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High aspect in the English *be going to* construction: Syntactic evidence

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Research into the syntax of English *be going to* has typically focused on how *going to* relates to *gonna*, but work has tended to focus less on the location and structure of the construction within the clausal spine. This paper compares two competing hypotheses for this location: the high aspect account, in which *going to/gonna* is a modal with *be* in a high functional head above it, and the little *v* account, in which future *be going to* is quite similar to the progressive main verb in structure. I observe that these proposals make contrasting predictions regarding additional material in the inflectional domain: the high aspect account prohibits future *be going to* from being preceded by a modal or *have*, while the little *v* account makes no such restriction. The synchronic accounts likewise represent differing views on the diachronic grammaticalization process. I test these predictions in two online experiments: a task in which participants determine the grammaticality of sentences containing *be gonna*, and a task in which participants determine whether sentences containing *be going to* take a future or motion reading. Results show that *be gonna* is ungrammatical when preceded by modals/perfect, and *be going to* takes more of a motion reading in the same context. Both tasks strongly favor the high aspect account. This supports syntactic approaches to grammaticalization that take items to move into and up the clausal spine.

1 Introduction

One of the ways in which English employs a periphrastic future is through use of *be going to*, as in (1).

(1) They **are going to/gonna** finish the project tomorrow.

Particularly because *going to* can be contracted to *gonna,* the construction has received attention from several areas of linguistics over the years, including sociolinguistics, historical linguistics, semantics, and syntax. Much of this research concerns the grammaticalization of the construction (Hopper & Traugott 1993; Danchev & Kytö 1994; Krug 2000; Poplack & Tagliamonte 2000; Traugott & Dasher 2001; Eckardt 2006; Wu et al. 2016). However, previous research into the construction has also considered the rising use of *be going to* in spoken English (Tagliamonte et al. 2014; Denis & Tagliamonte 2017) and the degree of lexicalization of *gonna* (Lorenz 2013, see also Broadbent & Sifaki 2013). The construction has seen limited research from formal perspectives as well. Much of this concerns the semantics of the construction in terms of both tense and modality (Nicolle 1998; Brisard 2001; Copley 2009; Klecha 2014). From a syntactic point of view, we may be additionally interested in how the construction fits into English inflectional and verbal structure. As with other research, such work has tended to focus on *gonna,* considering it to be a form of *to*-contraction (Postal & Pullum 1982; Pullum 1997) or cliticization (Krug 2000). The focus on *gonna* has also led to the examination of what can follow it (Roberts 1997).

In this paper, I aim to contribute to our understanding of the syntax of *be going to* by considering how the construction as a whole fits into the inflectional domain. Given the construction's importance to the study of grammaticalization (Hopper & Traugott 1993), this would seemingly be a key issue in shaping an understanding of this area of research. However, how *be going to* interacts with the inflectional domain is a topic more often glossed over or implicitly theorized by giving the construction a label such as semi-auxiliary (as in Quirk et al. 1985: 137). For this reason, multiple viewpoints of the syntax of *be going to* have been expressed, but rarely formalized explicitly (with Copley 2001; 2009 being a key exception). To my knowledge, the disagreement between these viewpoints has not been resolved. These viewpoints appear to fall into two clear types of proposal. The first, which I will call the HIGH ASPECT account, suggests that *be going to* is inserted quite high in the inflectional domain (Copley 2001; 2009). In this account, *going to* occupies the same functional head as other modals, and *be* is inserted above this. In Copley's formulation, *be* occupies a functional head bearing progressive aspect. However, that *be* is quite high in the inflectional domain is the key part of such a proposal, whether it is an aspectual head, some other functional head, or a default insertion (cf. Bjorkman 2011). Regardless, in this account future *be going to* is therefore syntactically distinct from main verb *be going to*. The second viewpoint, which I will call the LITTLE *v* account, suggests that future and progressive main verb *be going to* do not need to be quite so distinct (Klecha et al. 2008). Rather, in the future,

be going to keeps *be* as introducing progressive aspect above *going* to in *v* (see Cournane 2015 for an example of this view).

Both of these viewpoints have been expressed most clearly in the course of developing a compositional semantics of the future. In fact, the little *v* account arises more from arguing that the semantics of the future can be derived without relying on the high aspect account (Klecha et al. 2008), or implicitly from describing the grammaticalization of the construction, than from explicitly arguing for *going* being in vP. However, to my knowledge they have not been rigorously evaluated as syntactic proposals.

I observe that these competing proposals make contrasting predictions regarding additional material in the inflectional domain: the high aspect account prohibits future *be going to* from being preceded by a modal or perfect, while the little *v* account makes no such restriction. There is thus a relatively straightforward way of evaluating the accounts: does this restriction exist or not? 'Relatively' is a key modifier here; while the question is straightforward, the judgements involved in answering it are less so. For this reason, rather than rely on my own judgements I report two online tasks designed to test for the potential restriction across a wider sample of speakers. The results of both tasks favor the high aspect account in which *going to/gonna* is inserted above the perfect and progressive aspectual heads. Even if the semantics of *be going to* were to not ultimately support an inclusion of aspect, as argued by Klecha et al. (2008), the results favor the presence of some functional head above the modal in which a default *be* can be inserted (Bjorkman 2011). The experimental tasks additionally show *be going to* to be syntactically different from superficially similar constructions like *be about to*, which have also been classed as semi-auxiliaries (Quirk et al. 1985).

In the following sections, I first outline the high aspect and little *v* accounts in greater detail, including the key prediction tested here. I also note how the synchronic structure proposed in the two accounts, as models of the outcome of a diachronic grammaticalization process, effectively postulate competing approaches to grammaticalization. I then report the two experimental tasks: first a grammaticality judgement survey in which participants evaluate sentences involving *gonna*, and secondly a task in which participants decide whether sentences with *going to* have a motion or future reading. While these tasks favor the high aspect account, I consider alternate approaches to the little *v* account that may yield the experimental data. I ultimately conclude, however, that the simplest explanation of the data is that an account closer to the high aspect account, in which a modal *going to* inserted high in the inflectional domain, with still higher *be*, is the more accurate approach to the structure and location of future *be going to* in the syntax.

2 Approaches to *be going to*

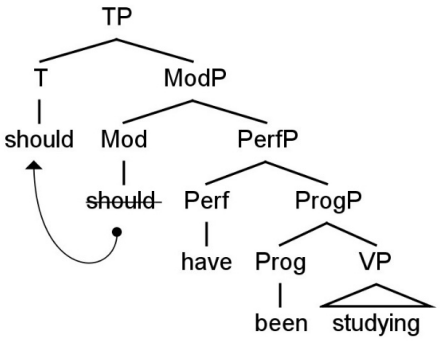
This section outlines the high aspect and little *v* accounts of *be going to*. I assume that both accounts fit into standard approaches to the English inflectional domain (Roberts 1985; Jaeggli

and Hyams 1993; Adger 2003). Such approaches seek to explain why sentences with multiple auxiliaries follow a fixed order of modal-perfect *have*-progressive *be*, as in (2), by locating them in a series of functional heads between TP and vP.

(2) a. I should have been studying.
b. *I am should have studied.
c. *I should be have studied.

The fixed order in which modal/auxiliary verbs may appear reflects their hierarchical order; verbs that surface later merge lower in the syntax, and verbs that surface earlier are merged into the syntax higher up. I take modals to merge into a ModP (van Gelderen 2003) rather than directly into T (Adger 2003). The highest merged modal/auxiliary moves to T and is tensed (Pollock 1989; Adger 2003; van Gelderen 2003), but crucially any other auxiliaries present remain *in situ* (3).

(3)



After sketching out the competing accounts, I discuss the predictions each account makes regarding co-occurrence of the construction with modals/perfect, and what processes of grammaticalization these accounts are apparently an outcome of.

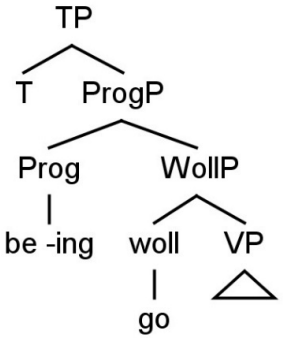
2.1 High aspect

Descriptions of *be going to* often gloss over a specific view of where the construction fits into the syntax. However, claims that sentences with *be going to* are monoclausal (Krug 2000), with *be going to* being semantically a modal (Klecha 2014) and taking an auxiliary or auxiliary-like role (Quirk et al. 1985; Krug 2000), seem to offer an implicit argument for locating *be going to* in the inflectional domain above vP. Likewise, although the syntax of the construction itself is typically not explicitly addressed, suggestions that *be* and *going to* contribute separately to the construction's meaning (Nicolle 1998) may indicate that its pieces occupy two or more functional heads.

In her work on the semantics of the future, Copley (2009) formalizes such an approach. She notes that future *be going to* appears to maintain some progressive aspect in its meaning,

and argues that this would mean that the construction includes some sort of functional head (henceforth Asp, following van Gelderen 2003) that triggers progressive morphology on *go*. In Copley's (2009) account, *be* takes this Asp position while *going to* introduces the future reading. This introduces a complication, as progressive *be* is quite low in the inflectional domain (Adger 2003) while the future would be introduced higher in Mod. An account placing *be going to* fully in the inflectional domain must therefore posit a novel functional head: either as part of an AspP above the modal, or as a modal appearing below ProgP. Copley (2001; 2009) opts for the former, proposing that Asp takes a high position above other auxiliaries.[1] Crucially, this AspP is distinct from the typical English ProgP; canonical progressives are still inserted in the position assumed under standard approaches to the English inflectional domain (cf. Adger 2003). In her formalization, Copley (2001: 95) proposes that *going to* appears in the WollP proposed by Abusch (1985):

(4)



Nie (2015) incorporates a modified version of this account into her approach to the Canadian French periphrastic future, placing the future in ModP. I follow Nie in taking Copley's (2001; 2009) use of WollP to be equivalent to ModP. Under the approach to the inflectional domain that I assume, this would give the following proposed structure for *be going to*:[2]

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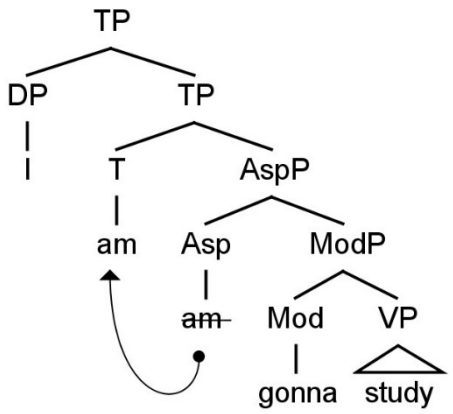
[1] Copley's reasoning for choosing a high Asp head over a low Mod head is based on Cinque's (1999) cartographic approach to functional heads. Cinque offers a fine-grained hierarchy of functional heads, which defines the order in which heads occur in a clause. If in a given utterance a lower head precedes a higher one in this hierarchy, that would be evidence that either movement has occurred or that the utterance is biclausal. Copley suggests that according to Cinque's (1999) hierarchy, if Asp is in the typical low position of English, utterances with *be going to* would have to be triclausal because it precedes the future. It is unclear that this in fact the case. Given that several authors have argued for treating *be going to* as a Restructuring phenomenon (Pullum 1997; Roberts 1997; Goodall 2006) which would therefore have monoclausal-like properties (Wurmbrand 2003), an alternative analysis keeping *be* in ProgP and *going to* in ModP would simply have ProgP select a TP or ModP as its complement. With respect to the contrasting predictions discussed in this paper, this alternative analysis is not distinguishable from the little *v* account.

[2] An anonymous reviewer asks whether this account needs to allow for epistemic modals to move past T or Asp. AspP is distinct from the typical English ProgP, which means that non-*be going to* epistemic modals can still properly precede ProgP (i). At the same time, AspP appearing above ModP is not problematic for epistemic *be going to*, as *be* surfaces before *going to/gonna* regardless of the reading (ii–iii)

(5)



This approach to *be going to* fits the broader generalizations about the construction noted above. Given that *be* is in Asp and *going to/gonna* is in ModP, the following verb is in fact the main verb of a monoclausal sentence. At the same time, placing *going to* in Mod makes it syntactically a modal while fitting the characterization of it as semantically modal (Klecha 2014). It is not clear from Copley's proposal where *to* is located in *going to*. She notes that unlike in other contexts with *to* as a finite tense head, the two items cannot be separated. Where *to* lies is exactly is beyond the scope of this paper, but I will effectively treat *going-to* as a single lexical item here, as the internal structure will not be relevant to the experimental design or analysis.

Note that while I follow Copley's assertion of a progressive reading in placing *be* in Asp, this is not necessarily crucial to the analysis. *Be* could of course occupy a functional head without being aspectual. At the same time, even if there was not a second progressive aspectual head this high in the inflectional domain, placing *going to/gonna* in Mod would most likely necessitate insertion of *be* as an auxiliary because *going to/gonna* has progressive morphology directly. This would seem to block it from being tensed, which would mean it could not raise to T as the highest modal/auxiliary present. This failure to be tensed would lead to default insertion of *be* above *going to/gonna* (Bjorkman 2011). The key part of the high aspect account, therefore, is the positing of *going to/gonna* being inserted in Mod, as there are multiple reasons why *be* could appear above Mod.

2.2 Little *v*

As seen, the high aspect account essentially accounts for *be going to* having modal qualities (Klecha 2014) by making it syntactically a modal. However, Klecha et al. (2008) note that in Copley's (2009) account *be going to* is effectively the marked form of expressing the future because

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(i) Emily might be eating dinner right now.

(ii) That child is gonna fall in the pool! (Epistemic)

(iii) Jeff is gonna fly to Paris tomorrow. (Deontic)

its aspect head above ModP is additional material not present in *will*. In this sense *be going to* is probably more syntactically marked as well, but Klecha et al. focus on semantics. They propose the opposing view: *be going to* is the unmarked future, and *will* is marked by having a context restriction operator. As evidence that *be going to* is the unmarked future they note that children acquiring English adopt use of *be going to* before use of *will*, and in more contexts than *will* early on. Because their focus is on the semantics of *be going to*, Klecha et al. (2008) unfortunately do not offer a syntactic account of what this unmarked approach to *be going* to would look like, but we can consider two possibilities.

One possibility involves *be going* to being high in the inflectional domain like in Copley (2009). To do so would mean locating the entirety of *be going to* as a single lexical item within ModP, so as to not be more syntactically marked than *will*. This seems unlikely, as *be* is clearly an auxiliary within the construction. It participates in inversion, is tensed, and precedes negation (6–8).

(6) Are you going to/gonna eat that?

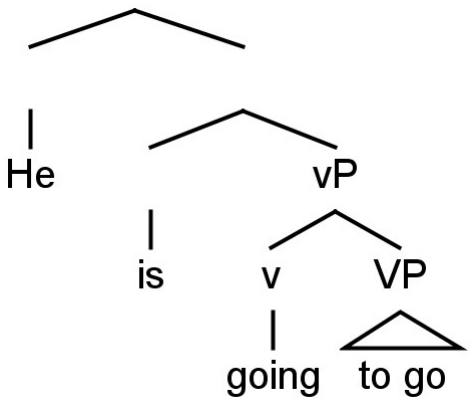
(7) a. I was going to/gonna say the same thing as Jackie.
b. The rhythm is going to/gonna get you.

(8) I'm not going to/gonna buy that, I promise.

In order to act as a typical English auxiliary, it seems quite clear that the *be* in *be going to* is a head distinct from *going to*.

The alternative is to keep the syntax of *be going to* as reflective of linear surface order as possible. However it is implemented, such an approach would locate *be* in a head below ModP. Because the construction involves *be* introducing a verb with progressive morphology in linear surface order, a clear possibility is that *be* is in ProgP and *going* in *v* or V. This appears to be the approach roughly adopted by Cournane (2015: 103), who describes *be going to* as a little *v* modal in her study of L1 modal acquisition:

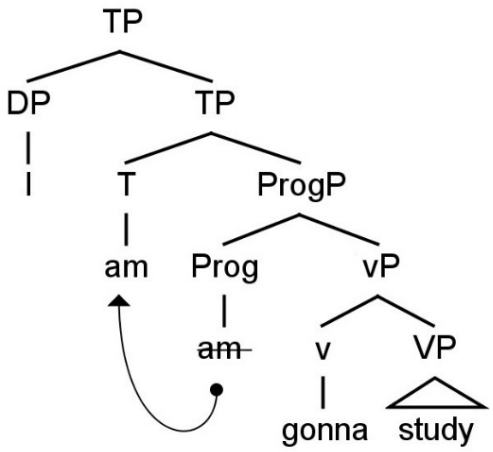
(9)



(Cournane 2015: 103)

As seen, *going to* is lower in the clause. The status of *be* is less clear, as the phrase is left unlabeled in the original work. However, that it is unlabeled suggests to me that there is no novel head posited, as that would necessitate some discussion. Cournane (p.c.) confirms that this tree treats *be* as some aspectual head while remaining agnostic as to where it is placed. As with Copley's (2001) high aspect proposal, it is not entirely clear where *to* lies in the syntax since it is compiled into VP with the remainder of the sentence, although it is most likely the typical finite tense head. Taking this head to be Prog gives the little *v* account of *be going to*:

(10)



Similar views take *going to/gonna* to be a Restructuring phenomenon (Pullum 1997; Roberts 1997; Goodall 2006) that selects for something smaller than a full CP. My use of VP as the complement of *going to/gonna* is consistent with these views, but the complement could in principle be larger if the construction is indeed a case of Restructuring. Because Restructuring phenomena have monoclausal-like properties (Wurmbrand 2003), this would mean Krug's (2000) suggestion that *be going to* is analyzed as monoclausal is accounted for in this account.

The account in (10) captures a view of *be going to* present in work like that of Cournane (2015). However, even if such a view were not present in the literature, it would make sense to adopt it as an alternative hypothesis to the high aspect account because it is effectively a null hypothesis: rather than adopt a novel functional head, assume future *be going to* is minimally distinct from main verb *be going to* in the syntax.

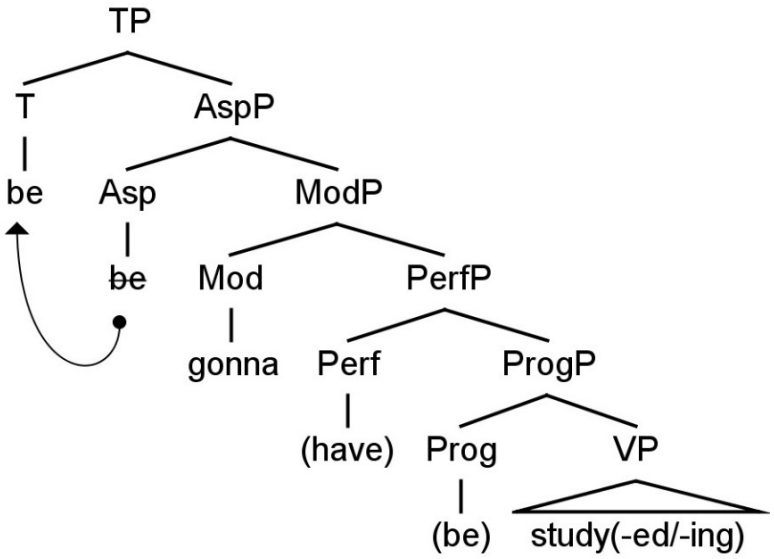
2.3 Interaction with the inflectional domain

In sentences where *be going to* is present without other modals/auxiliaries, it is difficult to distinguish between the high aspect and little *v* accounts.[3] However, because they insert *be going*

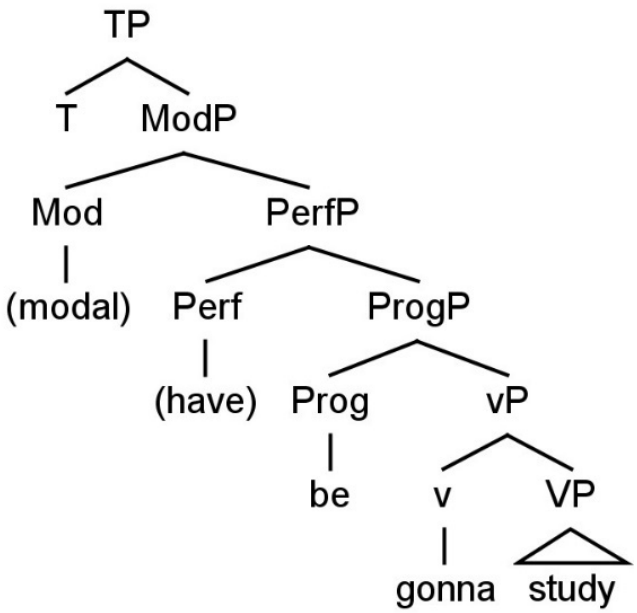
[3] An anonymous reviewer asks whether the two possible positions for *be going to* might yield different meanings, and specifically whether one position involves more semantic bleaching than the other. While beyond the scope of this paper, this is an interesting question that could bear on the historical development of the construction.

to in such different positions within vP and the inflectional domain, this does influence what is predicted to be able to precede the construction. In obtaining such predictions, I continue to assume standard approaches to the English inflectional domain (Roberts 1985; Pollock 1989; Adger 2003; van Gelderen 2003). Importantly the highest merged auxiliary raises to T, with no additional movement of lower heads. In (11–12) respectively I repeat the high aspect and little *v* accounts. In these trees, I include more of the inflectional domain for illustrative purposes.

(11)



(12)



The trees in (11–12) point to a clear difference in what strings of auxiliaries are permitted in each account. In the little *v* account, the progressive *be* is merged below ModP and PerfP. As such, we would expect examples such as (13–14), in which another auxiliary is merged and tensed above *be*, to be licit:

(13) ?I'm glad the pool closed [due to the pandemic], because I had been going to/gonna feel bad about not going otherwise.

(14) ?Emma might be going to/gonna eat dinner soon.

In contrast, the high aspect account merges *going to/gonna* in ModP, and *be* above other potential auxiliaries. Because in this account *be* is the highest auxiliary, PerfP should not be able to be merged above *be going to*. At the same time, because *going to/gonna* is in ModP, other modals are blocked from being inserted. For these two reasons, the high aspect account predicts that future *be going to* cannot occur as in (13–14). This is a clear contrast between the two competing accounts.

Note that these accounts are not clearly contrasted with respect to what may follow *be going to*. It is clear that the high aspect account predicts that auxiliary modals may not follow it, as *going to/gonna* is in ModP blocking other modals (15). Likewise, the account predicts that semi-auxiliaries like *have to* and perfects may follow *be going to*, as these can be merged below ModP (16–17).

(15) ?I'm gonna might teach French next year.

(16) ?I'm gonna have to call you back later.

(17) ?I'm gonna have eaten lunch before you arrive.

However, it is less clear what the predictions are for the little *v* account because it is unclear what *going to/gonna* selects as a complement. We might assume it to be VP, but if we take *be going to* as a Restructuring phenomenon (Pullum 1997; Roberts 1997; Goodall 2006), this would mean that *going to/gonna* simply selects for something smaller than a CP. As such, the little *v* account could permit (15–17), block (15–17), or allow a subset of these. For this reason we will focus on the clear contrast between accounts in what may precede *be going to*.

The prediction that future *be going to* is blocked when preceded by a modal/perfect in the high aspect account, but not the little *v* account, takes two forms depending on whether the sentence includes *going to* or *gonna*. *Gonna* is only allowed with a future reading, and cannot be used as a main verb to indicate motion.

(18) a. Mary is gonna teach the class.
b. *Mary is gonna the store.

If the high aspect account is correct, this means that since future *be going to* cannot be preceded by a modal/perfect, examples like (13–14) are ungrammatical with *gonna*, as the only context in which it is permitted is blocked.

In contrast, *going to* can act as a main verb denoting motion. In this context its progressive would presumably be derived in the ProgP typically assumed of English and adopted by the little *v* account. As such, sentences such as (13–14) would not be immediately ungrammatical. However, the structure for the future reading is still blocked in such examples. In this case, the prediction is that the sentence is forced to be read as motion when *be going to* is preceded by a modal/perfect.[4]

It is important to note that even though the predictions when *going to* is present involve the meaning of the sentence, this is solely a syntactic effect. Other periphrastic future constructions, as well as the progressive, are both licit when preceded by modal/perfect, as shown in (19–20):

(19) a. I had been about to start working when the power went out.
b. Maisie might be about to leave the party.

(20) a. I had been jogging in the park when the storm started.
b. Their plane should be taking off right now.

These predictions make clear, testable contrasts. When *gonna* is present, the question is whether a sentence with preceding modal/perfect is grammatical. When *going to* is present, the question is whether a sentence with preceding modal/perfect must indicate the future. While the questions are clear, answering them is less clear. I certainly do not trust my own judgements; sentences with modal/perfect *be gonna* seem quite degraded, but I do utter such examples (including 13) from time to time. It is unclear to me, then, whether such utterances are grammatical or speech errors. At the same time, corpus studies of the English future which code data for syntactic context do not account for these potential environments (Szmrecsanyi 2003; Tagliamonte et al. 2014; Denis & Tagliamonte 2017). Two issues arise with this omission: it is unclear whether the omission is due to a lack of examples or a lack of looking for them, and even if few/no instances were found, it would be difficult to prove this is a systematic gap rather than an accidental gap. For these reasons, I turn to experimental methods to obtain a larger number of non-linguist judgements on the contrasts. Judgements obtained experimentally tend to correlate with more informally obtained judgements (Sprouse et al. 2013), and in this case the extra judgements may prove helpful in resolving the research question.

[4] This raises a question as to what exactly the structure is in this context. I tentatively suggest that the nonfinite verb phrase is coerced into being a Small Clause complement to the preposition *to*.

2.4 *Be going to* and grammaticalization theory

The reanalysis of *be going to* to indicate the future is held up as a classic example of grammaticalization (Hopper & Traugott 1993; Krug 2000; Eckardt 2006). In this context, any syntactic description of the construction is inherently a description of some stage of its grammaticalization. We should therefore consider what the competing accounts of *be going to* offered above imply about syntactic change during grammaticalization. Because its grammaticalization and adoption as a dominant form of future expression is quite advanced in many English varieties (Tagliamonte et al. 2014), it makes sense to think of the high aspect and little *v* accounts of *be going to* as representing the outcome of the grammaticalization process. Taken as endpoints of this process, the two approaches assert differing manners for grammaticalization to proceed.

Both accounts share the claim that *to* has moved somewhere in the main clausal spine, as it no longer heads a prepositional phrase. Beyond this, the conversion of *be going to* into a Restructuring phenomenon is the primary syntactic change to occur in the little *v* account. Relatively little changes in the hierarchical positioning of heads; because *be* remains in ProgP, *going to/gonna* can at highest be merged into *v* (Cournane 2015). In contrast, the high aspect account changes where *be going to* is located quite drastically by placing the entirety of the construction in the inflectional domain since *going to/gonna* is in ModP and *be* is in a novel functional head above this (Copley 2001; 2009).

While we cannot ascribe the changes yielding the modern synchronic form to movement without historical evidence *per se*, it is worth noting that the high aspect account is consistent with arguments that a lexical item grammaticalizes by moving into and up the clausal spine, whether due to principles of economy ("merge-over-move", van Gelderen 2004) or parametric changes and markedness (Roberts & Roussou 2003). The high aspect account, in which *to* is now in the clausal spine and future *be going to* as a whole is higher up the clausal spine than main verb *be going to*, reflects the kind of outcome we would expect from this kind of grammaticalization process. The little *v* account involves some of the movement assumed in this view as well, as the entry of *to* into the clausal spine and movement of *going to/gonna* to *v* are instances of such movement. However, the view of grammaticalization put forward by Roberts & Roussou (2003) and van Gelderen (2004) is not sufficient to obtain this account. Rather, the little *v* account appears to posit reanalysis as a Restructuring construction as a diachronic grammaticalization process in and of itself.

Testing which account best captures the facts surrounding the place of *be going to* in the inflectional domain thus offers more information beyond simply informing us about the structure of a particular phenomenon. Indeed, comparing the high aspect and little *v* accounts of *be going to* informs our understanding of the process of grammaticalization. Evidence in favor of the high aspect account would constitute independent evidence in support of views of grammaticalization

as primarily movement up the clausal spine (Roberts & Roussou 2003; van Gelderen 2004). However, evidence in favor of the little *v* account would suggest that the process they describe is not the only syntactic process involved in grammaticalization, and would offer a path forward for exploring potential other processes.

3 Experiment 1

The goal of Experiment 1 was to test the grammaticality of the *be going to* construction with a preceding modal or perfect. As noted above, this involves soliciting grammaticality judgements of sentences using *gonna*. This section describes the methods used, predictions of the high aspect and little *v* accounts, and the results of the experiment.

3.1 Methods

This experiment utilized a grammaticality judgement task. Participants were presented visually with novel sentences (n = 87), constructed by manipulating examples found online through a Google search. Sentences were presented in a randomized order. Of these, 36 items were key test stimuli (Supplementary file). These included 6 uses of *be gonna* without additional inflectional material (21), 6 uses with a preceding modal (22), 6 uses constructed as a perfect (23), and a contrast set using *be about to* in these same three environments (6 uses in 3 environments gives n = 18, 24–26).

(21) Madison is gonna write an email.

(22) Emma might be gonna eat dinner.

(23) I had been gonna do my homework until it started snowing.

(24) Jim is about to miss his flight.

(25) Maisie might be about to leave the party.

(26) Sam had been about to buy a house when she lost her job.

The remaining items in the task were fillers: clearly grammatical and ungrammatical items (n = 6 each, 12 total), as well as non-test conditions involving *be gonna* in other syntactic environments (n = 39). Participants were asked to rate these sentences for acceptability, defined as how natural the sentence seemed to the participant, on a sliding scale from 1–100 in which a rating of 1 indicated a sentence was completely unacceptable and a rating of 100 indicated a sentence was completely acceptable. Because the visual presentation of examples included *gonna*, participants were explicitly told that their rating of a sentence's acceptability should not reflect whether the

sentence is acceptable in formal writing. Participants were asked to test the scale on two control items before proceeding to the task. Following the task, participants gave some basic demographic information and indicated whether they would be willing to participate in a follow-up study.

The grammaticality judgement task was produced and hosted on the PCIbex Farm (Zehr & Schwartz 2018). Participants were recruited via Prolific, a platform designed to enable the screening, recruitment, and fair payment of participants in academic studies (Peer et al. 2017; Palan & Schitten 2018). The task was estimated to take 20 minutes to complete, and participants were paid the USD equivalent of £2.50 for their time (as of November 2020, a £7.50 hourly rate). Payment was approved after confirming that the participant passed attention checks which indicated that they understood and executed the task. Attention checks were defined as the 12 clearly grammatical and ungrammatical items in the task: if visual inspection of violin plots of the distribution of ratings for these conditions showed that they clearly differed, the participant passed. Participants were instructed to take the study on a desktop computer. Fifty participants were targeted for inclusion in the study. To achieve this, 52 total people engaged with the task. One returned it without completing it (i.e., reserved a space, chose not to participate, and released the space back to the broader participant pool), and one was rejected for failing the attention checks.

Because some literature suggests that *be going to* is more established in American Englishes than other varieties (Szmrecsanyi 2003; Tagliamonte et al. 2014: 81), participants were prescreened to live in the United States. Upon review of the demographic information that participants provided, this was too broad; although passing the attention checks shows the participants to be fluent English speakers, a few participants indicated that English was not their first language and/or they were not originally born in the US. Rather than exclude these participants, the experiment was re-run to select for a more targeted population. Fifteen participants were targeted for the re-run; 19 in total engaged with the task. One participant returned the task, one exceeded Prolific's time limits for completion, and two were rejected for failing attention checks. The prescreening criteria used for the re-run were that the participant lived in the US, was born in the US, spoke English as their first language, and did not take the first run of the study. Comparison of both trial groups shows that any differences in ratings are minimal. The sole significant difference is that sentences with bare *gonna*, as in (20), are rated as slightly less natural by the second trial group (**Figure 1**).

As seen in **Figure 1**, both groups rate such sentences highly despite the minimal between-group difference. This suggests to me that any differences in ratings are based more on sociolinguistic evaluation than syntactic constraints. For this reason, I present the experimental results with the two groups combined, but will account for trial group where relevant in statistical analyses.

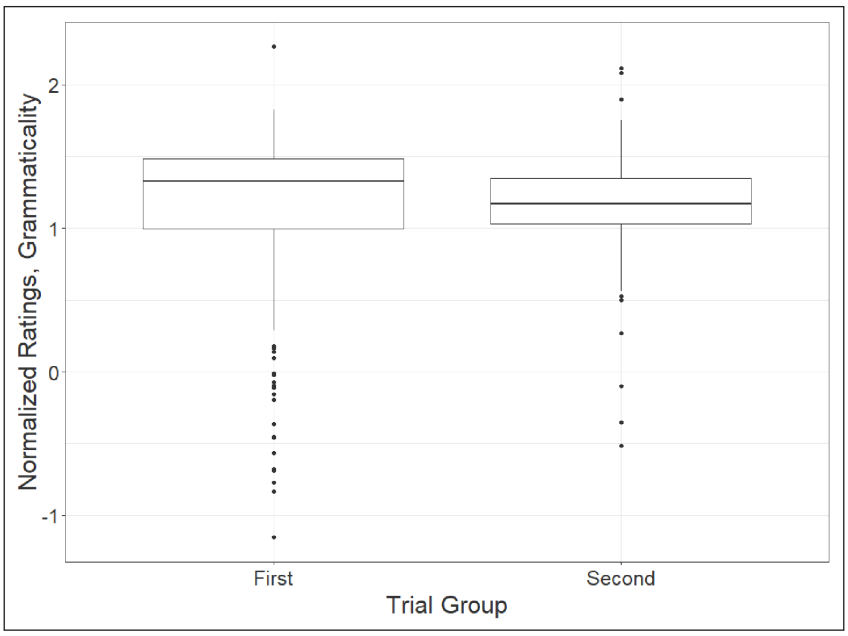


Figure 1: Grammaticality ratings for bare *gonna* by trial group.

3.2 Predictions

The key test items introduce two independent variables: Verb (*gonna* vs. *about to*) and Context (bare vs. modal vs. perfect). Regardless of the syntax of the construction, the test items in the bare context are expected to be rated as grammatical. Likewise, the data in section 2 indicates that the test items involving *about to* are expected to be rated as grammatical regardless of context. The high aspect and little *v* accounts differ with respect to *gonna* + modal/perfect (**Table 1**).

	High Aspect Account	**Little *v* account**
Bare *be gonna*	Grammatical	Grammatical
Modal + *be gonna*	Ungrammatical	Grammatical
Perfect + *be gonna*	Ungrammatical	Grammatical

Table 1: Contrasting *be gonna* grammaticality predictions for accounts under consideration.

The high aspect account predicts ungrammaticality in these contexts. In the modal context, this is because insertion of the modal *gonna* into Mod blocks insertion of other modals in this head. Meanwhile, in the perfect context *be gonna* is inserted above *have*. This means that a statistically significant interaction between Verb and Context in the expected direction constitutes evidence in favor of the high aspect account.

In contrast, the little *v* account predicts *gonna* + modal/perfect to be grammatical, because in both ModP and PerfP can be inserted above *be* in ProgP. The prediction is therefore a nonsignificant interaction. Note that since it effectively is the null hypothesis, this means this experiment cannot directly support the little *v* account. However, nonsignificance in conjunction with high grammaticality ratings would certainly favor the little *v* account in comparison to the high aspect account, although further research would be required to confirm this.

3.3 Results

The data to be analyzed includes the test items for 64 participants (n = 2304; age 18–75; self-identified gender 34 female/28 male/2 other; approximately 60% White; approximately 60% with BA or higher education level). This includes 49 of the participants from the first run and all 15 from the second. One participant was excluded after completing Experiment 2 (below) and failing the attention checks. Upon review of the Experiment 1 data, it was found that this participant had very nearly failed the Experiment 1 checks as well, as the distribution of clearly grammatical/ungrammatical ratings overlapped to a large degree with means differing in the correct direction. It was concluded that the participant likely should not have passed the checks for this experiment due to the overlap, even if the difference in means was on the whole correct. Another participant who failed the Experiment 2 attention checks did pass the Experiment 1 checks, and is included in the data reported here.

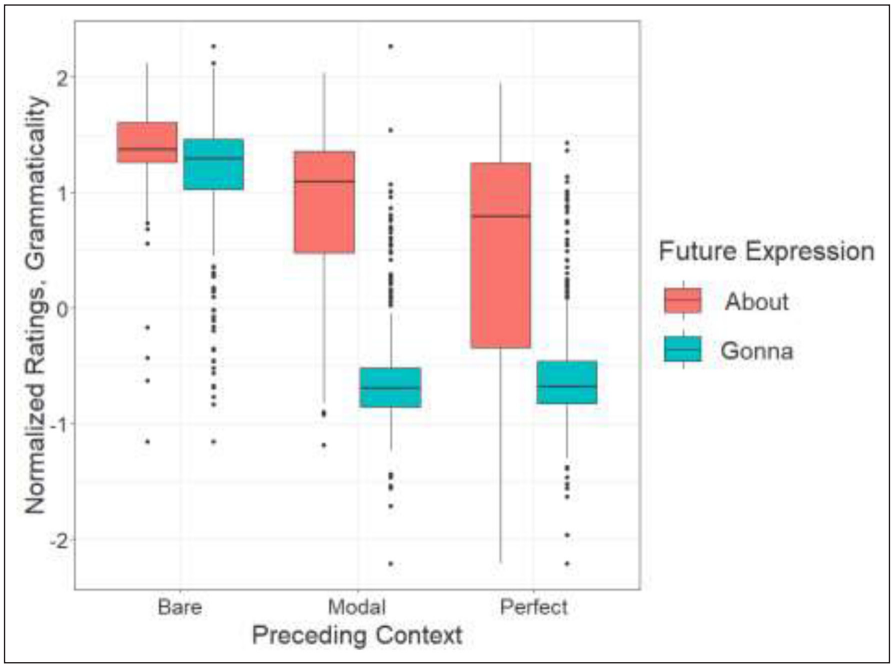


Figure 2: Grammaticality ratings of *be gonna*.

Data was normalized by z-scores to account for participants using differing ranges of the sliding scale. Low values indicating overall ungrammaticality correspond to negative z-scores, and high values indicating to overall grammaticality correspond to positive z-scores. Visual inspection of the results (**Figure 2**) shows that, as expected, bare *about to* and *gonna* are rated as grammatical. However, they differ in how ratings pattern in the modal/perfect contexts. *About to* ratings decrease but tend toward grammaticality when preceded by modal/perfect. In contrast, *gonna* ratings are quite low and indicate ungrammaticality when preceded by modal/perfect.

Linear mixed effects regression, using the *lme4* package (Bates et al. 2015) in R (R Core Team 2020), was used to further evaluate the results. The model was first run using random effects only. Participant and Experiment Item were included as random intercepts, and Presentation Order, representing when in the task a given item was encountered, was included as a by-participant random slope. The *step* function was then used to determine by a stepdown process which, if any, effects should be kept in the final model. This process kept the random intercepts, but eliminated the random slope for Presentation Order. Next, the fixed effects were added into the model alongside the random effects. I begin maximally, including Verb, Context, and Trial Group as main effects and all combinations of two- and three-way interactions. The *step* function was then used again to determine which fixed effects should be kept in the final model. This approach yielded the final model in (27):

(27) lmer(Rating ~ Verb + Context + Trial Group + Verb:Context + Verb:Trial Group + Context:Trial Group + (1 | Participant) + (1 | Item))

I use bare *about to* as the baseline condition for this model (**Table 2**).

As seen, although the main effect of Trial Group and its interactions with Verb and Context are kept in the model, these effects are the smallest of any in the model and only the interaction between Verb and Trial Group is statistically significant. This represents the difference illustrated earlier in **Figure 1**: sentences with *gonna* are rated slightly less grammatical in the second group than in the first. In contrast, we see stronger, significant main effects of Verb and Context. As noted above, the main effect of Verb may well be due to sociolinguistic evaluation as the estimate for the effect is quite a bit smaller than the intercept estimate (–.205 vs. 1.363). This indicates that while bare *gonna* is rated slightly worse than bare *about to*, both are seen by participants as grammatical. The main effect of Context may be a grammatical effect whereby some participants find *about to* grammatical when preceded by modal/perfect and others do not. It may also be a task effect whereby more complex sentences are rated worse than simpler sentences. This would make sense, given that the Context effects in conjunction with the Intercept estimate still yield positive ratings. However, the interaction between Verb and Context shows that *gonna* is rated significantly worse than *about to* when preceded by modal/perfect. The large estimate values, combined with the fact that we have already observed a main effect of Verb and Context,

strongly suggests that the interaction reflects a grammatical constraint, as any task effects should have already been accounted for. Finding the significant interaction between these factors is uniquely predicted by the high aspect account of *be going to*.

	Estimate	**Std. Error**	**df**	**t value**	**Pr(>|t|)**
Intercept (Bare *about to*)	1.363	0.049	45.254	27.90	**<<0.0001**
Verb—Gonna	–0.205	0.063	32.872	–3.24	**0.0027**
Context—Modal	–0.539	0.064	34.356	–8.42	**<<0.0001**
Context—Perfect	–0.911	0.064	34.356	–14.23	**<<0.0001**
Trial Group—Second	0.107	0.067	283.941	1.60	0.1107
Verb--Gonna: Context--Modal	–1.199	0.087	30.000	–13.70	**<<0.0001**
Verb--Gonna: Context--Perfect	–0.838	0.087	30.000	–9.57	**<<0.0001**
Verb--Gonna: Trial Group—Second	–0.128	0.057	2201.999	–2.25	**0.0248**
Context--Modal: Trial Group—Second	–0.068	0.070	2201.999	–0.97	0.3340
Context--Perfect: Trial Group—Second	0.134	0.070	2201.999	1.92	0.0550

Table 2: Linear mixed effects regression of grammaticality rating task.

4 Experiment 2

As discussed in section 2, *be going to* is grammatical when preceded by a modal or *have* if the surface form is *going to*. As such, the contrast in question is not one of whether a sentence is grammatical or ungrammatical, but rather whether a sentence carries a motion reading or a future reading. Experiment 2 was designed to test this contrast. This section describes the methods used, predictions of the high aspect and little *v* accounts, and the results of the experiment.

4.1 Methods

Experiment 2 followed the template of Experiment 1 as closely as possible. Participants were presented visually with novel sentences (n = 54), of which there were 36 key test items (Supplementary file). The independent variable of Context (bare vs. modal vs. perfect) was kept from Experiment 1, while the additional contrast was one of Phrase: the sentence included *going* followed by either a PP, which was expected to yield a motion reading, or VP, which was

expected to yield a future reading. The *going* VP items used the same VP frames as the *gonna* items in Experiment 1 (28–30), while the remainder were constructed by manipulating examples found in a Google search (31–33). The remaining items were fillers designed to clearly yield a motion or future reading through use of tense, verb choice, and temporal adverbs (n = 6 each, 34–35), or neither reading through omission of any relevant cues (n = 6, 36). Sentences were presented in a randomized order.

(28) I'm going to write an email.

(29) Isla might be going to eat dinner.

(30) I had been going to do my homework until it started snowing.

(31) Elizabeth is going to the beach.

(32) I should be going to the bank.

(33) I had been going to the bookstore when you called.

(34) Oliver sprinted away from the loud noise.

(35) I will call my aunt later today.

(36) I married my best friend.

Participants were asked to rate the meaning of each sentence on a sliding scale from 1–100, with a rating of 1 indicating that the sentence only had a motion reading and a rating of 100 indicating that the sentence only had a future reading. This is an admittedly strange task. However, given that many surveys (for example, Bowman et al. 2015) use results to feed computational models of natural language meaning, this is perhaps less strange of a task than it might initially appear. A computer may well need to distinguish between motion and future readings of *go*, and to achieve this would require similar human judgement data. Thus, for a registered participant on a platform like Prolific, such a task may not be out of the realm of normal. The similarity in form between sentences with different readings was explicitly remarked upon in the instructions to the participants:

> You will be deciding whether these sentences are describing someone/something in motion, or if they are describing events that will occur in the future. In English, we can use similar words and phrases to mean these very different things. We are interested in which kinds of sentences give the motion meaning, and which kinds give the future meaning.

The task was produced and participants were recruited in the same manner as in Experiment 1. Participants were compensated the November 2020 USD equivalent of £1.88 (£7.52 hourly wage) for an estimated 15 minutes of their time. The attention checks used in approving compensation

were defined as the 12 items with clear motion and future readings in the task: if visual inspection of violin plots of the distribution of ratings for these conditions showed that they clearly differed, the participant passed. The same participants who took Experiment 1 were targeted to take this study by using a custom allowlist as prescreening criteria. This included both the first run that broadly recruited US residents and the second run that recruited US residents who were born in the US and speak English as their first language. From the first group, 49 of 50 participants engaged with the study. One returned it, and two were rejected for failing attention checks. This left a total of 46 participants from this group. All 15 participants from the second group engaged with the study, completed it, and passed the attention checks.

4.2 Predictions

The key test items introduce two independent variables: Phrase (VP vs. PP) and Context (bare vs. modal vs. perfect). Regardless of the syntax of *be going to*, a main effect of Phrase is expected: *going* PP is expected to favor a motion reading over *going* VP. **Table 3** shows the competing accounts predicted outcomes in the VP condition's three possible contexts.

	High Aspect Account	**Little *v* account**
Bare *be going VP*	Future	Future
Modal + *be going VP*	Motion	Future
Perfect + *be going VP*	Motion	Future

Table 3: Contrasting *be going VP* motion/future reading predictions.

The high aspect account, in which *be* is high and *going to* is in Mod like *gonna*, predicts a statistically significant interaction between Phrase and Context. Because in this account future *going to* competes for insertion with other modals and is inserted above PerfP, the future reading is expected to be incompatible with preceding modal/perfect contexts. In contrast, the little *v* account predicts that the presence of modal/perfect will not influence whether the sentence takes a motion or future reading.

4.3 Results

The data includes the 36 test items, normalized using z-scores, from 61 total participants (n = 2196). Trained linguists who took a pilot version of this experiment gave feedback indicating that the task was quite difficult.[5] This feedback suggested that the difficulty lay in making the judgements rather than understanding the instructions. Indeed, participants'

[5] An example of such feedback was, "[S]ome of those sentences hurt my brain" (Allison Shapp p.c.).

responses to the filler items show that the task itself was understood well. **Figure 3** shows the distribution of ratings for the items that were designed to clearly yield a motion or future reading. Because the values are z-normalized, negative values correspond to a judgement that the sentence indicated motion (a low overall rating), while positive values correspond to a judgement that the sentence indicated a future event (a high overall rating). As seen, the categories are quite distinct and nearly separated, with only a handful of outlier responses for one category overlapping with responses for the other. This is, admittedly, a post hoc assessment; participants were excluded from the study if the distribution of ratings for the two categories did not show at least some separation. However, the degree of separation, and that responses to the fillers largely fell into the extremes of participants' ratings, suggests that the task was understood and achievable.

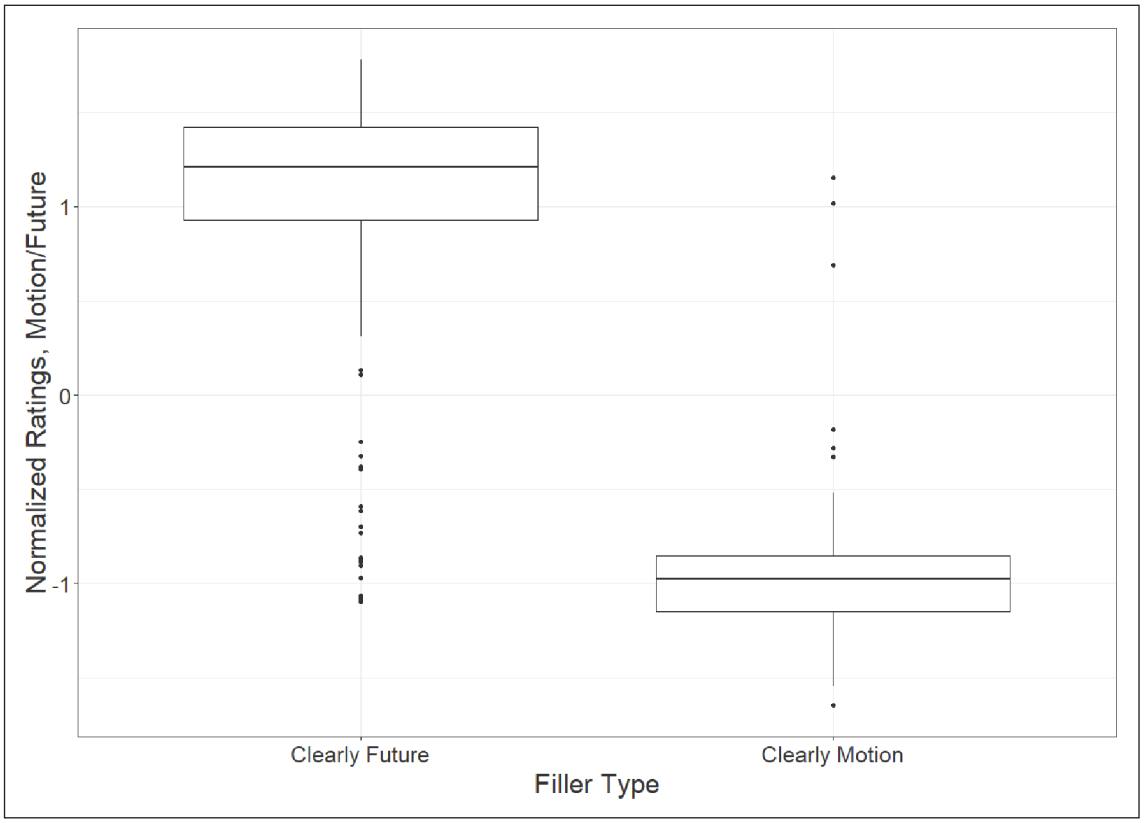


Figure 3: Motion/future ratings for filler items.

That participants could easily categorize sentences as having a motion or future reading in the obvious cases suggests that the difficulty reported by my piloters had to do with the test items. **Figure 4** illustrates one reason why this may be the case.

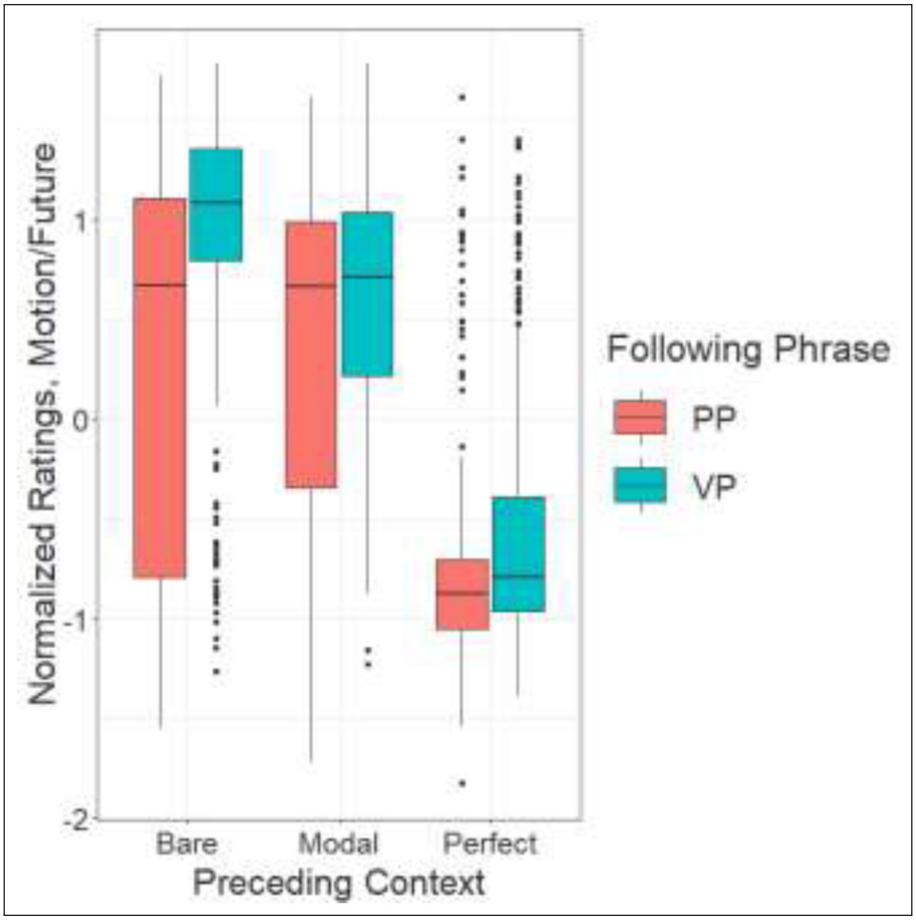


Figure 4: Results of motion/future rating experiment by Phrase and Context, faceted by Trial Group.

We had expected that bare *going* PP would yield a clear motion reading. This was not the case; ratings ranged widely for this condition between motion and future readings. Participants evidently interpret *going* as indicating the future to a degree regardless of context, which introduces a bit of a semantic confound to the experiment.[6] Aside from the results indicating that *going to* includes a future component, we see that bare *going* VP is rated as more indicative of the future than bare *going* PP, and that this difference is largely neutralized when a modal or perfect precede the sentence.

Visual inspection of the results therefore is suggestive of the main effect of Phrase and interaction between Phrase and Context predicted by the high aspect account. The question

[6] An anonymous reviewer notes that while this confound may be inconvenient for data analysis, it is itself a useful outcome. Accounts of the grammaticalization of *be going to* often suggest that speakers reanalyzed the meaning of the phrase early on in the process (Eckardt 2006; Hopper and Traugott 1993). That we find *going* PP to carry a mix of future and motion readings synchronically provides accidental confirmation of the plausibility of such an analysis.

remaining is whether these effects are significant, or whether the wide range of ratings and small differences in means make the overall results inconclusive. The z-normalized results were subjected to linear mixed effects regression, with the basic plan of testing for Phrase/Context main effects and interaction. The model was initially built with random effects alone. Participant and Experiment Item were included as random intercepts, and Presentation Order (scaled to z-scores) was included as a by-participant random slope. The *step* function in R was used to determine if any random effects should be dropped from the model; all were kept. The fixed effects were added to the model including these random effects. I included Phrase, Context, and Trial Group as main effects and all possible two- and three-way interactions between them. *Step* was again used to determine if any effects should be dropped from the model. Trial Group was dropped both as a main effect and from all interaction contexts. This process yielded the final model for analysis described in (37).

(37) lmer(Rating ~ Phrase * Context + (1 + Presentation Order | Participant) + (1 | Sentence)

The results of this model are reported in **Table 4**. Two significant effects here reflect the overall tendency of participants to rate bare *going* PP as involving some degree of a future reading. The intercept, representing bare *going* PP as a baseline, has a positive estimate indicating this future reading. There is also a main effect of being in a perfect: sentences in this condition have ratings indicating a motion reading. The remaining effects involve the *going* VP context. A main effect shows that this context is rated as involving a future event significantly more than the PP context. The interactions with preceding context show that *going* VP is rated as involving the future less when not in the bare context.

	Estimate	**Std. Error**	**Df**	**t value**	**Pr(>|t|)**
Intercept (Bare PP)	0.275	0.069	29.941	3.99	**0.0004**
Phrase--VP	0.603	0.097	29.954	6.19	**<<0.0001**
Context--Modal	0.116	0.097	29.932	1.19	0.2422
Context--*have*	–1.055	0.097	29.969	–10.82	**<<0.0001**
Phrase--VP:Context--Modal	–0.467	0.138	29.948	–3.39	**0.0020**
Phrase--VP:Context--*have*	–0.365	0.138	30.026	–2.65	**0.0127**

Table 4: Linear mixed effects regression of motion/future rating experiment.

Despite the confound of *going to* PP involving some semblance of a future reading, the results thus reflect the predictions of the high aspect account. The main effect of Phrase is expected by all accounts, but the high aspect account uniquely predicts the significant interactions between

Phrase and Context favoring the motion reading. Note that these results do not reflect a clear motion reading for *going* VP when preceded by modal/perfect. Rather, the effects appear to undo the main effect for the bare context. When preceded by modal/perfect, *going* VP has the same degree of motion/future meaning as *going* PP. In this light, the results are wholly consistent with the high aspect account.

5 Discussion

The experiments above were designed to test two accounts of the syntax of *be going to* in English. As described in section 2, the accounts in question differ in whether the construction is merged high or low in the inflectional domain. In the high aspect account, *be* is inserted above Mod, with *gonna/going-to* inserted into Mod (Copley 2001; 2009). In contrast, the little *v* account assumes future *be going to* is in a similar position to progressive + main verb *be going to*. These accounts make different predictions as to whether additional auxiliaries can be added to a sentence with the construction. These predictions and the overall findings are summarized in **Table 5**.

	Predictions		
	High Aspect Account	**Little *v* account**	**Finding**
Experiment 1	Substantially lower grammaticality ratings following modal/perfect	No major difference in ratings between bare and modal/perfect	Substantially lower grammaticality ratings following modal/perfect
Experiment 2	Rated substantially more motion-like following modal/perfect	No major difference in ratings between bare and modal/perfect	Rated more motion-like following modal/perfect

Table 5: Predictions of competing analyses and experiment findings.

In both experiments, the predictions were operationalized by testing for an interaction between preceding Context and Verb or following Phrase. The high aspect account predicted a significant interaction in both experiments. Experiment 1 shows this quite clearly: bare *gonna* and bare *about to* are rated as grammatical, but *gonna* ratings are sharply lower than *about to* ratings when preceded by modal/perfect. The results of Experiment 2 are a bit messier, as *going* PP is rated as having some degree of a future reading by participants. However, we see the same interaction: *going* VP is rated as more clearly expressing a future reading than *going* PP, but this difference disappears when *going* VP is preceded by modal/perfect. This is what the high aspect account predicts, as the preceding context is leading *going* VP to apparently be treated more like main verb *going*. However, the difficulty of the task combined with the apparent semantic

confound of main verb *going* having a future component makes the result of Experiment 2 less clear than that of Experiment 1. Both experiments, however, show significant results that are uniquely predicted by the high aspect account, and I suggest that together they constitute strong evidence for this account.

It is important to note that both experiments are testing the same hypothesis: English grammar constrains the environments in which future *be going to* can surface. In this sense, we would expect results on both tasks to be correlated. There is a degree to which this expectation is obvious, as we hypothesize (and find) the same contexts to lead to lower ratings in both tasks. However, this should be reproduced at a smaller scale as well. A participant who gives strong (un)grammaticality ratings should also express strong motion/future ratings, as they are expressing a strong reaction to the same syntactic constraint in both contexts.

Because the *going* VP test items in Experiment 2 were constructed using the same VP frames as the *gonna* test items in Experiment 1, we can test for this predicted correlation. I combine the data for these 18 test items from both experiments for the 61 participants who took both studies (n = 1098). I keep the z-normalized motion/future ratings as is as a dependent variable. However, grammaticality ratings cannot be included as is as an independent variable, because their correlation with Context will mean the factors are collinear. Instead, I use the residuals of the model capturing the Experiment 1 results. Residualization expresses the variability in the data not explained by the model, and can be used to avoid problems in an analysis raised by collinearity (see MacKenzie 2012; Hopp 2016 for examples). In this case, positive residuals are grammaticality ratings higher than those predicted by the model, and negative residuals are those lower than predicted. The predicted correlation outlined above should therefore be positive. After accounting for Context and random effects, we should still see higher residual values from the grammaticality study correlating with ratings indicating a sentence has more of a future rating. **Figure 5** shows this correlation does appear to be present.

I test whether this correlation is significant using the same approach as above. First, I regress motion/future ratings against random effects alone. I include Participant and sentence as random intercepts, and Presentation Order for each study (scaled to z-scores) as separate by-participant random slopes. I then use the *step* function to determine which effects should be kept. The random intercepts and Presentation Order for the motion/future task were kept. Next, fixed effects of grammaticality rating (residualized), Context, and Trial Group were added as main effects and each combination of interaction. *Step* was again used to arrive at the final model in (38).

(38) lmer(Motion/Future Rating ~ Grammaticality Rating Residuals + Context + (1 + Presentation Order | Participant) + (1 | Item))

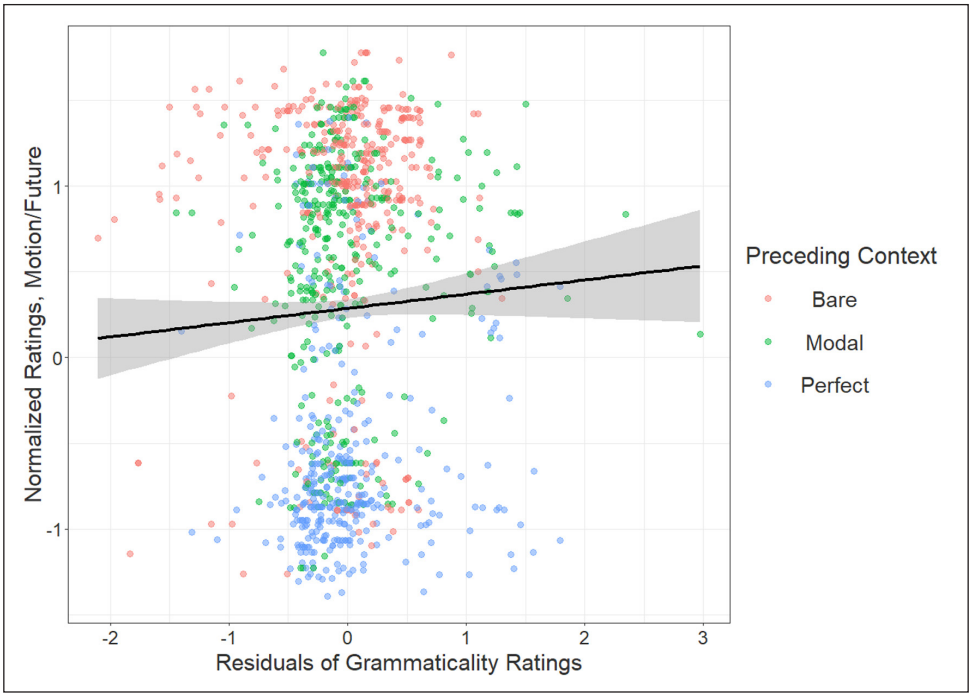


Figure 5: Correlation of Experiment 1 and Experiment 2 results.

The results of the final model (**Table 6**), unsurprisingly, show main effects of context whereby preceding modal/perfect result in a rating indicating more of a motion reading. This is the same effect as the interaction term found in Experiment 2. We also find a significant effect of grammaticality rating: after accounting for other effects on grammaticality ratings, higher ratings for items in this task correspond to higher ratings on the motion/future task.

	Estimate	**Std. Error**	**df**	**t value**	**Pr(>|t|)**
Intercept (bare)	0.876	0.075	15.867	11.67	**<<0.0001**
Grammaticality Rating (Residualized)	0.096	0.041	1031.207	2.36	**0.0184**
Context—Modal	–0.352	0.105	14.969	–3.37	**0.0042**
Context—Perfect	–1.427	0.105	15.000	–13.63	**<<0.0001**

Table 6: Linear mixed effects regression of Experiment 1 results vs. Experiment 2 results.

The main effect of grammaticality could be an effect of familiarity with test items, as prior exposure in the first task could influence ratings on the second task. However, while such an effect is reasonable to look for, it is unclear in isolation why it would go in this direction.

That is, if the high aspect account were unsupported, why would the correlation between the grammaticality and motion/future tasks link grammaticality and future? If this correlation is a familiarity effect, pointing in this direction is either arbitrary, in which case we would expect different participants to have different effects, or a result of the tasks in fact testing the same contrast. Because we have accounted for participant in our random effects, I suggest that the correlation between tasks reflects that the tasks are testing the same contrast. This lends further support to the high aspect account, as there is no reason to expect any correlation between results in the other account. Regardless, the results on the tasks themselves point quite strongly to the high aspect account.

As noted previously, one line of argumentation used to construct the little *v* account stems from an objection to the inclusion of a high progressive in the semantics of *be going to*, as it seemingly makes *be going to* more marked than *will* (Klecha et al. 2008). Note, however, that while the experiment results support a high *be going to*, they do not inherently indicate that *be* must carry the progressive aspect advocated by Copley (2001; 2009). One way to resolve the apparent conflict between the account offered by Copley (2001; 2009) and the critique from Klecha et al. (2008) is to treat *going to/gonna* as deficient for being tensed (perhaps because *-ing* blocks present/past tense from surfacing). This would lead to *be* surfacing as a default auxiliary in order for the sentence to be tensed (Bjorkman 2011). In this sense, *going to/gonna* could indeed be less semantically marked than *will* as advocated by Klecha et al. (2008), with *be* being inserted in a higher functional head for syntactic wellformedness.

5.1 Alternative approach

The interpretation of the experimental results offered above assumes that standard approaches to the syntax of the English inflectional domain (Roberts 1985; Pollock 1989; Jaeggli & Hyams 1993; Adger 2003; van Gelderen 2003), in which linear surface order of modals/auxiliaries reflects hierarchical structure and only the highest merged modal/auxiliary raises to T, are correct. My interpretation also assumes that these standard approaches apply as normal to *be going to* in both the high aspect and little *v* accounts. Relaxing this latter assumption, however, could allow the little *v* account to generate the experimental data. Here I briefly consider how this and another adaptation of the little *v* account could result in future *be going to* being blocked from having a preceding modal/perfect.

The issue to address here is essentially that we find in Experiment 1 that “semi-auxiliaries” (Quirk et al. 1985) are not in fact a cohesive group. *Be gonna* and *be about to* are treated differently by experiment participants. The high aspect account is easily amenable to this; the two constructions are syntactically different. But, the constructions are much more alike syntactically according to the little *v* account because *be* is merged quite low, and *going to* and *about to* may in fact both be located in *v* (Cournane 2015). To be viable, the little *v* account must be able to explain why there

is a difference between *be gonna* and *be about to*. I suggest that for the little *v* account to derive the experimental results syntactically, the assumption that the highest merged modal/auxiliary raises to T cannot hold. Since *be* is inflected for tense in future *be going to*, we know that it does raise to T when no other auxiliaries are present. One way for the little *v* account to block future modal/perfect *be going to* is to make this raising obligatory: the *be* in *be going to* MUST raise to T. Such a rule would be rather arbitrary and apparently lexically specific. We see from Experiment 1, after all, that *be about to* is relatively acceptable with a preceding modal/perfect, which would suggest that *be* is merged low and stays low in this case. Likewise, other progressives permit a preceding modal/perfect. For the little *v* account to generate the appropriate facts syntactically, it therefore must arbitrarily introduce a new rule to the inflectional domain which applies solely to *be*, if and only if it co-occurs with *gonna/going to*.

Another possibility is that the restriction is semantic rather than syntactic. Perhaps *be going to* is simply incompatible with modals and perfects. Such a restriction would seem to be compositional; however, the same facts that are inconvenient for the above approach are as inconvenient here. *Be going to* appears to have some future and progressive components. As such, if these were to be compositionally incompatible with modals or perfects, we would expect either or both of other future constructions and the progressive to also be incompatible in these environments. This is not the case. As such, it appears that for the little *v* account to assert an incompatibility with modals and perfects on semantic grounds, this must again be lexically specified as only applying to *be going to*. Such a claim is not readily falsifiable due to its specificity, but it is unclear whether there is a principled way to justify such an approach.

What these approaches have in common is that for the little *v* account to be viable, there must be some novel restriction that is lexically constrained in application to *be going to* in comparison to other constructions like *be about to*. For this reason, any evidence of a wider distribution of that restriction would be difficult to explain, as an account asserting a lexically constrained rule will have to explain why the restriction applies to one subset of contexts but not another. This wider distribution of the restriction may in fact exist: usage of *be fixing to*, commonly associated with Southern US Englishes (Myers 2014), is reported as being quite restricted in co-occurrence with the past perfect and *will* (Staub & Zentz 2017).[7] In varieties of African American English, *fixing to* can additionally be contracted to *finna*. In such varieties, we would expect to see overt *be/been* preceding *finna* in the contexts discussed in this paper (Green 1998; 2002). Google searches show that co-occurrence of *finna* with modal/perfect are restricted in a similar way to

[7] Staub & Zentz (2017) do suggest that *had been fixing to* is grammatical, but note that it is quite constrained in meaning compared to bare *fixing to*. In this sense, the restriction appears to be more like the effect shown for *going to* in Experiment 2 than the effect for *gonna* shown in Experiment 1.

gonna (**Table 7**).[8] I searched for several constructions that can indicate the future in their bare form, and following *be* and *been* (reflecting co-occurrence with modals or *have*, respectively). As seen, while co-occurrences are a low overall proportion of search results for *about to* and *planning to*, these proportions are orders of magnitude lower for *gonna* and *finna*. The rarity of examples in these cases suggests a restriction on co-occurrence.

	Bare	*Be* + **Form**		*Been* + **Form**	
	Hits	**Hits**	**Proportion of Total**	**Hits**	**Proportion of Total**
About to	411,000,000	40,800,000	0.09927	7,080,000	0.01723
Planning to	159,000,000	4,230,000	0.02660	4,340,000	0.02730
Gonna	532,000,000	799,000	0.00150	138,000	0.00026
Finna	42,000,000	11,100	0.00026	839	0.00002

Table 7: Google search results for *be* + *X* future constructions.

For the little *v* account to be viable, it will have to explain why the same restriction exists for *gonna* and *finna*, but not for *planning to* and *about to*. This cannot simply be a matter of referring to these forms being contracted, as Experiment 2 shows that the future reading of *going to* is relatively blocked in the uncontracted form. Rather, there would need to be a principled semantic distinction among these constructions or reason for some of these constructions to trigger obligatory raising of *be* but not others. In contrast, the high aspect account would take *finna* to be inserted into Mod, like *gonna*. Thus, the grammaticalization of *be* + X constructions in English may involve placing X in ModP, with *be* in a higher functional head, more generally than *be going to* alone.

5.2 Grammaticalization revisited

In section 2, I noted that the high aspect and little *v* accounts represent differing approaches to grammaticalization. While in both accounts *to* appears to have moved into the clausal spine because it is followed by an infinitive, they crucially differ in what other changes must have occurred diachronically. The high aspect account effectively suggests that future *be going to* has moved up the clausal spine over time, as the construction is higher in the clause than main verb *be going to* in the present day. In contrast, that the little *v* account keeps *be going* in the same position as the progressive and a quite close position to the main verb suggests that relatively little of such movement has occurred. For this account, reanalysis of *be going to* as a Restructuring construction is sufficient to obtain the modern future *be going to*.

[8] Searches were conducted 10 August, 2020 on Google's UK search site.

Taken broadly, syntactic approaches to grammaticalization suggest that one common diachronic process involves a lexical item moving into and up the clausal spine (Roberts & Roussou 2003; van Gelderen 2004). The high aspect account of the structure of *be going to* as a synchronic phenomenon is thus quite consistent with being an outcome of this approach to grammaticalization. For this reason, the experimental evidence in favor of the high aspect account lends additional support to the approaches advocated by Roberts & Roussou and van Gelderen. It is worth noting that the synchronic evidence offered here is consistent with a fairly maximal movement up the clausal spine, as *be going to* has ended up at the upper edge of the English inflectional domain. However, an anonymous reviewer notes that items in IP regularly grammaticalize into CP, so further grammaticalization of *be going to* remains possible in the future. Some varieties of Scots may in fact be engaging in such further grammaticalization. Sailor & Thoms (2019) observe that for some Scots speakers, *gonnae* can be used to introduce an exhortative clause:

(39) Gonnae you drop that!
'(Will you please) drop it right now' (Sailor & Thoms 2019)

They suggest that in such sentences, *gonnae* appears in the CP domain.

While ending up with a high *be going to* is consistent with syntactic approaches to grammaticalization, this does not mean that future *be going to* must have developed this particular structure in one fell swoop. Although synchronic experimental data cannot shed light on this, it is quite possible that there were one or more intermediate steps in the development of future *be going to*. Semantic evidence would seem to support such a view, as *be going to V* first developed as a purpose clause (Danchev and Kytö 1994; Eckardt 2006). One possible intermediate step is in fact the structure proposed in the little *v* account: *to* has moved into the clausal spine, perhaps here developing the purpose clause reading. This would enable semantic reanalysis of *be going to* as a future marker (Eckardt 2006) as well as syntactic reanalysis of the construction as a Restructuring phenomenon. From there, *be going to* could be subsequently reanalyzed upwards out of vP and fully into the inflectional domain. This would mean sentences containing the construction progressed from biclausal with two TPs, to monoclausal-like, to truly monoclausal over time.

It is worth noting that describing the high aspect account as the endpoint of the grammaticalization process may not be the complete story. Krug (2000: 253–54) notes further reduction of *gonna* (40), and suggests it may represent further grammaticalization of the construction.

(40) Imma stay until I finish my coffee.

However, this is quite reminiscent of double contraction, as in (41). As seen, the perfect auxiliary *have* can be contracted to the already-contracted modal *would*.

(41) I had to eat the burrito much faster than I'd've liked.

If *going to/gonna* is indeed in ModP, it would not be surprising for it to be able to contract to *I* and *be*. The high aspect account of *be going to* can therefore account for the appearance of reduced forms like *imma* without additional grammaticalization taking place. However, further research would be necessary to determine if *imma* is simply an instance of contraction.

6 Conclusion

This study calls attention to the syntax of future *be going to* in English, with particular emphasis on where in the inflectional domain the construction is inserted. Experimental evidence demonstrates that the high aspect account proposed by Copley (2001; 2009), in which *going to/gonna* is inserted into ModP like other modals, with *be* inserted into a high functional head above ModP, correctly predicts both grammaticality judgements involving *be gonna* and whether the construction takes a future reading with respect to co-occurrence with modals/perfect. This is a novel result which demonstrates that *be X to* constructions do not form a coherent class of "semi-auxiliaries," contra Quirk et al. (1985), and independently supports syntactic approaches to grammaticalization in which lexical items move into and up the clausal spine as they become functional items (Roberts and Roussou 2003; van Gelderen 2004).

One question that remains is whether the syntax of this construction is the same for all (American) English speakers. The data presented in **Table 7** as evidence that *finna* may have a similar structure shows modal/perfect *be gonna* to occur infrequently online. Crucially, however, it does occur a nonzero amount of the time. This would be unexpected if that context were ungrammatical for all speakers. One intriguing explanation of these nonzero online occurrences, as well, perhaps, as my observation that I myself have used perfect *be gonna* on occasion, could be that there is covert heterogeneity (Biggs & Tamminga 2016) in the syntax of the construction: while the same form surfaces, it is derived through different grammars for different people. A linguistics blog and its comment section similarly noted the existence of sentences including *might be gonna* (Mr. Verb 2007), and offers an additional suggestion that such examples may be double modal constructions.[9] While these possibilities are worthy of scrutiny in future work, the robustness of the experimental results suggest that any such variability is quite unbalanced; most (American) English speakers appear to have a high future *be going to*.

[9] Depending on the syntax of a double modal construction, this may in fact be compatible with the high aspect account. However, given the experimental results and population sampled, such discussion is beyond the scope of this paper.

Additional file

The additional file for this article can be found as follows:

- **Supplementary file.** Test items for Experiment 1 and Experiment 2 can be found in the associated data file. DOI: https://doi.org/10.16995/glossa.5850.s1

Ethics and consent

The studies were approved by the Newcastle University Ethics Committee, Ref: 4465/2020.

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Competing interests

The author has no competing interests to declare.

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