonological analysis of the utterances that is beyond the scope of this paper, acoustic results already suggest that the relative F0 peak height on *BIN* to F0 of surrounding material can vary gradiently (Figure 12). Prosodic renditions of *BIN* constructions ranged within and across speakers from ones with steep F0 rises followed by an extremely reduced F0 range, more like the two F0 tracks shown in Weldon (2019), to ones like Figure 3 from CORAAL, where F0 height was similar between *BIN* and in the immediately following word. What may underlie prosodic variability like this in *BIN* renditions awaits further research. For instance, the pattern of an utterance-initial high F0 before dropping into a lower F0 range in *BIN* and following material observed in Weldon (2019) and some CORAAL examples such as Figure 1 was not a pattern characteristic of the SWLAT *BIN* data. Further work would be needed to disentangle if the absence of this utterance-initial high F0 pattern in the SWLAT data was due to an absence of pronoun-initial sentences in the stimuli, an absence of the relevant pragmatic factors associated with the F0 pattern, and/or task effects.

Beyond the characterization of the realization of *BIN* utterances, perhaps the most striking lesson we learned from the SWLAT results—via the large proportion of mismatches between *BIN*/

been$_{PPART}$ environments and the elicited *BIN*/*been type* perceived—was the importance of pragmatic factors in influencing *BIN* versus been$_{PPART}$ readings in the speakers, as well as the listener. The subset of mismatches that were coded as "accommodated" draw attention to two kinds of pragmatic issues: (i) the difficulty of crafting short, contrived scenarios that make a long time context completely unmistakable to the speaker, and (ii) even if the long time context is unmistakable, inherent variability in *BIN* versus been$_{PPART}$ usage due to the speaker's choice of whether or not to make the long time period explicit. The first type of issue could be addressed in revisions of the stimuli and a task re-design to provide richer contexts. The second type of issue raises questions about what factors might contribute to whether or not a speaker chooses to make the long time period explicit. Finally, some proportion of the mismatches undoubtedly was related to experimental task issues. The overall bias toward *BIN* productions may have been due in part to the high proportion of *BIN* environments among the experimental stimuli, relative to the non-*BIN* environments and fillers. While we kept the total number of items limited in this first pilot study to keep the experiment short, we would want to include more fillers in future studies.

4 General discussion and conclusion

Two characteristics of AAE that are often mentioned in general descriptions of the linguistic variety but not extremely well researched are its intonational patterns and tense/aspect properties. Following up on the call in Rickford (1975) to employ multiple methods in conducting research on constructions in spoken AAE that might not occur in data from interviews, we consulted corpus data and also elicitation tasks, yielding a wider data source and a study that can be replicated. These methods yielded data that provide insight into the phonology and semantics of AAE, and the contributions of the study go beyond descriptions of properties of AAE in those disparate areas and begin to provide information about the interplay between the two areas. In addition, a number of questions are also raised about the syntax of AAE and the structure of *BIN* constructions. For instance, given the restriction on the occurrence of adverbial modification of *BIN*, further research should address the issue of the structural placement of lexical items that are allowed to modify the verbs in *BIN* constructions but are prohibited from modifying *BIN*.

Since the first observations about the meaning and use of *BIN*, the presence versus absence of "stress" on the marker has been noted as indicating the meaning contrast with been$_{PPART}$. The findings from this study raise questions about this characterization given the overlap in the phonetic realizations of *BIN* and been$_{PPART}$—as well as the role that the rest of the utterance and the pragmatic context outside of the utterance play in the interpretation of *BIN*. In varieties of English with stress, only a syllable of a word that is stressed can bear an accent (see e.g., Gussenhoven, 2018). There were examples of pitch-accented *BIN/been* in both CORAAL and SWLAT that had acoustic realizations that could be perceived as *BIN*. Yet a number of these were interpreted as either ambiguous between a *BIN* or been$_{PPART}$—or as clearly a been$_{PPART}$ when the semantic, pragmatic, and/or syntactic context ruled out a *BIN* interpretation. That is, both *BIN* and been$_{PPART}$ can surface as being pitch accented.[9] The difference between *BIN* and been$_{PPART}$ is not that one is always stressed and the other is never stressed, but rather that the contexts in which they are accented differ. There is a restricted set of contexts, such as focus contexts, under which been$_{PPART}$ is accented. But, based on our study, it seems that in most syntactic, pragmatic, and semantic contexts for *BIN*, the marker is in general produced as accented with a high F0 peak and followed by a reduced pitch range, possibly deaccenting—although the tone that is associated to accented *BIN* and the implementation of the following downtrend may vary. The SWLAT data showed this general trend quantitatively and also that a high F0 peak in the post-*BIN* region shifts the interpretation of the utterance toward (and sometimes all the way to) a been$_{PPART}$ utterance. Further work will be needed to determine if/how the intonation of *BIN* is distinct from the intonation of focused contexts for been$_{PPART}$. The CORAAL

data showed one utterance interpreted as *BIN* which suggested that perhaps, while *BIN* is accented, what tone associates to *BIN* might not always be a high one. The discovery of such unexpected examples is a strength of the naturalistic and broad coverage of sociolinguistic interviews: they can result in contexts that give rise to uses and realizations of *BIN* that we have not yet conceived of and thus have not included in experimental designs.

There are a number of factors that should be addressed in future *BIN* experimental studies. Owing to the fact that AAE is predominantly a spoken variety and most of the data on it are based on interviews, there are not yet any established methods for using controlled reading tasks, such as the one discussed for the SWLAT participants. This method of elicitation is new, so a number of questions remain. The results from the SWLAT tasks confirmed that speakers certainly could produce *BIN* in different contexts that corresponded to the reported uses of the marker, but one question is about the naturalness of the data prompts designed to elicit *BIN*/*been*. One direction is to keep some of the control of the elicitation task and still precisely manipulate contexts to elicit different *BIN/been* types, but to enrich the contexts and reduce restrictions on what the speakers produce in those contexts, such as in a discourse completion task (Vanrell et al., 2018).

This study has also uncovered some possible areas of ambiguity in the perception and interpretation of *BIN/been*-types, so further investigation is needed not only in the perception of *been*/*BIN* tokens across varieties of AAE in the United States but also in sentence processing. In this research, we have shown that the entire *BIN* utterance—not just the "sound" of *BIN/been* itself—influences how the marker is understood, and psycholinguistic studies that provide insight on how speakers process different parts of the utterance leading to and following the *BIN/been* token would be useful. Studies that control the acoustic properties of the utterance and examine the effect of syntactic factors and discourse context on the interpretation of the utterance would also be useful to illuminate how non-"sound" factors play a role. Previous studies have shown that the prominence of the same acoustic stimulus is perceived differentially depending on discourse context, for example, Bishop (2012). Finally, the question about variable occurrence of *BIN* constructions and adverbs denoting the far past is underscored in this research. In addition to questions about the extent to which certain adverbial phrases are actually equal variants for *BIN* constructions, this paper shines light on factors, noted in Rickford (1975), such as the interview speech style, which might explain why some speakers choose to use $been_{PPART}$ + long time adverbial in certain linguistic situations instead of the aspectual marker *BIN*. Phonological variation has been a common theme in the study of AAE; however, variable production of *BIN* has not been considered but certainly should be, given the different factors that might influence the perception of *been*/*BIN*. This topic remains unexplored from the angles of both intraspeaker variation and variation within speech communities and across regions.

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Notes

1. It should be noted that by referring to *BIN* as a remote past marker, we are not making any strong claims about any syntactic or semantic tense properties. We are highlighting a major property of the marker, and in no way are we calling it a tense marker. Along similar lines, since work in 1993, one of the authors (Green, 1993) has addressed BIN's perfect properties. We do not have the space to address those issues here, but more recent research in Whitmal (2022) provides an analysis of the syntactic, semantic, and pragmatic properties of the marker that explores features of the marker.
2. Some stative verbs may also be used in this context and yield eventive readings, as in I BIN having this headache to mean "For a long time, I have had a bad headache off and on."
3. An anonymous reviewer pointed out that *BIN* and *been* can be quite similar in meaning and may even overlap in some contexts. While we do not have the space to discuss the semantics of *BIN*, the view that we take in this paper is that *BIN* situates some part of an eventuality in the distant past. A part of the range of meaning associated with *BIN* constructions is related to the types of predicate forms that occur with the marker. The reviewer notes that *been* can also be stressed in varieties of standard or "general" American English. Winford (1997, 1998) provides historical account of how *BIN* might have arisen in AAE, which draws on creole uses and *been* in English. Such historical accounts must also be taken into consideration in explanations in the overlap in meaning between the two forms.
4. V-*ed*/-*en* is used to show that AAE does not always distinguish between simple past and past participle morphology. For instance, the form "ran" can be used in simple past (*She ran 10 miles*.) as well as in participial contexts (e.g., perfect, *She done ran 10 miles*).
5. An anonymous reviewer pointed out that "Bruce has long been able to walk on stilts." is a simpler gloss. We have chosen to continue to use "for a long time" for consistency. Also, the preposed phrase may also tell us something about the scope of *BIN* with respect to the modal *could.*
6. The intonational phrase is often abbreviated as "IP" but we use the abbreviation "IntP" here to avoid confusion with the syntactic inflectional phrase.
7. Two reviewers report hearing prominence on *woulda* in Figure 1 and thus suggest there is in fact a pitch accent on *woulda.* F0 over utterance-initial *they* is ill-defined since glottal pulse widths over *they* are irregular, and there is no clear pitch percept. However, there is a clear steep F0 fall over *woulda*, which is inconsistent with what we would expect for a high or rising pitch accent on *woulda*, for example, the H*, L + H* of MAE-ToBI (Beckman & Elam, 1997; Veilleux et al., 2006). If anything, high peaks from a H* or L + H* are expected to be delayed (peak delay), not occurring in the preceding syllable. What we would expect for either a H* or L + H* is an initial F0 rise into and/or at the beginning of *woulda*, and not the fall that is observed. Perhaps the observed F0 fall could be consistent with an H + !H*, or H + L* (e.g., like the falling nuclear accent in polar interrogatives in some varieties of Catalan; Prieto et al., 2015) on *woulda*.
8. An earlier version of some portions of this section appears in a NWAV48 proceedings paper by the authors, Neal et al. (2020), which goes into more detail about the influence of pragmatic factors in the SWLAT experimental design and results.
9. Function words that may be underlyingly unstressed in the lexicon like $\text{been}_{\text{PPART}}$ but nevertheless pitch-accented (e.g., under focus) have been analyzed as receiving stress because the presence of a pitch accent and requirements for that presence induces the word to form a foot by itself and thus be the head of a foot, that is, stressed (E. Selkirk, 1996).

References

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Baugh, J. (1983). *Black street speech: Its history, structure, and survival*. University of Texas Press.

Beckman, M. E., & Elam, G. A. (1997). *Guidelines for ToBI labelling*. https://www.ling.ohio-state.edu/research/phonetics/E_ToBI/

Beckman, M. E., Hirschberg, J., & Shattuck-Hufnagel, S. (2005). The original ToBI system and the evolution of the ToBI framework. In S.-A. Jun (Ed.), *Prosodic typology: The phonology of intonation and phrasing* (pp. 9–54). Oxford University Press.

Beckman, M. E., & Pierrehumbert, J. B. (1986). Intonational structure in English and Japanese. *Phonology Yearbook*, *3*, 255–310.

Beyer, T., Edwards, K. A., & Fuller, C. C. (2015). Misinterpretation of African American English BIN by adult speakers of Standard American English. *Language & Communication*, *45*, 59–69. https://doi.org/10.1016/j.langcom.2015.09.001

Bishop, J. (2012). Information structural expectations in the perception of prosodic prominence. In G. Elordieta & P. Prieto (Eds.), *Prosody and meaning (interface explorations)* (pp. 239–269). Mouton de Gruyter.

Boersma, P., & Weenink, D. (2019). *Praat: Doing phonetics by computer* (Version 6.0.46) [Computer software]. http://www.praat.org

Büring, D. (2010). Towards a typology of focus realization. In M. Zimmermann & C. Féry (Eds.), *Information structure: Theoretical, typological, and experimental perspectives* (pp. 177–205). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199570959.003.0008

Clopper, C. G., & Smiljanic, R. (2011). Effects of gender and regional dialect on prosodic patterns in American English. *Journal of Phonetics*, *39*(2), 237–245. https://doi.org/10.1016/j.wocn.2011.02.006

Cole, J., & Shattuck-Hufnagel, S. (2016). New methods for prosodic transcription: Capturing variability as a source of information. *Laboratory Phonology*, *7*(1), Article 8.

Cole, J., Thomas, E. R., Britt, E., & Coggshall, E. (2008). *Gender and ethnicity in intonation: A case study of North Carolina English*.

Comrie, B. (1976). *Aspect: An introduction to the study of verbal aspect and related problems*. Cambridge University Press.

Dayton, E. (1996). *Grammatical categories of the verb in African American vernacular English*. University of Pennsylvania.

Farrington, C., Kendall, T., Brooks, P. S., Jenson, L., Tacata, C., & McLean, J. (2020). *The Corpus of Regional African American Language: ATL (Atlanta, GA 2017)* (Version 2020.05). The Online Resources for African American Language Project.

Fasold, R. W. (1972). *Tense marking in Black English*. Center for Applied Linguistics.

Garellek, M. (2019). The phonetics of voice. In W. Katz & P. Assmann (Eds.), *The Routledge handbook of phonetics* (pp. 75–106). Routledge.

Grabe, E. (1998). *Comparative intonational phonology: English and German* [Doctoral thesis, Katholieke Universiteit Nijmegen].

Green, L. J. (1993). *Topics in African American English: The verb system analysis* [Doctoral thesis, University of Massachusetts Amherst].

Green, L. J. (1998). Remote past and states in African-American English. *American Speech*, *73*(2), 115–138. https://doi.org/10.2307/455736

Green, L. J. (2002). *African American English: A linguistic introduction*. Cambridge University Press. https://doi.org/10.1017/CBO9780511800306

Gussenhoven, C. (2004). *The phonology of tone and intonation*. Cambridge University Press. https://doi.org/10.1017/CBO9780511616983

Gussenhoven, C. (2016). Analysis of intonation: The case of MAE_ToBI. *Laboratory Phonology*, *7*(1), Article 10.

Gussenhoven, C. (2018). Prosodic typology meets phonological representations. In L. M. Hyman & F. Plank (Eds.), *Phonological typology* (pp. 389–418). Walter de Gruyter GmbH.

Hayes, B., & Lahiri, A. (1991). Bengali intonational phonology. *Natural Language & Linguistic Theory*, *9*, 47–96.

Holliday, N. R. (2016). *Intonational variation, linguistic style, and the Black/biracial experience* [Doctoral thesis, New York University].

Holliday, N. R. (2019). Variation in question intonation in the Corpus of Regional African American Language. *American Speech*, *94*(1), 110–130. https://doi.org/10.1215/00031283-7308038

Jun, S.-A. (2022). Author response to the commentary: ToBI is not designed to be phonetically transparent. In J. A. Barnes & S. Shattuck-Hufnagel (Eds.), *Prosodic theory and practice* (pp. 204–211). The MIT Press.

Jun, S.-A., & Fletcher, J. (2014). Methodology of studying intonation: From data collection to data analysis. In S.-A. Jun (Ed.), *Prosodic typology II: The phonology and phonetics of intonation and phrasing* (pp. 493–519). Oxford University Press.

Jun, S.-A., & Foreman, C. (1996). Boundary tones and focus realization in African American English intonations. *The Journal of the Acoustical Society of America*, *100*, Article 2826.

Kawahara, H., Agiomyrgiannakis, Y., & Zen, H. (2016). Using instantaneous frequency and aperiodicity detection to estimate F0 for high-quality speech synthesis. *In Proceedings of the 9th ISCA Speech Synthesis Workshop* (pp. 221–228).

Kendall, T. (2019). New perspectives on African American Language through public corpora. *American Speech*, *94*(1), 13–20. https://doi.org/10.1215/00031283-7482427

Kendall, T., & Farrington, C. (2020). *The Corpus of Regional African American Language* (Version 2020.05). The Online Resources for African American Language Project. http://oraal.uoregon.edu/coraal

Kendall, T., Fasold, R. W., Farrington, C., McLarty, J., Arson, S., & Josler, B. (2018a). *The Corpus of Regional African American Language: DCA (Washington DC 1968)* (Version 2018.10.06). The Online Resources for African American Language Project.

Kendall, T., Quartey, M., Farrington, C., McLarty, J., Arson, S., & Josler, B. (2018b). *The Corpus of Regional African American Language: DCB (Washington DC 2016)* (Version 2018.10.06). The Online Resources for African American Language Project.

Khan, S. U. D. (2008). *Intonational phonology and focus prosody of Bengali* [Doctoral thesis, University of California, Los Angeles].

Khan, S. U. D. (2014). The intonational phonology of Bangladeshi Standard Bengali. In S.-A. Jun (Ed.), *Prosodic typology II: The phonology and phonetics of intonation and phrasing* (pp. 81–117). Oxford University Press.

King, S. (2018). *Exploring social and linguistic diversity across African Americans from Rochester, New York* [Doctoral thesis, Stanford University]. https://searchworks.stanford.edu/view/12739840

King, S., Farrington, C., Kendall, T., Mullen, E., Arson, S., & Jenson, L. (2020). *The Corpus of Regional African American Language: ROC CORAAL user guide (as of May 2020) 14 (Rochester, NY 2016)* (Version 2020.05). The Online Resources for African American Language Project.

Klein, W. (1994). *Time in language*. Routledge.

Labov, W. (1972). *Language in the inner city: Studies in the Black English vernacular*. University of Pennsylvania Press.

Ladd, D. R. (1996). *Intonational phonology*. Cambridge University Press.

Ladd, D. R. (2022). The trouble with ToBI. In J. Barnes & S. Shattuck-Hufnagel (Eds.), *Prosodic theory and practice* (pp. 247–257). The MIT Press.

Lavandera, B. R. (1978). Where does the sociolinguistic variable stop? *Language in Society*, *7*(2), 171–182. https://doi.org/10.1017/S0047404500005510

Loman, B. (1975). Prosodic patterns in a Negro American dialect. In H. Ringbom, A. Ingberg, K. Norrman, R. Nyhholm, R. Westman, & K. Wikberg (Eds.), *Style and text: Studies presented to Nils Erik Enkvist* (pp. 219–242). Språkförlaget Skriptor AB.

McAuliffe, M., Socolof, M., Mihuc, S., Wagner, M., & Sonderegger, M. (2018). *Montreal forced aligner* (Version 1.1.0) [Computer program]. http://montrealcorpustools.github.io/Montreal-Forced-Aligner/

McLarty, J. (2011). *An apparent time analysis of intonation using ex-slaves: Comparing Raleigh, North Carolina AAE and EAE pitch accent types and frequencies* [MA Capstone, North Carolina State University].

McLarty, J. (2018). African American Language and European American English intonation variation over time in the American South. *American Speech*, *93*(1), 32–78. https://doi.org/10.1215/00031283-6904032

Mufwene, S. S. (1994). On the status of auxiliary verbs in Gullah. *American Speech*, *69*(1), 58–70. https://doi.org/10.2307/455949

Neal, A., Whitmal, A., Green, L., & Yu, K. (2020). *Investigation of the effect of contextual factors on BIN production in AAE* (Working Papers in Linguistics: Selected Papers Form New Ways of Analyzing Variation [NWAV 48]). University of Pennsylvania.

Oetting, J. B., & McDonald, J. L. (2002). Methods for characterizing participants' nonmainstream dialect use in child language research. *Journal of Speech, Language, and Hearing Research*, *45*(3), 505–518. https://doi.org/10.1044/1092-4388(2002/040)

Pierrehumbert, J. (1980). *The phonology and phonetics of English intonation* [Doctoral thesis, Massachusetts Institute of Technology].

Prieto, P., Borràs-Comes, J., Cabré, T., Crespo-Sendra, V., Mascaró, I., Roseano, P., Sichel-Bazin, R., & Del Mar Vanrell, M. (2015). Intonational phonology of Catalan and its dialectal varieties. In S. Frota & P. Prieto (Eds.), *Intonation in romance* (pp. 9–62). Oxford University Press.

R Core Team. (2018). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/

Rickford, J. R. (1973). *Been in Black English*. University of Pennsylvania.

Rickford, J. R. (1975). Carrying the new wave into syntax: The case of Black English been. In R. W. Fasold (Ed.), *Variation in the form and use of language* (pp. 98–119). Georgetown University Press.

Rickford, J. R. (1977). The question of prior creolization of Black English. In A. Valdman (Ed.), *Pidgin and creole linguistics* (pp. 190–221). Indiana University Press.

Rickford, J. R. (1999). Phonlogical and grammatical features of African American vernacular English. In J. R. Rickford (Ed.), *African American vernacular English* (pp. 3–14). Blackwell.

Rowe, R. (2005). *The development of African American English in the oldest Black town in America: Plural -s absence in Princeville, North Carolina* [Master's thesis, North Carolina State University]. http://repository.lib.ncsu.edu/handle/1840.16/711

Rowe, R., Wolfram, W., Kendall, T., Farrington, C., & Josler, B. (2018). *The Corpus of Regional African American Language: PRV (Princeville, NC 2004)* (Version 2018.10.06). The Online Resources for African American Language Project.

Selkirk, E. (1996). The prosodic structure of function words. In J. L. Morgan & K. Demuth (Ed.), *Signal to syntax: Bootstrapping from speech to grammar in early acquisition* (pp. 187–213). Lawrence Erlbaum Associates.

Selkirk, E. O. (1978). On prosodic structure and its relation to syntactic structure. In T. Fretheim (Ed.), *Nordic prosody II* (pp. 111–140). Tapir.

Shue, Y.-L., Keating, P., Vicenik, C., & Yu, K. (2011). Voicesauce: A program for voice analysis. In *Proceedings of ICPhS XVI* (pp. 1846–1849).

Spears, A. K. (2017). Unstressed been: Past and present in African American English. *American Speech*, *92*(2), 151–175. https://doi.org/10.1215/00031283-4202009

Tarone, E. E. (1973). Aspects of intonation in Black English. *American Speech*, *48*(1/2), 29. https://doi.org/10.2307/3087890

Thomas, E. R. (2015). Prosodic features of African American English. In S. Lanehart (Ed.), *The Oxford handbook of African American language* (pp. 420–438). Oxford University Press.

Vanrell, M. del M., Feldhausen, I., & Astruc, L. (2018). The Discourse Completion Task in Romance prosody research: Status quo and outlook. In I. Feldhausen, J. Fliessbach, & M. del M. Vanrell (Eds.), *Methods in prosody: A Romance language perspective* (pp. 191–227). Language Science Press.

Veilleux, N., Shattuck-Hufnagel, S., & Brugos, A. (2006). *Transcribing prosodic structure of spoken utterances with ToBI* (January IAP 2006, 6.911). MIT OpenCourseWare, Massachusetts Institute of Technology. https://ocw.mit.edu/courses/6-911-transcribing-prosodic-structure-of-spoken-utterances-with-tobi-january-iap-2006/

Weldon, T. L. (2019). Race, class, and linguistic camouflage: Remote past BEEN and the divergence debate revisited. In R. Blake & I. Buchstaller (Eds.), *The Routledge companion to the work of John R. Rickford*. Routledge. https://doi.org/10.4324/9780429427886-13

Weldon, T. L. (2021). *Middle class African American English*. Cambridge University Press.

Whitmal, A. (2022). *What lies among aspect and adverbials: AAE's stressed BIN*. University of Massachusetts Amherst.

Wickham, H. (2016). *ggplot2: Elegant graphics for data analysis*. Springer. https://ggplot2.tidyverse.org
Wickham, H., François, R., Henry, L., & Müller, K. (2019). *dplyr: A grammar of data manipulation*. https://CRAN.R-project.org/package=dplyr
Wickham, H., & Henry, L. (2019). *tidyr: Easily tidy data with "spread()" and "gather()" functions*. https://CRAN.R-project.org/package=tidyr
Winford, D. (1993). *Predication in Caribbean English creoles*. John Benjamins Publishing Company. https://doi.org/10.1075/cll.10
Winford, D. (1997). Re-examining Caribbean English creole continua. *World Englishes*, *16*(2), 233–279. https://doi.org/10.1111/1467-971X.00061
Winford, D. (1998). On the origins of African American vernacular English—A creolist perspective: Part II: Linguistic features. *Diachronica*, *15*(1), 99–154. https://doi.org/10.1075/dia.15.1.05win
Wyatt, T. A. (1991). *Linguistic constraints on copula production in Black English child speech* [Doctoral thesis, University of Massachusetts Amherst].