24.902: trying to explain the EPP

(1) a. **There** arrived a man. [*English*]
b. **Il** est arrive un homme. [*French*]

(2) a. É arrivato un uomo. [*Italian*]
b. Apareció un hombre. [*Spanish*]
c. Va venir un home. [*Catalan*]

- EPP vs. no EPP?
- overt expletives vs. null expletives? (Rizzi 1982)
- verb incapable/capable of checking EPP? (Alexiadou and Anagnostopoulou 1998)

→ claim: a version of the last proposal is the right one.

a preliminary; metrical feet:

Rules for assignment of stress are going to be important. Here are some simple stress systems:

Hungarian: main stress on initial syllable, secondary stress on odd-numbered syllables

ból.dog 'happy' ból.dog.tà.lan.sà:g 'unhappiness'

Mapudungun: main stress on second syllable; secondary stresses on even-numbered syllables

e.lá.a.à.new 'he will give me' ki.mú.fa.lù.wu.làу 'he pretended not to know'

Weri: main stress on final syllable, secondary stresses on preceding odd-numbered syllables, counting backwards.

ʊ.lɔ̀.a.mít 'mist' à.kʊ.nà.te.pál 'times'

Warao: main stress on penultimate syllable, seconary stresses on even-numbered syllables counting backwards from main stress.

yà.pu.rù.ki.tà.ne.há.se 'verily to climb'
e.nà.ho.rò.a.hà.ku.tá.i 'one who caused him to eat'

a classic way of talking this invokes a grouping of (often two) syllables into *feet*.
(ki.mú)(fa.lù)(wu.làу) 'he pretended not to know' (*Mapudungun*)

parameters for getting the above systems:
- within a foot, stress the syllable on the right/left
- if there's an odd number of syllables, put the leftover syllable on the right/left edge

1. Tense and Stress

Oltra-Massuet (1999, 2000), Guerzoni (2000), Oltra-Massuet and Arregi (2005):
In Catalan, Italian, and Spanish, the vowel before the Tense morpheme receives stress.

(3) a. cantá **-ba** -is [*Spanish*]
sing **ImpInd** 2pl
'You (pl) sang (imperfect indicative)'

b. cantá **-ra** -is
sing **ImpSubj** 2pl
'You (pl) sang (imperfect subjunctive)'

c. cantá **-steis**
sing **Perfect**.2pl
'You (pl) have sung'

d. cantá **-is**
sing **Present**.2pl
'You (pl) sing'

e. canta -ré **-Ø** -is
sing FUT **Pres** 2pl
'You (pl) will sing'

f. canta -rí **-a** -is
sing FUT **Past** 2pl
'You (pl) would sing (conditional)'

proposal of the above papers:
In Catalan, Italian, and Spanish, T is preceded by a foot boundary.

formally (cf. Idsardi (1992)):
Line 0: put a Right bracket to the Left of T
project the Rightmost * in each foot to line 1

Line 1: put a Right bracket at the end of the word
project the Rightmost * of each foot to Line 2

Line 2			*							*					
Line 1			*	)						*	)				
Line 0	*	*	)*		*			*	*	*	)*		*		
	can	ta	ba		is			can	ta	ri	a		is		
	sing	- TENSE	-AGR					*sing*	-'FUT'	-TENSE	-AGR				

(4) a. chantiéz [*French*]
'You (pl) sang (imperfect indicative)'

b. chantessiéz
'You (pl) sang (imperfect subjunctive)'

c. chantâtés
'You (pl) have sung'

d. chantéz
'You (pl) sing'

e. chanteréz
'You (pl) will sing'

f. chanteriéz
'You (pl) would sing (conditional)'

contrast (4) with (3):
In French, stress is reliably final (apart from cases like (4c), where final schwa avoids stress)

an upshot?

- in French, you can't insert any metrical structure until a word has been completed.
- in Italian/Spanish/Catalan, you can insert a metrical boundary to the left of T, as soon as T is introduced into the structure.

Another difference between French and Italian/Spanish/Catalan:

(5) a. **There** arrived a man. [*English*]
b. **Il** est arrive un homme. [*French*]

(6) a. É arrivato un uomo. [*Italian*]
b. Apareció un hombre. [*Spanish*]
c. Va venir un home. [*Catalan*]

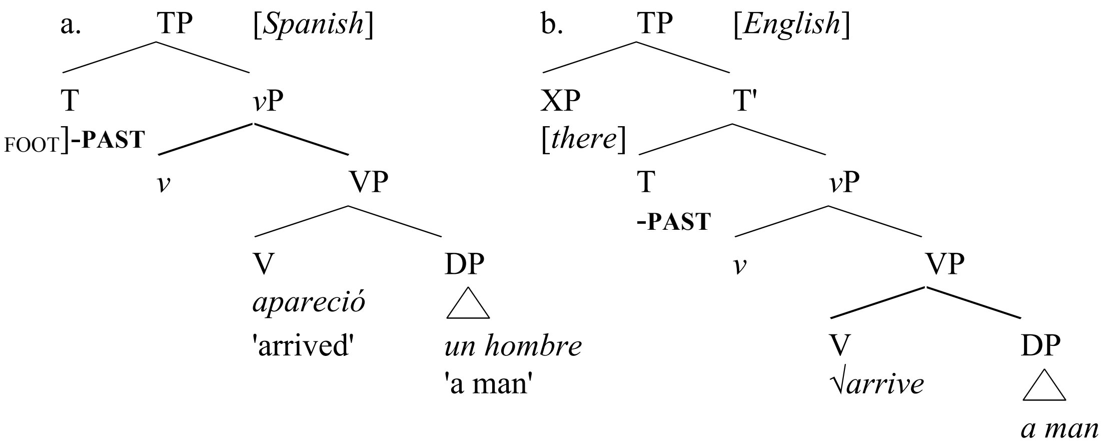
proposal:

T-support (version 1 of 2):
If T is a suffix, it must follow metrical structure.

...where 'things with metrical structure' include:

- metrical boundaries projected by T itself (Italian, Spanish, Catalan)
- phrases (English, French)

(7)



a useful assumption:
Something like the Idsardi-style derivation of stress *begins happening in the syntax:*

Spanish, following Oltra-Massuet and Arregi:
Line 0: put a Right bracket to the Left of T
project the Rightmost * in each foot to line 1

Line 1: put a Right bracket at the end of the word
project the Rightmost * of each foot to Line 2

```
Line 2        *                                *
Line 1        *  )                             *    )
Line 0   *    *  )*     *          *    *  *    )*      *
         can  ta  ba    is         can  ta ri    a      is
         sing   - TENSE -AGR       sing   -'FUT'-TENSE -AGR
```

- in Spanish, as soon as T is Merged, there's a metrical boundary before it (line 0)
- in French (and presumably also in Spanish), another boundary is Merged once the whole word is complete (line 1)

→ the things with metrical structure in the syntax are:
(i) heads like Spanish T, and (ii) complete words.

what's special about phrases:
They consist of complete words.

V, by contrast, is just part of a word → no metrical structure yet in English, French

we'll see instances of *opacity* later:

- some Spanish verbs are irregular, don't have the metrical boundary before T
- some complete words are 'irregular', don't have metrical boundaries (e.g., clitics)

→ neither of these has syntactic consequences.

I'll assume that these lexical irregularities are introduced into the structure *postsyntactically*.

lexical access happens twice?

first time accesses properties that hold generally of elements of a given class ("T is a suffix in this language"),

second time is postsyntactic, adds lexically idiosyncratic properties ("this instance of T is pronounced *d*")

All the languages discussed so far are tense-suffixing. Extend the notion of T-support:

T-support (version 2 of 2):
If T is an affix, there must be metrical structure in the direction in which it attaches.

2. A Typology

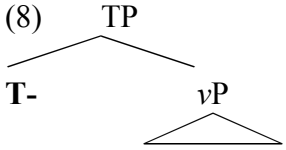
"T-support" suggests a typology, involving the following parameters:

- T can be syntactically head-initial or head-final
- T can be a prefix, a suffix, free-standing...
- T can project its own metrical boundary (Spanish) or not (English)

2.1. Head-Initial T

2.1.1. Head-Initial T: Prefix, or free-standing

If T is free-standing, then T-support won't apply to it; we shouldn't get EPP effects.
Free-standing head-initial T may be difficult to distinguish from prefixal head-initial T.
Fortunately, for us, prefixal head-initial T also shouldn't trigger EPP effects.
T-support would require such T to be followed by a phrase, which it always is:

(8)


(9) **Na'e** kai 'e Sione 'a e mango [*Tongan*: Otsuka 2000, 50]
PAST eat ERG Sione ABS DEF mango
'Sione ate the mango'

(10) **Tyi** i-kuch-u aj-Maria jiñi si' [*Chol*: Coon 2010, 355]
PRFV 3.ERG-carry-TRANS DET-Maria DET wood
'Maria carried the wood'

(11) **D'** inis sé scéal a bheatha di [*Irish*: Duffield 1995, 177]
PAST tell he story his life to.her
'He told her the story of his life'

(12) **Wá7**=k'a ka-mays-túm-a ts7a ku=káoh e=ti=n-snúk'w7=a
IMPF=EPIST CIRC-fix-PASS-CIRC this DET=car by=DET=1SG.POSS-friend=EXIS
'My friend could probably fix this car' [*St'át'imcets*: Davis 2007, 33]

(13) **E-**stil-e o Petros to grama [*Greek*: Roussou and
PAST-send-3SG the Petros the letter Tsimpli 2006, 329]
'Petros sent the letter'

(14) **B**-da'uh Gye'eihlly so'p nài' [*San Lucas Quiaviní Zapotec*:
PERF-eat Mike soup yesterday Lee 2005, 96]
'Mike ate the soup yesterday'

(15) **N**-ag-bili ang magsasaka ng bigas [*Tagalog*]
PRF-NOM.TRANS-sell ANG farmer UNM rice
'The farmer sold rice'

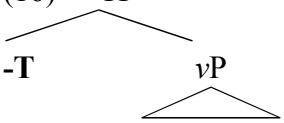
In none of these languages do we expect stress to be sensitive to morpheme boundaries:

- Irish stress is generally initial (Bammesberger 1983, 11)

• St'át'imcets stress is trochaic, from left to right (Roberts and Shaw 1994, Caldecott 2007)

2.1.2. Head-Initial T: Suffix

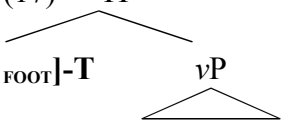
(16) TP



If head-initial T is a suffix, then its metrical requirements cannot be satisfied by the *v*P complement of T; these are the languages that can in principle show EPP effects, though we have already seen that not all of them do.

2.1.2.1. Head-Initial T: Suffix, projects own metrical boundary

(17) TP



(18) a. É arrivato un uomo. [*Italian*]
b. Apareció un hombre. [*Spanish*]
c. Va venir un home. [*Catalan*]
arrived a man
'A man arrived'

Oltra-Massuet (1999, 2000), Guerzoni (2000), Oltra-Massuet and Arregi (2005):
in Italian, Spanish, and Catalan, T is always preceded by a foot boundary.

note that there are some irregular verbs...

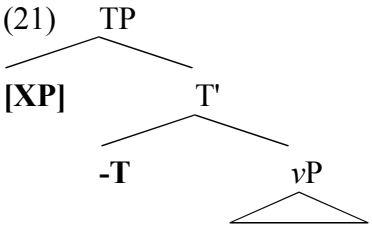
		regular			*irregular*	
(19)	a.	temí-Ø fear-**PERFECT**.1SG 'I feared'	(20)	a.	p**ú**se-Ø put-**PERFECT**.1SG 'I put'	[*Spanish*]
	b.	temí-ste fear-**PERFECT**.2SG 'you feared'		b.	pusí-ste put-**PERFECT**.2SG 'you put'	

...which are typically irregular in several ways (the infinitive for (20) is *poner*).

→ syntax must not know about irregular verbs; **these are introduced postsyntactically.**

2.1.2.2. Head-Initial T: Suffix, projects no metrical boundary

(21)



These will be the languages with EPP effects: T doesn't project its own foot boundary, so will need to be preceded by something that does.

(22) **There** arrived a man. [*English*]

(23) **Il** est arrive un homme. [*French*]

(24) **Sitä** leikkii lapsia kadulla. [*Finnish*: Holmberg and Nikanne 2002]
EXPL play children in.street
'Children play in the street'

Note that *pro* seems to be capable of satisfying EPP in Finnish:

(25) Puhu-n englantia
speak-1SG English
'I speak English' [Holmberg 2005, 539]

→ again, syntax isn't aware of phonological idiosyncracies. Finnish has many pronouns; the syntax isn't keeping track of which of them are null. (and also: this is not a theory of pro-drop)

2.2 Head-Final T

(here I will skip some details, for reasons of time)

2.2.1. Head-Final T: Suffix

(26) TP

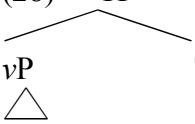
Should be fine: T is supported by *v*P.

(27) John-ga hon-o yon-**da** [*Japanese*]
John-NOM book-ACC read-**PAST**
'John read the book'

2.2.2. Head-Final T: Prefix

2.2.2.1. Head-Final T: Prefix, projects own metrical boundary

(28) TP



A language of this type will not show EPP effects, since T satisfies its own T-support requirement.

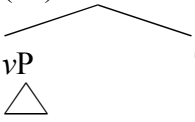
"Despite the difficulty in hearing stress in some of the [Athabaskan] languages, certain facts about stress have become evident over the years. First and foremost is the attraction of stress to the stem." [Hargus and Rice 2005, 34]

(29) s- **ə-** s- Gúh [*Witsuwit'en*: Hargus 2005, 400]
CNJ **PERF** 1SGS catch
'I caught it'

2.2.2.2. Head-Final T: Prefix, projects no metrical boundary

Unattested?

(30) TP



T-support should fail.

Dryer (1992):

> Tense suffixes are cross-linguistically more common than Tense prefixes, and in V-final languages, Tense prefixes are very rare (only 10% of Dryer's sample of OV languages have Tense prefixes; 30% of his VO languages do)

If the account sketched here is right, in an OV Tense-prefixing language, Tense would have to project its own metrical boundary. Maybe that's why Tense-prefixing is less common in OV than in VO.

3. Some interim conclusions/questions

Proposed universal: if T is an affix, then there must be something with metrical structure in the direction to which T attaches.

Parameters:

- T is head-initial/final
- T is a prefix/suffix/...
- T projects (or doesn't) its own metrical boundary

What does syntax know?

Syntax doesn't seem to know anything that's specific to particular lexical items:

> irregular verbs in Spanish, null pronouns in Finnish, etc.

Moreover, it seems not to be able to 'look ahead' to the rest of the syntactic derivation:

(31) Did **there** arrive a man?

there inserted to satisfy T's need for metrical structure...

> ...and then T moves further, subsequently.

Although we're allowing syntax to make reference to properties of phonological representation (metrical boundaries, prefix/suffix distinction), we apparently want those properties to be present in the syntactic representation.

What's so special about T?

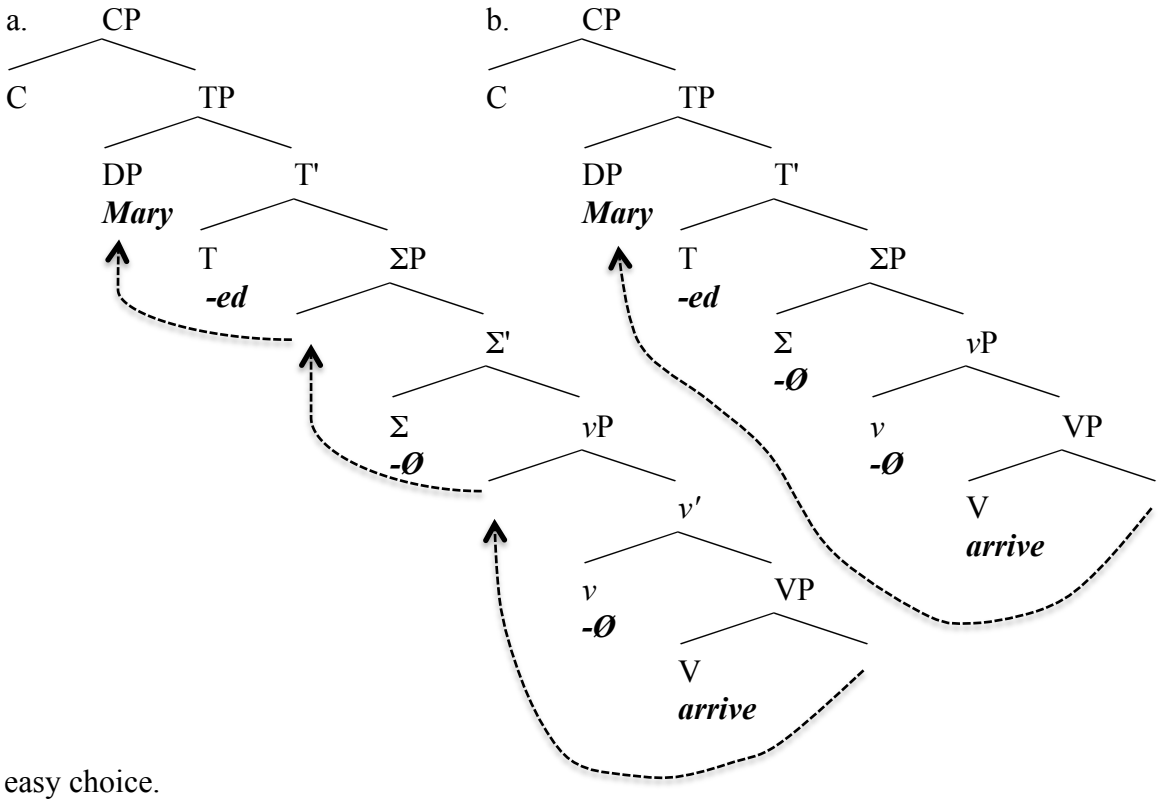
Nothing. Suppose we generalize the principle further:

Affix Support
If any head is an affix, there must be metrical structure in the direction in which it attaches.

At this point, this looks like one of those ideas that doesn't cause any obvious harm.

Consider a language like English or French, with EPP effects on T. The question of whether to generalize T Support to Affix Support is basically the choice between the trees in (32):

(32)



Not an easy choice.

What about EPP-less languages, like Irish? Irish verbs do have suffixes:

(Bammesberger 1983, Carnie 1995, Duffield 1995):

(33)

a. déan -aimid [*Irish*]
do 1PL.NONPAST
'we do' (**present**)

b. déan -f -aimid
do IRR 1PL.NONPAST
'we will do' (**future**)

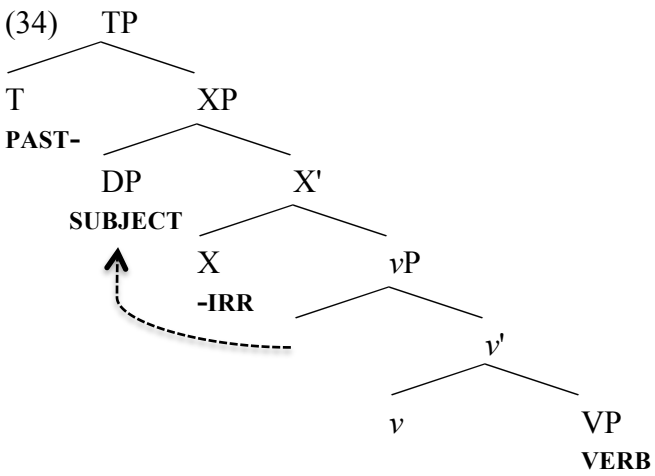
c. (**do**) **dh**ein -amar
PAST PAST-do 1PL.PAST
'we did' (**past**)

d. (**do**) **dh**éan -aimis
PAST PAST-do 1PL.??
'we did, habitually' (**habitual past**)

e. (**do**) **dh**éan -f -aimis
PAST PAST-do IRR 1PL.??
'we would do' (**conditional**)

But as long as these suffixes are lower than the Tense morphology, and as long as the verb raises to Tense, Irish will still be VSO:

(34)



The suffixal head of XP induces an EPP effect after the verb.

Might help explain Irish post-verbal expletives:

(35) a. Tá **sé** fíor [go raibh Ciarán i láthair] [*Irish*: McCloskey 1984, 452-453]
is **it** true that was Ciaran present
'**It** is true that Ciarán was present'

b. Th-ioc-f-adh **leis** a bheith ag cur
PAST-come-IRR-AGR to.it to.be raining
'**It** could be raining'

Let's now try to test the theory more broadly.

4. Using WALS

http://wals.info/index

- online information about 2,650 languages
- each language described in terms of up to 142 properties
- …with some inevitable judgment calls.

- allows you to combine features to generate tables like this one:

Order of Subject, Object and Verb and Position of Tense-Aspect Affixes

		Position of Tense-Aspect Affixes				
		Tense-aspect prefixes (150)	Tense-aspect suffixes (629)	Tense-aspect tone (11)	Mixed type (133)	No tense-aspect inflection (139)
Order of Subject, Object and Verb	SOV (497)	18	331	2	29	24
	SVO (436)	74	89	7	44	79
	VSO (85)	17	13		21	6
	VOS (26)	6	7		4	4
	OVS (9)	1	3		1	1
	OSV (4)		1			
	No dominant order (171)	13	85	2	20	16

"Tense/aspect" is not really what we're after; what we'd really like to know is the status of the highest affix (if we're generalizing "T-support" to "Affix support"). But this is what WALS can do for us, and it's a start.

In what follows I'll concentrate on V-peripheral languages (that is, SOV and V-initial). I'm doing that because these are the languages in which it's easiest to get the theory to fail. Two unexpected kinds of languages (and cf. Hawkins and Cutler 1988):

(36) a. S O **PREFIX**-V

b. V-**SUFFIX** S O

In both of the examples in (42), the verb bears morphology that seems to require Support in a direction where there isn't any. So when we see examples like these, we need to consider them carefully.

By contrast:

(37) S V O

Even if we don't see morphology on the verb that would require S to raise to a higher specifier, it's easy enough to posit null suffixes, if we decide we need them.

So we'll look at the verb-peripheral languages…very quickly, for reasons of time. More data on request…

There certainly are apparent counterexamples to our expectations:

	V-final	V-initial
tense/asp prefix	**18**	32
tense/asp suffix	331	**35**

Let's consider the SOV languages first, and then the V-initial languages.

4.1. SOV languages

331 of these behave the way the theory says they should (Tense-suffixing), and 18 don't (Tense-prefixing). Here's a list of the problematic 18:

SOV languages with Tense prefixes (18)

Apache (Western)	Athabaskan	
Chipewyan	Athabaskan	
Navajo	Athabaskan	
Slave	Athabaskan	
Gumawana	Austronesian	(Oceanic: Papua New Guinea)
Iduna	Austronesian	(Oceanic: Papua New Guinea)
Maisin	Austronesian	(Oceanic: Papua New Guinea)
Manam	Austronesian	(Oceanic: Papua New Guinea)
Sinaugoro	Austronesian	(Oceanic: Papua New Guinea)
Tawala	Austronesian	(Oceanic: Papua New Guinea)
Maklew	Bulaka River	(Papua New Guinea)
Seri	Hokan (Seri)	
Kiliwa	Hokan (Yuman)	
Marind	Marind	(Papua New Guinea)
Yaqay	Marind	(Papua New Guinea)
Zimakani	Marind	(Papua New Guinea)
Yelî Dnye	Yele	(Papua New Guinea)
Ket	Yeniseian	

4 of these are Athabaskan; see section 2.2.2.1 above.

(11 of them are from Papua New Guinea)

2 of them are arguably like Athabaskan in having verb roots that are metrical units:

- Ket (Vajda 2008)
- Seri (Marlett 2008; stress on penultimate syllable of root)

Seri (Hokan): Marlett (2008: 2, 13)

(42)

a.	t-	ása				'it stinks'
	REAL-	stink				
b.	po-	m-	ása			'it will not stink'
	IRREAL-	NEG-	stink			
c.	i-	t-	áxpx			'S/he is angry with h/'
	3S3O-	REAL-	be.angry.with			
d.	i-	t-	áxapx	-at		'They're angry with h/'
	3S3O-	REAL-	be.angry.with	-PL.SUBJ		
e.	i-	t-	áxapx	-olca		'They're being angry with h/'
	3S3O-	REAL-	be.angry.with	-PL.SUBJ/IMPERF		
f.	i-	t-	atólec			'S/he asks h/ for help'
	3S3O-	REAL-	ask.for.help			
g.	i-	t-	atólej	-oj		'They ask h/ for help'
	3S3O-	REAL-	ask.for.help	-PL.SUBJ		
h.	i-	t-	atólejc	-am		'They're asking h/ for help'
	3S3O-	REAL-	ask.for.help	-PL.SUBJ/IMPERF		

So in Seri (unlike English or French), as soon as you have a root, you can give it prosodic structure, assigning a trochaic foot to its right edge. Any affixes you add after that are being added to something with prosodic structure, so Affix Support is satisfied.

Score so far:

337 languages the theory already handles	(SOV languages with tense suffixes (331), or with metrically independent prefixes (6))
12 languages that require further investigation	(SOV languages with tense prefixes)

4.2. Verb-initial languages

WALS statistics:

	Tense/aspect-suffixing	Tense/aspect-prefixing
verb-initial	35	32

two complications, just in case you're comparing these with the previous table:

- WALS has a category of "V initial but S and O are freely ordered after V"; those are listed as VS and VO, but not as VSO or VOS.
- WALS also has a few languages[1] that are listed as "SVO in transitive clauses and VS in intransitives". We won't consider those.

These numbers don't look as inviting; our theory predicts that verb-initial languages shouldn't have (prosodically dependent) suffixal tense (well, a suffixal highest affix, anyway). But there are 35 verb-initial languages with tense suffixes in the WALS database.

Consider these problematic languages:

Verb-initial languages with tense/aspect suffixes (35):

Baure	Arawakan	VOS
Garífuna	Arawakan	VSO
Goajiro	Arawakan	VSO
Ignaciano	Arawakan	V-initial
Garrwa	Australian (Garrwan)	VOS
Anindilyakwa	Australian (Gunwinyguan)	V-initial
Warrnambool	Australian (Pama-Nyungan)	V-initial
Wembawemba	Australian (Pama-Nyungan)	VOS
Gude	Chadic	VSO
Chumash (Barbareño)	Chumash	VOS
Breton	Indo-European (Celtic)	VSO
Welsh	Indo-European (Celtic)	VSO
Domari	Indo-European (Indic)	V-initial
Kariri	Macro-Ge (Kariri)	VOS
Chontal Maya	Mayan	V-initial
Zoque (Copainalá)	Mixe-Zoque	VOS
Zoque (Ostuacan)	Mixe-Zoque	V-initial
Nicobarese (Car)	Mon-Khmer	VOS
Ik	Nilo-Saharan (Eastern Sudanic)	VSO
Karimojong	Nilo-Saharan (Eastern Sudanic)	VSO
Coos (Hanis)	Oregon Coast (Coosan)	V-initial
Yagua	Peba-Yaguan	V-initial
Costanoan	Penutian	V-initial
Sahaptin (Northern)	Penutian	VSO
Yokuts (Yaudanchi)	Penutian	V-initial
Bella Coola	Salishan	VSO
Chontal (Huamelultec Oaxaca)	Tequistlatecan	V-initial
Nahuatl (Huasteca)	Uto-Aztecan	VSO

[1] e.g., Mapudungun (Araucanian), Mocoví (Guaicuruan), and Pilagá (Guaicuruan)

Nahuatl (Michoacán)	Uto-Aztecan	V-initial
O'odham	Uto-Aztecan	V-initial
Pipil	Uto-Aztecan	V-initial
Tepehuan (Northern)	Uto-Aztecan	VSO
Tepehuan (Southeastern)	Uto-Aztecan	V-initial
Kyuquot	Wakashan	VSO
Makah	Wakashan	VSO

31 of these 35 languages turn out to be explicable under the theory developed here. The remaining 4 require further study.

4.2.1 Explaining the explicable

The 31 "explicable" languages fall into the following categories:

- not clearly verb-initial (6)
- not really tense/aspect-suffixing (9)
- "tense/aspect" arguably not the highest affix (3) `
- arguably exhibit EPP effects (9)
- root has metrical structure (4)

We'll consider each of these in turn.

4.2.1.1 Not clearly verb-initial (6)

Dryer (2008):
"The rule of thumb employed is that if text counts reveal one order of a pair of elements to be more than twice as common as the other order, then that order is considered dominant…"

As rules of thumb go, this one is pretty permissive…

6 of the languages in the "problematic" list are described by authors of grammars or other works about them as having fairly free word order, without the freedom being explicitly associated with emphasis, topic, or focus.

Anindilyakwa (Australian: Gunwinyguan): Leeding (1989)

(43) a. mwipwina mwitjiyanga akwithangwe kimwingwirthinamwa
that.unseen boat near will.be.sinking
'That boat will be sinking' (p. 454)

b. ana anhinga ningalyipwarnamwa ngayiwa kilhikatjawa lhikwiniyawa
this food 1.EXCL.SG.am.eating 1.EXCL.SG 1EXCL.SG.will.go-ALL last
'I am eating this food [and] I will be going later' (p. 460)

Coos (Oregon Coast: Coosan): Frachtenberg (1922, 426)[2]

(44) X'ōwā'yas hän djî'letc xal'^{E}mats
snake his at.thighs it.wraps.around.him
Hän we'hel la^{u} he'łaq lE x'ōwā'yas
his.to waist that it.arrived the snake
'The snake coiled around his thigh. It crawled up to his waist'

Ignaciano (Arawakan): Ott and Ott (1967, 91)[3]

(45) ema achane vaʔi maeperaikaʔini mapera
he person not he.esteem his.mount
'The man didn't care for his mount'

Northern Sahaptin (Penutian): Rude (1997)

(46) Tílaaki i-nánan-a k'úsi-na
woman 3NOM-bring-PAST horse-OBJ
'The woman brought the horse'

O'odham (Uto-Aztecan): Hale and Selkirk (1984, 162-163)

(47) a. Wákial 'at g wísilo cépos
cowboy AUX.3.PERF DET calf brand
'The cowboy branded the calf'
b. Wísilo 'at cépos g wákial
c. Cépos 'at g wákial g wísilo

Yokuts (Yaudanchi) (Penutian): Kroeber (1904, 259)[4]

(48) ama tanit yiwin an limkin tanji
then there.from wife his prairie.falcon go
'Then the prairie falcon's wife went from there'

Some of these languages fall under generalizations to be offered later, as well.

[2] Mithun (1992, 46) claims, on the basis of text counts, that the basic word order of Coos is OVS.

[3] In fact, Ott and Ott (1967) appear to me to be saying that the order of S, V, and O is completely free. They write (p. 89), "In the following formulas, the tagmemes listed before the P tagmeme are fixed in order. The mutual order of all other tagmemes is optional." Their formula for a declarative transitive clause is then (p. 89) "±Intro:intro/Cl 106-107 ±Neg:neg/Warn:warn +**P** tr:Vb 11 ±**O**:N 3/5/7/9-11/15 ±**S**:N 1-2/5 pro 5 ±T:N 9/18/21/Cl 101-102 ±L:N 4/11/13-15 ±Ref:Cl 101 ±Req:req ±Hes:pro 10]". In this formula, P is the transitive verb, and the tagmemes listed before it are "Intro" (introductory particles with meanings like "then" and "so") and "Neg" (negation). These are the two tagmemes which should be in a fixed order, by their description; "all other tagmemes", which includes P (the verb), S, and O, are freely ordered.

[4] Kroeger (1904, 233): "…the order of words in the Yaudanchi sentence is rather shifting. A usual order is quite perceptible, but this is often departed from. As regards the three chief parts of the sentence, the verb most frequently comes first, the subject next, and the object last."

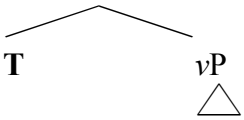
4.2.1.2. Not really tense/aspect-suffixing (9)

For 5 of the languages on the WALS list, the tense/aspect morphemes in question appear to be second-position clitics rather than suffixes. If second-position clitics are free-standing in the syntax, and are cliticized postsyntactically via "prosodic inversion" (Halpern 1992), then T-support won't recognize these instances of T as needing support.

In 2 other languages, it is unclear that the tense/aspect morphemes are affixes at all.

Another 2 have, in addition to the putative tense/aspect suffix, another tense/aspect morpheme which is either a prefix or a free-standing morpheme.

(49) TP — non-affixal T: no EPP



The 5 tense/aspect-cliticizing languages are:

Garrwa (Australian (Garrwan)): Mushin (2006, 313)

(50) a. jilajba=**yili**=nurru juju
walk=**HAB**=1PL.EXCL long.way
'We would walk a long way'

b. miku=nurr=**ili** jarr-kanyi mukawu
NEG=1PL.EXCL=**HAB** eat-NEG cow
ngawamba=**yili**=nurri jarrba munjimunji-nyi wada
only=**HAB**=1PL.EXCL eat bush-DAT food
'We didn't eat beef. We only would eat bush food'

Ik (Nilo-Saharan: Eastern Sudanic): Serzisko 1992, cited in Julien (2002, 71)

(51) a. en-ata **be** ceki-a saatso
see-3P PAST woman-ACC yesterday
'They saw the woman yesterday'

b. na **be** ceki-a en-ie wici-a …
when PAST woman-ACC see-SUBJC children-ACC
'When the woman saw the children…'

Kyuquot, Makah (both Wakashan)[5]: Davidson (2002, 112, 107)

(52) a. waha•k^{w}=**'eyik**=id ʔa•beyuƛ=˚iq
go.PERF=**FUT**=INDIC.1PL tomorrow=ART
'We will go tomorrow'

b. yu•q^{w}a•='aƛ=**(b)it**=s dudu•k='aƛ
likewise=TEMP=**PAST**=INDIC.1SG sing=TEMP
'I was singing too'

Northern Tepehuan (Uto-Aztecan): Bascom (1982, 280)

(53) a. gɨi=á=n=**ta**
fell=BASE=I=COMPL
'I fell'

b. ááni=a=n=**t** íí
I=BASE=I=COMPL went
'I went'

c. káši=a=n=**t** íí
already=BASE=I=COMPL went
'I already went'

Nicobarese Tense morphemes appear to be free-standing:

Nicobarese (Mon-Khmer): Das 1977, cited in Julien (2002, 96)

(54) cuɛl iskul cin **min** hu̲rɛic
go school I FUT tomorrow
'I will go to school tomorrow'

Kaufman (2010) argues that Garífuna tense/aspect morphemes, analyzed by Taylor (1951) as suffixes, should actually be analyzed as auxiliaries. Arguments include the fact that the auxiliaries function for stress like independent words, and the fact that they can take prefixes:

Garífuna (Arawakan): Kaufman 2010

(55) a. N-ari-ha **ña**-dibu
1SG.G-see-VRBL PROG-2SG.D
'I am seeing you'

b. Ari-ha n-**a** mesu le
see-VRBL 1SG.G-PRF cat DEF.MSC
'I already saw the cat'

[5] These examples are Makah. Makah and Kyuquot are similar dialects of Nootka, and multiple sources refer to Kyuquot as having tense clitics, but I have not yet found the actual Kyuquot examples.

Finally, two languages from the list have, in addition to what look like tense or aspect suffixes, other morphemes indicating tense or aspect which are prefixes, or possibly free-standing words:

Chontal Maya (Mayan): Knowles (1984, 228, 231)

(56) a. **muk'** ʔu t'äb-o
PROG A3 climb-IMPERF.INTRANS
'He is climbing'

b. **muʔ** ʔu häɕ'-eʔ-Ø
PROG A3 hit-IMPERF.TRANS-B3
'He is hitting it'

c. **ʔa** k'ot-Ø-on
ASP arrive-PERF.INTRANS-B1
'I already arrived'

d. **ʔa** kä k'uš-i-Ø
ASP A1 eat-PERF.TRANS-B3
'I had already begun eating it'

Gude (Chadic): Hoskison (1983, 82)

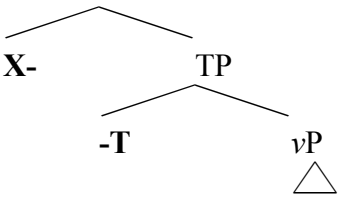
(57) **kə** kii Musa faara
PERF throw-PERF Musa stone
'Musa threw a stone'

4.2.1.3 "Tense/aspect" arguably not the highest affix (3)

There are three languages in the problematic list which are indeed verb-initial, and do indeed have suffixes that are labelled by grammars as reflecting tense or aspect, but which appear to have verbal prefixes that can be argued to be higher than the problematic tense/aspect suffixes.

Recall that the prediction of the theory is just that verb-initial word order should be impossible if the highest affix is a metrically dependent suffix; lower suffixes might cause phrases to move in the course of the derivation, but the verb will then move past them to pick up the higher affixes.

(58) XP — Suffixal T/Asp, but a higher prefix masks its effects



The three languages in this category are Bella Coola (Salish), and the two Celtic languages Welsh and Breton.

• ***Welsh*** (Indo-European (Celtic))

Welsh verbs may optionally be preceded by particles which indicate things like negation, affirmation, and clause type:

(59) a. **Mi** welais i Siôn (Roberts (2005, 120))
AFF saw-1SG I John
'I saw John'
b. **Ni** ddarllenodd Emrys y llyfr
NEG read Emrys the book
'Emrys didn't read the book'
c. y dynion [**a** ddarllenodd y llyfr]
the men REL read the book
'the men who read the book'
d. Dw i 'n meddwi [**y** dylech chi ddeud wrtho fo]
am I ASP think DECL ought you say to-3SG he
'I think you ought to tell him'

These particles trigger various mutations of the initial consonant of the following verb, which become optional if the particles are dropped (though it is apparently becoming common to retain the mutation even if the particles are missing (King 2003, 185))

(60) a. (Mi) weles i ti ddoe
AFF SOFT.MUTATION-saw-1SG I you yesterday
'I saw you yesterday'
b.(*Mi) gweles i ti ddoe
AFF saw-1SG I you yesterday

(61) a. Collodd e'r arian
lost he-the money
'He lost the money'
b. Gollodd e'r arian?
SOFT.MUTATION-lost he-the money
'Did he lose the money?'
c. Cholles i ddim byd
ASPIRATE.MUTATION-lost-1SG I not anything
'I didn't lose anything'

If we can regard these mutations as mutation-causing prefixes, then we're all set; Welsh verbs routinely begin with prefixes that are associated with things like negation, embedding, affirmation, question, etc.

• ***Breton*** (Indo-European (Celtic))

Breton is verb-initial only in embedded clauses, and is V2 in matrix affirmative clauses:

(62) a. [Ar vugale] o deus gwalc'het ar wetur dec'h (Schafer 1995, 141)
the children PRT have.3PL washed the car yesterday
'The children washed the car yesterday'
b. [Ar wetur] o deus ar vugale gwalc'het dec'h
the car PRT have.3PL the children washed yesterday
'The children washed the car yesterday'
c. [Dec'h] o deus ar vugale gwalc'het ar wetur
yesterday PRT have.3PL the children washed the car
'The children washed the car yesterday'
d. [Gwalc'hin ar wetur] o deus graet
wash the car PRT have.3PL done
'They really did wash it'

(63) a. Kredin ran [en deus aret Yann e bark] (Schafer 1995, 136)
believe do.1SG PRT have.3M plowed Yann his field
'I believe that Yann has plowed his field'
b.* Kredin ran [[Yann] en deus aret e bark]
believe do.1SG Yann PRT have.3M plowed his field
'I believe that Yann has plowed his field'

Just as in Welsh, the Breton verb is immediately preceded by a variety of particles (*o* and *en* in the examples above), which trigger mutations at the beginning of the verb; if these mutations are prefixes, then there should be no EPP effects.

• ***Bella Coola*** (Salish)

WALS lists Nater (1984, 60) as its source for the claim that tense and aspect morphemes are suffixes in this language. And, indeed, he has a long list of Bella Coola suffixes, some of which have names that look like good names for aspects:

"The verbal suffixes are: …-a(n)m/-(a)lc inchoative, -t-nm$_2$ / -nm$_2$ habitual, nu-s-X-mc predilectional, (nu-X)-ik/-al-us desiderative…" (Nater 1984, 60)

But in fact, these suffixes appear to be derivational rather than inflectional.

Nater (1984, 72): "When affixed to verbo-adjectival statives, -anm is glossed as to become increasingly Xer: scanm to get worse and worse, to wear out (sc bad).... When following a verbal base that describes a seasonal, routinely, or regularly performed activity, -anm means it is time for one to X, one must go Xing now: 7ilhtsayanmts it is (the) time (of the year) for me to (start) pick(ing) berries (7ilh-tsay), 7alhpsanmts I must eat (7alhps) now."

Nater (1984, 73): "The habitual suffixes -t-nm$_2$ and -nm$_2$ are affixed to transitive performative bases. The majority of the resulting complex verbs typically expresses communal-benefactive activities (often prolonged): to X with or for the benefit (entertainment) of other individuals…and often describe some household or other routinely performed acti, occupation, profession, or a specific role in a competitive game or contest…. -t-nm$_2$ appears only in the following items: tslhtnm "to break (tslh) the string"=to (be the) win(ner) in a race… sp-alustnm to be splitting wood (-alus) (sp' to hit something with an object)…"

Nater (1984, 73): "-nm$_2$ is more productive than -t-nm$_2$: mnts'-aqw'snm to crush, squeeze berries (to extract the juice) (mnts'aqw's to squeeze berries)…qat'iixwnm 'to pull towards oneself (qat') plant tops (-iixw)" = to be picking elderberries, sp'lxsnm 'to be hitting (sp') the end (-lxs)" = to hit the Morse key, wire a telegram, (use the) telephone…"

But Bella Coola also has aspectual prefixes, which appear to be more productive and inflectional:

Nater (1984, 96-97): "7alh- stative-progressive … Before predicates (inflected verbs), 7alh- conveys progressivity - to be Xing: 7alh7ayutsmtim somebody was telling (7ayutsm) them to…, 7alhpik'm sparks are flying around √pik' to shine, glitter, spark), 7alhp'uyaax (tree) lies fallen (p'uyaax). "

So, yes, Bella Coola has suffixes that are called "aspectual" in Nater's grammar, but it also has aspectual prefixes, and the latter seem more inflectional (hence higher) than the former.

4.2.1.4. Exhibit possible EPP effects (9)

Nine of the languages in the "problematic" list can be seen as satisfying the EPP via unorthodox means.

- ***Yagua*** (Peba-Yaguan)

Yagua certainly does have suffixal tense (Payne (386-387)):

-jásiy 'PROX1' (within a few hours ago)
-jay 'PROX2' (a day ago)
-siy 'PAST1' (a week to a month or so ago)
-tíy 'PAST2' (a month to maybe two years ago)
-jada 'PAST3' (more than two years ago)

And, as we'll see, Yagua sentences are generally verb-initial, though it's possible to front DPs for emphasis.

Yagua has two types of verbal agreement: Set I (=Ergative?) is prefixed to the verb, while Set II (=Absolutive?) encliticizes to whatever's immediately before the Absolutive argument:

(64) a. siimyiy Alchíconíí quiivą (Payne and Payne 1990, 255)
sa-jimyiy Alchíco-**níí** quiivą
3sgERG-eat Alchíco-3sgABS fish
'Alchíco is eating the fish'

b. siimyiy sinumunií quiivą
sa-jimyiy sinu-mu-**níí** quiivą
3sgERG-eat land-LOC-3sgABS fish
'He is eating the fish on land'

Intransitive verbs come in two classes. Some have only Ergative agreement:

(65) a. **sa**-murą́ą́y Manúngo
3sgERG-sing.to.call.spirits Manúngo
'Manúngo is singing to call the spirits'

b. Manúngo murą́ą́y
Manúngo sing.to.call.spirits

These verbs are always preceded by either the Ergative agreement or the subject (but not both).

Another class of intransitive verbs have only Absolutive agreement:

(66) múúy jų́ų̨ñíí (Payne and Payne 1990, p. 256)
múúy jų́ų̨y-**níí**
there fall-3sgABS
'There he falls'

Verbs in clauses with only Absolutive (non-prefixing) agreement "…are most commonly preceded by a locative demonstrative díiy 'there (near)', jásiy 'there (yonder),' or múúy 'there (distant)'. Examples like [(66)] were judged ungrammatical without the initial locative" (Payne and Payne 1990, p. 257)

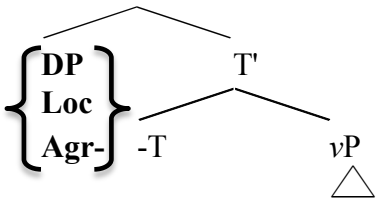
They do also note that there are other examples that are acceptable without these locatives:

(67) siimyaasiy sų̨ų́síjyų̀níí
siiy-maasiy **sa**-jų́siy-jų̀-**níí**
run-go.out 3sgERG-behind-ADLAT-3sgABS
'He runs out behind him'

Various ways we could imagine handling this particular example; this is something to study further.

Pending future study, though, it looks as though Yagua verbs are generally preceded by (i) a full DP, (ii) a locative expression, or (iii) an Ergative agreement morpheme.

(68) TP **EPP**, satisfiable by DP, Locative, or Agreement proclitic



That would be a nice result, because a lot of the "problematic" languages have obligatory agreement prefixes. Maybe these languages are all really Yagua in disguise.

Barbareño Chumash (Chumash): Beeler 1976

(69) a. **k**-iwa-uliš (p. 263)
1-a.while-hold
'I will hold it for a while'

b. **s-iy**-qili-toxš liy'al'ališaw (p. 264)
3-PL-HABIT-fight every.day
'They used to fight every day'

[note that Barbareño Chumash also has tense/aspect prefixes, in addition to its tense/aspect suffixes….]

Goajiro (Arawakan): Holmer 1949

Holmer (1949) recognizes two major types of tensed indicative verb. The *finite indicative* is only possible for transitives, and involves obligatory agreement prefixes/proclitics:

(70) a. **t-**er-e•-či (Holmer 1949, p. 148)
1SGSUBJ-see-FUT-3MSGOBJ
'I will see him'
b. **pu-**tũk-ir-e•-ra
2SGSUBJ-sleep-CAUS-FUT-3FSGOBJ
'You will put her to sleep'

The *participial* form can appear with transitives and intransitives, and has no pronominal prefix, but always prefixes *a-*:

(71) a. **a**-sə-š taya wəĩ (Holmer 1949, p. 149)
PART-drink-DUR I water
'I drink water'
b. **a**-ukt-e•-č
PART-die-FUT-3MSG
'He will die'

→ all the verbs have some prefix (either an agreement prefix/proclitic, or the participial-forming *a-*).

Karimojong (Nilo-Saharan (Eastern Sudanic)): Lesley-Neuman 2007
"The Karimojong verb has two prefix slots before the stem, and three suffix slots following it. The first prefix slot, occupied by either a pronominal prefix or an infinitive prefix, is obligatory." (Lesley-Neuman 2007, p. 15)

(72) a. **à**-dòŋ-i (Lesley-Neuman 2007, 9)
3SG-pinch-IND.ACT.PAST.PROG
'He was pinching'
b. **àkà**-limókìn-ì ɑęɔ́ŋ ij ɔ́ŋ (Lesley-Neuman 2007, 25)
1SG.2SG-tell-IND.FUT I you.SG

Nahuatl (Huasteca) (Uto-Aztecan): Beller and Beller 1979
(73) **ni**-h-cayana-s no-yoyo (p. 288)
1SG-3INAN-tear-FUT my-clothes
'I will tear my clothes'

Nahuatl (Michoacán) (Uto-Aztecan): Sischo 1979
(74) **ni**-h-koč-ti-aya (p. 354)
I-him-sleep-CAUS-PAST
'I put him to sleep'

Pipil (Uto-Aztecan): Campbell 1985
(75) **ti-nech**-ita-k (p. 56)
you-me-see-PAST
'You saw me'

Baure (Arawakan): Danielsen 2007
(76) a. **ro**-moroko-w (p. 256)
3SG-dry-COP
'It is dry'
b. **ro**-moroko-wapa
3SG-dry-CHANGEOFSTATE
'It is drying'
c. **ro**-moroko-pa
3SG-dry-GO
'It is going to be dry'

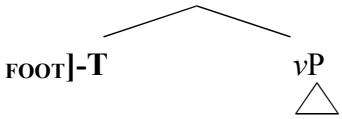
Wembawemba (Australian: Pama-Nyungan): Hercus 1986
In Wembawemba, agreement is a 2nd position clitic:

(77) a. dag-in-**anda** ginmer bembeŋgug biəl-u djelig-djelig (p. 51)
hit-PAST-1SG.SUBJ these children stick-ERG yesterday
'I hit these children with a stick yesterday'
b. wemba-**nda** nja-in manjam djelig-djelig (p. 52)
not-1SG.SUBJ see-PAST him yesterday
'I didn't see him yesterday'
c. winjar-**ar** njembar-a (p. 53)
who-2SG.SUBJ await-PRES
'Who are you waiting for?'

4.2.1.5. Root has metrical structure (4)

4 of the languages in the "problematic" list are arguably like Seri and Ket, in that the tense suffixes are being attached to a root that already has metrical structure. Evidence for this comes from the fact that stress in these languages is unaffected by affixation, and always appears in a fixed position on the root.

(78)



Suffixal T preceded by a foot boundary, satisfying T-support

• ***Domari*** (Indo-European (Indic))
Matras (1999, 13) says that stress on verbs is reliably on the syllable before certain suffixes, including the tense suffix and object agreement suffixes:

(79) a. lahed-óm
saw-1SG
'I saw'
b. lahed-óm-a
saw-1SG-PRET
'I had seen'

• ***Southeastern Tepehuan*** (Uto-Aztecan)
Willett (1991, 21-22): "All native Southeastern Tepehuan words are accented on one of the first two syllables of the stem, including reduplicated forms. Of these two syllables, it is the HEAVIER one that is accented. If, however, they are equally HEAVY, then the first syllable is accented…**The rule of accent placement crucially depends on the presence of the initial stem boundary, since it is only the first or second syllable of STEMS that are accented**."

(80) va-hi-tšu-ñ-ʔáa.gi-ʔñ
RLZ-INC-EXT-1SOBJ-speak-to
'He then began speaking to me'

• ***Zoque (Copainalá and Ostuacan)*** (Mixe-Zoque)
Wichmann (1995, p. 189) describes a shared innovation among the Zoquean languages, one which distinguishes them from their Mixe relatives:

"(8.0.3) Primary word stress is shifted from being determined primarily by syllable weight to being fixed on the **rightmost lexical morpheme of the word string**. Polysyllables generalize the stress pattern of those pMZ polysyllables that do not contain heavy syllables, with the effect that **verbs are stressed on the ultimate and nonverbs on the penultimate syllable of the root"**

4.2.1.6. The mysteries (4)

Finally, four languages require further study. These are:

Warrnambool	Australian (Pama-Nyungan)	V-initial
Kariri	Macro-Ge (Kariri)	VOS
Costanoan	Penutian	V-initial
Chontal (Huamelultec Oaxaca)	Tequistlatecan	V-initial

4.2.2 Conclusion

What have we learned?

- EPP can sometimes be satisfied by agreement proclitics/prefixes.
- Second position clitics are treated, for purposes of Affix Support, as though they were free-standing words in initial position (satisfy EPP in Wembawemba, and fail to trigger EPP effects in languages like Garrwa and Northern Tepehuan).

The original "problematic" table is reproduced here, organized by solution:

Warrnambool	Australian (Pama-Nyungan)	??mystery
Kariri	Macro-Ge (Kariri)	??mystery
Costanoan	Penutian	??mystery
Chontal (Huamelultec Oaxaca)	Tequistlatecan	??mystery
Garrwa	Australian (Garrwan)	clitic tense
Ik	Nilo-Saharan (Eastern Sudanic)	clitic tense
Tepehuan (Northern)	Uto-Aztecan	clitic tense
Kyuquot	Wakashan	clitic tense
Makah	Wakashan	clitic tense

Wembawemba	Australian (Pama-Nyungan)	EPP-satisfying agreement clitic
Baure	Arawakan	EPP-satisfying proclitics
Goajiro	Arawakan	EPP-satisfying proclitics
Chumash (Barbareño)	Chumash	EPP-satisfying proclitics
Karimojong	Nilo-Saharan (Eastern Sudanic)	EPP-satisfying proclitics
Yagua	Peba-Yaguan	EPP-satisfying proclitics
Nahuatl (Huasteca)	Uto-Aztecan	EPP-satisfying proclitics
Nahuatl (Michoacán)	Uto-Aztecan	EPP-satisfying proclitics
Pipil	Uto-Aztecan	EPP-satisfying proclitics
Garífuna	Arawakan	free-standing aspect morpheme
Gude	Chadic	free-standing aspect morpheme
Chontal Maya	Mayan	free-standing aspect morpheme
Nicobarese (Car)	Mon-Khmer	free-standing aspect morpheme
Ignaciano	Arawakan	not V-initial
Anindilyakwa	Australian (Gunwinyguan)	not V-initial
Coos (Hanis)	Oregon Coast (Coosan)	not V-initial
Sahaptin (Northern)	Penutian	not V-initial
Yokuts (Yaudanchi)	Penutian	not V-initial
O'odham	Uto-Aztecan	not V-initial
Breton	Indo-European (Celtic)	prefixes higher than T/Asp
Welsh	Indo-European (Celtic)	prefixes higher than T/Asp
Bella Coola	Salishan	prefixes higher than T/Asp
Domari	Indo-European (Indic)	tense attached to metrically structured verb
Zoque (Copainalá)	Mixe-Zoque	tense attached to metrically structured verb
Zoque (Ostuacan)	Mixe-Zoque	tense attached to metrically structured verb
Tepehuan (Southeastern)	Uto-Aztecan	tense attached to metrically structured verb

5. Conclusion

final score:

400 languages the theory handles:	331 SOV languages with tense suffixes, 32 V-initial languages with tense prefixes, 37 "explicable" V-peripheral languages with apparently misdirected affixes
16 languages that require further investigation:	12 SOV languages with tense prefixes, 4 V-initial languages with tense suffixes

The theory succeeds for roughly 96% of the verb-peripheral languages in the WALS database. The rates of success for SOV and for V-initial languages are not statistically significantly different ($p \approx 0.3$)

- also, clitics are treated, for purposes of Affix Support, as though they were free-standing words (satisfy EPP in Yagua, and fail to trigger EPP effects in languages like Garrwa).

Next stop: subjecting the 'predicted' languages to the same level of scrutiny as the 'surprising' languages…

Conclusion: There is no "EPP parameter". Universal principle:

> **Affix Support**: An affix must, in the syntactic representation, be adjacent to material with metrical structure in the direction of affixation.

Material that can satisfy this requirement includes:

- maximal projections
- predictable word-internal metrical boundaries
- agreement clitics

Language variation is a matter of parameters referring to directly observable properties: whether the highest verbal affix is a prefix or a suffix, how stress is assigned within the verb, the presence or absence of obligatory agreement proclitics, and head direction.

Where is Affix Support enforced?

I've been claiming that the answer is "syntax"--but a version of syntax with a very limited amount of information about the final phonological structure. Syntax clearly is operating in ignorance of various morphophonological facts that may not come into the representation until later: the computation that enforces Affix Support doesn't know about Spanish irregular verbs, the fact that agreement proclitics in fact have no robust metrical structure, etc., etc.

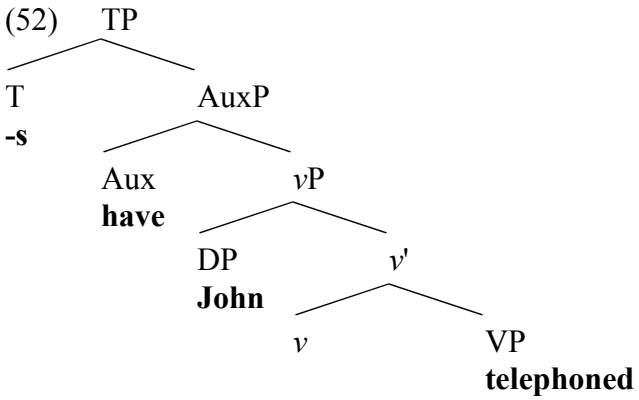
More generally, the syntax apparently contains no lexically idiosyncratic information, just information that's predictable from syntactic label ("the T morphemes in this language are all suffixes preceded by metrical boundaries"). Not obvious that there's any segmental information.

6. And another thing…

(51) a. John may **not** have been promoted
b. John has **not** been promoted
c. John was **not** promoted
d. * Mary promoted **not** John
e. Mary did **not** promote John

"In English, the first auxiliary raises past negation; main verbs don't"

(52)



- highest Aux raises to T
- subject raises to T
- main verb doesn't.

→ raise things to T, until Affix Support is satisfied.

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