

## Toward a true theory of the periphery: Why Culicover’s “Odd Prepositions” aren’t that odd\*

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### 1. A chaotic picture of English prepositions

In *Syntactic Nuts*, Culicover (1999) uses the existence of lexical idiosyncrasies to argue that the learner of English must be “conservative” and “attentive”. What he means by this is perhaps most clear in his discussion of prepositions.

A normal preposition precedes its argument as in (1a), and pied-pipes, preceding its argument as in (1b). It does not follow its argument, either in canonical position (1c) or pied-piped (1d). It can strand, however, as in (1e):

(1) a. John sent a letter **to** Mary.  
b. This is the lady **to** whom John sent a letter.  
c. \*John sent a letter Mary **to**.  
d. \*This is the lady whom **to** John sent a letter.  
e. This is the lady John sent a letter **to**.

But *notwithstanding*, *ago*, *since*, *during*, *out*, and *off* each differ from this picture in their own little way. Culicover summarizes their properties as in Table 1.

**Table 1: Behavior of odd prepositions according to Culicover (1999:82)**

Preposition	Precede NP	Piedpipe (prec.)	Follow	Piedpipe (follow)	Strand
<i>notwithstanding</i>	yes	yes	yes	no	no
<i>ago</i>	no	n/a	yes	yes	no
<i>since</i>	yes	with <i>when</i>	no	n/a	no
<i>during</i>	yes	yes	no	n/a	??
<i>out</i>	yes	no	no	n/a	no
<i>off</i> $\emptyset$	yes	no	no	no	no

\* Thanks to Ivan Sag, Arnold Zwicky, Charles Fillmore, and Daniel Johnson for useful insights.

Table 1 shows the whole range of patterns: some prepositions must strand, some must pied-pipe, and some do neither. In summary of this table, Culicover writes, “a number of possible patterns are realized, with no apparent generalization emerging among the exceptions” (p. 82). Based on this, he argues for “the conservative [learning] strategy of ‘setting’ the ‘features’ [STRAND] and [PIEDPIPE] independently [for each word], on the basis of positive experience” (granted, with scare quotes). This describes an *attentive* learner, who pays attention to what prepositions have (for example) pied-piped, and a *conservative* one, who does not allow a preposition to pied-pipe unless it has been seen doing it. By this logic, [PRECEDE NP] and [FOLLOW NP] must also be individually-set features.

The goal of this paper is to evaluate the empirical basis for Culicover’s conclusion about learning. I will argue that a corrected version of the picture that he presents follows from deeper principles, and that prepositions do not differ arbitrarily in their ability to precede or follow their argument, strand, or pied-pipe.

## 2. Quibbling with the data

Before developing an account of the facts, I would like to establish the facts more accurately; some of the entries in Table 1 appear to be incorrect. The native English-speaking reader is encouraged to independently assess the data judgments before getting to the analysis to be presented, to avoid bias.

### 2.1. Typo regarding *off ə*

If a preposition never follows its argument, then there is no reason to expect that it should follow its argument when pied-piped. Therefore, the value in the “Piedpipe (follow)” column should be “n/a” whenever the “Follow” column is “no,” as it is for *since*, *during*, and *out*. The “no” in the “Piedpipe (follow)” column for *off ə* should therefore read “n/a”. This renders the last two rows identical, so neither *out* nor *off ə* can be considered a unique “nut.”

### 2.2. Pied-piping with *since*

Culicover judges that *since* cannot be pied-piped, except when its argument is *when*, citing the contrast between these two examples:

- (2) \***Since** which party hasn’t John called?
- (3) **Since** when have you been able to speak French?(!)

There are other examples of pied-piped *since* that sound fine (found on the Web):

- (4) **Since** what year have all popes been cardinals?
- (5) **Since** what war has Sweden remained a neutral country?

Presumably then, it is for pragmatic reasons that (2) sounds awkward, and “with *when*” in *since*’s entry for “Piedpipe (prec.)” should be a “yes.”

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According to Table 1, the preposition *since* cannot strand, and stranding with *during* gets a **??**. They seem equally acceptable stranded, however:

(6) **??**World War I was the war that Sweden has been neutral **since**.  
 (7) **??**World War II was the first war that Sweden was neutral **during**.

Therefore I put a “no” under “Strand” for both *during* as well as *since*.

### 2.3. Stranding with *out*

Culicover claims that stranded *out* is ungrammatical without *of*, thus:

(8) This is the door that you go **out** of.  
 (9) \*This is the door that you go **out**. [C.’s judgment]

I find the *of* to be optional, and examples of stranded *out* without *of* are readily found on well-written Internet pages. Some members of the BLS audience even rejected (8), preferring (9). There should be a “yes” under “Strand” for *out*.

### 2.4. The new picture

All of these corrections leave us with the picture in Table 2. Deviations from the normal pattern are shown in bold; corrections are shown with strike-throughs.

**Table 2: Behavior of odd prepositions (revised)**

Preposition	Precede NP	Piedpipe (prec.)	Follow	Piedpipe (follow)	Strand
<i>to</i> (normal)	yes	yes	no	n/a	yes
<i>notwithstanding</i>	yes	yes	<b>yes</b>	<b>no</b>	<b>no</b>
<i>ago</i>	<b>no</b>	<b>n/a</b>	<b>yes</b>	<b>yes</b>	<b>no</b>
<i>since</i>	yes	<del>with</del> <i>when</i> yes	no	n/a	<b>no</b>
<i>during</i>	yes	yes	no	n/a	<b>?? no</b>
<i>out</i>	yes	<b>no</b>	no	n/a	<b>no</b>
<i>off</i> ↗	yes	<b>no</b>	no	<del>ne</del> n/a	<b>no</b>

Already this picture is less chaotic than the one in Table 1; it contains two pairs of identical prepositions, *since* and *during*, and *out* and *off* ↗. With the deviations from the normal pattern highlighted, it can also be seen that the cases of deviation from the normal pattern are less numerous than cases in which the normal pattern is followed. There is a heavy concentration of deviations under the “Strand” column, where there is ironically quite a uniform pattern of “no”s. The row for *ago* is likewise uniformly deviant from the normal pattern. This picture does not seem quite as hopelessly inexplicable as the other.

### 3. Explaining the new picture

Indeed, with a small number of independently-motivated principles, we can derive the picture in Table 2.

#### 3.1. *since* and *during*

The unusual property of *since* and *during* is the inability to strand, as shown in (6) and (7). This seems to follow from a general constraint, because temporal prepositions all have difficulty stranding:<sup>1</sup>

- (10) ??That is the war that Sweden became a neutral country **after**.
- (11) ??That is the war that Sweden was our ally **until**.
- (12) ??That is the war that Sweden was our ally **before**.

One might be tempted to explain this generalization under some form of the Adjunct Condition (Huang 1982, later derived by Chomsky's 1981 principle of Subjacency), which bars extraction out of adjuncts. The empirical status of this principle is not strong, however; extraction from locative adjuncts can be perfectly acceptable:

- (13) Which room does Julius teach his class **in**? (Pollard and Sag 1994:191)

Johansson and Geissler (1998) find in a corpus study that pied-piping out of adjunct PPs is more common than pied-piping out of complement PPs, but that both occur a fair amount. It may be the case that extraction degrades as the adjunct becomes more clause-peripheral, however. Hoffman (2005) used a more fine-grained analysis of PP types in an elaborate corpus study and concluded that the "sentence adjunct" type involves obligatory pied-piping. Regardless of how this issue is ultimately resolved, the generalization that temporal prepositions strand with difficulty will remain intact.

#### 3.2. *ago*

All of *ago*'s properties are strange for a preposition. It can follow its argument, and can never precede it:

- (14) John received a very generous offer a few minutes **ago**.
- (15) \*John received a very generous offer **ago** a few minutes.

It pied-pipes, but only following the NP (as one would expect based on its behavior in canonical sentences):

- (16) How long **ago** did John receive the offer?

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<sup>1</sup> The preposition *on* seems to be an exception to this generalization: *What day did he leave on?* The fact that *on* is primarily spatial may be the explanation for this.

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(17) \***Ago** how long did John receive the offer?

and it doesn't strand:

(18) \* How long did John receive the offer **ago**?

Like Fillmore (2002), I propose to analyze *ago* as an intransitive preposition, like complement-less *before* and *after*, and *abroad*, *north*, and *downstairs*, to name a few of the 40 intransitive prepositions listed in the *Cambridge Grammar of the English Language* (CGEL; Huddleston and Pullum 2002).

I propose to analyze the argument of *ago* as a specifier, like measure phrases that modify prepositional phrases, as in *[three years] in the past* or *[two blocks] past the light*. This analysis is fully in line with that of Fillmore (2002), which relates the syntax of time expressions to a simple but explicit semantic ontology. Expressions like these are “Vector Constructions” which locate a Target (e.g. the time of the event) at a Distance (e.g. 3 months) in a Direction (e.g. before) from some Landmark (e.g. now). The Distance argument in a Vector Construction is expressed as a specifier. Unlike *before* and *after*, the preposition *ago* idiosyncratically requires its Distance argument to be expressed.

These assumptions account for the facts as follows. *Ago* follows its argument because specifiers precede their heads in English. The same principle accounts for ordering in pied-piping constructions. *Ago* cannot be stranded for the same reason that stranding of *book* is impossible in (19):

(19) \* Whose did you read book? [cf. *Whose book did you read?*]

However the constraint is formulated – as the “Left Branch Condition” or otherwise – specifiers do not strand their heads in long distance dependencies.

### **3.3. *notwithstanding***

The surprising properties of *notwithstanding* include its ability to follow its complement (20) as well as follow it (21):

(20) Your generous offer **notwithstanding**, we will demolish the building.  
(21) **Notwithstanding** your generous offer, we will demolish the building.

Yet (unlike the other cases we've seen) its behavior in pied-piping constructions does not mirror its behavior in declarative sentences; when it pied-pipes, it can only precede the argument:

(22) \*That was a generous offer, which **notwithstanding** we will demolish the building.  
(23) That was a generous offer, **notwithstanding** which we will demolish the building.

It also does not strand:

(24) \*That was a generous offer, which we will demolish the building **notwithstanding**.

I propose to account for these facts by splitting up *notwithstanding* into two lexemes. *Notwithstanding<sub>1</sub>* is a preposition, which, as such, can precede its argument and pied-pipe with that order as well. *Notwithstanding<sub>2</sub>* is a (subject-taking) participle which heads the modifier in absolute constructions, such as those illustrated in the following examples:<sup>2</sup>

(25) No other business arising, the meeting was adjourned. [The American Heritage Book of English Usage online]  
(26) The horse loped across the yard, her foal trailing behind her. [ibid.]  
(27) His hands gripping the door, he let out a volley of curses. [CGEL]

Because the argument of *notwithstanding<sub>2</sub>* is its subject, *notwithstanding* can follow its argument.

Why can't *notwithstanding* follow its argument when pied-piped? We do not find pied-piping of predicates within absolute modifiers in general:

(28) \*Here is the foal, which trailing behind her, the horse loped across the yard.  
(29) \*These are the hands, which gripping the door, he let out a volley of curses.

Clearly a general constraint, rather than a lexical idiosyncrasy, is at work here.

Regarding *notwithstanding*'s inability to strand, we have several possible deeper explanations, which may work in concert. Firstly, it is extremely formal, whereas stranding is uncommon in formal registers (Hoffman 2005). Use of a formal word in an informal construction can produce an effect of stylistic discord, as shown by Silva and Zwicky (1975), who explain the deviance of examples like (30) in terms of a scalar difference in formality level between the elements they contain – in this case, subject deletion (casual) and non-contraction of the auxiliary (formal).

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<sup>2</sup> Huddleston and Pullum (2002) argue that constructions involving post-argument *notwithstanding*, along with similar ones involving *apart* and *aside*, are not absolute constructions because *notwithstanding*, *apart*, and *aside* cannot be predicative: \**These objections are notwithstanding* or \**This is apart/aside* (p. 631). They argue for a prepositional analysis of these words on this basis. It seems to me that the non-predicativity is equally unexpected under the prepositional analysis, as prepositions can usually be predicative, so I think in either case it must be stipulated that these lexical items are restricted to the absolute construction.

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(30) \*Have not seen George around for a long time.

The combination of *notwithstanding* (formal) and stranding (casual) could cause a similar stylistic discord to occur. Another possible explanation is that *notwithstanding* always heads a sentence adjunct, and as discussed earlier, extraction from clause-peripheral phrases seems to be unacceptable in general.

### 3.4. *out*

The surprising property of *out* is its inability to pied-pipe:

(31) \*This is the door **out** which he went/ran.

This property is shared by *in* (meaning *through*, not *inside*):

(32) \*This is the door **in** which he went/ran.

This similarity gives us two options for explaining why *out* doesn't pied-pipe. It may be that prepositions describing movement through portals, as a semantic class, fail to pied-pipe. Alternatively, it could have to do with stylistic discord. Both *in the door* and *out the door* strike my ear as quite informal, especially compared with *in through the door* and *out through the door*, respectively. Because *through* pied-pipes, it cannot be that prepositions describing movement through a portal do not pied-pipe, as a rule:

(33) This is the door **through** which he went/ran.

For this reason, I suspect that the stylistic explanation is correct, but there may be an important semantic difference between *through* on the one hand and *in* and *out* on the other (*in* and *out* both specify locations, for example). In any case, this gap is not an idiosyncratic property of *out*.

### 3.5. *off*

Both pied-piping and stranding are difficult for *off*, without help from *of*:

(34) This is the chair **off** \*(of) which Robin fell.

(35) This is the chair which Robin fell **off** \*(of).

Culicover argues that *off NP* is a full reduction of *off a NP*, because they have the same distribution with respect to these properties:

(36) \*This is the chair **off** **a** which Robin fell.

(37) \*This is the chair which Robin fell **off** **a**.

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If this is true, then we can explain the restriction against (34) in terms of stylistic discord as well: *offə*, and hence *off*, are too informal to pied-pipe.

This idea could also explain why *off* cannot strand. It could follow from general restrictions on reduction, if *off* is a reduced form of *offə*. Compare:

(38) She's the person I told you I didn't approve of / \*ə.

It is well-known that this type of phonological reduction is barred in phrase-final position (Selkirk 1984; Inkelas and Zec 1993). Since stranding occurs phrase-finally, *off* as a reduced form of *offə* would not be expected to strand.

#### **4. Interim summary**

The chaotic picture that Culicover presents actually has an underlying orderliness; it follows from these general principles:

- The "Left Branch Condition" or equivalent: *wh* specifiers do not strand their heads in *wh*-dependency constructions. (hence no stranding with *ago*)
- No phrase-final phonological reduction (hence *offə* does not strand).
- Specifiers precede their heads (*ago, notwithstanding<sub>2</sub>*).
- Heads precede their complements (hence all transitive prepositions precede their argument).

In addition to these general principles, the analyses I have given have appealed to a couple of descriptive generalizations that could still be made to follow from deeper analyses:

- Temporal prepositions have difficulty stranding.
- Absolute participles do not pied-pipe.

I have also made use of some lexical stipulations: *ago* is intransitive and requires a specifier, *notwithstanding<sub>2</sub>* is limited to absolute constructions, and *off* is an extremely reduced form of *offə*. However, we do not need to stipulate restrictions on the ability of individual prepositions to strand or pied-pipe.

#### **5. Additional cases**

Having exhausted all of Culicover's examples does not imply that there are no prepositions that are arbitrarily restricted from pied-piping or stranding. Indeed, there are some other preposition-like words that do not pied-pipe. These are discussed by Huddleston and Pullum (2003) in their response to Maling (1983), in the context of a debate on whether to analyze certain words (*near, opposite, like, unlike, due, due to, worth*) as adjectives or prepositions.

A diagnostic Huddleston and Pullum give for status as a preposition is *predicativity as a fronted adjunct*: fronted adjuncts headed by adjectives must be interpreted as predicating over the subject of the sentence; those headed by

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prepositions need not be. In the following example, both the adjective *alone* and the preposition *ashore* are interpreted as predicating over the subject:

(39) Finally **ashore/alone**, John could relax.

Such a predicative interpretation is impossible when the subject is an expletive pronoun, and in that case only the preposition is grammatical (Huddleston and Pullum 2002, p. 531):

(40) **Alone/\*ashore**, there was much drunkenness.

By this diagnostic, *like* and *unlike* appear to be somewhat ambiguous between adjective and preposition. *Like* is marginal heading a non-predicative fronted adjunct:

(41) <sup>%</sup>Just **like** LA, there was a lot of smog. [H&P's judgment]

*Unlike* is better:

(42) **Unlike** yesterday, I'm feeling full of energy.

Both *like* and *unlike* can also function as predicative fronted adjuncts, and as the complement to *become*, which is a diagnostic indicating adjectivehood, so they can certainly function as adjectives as well as prepositions. In their prepositional function, it does not appear that they can pied-pipe:

(43) \*Seattle is a place **like** which we have a lot of fog here.

(44) \*That was a time in my life **unlike** which I'm feeling full of energy now.

In this case again, however, the putative pied-pipers are very informal words, which is stylistically discordant with the formality of the pied-piping construction.

The prepositional uses of *like* and *unlike* exemplified in (41) and (42) are quite clause-peripheral, and stranding is predictably bad with them:

(45) \*Seattle is a place which we have a lot of fog here **like**.

(46) \*That was a time in my life which I'm feeling full of energy now **unlike**.

There are non-clause-peripheral uses of *like* as a preposition which can strand:

(47) Your advisor is someone you should try to act **like**.

Prepositional *unlike* only appears to exist clause-peripherally.

Two other unclear cases discussed by Huddleston and Pullum (2003), which pass the test for non-predicativity of fronted adjuncts, are *effective* and *absent*:

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- (48) **Absent** further justification, nothing can be done.
- (49) **Effective** tomorrow morning, fares will increase.

I found some tokens of pied-piped *absent* on the internet, which sound fine to me:

- (50) These constitutive principles include ... both a principle of veracity and a principle of credulity, **absent** which we would be unable to...

Thus, *absent* behaves as a regular preposition. *Absent* cannot strand:

- (51) \*These are principles which civilization would be impossible **absent**.

As suggested by the erudite language in examples (48) and (50), *absent* is highly formal, so we would not expect to find it stranded.

Unlike *absent*, it seems that *effective* cannot pied-pipe:

- (52) \*That is the day **effective** which fares will increase.

*Effective* is a very formal word, so there is no stylistic discord here. Rather, the explanation for its inability to pied-pipe seems to lie in the categorial analysis of *effective*; it seems that *effective* is not a preposition, despite its ability to head a non-predicative fronted adjunct. This is supported by its complementation behavior; it resists NP complements:

- (53) Effective \*(at) 8am, fares will increase.

Other temporal prepositions such as *since* and *before* combine directly with bare time expressions: *since 8am*, *before 8am*.

In summary, none of Huddleston and Pullum's cases provide any further justification for Culicover's claim that the features [STRAND] and [PIEDPIPE] must be set individually for each word on the basis of positive experience.

## 6. Conclusion

Individual prepositions do not differ arbitrarily in their ability to strand or pied-pipe. This removes the argument that the features [STRAND] and [PIEDPIPE] must be set for each word individually on the basis of positive experience (nor is there even any evidence that such features exist).

Prepositions do not differ arbitrarily in whether they precede or follow their argument, either. [PRECEDE NP] and [FOLLOW NP] are likewise not features that must be set individually on the basis of positive experience, if they exist.

In her review of *Syntactic Nuts*, Janet Dean Fodor (2001) writes that "the route we have to take toward a true theory of the periphery" is to evaluate conjectures which "relate the stipulations to the general ecology of natural

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language grammars.” Some of what has been presented here can be seen as a step in that direction, and some of it goes even further: seen against the backdrop of general constraints of the grammar, idiosyncrasies can even disappear.

Does this mean that there are no features that must be set individually for each word on the basis of positive experience (or another mechanism that acquires arbitrary lexical gaps)? Maybe. Claims of arbitrary lexical variation like Culicover’s have been made for other phenomena, also in the context of learnability. The dative alternation is the celebrity among these (Baker 1979):

(54) a. Sue *gave/donated* \$100 to the library.  
b. Sue *gave/\*donated* the library \$100.

The causative alternation has also been treated as a case of arbitrary lexical variation (Bowerman 1988, p. 84):

(55) a. That huge bite made her *choke/gag/cough*.  
b. That huge bite *choked/gagged/\*coughed* her.

Over the decades, analyses have been proposed to account for these argument structure alternations. Grimshaw (2005) shows that the dative alternation is conditioned by a conjunction of metrical and lexical semantic constraints; all non-alternating dative verbs are either of the wrong semantic type or have the wrong metrical structure (being longer than one metrical foot). Levin and Rappaport-Hovav (1995) explain the contrasts in (55) using the semantic concept of *internally-caused* vs. *externally-caused* events; only the latter can undergo the causative alternation.

Other putative examples of arbitrary lexical variation have been argued to exist, by Baker and Culicover among others, but these remaining cases are in peril; perhaps the reader or I will soon have a clever analysis to offer. If we can explain all of these cases, then maybe arbitrary lexical gaps of this nature do not exist. If they don’t exist, then maybe the learner is *not* “conservative and attentive” in assigning syntactic properties to words.

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