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## Investigation of the Effect of Contextual Factors on BIN Production in AAE

### Abstract

Treatments of African American English (AAE) in the literature have focused primarily on morphosyntactic differences from mainstream American English. One of these differences is found in the tense and aspect system. While both dialects have the present perfect use for “been”, AAE also has a stressed variant of “been”, termed BIN. This aspectual marker is featured in the literature, but the main focus has been on its prosodic qualities. It differs from present perfect been in that it has the semantics of a remote past marker (Rickford 1973, Rickford 1975, Green 1998). For a comprehensive understanding of AAE’s tense aspect system, both syntactic-semantic and discourse-pragmatic aspects of these markers need to be studied as well. We complete a production experiment with members of an AAE-speaking community in Southwest Louisiana followed by an acceptability judgement task. The purpose of the experiment is twofold. First, it allows us to examine BIN production in canonical BIN environments and non-BIN environments. Second, by paying close attention to the context these environments occur in, we can also examine the influence of discourse-pragmatic factors (LONG-TIME, TEMPORAL JUST, POLAR QUESTIONS) on BIN production in unambiguous environments, as well as in ambiguous environments. The factors LONG-TIME and TEMPORAL JUST are found to be significant predictors of BIN production. Furthermore, there is a significant difference in ambiguity, such that the unambiguous contexts predicted BIN slightly less. Overall, the results of the experiment suggest that speakers are consistent in their BIN production for expected BIN environments, but more variable in the non-BIN environments for both unambiguous and ambiguous contexts. This raises the interesting question of why speakers are more variable in the non-BIN environments as well as questioning what the discourse-pragmatic factors are actually capturing. Together, however, it suggests that there are a variety of components that can influence BIN production. Future areas of work could further investigate in regards these components.

# Investigation of the Effect of Contextual Factors on BIN Production in AAE

Anissa Neal, Ayana Whitmal, Lisa Green, Kristine M. Yu, and Deniz Özyıldız

## 1 Introduction

Research on African American English<sup>1</sup> (AAE) started. In summarizing previous work on AAE, Wolfram (2007, 2015) noted that researchers had created sociolinguistic myths of the linguistic variety. That is, past approaches focused mostly on how the variety's morphosyntactic factors differs from the general American English rather than how speakers of AAE might themselves vary. One of these distinguishing factors was tense and aspect in AAE. Tense-modality-aspect (TMA) marking in AAE is argued to reflect syntactic and semantic properties that distinguish the variety from other dialects of English. The pronunciation of TMA markers *be*, *BIN*, and *dən* can differ from the pronunciation of the corresponding auxiliary/main verb forms, so, for example, resultant state marker *dən* is unstressed in AAE (e.g. He *dən* *done* his homework. 'He has already done his homework') although it is stressed in other varieties of English in which it occurs. In addition to syntactic and semantic descriptions, some informal observations have been made about the intonation of these markers; however, only prosodic properties of stressed *BIN* (3), which indicates that an eventuality or part of it is in the distant past, have been addressed in the literature. This paper builds on that work and investigates properties of *BIN* as a means of beginning the discussion about how both syntactic/semantic and contextual properties must be taken into consideration in presenting a description of patterns of tense and aspect marking in AAE.

### 1.1 Background

In AAE, three verbal markers have similar pronunciations but subtly different meanings. In this paper, we use a different orthographic representation for each marker: *been*, *bin*, *BIN*. The marker represented as *been* occurs in contexts in all varieties of American English. The marker *bin*, which is unstressed, has traditionally been called an anterior marker, and *BIN*, known as stressed *BIN*, is a remote past marker:

- (1) *been*: *I been to Jamaica five times.*  
'I have been to Jamaica five times'
- (2) *bin*: *I bin had this necklace fifteen or sixteen years.*  
'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 *been* in sentence (1) is similar to the *been* that occurs in perfect constructions in other varieties of English: *I have been running*. The difference is that for many AAE speakers, the auxiliary *have* is not produced in this context. On the other hand, for some speakers, it may be produced variably. The marker *bin* in the sentence in (2) generally occurs with *had*, so in this way, it differs from perfect *been* constructions. The focus in this paper is on the remote past marker *BIN* (3). Previous research on this marker has addressed questions about its meaning, origin, and how it is perceived. For instance, Labov (1972) characterizes the marker as a remote past perfect marker, and in Rickford (1973, 1975), it is defined as a marker that indicates 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. Winford is careful in noting that *BIN* may be the result of the reanalysis of the continuative perfect *been* under the influence of creole marker *bin*. In Green (1998), *BIN* is characterized as situating an eventuality or some part of it in the remote past. The eventualities can be defined as states that begin to hold at the initial point of a long period. There is one *BIN*, which

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<sup>1</sup> African American English (AAE) is used in this paper as the label for the linguistic variety spoken by some, not all, African Americans.

combines with different predicates to indicate three types of meanings. These meanings are labeled as state (*BIN<sub>STATE</sub>*), habitual (*BIN<sub>HAB</sub>*), and resultant state (*BIN<sub>RS</sub>*). When *BIN* combines with predicates, V-ing, Noun, Adjective, Adverb, and Preposition, the resulting reading is the *BIN<sub>STATE</sub>* reading (4), in which the event indicated by the predicate started in the far past and continues to hold until the moment of utterance. When *BIN* combines with non-stative V-ing predicates (5), the resulting reading is habitual, such that the event expressed by the verb is understood as a habit that began in the distant past. When *BIN* combines with a non-stative V-ed/-en (6), the eventuality expressed by the verb is interpreted as having ended in the far past.

- (4) *BIN<sub>STATE</sub>*:
- |                                  |   |
|----------------------------------|---|
| a. Bruce BIN running.            | ‘Bruce has been running for a long time’        |
| b. Bruce BIN knowing the answer. | ‘Bruce has known the answer for a long time’    |
| c. Bruce BIN in the kitchen.     | ‘Bruce has been in the kitchen for a long time’ |
| d. Bruce BIN knew the answer.    | ‘Bruce has known the answer for a long time’    |
- (5) *BIN<sub>HAB</sub>*: Bruce BIN running. ‘Bruce started running a long time ago, and he runs from time to time’
- (6) *BIN<sub>RS</sub>*: Bruce BIN ran. ‘Bruce ran a long time ago’

It is important to note that stative verbs can also occur in the *BIN* constructions. While non-stative verbs ending in *-ing* in *BIN* constructions can get a habitual reading (as in (5)), stative verbs ending in *-ing* cannot. They get a stative reading, as shown in (4). Also, stative verbs can occur with past morphology (4) and get a *BIN<sub>STATE</sub>* reading, not a *BIN<sub>RS</sub>* reading.

This inventory of markers helps to identify ways in which the markers *been*, *bin*, and *BIN* are distinguished and the ways in which they overlap. The marker *bin* is unstressed, and it occurs preceding *had*, and *BIN* also occurs with *had*. In addition to stress, another way to distinguish the markers is by other modifying elements that occur with them. For instance, while perfect *been* can co-occur with temporal adverbs that modify the duration of the event expressed by the predicate (7), *BIN* cannot (8).

- (7) *Bruce been here for two days.*
- (8) \**Bruce BIN here for two days.*

## 1.2 Research questions

Context in the discourse seems to be another factor that differentiates *BIN* from *been* and *bin*. Given that long duration of an eventuality is encoded in the semantics of *BIN*, discourses that also mention or allude to long eventualities may elicit *BIN* usage. The combination of negation and temporal ‘just’ to establish left boundary of an eventuality near the present can also elicit *BIN* usage. This combination comes in the form of a statement or a polar question with a negative answer in the contexts in the study. These two examples may reflect a pragmatic function of *BIN*: moving the common ground towards certainty. This lies outside the realm of this paper but may be useful to pursue in further research.

Our first research objective is to characterize range in use and meaning of *BIN*: to what extent did speakers produce *BIN* in *BIN* environments (e.g., *been* + V-ing, *been* + V-en/ed) and *been* in *been* environments (e.g., *been* + temporal adverbial, perfect *been*)? Additionally, were speakers more likely to produce *BIN* in obligatory *BIN* environments (resultant state: *been* + V-en/ed and *been* + high modal) relative to other *BIN* environments? Our second research objective is to examine the contextual properties surrounding the production of *BIN*. This question asks whether there are certain discourse factors that act as more reliable predictors for the production of *BIN*. The following experiment addresses both of these research questions, and seeks to paint a comprehensive picture of *BIN* production.

## 2 Southwest Louisiana production experiment

### 2.1 Materials and methods

#### 2.1.1 Stimuli

In total, there were 71 stimuli with *been*/*BIN*. They consisted of 11 items with *been* introducing a VP and 8 items with *been* introducing a PP. Each VP item was presented in three *BIN* environments (*BIN<sub>STATE</sub>*, *BIN<sub>HABIT</sub>*, *BIN<sub>STATE</sub>*) and two non-*BIN* environments (perfect *been* and habitual+adverbial). Each PP item was presented in the *BIN<sub>STATE</sub>* environment and the perfect *been* environment. Additionally, 6 of the VP items were also presented in the *BIN* + modal environment (*been could* or *been supposed to*, e.g., *Aw, the workers been was supposed to remove the chewing gum and old paper*), and 5 in the non-*BIN* *been* + long time adverbial environment (*The maintenance workers been numbering those tables for a long time*). Items were constructed to have a majority of sonorant sounds to avoid segmental perturbations to the fundamental frequency contour. Stress patterns on the target verbs and prepositions were chosen to systematically vary 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. Short texts and accompanying illustrations were constructed to set up the appropriate context for each environment. The texts were spoken by one of the authors (a speaker of the community variety) and recorded for auditory presentation. Coding of the contexts was done holistically where both context and the target responses were considered. Two of the authors discussed the coding of each context together. The contexts were coded into three categories: TEMPORAL JUST, POLAR QUESTION, and LONG-TIME. A context was coded with contrastive aspect if it contained some variant of “(subject) didn’t just VP” or “did just VP” and “did just VP” + a target felicitous with negation. Any sentence that contained a polar question was coded as such. A LONG-TIME reading was coded from the context explicitly, such as clear uses like “for X amount of time” or gathered pragmatically, which involved considerations of whether the eventuality was still going on. The prediction is that instances of long-time coding should be more prevalent in *BIN* contexts. Temporal just should also lead to *BIN*, and the lack of a polar question should as well. A combination of deviations from the predictions in regards to what type of *BIN* should be produced were considered ambiguous contexts. Further details on these specific contexts can be found in Section 2.3.

“been” type	Context	Context type
<i>BIN<sub>RS</sub></i>	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.	✓ TEMPORAL JUST
		✓ LONG-TIME
		✓ POLAR QUESTION
<i>BIN<sub>HAB</sub></i>	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.	✓ TEMPORAL JUST
		✓ LONG TIME
		✓ POLAR QUESTION
<i>BIN<sub>STATE</sub></i>	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?	✓ TEMPORAL JUST
		✓ LONG TIME
		✓ POLAR QUESTION
<i>Perfect been</i>	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.	✗ CONTRASTIVE ASPECT
		✗ LONG TIME
		✗ POLAR QUESTION
Target	The maintenance workers been numbering (numbered for <i>BIN<sub>RS</sub></i> ) those tables.	

Table 1: Sample contexts

Fifteen fillers made of grammatical AAE constructions were also given. Sample texts and illustrations for the item *been* + VP number-ing/ed are shown in Table 2.

### 2.1.2 Speakers

Speakers came from a small-town community in southwest Louisiana. This community has a population of 2,800, which is predominantly European American and 11% African American. The community has been historically segregated, and the members of the African American community are predominantly native AAE-speakers who share some language patterns with the local European Americans in their areas.

Nine participants, six females and three males between the ages of 25 and 67, were recorded. Six participants spent their entire lives in the community, and the other three 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 two years in college and the other earned a BS degree and a nursing degree.

### 2.1.3 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 44.1kHz 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. After the auditorily presented context finished playing, the target sentence to be uttered appeared on the slide for the participant to read. Only the orthographic form *been* was used in the target sentence regardless of whether the context presented a *been* or *BIN* environment. Participants were asked to repeat their utterances again if they were disfluent. 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.

Stimuli were presented with a Latin Square design in five blocks of 16-17 stimuli each, where no more than a single stimulus from an item set appeared within a block. Within a block, stimuli were pseudorandomized to avoid the same *BIN*/non-*BIN* environment appearing consecutively. The whole experiment took about 30 minutes.

### 2.1.4 Analysis

Recordings were segmented into individual utterances in Praat (Boersma and 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 analysis 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 an author (a speaker of the variety), with occasional additional input from another author familiar with AAE. Listener judgments are a standard way to characterize AAE and other varieties of English (Oetting and McDonald 2002). Two kinds of judgments were made: (i) the acceptability of the utterance, given the context, and (ii) a classification of the *been* type uttered (if the utterance contained *been*). Acceptability ratings were made on a 4-value scale: *good*, *ok*, *?*, *\**. “Good” ratings were judged to be better than “ok” ratings. To distinguish between “?” and “\*”, “?” was judged less acceptable than “ok” but more acceptable than “\*” in certain contexts, whereas “\*” was judged to be completely unacceptable given the context. The *been* type was classified as: *BIN*, stressed perfect *been* (phonetic realization with prominence of *BIN*, but in a non-*BIN* environment), or perfect *been*. 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.

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  $\alpha$ -level of 0.05. For logistic models, p-values were estimated with Wald tests; for linear models, significance at an  $\alpha$ -level of 0.05 was estimated using a 2 SE threshold (Gelman and Hill 2007, p. 42).

**2.2 Usage of BIN/been type in BIN and non-BIN environments**

To assess if participants were using *BIN* in *BIN* environments, we first partitioned environments into a binary split between *BIN* environments ( $BIN_{RS}$ ,  $BIN_{HABIT}$ ,  $BIN_{STATE}$ , *BIN* + modal) where *BIN* was expected, and non-*BIN* environments (perfect *been*, *been*+long time adverbial context), where non-*BIN* was expected. Across speakers (excluding la01, who failed task elicitation threshold criteria), the mean percentage of perceived *BIN* was  $85\pm 5\%$  (1SE) in *BIN* environments and an unexpectedly high  $46\pm 8\%$  (1SE) in non-*BIN* environments. However, this includes acceptable utterances with perceived *BIN* in non-*BIN* environments and acceptable utterances with perceived non-*BIN* in *BIN* environments. If those are excluded, the mean percentage of perceived *BIN* was  $91\pm 4\%$  (1SE) in *BIN* environments and  $39\pm 9\%$  (1SE) in non-*BIN* environments. Percentages of utterances perceived as *BIN* vs. non-*BIN* within *BIN* and non-*BIN* environments for each speaker are shown in

Figure 1. Speaker la10 comes closest to having a distribution of only perceived *BIN*s in *BIN* environments and only perceived non-*BIN*s in non-*BIN* environments. Speakers la04 and la05 show a large bias towards producing only perceived *BIN*s across environments. Other speakers fall somewhere in between these extremes.

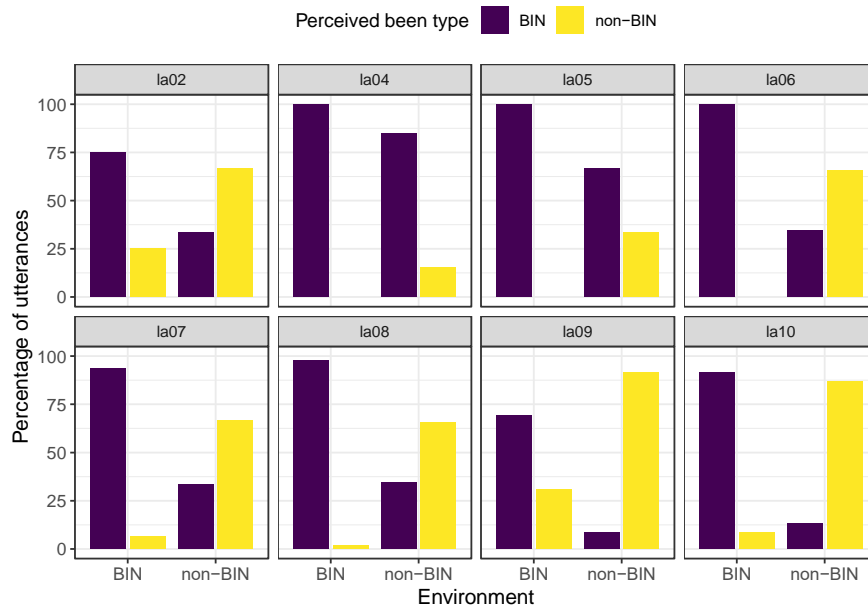


Figure 1: Percentage of utterances perceived as *BIN* vs. non-*BIN* within *BIN* and non-*BIN* environments for each speaker. Acceptable utterances with perceived *BIN* in non-*BIN* environments and acceptable utterances with perceived non-*BIN* in *BIN* environments are excluded.

Even including acceptable utterances with perceived *BIN* in non-*BIN* environments and acceptable utterances with perceived non-*BIN* in *BIN* environments, regression analysis 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 been type was *BIN* as the dependent variable, environment (*BIN* vs. non-*BIN*) 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 model ( $\chi^2(5) = 122.97$ ,  $p < 2.2e-16$ ). The effect of environment was significant:  $\beta = 2.279$ ,  $SE = 0.381$ ,  $z = 5.982$ ,  $p = 2.2e-9$ , odds ratio of 9.8.

Within VP items, we also checked whether perceived *BIN* was more likely in obligatory *BIN* environments (*BIN<sub>RS</sub>*, *BIN* + modal) than in the other *BIN* environments. Excluding la01, speakers produced perceived *BIN* 94±4% (SE) of the time in the *BIN<sub>RS</sub>* and *BIN*+ modal environments vs. 79±6% (SE) of the time in the other *BIN* environments. Considering only utterances in *BIN* environments, a logistic mixed effects model was built with an indicator variable for whether or not PERCEIVED BEEN TYPE was *BIN* as the dependent variable, ENVIRONMENT (obligatory *BIN* vs. not) as a fixed effect, and a by-subject random intercept. 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 ( $\chi^2(1) = 6.5301$ ,  $p = 0.01061$ ). The effect of ENVIRONMENT was significant:  $\beta = 1.3801$ ,  $SE = 0.5893$ ,  $z = 2.342$ ,  $p = 0.0192$ , odds ratio of 8.7.

### 2.3 Context ambiguity

The purpose of the context coding was to capture the discourse-pragmatic factors that may be driving *been* production. Of the 71 total contexts, there were 24 contexts comprising the expected *non-BIN* environments. Within these 24 contexts, all were coded for certainty, and 87.5% (21/24) had no contrastive aspect. For the long-time condition, 41.7% (10/24) were coded as indicating a long period of time. However, of these 10 contexts, 5 were the *been* + long time adverbial context. This was also the context that contains the only 3 recorded instances of contrastive aspect in the *non-BINs*. For the expected *BIN* environments, 93.6% (44/47) were coded for certainty, and 85.1% (40/47) did not have contrastive aspect. Nearly all of the expected *BIN* environments were coded-long time, with 91.4% (43/47) indicating a long time period.

Using the three context factors, a total of 12 context appeared to be ambiguous. Ambiguity here was determined by whether or not context coding of a context matched what was predicted in the environment. For example, there are two contexts in the *BIN* environment that lack a long time reading and contrastive aspect, but have certainty. In the *non-BIN* environment, there are ten contexts that are long-time coded. Of these ten, however, five of them are habitual adverbials. Three of the habitual adverbials are also coded for contrastive aspect. Overall, as seen in Figure 2, in ambiguous expected *BIN* environments speakers produced a perceived *BIN* 100% of the time. In the ambiguous expected *non-BIN* environments that pattern like *BINs*, the stressed *BIN* was produced with a mean frequency of 51.3±9% (1SE).

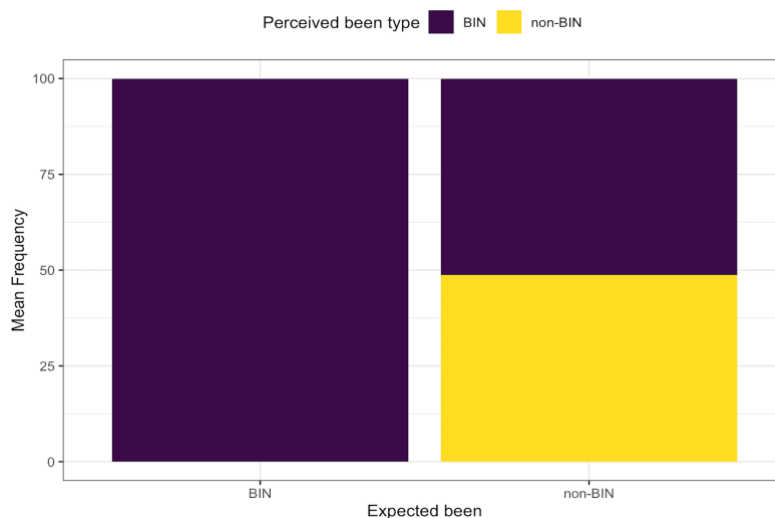


Figure 2: Mean frequency of perceived *BINs* from ambiguous contexts. Ambiguous *BIN* contained 2 contexts, and ambiguous *non-BIN* contained 10.



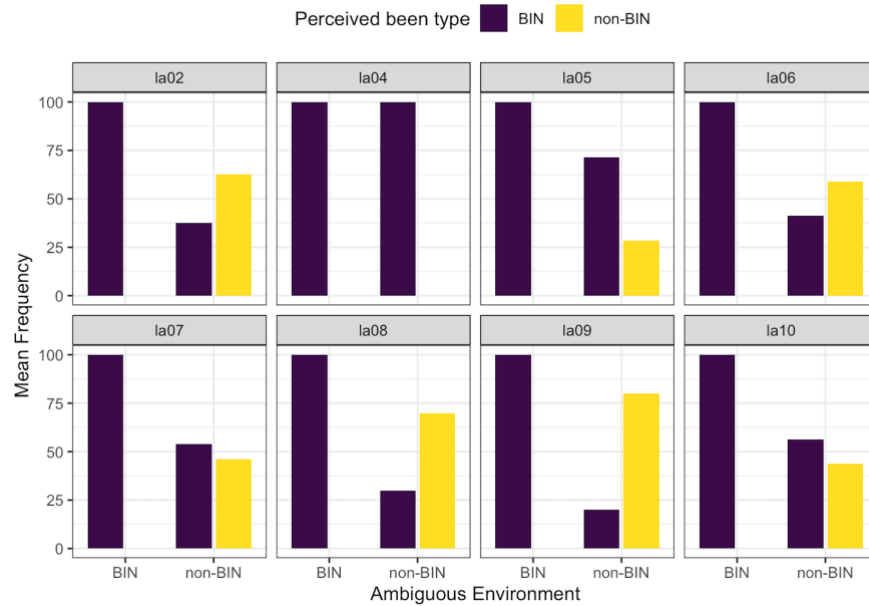


Figure 3: Percentage of utterances perceived as *BIN* vs. non-*BIN* within ambiguous *BIN* and non-*BIN* environments for each speaker.

Individual speakers appeared to show variation in their approach to *BIN* production in the ambiguous environments, as seen in

Figure 3. Speakers appear to be consistent in their *BIN* production in ambiguous expected *BIN* environments. One speaker, la04, produces *BIN*s in both ambiguous environments. In terms of the ambiguous expected non-*BIN* environments, speakers are less consistent. Speakers la02, la06, la08 and la09 are the only three that produce more non-*BIN*s in the ambiguous expected non-*BIN* environment.

A logistic mixed-effects model with PERCEIVED BEEN TYPE as the dependent variable was built. The three context factors (LONG-TIME, TEMPORAL JUST, POLAR QUESTION) centered to account for collinearity and were used as fixed effects; by-subject random slope was an intercept. There was not enough power to test for interactions between the three context factors. Using a likelihood ratio test, this model was compared to the null model. The result was significant ( $\chi^2(3) = 49.17$ ,  $p < 1.2e-10$ ), indicating that the inclusion of the three context factors bettered the prediction of perceived *BIN*.

Both LONG-TIME and POLAR QUESTION are significant, and TEMPORAL JUST is not:  $\beta = -1.221$ ,  $SE = 0.21$ ,  $z = -5.95$ ,  $p = 2.7e-9$ ;  $\beta = 3.163$ ,  $SE = 1.09$ ,  $z = 2.91$ ,  $p = 0.0042$ , and  $\beta = 0.1253$ ,  $SE = 0.31$ ,  $z = 0.41$ ,  $p = 0.68$ , respectively. Another logistic mixed-effects model with reverse Helmert contrast coding was run to establish whether the ambiguous cases resulted in a difference in perceived *BIN* production compared to the non-ambiguous cases. A model using PERCEIVED BEEN TYPE was the dependent variable, with AMBIGUITY (ambiguous, unambiguous *BIN*, unambiguous non-*BIN*) as a fixed effect with by-subject random slope as the random effect. There were two significant results. First, ambiguous compared to unambiguous non-*BIN* is less likely to result in a perceived *BIN* ( $\beta = -0.7449$ ,  $SE = 0.12$ ,  $z = -6.05$ ,  $p = 1.4e-9$ ). Second, unambiguous *BIN* compared to the other two categories is more likely to result in a perceived *BIN* ( $\beta = 0.5162$ ,  $SE = 0.08$ ,  $z = 6.81$ ,  $p = 9e-12$ ). A likelihood ratio test was also run to compare the above model to the null model. The result was significant ( $\chi^2(2) = 109.23$ ,  $p < 2.2e-16$ ).

### 3 Discussion

Overall, speakers are consistent in their production of *BIN* in expected *BIN* environments across ambiguous and unambiguous items. All speakers produce *BIN* in the expected environment at a rate greater than 70% of the time. In the unambiguous contexts,

Figure 1, there is the occasional speaker who produces a *non-BIN* in the expected *BIN* environment, but this disappears in the ambiguous environments, see

Figure 3. This change is likely due to the items that comprise the ambiguous expected *BIN*s. There are only two items in this context, and they are a resultant state (see Table 1) and modal, which is where the target contained “supposed to” (e.g. *Aw, Mona been was supposed to remind her about the meeting*). Despite being noted as ambiguous in context coding due to a lack of long-time reading, which was a consistent factor across the expected *BIN*s, these are two environments where the only possible production is stressed *BIN*, and our results reflect that.

Both unambiguous and ambiguous contexts for the non-*BIN*s present more opaque results. As seen in the previous figures, speakers vary in their production of non-*BIN* in the non-*BIN* environment. Some speakers, such as la10, show a fairly staunch distinction between *BIN* and non-*BIN* production in the expected environment. However, this distinction becomes less certain in the ambiguous non-*BIN* contexts, where their production becomes more 60/40 for *BIN* production. This may be due, in part, to the types of items that make up the ambiguous non-*BIN* contexts. There are ten contexts in the ambiguous non-*BIN*. Of those, half are perfect *beens* and the other half are habitual s+ adverbials, which are habituais but with a long time adverbial in the target (i.e. *Melanie been arranging the flowers for a while*). Closer inspection into these two different types revealed that speakers, in both the perfect and habitual+adverbials, produced *BIN*s in these ambiguous non-*BIN* environments more or less at chance. Altogether, however, the ambiguous and unambiguous contexts do not seem to differ too much, recalling that there was no significant difference between the two in regards to production of perceived *BIN*.

Another interesting result is what context factors were significant, which were long-time and certainty. Despite TEMPORAL JUST not being significant factor in the logistic mixed effects model, there does seem to be more *BIN* usage when contexts with aspectual contrasts are presented. Recall that temporal “just”, when combined with negation (in a question/response pair or in a negative statement), evokes *BIN* usage because the left boundary or start of the eventuality is explicitly to the non-immediate left of the present. Overall the ambiguous non-*BIN* contexts participants exhibited a 50/50 split between *BIN* and perfect *been*. Within these, the perfect *been* condition contexts did not make use of temporal “just” and participants varied in their responses with 52% non-*BIN* and 48% *BIN*. Within the habitual+adverbial condition, in the cases which made use of temporal “just” participants produced roughly 60% *BIN* and 40% non-*BIN* while the cases without temporal “just” exhibited a 52% *BIN* and 48% non-*BIN* split. The standard error was roughly  $\pm 11$  in all three cases, but it is interesting that the habitual+adverbial cases with temporal “just” pull slightly away from the 50/50 split that is seen in the cases without.

The concept of temporal “just” is an important one to clarify. We coded for only one type of temporal “just”, but in actuality it comes in multiple flavors. The one we used in this study combined with negation (and sometimes questions) to pick out *BIN*. But another type of temporal “just” picks out the perfect *been*. These can be the embedded question sentences like “We know what they were just doing.”. These show up exclusively in intended perfect *been* contexts and they evoke a reading of present relevance, which is a key aspect of present perfect meaning (Comrie 1976). The fact that these sentences are not found in *BIN* environments begs the question of *BIN*'s status as (present) perfect. While the eventuality in question should not be finished if *BIN* is to be licensed, it's not clear that that is the same present relevance that comes with present perfect *been*. This is not to say that there is no overlap between *BIN* and perfect *been*. We can somewhat see the overlap from use of both forms when presented with the ambiguous contexts as well as from the fact that *BIN* is often glossed into mainstream English with present perfect *have+been*. But it doesn't seem accurate to call *BIN* a perfect outright. There are uses of *BIN* that do not translate well into mainstream English with perfect *have+been* (consider ‘she *BIN* left’ = ‘she left a long time ago’  $\neq$  ‘she has left/gone’). So perhaps perfectness is a subset of the semantics of *BIN*, which is a remote past marker as opposed to a remote perfect.

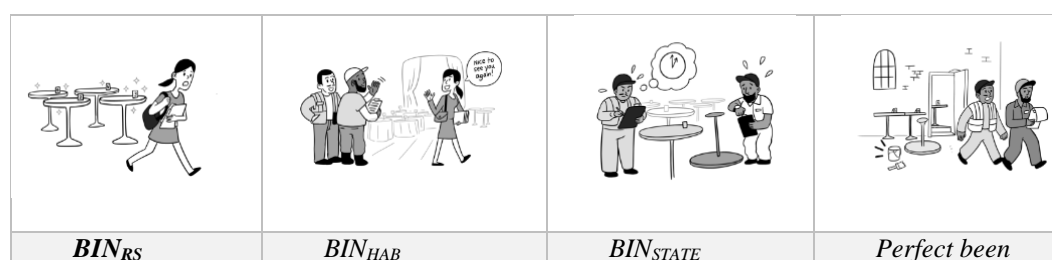
#### 4 Conclusion

The results from the production study showed that speakers overall did obey the intended split between *BIN* and non-*BIN* environments. With the exception of speakers la04 and la05, speakers

produced more BINs than non-BINs in *BIN* environments and more non-BINs than *BIN*s in non-*BIN* environments (see Figure 1). Within the class of *BIN* environments, *BIN*s were produced more in obligatory *BIN* environments than non-obligatory *BIN* environments (see Section 2.2). These facts together suggest that intended *BIN* environments are very consistent in the *BIN* production that results. Production in the non-*BIN* category is much more nebulous and further research could involve investigating the reason for this. The production data in concert with the logistic mixed effects model demonstrate that LONG-TIME and POLAR QUESTION were reliable predictors of *BIN* usage out of the three factors we coded for (LONG-TIME, TEMPORAL JUST, POLAR QUESTION). Future research might then involve determining what factors of the discourse elicit use of perfect *been* + long time adverbial, which seems to be in complementary distribution with *BIN*, as shown by the trend in the alternation shown in (7) and (8).

## 5 Appendix

A sample of the picture stimuli paired with their respective context scenarios.



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