# Variations of Gant 'With' and Prepositional Agreement in Léonard Breton 

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## I. Introduction

Breton is a Celtic language spoken in Brittany, a peninsula in the northwest corner of France (Ethnologue). Around 200,000 people in Brittany speak the language, although many are over 50 years old and the language is considered endangered (Ethnologue, Adkins 2013:56, Davies-Deacon 2020:23). The Celtic languages are a branch of the larger Indo-European language family, originally spoken throughout Western Europe but now confined to small areas on the western coasts of France, Ireland, and the United Kingdom. The Celtic languages show a number of syntactic features that are highly uncommon among Indo-European languages, including morphological agreement of prepositions with their objects. In other words, Celtic prepositions are combined with their objects in a single form, whereas in most Indo-European languages they are left separate. Breton shares this tendency, as seen in (1), where what in English is expressed as two words ('to me') is expressed as a single word in Breton (evidon):
(1) Ne oa riskl ebet nag evidon nag evit hemañ
neg be.IMPF risk neg nor for-1sg nor for him
'There was no risk for me or for him.'
(Envorennoù, 10)

This is not just a spelling convention that clumps together a preposition and a pronoun: a one-for-one translation of 'with me' into Breton would yield the unacceptable *evit me. What exact terminology to use for this phenomenon has been a fraught question among Breton grammarians ever since the inception of Breton grammar studies (Ledunois 2002:78, Favereau 1997:408, ARBRES).

Forms like evidon are often referred to as being "conjugated" (fr. conjugué, br. displeget), but certain linguists have been uncomfortable with the analogy that this draws between the preposition and the sort of agreement found on verbs. For example, François Favereau and Roparz Hemon, two prominent linguists of Breton, have opted to instead refer to the endings as "suffixed pronouns" (fr. pronoms suffixés, Favereau 1997:408, Hemon 1975:89). There has been no work fully dedicated to the syntax of Breton prepositions in the modern period, and the question of whether their endings should be considered true inflections or cliticized pronouns,
when their syntactic behavior and dialectal variation are taken into account, is the main subject of the present paper.

Only a fairly small closed class of prepositions can actually be "inflected" in Breton (complex prepositions are also marked for agreement, but in more periphrastic ways) and the endings differ slightly in form depending on the preposition. These can be grouped into roughly two paradigms, usually categorized under the first-person endings -on (for the first group) and -in (for the second group). The table in 2 below lists both paradigms (under the heading "prepositional") alongside the subject and possessive pronouns and the verbal endings in the present and imperfect tenses:
(2) Pronouns and pronominal morphemes (expanded from the table used by Ledunois (2002:70):

|  | pronouns |  | prepositional |  | verbal |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | subject | possessor |  |  | present | imperfect |
| 1st | me | ma | -in | -on | -an | -en |
| 2nd | te | $d a$ | -it | -out | -ez [ $\varepsilon s$ ] | -es [Es] |
| 3rd (m) | $e n ̃$ | $e$ | -añ |  | - $\varnothing$ | -e |
| 3 rd (f) | hi | he(c 'h) | -i |  |  |  |
| 1st | $n i$ | hor/hon | -omp/-eomp | -omp | -omp | -emp |
| 2nd | $c^{\prime} h w i$ | ho(c'h) | -oc'h/-eoc'h | -oc'h | -it | -ec 'h |
| 3rd | int | $o$ | -o/-e |  | -ont | -ent |

As shown in this table, there is a high degree of correspondence between the prepositional endings and the verbal endings, with a few noteworthy divergences (primarily the second person singular and third-person forms). This table, however, does not represent the full complexity of the prepositional system across the distinct varieties that make up the Breton language; in fact, this table only displays the endings found in the "standard" Breton variety, the one taught in
schools (where possible). This variety was carefully constructed by Breton grammarians and language planners, and largely reflects the kind of Breton spoken in the parish of Léon in the north-western part of Brittany (Hornsby \& Quentel 2013). However, even Léonard Breton (henceforth called by the autonym Leoneg) makes use of a number of forms that have not made their way into the paradigms of the standard language shown in 2. Although I was taught Standard Breton when I initially learned the language, Leoneg is familiar to me from the native speakers that I have gotten to know, and its particular features motivated me to write this paper.

In this paper, I consider whether the verb-like morphology and syntactic behaviors of prepositions in Leoneg pose a challenge to any or all of the existing models of prepositional agreement in Breton. I begin by reviewing the literature as it stands concerning agreement and syntactic structure in Breton in the Background section, teasing out from there the main models against which I will consider the phenomenon in question. The literature on agreement in Breton has thus far largely been focused on verbs, and verbal agreement theories will provide the foundation for theories of prepositional agreement. I then proceed to overview the challenges to existing models in section III, including background on the significant and highly irregular preposition gant 'with' and its forms and uses. This leads straight into an analysis of whether the morphological resemblances of gant and other prepositions to verbal paradigms can be seen to give any information about the syntactic structures underlying them, with reference to the models outlined in the first section. I then evaluate in section IV whether or not the prepositions can be explained by any of these models, or if an entirely new structure must be proposed. I demonstrate that Case is the key feature relating prepositions to their endings, and proposed that pronominal endings on prepositions should really be taken as forms of pronouns in a fixed array of cases. Finally, I present a summary of the argument with my conclusions, while indicating some questions that require further study. With this paper, I intend partially to make a contribution to the study of prepositional agreement, but most especially to broaden the view of Breton syntactic literature by considering the nuances of Breton dialects as well as the integral roles of certain prepositional constructions.

## II. Background

Before answering the question of whether Breton prepositions host true inflection, three broad concepts need clarification: what a preposition is, what agreement/inflection is, and how the
relevant parts of Breton syntax work. I address these issues in this section, starting with a brief definition of a preposition. I then move to a basic explanation of agreement according to the Minimalist Program (the grammar framework that I will be using), and then to the works that have covered prepositional and agreement syntax in Breton. I also summarize previous answers to the question of this paper, which will be analyzed in following sections.

The Minimalist Program (cf. Chomsky 1995) is a program within the theory of Universal Grammar. The basic assumptions of minimalism which are relevant to this paper are the following: that there is an underlying syntactic structure for every expression in a language, governed by the set of syntactic rules that define the language (Chomsky 1995:170); that the basic operations of this syntactic system are Merge, whereby two syntactic nodes become a new single node (allowing the representation of these structures as trees; Chomsky 1995:226), Move, whereby one node moves to another location in the structure (Chomsky 1995:250), and Agree, whereby a syntactic element with an interpretable feature checks and deletes the corresponding uninterpretable feature on another element (see later; Chomsky 2001:3); and that the list of features includes Case features, $\varphi$-features, categorial features, and tense features (e.g. Chomsky 1995:238, 277).

## II. 1 Prepositions

In modern theories of syntax, prepositions are somewhat fraught as a category (cf Bader \& Bayer 2007, Fagard et al. 2020): they are not as essential to human language as the noun or verb-certain languages, for instance, lack a separate category for them-but in languages that do have them, they perform a variety of different and often vital functions. In the Celtic Languages especially, prepositions serve as required connectors in a number of important expressions, and can sometimes be interchanged to indicate subtle differences in meaning. Fagard et al. (2020) group prepositions together with cases as "basic nominal relators," with prepositions in particular defined as small single-morpheme words that take a nominal complement. They link the nominal to some previous constituent in a way defined by the semantics of the preposition (2020:11). The relationship of the preposition to the previous constituent is much weaker than its relation to its complement (2020:3).

The exact tree structure of the prepositional phrase is not completely clear. The three following trees represent different ways of approaching the issue:
2. Tree structures for PP.
a.

b.

c.


The first tree (2a) is the most simple and most widely used. The second (2b) represents a more complex structure including a "small p" analogous to the $\nu \mathrm{P}$ or $n \mathrm{P}$, proposed by Koopman et al. (2000). The third structure (2c) is not actually a Prepositional Phrase, but an overarching projection with relational meaning devised by David Adger (2012) to explain the behaviors of "relational nouns," with a functional projection $p$ analogous to T .

Additionally, as indicated by Fagard et al. (2020), the line between preposition and the other "nominal relator"-case-is particularly contentious. The general assumption (Fagard et al. 2020, Adger 2003 \& 2012 \& 2021, Ostrove 2020, Bader \& Bayer 2007) is that prepositions assign case to nominals, either in the syntax (e.g. Adger 2003) or afterwards (Ostrove 2020; for a definition of the post-syntax, see the end of this section). In his work on relational nouns (2012) and quirky subjects (2021), however, David Adger argues that prepositions may in a number of circumstances actually be expressions of the case head (written as K). Bader and Bayer (2007) point out the difficulties of prepositions as a simultaneously lexical (meaning-carrying) and functional category, and go so far as to assert that the prepositional phrase and the case phrase are essentially mutually-exclusive realizations of some nominal case (for a full discussion of case, see Analysis).

## II. 2 Agreement

The phenomenon of inflection is often attributed by syntacticians (e.g. Chomsky 2001) to the operation Agree, one of the aforementioned core operations accepted by the Minimalist view of syntax (cf. Chomsky 2001). At the heart of this operation is a relationship where one object in the syntax needs to be 'checked' and then 'valued' by receiving information from another object in the syntax (Chomsky 2001:6). As mentioned in the introduction to this section, Minimalism
assumes that there is an abstract, structural representation for each sentence (Chomsky 1995:170). For this underlying structure to be transformed into actual sentences, certain parts of that structure need to be filled out. For instance, in the sentence "I am a student," we can imagine the abstract structure having only the vague elements of "I", "student," and some kind of linking verb "to be." In English, however, the relationship between "I" and the verb "to be" has to be shown. If the subject is ' $I$ ', then an English speaker pronounces the verb as 'am', or as 'is' if the subject is 'she'. If the person of the subject is unknown, then no particular form of the verb comes to mind and it cannot be said. In English, 'I' and 'she' are pronouns, and the difference between them is that 'I' is first-person (used by a speaker to refer to themself) and singular, while 'she' is third-person (used by a speaker to refer to someone or something other than the listener) and singular. These aspects-person and number—are known as $\varphi$-features (or phi-features), and are usually attached to nouns and pronouns (Chomsky 1995:277; Chomsky 2001:3). For Breton, as for many languages in the Indo-European language family, gender is also included in this group of features (cf. Jouitteau \& Rezac 2006; Weisser 2019; for other Indo-European languages, cf. Gelderen \& Abraham 2017).

Since the verb is pronounced differently depending on the pronoun subject, we can deduce that the features that it is looking for are $\varphi$-features. The final caveat to this English example is that it is not V (the meaning-bearing component of the verb), but T (the tense-bearing part of the sentence, that the verb is part of) that actually looks for $\varphi$-features (Chomsky 2001:3). It combines with auxiliaries or V to create their complete forms as we find them in surface speech. The example in (3) uses the verb 'burn', a less complicated verb than 'be', to demonstrate Agree.

## 3. English Agreement

$\left[\mathrm{TP}\left[\mathrm{T}_{[u \varphi][u \text { case }]} \sqrt{ }\right.\right.$ burn] $\left.\ldots\left[\operatorname{Paul}_{[3 \mathrm{MS}][\text { nom }]}\right]\right]$
[TP [ $\mathrm{T}_{[\text {man:3MG][m:nom] }}$ burns] $\left.\ldots\left[\operatorname{Paul}_{[3 \mathrm{MS}][n o m]}\right]\right]$
(Adapted from Adger 2003:254)

A T that is on the search for $\varphi$-features, like the one shown in the diagram, is said to have a $\varphi$-probe (Chomsky 2001:4). When it combines with the subject 'Paul,' the $\varphi$-probe is valued (represented in the diagram by crossing out), giving it Paul's 3 ms person feature, allowing the
root to be pronounced as 'burns.' Other features can be involved in Agree, and syntactic units other than T can have probes (cf. Chomsky 2001).

Case and tense features also figure prominently in the formation of verbs. The nominative case, represented in the tree above as [nom], represents a case that demarcates the subject of a sentence. In some versions of the current syntactic framework, $T$ gets its subject $\varphi$-features from the same entity as the one that provides its [nom] Case feature (Chomsky 2001:4). Another possible position asserts that T actually assigns Case, instead of receiving it, while certain linguists have rejected the placement of Case in the syntax entirely (Markman 2010; see Analysis). The reason that this is all important is that the Agree operation usually underlies the appearance of personal endings in languages that show such inflection.

## II. 3 Breton syntax

Quickly summarizing the major issues in the study of Breton syntax is difficult. A number of Breton's syntactic particularities are unusual for European languages due to its Celtic background, while others are unusual even within the Celtic family. One basic behavior of Breton phrases that has been puzzling to syntacticians involves the motion of topicalized elements to the first position in the sentence, as shown in the differences between these 4 phrases:
4. Me a ev kafe bep beure
$1 s g$ ptcl drink coffee every morning
$I$ (and not you) drink coffee every morning.
5. Kafe a ev-an bep beure.
coffee ptcl drink-1sg every morning
I drink coffee (and not tea) every morning.
6. Bep beure ec'h ev-an kafe every morning ptcl drink-1sg coffee
I drink coffee every morning (not just this morning).
7. Ev-añ a r-an kafe bep beure. drink-inf ptcl do-1sg coffee every morning I drink coffee (not go to the gym) every morning.
(Sentences devised from conversational data)

There is considerable disagreement about whether or not one of these orders is more "neutral" than the others. Some (e.g. Press 1986:128) have argued that the order in 7 is unmarked and the most frequent, while others (Stump 1984;300, citing Varin 1979; also cf. Schapansky 1992) have claimed that the subject-initial order in 4 is increasingly prominent among Breton speakers, and therefore asserted that Breton should be called an SVO language. Whatever the case, Breton is usually (barring those who subscribe to the latter theory) characterized as AVSO or V2, or some arrangement with a topicalized element of ambiguous syntax before the verb (cf. Favereau 1997, J\&R 2006, Weisser 2019). In the other Celtic languages, the consensus is that verbs move from the VP to the TP (as they do in some English phrases), producing the verb-initial VSO word order (cf. Adger 2000). Most modern scholars accept V-to-T raising in Breton as well (cf. J\&R 2006, Weisser 2019, Stump 1984). They situate the topical phrase (written here as XP) in a functional projection (here written as FinP) that includes the TP.
8. Focus structure. (Weisser 2019:16)


While this word-order grammar may not seem relevant to prepositions, the ways that Breton can move phrases and the changes that result from different orders are very important for all forms of apparent agreement in Breton, as I discuss later in this section.

## II.3.1. Breton prepositions

The only full work dealing exclusively with Breton prepositions (and their syntax) is a 2002 Ph.D dissertation from the Sorbonne by Jean-Pierre Ledunois, entitled La Préposition conjuguée en breton 'The conjugated preposition in Breton.' It is an expansive work which makes use of semantics, syntax, morphology, and Conceptual Metaphor Theory to provide a full investigation of the Breton preposition. In the dissertation, Ledunois compares the Breton preposition to those of English, French, and Swedish, using this comparison to draw larger conclusions about prepositions in world languages. He does not make any reference to generative syntax (the framework I use) but his extensive treatment of prepositions and their functions and uses in Breton is applicable to any syntactic model and highly pertinent for this paper.

Ledunois's first concern when discussing agreement morphology is to establish that Breton prepositions are indeed prepositions (i.e. not pronouns or case endings), and his second is to show that they are properly called 'conjugated.' It is worth noting here that, unlike case endings found in closely related Indo-European languages, Breton prepositions can precede clauses and not just nouns:
9. ...re bounner evit ma c'hell-fe he leuskel war al linenn too heavy for that able-cond.3sg her leave on the line "Too heavy for him to be able to leave it on the line." (Envorennoù, 73)

As we will see, however, case ending behaviors are highly variable among languages and do not always have to attach only to nouns and nominal modifiers. Ledunois points out that Breton prepositions are usually accepted simply as prepositions, while only their conjugated forms provoke questions about whether they might be pronominal forms or case endings. For consistency, therefore, and because they otherwise seem (to Ledunois) like run-of-the-mill prepositions, Ledunois prefers to classify them as such (2002:78). He goes on to point to their ability to link a variety of objects together: nouns with nouns, verbs with nouns, verbs with clauses, adjectives with nouns, etc. As such, they belong to both the plan nominal 'nominal plane' and plan verbal 'verbal plane' (e.g. 2002:101).

Following this, he draws attention to the consonants that precede prepositional endings, calling them consonnes axiales 'axial consonants.' When prepositions take personal endings, a consonant or small syllable may sometimes appear between what looks like the stem and the ending. The table below shows the range of possible consonants in the first person singular and third person plural.
10. Axial consonants.

|  | a <br> 'of, | da <br> 'to' | dre <br> 'by', | $e$ <br> 'in', | e-giz <br> 'like', | evid <br> 'for', | gant <br> 'with' | ouzh <br> 'toward' | war <br> 'on' |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1 sg | ac'hanon | din | drezon | ennon | egiston | evidon | ganin | ouzhin | warnon |
| 3pl | anezho | dezho | drezo | enno | egisto | evito | ganto | outo | warno |

Ledunois divides prepositions into four broad categories based on the elements that intervene before the suffix. He analogizes these elements to the thematic vowels of the various tenses (e.g. imperfect $-\underline{e} n,-\underline{e} s,-\underline{e})$ and argues that they must have some morphological value. Here, he introduces the idea of two competing tenseurs 'tensors': the tenseur topologique 'topological tensor' and the tenseur économique 'economic tensor.' While the topological tensor introduces morphological material, the economic tensor deletes it. Arranging the prepositions on a scale based on the 'weight' of the economic tensor (how little there is between the preposition and the ending), he finds that $d a$ 'to' and $a$ 'of' are on opposite ends of the scale. This is taken as evidence of their heavily grammaticalized roles (2002:162).

As regards the endings themselves, Ledunois asserts (citing Favereau) that the first and second person endings of the -in class come from the Middle Breton subjunctive (which has developed into a synthetic future) and that those of the -on class come from the verb 'to be' itself (2002:163-164). In fact, the -on endings, as enumerated in the first table in the introduction, are exactly the same in the first and second persons as the present conjugation of the verb 'to be.' This arises in the context of widespread grammaticalization of the verb bout in a variety of constructions, Ledunois points out. The third-person endings, which are the same in both paradigms, are not, however, found on verbs. This apparently results from the fact that the third person is marked by a null ending in the verbs, and that since prepositions are part of both
nominal and verbal 'planes,' they are able to search for endings from the real pronouns in the 'nominal plane' (2002:165).

It is at this point that he embarks on a categorization of pronouns (under which category he includes pronominal endings) into two groups: ontiques 'ontic,' i.e. denoting an entity; and existentiels 'existential' (2002:181). The existential pronouns include all of the verbal and prepositional endings. Since 3rd person pronouns are literally pro-nouns, replacing otherwise named entities, while 1st and 2nd persons are used to point to interlocutors in a discourse, 3rd-person pronouns are 'naturally ontic,' and thus it makes sense why they should be more nominal in the transitionary domain of prepositions (2002:184). His thinking in this case is parallel in some ways to generative understandings of pro-form phenomena and person, specifically that third-person pronouns are true pro-forms and have a null person feature, while first and second-person pronouns have person features but are not exactly pro-forms in the same way.

## II.3.2. Breton Agreement Phenomena

The mechanisms of Agree in Breton have been the subject of a number of papers in the field of generative syntax. Most of these papers make reference to prepositions, although they are all principally concerned with verbs. As the two systems of potential agreement morphology in Breton, prepositions and verbs are highly intertwined, and the existing material addressing Breton verbal endings from a generative perspective serves as important background for any discussion of prepositional syntax.

Any work on Breton agreement must start with the Complementarity Principle, indicated in 11:

## 11. Complementarity Principle:

Within a clause, overt argument noun phrases never appear with concording personal affixes.
(Stump 1984)

This effect can be observed in sentences 12-15. In 12, the verb is marked with the second-person inflection $-e z$, but the actual pronoun is left out. The sentence is fairly neutral, with slight
emphasis on the phrase bep beure 'every morning.' In 13, the appearance of the stressed subject pronoun te results in the disappearance of the inflection. A similar effect is observed in 14 and 15 , but now the overt subject is a noun phrase and is not in the sentence-initial position.

# 12. Bep beure ec'h evez kafe. every morning ptcl drink-2sg coffee <br> "Every morning you drink coffee." 

13. Te a ev kafe bep beure.
you ptcl drink coffee every morning
"Every morning you drink coffee."
14. Kafe a evont bep beure. coffee ptcl drink-3pl every morning "They drink coffee every morning."

# 15. Kafe a ev ar bugale bep beure. coffee ptcl drink the children every morning "The children drink coffee every morning." 

(Sentences devised from conversational data)

Much of the work on Breton syntactic agreement has been devoted to explaining, critiquing, or defending this principle. After all, this is not a conventional example of pro-drop, where a pronoun or DP can be omitted under certain circumstances. Here the pronoun that functions as the source of the agreement must be dropped. In the case of prepositions, what this means is that a conjugated prepositional form like ganti 'with her' can never occur with a name or other full DP: *ganti Naig 'with-her Naig,' *ganti ar plac'h 'with the girl.'

This principle was first applied to Breton by Gregory Stump in 1984, although some previous works had attempted to explain its effects without naming it. In his paper Agreement vs. Incorporation in Breton, Stump proposes two possible explanations of Complementarity, the first
one based on Agree and the second on incorporation. Before addressing these interpretations, however, Stump defends the accuracy of the Complementarity Principle by enumerating some alleged counterexamples: negative clauses, enclitic pronouns, and prepositional inflections (in certain circumstances). The latter two subjects both involve the behaviors of prepositional endings. In each of these alleged counterexamples, a pronoun appears to exist in the same phrase as its corresponding ending:

## 16. Negation.

Ar vugale ne lennont ket levrioù.
the boys neg read-3pl.impf neg books
"The children do not read books."

## 17. 'Echoic' pronouns.

Levrioù a lenn-an-me.
books ptcl read-1sg=1sg
"I read books."
18. 'Conjugated' prepositions.

Per ez eus marv-et ur vuoc'h d-ezhañ.
peter ptcl is die-pcpl a cow to-3ms
"A cow died on Peter."
(Examples from Stump 1984:293, 298, 304)

The negatives, as in 16 , are not violations of Complementarity because the overt subject actually lies outside the main clause (Stump 1984:296). Similar logic applies to the 18, where the explicit object of preposition (Per) is also apparently pre-sentential (1984:298). The enclitic pronouns are a separate issue, and a very important one. They are added to inflected verb forms to emphasize the subject where there is already a stressed element occupying the topic slot, like levrioù 'books.' They are completely homologous to the independent pronouns (in Leoneg), and can be attached to prepositions as well as verbs, which I return to in the final analysis. Stump
demonstrates that they cannot be considered normal nominal subjects, as their distribution is markedly different - the fact that they move into the verbal complex itself makes them more like the clitics or affixes which appear inside the negation in Breton (1984:305). In 20, it can be seen that they cohere very closely to the verb, unmoved by the appearance of other functional words associated with the verb phrase:
19. Negated sentence with overt subject.

Levrioù ne lenn-ont ket ar vugale.
books neg read-3pl neg the children
"The children do not read books."
20. Negated sentence with verbal subject and 'echoic' clitic.

Levrioù ne lenn-ont -int ket.
books neg read-3pl=3pl neg
"They do not read books."
21. Position of nominal subject.
*Levrioù ne lenn-ont ar vugale ket. books neg read-3pl the children neg
"The children do not read books."
(Stump 1984:299)

Whereas subjects like ar vugale 'the children' must appear after the negative marker ket or before the initial negative marker ne, echoic pronouns always go between the verb and ket.

Stump proceeds to introduce his competing interpretations of the syntactic methods behind the Complementarity Principle:

## 22. Agreement Analysis:

(a) A personal affix encoding some argument position $p$ is the surface realization of the element AGR governing position $p$. (b) The governee of AGR must be null.

## 23. Incorporation Analysis:

A personal affix encoding some argument position $p$ is the surface realization of an independent pronominal element occupying position $p$. A rule in the grammar converts independent pronouns into affixes.
(Paraphrased from Stump 1984:305)

The element Stump calls AGR is roughly the same as the Agree operation I outlined at the start of this section. The Agreement Analysis, therefore, consists of a more or less run-of-the-mill pro-drop rule followed by a Breton-specific constraint, underlined and listed as (b). The Incorporation Analysis does not involve Agree, and holds that the endings on verbs and prepositions are the result of an operation turning pronouns into affixes. As Stump notes, the Agreement Analysis is especially attractive because it matches well with Agreement found in other languages (1984:307).

Mélanie Jouitteau and Milan Rezac (J\&R) pick up from here with their 2006 paper Deriving the Complementarity Effect, which is primarily focused on the Breton verb system. Given that the rest of the Agreement Analysis is consistent with other agreement models, J\&R begin by reformatting assertion $b$ of the Agreement Analysis in more current syntactic terms as the $\varphi$-Phon Constraint:

## 24. $\varphi$-Phon Constraint

$\varphi$-Agree is limited to phonologically empty goals.
(J\&R 2006:3)

Instead of adopting this constraint, however, J\&R claim that its apparent existence actually originates from the inability of T's $\varphi$-probe to find a pronoun in certain cases. The $\varphi$-probe, as discussed earlier, is the unvalued feature on T that searches for some object to value it. Certain factors can block the $\varphi$-probe from finding a pronoun, such as a complex DP: in the sentence 'the man next to you is wearing pink,' the auxiliary 'to be' does not find 'you,' because the pronoun is contained in something else. If it did not work like this, we could get something like 'the man
next to you are wearing pink,' which is ungrammatical in English. J\&R bring this idea to the fore for the Breton verb:

## 25. Locality Effect:

When there is an intervener with $\varphi$-interpretable features between $T$ and the subject, T takes on those features.

They claim that the "freezing" of Breton verbal agreement in the 3rd person when an overt subject element is present (such as in sentences 13 and 15) is due to such an intervention. The intervener in this case is the "nominal clausal functional projection containing the subject" (J\&R 2006:3). J\&R draw on a large amount of evidence and previous work to show that the $v \mathrm{P}$ in Breton has nominal properties (notated by them as a $[+D]$ feature). Since the $v \mathrm{P}$ contains the subject, T comes up against the $\nu \mathrm{P}$ first when it looks for something to agree with, and receives the 3 sg features it is looking for, whatever the real subject's features may be.
29. Intervention by the FP in $\varphi$-Agree (from J\&R 2006:9)


On the other hand, in keeping with the Incorporation Analysis, they hold that pro (phonologically null) is able to circumvent the intervention by being cliticized to $\mathrm{T}^{0}$ itself-satisfying T's $\varphi$-probe at the same time and producing agreement morphology (J\&R 2006:7).

J\&R then highlight three notable contrasts between the verbal and prepositional systems of agreement, largely for the purpose of proving that the verb does indeed have a $\varphi$-probe: firstly, prepositions have a base form that is used when associated with non-pronominals, that serves as
the stem for its other forms (the third-person verb form may appear like a stem, but certain verbs like bout 'to be' (third person eo) and gouzout 'to know' (third person oar) demonstrate otherwise); secondly, prepositions agree in gender with their objects, while verbs do not; and thirdly, the pronominal elements in prepositions seem to be able to coordinate with DPs, unlike the $\varphi$-feature affixes on T (this issue will be revisited later in detail). For these reasons, J\&R assert that the prepositions themselves have no $\varphi$-probe and that their "agreement" morphology is in fact a kind of post-syntactic prosody-sensitive spellout (2006:15, covered in detail at the end of this section).

Philip Weisser's 2019 paper A Remove-Based Theory of the Complementarity Effect in Breton responds to J\&R (2006) directly, offering a new perspective on the Complementarity Principle by proposing a syntactic operation known as Remove as the ultimate cause for the disappearance of pronouns when inflections are present. Weisser goes on to assert that T does not have a $\varphi$-probe in Breton, except in the particular case of the verb kaout 'to have' (his arguments about kaout are out of the scope of this paper, but important; cf. Weisser 2019:24). Instead, verbs acquire $\varphi$-features through Remove. Remove, an operation where a given head removes a phrase that it c-commands, was devised precisely to deal with situations where an invisible element has effects in the grammar (Weisser 2019:2). Weisser stresses that if an object is Removed by the head of which it is the complement or specifier, anything that has been Merged with that object further down is then Merged with the removing head, as shown in 30.1 and 30.2:
30. Remove (from Weisser 2019:15).
a.

b.


He uses this to argue that there is a way for F (the unidentified functional projection above the $v \mathrm{P}$, as encountered in $\mathrm{J} \& \mathrm{R}$ ) to gain the $\varphi$-features of a pronoun directly. This works if a pronoun's $\varphi$-features are their own miniscule structure that is Merged with some pronominal D (Dpro) to
form the pronoun, like the structure in 31(1) below. Building off of this assumption, if the Dpro is Removed by F, then $\varphi$, which is Merged with Dpro, moves to being merged with F:
31. Possible Remove operation in Breton (Weisser 2019:16-17):
a. pronoun
b. Move
c. Remove



Pronouns that remain (such as pre-verbal pronouns), presumably have some feature on their Dpro head (such as [topic]) that prevents deletion (2019:18).

Despite his critiques, Weisser agrees with J\&R on the analysis of prepositional agreement as a post-syntactic operation. He is motivated in part by the resemblance of 2nd- and 3rd-person prepositional endings to their corresponding pronouns (as in Table 1), but most of all by the ability of prepositional endings to coordinate with DPs:
32. Coordination of prepositional "endings".
etrez-i hag ar gorrien
between-3fs and the dwarves
"between her and the dwarves."
(Weisser 2019:20)

This kind of apparent affix-DP conjunction is highly unusual and both empirically and theoretically impossible for verbal affixes in Breton (J\&R 2006:15). This strongly suggests to Weisser that the 'suffix' on the preposition is in fact to be understood as a phonologically bound pronoun (Weisser 2019:20).
$J \& R$ and Weisser converge on the idea that conjugated prepositions in Breton are really the results of prosody-sensitive spellout. In this, they both reference a 2003 article by Peter

Ackema and Ad Neeleman entitled Context-Sensitive Spellout, which formulates a post-syntax theory accounting for the conjugated prepositions in Irish. Spellout and the post-syntax are important components of the Distributed Morphology framework of contemporary linguistics. In brief, these are the processes by which the underlying syntactic structures of words and sentences get transformed into speech. An example of such a process that is widely accepted is Linearization (cf. Ackema \& Neeleman 2003:683), which is how the complex nested syntax trees get turned into linear strings of words.

Certain mechanisms in the post-syntax are sometimes thought to have the ability to access both the underlying structure and the phonology. Ackema and Neeleman build off of this to create an operation that derives surface forms through "phonological constituency." They begin by noting that some phonological-prosodic "constituents" differ from syntactic constituents, as shown in 33 . Here, the rhythm of English speech treats 'a big' as a unit, which it is clearly not (grammatically):
33. Syntax: [ ${ }_{\mathrm{DP}} \mathrm{a}$ [ ${ }_{\mathrm{NP}}\left[{ }_{\mathrm{AP}} \mathrm{big}\right]$ house $\left.]\right]$

Phonology: [ ${ }_{\Phi}\left[\omega\right.$ a big] [ ${ }_{\omega}$ house $\left.]\right]$
(Ackema \& Neeleman 2003:682)

In fact, the break-up of the sentence into such a prosodic structure is ordered before the final phonological spell-out of the individual words, according to the schema outlined in this paper. Therefore, Ackema and Neeleman propose that a spell-out rule with the ability to "see" the phonology might take into account the phonological constituents and produce something that appears like an affix (2003:689).

For some accessible proof of this phenomenon, they draw attention to the English word 'wanna/want to.' In most cases, the 'to' part of this is actually grammatically linked to the next element in the phrase, despite the fact that it often appears in surface speech as the end of a single word 'wanna' (2003:714). A special spell-out rule for 'wanna' seems especially necessary since 'to' does not do this with certain other preceding verbs (e.g. 'wish,' 'hope,' 'dream'). In the case of Breton prepositions, this would mean that the underlying structure for something like 'with you' is [gant [PN2sg]], with a spell-out rule $<$ gant PN2sg> $\rightarrow$ /ganez/ motivated by the fact that the two words form a prosodic unit. This rule is generalized in (34):

## 34. Prosodic morphology rule.

Any pronoun that forms a prosodic unit with a preceding preposition is realized as a suffix in the final Spell-out.

This is not necessarily a single rule but a summation of smaller rules like the one above, with a corresponding rule for each preposition: e.g. <war PN1sg> $\rightarrow$ /warnon/, etc. This is the sort of rule, or assemblage of rules, that J\&R and Weisser suggest explain Breton prepositional endings (J\&R 2006:15, Weisser 2019:21). Ackema and Neeleman's paper is particularly relevant to Breton because one of its sections aims to explain the more limited Complementarity Effect found in Irish verbs. They assume that the same mechanism of prosody-sensitive spell-out developed for the subjects of verbs can explain the Complementarity Effect found in Irish prepositions.

Another text cited by J\&R and Weisser in reference to prosody-sensitive spell-out in Celtic languages is a 2003 paper by David Adger, although this does not in fact discuss prosody-sensitive spell-out, but rather spell-out conditioned by linear adjacency and "morphological interpretability" (2003:79). Critically, Adger situates the origin of apparent personal agreement in Irish and Scottish Gaelic at the interface between syntax and post-syntax, not the interface of post-syntax and phonology, which is the focus of Ackema and Neeleman (2003). In this paper Adger makes reference to general theories about VSO structure, especially the works of Edit Doron, who mainly studied the effects of VSO in Hebrew, and James McCloskey, who has been a leading figure in Irish syntax for decades, and who has argued for null pro as the trigger of morphological agreement in Irish (e.g. McCloskey and Hale 1983).

More recent works on Celtic syntax such as Brennan (2009) and Diertani $(2008,2011)$ have continued in the same vein as Adger, with Diertani drawing attention to the unexpected development of a certain Old Irish verbal ending into a pronoun (muid 'we', Diertani 2011;174) as an example of the blurred line between pronoun and affix in Celtic languages. Brennan (2009) proposes that verbal subject markers in Irish are tense-marked pronouns that undergo syntactic and morphological processes to produce affixal realizations, and suggests that prepositional objects work similarly (Brennan 2009:21). Given that a post-syntactic explanation for person morphology has gained so much traction among linguists of the Goidelic languages, it is
surprising that there is not more literature on whether or not this could apply to the Brythonic branch (even works like Ackema and Neeleman 2003, for instance, mention Welsh only as an afterthought). By that same token, it is not surprising that J\&R and Weisser propose a post-syntactic explanation for prepositions, but significant that they argue against this in the case of verbs. While their construction of the null pro is closely analogous to McCloskey's, they diverge from him in arguing that prepositions must be derived in a different way (McCloskey and Hale 1983).

## III. Challenges to Existing Theories

In this section, I will consider the major challenges to the theories about prepositional syntax and post-syntax put forward by the existing literature. I begin by reviewing the arguments against a syntactic analysis of prepositional agreement. I proceed to introduce a Léon-specific paradigm of gant and its history, which I supplement by presenting the characteristics of preposition use in Breton with a particular focus on gant. I conclude by enumerating the syntactic challenges to claims made in previous works, bolstered by data from a consultant and a small corpus of literary texts and folklore materials written in Léon.

## III.1. Phonological Issues

Despite disagreements over what might be possible in the syntax, as discussed later, J\&R and Weisser agree on the principle that prepositional forms are not made in the syntax, but in the morphophonology. On the surface level, J\&R point to the similarities between endings such as etrezil 'between her' and etrezañ 'between him' and the pronouns $h i$ 'she' and eñ 'he'. Weisser goes further, citing such similarities as strong evidence that prepositional endings are phonologically or prosodically—not syntactically—attached. The table below is adapted from Weisser (2019:19) and represents a comparison between the endings of the preposition gant 'with' and the pronoun system:
35. Table from Weisser 2019:19.

|  | Prepositional (gant) Agr. | Pronoun |
| :--- | :--- | :--- |
| 1 sg | -in | me |
| 2 sg | -it | te |


| $3 \mathrm{~ms}, 3 \mathrm{fs}$ | - tañ, -ti | eñ, hi |
| :--- | :--- | :--- |
| 1 pl | - omp | ni |
| 2 pl | -c h | c'hwi |
| 3 pl | $-(\mathrm{n})$ to | int |

Weisser acknowledges the same third-person singular correspondences as J\&R (ganti resembles gant hi), and goes further to point out that even the /n/ in ganto 'with them' may be from an earlier suffix that looked very much like the pronoun int 'they' (Weisser 2019:19). Notably, however, this $/ \mathrm{n} /$ does not show up in any other preposition, and even the /t/ cannot be considered a consistent part of prepositional endings, as we will see. Weisser admits that the first person endings seem to bear little resemblance to their corresponding pronouns, but contends that the 2nd- and 3rd-person endings provide enough resemblance to justify the idea that they are clitics.

As mentioned in my introduction, however, this is not the only extant paradigm of gant, a very versatile and important preposition. In Leoneg, the northwestern dialect that is the focus of this paper, the paradigm does not offer the same easy comparison:
36. Leoneg gant and the pronouns.

|  | gant | pronouns |
| :--- | :--- | :--- |
| 1 sg | ganen/ganin | me |
| 2 sg | ganez | te |
| $3 \mathrm{~ms}, 3 \mathrm{fs}$ | gantañ, ganti | eñ, hi |
| 1 pl | ganeomp | ni |
| 2 pl | ganeoc' $h$ | c'hwi |
| 3 pl | ganto | int |
| I. | ganeor | - |

(Table by me; data from consultants, ALBB (1927) and Favereau 1997)

Clearly, however, the Leoneg paradigm of gant does not offer the same easy comparison. What little similarity there is between -it and -te does not hold between te and -ez. Since the /nt/ of ganto is part of the stem, this leaves only the third-person singular and second-person plural forms with any real resemblance to the pronouns. If Weisser is right that a clitic should bear some surface similarity to the independent form, a cliticizing explanation seems unlikely.

This is especially true because Weisser and J\&R have argued against such an explanation for the verbs. The change from ganit to ganez brings the paradigm of gant in the first and second persons extremely close to that of the verb. The verb kanañ 'to sing,' for instance, would be conjugated as kanez in the 2nd person singular and kanen in the 1st person singular imperfect, forms almost identical to gant in these persons. It seems very unlikely for this kind of phonologically-conditioned pronoun suppletion to exhibit by coincidence an almost complete overlap with the endings of a syntactically inflected verb. Despite being very surface-level evidence, it was this form and this conundrum that inspired the current paper. The next three subsections give an overview of the paradigms of gant, how it obtained its endings, and what sorts of syntactic roles it fills, before I return to J\&R's other arguments in section III.2.

## III.1.1. Paradigms of gant

It should be stressed at this point that no other preposition in Leoneg Breton takes the -en, -es endings in the 1 st and 2 nd persons. In the general literature, gant is held to form a morphological class with the other prepositions that form their endings in -in (cf. Ledunois 2002:69; Favereau 1997:408, Press 1986:119). This includes $d a$ and another preposition ouzh, which itself is very common. Their conjugations in Leoneg and Standard Breton are displayed here, with gant for comparison:
37. Prepositions with -in.

|  | da 'to' | ouzh 'towards' | gant 'with' |
| :--- | :--- | :--- | :--- |
| 1 sg | din | ouzhin | ganen/ganin |
| 2 sg | dit | ouzhit | ganez |
| $3 \mathrm{~ms}, 3 \mathrm{fs}$ | dezhañ, dezhi | outañ, outi | gantañ, ganti |
| 1 pl | dimp | ouzhimp | ganeomp |
| 2 pl | deoc'h | ouzhoc'h | ganeoc'h |
| 3 pl | dezho | outo | ganto |

(Table by me; data from Ledunois 2002 and Favereau 1997)

As can be seen in 37 , even in the most regular forms, there is a certain amount of variation. This is not found in the -on class-for instance, all 2 pl endings in the -on class end in -oc' $h$. This makes it hard to settle on an exact paradigm for the -in prepositions. Nevertheless, the forms of
gant in -en, -ez are clearly outliers. In the entirety of the secondary literature and primary source data I consulted, never once did I find $d a$ or ouzh deviate from -in, -it endings in the 1st- and 2nd-person singular (in Léon).

## III.1.2. History of gant forms

It is worth asking at this point what the phonological history of this second-person ending is, since its phonological status is of particular interest to this paper. Prepositional endings are a common feature of the modern Celtic languages, as stated above, and date back to at least the Early Middle Ages (Matasović 2007:101-107). However, they are not shared whatsoever with nearly any other Indo-European language. ${ }^{1}$ Therefore, at a certain point in the past, these endings must have appeared by some mechanism. This mechanism, unsurprisingly, turns out to be the affixing of reduced pronouns to prepositions in the earliest stage of Breton (Hemon 1975:89).

As these pronouns melded more and more closely with their hosting prepositions, the Celtic languages were subject to other large changes in their pronominal/verbal systems that led them to go in different directions. In Gaelic varieties, for instance, there was a dramatic reduction in the morphology of the verb, accompanied by some verbal endings becoming detached from their stems and transforming into pronouns, as mentioned in the Background section (cf. Diertani 2008). As I note later, the dramatically reduced verbal system of the Gaelic varieties complicates their use as a framework for understanding Breton syntax.

In Old Breton, the oldest attested stage of the Breton language, the endings eet and -ot were attached to prepositions for the second person (Hemon 1975:105). In contrast, verbs were suffixed with -ith to indicate the second person singular, which became -ez in Middle Breton, with the spelling representing /e日/ or /eð/ in that period. Roparz Hemon (1975:182) notes that it is strange that this ending should end up as $-e z$ across modern Breton varieties (as it does), since word-final $/ \theta \sim \delta /$ was generally deleted in the dialect areas of Trégor and evolved into $/ \mathrm{x} /$ in Vannes. We would therefore expect to find $e / \mathrm{e} /$ and $e z h / \mathrm{ex} /$ as variations, which are as yet unattested.

It seems hardly a stretch to point out the similarities between the endings -et, -ith, and -ez $/ \mathrm{e} \theta /$, especially at a time in Breton history (the Old and Middle Breton periods) where the lenition of /t/ to / $\theta /$ was commonplace, including as a morphological mutation. Furthermore, if

[^0]orthography is an indicator, there was a high degree of variability between /i/ and /e/ in words and endings in Middle Breton. All of this is to say that analogy may not be necessary or even favorable as an explanation for the convergence between the 2nd-person endings of gant and the verbs. Alternatively, this change in ending could be a reflex of the still-productive leniting mutation of $t$ to $z$ (tad "father," da zad "your father") which results from the older historic $/ \mathrm{t} \rightarrow \theta$ / mutation.

But why only gant? Whether medieval or modern sound changes, it would be very strange for them to only apply to one preposition and its endings. However, it is not unheard of for sound or other historical changes to apply unevenly across a language. For instance, the word "wife" retains its full phonological form when used in compounds such as "fishwife," but was dramatically reduced in the word "woman" (originally wifman). This tends to occur with words that are especially common in a language (like "woman") or especially prone to being used in a lenition-friendly context (Bybee 2015:43). And it is true, as noted previously, that gant is a very common preposition. In my corpus, gant is more than twice as common as the next-mostcommon preposition. Nevertheless, both $a$ and $d a$ remain much more frequent-and $d a$ retains the completely expected morphology for a preposition of the -in class. It seems unlikely, then, that gant has been subject to special phonological reduction. I will not rule out the possibility, though, since there may have been a time in the Old and Middle Breton stages of the language where gant was much more frequent even than it is today, at which point such a shift may have happened. But going forward I will operate on the assumption that the change is due to analogy rather than phonology, as Hemon (Hemon 1975:89) and Fleuriot (Fleuriot 1962:556) assert.

## III.1.3. Uses of gant

Originally, gant was used mainly in the comitative sense; in English, this is also one of the primary meanings of 'with' as in 'I went with Naig to the party.' Over the course of Breton's history, however, gant has taken on a wide variety of other roles and meanings. These vary greatly according to the dialect, and it is important to clarify that the uses of gant examined in this section will be those found in Leoneg and Standard Breton. The most notable non-comitative uses of gant for the purposes of this paper are: as a marker of possession in conjunction with bout 'to be'; as an attributive marker of possession; as an agentive marker in passive constructions; and as an indicator of some thematic role in impersonal expressions.

When indicating possession, gant appears in one of two ways: either it follows a definite noun and is more or less in the position of an attributive adjective (37), or it is connected to a noun via the verb bout "to be" to form a verbal attributive construction (38):
37. Possessive (modifier) gant.
ar stal ganeomp the shop with-1pl
"... our shop."
38. Verbal gant.
ur zac'h soudard a oa c'hoazh ganen
a bag soldier ptcl be.3sg.impf still with-1sg
"A soldier bag which was still with me/which I still had."
(Envorennoù, 32 \& 8)

The use of gant with bout as in 38 is usually described as indicating immediate (but alienable), personal possession, a very transparent extension of its comitative meaning. The usage in 37 is less clearly linked to the comitative, since the "shop" in question can hardly be accompanying the speaker in the same way that a bag or a person might. The roles of possessor with bout and attributive possessor are shared with $d a$ 'to,' which indicates a more permanent state of affairs. The following phrases would both be appropriate ways of saying 'my mother,' according to my consultant:
39. ma vamm
my mother
"my mother."
40. ar vamm din-me the mother $\mathbf{t o - 1} \mathbf{s g}=\mathbf{1} \mathbf{s g}$
"my mother."

In addition to the possessive pronoun in 39, the preposition $a$ 'of' can also be used to indicate possession, although this is more rare and circumscribed.

Breton makes extensive use of the passive, and in these situations, it is gant that takes on the role of identifying the agent:
41. Ur wech treuz-et gan-ez ar bont ...
a time cross-pcpl with-2sg the bridge
"As soon as you've crossed the bridge ..."

In 41, "you" are the agent of "crossing," and this is expressed with gant. The inflected preposition has undergone an interesting kind of semantic bleaching: instead of indicating that "you" are in a relationship of "with" to a noun, gant brings the person represented by its inflection into a relationship of agency with a passive participle. Note also that the construction treuzet ganez has no actual verb in it: treuzet is a participle. Furthermore, the slot which is usually occupied by the verb is taken up in this case by a prepositional phrase (cf. Hewitt 2002).

Perhaps related to its capacity as an agentive marker, gant can also serve to indicate thematic roles in impersonal constructions other than passives: especially in the Experiencer role, as shown in 42 and 43 .
42. ... e sav c'hoant gan-en goulenn digant-añ
$\ldots$ ptcl arise want with-1sg ask from-3ms
"I want to ask him..."
43. ar pezh a oa c'hoarvez-et gan-en.
the thing ptcl be.impf.3sg happen-pcpl with-1sg
"The thing which happened to me."

In the expression in 42 , the arising of desire in the main character is expressed impersonally, connected to its Experiencer by means of a prepositional, not a verbal, ending. This was by no means the only occurrence of such a construction in the corpus I consulted, and a similar sense can even be found with English 'with': we can say 'how are things with you?' Sentence 43
contains a very frequently-occurring construction that links the verb c'hoarvezañ 'to happen' to its Experiencer by means of gant, similarly to how English uses 'to' to introduce the Experiencer of 'happen.' Furthermore, non-Agent thematic roles are by no means limited to being expressed by gant, as other prepositions may take its place. In 44, for instance, ouzh introduces the theme of sellet 'to look', similar to English 'to look at' but with the semantics of 'watch':
44. ... sellet ouzh ar skinwel
... watch at the television
"watch the television."

As demonstrated, gant can fulfill a wide variety of different semantic-syntactic roles. It is undoubtedly one of the most commonly used prepositions, behind only $d a$ 'to' and just before $a$ 'of' (Ledunois 2002:162). These three also have the most extended range of semantic and syntactic roles of all Breton prepositions, and all appear in a number of fixed idiomatic expressions. There is nothing in all of this, however, that suggests gant is in any way more "verbal," especially not more so than $d a$, which can also express possession and thematic roles.

## III.2. Plausibility of Prosody

Returning to the main subject, it is clear that the suggestive phonological ressemblances referenced by J\&R and Weisser are not as wide-ranging as they insinuate. Moreover, there are a variety of stem changes, especially in the third person, that are left out of the picture by just addressing gant. The range of these were already shown in the subsection on Ledunois's "axial consonants," but I provide a more full picture of certain prepositions in the following table, with the aim of showing the stem variation that occurs throughout certain paradigms:
45. Stem comparison table.

|  | a 'of' | da 'to' | war 'on' | rak 'in front of' |
| :--- | :--- | :--- | :--- | :--- |
| 1sg | ac'hanon | din | warnon | razon |
| 2sg | ac'hanout | dit | warnout | razout |
| 3 ms, 3fs | anezhañ/anezhi | dezhañ/dezhi | warnezhañ/warnezhi | razañ/razi |
| 1 pl | ac'hanomp | dimp | warnomp | razomp |
| 2 pl | ac'hanoc'h | deoc'h | warnoc'h | razoc'h |


| 3 pl | anezho | dezho | warnezho | razo |
| :--- | :--- | :--- | :--- | :--- |

Undoubtedly, these prepositions do have a base form for pairing with overt DPs (found in the first row) that differs from their third-person forms. But this is not the same as the stem for the "inflected" forms. In gant, the stem for first- and second-person forms seems to be gan-. If one assumed a purely phonological approach, it could be said that the /t/ is elided for some phonological reason, but what should the stem be for $a$, or war? It seems more implausible to suggest that $a$ and -on should yield ac'hanon /a'xã:nõn/, especially since the stress of the word falls on the mysterious middle syllable. Conversely, one could claim that war is simply an expression of underlying warn, but Breton words have no prohibitions on $/ \mathrm{rn} /$ as a final consonant cluster (e.g. dorn, skorn, daouarn, houarn). Spell-out rules solve the problem of pure phonology by introducing allomorphs conditioned by prosodic structure, but not themselves derived from phonology.

This raises the question, however, of whether there is any independent prosodic-phonological motivation for this kind of rule. Aside from being phonological constituents, there is actually little prosodic similarity between different Breton prepositions. Some are two-syllable words when inflected, and are accented on the second syllable: ganez [ga'nes]; others become two syllables with the accent on the penult: warnout ['warnut]; and still others become three syllables with the accent on the penult: ac'hanout [a'xã:nut]. Furthermore, we might ask why the prepositions in the following examples do not turn into suffixed forms:
46. Coordinated pronouns.

Mavi-jemp, te ha me, en tu-se.
if be-irr. 1 pl 2 sg and 1sg in-the place-that
"If we were in that place, you and I."
47. Coordinated noun and pronoun.

Mat e yelo an traoù etre Per ha me. good ptcl go-fut the things between Peter and me "Things will go well between Peter and me."
(Sentences from consultant)

In 46 and 47, we have evidence of the prosodic units Per ha me and te ha me. The word ha(g) 'and' is not a preposition, but if the process above is motivated purely by the prosodic apposition of a pronoun and a grammatical word, it seems fair to ask why ha me does not surface as hagin, hagen, hagon, or even hin. This would require broadening the pattern beyond prepositions, but in languages that do have clitics (relatively free but phonologically dependent elements), the clitics usually do not show this kind of discrimination (cf. Zwicky 1977).

## III.3. Testing Coordination

Do all of these difficulties with phonology and prosody-sensitive spell-out operations mean that prepositions really do show agreement? As we have seen, J\&R present three arguments to justify their position that prepositional endings are pronouns adjoined to prepositions in the phonology, not in the syntax (2006:13). Weisser accepts their argument that centers around coordination, but rejects their points about bare forms and gender inflection on the 3 sg forms. The first argument he considers invalid because he does believe that the third-person verb form is the same as the stem, aside from some corner cases, and the second argument he considers unnecessary because the paradigms of verbs and prepositions need not look the same (2019:22).

While they disagree elsewhere, both Weisser and J\&R agree that the coordination of endings with overt DPs is strong evidence that such endings are not formed in the syntax, where they should be inaccessible to coordination (since they would simply be the spell-out of features on T itself). Certainly, endings formed by Agree should not coordinate, and an alternative explanation would be justified if they were found to exhibit such behavior. Weisser and J\&R present example (32), repeated here as (47):
47. Coordination of prepositional "endings".
etrez-i hag ar gorrien between-3fs and the dwarves
"between her and the dwarves."
(Weisser 2019:20)

This example is very suggestive, but the surface utterance does not always reveal the structures that underlie it. For instance, there could be a phonologically null pronoun that acts as the goal for Agree and coordinates with the following overt DP. This would mean that the preposition was agreeing with only the first part of the conjunct phrase. Probes that only agree with the first element in a conjunct phrase do exist cross-linguistically, and this phenomenon is called Left Conjunct Agreement. J\&R refute this as a property of Breton by pointing to the verbal system, where personal endings cannot be coordinated with DPs:

## 48. Verb with third-person ending and nominal subject. <br> Dec'h e erru-as Nolwenn. <br> yesterday ptcl arrive-pret Nolwenn <br> "Nolwenn arrived yesterday."

49. Verb with third person ending and coordinated nominal subject.
*Dec'h e erru-as hag ar gorrien. yesterday ptcl arrive-pret and the dwarves.
"She and the dwarves arrived yesterday."
(J\&R 2006:15)

If the verb in 49 agreed with only the invisible pronoun under Left Conjunct Agreement, this should be acceptable. As it is not, and since J\&R argue extensively for agreement morphology in the verbs, something different must be happening with the preposition in 47-unless we were to posit that the verb and preposition would both show agreement but exhibit different agreement rules with conjuncts, which seems highly unlikely.

J\&R and Weisser, in their investigations of pronouns, confine themselves largely to discussing third-person conjugated prepositions. However, as seen in table (2) and subsequently, the surface morphology seems to treat the third-person differently from the others. To flesh out the analysis with information for other persons, I examined a corpus of 2 novels and 2 folklore collections from Léon. The novels are Tammou eñvorennou euz eun amzer griz and Yann-Ber Kalloh (both published 1994) by Yves Miossec, and the collections are Marvailhoù ar Vretoned
e-tal an tan collected by J. M. Perrot and Koñchennoù eus Bro ar Ster Aon collected by Yann ar Floc'h. Since this is a relatively small amount of data and contains a relatively specific register of language use, I also met with a native-speaker consultant, to whom I presented sentences for acceptability judgments. He told me how they sounded and, when needed, devised new and more acceptable paraphrases. The Breton examples in the rest of this paper, unless indicated otherwise, are from these sessions.

Permutations of sentence 47 in other persons are perfectly acceptable and attested, even one with a coordinated independent pronoun:
50. Mat e yelo an traoù etre Per ha me.
good ptcl go.fut the things between Peter and me
"Things will go well between Peter and me."
(Envorennoù)
51. Mat e yelo an traoù etrez-on ha Per. good ptcl go.fut the things between-1sg and Peter "Things will go well between Peter and me." (From consultant session)

While these sentences show that this kind of coordination works for different persons, it does not show that it works for other prepositions. And there is reason to think that it might not: the pronoun used in 47 and 50-51 is etre 'between.' As in English, etre requires at least two objects, and it is the only simple preposition in Breton that does so (others with similar requirements, like e-touez 'among,' are complex prepositions).

If an ending could be coordinated with a pronoun or DP, as in 52 , or if a coordinated pair of pronouns could take the place of an ending, as in 53 , we would have very strong evidence of cliticization, likely of the prosody-sensitive kind.
52. Coordination of ending and pronoun.

> *N' eo ket mat an traoù gan-it ha me. neg be.3sg neg good the things with-2sg and me. "Things aren't good with you and me."
53. Coordination of pronouns with no ending.

* N ' eo ket mat an traoù gant te ha me. neg be.3sg neg good the things with you and me.
"Things aren't good with you and me."

Each of these sentences, however, is completely unacceptable, especially 52 . As seen in 52 and 53, the extremely common prepositions gant and $d a$ do not at all behave towards coordination in the way that we would expect based on etre. This does not negate the serious challenge to agreement posed by sentences 47,50 , and 51 , but is important data and demonstrates that a single inflected preposition cannot be used to represent the generality.

The unacceptability of sentences 52 and 53 , both of which would provide strong evidence for the pronouns being prosody-sensitive clitics, leaves open the possibility that these endings are, in fact, governed by Agree. Languages without Left-Conjunct Agree allow probes to agree with the aggregate features of a coordinated phrase (Doron 2000). In 54, ‘Anna' and 'Job’ would both agree with the verb 'to walk' to produce the form 'walks.' When they are coordinated, however, the verb is conjugated as if the subject were 'they:'
54. Anna and Job are walking.

Similarly, a sentence with 'you' and 'I' as the subjects will agree as if the subject is 'we'. If these pronouns in Breton, as in 55, could produce combined agreement from a preposition, this would be almost unambiguous evidence for Agree.
55. *N' eo ket mat an traoù ganeomp te ha me. neg be.3sg neg good the things with-1pl you and me. "Things aren’t good with you and me."

These sentences, however, are as unacceptable as the previous set. This is not unexpected, since the Complementarity Principle dictates that a pronoun should never appear next to the affix that corresponds to it. The question, nonetheless, remains unanswered.

Beyond pronouns, it seems that for the variety of Leoneg spoken by my consultant, not even coordinated DPs are acceptable inside prepositional phrases:
56. *Drouk a oa er c'hapiten hage vartoloded.
bad ptcl be.impf.3sg in-the captain and his sailors
"The captain and the sailors were upset."
57. Drouk a oa er c'hapitenhag en e vartoloded. bad ptcl be.impf.3sg in-the captain and in his sailors "The captain and the sailors were upset."

While 57 is perfectly acceptable, 56 is nonsensical, even hard to understand. This is not what we would expect from either Agree or the prosody-sensitive spell-out hypothesis.

In this section, I have reviewed the serious challenges faced by a post-syntactic prosody-sensitive explanation of prepositional morphology. I then raised some issues with the claims made in the previous literature about the behavior of coordinated prepositional objects, which has until now omitted data from the majority of prepositions. I have also provided a history and grammatical description of the preposition gant, whose morphology was the impetus for this paper and whose syntactic roles show the range of functions performed by prepositions in Breton.

## IV. Analysis

The Breton language has undergone several centuries of repression, but continued to have considerable vitality in its home region of Breizh Izel (Lower Brittany) until the past century. This resulted in the formation of various fairly distinct varieties or "dialect regions" of the language. There is a significant degree of syntactic variation between these dialect regions. The same structure may therefore be interpreted differently in different regions, or may be admissible in some but impossible in others. In the following section, I present a rough analysis that seems
to underlie the Breton of the Léon region, but I cannot and will not assert that this analysis holds for every other Breton variety, even some of the varieties on the border of Léon. As the language continues to change, with increasing influence from Standard Breton and the speech of immersion school students, new structures and interpretations will likely emerge. In what follows, I begin by addressing the implications of the incompatibility of my own data on prepositional morphology in Breton with the existing theories. I then discuss case phenomena and their viability as an explanation for Breton prepositions, before briefly touching on pronoun typology and some extra evidence for the case hypothesis. I offer some directions that a case-based theory of prepositional agreement could go in with more data, before concluding with a statement of my final analysis and some thoughts on how it might connect to verbal agreement.

As indicated in the previous section, the evidence from coordination does not support the idea that prepositional morphology is derived from Agree or that it is derived from some prosody-motivated or even phonological process. To suggest that the pronouns appear as pronominal endings simply because they are linearly adjacent to prepositions in the post-syntax leaves unanswered the question of why prepositions and their objects cohere so closely in Breton as to reject any internal coordination. So, with $\varphi$-Agree seeming more and more unlikely and simple adjacency not accounting for all of the facts, a new option must be sought. The remaining syntactic mechanism that could mediate the preposition/object relationship is Case After all, whether prepositions Agree or not with their objects, they must always have some Case relation with them (Markman 2010). Before accepting it as a decisive factor in this elusive relationship, however, I must define what I mean by Case.

Case, as briefly mentioned in Background and Challenges, is another kind of 'nominal relator,' expressing or governing some kind of relation between two syntactic objects, almost always involving a noun or noun-like entity as its governee. Generally, Case is seen as a feature possessed by a noun, but it has had a varied history of reception in modern generative syntax. For a noun to appear in some sentence, in this way of viewing things, it must have some kind of Case feature (which is to say, the noun is "licensed" by Case) that is checked by a higher-up object's Case probe. This is to say that inasmuch as words are always in relation with each other, a noun cannot exist without the features that determine the kind of relationship it is in. This interpretation of Case is the one found in the diagram in 4 in Background.

More recently, the idea has been proposed that Case is not so much a feature as the head of one of the outermost shells of the nominal phrase, either above or below the DP shell. This has gained some currency and is represented as KP—a projection whose relationship to or identification with PP is especially unclear (cf. Bayer and Bader 2007). Still more recently, some have suggested that the fixed positions of objects in trees negates the need for further relational features, and that what appears on the surface to be morphological case is in fact the result of several post-syntactic processes (Markman 2010, cf. Ostrove 2020). For the purposes of this paper, I take Case to be a syntactic phenomenon, specifically a set of features attached to a noun or D head. That said, I believe it would be fairly easy to adapt my theories to a system that takes KP as the locus of Case.

How can Case resolve the mysteries in the data? If we assume that prepositions are lexical heads (heads that have meaning of their own, like N and V ), and that they also license their direct objects through Case, this does not in and of itself solve our coordination issue. After all, verb phrases assign Case to their objects in many languages where coordinated objects are permissible. Feature assignment/checking does not work in the same way for every feature, however. Some features are "strong," meaning that they can only be checked by a sister node. Why this is is not totally clear (cf. Adger 2000), but feature strength is a property of many languages. If the DP with some prepositional case had a strong case feature, it would need to be the sister of $P$ to get checked. Since a DP cannot exist without case (in this framework), it therefore must be the sister of P and coordination is not allowed.

If P had a strong feature requiring that its sister have a certain case, we would run into a problem trying to derive the impossibility of coordination. \&Ps usually have more or less the same distribution as the elements that they contain within them: a coordinated pair of adjectives like 'tall and sturdy' acts like an adjective, a coordinated pair of nouns like 'rocks and streams' acts like a noun, etc. From this we infer that the \&P takes on some feature from its internal elements that makes it appear like those objects to other syntactic elements. To suggest that a strong Case feature on P would not accept an \& P would be to suggest that the Case features on the $\& P s$ constituent DPs do not percolate up to the $\& P$ itself. This seems arbitrary and unnecessary if the strong feature could be on the DP instead.

Brennan (2009) argues extensively that the pronominal agreement morphologies of Irish prepositions and verbs are really composed of pronouns that trigger their own movement into the
respective prepositional and verbal heads. This is the simplest explanation of Complementarity, he points out, because Complementarity naturally and indeed obviously follows if the ending is itself a form of pronoun. Furthermore, prepositional endings in Irish and Breton can take modifiers that otherwise go with pronouns:
59. ni hon-daou
us our two
"the two of us"
60. ...ganeomp hon-daou
...with-1pl our two
"with the two of us."

Although the endings are pronouns, not all pronouns are created equal. Scholars such as Cardinaletti and Stark (1994; cited in Brennan 2009:11) and Déchaîne \& Wiltschko (2002) have suggested that there is a sub-typology of different structures within the category of pronouns. Brennan suggests that the endings on Irish prepositions are properly called 'deficient pronouns,' with a reduced internal structure:
61. Deficient pronoun structure (Brennan 2009:14).


An investigation of pronominal elements in Breton could yield evidence of a similar structure, at least for the inflectional morphemes on prepositions.

Prepositional endings, therefore, are not the realization of $\varphi$-Agree features, but they are still syntactically motivated in that the pronominal endings represent cased pronouns, not just pronouns adjacent to prepositions. Case is firmer ground for pronoun suppletion (when two forms of the same word are derived from different roots and bear little resemblance to each other; cf. Smith et al. 2019); after all, the forms of the first person in different cases are derived
through suppletion in many Indo-European languages (including nominative ' $I$ ' and accusative 'me' in English). Additionally, this idea has ample precedent in traditional grammars. The earliest grammars of Breton (Maunoir 1659; De Rostrenen 1738) treat $m e$ as the nominative and din 'to me' as the dative of the first-person pronoun. In this they were undoubtedly influenced by Greek and Latin (Maunoir was a priest and his grammar shows clear evidence of Latinization, cf. Vogt 2018), but it is nonetheless notable that they chose to represent these as case-bearing pronouns, instead of a preposition and pronoun pronounced together such as Latin mēcum 'with me.' Furthermore, some notable modern Breton linguists, such as Jean-Yves Urien, also consider these to be essentially forms of pronouns (pronoms prépositionels), not prepositions attached to pronouns (Ledunois 2004;78).

I do not consider the entire prepositional phrase to be one form in the way that these earlier works do, due to the insights of Ledunois that prepositions act as their own words and can be paired with verbs and clauses. I therefore take the cased pronoun to be only that part of the "conjugated form" that follows the prepositional stem: e.g. -in, -ezhi, etc. The set of ending paradigms is smaller than the set of simple prepositions, meaning that some pronouns would be in the same case across multiple prepositions. Case is usually understood to contain a fairly limited set of features in the actual syntax, so this smaller set of pronominal cases is attractive from a theoretical point of view. This would leave us with the following separate pronominal cases:
62. Table of possible cases.

| Case | Examples | Other members |
| :--- | :--- | :--- |
| Dative/Allative | da 'to': din 'to me', dezhañ 'to him <br> ouzh 'towards': ouzhin 'towards me', <br> outañ 'towards him' | diouzh 'from towards' |
| Comitative | gant 'with': ganin/ganen 'with me', <br> gantañ 'with him | digant 'from with' |
| Locative | war 'on': warnon 'on me', warnañ 'on <br> him' <br> e 'in': ennon 'in me', ennañ 'in him', | dindan 'in'; diwar 'from on' |
| Proximative | dre 'by': drezon 'by me', drezañ 'by him' | rak 'before'; dirak 'before'; |


|  | a-raok 'in front of': araozon 'in front of <br> me', araozañ 'in front of him' | etre 'between'; hervez <br> 'according to' (?) |
| :--- | :--- | :--- |
| Comparative | e-giz 'like': egiston 'like me', egistañ 'like <br> him' <br> evel 'like': eveldon 'like me', eveltañ 'like <br> him' | hep 'without'; a-zioc'h <br> 'above' (?) |
| Contrastive | eget 'than': egedon 'than me', egetañ 'than <br> him' <br> nemet 'only': nemedon 'only me', nemetañ <br> 'only him' | dreist 'on top of' (?); panevet <br> 'if it wasn't for' (?) |
| Purposive | evit 'for': evidon 'for me', evitañ 'for him' <br> davet 'for': davedon 'for me', davetañ 'for <br> me' | - |
| Partitive | a 'of': ac'hanon 'of me', anezhañ 'of him' | - |

My grouping of the ending forms here is not exactly the same as that used by other scholars (cf. Favereau 1997). It is promising, however, that many of these groups do have intuitive syntactic commonalities, like war and e, or evit and davet. Whether convincing or not, I hope that this table gives an impression of the complexity and expressiveness of the Breton prepositional system.

Despite all of this, the previously mentioned possibility that the entire 'conjugated prepositions' are actually just cased pronouns, and that the preposition is nothing more than a realization of case, does not seem totally out of the question. As Bayer and Bader (2007) and Adger (2012) note, prepositions do often seem to be realizations of the same thing as K . The fact that they go with clauses is not necessarily damning for this interpretation, since we have already seen that prominent scholars of Breton syntax such as Jouitteau and Rezac consider the Breton $v \mathrm{P}$ to have a feature $[+\mathrm{D}]$ that makes it DP-like. This would, of course, mean that every preposition corresponded to its own Case. This is not out of the question either, but might be better explained by post-syntactic morphology (e.g. Ostrove 2020, Adger 1999).

An extra piece of evidence for the cased pronoun hypothesis (in whatever form) comes in the form of the "echoic" or "clitic" pronouns. As seen in Background, these are a set of pronouns, corresponding exactly (in Leoneg) to the independent pronouns, that can be suffixed to prepositional endings to indicate emphasis or contrastiveness, as in 63:
63. Un dra a lavar-e d-eoc'h -c'hwi.
a thing ptcl say-impf. 3 sg to- $2 \mathrm{pl}=\mathbf{2 p l}$
"(S)he was saying something to you (pl)."

Echoic pronouns do not attach to the independent pronouns, e.g. me-me (though this may not be true in other dialects, cf. ARBRES). They can, however, attach to a noun or nominal element that is governed by a preceding possessive pronoun:
64. ma hini-me.
my dem=1sg.
"... my one."

The possessive pronouns are not conjugated prepositions, but likely possess a kind of genitive case. Given that the possessives are more or less the only other example of a dependent pronoun in an oblique case, this is a good sign that the case theory is on the right track.

As we have seen, some features need to be checked in a tree structure by their direct sister. If such a feature is located in a place in the tree where it does not have a sister with the corresponding probe, it will move. In English, T' has a strong feature that requires a DP to be its sister. In the diagram all the way up in 4, 'Paul' is represented as being lower than T, because the DP is generated to satisfy the requirements of the verb itself, which needs to know who is performing it. The strong feature on $T$ ', however, pulls 'Paul' into a relationship of sisterhood with it, resulting in the SVO word order that we have in English. Whenever an object gets moved, however, it leaves a 'trace' behind. The emphatic clitics that we have seen could be the pronounced traces or copies of pronouns that have moved (for discussion of traces and resumptive pronouns in Celtic languages, cf. McCloskey 1990).

If the "echoics" work the same way, then the pronoun must be moving somewhere. But where would it move? Let us reconsider the structure of a prepositional phrase and the structure of a reduced pronoun:
65. Reduced pronoun (a) and prepositional phrase (b).
a.


There are two options for movement: it could be that the case feature on $\mathrm{D}^{0}$ is strong, and that it moves to form a complex head with P (shown in 66.1); alternatively, it could be that $\mathrm{P}^{\prime}$ possesses the strong case feature and that the DP moves to SpecPP (shown in 66.2).
66. Dpro movement.

67. DP movement.



If the cased Dpro and P did form a complex head (as in 66), this could easily be realized as a single word. Then, only one prepositional Case would be needed, and the remaining variations could be due to the realizations of a direct merge of P and D pro. The D in nominal DPs could potentially also undergo movement into P : there are at least a couple of examples (e.g. er 'in the') of a preposition and a determiner pronounced as the same form, but these are few and far between (and easily attributed to linear adjacency or even phonology) and more data is needed to
investigate them. Alternatively, Adger (1999) explores the possibilities of morphology-driven movement to locations other than SpecXP in the post-syntax, which may account for the phenomena we observe here.

Echoic pronouns do not show up in the case of third-person pronouns for either possessives or conjugated prepositions. The question of why this is the case is beyond the scope of this paper, but it may have something to do with the fundamental difference between the third person and the other persons-as noted by Ledunois. The divergence between the first and third-person pronouns in terms of echoics may thus be due to pronoun sub-typology. If Dpro is indeed what moves into the P head, then 3rd person pronouns might contain some other element (such as an $n$ or N ) that is not moved that is actually what is being pronounced as the "pronoun." Whatever the case, I suspect that pronoun typology has answers for this problematic difference.

In this section, I proposed case as an explanation for the observable prepositional agreement phenomena. I preceded to an overview of the mechanics of Case in modern syntax. I then provided my analysis of cased pronouns in Breton and the evidence for them from the echoic pronouns. In Breton, prepositions have a Case probe that pairs with strong Case features on pronouns and DPs. A similar system of cased (and perhaps tensed) pronouns may be behind the verbal morphology of Breton as well: as echoic pronouns and the Complementarity Effect are both properties the verbal system as well, a theory that harmonizes verbal and prepositional endings is very appealing.

Finally, I have left unaddressed the preposition etre and its particular requirements for plural complements: as the semantics of etre are very particular, its unusual behaviors should not detract from a hypothesis about the overall pattern of prepositional agreement. Furthermore, the word $h a(g)$ 'and' in Breton possesses a number of meanings beyond simple conjunction, which may explain why it produces an apparent coordination of an ending with a pronoun in that case.

## V. Conclusion

In this paper, I have investigated the models for Breton prepositional syntax as they exist, and have proposed a new model that stresses Case features as the driver behind the phenomenon of 'inflected prepositions' in Breton. In the Introduction I presented the problem of "prepositional agreement." In Background, I overviewed the main concepts relevant to the question of
'prepositional agreement,' including the preposition as a category, Agree and its implications, the preposition in Breton, Agree in Breton, and context-sensitive Spell-out. In Challenges, I problematized the prevailing position that Breton prepositional agreement represents prosody-sensitive Spell-Out with a more in-depth look at the history, functions, and syntax of prepositions in the language. I continued in Analysis to explore new interpretations of 'conjugated prepositions,' settling on the centrality of a strong Case feature on the object of the preposition as the driver behind Breton prepositional syntax. I indicated the possibility that Move could also be involved in this process before concluding with some thoughts about the irregular preposition etre 'between' and the applicability of this study to the verbal system. This paper is in no way the last word on this issue, and despite the paucity of my data, I hope that an approach centered more directly on a large amount of language examples can eventually solve this question once and for all. There are many notable differences between prepositional conjugation in Breton and its counterparts in the Goidelic languages, but I leave open the possibility that a more in-depth study of Breton prepositions could have implications for its cousins in Ireland, Scotland, and Man.

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## List of Abbreviations

A. Adjunct.

AP. Adjunct Phrase.
$b r$. Breton.
D. Determiner.

DP. Determiner Phrase.
dem. Demonstrative.
cond. Conditional.
$f r$. French.
fut. Future.
inf. Infinitive.
irr. Irrealis.
N. Noun.

NP. Noun Phrase.
nom. Nominative.
P. Preposition.

PP. Prepositional Phrase.
pcpl. Participle.
pret. Preterite.
ptcl. Particle.
T. Tense.

TP. Tense Phrase.
1sg. First person singular.
2sg. Second person singular.
3sg. Third person singular.
3 ms . Third person masculine singular.
3fs. Third person feminine singular.
3pl. Third person plural.


[^0]:    ${ }^{1}$ Persian and all that.

