Mobile Inflections in Polish[*]

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0. Introduction

In this paper I address questions concerning the relationship between morphological/syntactic form and phonological behavior as they arise in an examination of the 'mobile' or 'floating' inflections of Polish. The mobility of the inflection in question is exhibited in the following minimal pair of sentences, in which *-ście*, a piece of verbal agreement which indicates a Second-Person Plural subject, may appear either on the verb or on the fronted *wh*-word:

(1) Gdzie byliście?
    where were-2-PL
    'Where were you?'

(2) Gdzieście byli?

This phenomenon has provoked investigations from a number of perspectives, including the historical, the phonological/morphophonological, and the syntactic; particular

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analyses will be presented and examined as the discussion proceeds. Rather than pursuing a single line of inquiry, I will present here an analysis of the mobile inflections that focuses on the interface between syntax/morphology[1] and phonology, looking in particular at the manner in which two sets of elements that appear to be clitics exhibit different patterns of phonological interaction with different hosts. In analyzing these patterns of behavior, the focus of the discussion will be on the interface between morphology/syntax and phonology. It will be shown that the difference in phonological behavior reflects a difference in the morphological structures, and that this provides insight into the manner in which the phonological component may interpret minimally differentiated morphological representations.

1. Morphology of the Polish Past Tense Verb

The italicized piece of agreement seen in (2) to appear on the *wh*-word *gdzie* is only one part of the verbal agreement of the fully inflected past-tense verb in (1); it indicates Person-Number agreement. In order to make clear the full structure of the past-tense verb, I will lay out here the paradigms for the Polish past tense and conditional verb, as this will provide a basis for the subsequent discussion. To begin with, the morphological decomposition of a Polish past tense verb is as follows:

(3) POLISH PAST TENSE VERBAL MORPHOLOGY
    Stem + Thematic Vowel + Past + Gender-Number + Person-Number

This may be made clearer with reference to an example. For *czytałaś*, 'You (Feminine-Singular) read', we have:

(4) czytałaś
    -ł- = Past Tense
    -a- = Feminine-Singular
    -ś = Second Person-Singular

As noted earlier, the 'floating' inflection is the marker of Person-Number agreement. For the verb *czytałaś*, then, the Person-Number agreement marker *-ś* would be able to appear in positions prior to the verb. For reference, I have included the following full paradigm for the past tense of the verb 'to buy':

(5) Past Tense of *kupić*, 'to buy':

Number	Gender		1st Pers.	2nd Pers.	3rd Pers.
SINGULAR	Masc.		kupiłem	kupiłeś	kupił
	Fem.		kupiłam	kupiłaś	kupiła
	Neut.	–			kupiło
PLURAL	Virile		kupiliśmy	kupiliście	kupili
	Non-Virile	kupiłyśmy		kupiłyście	kupiły

In 'subjunctive' or 'conditional' sentences, the particle *by* appears in the verbal morphology between the Gender-Number and Person-Number agreement morphemes:

(6) Poszedłbym

poszed   ł   a   by   m

gone   PAST FEM/SING IRR 1S

'I would have gone'.

In addition to being able to appear directly after the verb, the subjunctive marker also appears in positions preceding the verb; when it does so, it always has the Person-Number agreement particle with it.

2. A Historical and Dialectal Overview

2.1 The Historical Situation

The Person-Number agreement particle seen in the previous section is derived historically from the auxiliary form of the verb *to be*. Forms for the auxiliaries in older stages of Polish may be seen in the chart in (7), which is adapted from Andersen (1987) and Decaux (1955). The forms given here for Old Polish are those for what Andersen calls the 'orthotonic' forms of the auxiliary, as well as those for the 'atonic' forms. As may be seen in the chart, the atonic auxiliaries, which were apparently subject to Wackernagel type restrictions, are very similar in form to the P-N markers in contemporary Polish.[2]

(7) Historical Development of the Indicative Auxiliary

PERS/NUM	Old Polish Atonic	Tonic	Modern
1st Sing.	-śm/-m	jeśm	-m
2nd Sing.	-ś	jeś	-ś
3rd Sing.	-Ø	jest/jeść/je	-Ø
1st Pl.	-śmy	jesm(y)	-śmy
v2nd Pl.	-ście	jeście	-ście
3rd Pl.	-Ø	są	-Ø

2.2 The Dialect Situation

The status of the P-N markers within the various dialects of Polish seems to be an extremely complex affair. I will do no more than mention certain of the key points in passing here, in order to expedite later discussion.

In addition to providing general background, the purpose of this historical summary is to pose a question concerning the nature of the elements in the above chart. Although it is labelled as showing the indicative *auxiliaries* in its cells, it is crucial to point out that I am not assuming the forms given for Modern Polish (or for that matter the atonic forms for Old Polish) to be the spell-out of the position headed by the auxiliary in the syntax, but only that these forms appear in indicative past-tense clauses. The question of whether the P-N markers are themselves auxiliaries or whether they are inflectional morphemes will play an important role in the analysis to come, and will be addressed in §5.

There seem to be some dialects in which younger speakers do not allow for the P-N markers to appear on anything but the participle; it has been reported to me that this is the case for Warsaw Polish.[3] The dialects that I will be concerned with in this paper are those in which the mobile inflection has maintained a certain degree of mobility; the data presented has been gathered from speakers from the Cracow area, and from a speaker from Northern Poland as well. For the purposes of this analysis, this will of course mean that the claims made here are to be restricted to the dialects that exhibit the pattern that will be summarized in (18) below; I leave open the possibility that patterns of phonological behavior differing from those examined here may be found in other dialects.

3. Morphological and Morphophonological Considerations

3.1 A Phonological Diagnostic

Discussions of the 'Floating Inflections' from a phonological point of view are to be found in Gussman (1980), Dogil (1987), Booij and Rubach (1987), and Aguado and Dogil (1989). These accounts have concentrated on the fact that certain processes in the Lexical Phonology of Polish are affected by the presence/absence of the Person-Number particle. I will review some relevant features of these accounts, and then show that the lexical approach to the P-N markers argued for in Booij and Rubach (1987) cannot be maintained for the dialects to be examined here. A primary objective in the examination of the phonological accounts will be to show how phonological tests reveal differences in the manner in which the P-N markers and the *by*-forms interact with their hosts. In examining the phonological patterns exhibited by the P-N markers and *by*, we will have a diagnostic that may be used in determining the syntactic/morphological structures in which these elements appear.

Significant among the phonological processes which interact with the P-N markers is /o/-RAISING, which raises /o/ to [u] in the context of word-final syllables closed by a voiced obstruent.[4] Dogil (1987) presents the following example (this (12)) to show how this lexical rule is affected by the presence or absence of the P-N clitics:

(8) Ja mu pom[o]głem = jam mu pom[u]głt

I   him helped-1S   = I-1S him helped

'I helped him.'

In the form on the left in (8), the presence of the P-N agreement on the verb eliminates the environment for RAISING, with the result that the bracketed vowel emerges as /o/. In the case on the right, however, the conditions for the application of RAISING are met in *pomógt*, and the vowel raises to [u].[5]

RAISING is treated by Booij and Rubach (1987) as a Lexical rules on the grounds that it allows for exceptions, the hallmark of Lexical Phonology as opposed to Postlexical rules. The question that then arises within the theory of Lexical Phonology is how something with the distribution of a clitic (rather than that of an affix) may affect lexical rules. Dogil proposes a 'copying' account for the distribution of the P-N Marker in which the clitic is generated

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[2] I have omitted the agreement forms for the Dual, which do not appear in contemporary Polish.

[3] There do appear to be some exceptions to this, however, as it has been pointed out to me that the inflection may appear on a number of *wh*-words.

[4] While there are some exceptions to the application of RAISING, the generalization that both voicing and word-finality are relevant to the process seems to be accurate (I would like to thank Iwona Kraska-Szlenk for discussion on this point.)

[5] Polish orthography is sensitive to the raising of /o/: unraised /o/ is *o*, while raised /o/ (i.e. [u]) is *ó*.

on the verb, and then copied on to all other constituents in the sentence. Housekeeping rules then apply to remove all but one occurrence of the P-N Marker from the clause. An approach similar to Dogil's is taken in Booij and Rubach (1987), in what they call the theory of *Lexical Cliticization*. Like Dogil (1987), Booij and Rubach (1987), note that the rule /o/-RAISING is sensitive to the presence of a P-N-clitic on the verb. They conclude from such data that a movement account of the variable position of the P-N Markers will be problematic given their assumptions, because /o/-RAISING is a postcyclic lexical rule in their classification, and movement in the syntax would apply after the lexicon. Unless the affix is attached in the lexicon, then, the fact that the verb does undergo the [o~u] alternation in the preceding example would remain completely mysterious. Concluding that the phonological data presented thus forces a Lexical account of the variable placement of the agreement morpheme, they argue that the cliticization is actually effected by a Word Formation Rule in the lexicon.[6] To account for the surface generalization that only one such clitic may appear in any given clause, a filter is posited in the syntax to disallow cases in which multiple occurrences of a given Person-Number particle appear.

This lexical treatment of the P-N clitics is distinguished from the treatment given to cases with *by*. The presence of *by* on the verb does not affect RAISING:

(9) m[u]glby 'he would be able'
(10) m[u]gł 'he could'

This pattern is seen whether *by* is followed by a P-N Marker or not. On the basis of this difference, Booij and Rubach conclude that *by*, unlike the P-N Markers, is a syntactic clitic.

3.2 Stress

Stress facts also differentiate the P-N Markers and *by*. It is noted by Booij and Rubach (1987) that the appearance of the P-N Markers on the verb causes changes in the stress pattern of the verb. Primary stress in Polish falls regularly on the penultimate syllable;

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[6] The behavior of the P-N Markers on participles is not the sole piece of evidenced advanced in support of the claim that the cliticization is lexical; as further evidence for their lexical approach, Booij and Rubach cite the following data (once again adapted from Dogil (1984)), in which cliticization of agreement interacts with the formation of indefinites, which consist in Polish of a *wh*-word with -*ś* affixed to it. Thus we have:

(i) jako 'how'   → jakoś 'somehow'
     kiedy 'when' → kiedyś 'sometime'
     kto 'who'   → ktoś 'someone'
     co 'what'   → coś 'something'
     gdzie 'where' → gdzieś 'somewhere'

When such an indefinite appears with a cliticized PN agreement morpheme, the PN-clitic appears inside of the element -*ś* (examples here are Booij and Rubach's (77)):

(ii) jako ś   mu   pomoglem = jako m ś   mu   pomógł
     how INDEF him helped-1S = how 1S INDEF him helped
     'I helped him somehow.'

The extent to which such examples are acceptable is unclear. It has been reported in the literature that some speakers reject them altogether: the speakers I consulted also rejected these examples. Although such cases would certainly be of interest to the present discussion, I will refrain from treating them further here on the grounds that I do not have access to an entire set of data from speakers accepting these forms.

when the Person-Number agreement markers -*m* and -*ś* appear on, as opposed to prior to, the verb, we find the following (Booij and Rubach's (67)):[7]

(11) jak   ro-bi´-tem = jakem ro-´bit
     how did-1S
     'as I did'

Once again, *by* differs from the P-N Markers in that it does not affect the placement of stress on the verb:[8]

(12) jak   ro-´bit-bym = jak bym ro-´bit
     how did-IRR-1S
     'as I would do'

These facts are taken to provide further evidence that the P-N Markers are attached to their hosts in the lexicon. While I will not discuss stress in detail here, opting instead to use RAISING as a diagnostic for morphological structure, the fact that the stress correlates with RAISING in these cases establishes the fact that the differences with respect to RAISING seen in *by* and the P-N Markers are indicative of a set of systematic differences which involve more than one phonological phenomenon.

3.3 Problems with the Lexical Account

Given a certain set of assumptions, the interaction of the Person-Number morpheme with the lexical phonological rules seen above seems to motivate a lexical as opposed to syntactic analysis for the first group of clitics under discussion, and this is how the authors noted earlier propose to treat the phenomenon under discussion. Although I do not share the same assumptions concerning the interaction between morphology and phonology that lead to a lexical treatment of these phenomena, it will be instructive to see where the lexicalist treatment fails, as this will frame the questions that are relevant to the present analysis.

One problem that will be of importance later concerns data not considered by Booij and Rubach (1987), and will be taken up shortly. Yet even when we restrict ourselves to the data given above, there are problems with viewing the appearance of the P-N Markers as a purely lexical phenomenon. First, as pointed out by Borsley and Rivero (1994), the lexical account is unable to account for a fairly basic distributional fact about the P-N agreement morpheme: it can appear only on preverbal hosts, or on the verb (participle) itself. This may be seen in the following group of sentences, taken from Sussex (1980):

(13) Ale kupiliśmy   książki.
     but bought-1-PL. books
     'But we bought the books.'

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[7] In some cases, the plural P-N Markers *śmy* and *ście* may be seen to behave like *by* in not interacting with the stress of their hosts (example from Booij and Rubach):

(i) robi´-liśmy ~ robili´śmy

[8] In Polish orthographic practice the *by*-forms are written as one word with the verb when the follow it, but as independent words when they appear before the verb.

(14)   * Ale kupili książkiśmy.

A second problem concerns the manner in which *by* and the P-N Markers are treated by Booij and Rubach. As noted above, the P-N Markers always appears suffixed to *by* when both are present in a clause. On the analysis of Booij and Rubach, however, there is nothing to require that this should be the case. This and the problem mentioned above call into serious question the internal consistency of the lexical approach.

An equally serious problem with the lexical approach may be found when we extend the very line of reasoning used to establish that the Person-Number Markers must be added in the lexicon. Recall that the argument above for that the Person-Number Markers must be added from the fact that the presence of *-m* on the verb in (8) blocked the lexical rule of /o/-RAISING, while its presence on a preverbal host resulted in a situation in which the relevant vowel in the verb does raise. One way in which to test the validity of the claim that the relevant inflections are always added in the lexicon would thus be to duplicate the conditions relevant to RAISING on a non-verbal host, and then attempt to block RAISING with the affixation of a P-N Marker.[9] Such an example requires a preverbal host in which the final syllable shows /o/-RAISING. This criterion is met by nouns like *gród*, 'town'; the entire declension for this noun is given in (15), which is instructive because it shows the application of RAISING in the relevant environments:[10]

(15)   Singular Declension of *gród* ('town')

CASE	FORM	RAISING?
Nom.	gród	Raising
Gen.	grodu	No Raising
Acc.	gród	Raising
Dat.	grodowi	No Raising
Loc.	grodie	No Raising
Instr.	**grodem**	No Raising
Voc.	grodzie	No Raising

A form of particular interest is the bold-faced form given in the cell for Instrumental case. This is *grodem* with unraised /o/, with a case-ending which allows for a direct comparison with the first-person singular P-N Marker *-m*. Recalling that the presence of the inflection *-m* on the verb in (8) prevented the application of RAISING, consider now the following pattern for nouns like *gród* with the P-N marker:[11]

(16)   Gród widział̲e̲m̲ = Gródem widział.

town saw-1S

'I saw the town.'

[9] Another diagnostic that might come to mind would involve inducing RAISING on /o/-final preverbal hosts. This turns out not to be effective, however, as the two consonants with which it could be tested, the P-N Markers *-m* and *-ś*, do not cause RAISING.

[10] That the effects of RAISING may be seen clearly in the case of this noun is important to establish for the purposes of the test envisioned, given the many subtleties associated with this process.

[11] Forms in which the P-N Marker appeared on a preposed nominal were regarded as archaic by some of my informants from the Cracow area, but accepted by others; this may would seem to be the result of dialectal variation, but more research is needed on this point.

The resulting pattern, in which RAISING occurs in the preverbal *gród* despite the presence of *-m*, is one which contradicts the predictions of the theory of lexical cliticization, and shows that the P-N Marker does not interact with different hosts in the same way.

The point may also be established without appealing to the presence of the P-N marker on a pre-verbal NP; this is desirable because, as noted earlier, certain speakers regard the presence of the P-N Marker on such an NP as archaic. The following three examples involving the *wh*-word *co* 'what' suffice to show that RAISING in a non-verbal host is not affected by the presence of the P-N Marker:

(17)   a.   Co   widział̲e̲ś̲?

what seen-2S

'What did you see?'

b.   Cóż   widział̲e̲ś̲

what-CONTR. saw-2S

'What did you see?'

c.   Cóżeś widział?

In the second form, the addition of the contrastive enclitic *ż* has induced RAISING in the *wh*-word. When the P-N Marker is further added to this, the result is the form in (17c), which is syllabified as *có-żeś*; notably, it shows RAISING despite the fact that both environments relevant to the application of this process (the closed syllable and word-final syllable requirements) are not present.

With the full pattern now at hand, the behavior of the P-N Markers, *by*, and their different hosts with respect to RAISING may be summarized as follows:

(18)   Summary the behavior of P-N Markers, *by*, and their hosts

Structure	RAISING Affected?
Verb+P-N	yes
Verb+by+P-N	no
Other+P-N	no
Other+by+P-N	no

The above discussion shows that the lexical approach to the P-N Markers is incapable of capturing the phonological pattern exhibited in this section, in addition to not being able to account for the basic facts concerning the distribution of the P-N Markers. Further, it has established the full pattern of interactions that must be accounted for; before I proceed to present my analysis, however, it will be necessary to examine in greater detail certain aspects of the syntactic behavior of the P-N Markers.

4. Syntax

As should be clear by this point, the Person-Number agreement particle does not always appear on the verb; it may also appear on preverbal elements of a variety of categorial types, as illustrated in the following cases with subject/object pronouns, *wh*-words, adverbs, and complementizers:

(19)   a.   Ty   to widział̲e̲ś̲.

you it saw.

'You saw it.'

(Dogil (1987))

(20) b. Tyś widział.
    c. Ty toś widział

(20) a. Kiedy widziałeś królika? (BR 1994)
      when saw-2S rabbit
      'When did you see the rabbit?'
    b. Kiedyś widział królika?

(21) a. Daleko poszłam (BR 1994)
      far went-FEM-1S
      'I went far.'
    b. Dalekom poszła.

(22) a. Janek powiedział, że pojechałeś do Warszawy. (BR 1994)
      Janek said that went-2S to Warsaw
      'Janek said that you went to Warsaw.'
    b. Janek powiedział, żeś pojechał do Warszawy.

As also noted earlier, there are restrictions on the appearance of the P-N Marker. Borsley and Rivero (1994) note that in addition to not being able to appear on anything to the right of the verb, the P-N Markers are clause-bounded, and may not appear on the negation marker or on transitive prepositions. Based on these facts, Borsley and Rivero offer a syntactic account of the distribution of the P-N Markers that has two major components. The first of these consists of the identification of the P-N Marker as an auxiliary verb that has been reduced to clitic status, based on the historical facts examined earlier.[12]

The second component of Borsley and Rivero's analysis is that, when the P-N marker appears on the verb, the verb has undergone Head Movement and incorporated into the head of the auxiliary (on their assumptions, the verb moves into I^0, which is the position in which the auxiliary is generated.) This is illustrated in (23):

(23) Participle Incorporation into the Auxiliary

$$
\begin{array}{c}
\text{IP} \\
| \\
\text{I}' \\
/ \ \backslash \\
\text{I}^0 \quad \text{VP} \\
/ \ \backslash \quad | \\
\text{czytał}_i \ \text{-eś} \quad t_i
\end{array}
$$

In cases in which the clitic auxiliary does not appear on the verb, Borsley and Rivero say that it has remained *in situ* and undergone phonological cliticization (due to the fact that it is not a free-standing word). This accounts for its appearance on elements to the left

[12] Borsley and Rivero treat the P-N Markers as the actual heads of the projection headed by the auxiliary, a point on which I will ultimately differ with them.

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of the verb. As presented, the analysis treats the clitic auxiliaries as immobile; this is taken by Borsley and Rivero to endow the account with a certain degree of naturalness.[13]

5. Two Sets of Auxiliaries

The discussion thus far has involved two main points: first, that the P-N markers and *by* exhibit different patterns of behavior in their interactions with their hosts; and, second, that the distribution of these elements is syntactically that of an auxiliary verb, and must be captured syntactically. The question that then arises concerns how the systematically differing phonological behaviors may be captured within the bounds of a syntactic analysis. Given the syntactic nature of the phenomenon, the answer to be pursued will be one that crucially involves structures created in the syntax and morphology; specifically, the differing phonological behaviors with respect to the diagnostic provided by RAISING will be taken to be the reflections of different morphological/syntactic structures.

The first step in the analysis will be an examination of *by*. As mentioned earlier, *by* always appears with the P-N Marker suffixed to it; this may be seen in the following paradigm, adapted from Sussex (1980):

(24) a. Ale czytałabyś
      but read-FEM/SING-IRR-2S
      'But you would read'
    b. Ale byś czytała.
    c. * Aleś by czytała.
    d. * Ale by czytałaś.

I will pursue an approach similar in spirit to that of Borsley and Rivero (1994) and hold that in these cases *by* is the stem of the irrealis auxiliary, with the P-N Markers serving as inflectional markers on this stem.[14] Evidence for this position may be found in a comparison of the forms in Old Polish with those in Modern Polish:

[13] For one type of example, Borsley and Rivero argue that it is impossible to hold that the auxiliary has not moved. The relevant examples involve fronted sequences of *wh*-words, and the positioning of the clitic auxiliaries among these:

(i) Co by komu kiedy Jan dał?
    what SUBJ-3S to-whom when Jan given
    'What would Jan give to whom when?'

(ii) Co komu by kiedy Jan dał?

Assuming that *wh*-words after the first in a multiple-*wh* sequence in Polish are adjoined to IP (cf. Lasnik and Saito (1984), Rudin (1988)), Borsley and Rivero conclude that in this case the auxiliary *by* has moved and adjoined to IP. It is possible that such examples may be analyzed as having movement of the auxiliary to C^0 (or to a functional head above Borsley and Rivero's I^0) with subsequent *Merger* or a similar inversion process in the relevant cases, but more work is needed on the nature of the syntactic structures involved.

[14] Here (and in the discussion to follow) my use of the term 'stem' is not meant to carry any theoretical connotations beyond its use as a name for the item that spells out the auxiliary position; this is relevant given the substantial discussion of notions like 'stem' in the recent morphological literature.

(25)   The Change of Inflection on *by*

Pers./Num.	Old Polish	Modern Polish
1st Sing.	bych	bym
2nd Sing.	by	byś
3rd Sing.	by	by
1st Pl.	bychom	byśmy
2nd Pl.	byście	byście
3rd Pl.	bychą	by

The idea here is that the irrealis auxiliary, which formerly had a series of endings distinct from the indicative markers, eventually came to be a stem infected with the P-N Markers. As a result, *by* appears with the P-N Marker for the relevant person and number affixed to it, except in two cases: the third singular and third plural, in which the P-N Markers are null. The fact that the P-N Marker never appears on anything but *by* when both are present follows directly from the fact that the P-N Marker is agreement on the *by* stem.

In the case of the indicative, there are at least two options concerning what counts as the actual auxiliary. One option would be to treat each auxiliary as uninflected, i.e. as fitting into the following paradigm:

(26)   Paradigm Assuming P-N Markers as Syntactic Heads of I⁰/Aux⁰

Pers./Num.	Form
1st Sing.	-m
2nd Sing.	-ś
3rd Sing.	Ø
1st Pl.	-śmy
2nd Pl.	-ście
3rd Pl.	Ø

According to this view, the P-N Markers would themselves spell out the heads of the projection taken to be headed by the auxiliary. I will not adopt this position on the grounds that it forces an undesirable split in the nature of the P-N Markers. The treatment adopted for the *by* cases is one according to which the P-N Markers are pieces of inflectional morphology; in assuming the P-N Markers in indicative clauses to be auxiliaries, one would be positing a dichotomous nature for the P-N Markers, treating them in some cases as full-fledged auxiliary verbs and in some cases as inflectional morphemes.

The option that I will follow involves treating the P-N Markers in the indicative cases as inflectional morphemes on a null stem. That is, while in (25) above the P-N Markers were taken to be affixed to the irrealis stem *by*, in the indicative case they are affixed to the stem for the indicative auxiliary, which is phonologically null. This yields the following paradigm for the indicative auxiliary:

(27)   Paradigm Assuming a Null Indicative Aux. Stem

Pers./Num.	Form
1st Sing.	Ø–m
2nd Sing.	Ø–ś
3rd Sing.	Ø–Ø
1st Pl.	Ø–śmy
2nd Pl.	Ø–ście
3rd Pl.	Ø–Ø

The advantage of this approach is that it allows for a uniform treatment of the P-N Markers; in all cases, even when they are mobile (i.e. even when they appear on a host other than the verb), they are inflectional morphemes added to verbal stems.[15] Their appearance on the surface results from the fact that one of the auxiliary stems to which they are added is phonologically null.[16] The uniform treatment of the P-N Markers results in there being three separate stems on which they serve as agreement; in addition to the irrealis and indicative auxiliaries, there is the verb *być*, 'to be', which is as follows:[17]

(28)   The verb *być*, 'to be'

Pers./Num.	Form
1st Sing.	jest- m
2nd Sing.	jest- ś
3rd Sing.	jest-Ø
1st Pl.	jest- śmy
2nd Pl.	jest- ście
3rd Pl.	są

In sum, this treatment of the auxiliaries takes what we have been calling the 'P-N Markers' as inflectional morphemes which, because the stem to which they attached is phonologically null, must become enclitics on an adjacent host. Taking this analysis of the auxiliaries, we may now proceed to an examination of the differences in phonological behavior that they exhibit.

6. Morphological Structure and Phonological Form

Having made explicit in the previous section how the P-N Markers may be treated as inflectional morphemes, I will now address the question of the differing phonological behaviors discussed earlier. The main thrust of the argument is that the differences shown with respect to the phonological diagnostic of RAISING may be directly correlated with different syntactic/morphological structures being mapped to the phonological component.

Before the actual structures in question are examined, some points concerning my assumptions about the workings of agreement must be made. I will assume following

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[15] The mechanics assumed for the application of inflectional morphology will be discussed shortly.
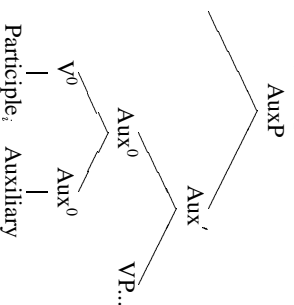
[16] Their appearance on the surface may also be determined by syntactic movement of the auxiliary; cf. Fn.13 above.

[17] The *jest* forms in the paradigm given here surface as *jestem, jesteś, jest, jesteśmy* and *jesteście*; I have omitted the *e* from the agreement morphemes in this paradigm to make it symmetrical with the irrealis and indicative paradigms.

Marantz (1991) and related work that agreement morphology is added at a level of Morphological Structure in accordance with language-particular criteria governing the well-formedness of words.[18] In the cases to be examined, this will take the form of the addition of an Agr node to the verbal stem requiring inflection.
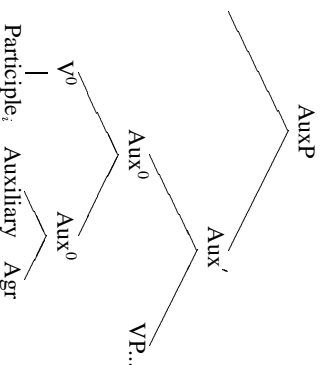
Proceeding now to the actual cases to be examined, the syntactic structure for the cases in which the participle has incorporated into the auxiliary would be as follows:
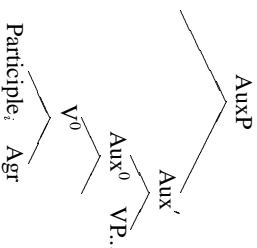
(29)   The syntax prior to MS

AuxP
Aux′
Aux^0 VP...
V^0
Aux^0
Participle$_i$ Auxiliary

With the addition of the Agr node at MS, the following structure is produced:

(30)   The addition of agreement at MS

AuxP
Aux′
Aux^0 VP...
V^0
Aux^0
Aux^0
Participle$_i$ Auxiliary   Agr

Recalling now that the cases of *by* on the incorporated participle behave differently from the cases of the P-N Marker alone on the participle in not affecting RAISING, the correlation between morphological structure and phonological behavior may be seen to hinge on the fact that the indicative auxiliary has a null stem. A mechanical explanation of how these two structures are different could be stated in a number of ways. For the purposes of the present discussion, I will focus on the idea that in the indicative examples in which the P-N agreement appears on the verb, it is effectively treated by the phonology as if the Agr node had been added directly to the participle, as in the following:

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[18]Case morphemes are treated similarly within this system, a point which will be relevant later in the discussion.

(31)   'Pruned' MS Tree

AuxP
Aux′
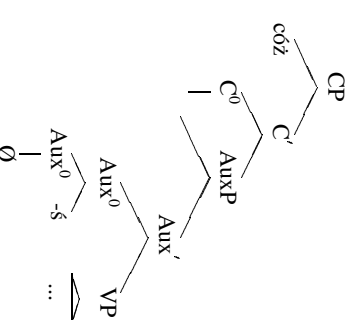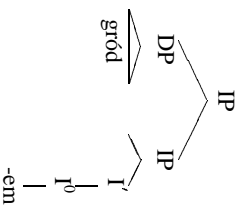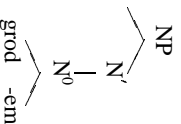Aux^0 VP...
V^0
Participle$_i$ Agr

The point to be made here is not that the structure in (30) must be altered to that in (31), but rather that structures like (30) are effectively treated phonologically as if they had the structure in (31) when the auxiliary is indicative. One way to achieve this effect would be to have a 'Pruning' operation at MS produce the structure in (31), with the phonological differences resulting from the structures in (30) and (31) being mapped to different phonological bracketings. As an alternative, one could hold that without any mechanical change at MS, the structure in (30) is simply interpreted by the phonology as involving a bracketing like [Participle-Agr] when the auxiliary is the null indicative, but as [Participle [*by* Agr]] in the irrealis cases. It is unclear at this point whether one of these solutions should be preferred over the other; for the time being I will motivate the proposed correlation between (30) and (31) by drawing a parallel between the Participle+Agr cases and some examples of NPs with a case affix.

The explanation for the difference in behavior between the two auxiliary types is motivated by a consideration of the cases in which NPs to which the P-N Marker has attached show no change in RAISING. In the following pair, in which RAISING is not affected as it is in the participle case, the syntactic structure is as in (34):

(32)   Cóż   widziałeś   (Raising)
        what-CONTR. saw–2S
        'What did you see?'

(33)   Cóżeś widział?   (Raising Again)

(34)   Cliticization Over a Larger Structure

CP
C′
C^0 AuxP
cóz
C^0
Aux′
Aux^0 VP
Aux^0 ...
Aux^0 -ś
∅

The presence of the P-N Marker on the fronted *wh*-word is the result of phonological cliticization across a structure that differs markedly from the cases in which a participle has incorporated into the position of the auxiliary, i.e. the structure in (30) above.

In the case of NPs to which the P-N Marker has been affixed, a distinction between the effects of the P-N Marker and a homophonous Case affix on RAISING provides a parallel for the case in which the P-N Marker blocks RAISING on an incorporated participle. With the Instrumental case affix, the relationship is one in which the Case morpheme has been directly suffixed to the noun; this results in the blocking of RAISING (35a). In the case of the P-N Marker for first-singular agreement there is cliticization across a different structure, with the agreement marker in I^0 and the fronted (presumably adjoined) NP, as in (35b):

(35) a. NP host: *grodem*, Inst. Case

$$\text{NP} \quad N' \quad N^0 \quad grod \quad \text{-em}$$

b. NP host: *gródem*, P-N Agr

$$\text{IP} \quad \text{DP } gród \quad \text{IP} \quad I' \quad I^0 \quad \text{-em}$$

The parallel between the NP cases here and the participial cases seen earlier may now be made in full. With the affixation of the case suffix, RAISING is blocked in the NPs in which it is otherwise seen to occur, but not in the case of cliticization in (35b). The structural difference at MS between the two NP cases is reflected in the difference in the following phonological bracketings:

(36) a. grodem (i.e (35a)) = [grod em]
      b. gródem (i.e. (35b)) = [gród [em]]

The manner in which the P-N Marker affects RAISING in incorporated participles discussed above thus betrays a similarly intimate relationship between the participle and the P-N Markers.

7. Conclusion

The primary concern of this discussion has been an examination of the manner in which differences in morphological and syntactic structure may be manifested phonologically. I have argued that the difference in phonological behavior between indicative (just P-N Marker) cases and irrealis (*by* + P-N) cases may be reduced to the fact that the former involve a phonologically null stem, while the latter involve the stem *by*. This difference in structure is reflected phonologically in the different effects that *by* and the P-N markers have on stress and RAISING.

One of the main questions arising as a result of this analysis concerns the fact that the indicative cases in which RAISING on the participle is blocked behave as if the Agr node had been added directly to the participle. In making this point earlier I refrained from taking the position that an actual change is effected in the relevant structures. As mentioned earlier, the relationship between these two cases could be expressed in a number of different ways, depending upon one's theoretical assumptions. With nothing to push a choice at this time, a decision on a mechanical procedure seems premature. The insight nevertheless gained stems from the fact that in analyzing things as we have, the manner in which the phonology reacts to two different structures may be seen at a very high level of detail.

Given that the present analysis is for a single language, we are also led to a question that is cross-linguistic in nature; in addition to what is appropriate for this case, data from parallel cases in other languages must play a crucial role in determining what sorts of mechanisms should be employed in handling null-stem effects. For instance, one could imagine that there is a universal 'pruning' mechanism that applies to remove nodes like the Polish indicative auxiliary in the mapping to the phonological component, but this is a matter for empirical investigation. Phenomena involving null verbal stems are attested in other languages (e.g. Menomini and Nimboran, in Bloomfield (1962) and Inkelas (1993) respectively), but it is not clear at this point whether or not they are sufficiently similar to Polish to warrant a direct comparison. The question of what sort of theoretical apparatus should be invoked in the case at hand is thus one that is best answered after similar cases have been analyzed. For the time being, we are left with one clear case in which a structure involving a null stem figures significantly in the morphology/phonology interface, and this is a first step towards answering the broader cross-linguistic questions that have been raised.

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