

Prenominal Adverbs, or Apparent Selectional Violations in Coordination*

Adam Przeźiórkowski and Agnieszka Patejuk

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1 Introduction

Apparent violations of selectional restrictions, illustrated in (1a) (Sag et al. 1985: 165, (124b)), figure prominently in discussions about the structure of coordination.

- (1) a. You can depend on [[_{NP} my assistant] and [_{CP} that he will be on time]].
b. You can depend on [_{NP} my assistant].
c. *You can depend on [_{CP} that he will be on time].

What is interesting about (1a) is that it seems to involve coordination of an NP and a CP in a position in which this CP alone would not be acceptable – see (1c). Such examples are often interpreted as providing support for asymmetric theories of coordination, on which a single conjunct determines the category of the coordinate structure (e.g., Munn 1993: 79–80, Johannessen 1998: 14, Zhang 2009: 50–51, Zhang 2023: 4–5).

While all selectional violation examples in Sag et al. 1985 involve an apparent coordination of an NP and a CP in a strictly nominal position, as in (1), Bruening and Al Khalaf (2020) (henceforth B&AK) argue that there is another kind of selectional violation, involving an apparent coordination of an AdvP and an AdjP in a strictly adjectival prenominal position, illustrated in (2) (Bruening and Al Khalaf 2020: 2, (4)).¹

- (2) a. The [[_{AdvP} Once] and [_{AdjP} Future]] King (book title)
b. *the once king

Also this second kind of apparent selectional violation has been interpreted as providing an argument for asymmetric theories of coordination (Zhang 2023: 5, fn. 2).

However, other cases of unlike category coordination seem to provide evidence for symmetric theories of coordination, on which categories of all conjuncts contribute to the cat-

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¹The ungrammaticality marking of (2b) is B&AK’s and it will be disputed below.

egory of the coordination (e.g., Borsley 1994: 230–231, Borsley 2005: 463–465, Dalrymple 2017: 34–35, Neeleman et al. 2023: 57–58).² This is illustrated in (3) from Bruening and Al Khalaf 2020: 25, (85).

- (3) a. Danny became [[_{NP} a political radical] and [_{AdjP} very antisocial]].
b. *Danny became [[_{NP} a political radical] and [_{PP} under suspicion]].

Given that *become* selects for an NP (*Danny became a political radical* is fine) or an AdjP (*Danny became very antisocial* is also fine), but not a PP (**Danny became under suspicion* is bad), [_{NP} & _{AdjP}] is a possible argument of *become* (see (3a)), but a coordination involving a PP conjunct is not (see (3b)). That is, categories of all conjuncts must satisfy selectional restrictions, contrary to predictions of asymmetric theories of coordination. To the best of our knowledge, contrasts such as (3) have not been addressed by the proponents of asymmetric approaches to coordination.

Apparent selectional violation examples such as (1)–(2) are also important for the linguistic theory at large, as they have been explained using a variety of nonstandard theoretical mechanisms and, thus, could be construed as providing evidence for such nonstandard mechanisms. For example, the analyses of B&AK and Bruening 2023 assume: 1) left-to-right (rather than bottom-up) structure building, 2) categories organized into stacks, with stipulations about which processes only see the top of the stack, and which have access to all stack elements, 3) a syntactic mechanism of S(emantic) selection, whose function is largely the same as that of purely semantic selection, but which has some very special properties crucial in the analysis of coordination, etc. Hence, showing that the postulated selectional violations are only apparent would have consequences not only for the theory of coordinate structures, but also for grammatical theory in general.

This is exactly *the aim of this paper* – to show that selectional violations are not real. The apparent “CPs in NP positions” violations (as in (1)) have already been questioned in Patejuk and Przepiórkowski 2023 and in Kim and Lu 2024. In particular, Kim and Lu (2024) argue on the basis of an acceptability judgment experiment that such apparent violations involve the

²In this paper, we assume that coordination of unlike categories is possible, i.e., that the Law of the Coordination of Likes (LCL; Williams 1981: §2), widely assumed until recently, is a myth. Multiple arguments against LCL may be found in, e.g., Levine 2011, Dalrymple 2017, Przepiórkowski 2022, and Neeleman et al. 2023; see also Bayer 1996. While Bruening and Al Khalaf (2020) defend LCL, this defense is refuted in Patejuk and Przepiórkowski 2023, and – in a reply to that paper – Bruening (2023: 1) concedes that “[Patejuk and Przepiórkowski 2023] are correct, and there is no requirement that conjuncts match in syntactic category”. Also, while an early draft of Neeleman et al. 2023 assumed LCL, the published version provides an analysis of coordination of different categories. Hence, there seems to be a growing consensus that unlike category coordination is real.

processing effect of grammaticality illusion (Gibson and Thomas 1999) rather than genuine selectional violations. In the current paper, we deal with the purported “AdvPs in AdjP positions” violations (as in (2)) and show – on the basis of corpus and experimental evidence – that they are also not real. Together, the results of these papers remove an important argument for asymmetric theories of coordination and free the linguistic theory from the unnecessary burden of nonstandard mechanisms needed to account for such apparent violations of selectional restrictions in coordination.

2 Empirical Claims

B&AK claim that it is not possible to coordinate unlike categories (cf. fn. 2). They account for examples such as *the once and future king*, involving an adverb and an adjective, by analyzing non-*ly* adverbs as adjectives necessarily embedded in adverbial projections, e.g., $[\text{ADV} [\text{ADJ} \textit{once}] \emptyset_{\text{ADV}}]$. However, such adverbial projections may be elided in specific configurations in coordination, leaving behind pure adjectives, e.g., $\{\text{ADV} [\text{ADJ} \textit{once}] \emptyset_{\text{ADV}}\}$, resulting in coordination of two adjectives. Hence, all non-*ly* adverbs may in principle be coordinated with adjectives. By contrast, typical adverbs ending in *-ly* are immune to this analysis, so such typical adverbs may not be coordinated with adjectives (cf. **She became unnerved and distractedly*; Bruening and Al Khalaf 2020: 16, (51b)). Crucially, B&AK claim that the relevant adverbs alone cannot be prenominal modifiers, i.e., that NPs such as *the once king*, *the twice president*, *the soon return*, etc., are ungrammatical.

All of B&AK’s relevant examples involve just 5 adverbs: *once*, *twice*, *thrice*, *now*, and *soon*. Patejuk and Przepiórkowski (2023) (henceforth P&P) show that many other non-*ly* adverbs do not behave like *once* and cannot be coordinated with an adjective. Patejuk and Przepiórkowski (2023: 342, (72)–(75)) also present the following attested examples, which demonstrate that *once*, *twice*, *now* and *soon* can in fact be used as prenominal modifiers on their own, contrary to the purported ungrammaticality of (2b) (*the once king*):

- (4) The Once-King of Penn State
- (5) Twice Winner of the Man Booker Prize
- (6) Many years ago Korn’s father had dealings with the now president.
- (7) They call him the Thane of Glamis, Thane of Cawdor, and the soon king.

If these examples are grammatical and adverbs such as *once* may be used prenominally, then examples such as (2a) (*the once and future king*) do not involve selectional violations. P&P

conclude that the following generalization from *The Cambridge Grammar of the English Language*, which precludes selectional violations, is essentially right:

- (8) *If (and only if) in a given syntactic construction a constituent X can be replaced without change of function by a constituent Y, then it can also be replaced by a coordination of X and Y.* (Huddleston and Pullum 2002: 1323)³

In a reply to P&P, Bruening (2023) (henceforth B) only agrees with the “if” part of (8), but not with the “only if” part, claiming that the two kinds of apparent selectional violations discussed by B&AK are “fully general” and provide valid counterexamples to (8). However, rather than defending B&AK’s analysis of the apparent “AdvPs in AdjP positions” violations, which relies on the *-ly* vs. non-*-ly* distinction, B proposes a new analysis, one which relies on idiosyncratic feature composition of particular adverbs: the 5 considered in B&AK, i.e., *once*, *twice*, *thrice*, *now*, *soon*, as well as possibly 3 more “identified” in Bruening 2023: 16, i.e., *always*, *often*, and *seldom*.

B follows B&AK in claiming that such adverbs may be coordinated with adjectives but cannot be used alone as prenominal modifiers. However, while B dismisses (6)–(7) as “completely unacceptable, in my judgment” (Bruening 2023: 8) and (5) as “telegraphic” for *Twice the Winner...* (rather than *The Twice Winner...*, ungrammatical according to B), he no longer claims that strings such as *once king* in (4)⁴ are always ungrammatical, as B&AK did. Instead, B posits that a minority of speakers accept them as compounds. By contrast, coordinations such as *the once and future king* are supposed to be grammatical for all speakers as regular syntactic constructions. Hence, a prediction of this analysis is that there should be no correlation between how readily a speaker accepts the hypothetical [N Adv N] compound (this depends on the speaker’s lexicon) and how readily they accept the corresponding [Adv & Adj N] syntactic construction (this depends on their grammar).

Our position is that the relevant [Adv N] constructions are not lexical, but syntactic, and in principle grammatical. Speakers may differ in the extent to which they accept specific adverbs as prenominal modifiers, but – given the biconditional in (8) – whether they accept a given adverb as a prenominal modifier or not, they should do so in both syntactic constructions: [Adv N] and [Adv & Adj N]. That is, unlike B, we predict a correlation regarding speakers’ acceptance of the two constructions.

³(8) is a variant of “Wasow’s generalization” and together with other such variants it abstracts away from matters of agreement; see Przepiórkowski 2022: §§5–6 for discussion.

⁴We follow B in ignoring orthography, i.e., we equate *once king* with *Once-King*, etc.

3 Corpus Evidence

On the basis of attested data, we first (in §3.1) show that prenominal adverbs which B considers unacceptable (*now*, *soon*) may easily be found in corpora and in the Internet, and then (in §3.2) we refute B’s claims about the “telegraphic” nature of strings such as *twice winner*. In the main part of this section (in §3.3), we show in detail that constructions such as *once king* are not compounds. These results are consistent with what dictionaries say about *once*, *now*, etc. (see §3.4). We finish (in §3.5) with a discussion of corpus evidence.

3.1 Now and Soon May Be Used Prenominally

As noted above, B considers sentences (6)–(7) with prenominal *now* and *soon* completely unacceptable. However, it is easy to find such prenominal adverbs in corpora. For example, in the English Web 2020 corpus,⁵ the pattern [*a/the Adv N*] produced 12,894 matches for *Adv = now* and 653 for *Adv = soon*. Manual inspection of random samples of 100 matches suggests that over 40% of *now* and over 85% of *soon* matches are true positives, so there should be well over 5000 genuine instances of [D *now N*] and well over 500 of [D *soon N*].

In fact, following the death of Queen Elizabeth II in September 2022, there was an increased media presence of such prenominal adverbs, especially *now*. Here are a few examples from the BBC (see (9)), *The Guardian* (see (10)), *Daily Mirror* (see (11)), *Harper’s Bazaar* (see (12)), and *The New York Post* (see (13)).⁶

- (9) He claims the *now Prince of Wales* ordered him to shave it off after a week-long argument... Harry told Bradby he didn’t think the *now Duchess of Sussex* would have recognised him clean-shaven...
- (10) At last year’s global climate talks in Glasgow, the *now monarch* said: “We know what we must do.”
- (11) In the letter, the *now king* wrote: “Dear Granny, I am sorry that you are ill...”
- (12) ...the *now Prince and Princess of Wales*, William and Catherine...
- (13) The *once Duke and Duchess of Cambridge* made their first public engagement appearance post-funeral yesterday.

Such adverbs do not only occur prenominally alone, but they may also occur as second conjuncts in prenominal coordinations:

⁵<http://www.sketchengine.eu/> (Jakubíček et al. 2013, Kilgarriff et al. 2014)

⁶Specific sources of attested examples are given in Appendix B.

- (14) Umberto II's heir was Prince Vittorio Emanuele, the *then and now* Prince of Naples.
 - (15) And we share your hope that there is a *final and soon* resolution to the peace process.
- Examples such as (14)–(15) directly contradict analyses proposed in Bruening and Al Khalaf 2020 and Bruening 2023, which predict that adverbs can occur prenominally only when coordinated with an adjective, and then only when the adjective is the last conjunct.

3.2 Twice Winner Is Not Telegraphic

Bruening (2023: 8) claims that P&P's example (5) is “telegraphic. If the determiner were pronounced, it would come after *twice*”, illustrating this claim with (16) (his (21)).

- (16) a. (It is) twice the winner of the Man Booker Prize.
- b. *(It is) the twice winner of the Man Booker Prize.

However, contrary to B's ungrammaticality marking, examples such as (16b) are grammatical and easily found in corpora: there are 40 matches for the specific sequence of lexemes *a/the twice winner* in English Web 2020 – all true positives – including those in (17)–(19).

- (17) He is the *twice* winner of the UK open Kumite Karate Championships.
- (18) The Londoners travel to the *twice* winners of the League Cup...
- (19) He was also a *twice* winner of the Paris Six Hour Enduro.

Corpora and Google also provide numerous examples of *twice* pre-modifying nouns other than *winner*, including *champion* and *loser*, for instance:

- (20) The sledge hockey team Udmurtia is the *twice* champion of Russia.
- (21) Ted Griffin followed on as holder and the *twice* loser of the shield...

The same applies to *thrice* (also discussed by B&AK), for instance:

- (22) ... “Old Tom” is the *thrice* winner of the first major golf tournament...
- (23) Citadel's billionaire investor Ken Griffin calls Trump a ‘*thrice* loser’
- (24) A *thrice* world and *twice* Pan-American Champion, Bia now has her sights set on the European Jiu-Jitsu Championship...

In summary, both *twice* and *thrice* may in fact act as direct pre-modifiers of nouns, contrary to B's claim about the “telegraphic” nature of *twice winner* in (5).

3.3 Prenominal Adverbs Do Not Form Compounds

Bruening and Al Khalaf (2020: 14–15) state that strings such as *the once king*, *the twice president*, *the soon return*, and *the now Democrat* are ungrammatical. This claim cannot be main-

tained given P&P's attested examples and B's own acceptability judgment experiment (discussed in §4 below), which shows that a considerable number of native speakers accept such strings. In order to retain the analysis of constructions such as (2a) (*the once and future king*) as involving selectional violations, B posits that the relevant adverbs combine with nouns not via regular syntactic processes, but via compound forming processes; for example, *once king* is supposed to have the lexical structure [_N *once king*]. On this view, the relevant adverbs cannot directly combine with nouns in syntax, but they can still be initial conjuncts in prenominal coordinations, in an apparent selectional violation.

If B were right, this would be an important discovery of a new kind of compound in English, not registered by linguists specializing in compounding so far, adding [Adv N] to the repertoire which already contains [Adj N] (e.g., *blackbird*) and [N N] (e.g., *bird flu*).⁷ However, B's main argument for this claim is based on the anaphoric *one*. B assumes that *one* cannot refer to the noun within an [Adv N] compound.⁸

In an acceptability judgment experiment, B considers pairs such as (25).

- (25) a. We want to meet the now Caliph and the old one. (Adv)
 b. We want to meet the current Caliph and the old one. (Adj)

On the compound hypothesis, (25a) is supposed to be ungrammatical, as *one* attempts to refer to *Caliph* – a proper part of the hypothetical compound [_N *now Caliph*]. On the other hand, (25b) is grammatical because *current Caliph* is a regular syntactic construction with a syntactic constituent, [_N *Caliph*], to which *one* may refer. In §4 below, we show that the results of this experiment do not support B's compound hypothesis; here we demonstrate that also corpus data contradicts it.

[Adv N] constructions are relatively rare and *one*-anaphora is also textually infrequent, which makes it difficult to find examples, similar to (25a), which would combine both these rare phenomena. Nevertheless, (26)–(27) are two such attested examples; in both *one* refers to the noun in *now wife*.

- (26) In his will he says ‘My *now wife*,’ as though he had had a previous *one*...

⁷See, e.g., Lieber 2009 and Bauer 2020 on types of compounds in English.

⁸B does not say anything about the nature of compound formation. One way of substantiating B's analysis is to assume that compounds are complex words formed within the lexicon and that words in general are boundaries for *one*-anaphora. However, Bruening 2018a argues that compounding takes place in syntax and that compounds are not boundaries for *one*, citing example (i) (his (12c); brackets indicating compound boundaries and italics added).

(i) The old [the-dog-ate-my-homework excuse] won't work because I know you don't have *one*!
 If so, additional assumptions would be needed to prevent *one* from referring to the noun in hypothetical [Adv N] compounds.

- (27) Boris Johnson... Private Eye reports he was caught receiving a blow job in the Foreign Office when he was Foreign Secretary by his *now*-wife, while he was still married to the previous *one*.

However, the *one*-anaphora test is only one of many tests employed to distinguish compounds from regular syntactic constructions – all imperfect. It is routinely noted that “there are (almost) no reliable criteria for distinguishing compounds from phrases” (Lieber and Štekauer 2009a: 14). As discussed in Giegerich 2009, there are two criteria that are commonly assumed to be valid, but in one direction only: a given construction is a compound if (but not only if) it satisfies at least one of them. The first is phonetic: when the first element is stressed, as in *blackbird* (a particular species), but not in *black bird* (any bird that is black), it is a compound, not a phrase. The second is semantic: the meaning of *blackbird* is not fully compositionally derived from *black* and *bird* (it is not just any bird that is black), so it is a compound, not a phrase. These tests do not provide arguments for the compound status of *once king*, etc., as the stress is on the noun and the meaning is fully compositional, but they also do not exclude this possibility.

As for syntactic tests, the *one*-test is used relatively frequently, but – as discussed, e.g., in Giegerich 2009: §9.5 – it is known to be unreliable. A test that works better, in the sense that apparent counterexamples are easier to account for, is the internal modifiability test: if the first or the second element may be modified, then it is not a compound. Also Lieber and Štekauer (2009a: 11–12) consider modifiability of the second element as the most reliable test, followed by the modifiability of the first element (with *one*-anaphora as the third, less reliable test).⁹ According to the first of these tests, *black bird* is not a compound, as *black ugly bird* is fine. By contrast, *ugly* cannot modify *bird* alone in *blackbird*, so *blackbird* is a compound. According to the second test, *very black bird* is fine, so *black bird* is not a compound. By contrast, a similar modification is impossible in the case of *blackbird*, without it losing its reference to the specific species. It is possible to demonstrate that, according to these more reliable tests, the relevant [Adv N] constructions are syntactic phrases, not compounds.

Considering the first test, we first looked in English Web 2020 for constructions such as *a/the twice/thrice ... winner/champion*, where ... stands for 1 to 5 words. Among 169 hits, many involved the name of the award or competition, e.g., *the twice Booker Prize winner*, *the twice Paris Show champion*, etc. We excluded them as it could be claimed that *Booker*

⁹Also Huddleston and Pullum (2002: 449) rely on such modifiability tests, and not on *one*-anaphora.

Prize winner, *Paris Show champion*, etc., are complex compounds, to which *twice* attaches via lexical processes, resulting in even more complex compounds. In the following examples such a complex compound analysis is unlikely:

- (28) Maghsoodloo is a *twice* [Iranian national champion]...
- (29) Paikidze... is a *twice* [U.S. women's champion].
- (30) Zhang Zhong... is a Chinese chess grandmaster, a *twice* [Chinese champion]...

According to B, all these examples should be ungrammatical or only have the reading where the adverb modifies the immediately following adjective; the following examples, ungrammaticality markings and comments are Bruening's (2023: 26, (66b)–(67a–b)).¹⁰

- (31) *the once beloved king (only grammatical on parse *the once-beloved king*)
- (32) *the twice happy winner (only grammatical on parse *the twice-happy winner*)
- (33) *a soon short visit (only grammatical on parse *a soon-short visit*)

On this analysis, Maghsoodloo in (28) would be a champion who is *twice-Iranian* (whatever that means), Paikidze in (29) would be *twice-U.S.*, Zhang Zhong in (30) – *twice-Chinese*.¹¹

A very different example of modification of the second element which contradicts B's compound hypothesis is (34).

- (34) The *now* [alleged scammer and convicted felon], Danielle Miller, was a 13 year old girl, who sent her crush videos of herself masturbating with a Swiffer mop.

This example is particularly interesting, as – on the most prominent interpretation – *now* combines with the coordination *alleged scammer and convicted felon*, clearly a syntactic construction. Another example involving coordination is (35).¹²

- (35) After the *soon* [prime minister and alternate prime minister designates] concluded their remarks...

The relevant adverbs may also modify nominal constituents containing relative clauses, i.e., again, uncontroversial syntactic – not lexical – constructions.

¹⁰Note that, while the interpretation of (31) as “the king who was once beloved” is coherent, but not the only reading, the interpretation of (32) as “the winner who was happy twice” is clearly not the intended reading, and the interpretation of (33) as “a visit that will soon be short” is borderline incoherent.

¹¹We are not denying the possibility that the sequence Adv Adj N may have the structure [Adv Adj] N, but examples (28)–(30) demonstrate that it may also have the structure Adv [Adj N]. This structural ambiguity is clear in the following constructed example:

(i) The *once popular mayor of London* became...
 a. ...the most unpopular mayor in England. (assumes [*once popular*] *mayor...*)
 b. ...an equally popular Prime Minister. (assumes *once* [*popular mayor...*])

¹²The possibility of such coordinations is sometimes treated as a separate argument against compoundhood; see, e.g., Huddleston and Pullum 2002: 449–451.

- (36) The *once* [mother who was so caring] is no longer caring to her family members.
- (37) The *once* [mother who had all the time in the world for her children] suddenly began spending all her kid's trust fund...
- (36) cannot involve the structure “[once mother] who was so caring”, with the relative clause modifying the hypothetical compound *once mother*. This is clear from the context: (36) is taken from a forum, where the poster complains that her mother suffers from depression and is not caring to her family anymore. That is, (36) is about somebody who is still a mother, contrary to the compound analysis, which would be about somebody who was a mother once. (37) is analogous, with an even larger syntactic construction.

Similarly, (38) below is about Bill Hudson, who disowned 2 of his 5 children, i.e., about a father (just, in a sense, not of five anymore) rather than about a *once father*.

- (38) “I no longer recognize Oliver and Kate as my own,” the *once* [father of five] told Sunday’s The Mail.

Considering the second test, we looked for examples of *very* modifying the adverb in [Adv N]. This is in principle only possible in the case of the qualitative adverbs *soon*, *seldom*, and *often* (cf. **very once*, **very twice/thrice*, **very now*, **very always*), so we looked for *a/the very soon/seldom/often* followed by a noun. (39)–(44) are just 6 of the 59 examples found in English Web 2020.¹³

- (39) I wish nothing but label troubles, bankruptcy, and a *very soon* breakup for Deathstars in the future.
- (40) ...this co-evolution is the best way to assure a *very soon* death for VB.NET.
- (41) Violence and street fights occur on a *very seldom* basis.
- (42) It seemed to be one of the *very seldom* bugs in the game.
- (43) They are a *very often* occurrence at our office, she said.
- (44) ...they realize about the *very often* appearance of a sola flower bouquet in arts.

We conclude that the two most reliable syntactic tests for compoundhood show unequivocally that the relevant [Adv N] constructions are syntactic, not lexical. This – together with the *now wife... previous one* examples (26)–(27), which show that such constructions are syntactic also according to B’s own criteria, and with the correct interpretation of the results of B’s experiments offered in §4 – leaves no doubt that the relevant [Adv N] constructions can-

¹³Some of the native speakers we consulted found these examples – especially, (41)–(44), involving *seldom* and *often* – markedly worse than many of the other attested examples cited in this paper.

not be analyzed as compounds. In the next subsection, we demonstrate that this conclusion is compatible with what dictionaries say about *once*, *now*, etc.

3.4 Dictionaries

B&AK assume that the relevant adverbs cannot directly pre-modify nouns and B claims that, even if sometimes they can, it is only on a compound analysis. Such views should be contrasted with the fact that the Oxford English Dictionary (OED) records prenominal uses of the relevant adverbs and analyzes most of them in such uses as regular adjectives (*once*, *now*, *soon*, *seldom* – marked as “now chiefly U.S.”, *often* – marked as “now rare”) or as “quasi-adjectives”¹⁴ (*twice*, *thrice*) – crucially, as syntactic modifiers, not as parts of compounds. Some of the examples cited in OED in such lexical entries are given below:

- (45) The *once* queen who liked to play at milkmaid.
- (46) The *twice* pilgrim.
- (47) Till the *thrice* Confession Blot the *thrice* Denial out.
- (48) My *now* wife.
- (49) A white mist, thick, in the *soon*-twilight to be impenetrable.
- (50) With her small *seldom* smile.
- (51) ... a frequent mingling and an *often* hospitality...

Some of the relevant adverbs also have adjectival entries in other dictionaries. For instance, the Internet edition of Merriam-Webster¹⁵ lists adjectival *once* (exemplified with (52)), *now* (with (53)),¹⁶ and *seldom* (no example), Dictionary.com recognizes adjectival *once*, *seldom*, and – marked as “archaic” – *often*, etc.

- (52) ... contributions to enrich the legal resources of the *once* province of Britain.
- (53) the *now* president

It seems clear that dictionaries classify the relevant adverbs as adjectives on the basis of the usual definition of English adjectives as “words that modify nouns” (see Payne et al. 2010 for discussion). Whether they are right or not, the fact that such prenominal uses of these adverbs have long been recorded in dictionaries confirms our analysis of the relevant constructions as syntactic and, hence, supports our rejection of selectional violations in coordination involving

¹⁴The term *quasi-adjective* is used in some unrevised OED entries, while in revised entries “this term is not used: a word behaving as an adjective... is treated as an adjective” (<https://public.oed.com/how-to-use-the-oed/glossary-grammatical-terms/>).

¹⁵<https://www.merriam-webster.com/dictionary/>

¹⁶Recall that (6), containing the sequence in (53), was “completely unacceptable, in my judgment” for B.

hypothetical “AdvPs in AdjP positions”.

3.5 Discussion

On the basis of rich attested data, we demonstrated that there are no “AdvPs in AdjP positions” selectional violations in coordination: both configurations involving the relevant apparently adverbial words – [Adv & Adj N] and [Adv N] – are grammatical as syntactic constructions. The correct generalization seems to be that temporal and frequentative non-*ly* adverbs may pre-modify nouns (as in (54a), repeated from (53)) and, hence, may be coordinated with other such pre-modifiers, including adjectives (as in (54b)), conforming to *The Cambridge Grammar*'s view of coordination in (8).

- (54) a. the *now* president
b. the *now* and future president

We see at least two ways of modeling this generalization. The first, consonant with the discussion in the previous subsection, is that such temporal and frequentative words are in general categorially ambiguous between adverbs and adjectives. On this conservative view, *now* in (54a–b) is an adjective, so (54b) involves coordination of two adjectives and, hence, there is no selectional violation of any kind. The second possibility is that pre-modifiers of nouns constitute a more heterogeneous class which consists not only of adjectives, but also the relevant adverbs, some prepositions (Payne et al. 2010: 40), and perhaps nouns.¹⁷ On this view, different categories are coordinated in (54b), but – given the grammaticality of (54a) – also without any selectional violations.

No matter how such facts are analyzed, the generalization in terms of the semantically coherent class of temporal and frequentative adverbs seems to be robust, as also other adverbs in this class behave similarly. This is most clear in the case of *then*, which – just as the other relevant adverbs – may be used both in [Adv & Adj N] and in [Adv N] configurations, as attested by the following examples:¹⁸

- (55) a. There he met some of the *then and future* leaders of Fiji...
b. ... Sergey Bogdanchikov, the *then and current* President of Rosneft.

¹⁷Not all [N N] constructions are reasonably analyzed as compounds; see, e.g., Huddleston and Pullum 2002: ch. 5, §14.4, Giegerich 2009, Lieber and Štekauer 2009a, and references therein.

¹⁸There are over 100,000 occurrences of the [D *then* N] pattern in English Web 2020, including (56), which makes *then* a particularly productive prenominal adverb.

- (56) a. Lines were crossed, in particular by the *then* Director of the FBI.
 b. However, the *then* Prime Minister, Bulent Ecevit, rejected the offer...

Such “adjectival” uses of *then* are also recorded and exemplified in OED and Merriam-Webster. A similar case could be made for *yesterday* (also recorded as an adjective in OED and Dictionary.com), and perhaps also for *tomorrow*, *ever* (recorded in OED as “obsolete” and in Dictionary.com as “South Midland and Southern U.S.”), etc.

4 Experimental Evidence

The previous section showed that the adverbs considered by B&AK and B may be used as direct pre-modifiers of nouns and that such uses should not be analyzed as involving compounding. This section first (in §4.1) discusses problems with B’s two acceptability experiments, then (in §4.2) presents a new experiment, whose results directly contradict B’s empirical claims, and concludes with a discussion (in §4.3).

4.1 B’s Experiments

The aim of B’s experiments was to show that *syntactic* constructions such as *the now president* are ungrammatical; if such strings are acceptable, it is only on the compound interpretation, where *now president* is a noun with internal *lexical* structure. In this subsection, we point out some problems with B’s interpretation of the results of these experiments. The conclusion is that these experiments do not provide any evidence for the compound analysis of [Adv N].

4.1.1 Problem 1: Interpreting Lower Naturalness as Ungrammaticality

In the first experiment, stimuli included minimal pairs differing only in the use of an adverb or an adjective as a prenominal modifier, as in the following pair:

- (57) a. We want to meet the *now* vice president. (Adv)
 b. We want to meet the *current* vice president. (Adj)

In that experiment, performed via Amazon Mechanical Turk, in which responses of 65 American native speakers were taken into account, eight such pairs were used, two for each of *now*, *soon*, *once*, and *twice*.

Participants were asked to evaluate stimuli on a 5-point Likert scale, where the five points are labeled: 1: *Extremely unnatural*, 2: *Somewhat unnatural*, 3: *Possible*, 4: *Somewhat natural*, 5: *Extremely natural*. These names are used in Gibson et al. 2011, whose methodology B

follows. They are appropriate for making conclusions about one construction being less natural than another construction. However, scores resulting from such a scale cannot be directly mapped into “grammaticality” and “ungrammaticality”.

In particular, nothing justifies translating only average scores of 4 or above to “grammatical” and all scores below 3 to “ungrammatical”, and this is how these scores are interpreted in Bruening 2023. This is unjustified because grammatical constructions which are pragmatically deviant or have more natural or frequent paraphrases may easily be judged as *Possible* (score 3) or even *Somewhat unnatural* (score 2).¹⁹

The mean scores for versions with an adjective and with an adverb, as well as for grammatical and ungrammatical fillers, are given in the following table (Bruening 2023: 10).²⁰

(58)	gram. fillers	ungram. fillers	Adj	Adv
mean	4.45	2.27	4.75	3.16
SD	0.91	1.36	0.55	1.27

About these results, Bruening (2023: 11) says: “14 of 65 [subjects] rated Adv 4 or higher (22%), while 28 of 65 rated Adv below 3 (43%)… This means that approximately 43% of those surveyed find non-*ly* adverbs unacceptable as prenominal modifiers. However, approximately 20% rated Adv 4 or higher, which would seem to indicate that approximately 20% of the population accepts these non-*ly* adverbs as prenominal modifiers.” Note the lack of balance in this interpretation: averages in the half-open interval [1, 3) of length 2 (see “below 3” in the quotation) provided by 43% of subjects are considered as indicating unacceptability, while only those in the closed interval [4, 5] of length 1 (see “4 or higher”) provided by 22% of subjects are considered acceptable. This excludes from consideration 35% of subjects, whose average scores were in the interval [3, 4). We claim that such scores could also reasonably be interpreted as indicating acceptability.

Given the setup of the experiment, each respondent saw four sentences containing an Adv. Assume that three sentences were judged as *Possible* (i.e., 3) and one – as *Somewhat unnatural* (i.e., 2). This gives the average score of 2.75 – below 3, yet indicating that, for this respondent, the construction with Adv is *possible*, even if occasionally *somewhat unnatural*. A reasonable

¹⁹That is, we side here with Bruening 2018b: 6: “It is not possible to decide that below a given mean rating (say, 2.5) sentences are ungrammatical, and above that they are grammatical. For one thing, the judgments reported by subjects are judgments of acceptability, not grammaticality, and judgments of acceptability are affected by numerous non-grammatical factors (such as length, complexity, and familiarity).”

²⁰SD stands for standard deviation. Strictly speaking, it is not appropriate to report means and standard deviations for ordinal data (such as Likert scale, especially one with named points) or to train linear models on such data (see §§4.1.2–4.1.3 below), but this is a relatively common practice in experimental syntax.

interpretation would be that, for such a speaker, the Adv constructions are grammatical, even if dispreferred with respect to the usual Adj constructions.

So, given how the points on the scale are named, the opposite imbalance would be much more justified: treating responses averaging between *Possible* and *Extremely natural* as acceptable, and only those below *Somewhat unnatural* as unacceptable. But then, not just 22% but as many as $22\% + 35\% = 57\%$ of respondents would have to be interpreted as accepting the relevant [Adv N] constructions.²¹

4.1.2 Problem 2: Ignoring Additive Effects

The existence of a considerable number of speakers who accept [Adv N] constructions (e.g., *the once president*) means that the textual presence of [Adv & Adj N] constructions (e.g., *the once and current president*) cannot be immediately interpreted as “AdvPs in AdjP positions” selectional violations: perhaps such [Adv & Adj N] examples were produced by speakers who accept [Adv N] constructions in the first place. In an attempt to defend his analysis of apparent selectional violations, B claims that speakers only accept [Adv N] constructions on the compound reading of [_N Adv N]. In the case of the example at hand, this means that *once president* must be treated as a compound, i.e., a single word.

As discussed in §3.3, B uses the *one* substitution test to distinguish compounds from syntactic constructions. This test is based on the assumption that *one* may only refer to syntactic items, not to proper parts of compounds. On this assumption, (59a) should be ungrammatical, as *one* attempts to refer to *president*, which is a part of the purported compound *once president*, while (59b) is grammatical, as *one* refers to the syntactic item *president* (*past president* is not a compound).

- (59) a. At the event we saw the once president and the current one. (Adv)
b. At the event we saw the past president and the current one. (Adj)

²¹ A related but distinct problem is that B seems to assume that all grammatical sentences should have the same high acceptability. This is evident in the following quotation: “If P&P are correct and these non-*ly* adverbs are capable of being prenominal modifiers, then we should not see any difference in the ratings subjects assign to the two members of each pair” (Bruening 2023: 9). A similar misinterpretation of P&P’s claims may be found in the following quotation: “This indicates that, contrary to what P&P say, non-*ly* adverbs are not rated the same way as adjectives in prenominal position” (Bruening 2023: 13). Experimental literature is teeming with reports of uncontroversially grammatical constructions differing in acceptability in ways that are statistically significant; see, e.g., Francis 2022 and various articles in Goodall 2021 for overviews and examples. So, contrary to these quotations, the decreased acceptability of [Adv N] in comparison to [Adj N] does not automatically mean that [Adv N] is ungrammatical. On the other hand, this difference in acceptability does call for an explanation, and we offer some thoughts on this matter in §4.3.

(59) is one of eight minimal pairs (see (25) above for another one) used in B's second experiment. This experiment had an analogous design to the experiment reported above (with the same names of the 5-point Likert scale) and used responses of 77 subjects. The results of this experiment are presented in (60); for comparison, the results from the first experiment given in (58) above are repeated in (60) in brackets (in gray).

(60)	gram. fillers	ungram. fillers	Adj	Adv
mean	4.39 (vs. 4.45)	2.20 (vs. 2.27)	3.82 (vs. 4.75)	2.60 (vs. 3.12)
SD	0.95 (vs. 0.91)	1.27 (vs. 1.36)	1.08 (vs. 0.55)	1.17 (vs. 1.27)

Bruening 2023: 12 summarizes these results thus: "Participants behaved as expected on the grammatical and ungrammatical fillers. The Adj items were rated slightly lower than the grammatical fillers, but still close to 4. The crucial items are the Adv items. These are rated very low, below 3, like the ungrammatical fillers."

We believe that the crucial items here are not only the Adv items, but also the Adj items. B does not comment on perhaps the most conspicuous difference between the results of the two experiments: the sharp drop in acceptability of Adj constructions from 4.75 in the first experiment to 3.82 in the second experiment (with the accompanying rise of standard deviation from 0.55 to 1.08).²²

What may be observed here is a prototypical case of a well-known phenomenon in experimental syntax, namely, the (under)additive effect of multiple conditions (see, e.g., Keller 2000 and Hofmeister et al. 2014, as well as Francis 2022 for an overview). It is true that the first experiment shows that the relevant [Adv N] constructions are less acceptable (in the sense of being rated as less natural) than corresponding [Adj N] constructions. However, it is not clear whether the second experiment adds anything to this observation: [Adv N] constructions could have been rated lower in this experiment than in the first one simply because sentences involving the complex construction with *one*-anaphora are *generally* rated lower than the much simpler stimuli used in the first experiment.

In order to test this possibility, it is necessary to replace the two monofactorial analyses of the two experiments reported in Bruening 2023 with a single multifactorial analysis, not reported there. We conduct such an analysis in the following section.

²²Note that, assuming B's interpretation of the results of the first experiment, where only average scores of 4 and higher were considered to indicate acceptability, such uncontroversially grammatical constructions with adjectives should not be considered acceptable, as $3.82 < 4$.

4.1.3 Multifactorial Analysis

Considered individually, the models used in B's two experiments, developed using the tools made available by Gibson et al. (2011), are state-of-the-art (but see fn. 20): they are mixed effects linear models, fitted with the R (R Core Team 2012) package lme4 (Bates et al. 2015), with speakers and test items treated as random effects, and the Adv/Adj condition as the single fixed factor. The problem is that the results of such two separate monofactorial models cannot be directly compared in a statistically reliable way.

For this reason, we used the raw results of B's experiments and fitted a 2×2 bifactorial model.²³ The two fixed factors were part-of-speech (Adv vs. Adj, as in both experiments) and construction (simple in the first experiment and complex *one*-anaphora construction in the second experiment). We followed B in using mixed effects linear models fitted with the R package lme4, with speakers and test items treated as random effects.²⁴ Also following B, *p*-values were extracted from the fitted model using the Satterthwaite approximation implemented in the lmerTest package (Kuznetsova et al. 2017).

The analysis confirms that the acceptability of [Adv N] is highly significantly lower than that of [Adj N] (drop of 1.6; $df = 32.3$, $t = -7.50$, $p < 0.001$), but also that *one*-anaphora causes a highly significant decrease in acceptability over the simple construction (drop of 0.9; $df = 19.7$, $t = -4.82$, $p < 0.001$). Importantly, the interaction of these two conditions is slightly underadditive: the co-occurrence of [Adv N] and *one* increases acceptability (by 0.4) with respect to what might be expected if the effect of the two conditions were fully additive, although this interaction is not statistically significant ($df = 30.4$, $t = 1.4$, $p = 0.16$). Hence, the low rating of Adv items in B's second experiment may be explained by the usual (under)additive effect of two independent conditions and, hence, does not provide any evidence for B's analysis of [Adv N] as compounds.²⁵

²³We are grateful to Benjamin Bruening for making the raw results of his experiments available to us.

²⁴The maximal model that converged is given by the formula: Score ~ 1 + pos * construction + (1 + pos | Participant) + (1 + pos | Input), where Score is the expected score on the 1–5 Likert scale, construction is either simple or with *one*-anaphora, pos – Adj or Adv, and Participant and Input are the two random effects.

²⁵As pointed out by an anonymous reviewer, B's second experiment should have had one more condition, testing whether respondents accept simple [Adv N] constructions. Then, considering only speakers whose acceptance of [Adv N] and [Adj N] is comparable, a significantly larger drop of acceptability of *one*-anaphora with [Adv N] items compared to *one*-anaphora with [Adj N] items could be interpreted as an argument for the compound analysis of [Adv N].

4.2 New Experiment

B's analysis of the purported "AdvPs in AdjP positions" violations makes a number of predictions that were not tested in B's experiments. The first is that [Adv & Adj N] constructions should be significantly more acceptable than [Adv N] on average, as the former are grammatical for all speakers, while the latter are assumed to be grammatical only for a minority of speakers. The second is that the distribution of judgments on [Adv & Adj N] sentences should be unimodal, with the mode comparable to that of grammatical fillers, while in the case of [Adv N] sentences the distribution should be bimodal, with the two modes comparable to those of grammatical and ungrammatical fillers, given the two hypothetical populations of speakers of English differing in whether they have relevant $[_N \text{ Adv } N]$ compounds in their dictionaries. The third is that there should be no correlation between a speaker's acceptance of the *syntaxtic* construction [Adv & Adj N] and their acceptance of the corresponding apparently *lexical* construction [Adj N].

We tested these predictions in an acceptability judgment experiment involving minimal pairs such as (61).²⁶

- (61) a. Emily Kuhn spoke with Preston, the now head of global finances at Nestle.
b. Emily Kuhn spoke with Preston, the now and future head of global finances at Nestle.

We considered the same 4 adverbs that were tested in B's experiments. However, unlike B, we tested each of these adverbs separately and with a specific noun, as compounding is an idiosyncratic process; e.g., a speaker might have the hypothetical compound *now head*, but not *now prime minister* or *once head*. The table in (62) presents the specific sequences tested; they were selected as plausible on the basis of their occurrence in corpora.

²⁶The importance of such a direct comparison is acknowledged in Bruening 2023: 13: "Importantly for this article, although most English speakers reject non-*ly* adverbs as prenominal modifiers by themselves, they do accept them conjoined with an adjective in this position." However, we cannot agree with B's justification of this claimed acceptability difference given in the next sentence: "While examples like this were not tested directly in the two experiments reported here, B&AK present extensive corpus and judgment data to substantiate this claim." B&AK provide about 15 attested examples of [Adv & Adj N] (and it is equally easy to find numerous attested examples of [Adv N]; around 30 are given in §3) and they only provide their own judgments on some of the corresponding [Adv N] items.

(62)	Adv	[Adv N]	[Adv & Adj N]
	<i>once</i>	<i>once boss</i>	<i>once and current boss</i>
	<i>twice</i>	<i>twice winner</i>	<i>twice or three-time winner</i>
	<i>now</i>	<i>now head</i>	<i>now and future head</i>
	<i>soon</i>	<i>soon appearance</i>	<i>soon and certain appearance</i>

For each adverb, 8 minimal pairs such as (61) were tested. The experiment had the usual Latin square design, so that each respondent saw only one of the two sentences. For technical reasons, the experiment was split into two subexperiments, one containing *once* and *soon* stimuli, the other containing *twice* and *now*, i.e., each subexperiment contained 16 stimuli. As this experiment was combined with another experiment, there was an unusually large number of 80 fillers in each subexperiment: 32 test items of that other experiment and 48 true fillers ranging from fully grammatical to fully ungrammatical (but interpretable, i.e., no word salad).²⁷

In order to better judge the absolute acceptability, we included among the fillers the standard items from Gerbrich et al. 2019. Standard items are sentences grouped into 5 classes, A–E, known to reliably produce the whole range of different acceptability ratings.²⁸ Each class consists of 3 sentences; those in classes A and B are meant to be grammatical, C are borderline, and D and E are meant to be ungrammatical; see Appendix C for the complete list. By comparing ratings of stimuli to the ratings of such standard items, it is possible to assign specific acceptability labels to stimuli.

We measured acceptability using the Thermometer Method (TM; Featherston 2008, 2009), rather than the more usual Likert Scale; as argued in Featherston 2009, TM combines the strengths of Likert Scale and Magnitude Estimation (Bard et al. 1996), while avoiding their weaknesses. The idea of TM is that respondents are presented with two sentences, visible throughout the experiment: one which is relatively unacceptable (but interpretable) and one that is relatively acceptable (but not very natural). To this end, we used the following two sentences from Featherston 2021: 53:

- (63) The father fetches the wholemeal bread them.
 (64) The father fetches the children the wholemeal bread.

Sentence (63) is assigned value 20 and (64) is assigned 30, and respondents are asked to judge

²⁷The stimuli and fillers, as well as R code and analyses, are available in the following Open Science Framework repository: <https://osf.io/j27pn/>.

²⁸For example, on the Likert Scale 1–5, examples in class A produce average ratings close to 5, B – around 4, C – a little above 3, D – a little above 2, and E – between 1 and 1.5 (Gerbrich et al. 2019: 314–315; cf. Molimpakis 2019: 128–130, Featherston 2020: 169–171, and Brown et al. 2021: 16–18).

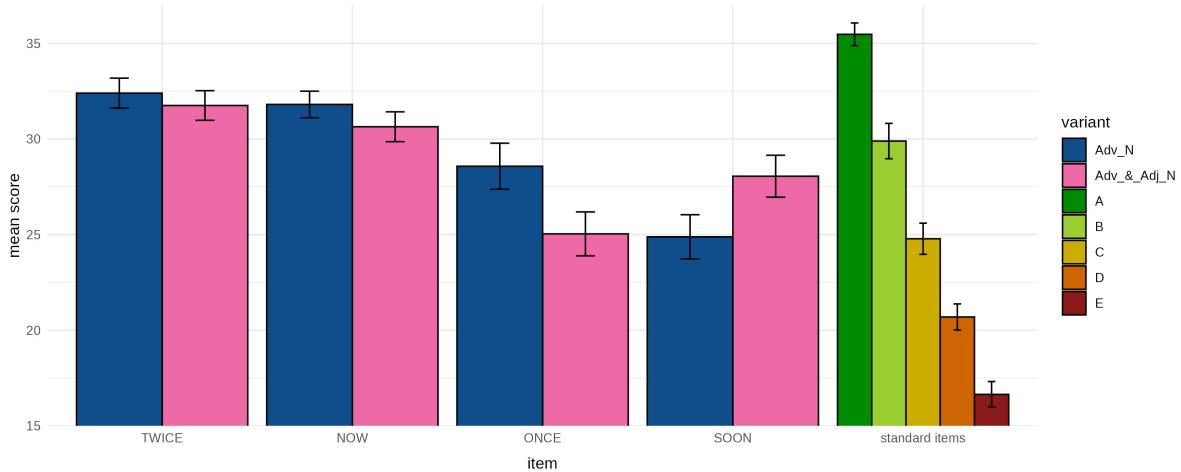


Figure 1: Average scores of stimuli and standard items (with 95% confidence intervals)

other sentences by comparing them to these two sentences.²⁹

The experiment was implemented in LimeSurvey,³⁰ with participants recruited via Prolific³¹ and remunerated according to its recommendations. 89 native speakers of English completed the experiment, but 19 were excluded from analysis due to not satisfying one or more of the quality control criteria listed in Appendix C. Of the remaining 70 participants, 24 were female and 46 male, all at least 20 years old ($M = 39.7$, $SD = 13.1$), all native speakers of English located in the UK ($N = 56$), the US ($N = 13$), or Canada ($N = 1$).

Average scores of [Adv N] and [Adv & Adj N] constructions involving particular adverbs are presented in Figure 1. The first prediction of B's analysis, that [Adv & Adj N] should be more acceptable on average than [Adv N], is only borne out in the case of *soon*; the acceptability of [Adv N] is significantly greater than that of [Adv & Adj N] in the case of *once*, and insignificantly so in the case of *twice* and *now* (see the confidence intervals).

Moving to the second prediction, that judgments of [Adv N] should have a bimodal distribution, we utilized three different methods of modality testing, as no single method is generally accepted as fully reliable, namely methods implemented in the following R packages: Laplaces-Demon (Statisticat and LLC. 2021), multimode (Ameijeiras-Alonso et al. 2021; using the default ACR method), and diptest (Maechler 2024). The results are presented in Figures 2–5, which contain juxtaposed histograms and density plots of the two constructions, [Adv N] and [Adv & Adj N], for the four adverbs. Titles of these figures contain information about the re-

²⁹Given that the vast majority of judgments in TM fall within the range of 15–35 (Featherston 2009: 64), the response scale was technically limited to 10–40.

³⁰<https://www.limesurvey.org/>

³¹<https://www.prolific.com/>

ONCE (Adv_N: bimodal, ACR: 0.108, dip: 0.277; Adv_&_Adj_N: unimodal, ACR: 0.904, dip: 0.987)

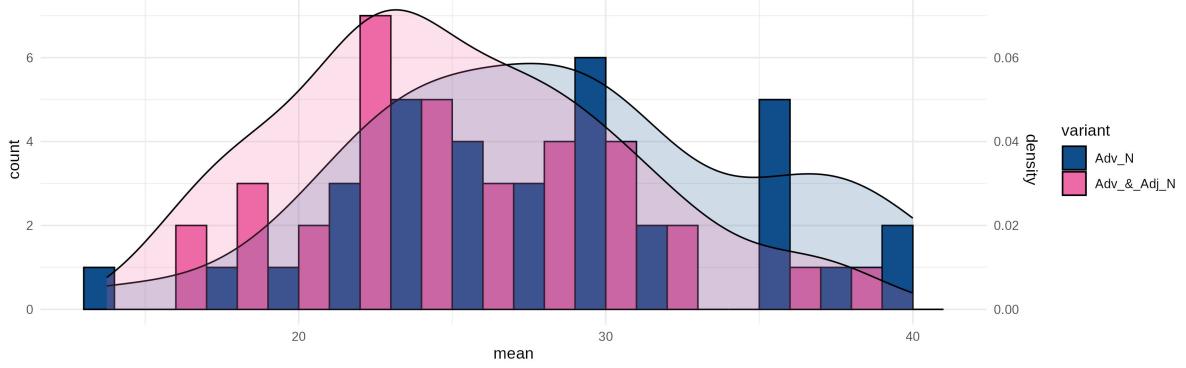


Figure 2: Histograms, density plots, and results of modality tests for *once boss* and *once and current boss*

TWICE (Adv_N: unimodal, ACR: 0.738, dip: 0.832; Adv_&_Adj_N: unimodal, ACR: 0.264, dip: 0.509)

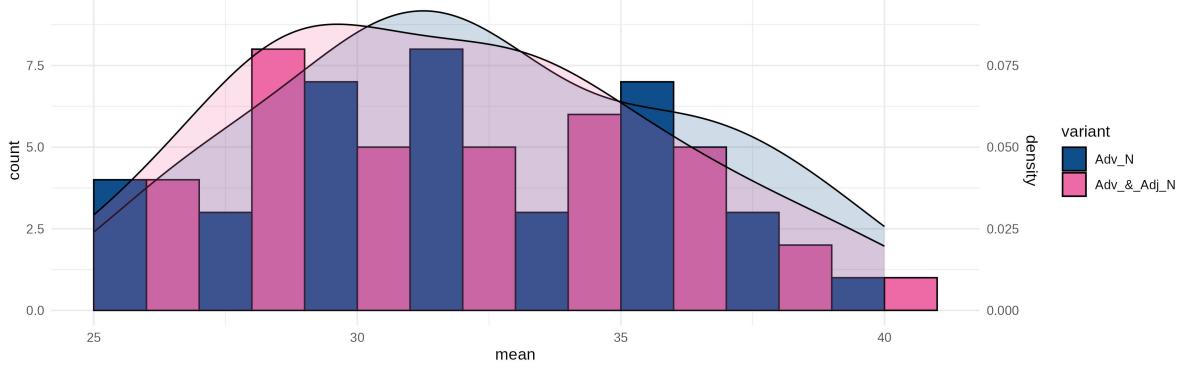


Figure 3: Histograms, density plots, and results of modality tests for *twice winner* and *twice or three-time winner*

sults of modality tests for both constructions. First, *unimodal* vs. *bimodal* reports the results of `is.unimodal` and `is.bimodal` functions from the `LaplacesDemon` R package. The following ACR and dip numbers are *p*-values reported by functions `modetest` (from the `multimode` package) and `dip.test` (from the `diptest` package). Values below 0.05 would make it possible to reject the null hypothesis that the distribution is unimodal and claim that it is multimodal.

Note first that all reported *p*-values are considerably greater than 0.05, so ACR and dip did not find multimodality in any of the datasets. Also `LaplacesDemon` reports unimodality for 3 out of 4 [Adv N] constructions, apart from *once boss*. However, instead of the expected modes corresponding to unacceptability (i.e., around 20 or less) and acceptability (around 30 or more), the detected modes are 27.6 and 36.6, which – by comparison to the standard items – may be interpreted as ‘marginal acceptability’ and ‘extreme acceptability’.³² Hence, it is safe

³²`LaplacesDemon` also reports bimodality for one of the 4 [Adv & Adj N] constructions, *now and future head*,

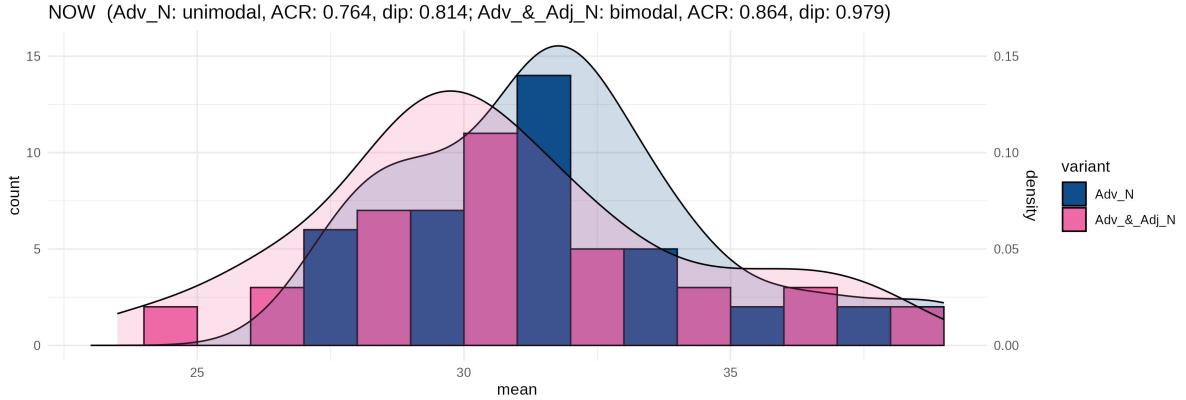


Figure 4: Histograms, density plots, and results of modality tests for *now head* and *now and future head*

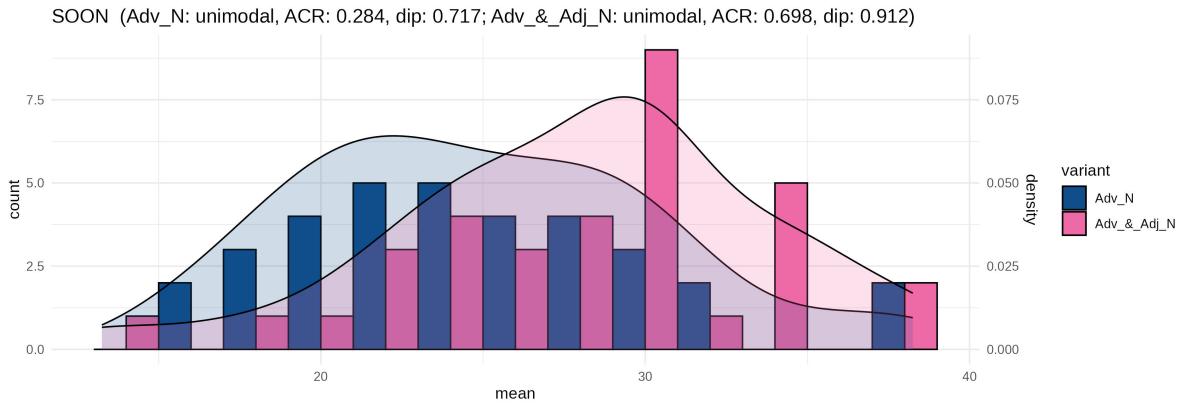


Figure 5: Histograms, density plots, and results of modality tests for *soon appearance* and *soon and certain appearance*

to conclude that judgments on both constructions have unimodal distributions, contrary to B's analysis, which predicts bimodality in the case of [Adv N].³³

Finally, if [Adv N] constructions were lexical and [Adv & Adj N] syntactic, as in B's analysis, there should be no correlation between their acceptability. We tested this third prediction for each adverb separately. In each case, we ordered speakers by their average z -score of [Adv N] items and by their average z -score of [Adv & Adj N] items, and we measured the correlation between these two lists using both Spearman's ρ and Kendall's τ coefficients. The results are presented in Figures 6–9.³⁴

but again with two modes indicating acceptability: 29.7 and 35.7.

³³Recall that the only adverb which met the prediction of B's analysis that [Adv N] should be less acceptable on average than [Adv & Adj N] was *soon*. However, all tests report unimodality for *soon*, directly contradicting B's analysis.

³⁴Acceptance is measured in z -scores rather than absolute scores, to counter the effect of different interpretation of scales by different participants. Correlations based on absolute scores are all statistically significantly positive (with $p < 0.01$ for *once* and < 0.001 for the other three adverbs) and all moderate (*once, twice*) or strong (*now, soon*).

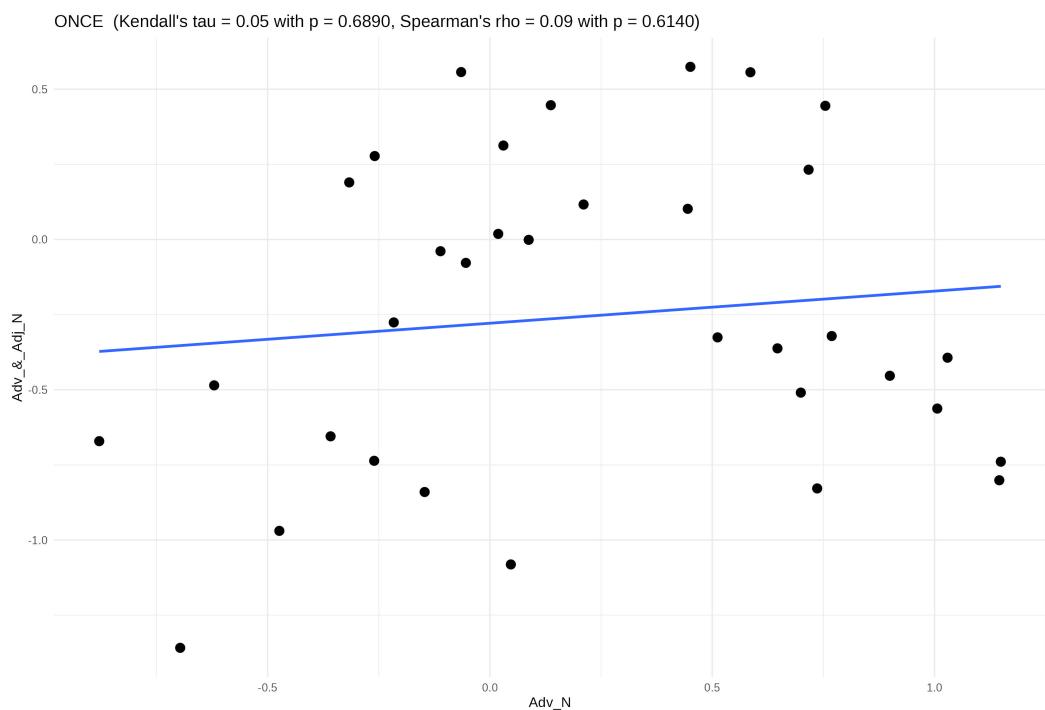


Figure 6: Correlation in respondents' z -scores of *once boss* and *once and current boss*; each dot represents a different respondent

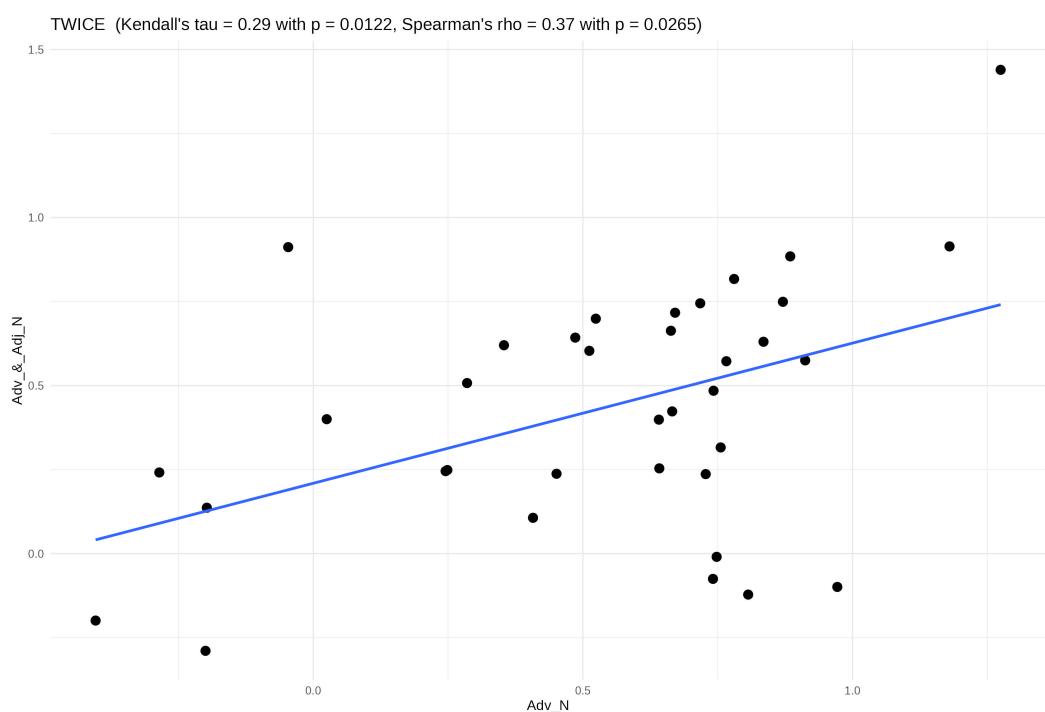


Figure 7: Correlation in respondents' z -scores of *twice winner* and *twice or three-time winner*; each dot represents a different respondent

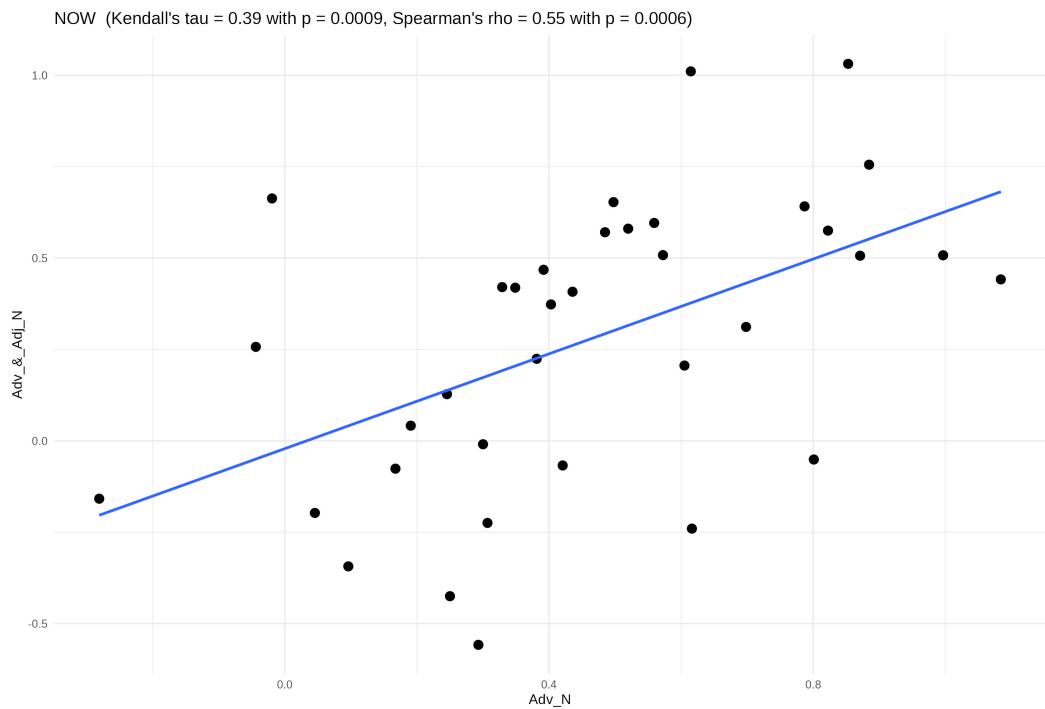


Figure 8: Correlation in respondents' z -scores of *now head* and *now and future head*; each dot represents a different respondent

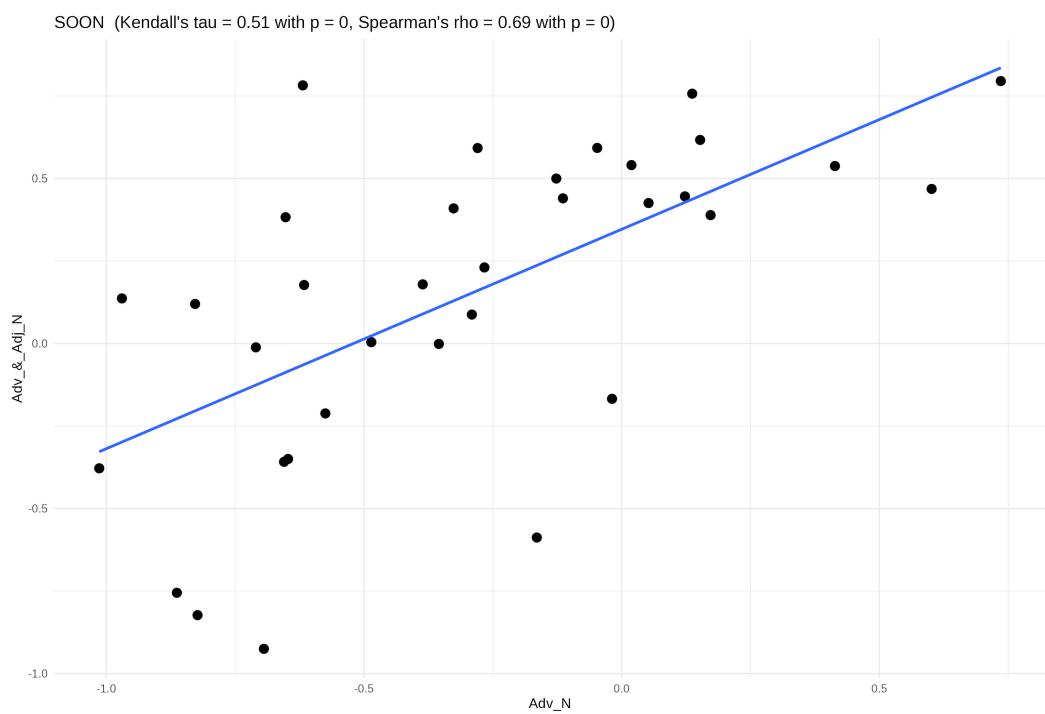


Figure 9: Correlation in respondents' z -scores of *soon appearance* and *soon and certain appearance*; each dot represents a different respondent

All correlations are positive, although in the case of *once* it is negligible and not statistically significant. Other correlations are statistically significant and range from borderline weak/moderate (*twice*), through moderate (*now*), to borderline moderate/strong (*soon*).^{35,36}

4.3 Discussion

Let us take stock. B's first experiment shows that a considerable number of native speakers accept [Adv N] constructions. B's second experiment was meant to show that they are only accepted as compounds, but fails to do so: its results are compatible with the usual (under)additive effect of two independent conditions, so it does not demonstrate that *one-anaphora* is impossible in the case of [Adv N].³⁷ Moreover, our own experiment demonstrates that none of the three predictions of B's analysis is borne out: [Adv N] is not uniformly judged as less acceptable than [Adv & Adj N], judgments on [Adv N] do not have bimodal distributions, acceptability of [Adv N] correlates with that of [Adv & Adj N]. Hence, experimental evidence unequivocally confirms earlier corpus-based conclusions: [Adv N] constructions with the relevant adverbs are acceptable as syntactic constructions, and not as compounds. There are no “AdvPs in AdjP positions” selectional violations.

The main aim of this paper was to refute B's (and B&AK's) claim that constructions such as *the twice or three-time winner* and *the now and future president* involve violations of selectional restrictions, and we believe that this aim has been fully achieved. Nevertheless, we end this section with some speculations on the reasons for the lower acceptability of prenominal adverbs than the corresponding prenominal adjectives, observed in the results of B's experiments (see the tables in (58) and (60)).

The key to explaining this effect seems to be the semantics and pragmatics of these adverbs. They are not exact synonyms of the corresponding adjectives, e.g., the prenominal *now* cannot always be replaced with *current*. Consider (11), repeated below as (65), and the attempt to replace *now* with *current* in (66).

- (65) In the letter, the *now king* wrote: “Dear Granny, I am sorry that you are ill...”
(66) In the letter, the *current king* wrote: “Dear Granny, I am sorry that you are ill...”

³⁵See <https://blogs.sas.com/content/iml/2023/04/05/interpret-spearman-kendall-corr.html> on such interpretations of the two correlation coefficients.

³⁶Note that the strongest correlation is witnessed for *soon*, which makes it very implausible that *soon appearance* is a compound accepted by a minority of speakers, despite what its diminished acceptability with respect to *soon* and *certain appearance* might suggest.

³⁷Recall the two attested examples of such anaphora in (26)–(27) on p. 7.

The context of this sentence is an article in *Daily Mirror*, written after the death of Elizabeth II, about a letter that Charles III wrote when he was 6 years old. In this context, replacing *now* with *current* is infelicitous, as the two modifiers make different implicit contrasts: *current king* implicitly contrasts with *former king*, i.e., with a different person, while *now king* implicitly contrasts with a different past role of the same person, in this case, with the young Charles. It is this latter contrast that is evoked in (65). Similar differences in implicit contrasts may be detected in the case of *once* (vs. *former*) and *soon* (vs. *future*). We believe that these subtleties in the semantics of the relevant adverbs may be partly responsible for their relatively low frequency in corpora, which in turn negatively impacts their acceptability, given the well-known correlation between frequency and acceptability (see, e.g., Lau et al. 2017 and references therein).

Second, possibly because of these semantic and pragmatic aspects, prenominal adverbs are more felicitous when they modify a noun whose referent has already been introduced in the discourse. Thus, an out-of-context joke may start with *A former prime minister walks into a bar...*, but not with *A once prime minister walks into a bar...*³⁸ In the experiment described in §4.2, all items with *once* and *twice* have such a referent introduced at the beginning of the sentence (as in (61)), and they are rated significantly higher on average than items with *once* and *soon*, which do not introduce a referent; cf. (67)–(68).

(67) They were waiting for the soon appearance of the King.

(68) The once boss of Virgin Records will speak at this event.

We note that all items used in B’s experiments also lacked such a facilitating context, which may go some way towards explaining the diminished acceptability of [Adv N].

Finally, it might be the case that different prenominal adverbs have different degrees of acceptability, as a lexical fact best explained from the diachronic and functional perspective.³⁹ For example *often*, claimed by B to be one of the adverbs taking part in selectional violations, is sometimes marked by dictionaries as “archaic” in the prenominal use (e.g., by Dictionary.com), so it may be marginally acceptable to some speakers, the more so, the more the speakers have been exposed to older texts. Also *soon* is clearly less acceptable than other adverbs, according to the results of both B’s and our experiments; as can be seen in Figure 1, its acceptability is at

³⁸This intuition is confirmed by corpus proportions of indefinites (which often introduce new discourse referents): 17% for [a *once* N] / [a/the *once* N] vs. 41% for [a *former* N] / [a/the *former* N]. This difference in proportions is statistically highly significant according to Pearson’s chi-square test: $\chi^2(1, N = 2,009,494) = 849.47, p < 0.001$.

³⁹This explanation assumes non-binary grammaticality. See, e.g., Keller 2000, Featherston 2005, 2019, and Lau et al. 2017 for specific approaches to non-binary grammaticality, and Francis 2022 for an overview.

the level of C standard items.⁴⁰ Given the unimodality of judgments, this relatively low acceptability is not a result of the existence of two populations such that [soon N] is grammatical for one and ungrammatical for the other (as B would have it), but rather a result of genuinely mid-range acceptability of some prenominal adverbs. While prenominal adverbs such as *twice* and *now* are significantly more acceptable than *soon*, the end of the scale is probably represented by *then*, which seems to be universally accepted as a prenominal modifier (see §3.5, especially fn. 18).⁴¹

Let us finish by noting that, within both [Adv & Adj N] and [Adv N] constructions, there are various collocations.⁴² For example, *once and future* – B's main example of [Adv & Adj] – accounts for 95% of matches of the pattern [D *once and* Adj N] in English Web 2020, i.e., it is a clear collocation. Within the matches of the more specific pattern [D *once and future* N], the most common noun is *king*, accounting for about 20% of hits. Similarly for some [Adv N] constructions; for example, *soon return* accounts for 45% of matches of [D *soon* N]. As our experiment tested specific lexicalizations of the two constructions, it is possible that some of these lexicalizations were just such collocations. This could explain the large differences between the means of scores of the two constructions in the case of *once* and, especially, *soon*, compared to statistically insignificant differences in the case of *twice* and *now*. For example, it could be that *soon and certain* (or the larger *soon and certain appearance*) is such a collocation, and for this reason *soon and certain appearance* is more acceptable than *soon appearance*, with bare *soon*, resulting in the opposite tendency than that observed for *twice*, *now*, and especially *once*, where [Adv N] is more acceptable than [Adv & Adj N].⁴³ We leave this matter for future research.

⁴⁰As for B's first experiment, we find that [Adv N] items with *soon* have the mean score of 2.48, while with the other three adverbs the means are in the range [3.23, 3.38].

⁴¹As noted by an anonymous reviewer, if the relevant prenominal adverbs are actually adjectives (see §§3.4–3.5), there might be a coercion process turning relevant adverbs into adjectives, and the applicability of this process may vary across adverbs (and across time and community).

⁴²The term *collocation* is understood rather differently in different linguistic traditions (for overviews see, e.g., Evert 2005: ch. 1 and Szudarski 2023: ch. 2). However, a common – on some approaches, defining – feature of collocations is that their corpus frequencies are significantly higher than what would be expected from the frequencies of their constituents.

⁴³The number of occurrences of the [D *soon and* Adj N] pattern in English Web 2020 is not sufficient to verify this hypothesis, but the results are compatible with it: among the 14 different matches (i.e., after excluding one repeated sentence from the 15 raw matches), only the adjectives *certain* and *literal* occurred twice, and other adjectives occurred each once.

5 Conclusion

If *The Cambridge Grammar of the English Language* is right, coordination is symmetric: X and Y may be conjoined in position P if and only if each of X and Y alone may occur in P. B disputes this generalization and claims that there are exactly two situations where coordination of X and Y is licensed in P even though X or Y alone is not.

We investigated one of these two purported selectional violations, exemplified by *the now and future president*, and showed that it does not involve any violations and is not an exception to the symmetric nature of coordination. In the process, we demonstrated – using both corpus evidence and experimental methodology – that the relevant [Adv N] constructions are syntactic and generally grammatical, contrary to B’s analysis, on which they are at best lexical compounds, acceptable only to a minority of speakers of English.

In a related publication, Kim and Lu (2024) explain the other purported selectional violation, exemplified by *You can depend on my assistant and that he will be on time*, as the processing effect of grammaticality illusion. If this explanation is confirmed by future research, their and our results jointly mean that there are no selectional violations in coordination. This in turn means that an important argument for asymmetric theories of coordination collapses, and also that various special mechanisms needed to account for such apparent selectional violations are not needed in syntactic theory. Hence, the effect of refuting the claim that selectional violations are possible in coordination is a more adequate theory of coordination and a leaner grammar.

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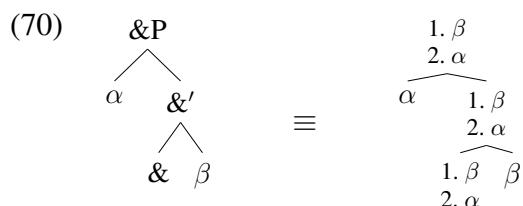
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Appendix A: Analytical Problems in Bruening 2023

In the case of the apparent “AdvPs in AdjP positions” violations in coordination, B does not retain B&AK’s account – criticized at length by P&P – but proposes a completely new analysis. On that analysis, categorial selectional features (C-selectional features, or C-features in short) may be specified using the set notation, as in “[C ∈ {NP, AdjP}]”, i.e., a C-feature that may be checked by an NP (noun phrase) or an AdjP (adjectival phrase), or as in “[C ∉ {N, CMPR}]”, i.e., a C-feature that may be checked by any category apart from N (noun) or CMPR (comparative).⁴⁴ B assumes that modifiers categorially specify the modified constituents. For example, adjectives bear the C-feature specified as “[C ∈ {N}]”, while adverbs such as *once*, *twice*, or *soon* bear the feature “[C ∉ {N, CMPR}]”. This last specification corresponds to the claim that such adverbs may modify almost any category, with the exception of nouns (see (2b) – *the once king* – ungrammatical according to B) or comparatives (see (69a) below from Bruening 2023: 39, apparently originally from Gobeski 2011).⁴⁵

- (69) a. She is {two times / *twice} taller than him.
 b. She is twice as tall as him.

Another difference with respect to Bruening and Al Khalaf 2020 is that in Bruening 2023 coordinations are assumed to be headed by the initially feature-less conjunctions,⁴⁶ which derive all their features from conjuncts (via Agree); such features are collected on a stack and shared along the spine of the coordinate structure:



⁴⁴We assume that, given a finite set of n categories $C_1, \dots, C_i, C_{i+1}, \dots, C_n$, the following two specifications are equivalent: “[C ∈ {C₁, …, C_i}]” and “[C ∉ {C_{i+1}, …, C_n}]”. Bruening 2023 is not entirely clear on this matter.

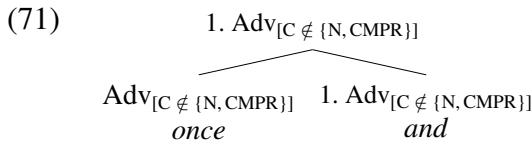
⁴⁵This last claim is most probably false; English Web 2020 contains over 800 examples of *twice* or *thrice*, followed by a comparative form ending in *-er*, followed by *than*, e.g.:

- (i) If she’s right, she’s *twice* stronger than me…
- (ii) Horn is *twice* denser than wood so that’s a bit less good.
- (iii) However, it seemed *twice* smaller than it was before.
- (iv) Vegetarians did *twice* better than non-vegetarians (meat-eaters).
- (v) Some Home Selling Guides argue that solar powered homes sell *twice* faster than homes using conventional electricity.

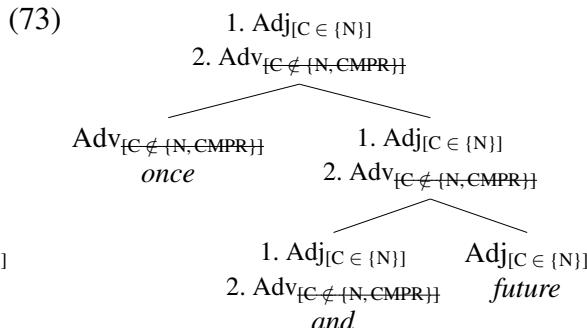
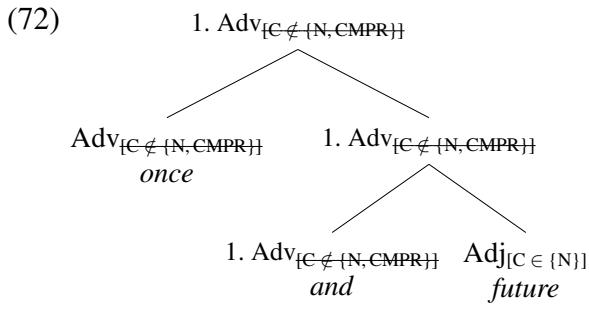
⁴⁶The idea that conjunctions are completely featureless seems at odds with the fact that there are conjunctions which have specific C-selectional restrictions; see, e.g., Zhang 2009: §3.3.2 on Chinese. (B cites Zhang 2009 in a different context but does not comment on this incompatibility.)

As in Bruening and Al Khalaf 2020, structures are assumed to be built from left to right, and features taken over by the conjunction from the conjuncts are put on a push-down stack as the derivation progresses. This is illustrated schematically in (70), where the first conjunct shares its α features with the conjunction, forming the bottom of the stack, and the second conjunct subsequently adds its β features to the top of the stack.

Given the left-to-right nature of the derivation, there is a stage where the coordination fragment *once and* has the following structure:



Immediately after *future* is integrated as the second conjunct, the structure of *once and future* is as in (72) (cf. Bruening 2023: 40, ex. (102)).



At this stage, the C-feature of the conjunction, $[C \notin \{N, \text{CMPR}\}]$, is checked when it is merged with the adjective *future*; this is possible because indeed $\text{Adj} \notin \{N, \text{CMPR}\}$.^{47,48} Subsequently, the categorial and selectional features of the adjective are added, via Agree, to the stack of the conjunction and its projections, resulting in the structure in (73). The only selectional feature left to be checked here is $[C \in \{N\}]$, so *once and future* may be used to modify a noun, unlike *once* alone, which is explicitly precluded from noun modification by the specification $[C \notin \{N, \text{CMPR}\}]$.

In the remainder of this appendix, we show that this analysis overgenerates in a number of

⁴⁷Note that this feature gets marked as checked everywhere it occurs, so such feature specifications cannot be understood as copies, but rather as links to a single “feature specification” object, analogously to the multi-dominance understanding of nodes “copied” in Internal Merge.

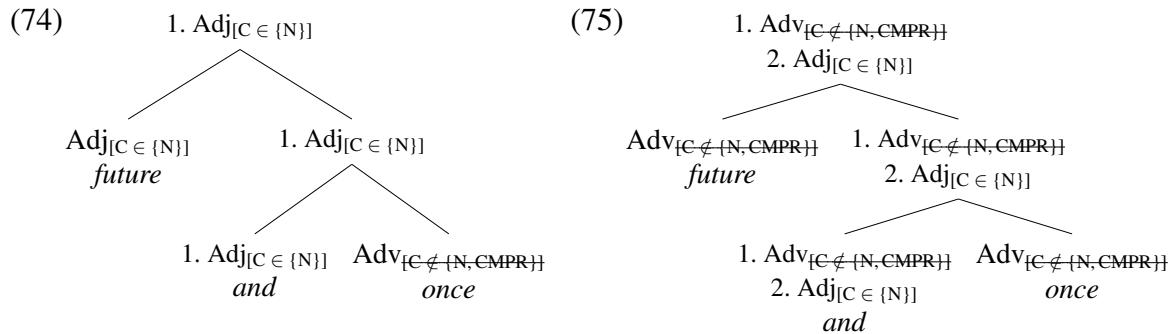
⁴⁸Unless the strict ordering “check C-features first, Agree later” is assumed, it seems that nothing in B’s setup prevents checking off these C-features already at the stage of *once and*, illustrated in (71). In this configuration, two siblings in the tree select for each other, so these selectional restrictions can be satisfied via mutual selection. Alternatively, one constituent may check off its C-feature against the other, which still results in the checking off of all copies of this C-feature (as noted in the previous footnote).

different ways and, hence, cannot be maintained.

Problem 1: Irrelevance of Order

Bruening (2023: 41) claims that, in the case of the reversed order, i.e., *future and once*, the C-feature of *once* “would not be checked off within the coordinate phrase and would percolate to &P”, but gives no reasoning to support this claim. We show that this claim does not stand up to scrutiny and that the analysis sketched above does generate structures such as *future and once king*, which B considers ungrammatical.

Consider (74) below – the stage of derivation of *future and once* analogous to the stage of *once and future* in (72).



At this stage, the Adv *once* with the specification $[C \notin \{N, \text{CMPR}\}]$ merges with the conjunction bearing the category Adj , which checks off this C-feature. It does not matter that the direction of checking in (74) is different than in (72): *once* may both pre- and post-modify (e.g., *once bitten* and *bitten once*). On the assumption that all features of *once* are copied onto the stack, including the checked C-features, the configuration in (75) ensues. However, whether these checked C-features are copied or not, the only unchecked C-feature on the top node is $[C \in \{N\}]$, so *future and once* may modify nouns and, hence, *future and once king* is predicted to be grammatical.

This is the first way in which B’s analysis overgenerates with respect to his empirical generalizations.

Problem 2: Recursive Modification

The second way in which B’s analysis overgenerates concerns recursive modification, as in (76)–(77).

(76) a terribly white face

(77) a slowly disappearing train

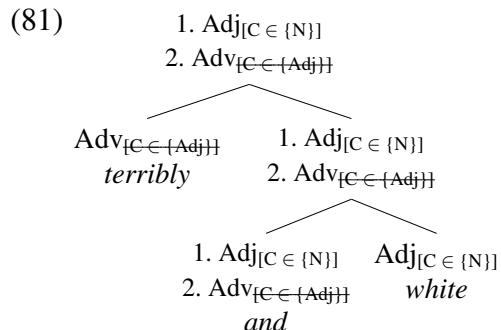
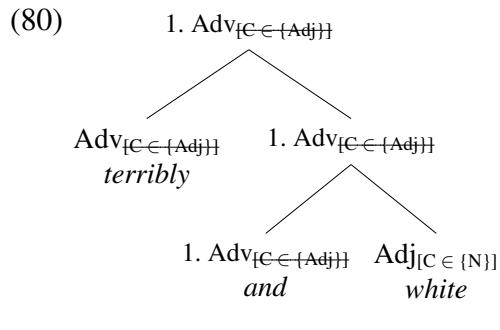
In (76), the adverb *terribly* modifies the adjective *white* and the whole AdjP *terribly white* modifies the noun *face*. Similarly, in (77), *slowly* modifies *disappearing*, and *slowly disappearing* modifies *train*.

The problem with the analysis of Bruening 2023 is that, for any such recursive modification “[Mod₁ Mod₂] H]”, the analysis predicts the grammaticality of “[Mod₁ & Mod₂] H]”. For example, it predicts the grammaticality of (78)–(79).

(78) *a terribly and white face

(79) *a slowly and disappearing train

The reason for this is that such coordinations have exactly the same – in all relevant respects – structures as coordinations of the *once and future* type. For example, the structures of the coordination in (78) corresponding to the stages (72)–(73) of *once and future* are shown in (80)–(81).⁴⁹



As in the case of *once and future*, the C-features of the adverb are checked off within the coordination, so only the C-features of the adjective are active at the top node, making *terribly and white* a nominal modifier, contrary to the fact that (78) is ungrammatical. The derivation of (79) and other similar ungrammatical examples is analogous.

This is the second respect in which the analysis of Bruening 2023 overgenerates – this time, not just with respect to B’s doubtful empirical claims, but more generally.

Other Analytical Loose Ends

In order to account for “AdvPs in AdjP positions”, B introduces new mechanisms, without motivating them independently or investigating their consequences. As noted above, the con-

⁴⁹Whatever the selectional restrictions of *terribly*, they must be satisfied by *white*, and whatever the selectional restrictions of *white*, they must be satisfied by *face*. Hence, without any loss of generality, we may simplify C-selectional restrictions of such items and assume that *terribly* is specified as $\text{Adv}_{[C \in \{\text{Adj}\}]}$ and *white* as $\text{Adj}_{[C \in \{N\}]}$.

junction is supposed to come from the lexicon featureless (and, in particular, categoryless) and to get all its features via Agree with its complement and its specifier. The only independent motivation for this idea is given as “(cf. Murphy and Puškar 2018)” (Bruening 2023: 27). However, mechanisms assumed by B differ from those of Murphy and Puškar 2018 in a number of crucial respects.

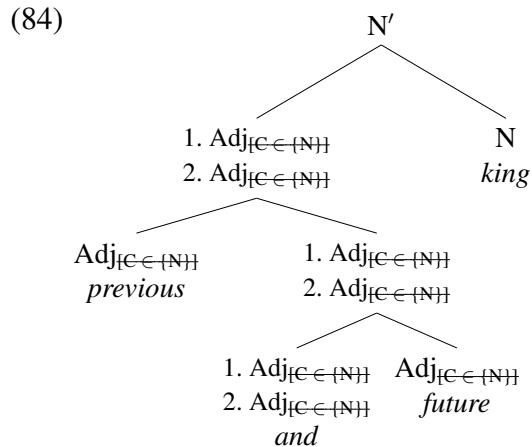
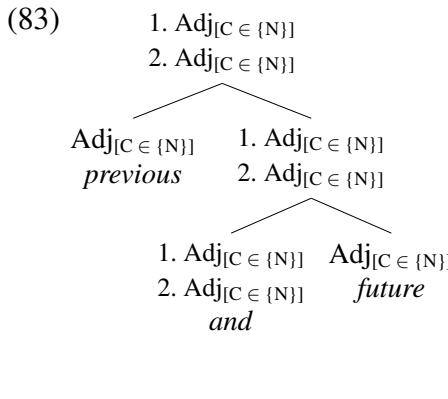
First, while Murphy and Puškar (2018) assume that, in nominal coordination, the conjunction has nominal selectional features checked by its complement and specifier, B assumes that conjunctions are featureless. But if so, it is not clear what motivates the Merge of a conjunction and a conjunct: no checking of selectional features takes place at this Merge, and such checking is usually assumed to motivate Merge.⁵⁰ This assumption is also explicitly made in Murphy and Puškar 2018: 1221.

Second, in Murphy and Puškar 2018, as elsewhere, what Agree copies from goals to probes are values of particular features such as gender or number, while in Bruening 2023 Agree is supposed to copy complete feature bundles, including the category and features already checked off. The consequences of this radical change in the operation of Agree for the rest of the grammar remain unexplored.

Finally, it is not clear how stacked categories and features interact with the rest of the grammar. B assumes that, when a head such as *become*, with the C-feature “[C ∈ {NP, AdjP}]”, combines with the coordination of an NP and an AdjP, such as *a political radical and very antisocial*, then both elements of the stack must satisfy this C-feature, as in (82) from Bruening 2023: 29, (75a).

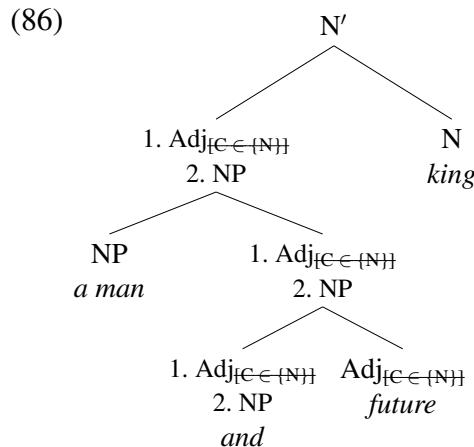
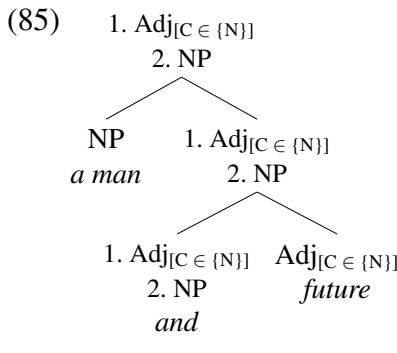
- (82) Danny became_[C ∈ {NP, AdjP}] [[1: AdjP, 2: NP] a political radical and very antisocial]. Hence, one may expect that, dually, C-features of all stack elements should be checked in unison against an item merged with the coordinate structure. For example, in the case of a run-of-the-mill coordination of two adjectives, the stack of the coordinate structure will contain two elements “Adj_[C ∈ {N}]” as shown in (83), and they both need to be checked by the noun, as in (84), as otherwise one of the C-features would remain unchecked and the derivation would crash.

⁵⁰See Zyman 2024 (the “supporting information” section) for arguments against the so-called “Free Merge”, not motivated by feature checking.



If so, it is not clear how the coordination *once and future*, whose stack contains two elements, only one of which has an active C-feature (see (72)), may combine with the following noun. Here, the feature checking does not work in unison for all stack elements, so the derivation should crash.

Moreover, if it were possible to only look at the top of the stack when checking features of coordination, then it is not clear what would stop coordinating an element without C-selectional features – for example, the NP *a man* – with a modifier, as in the tree in (85); compare this tree with the analogous structure of *once and future* in (73). Once the tree in (85) is merged with a noun, the C-features at the top of the stack are checked, resulting in a well-formed tree, as in (86).



It seems that any item without C-features may be the first element in such coordinations.⁵¹ Hence, this is the third way in which the analysis of Bruening 2023 – rather massively – overgenerates.

⁵¹In particular, since conjunctions do not have any features in the lexicon, it is not clear what would stop them from occurring as conjuncts in such configurations, in which case sentences such as *I read an and wise book* (cf. *I read an interesting and wise book*) would be predicted to be grammatical.

Appendix B: Sources of Attested Examples

Most of the attested examples come from English Web 2020: (15), (17)–(20), (24), (28)–(30), (39)–(44), (55a–b), and (56a–b). Other examples were found via Google:

- (9) <https://www.bbc.com/news/newsbeat-64209376>
- (10) <https://www.theguardian.com/australia-news/live/2022/sep/10/australia-reacts-to-queen-elizabeth-iis-death-albanese-and-dutton-to-lay-wreaths-at-parliament-house>
- (11) <https://www.mirror.co.uk/news/royals/hand-written-letter-king-charles-29401615>
- (12) <https://www.harpersbazaar.com/celebrity/latest/a42185461/prince-harry-meghan-markle-first-meet-royal-family-netflix/>
- (13) <https://nypost.com/2022/09/23/kate-middleton-prince-william-say-they-saw-rainbows-after-queens-death/>
- (14) <https://www.theroyalforums.com/threads/savoy-and-savoy-aosta-restoration-succession-heirs-and-conflicts-1-ending-2022.2411/page-2>
- (21) <https://www.barbarianrugby.co.nz/wp-content/uploads/BABANewsJun2010.pdf>
- (22) <https://www.transmissionfilms.com.au/films/tommys-honour>
- (23) <https://biz.crast.net/citadels-billionaire-investor-ken-griffin-calls-trump-a-thrice-loser/>
- (26) <https://www.njgsbc.org/files/familyfiles/p512.htm>
- (27) <https://bleedingcool.com/comics/who-will-succeed-boris-johnson-once-future-27-prepares-spoilers/>
- (34) <https://open.spotify.com/episode/6I1bK1uuht94rKIPvQMVF>
- (35) <https://themedialine.org/top-stories/bennett-sworn-in-as-israeli-prime-minister-netanyahu-heads-to-opposition/>
- (36) <https://forums.beyondblue.org.au/t5/anxiety/anxious-mother-anxious-family-psychotherapy/td-p/318226>
- (37) <https://www.reddit.com/r/AskReddit/comments/1drlvl/comment/c9t68fk/>
- (38) <https://www.nydailynews.com/entertainment/gossip/bill-hudson-children-oliver-kate-dead-article-1.2274050>

Appendix C: Our Experiment

Standard items

Below are all 15 standard items in groups A–E, used in assessing absolute acceptability of stimuli as recommended in Gerbrich et al. 2019.⁵²

A.

- (87) There's a statue in the middle of the square.
- (88) The patient fooled the dentist by pretending to be in pain.
- (89) The winter is very harsh in the North.

B.

- (90) Before every lesson the teacher must prepare their materials.
- (91) Jack doesn't boast about his being elected chairman.
- (92) John cleaned his motorbike with which cleaning cloth?

C.

- (93) Anna loves, but Linda hates, eating popcorn at the cinema.
- (94) Most people like very much a cup of tea in the morning.
- (95) The striker fouled deliberately the goalkeeper.

D.

- (96) Who did he whisper that had unfairly condemned the prisoner?
- (97) The old fisherman took her pipe out of mouth and began story.
- (98) Which professor did you claim that the student really admires him?

E.

- (99) Historians wondering what cause is disappear civilization.
- (100) Old man he work garden grow many flowers and vegetable.
- (101) Student must read much book for they become clever.

⁵²Specifically, we used the versions of these examples in Featherston 2020: 187–188, which sometimes differ a little from those in Gerbrich et al. 2019: 315.

Exclusion Criteria

The following exclusion criteria were implemented to ensure high quality of responses:

1. Participants must reside in an English-speaking country and report one of the following nationalities: American, British, Irish, Canadian, Australian, or New Zealander (5 participants failed this criterion).⁵³
2. Participants must answer at least 9 out of 12 comprehension questions correctly (5 participants).⁵⁴
3. Median response times must be within specific thresholds; see Juzek 2015: 249–251 (cf. Häussler and Juzek 2016: §3.2) for details (3 participants).
4. The average score on severely ungrammatical fillers must be significantly lower than the average score on fully grammatical fillers (2 participants).
5. The average score on severely ungrammatical fillers must be lower than 25 (5 participants).
6. The average score on fully grammatical fillers must be higher than 25 (0 participants).
7. Participants must not be current or former students of linguistics (9 participants).

⁵³We also asked participants whether they knew other languages (at least) as well as English (10 of the participants included in analysis answered ‘yes’) and on the number of years spent outside an English-speaking country ($M = 0.17$, $Mdn = 0$, $Max = 4$), but we did not exclude any participants on the basis of this information.

⁵⁴Such comprehension questions were presented at random after a sentence was rated and disappeared from the screen.