Variable Rules Meet Impoverishment Theory[1]

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ABSTRACT

In this paper, we attempt to revive the mechanism of variable rules from sociolinguistics within the theoretical framework of Distributed Morphology. We argue that 'leveling' variation, or non-categorical paradigm syncretism, is well modeled as the variable application of post-syntactic phi-feature deleting Impoverishment operations. We claim, moreover, that certain morphosyntactic features and combinations are inherently marked, and that this markedness is what triggers Impoverishment rules in the morphology, resulting in variable syncretism. The main substance of our paper consists of three case studies, wherein we show that the markedness of a particular morphosyntactic feature causes variable Impoverishment rules to apply, yielding the observed patterns of syncretism. First, in Monmouthshire, Wales, the marked feature [+Author] is responsible for variable leveling to the plural form *be* in the 1st person, as in *I be (am) proud of myself*. Second, in Buckie, Scotland, the marked feature [+Participant] causes a split pattern of variable leveling to the singular form *was* in the 1st person, as in *We was (were) laughing at each other*, but not in the 3rd person, as in *They were (*was) laughing at each other*. Third, in Smith Island, Maryland, the marked feature [+Negation] results in variable leveling to the plural form *weren't*, as in *She weren't (wasn't) scared*, as well as leveling to the form *ain't* across the entire agreement paradigms of present tense *be* and *have*.

1. Introduction and Structure of the Paper

In this paper, we attempt to revive the mechanism of variable rules from sociolinguistics (Labov 1969, Cedergren and Sankoff 1974, Rousseau and Sankoff 1978, Sankoff 1978, Sankoff and Labov 1979, Guy 1991) within the theoretical framework of Distributed Morphology (Halle and Marantz 1993, Embick and Noyer 2007). Specifically, we argue that 'leveling' variation, or non-categorical paradigm syncretism, is well modeled as the variable application of post-syntactic phi-feature deleting Impoverishment operations. Following recent work on

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dialect micro-variation developed in Arregi and Nevins (2007), and with important parallels to the work of Bresnan, Deo, and Sharma (2007), among others, we claim that these Impoverishment operations are markedness driven. In other words, certain morphosyntactic features and feature combinations are inherently marked, and this triggers the application of phi-feature deletion rules in the morphology, resulting in syncretism—variably, in the cases of interest.

The main substance of our paper consists of three cases studies analyzing the leveling variation in paradigms of English *be* in terms of variable application of morphological deletion rules. In each case, we show that the markedness of a particular morphosyntactic feature causes application of phi-feature deleting Impoverishment operations, yielding the observed patterns of syncretism. The first case comes from Monmouthshire, Wales (and Gloucestershire, England), where the marked feature [+Author] is responsible for variable leveling to the plural form *be* in the 1st person, as in *I be (am) proud of myself*. The second case comes from Buckie, Scotland, where the marked feature [+Participant] causes a split pattern of variable leveling to the singular form *was* in the 1st person, as in *We was (were) laughing at each other*, but not in the 3rd person, as in *They were (*was) laughing at each other*. The third case comes from Smith Island, Maryland, where the marked feature [+Negation] results in variable leveling to the plural form *weren't*, as in *She weren't (wasn't) scared*, as well as leveling to the form *ain't* across the entire agreement paradigms of present tense *be* and *have*.

These case studies are presented in Section 3, which follows a background overview given in Section 2. Open questions for further inquiry are posed and discussed in Section 4.

2. Background Overview

This section provides a brief overview of the empirical and theoretical background required for our analyses of the case studies in Section 3.

2.1 English *be* with pronominal subjects

We limit our study to pronominal subjects, where the phi-features of the subjects are clear, and free of the influence of the "Northern Subject Rule" or variable percolation of features from N-to-D occurring with full noun phrase subjects, as discussed in Börjars and Chapman (1998), Adger and Smith (2005), Adger (2006), Henry (1995) and Tortora et al. (this volume).

We also limit ourselves, to a large extent, to the copular/auxiliary verb *be*, as it is the only English verb that shows inflectional distinctions in the past tense. We have the following reasons for this empirical focus. First, *be* has allomorphic variants for person and number in both tenses:

(1) *Be* [+Past] (varieties without leveling)

	Singular	Plural
1st	*I was*	*we were*
2nd	*you were*	*you[2] were*
3rd	*she was*	*they were*
DP	*a boat was*	*boats were*

(2) *Be* [-Past] (varieties without leveling)

	Singular	Plural
1st	*I am*	*we are*
2nd	*you are*	*you are*
3rd	*she is*	*they are*
DP	*a boat is*	*boats are*

Second, paradigms for *be* show evidence of an Elsewhere form, as discussed further below. Third, inter- and intra-speaker variation (or, parametric and Labovian variation) in paradigms of *be* is both common in English varieties and relatively well studied in the sociolinguistic variationist literature, for example see among others Tagliamonte (1998), Wolfram and Schilling-Estes (1998), Tagliamonte and Smith (2000), Anderwald (2001), Schilling-Estes and Wolfram (2003), Wolfram and Schilling-Estes (2003), and Britain (2002). In all of our case studies, we rely on this important documentation of variation in English *be*. Finally, and most importantly from our theoretical perspective, is the ambiguous pattern of syncretisms in the standard English paradigm, in which a 'vertical' syncretism among the plural forms intersects with a 'horizontal' syncretism among the 2nd person forms. Arguably this leads to different "ways of underspecifying," an idea developed by Adger (2006) and important in our discussion below.

2.2 Morphosyntax of English *be*

In this article, we adopt a Distributed Morphology (DM) theoretical architecture, essentially following Embick and Noyer (2007) with some modifications. In this model, the output of the narrow syntactic computation is the input to the morphological component, where further operations apply during the computation to PF. Phonological exponents for functional morphemes are added post-syntactically—that is, DM is a 'late insertion' theory. However, departing from Embick and Noyer's (2007) treatment of 'dissociated' morphology,[3] we

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[2] Some English varieties have a distinct 2p pronoun, for example *y'all*, *yous*, *yins*, and possibly *you guys*. Because these various pronoun forms are not evidently relevant to the matters under investigation here, only the homophonous 2p form *you* appears henceforth.

[3] McFadden (2004) develops an extensive theory of dissociated case, and Parrott (2007) adopts a dissociated morphology account of both case and agreement.

assume that the Person and Number phi (φ) features on the syntactic terminal morpheme Tense (T$_{[\pm Past]}$) are present and valued by Agreement in the syntax (as in Pesetsky and Torrego to appear, among others). We adopt the following phi features for Person and Number (Halle 1997, among others):

(3)   Person phi features

      [±Participant, ±Author]

(4)   Number phi feature

      [±Plural]

Combining these three binary features yields the personal pronouns of English. Note that phi features are semantically interpretable on pronouns.

(5)   Pronominal phi features of English

	Singular		Plural	
1st	*I* = [+Part, +Auth, -Pl]		*we* = [+Part, +Auth, +Pl]	
2nd	*you* = [+Part, -Auth, -Pl]		*you* = [+Part, -Auth, +Pl]	
3rd	*she* = [-Part, -Auth, -Pl]		*they* = [-Part, -Auth, +Pl]	

Functional morphemes are provided with phonological features in the post-syntactic morphological component by Vocabulary items (or entries), which contain a paired listing of phonological exponents and the morphosyntactic features that identify terminal morphemes for Vocabulary insertion. This operation must obey the Subset Principle (Halle 1997, among others):

(6)   The Subset Principle for Vocabulary Insertion

      The Subset Clause: A phonological exponent realizes a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme.

      The Maximal Subset Clause: Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

(7) and (8) below contain the Vocabulary items for past- and present-tense *be* in English (of course, those varieties lacking the kind of leveling variation discussed in Section 3). For purposes of exposition, we employ a shorthand notation for *be* below. However, in Section 3.3.4, we further decompose *be* into its constituent syntactic and semantic features.
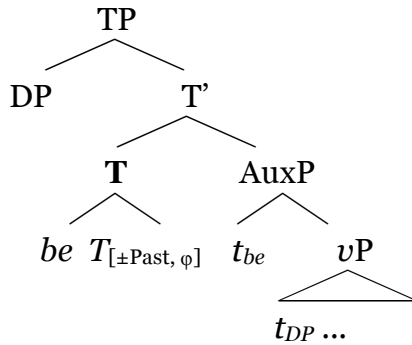
(7) Vocabulary for [*be* T$_{[+Past, \varphi]}$]

[-Pl] $\Leftrightarrow$ /wʌz/
elsewhere $\Leftrightarrow$ /wəɹ/

(8) Vocabulary for [*be* T$_{[-Past, \varphi]}$]

[+Auth, -Pl] $\Leftrightarrow$ /æm/
[-Pl] $\Leftrightarrow$ /ɪz/
elsewhere $\Leftrightarrow$ /aɹ/

Syntactic head movement raises *be* to adjoin with T$_{[\pm Past, \varphi]}$, as shown below; for reasons of exposition, movement is indicated with trace notation and internal structure is omitted in TP and *v*P.

(9) Syntax of auxiliary *be* (Adger and Smith 2005)

Following Embick and Noyer (2001) and Embick (to appear-a), we assume that morphological rules and objects can contain and make reference to both hierarchical and linear structures. Such information includes the constituency of complex heads that result from syntactic head movement and morphological operations such as lowering Merger. We adopt Embick and Noyer's definition of Maximum-Word (M-Word) as the highest terminal projection not dominated by any other terminal projection. This is the same definition given for H^{omax} in Chomsky (1995). In the case of English *be* above, the maximal projection of **T** in bold font is the M-word, while italicized *be* and $T_{[\pm Past, \varphi]}$ are the terminal sub-words it contains. This is illustrated in bracket notation below, where the M-Word boundary is indicated with the notation [$_M$ …].

(10) [$_M$ [*be*] T$_{[\pm Past, \varphi]}$]

Notice that the Vocabulary items above insert a single exponent for past-tense *be*, not separate exponents for *be* and T$_{[+Past]}$. Therefore, the features of the adjoined terminals [$_M$ [*be*] T$_{[+Past, \varphi]}$] must be combined into a single terminal node by the morphological operation of Fusion. Fusion results in a single locus of vocabulary

insertion. This operation, a mechanism of suppletion in DM theory, is illustrated in bracket notation below.

(11) Morphological Fusion of *be* and T$_{[+Past, \varphi]}$

$$...[_M \ [be] \ T_{[+Past, \ \varphi]} \ ]...$$
FUSION →
$$...[_M \ be \ T_{[+Past, \ \varphi]} \ ]...$$

The Vocabulary items in (8) do not generate the correct result for 2sg. It is a systematic fact of English that no morphological distinction for [±Pl] is ever realized in the 2nd person. This fact provides our first chance to introduce Impoverishment rules (Halle 1997).

Within a modular architecture of grammar, the failure of verbal inflection to signal a distinction between, for example, singular and plural subjects in the varieties of English under study, cannot be reflecting a process occurring in the semantics. Nor, arguably, is such a process located within the syntax—it would stretch the imagination to claim that verbs fail to Agree specifically with, say, 2nd-person subjects. Therefore, this loss of morphological distinction must occur in a module distinct from semantic interpretation, after syntactic agreement (which occurs as usual), and before phonological computation.

Clearly, the Vocabulary item *were* does not carry a singular/plural distinction in its representation for speakers who allow *were* with either 2nd-person singular or plural subjects. By hypothesis, the featural representation of the singular/plural distinction is lost on the way to phonological realization—that is, during the post-syntactic morphological computation to the PF interface. Following Bonet (1991), Noyer (1998), Harley (in press), Bobaljik (2002), and others, we model this information loss as the result of deletion rules that operating on morphosyntactic features. These rules are called Impoverishment because they enact the loss of otherwise expected morphological distinctions.

In the English case at hand, the loss of any number distinction in the second person is the result of an Impoverishment rule that applies categorically. This rule, given in (12) below, states that any Number features [±Pl] on the morphosyntactic terminal Tense (T) are deleted whenever T has Person phi features valued :

(12) Categorical [±Pl] Impoverishment rule, English varieties w/o leveling

$$T_{[\pm Pl]} \quad → \quad T_{[\varnothing]} \quad / \quad T_{[+Part \, , \, -Auth, \, \_\_ \,]}$$

This Impoverishment operation causes the loss of any number features in the environment of 2nd person, or [+Part , -Auth], as exemplified in (13) below:

(13) Morphological Impoverishment of number on T, English

IMPOVERISHMENT → $you_{[+Part, -Auth, -Pl]}$ ... $T_{[+Part, -Auth, -Pl]}$ ...

$you_{[+Part, -Auth, -Pl]}$ ... $T_{[+Part, -Auth]}$ ...

The result of (12) will be that a copular verb with a 2sg subject cannot insert the otherwise expected form *was*, because this terminal no longer bears the feature [-Pl], and hence is ineligible for exponence by *was* in accordance with the Subset Principle above. As a result, only the 'default,' or 'Elsewhere' item, *were* can be inserted, resulting in *You were*. Note that Adger (2006) adopts an alternative possibility, which we discuss below, whereby there are two Vocabulary items for *were*, with a distinct one for 2sg (or perhaps 2nd person more generally). Indeed, we think this is a real possibility for some dialects and speakers.

Before proceeding, we would like to mention the important role played by Elsewhere items in Distributed Morphology and in realizational theories of morphology more generally. Müller (2006), working on a general model of inflectional syncretism, points out that the Icelandic nominal declension exhibits a good deal of transparadigmatic syncretism. He suggests that a very practical restriction on the mapping between morphosyntactic features and Vocabulary Items, both from a learnability point of view and from empirically attested patterns, comes from the existence of a maximally underspecified Elsewhere Marker. Müller suggests that the existence of Elsewhere Items places an upper bound of the lack of "paradigm economy" (i.e. on the number of distinct signals markers within a set of inflectionally-related forms).

Müller musters important empirical and conceptual arguments for the existence of Elsewhere items, like English *were* above. An important consequence of the interaction of the Subset Principle and Impoverishment Theory is that Impoverishment will yield a terminal ineligible for its normal or expected Vocabulary item and hence a less-specified, often Elsewhere item will be inserted. It is thus expected that syncretism or "leveling" cannot occur with a highly specified item, such as *am*. In other words, the theory predicts the impossibility of *am*-leveling in a dialect of English. We return to this prediction in Section 4 below.

2.3 Impoverishment theory and morphosyntactic markedness

We specifically examine the conditioning role of markedness, formalized as the asymmetric grammatical treatment of one of the values of a binary feature. It is our hope that, regardless of differences among models of how deletion is achieved, the features themselves will be recognized as crucial for determining the environments in which variable syncretism occurs.

For all three phi features introduced in Section 2.2 above, [±Participant], [±Author], and [±Plural], the positive value (+) is marked (see especially Greenberg 1966, who however did not use [±Participant]). In marked environments, we expect to see fewer inflectional distinctions being overtly manifested. As Croft (1990) states, "If one is looking for inflectional-behavioral evidence for the markedness patterns of values in a grammatical category, one must look at other categories orthogonal to the category in question and count morphological distinctions." Thus, as 1st person and 2nd person are marked compared to 3rd, we expect to see a pattern of Impoverishment in the former group but not the latter. Similarly as plural is marked compared to singular, we expect to see a pattern of Impoverishment in the former group but not the latter.

In addition, we assume, following Croft (1990), Bresnan Deo and Sharma (2007), and others, that Negation is a marked environment. For convenience, we encode assertive polarity featurally as [±Negation], where again, '+' is the marked value.

2.4 Mechanisms of intra- (and inter-) speaker variation

All theories of morphosyntax provide mechanisms to account for the familiar phenomenon of allomorphy, where variant forms appear deterministically in a certain morphosyntactic environment. However, current theories lack mechanisms that can explain the existence of intra-speaker variation (a.k.a. inherent variation, sociolinguistic variation, or Labovian variation), where variant forms appear probabilistically in the same environment. Addressing the issue of mechanisms would seem to be a prerequisite for answering further questions about the relationship between intra-speaker variation and other phenomena such as language change.

Due to the longstanding gap between sociolinguistics and syntactic theory, this well-documented and evidently ubiquitous empirical phenomenon has gone largely without explanation in the Distributed Morphology (DM) theoretical framework (Halle and Marantz 1993, Embick and Noyer 2007), and other realizational theories of syncretism (e.g. Anderson 1992, Beard 1995, Wunderlich 1996, Stump 2001, Ackema and Neeleman 2004).

As a general set of desiderata, a mechanistic theory of variation should explain the following: a.) what kind of objects are the variant forms, b.) what kind of structure constitutes their environment, and c.) why do the forms appear variably instead of categorically. The theory should explain, in other words, how the mechanisms of variation differ from those of allomorphy.

In our DM model, a.) the variant forms are different phonological exponents of underspecified Vocabulary items, b.) their environment consists of the phi-features and associated values of terminal nodes, and c.) the forms appear variably instead of categorically when phi-feature deleting Impoverishment rules apply variably instead of categorically in the morphological component.

In developing a theory of morphosyntactic variation based on variable Impoverishment rules, we by no means intend to exclude other mechanisms of variation. For the cases at hand, in which the presence of marked morphosyntactic features lead to use of a default exponent—an Elsewhere Vocabulary item—Impoverishment rules turn out to provide a very good model. In dealing with variable syncretism, we attempt to follow the observation of Bresnan, Deo, and Sharma (2007) that "Variation within a single grammar bears a close resemblance to variation across grammars." In our model, the presence or absence of Impoverishment rules in different dialects of, for example, Basque can be related to variable application of these rules within a single speaker of Monmouthshire English.

We do not attempt any theory of the social significance of Labovian variation (e.g. Chambers 2002), which we regard as arising in the interaction of extra-linguistic performance systems and whatever variable mechanisms the grammar makes available. At this point, we would like to emphasize that our proposal for variable rules in morphology still allows us to maintain a "use-free" model of grammar (here we disagree with Embick to appear-b, who argues that only competing grammars can exclude usage). Following Adger's (in press) clearly drawn distinction between cognitive modules of Grammar (G) and Usage (U), there is no rule within our model that makes reference to the frequency of a variant, or to the social meaning of a variant. While U is clearly sensitive to both of these factors, G is sensitive only to morphosyntactic features and structures built up from them. U itself does not construct morphosyntactic representations, but simply conditions the probability of a variable rule being chosen to apply, or not, when the rule's structural description is met in G.

2.5 Variable rules in sociolinguistics

Variable rules have been proposed in the sociolinguistics literature in order to account for phenomena that resemble the normal input-output mapping processes modeled by rules with a structural description and a structural change, but which are not empirically observed to apply 100% of the time that their structural description is met.

A clear example can be found in the study by Guy (1991), who considers a phonological deletion rule in English, namely post-consonantal coronal stop deletion (e.g. *went* → *wen', paint* → *pain'*, etc.) in terms of a derivational rule in the standard generative phonology tradition. Guy models post-consonantal *t/d*-deletion with a structural description and a structural change, but crucially includes the fact that the rule fires with a *variable probability of application,* denoted as p_a:

(14) *-t, d* Deletion   (Guy 1991: 8)

<variable, probability of application = p_a>

$[t, d]$ → < Ø > / C___]

Deletion rules in phonology are often understandable in terms of either paradigmatic or syntagmatic markedness; in the case of word-final cluster simplification, there is clearly a marked dimension to consonant clusters and word-final coda position, both of which are resolved by variable application of a deletion rule.

3. Three Case Studies of Variable Impoverishment Rules

This section contains three case studies of leveling variation in agreement paradigms of *be* for several varieties of English. In each case, we argue that the observed patterns arise from a variable Impoverishment operation targeting a particular marked feature.

3.1 *Be* leveling in Monmouthshire, Wales: [+Auth] is marked

Our first case comes from Monmouthshire, a county in the southeast of Wales that is adjacent to Gloucestershire county, England.[4] We compare the variable leveling pattern in Monmouthshire with categorical syncretism in the counties of Devon and Wiltshire, England. The data appear in the *Survey of English Dialects* (SED, Orton 1962-1971) and Ihalainen (1991). For the following present-tense paradigms, we have relied upon SED data reported by Bresnan, Deo, and Sharma (2007).

3.1.1 The pattern
Both Devon and Wiltshire have categorical leveling to the plural form *be* in the first person, as illustrated in (15) below.

(15) Paradigm of Devon and Wiltshire (WS) *be* leveling (leveled forms **bold**)

	Singular	Plural
1st	*I **be***	*us be*
2nd	*thee art (WS: beest)*	NO DATA[5]
3rd	*her is*	*they be*

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[4] Although Bresnan, Deo and Sharma (2007) discuss data from Monmouthshire (starting on page 328), their map of the English counties (Figure 1, page 304) does not include Welsh Monmouthshire.
[5] Actually, no data is reported for 2pl in the SED.

Of interest for the Impoverishment analysis is the instantiation of this pattern as variable leveling to *be* (alternating with *am*) in Monmouthshire, as shown in (16) below.[6]

(16) Paradigm of Monmouthshire *be* leveling (variant with %)

	Singular	Plural
1st	*I **be** (%am)*	*us be*
2nd	*thee beest*	NO DATA
3rd	*her is*	*they be*

3.1.2 Impoverishment analysis

We propose the following Vocabulary for present tense *be* in Devon, Wiltshire and Monmouthshire. Note that *be* is the Elsewhere item on this analysis: it is compatible with any phi-feature set that arrives from the syntax or subsequent Impoverishment operations, but will be blocked by more specific Vocabulary items when these are compatible.

(17) Vocabulary for [*be* $T_{[\text{-Past, } \varphi]}$], Devon, Wiltshire, and Monmouthshire (MS)

[+Auth, -Pl]	⇔	/æm/
[+Part, -Auth]	⇔	/aɹt/ (WS, MS: /bɪst/)
[-Pl]	⇔	/ɪz/
elsewhere	⇔	/bi/

The following Impoverishment rule will account for the observed patterns of leveling variation. In this case, the marked feature [+Author] triggers deletion of phi features in the 1st person, allowing the insertion of a default form, *be*. This analysis links inter- and intra-speaker variation to the same mechanism: when Impoverishment applies categorically, the Devon/Wiltshire pattern results, and when Impoverishment applies variably, the Monmouthshire pattern results.

(18) Phi Impoverishment rule
     (Variable in Monmouthshire, categorical in Devon/Wiltshire)

$$T_{[\text{-Past, } \varphi]} \quad (\%) \rightarrow \quad T_{[\text{-Past, } \varnothing]} \quad / \quad T_{[\text{+Auth}]}$$

This Impoverishment rule deletes the phi-features on copulas when they contain a marked [+Auth] feature. As a consequence, only the Elsewhere item *be* will be available as a phonological exponent of the resulting phi-feature matrix.

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[6] Actually, in the SED, one individual from Monmouthshire and one from neighboring Gloucestershire had this pattern of variation, which we refer to as a Monmouthshire pattern following Bresnan, Deo, and Sharma (2007: 307 fn. 7; 329 Fig. 20).

3.2 *Was* leveling in Buckie, Scotland: [+Part] is marked

Buckie is a small and relatively isolated fishing village located in northeastern Scotland. Primary documentation of the Buckie dialect is found in Jennifer Smith's (2000) dissertation (see also Tagliamonte and Smith 2000 for comparison of leveling in Buckie and other dialects). In the discussion that follows, we rely on the descriptions of Buckie reported in Adger and Smith (2005) and Adger (2006).

3.2.1 The pattern
There is a "relatively rare variable/categorical split" (Adger and Smith 2005: 167) in the morphosyntactic environment for leveling in Buckie. Although leveled *was* occurs variably with full DP subjects (% *the boats was*), *was* is completely unattested with 3p pronominal subjects (**they was*).[7]

(19) Buckie *was* leveling, attested examples (Adger and Smith 2005: 156)

    a. Aye, I thought you was a scuba diver.
    b. We played on 'at beach until we was tired [...].
    c. They were (*was) still like partying hard.
    d. The mothers was roaring at ye comin' in.

(20) Paradigm of Buckie *was* leveling (leveled forms **bold**, variants with %)

	Singular	Plural
1st	*I was*	*we **was** (%were)*
2nd	*you **was** (%were)*	*you **was** (%were)*
3rd	*(s)he was*	*they were (*was)*
DP	*a boat was*	*boats **was** (%were)*

The crucial point is that there is categorical non-variation in 3rd person and variation in 1st and 2nd person. These, by hypothesis, share a marked feature: [+Particpant].

3.2.2 Impoverishment analysis
To derive the variation with pronouns, excluding 3p *they*, we propose the following Impoverishment analysis. Our analysis relies on Adger's (2006) idea that there is, in fact, accidental homophony in the Buckie analysis—in our DM terms, that there are two different Vocabulary items for *were*. Indeed, this idea reveals another source of variation: the ambiguous shape of the English paradigm, which allows for two possible analyses. Either 2sg is Impoverished and

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[7] On Adger and Smith's (2005: 168-170) analysis, which we accept provisionally, D's number features are variable in Buckie. This variation could be located in a feature copying rule, or it could be lexical as in Adger and Smith (2005). Either D inherits the number feature of its NP complement (ia), or it is specified for singular number regardless of NP's number feature (ib).

(i)   a. [$_{DP}$ D$_{[\alpha \pm Pl]}$ [$_{NP}$ N$_{[\alpha \pm Pl]}$]]
        b. [$_{DP}$ D$_{[-Pl]}$ [$_{NP}$ N$_{[\alpha \pm Pl]}$]]

were is the Elsewhere form, as above for other English varieties, or the Vocabulary item for 2sg is highly specified, and *was* is the Elsewhere form. It is this latter Vocabulary that we propose for Buckie, as illustrated below.[8]

(21) Vocabulary for [*be* T$_{[+Past, \varphi]}$], Buckie

[+Part, -Auth]	⇔	/wəɹ/
[+Pl]	⇔	/wəɹ/
elsewhere	⇔	/wʌz/

By hypothesis, the positive value (+) of the feature [±Participant] is marked. We propose a variable Impoverishment rule that deletes all of T's phi features (both Person and Number) when T has a [+Part] feature. This allows variable insertion of the Elsewhere exponent *was*, the leveled form. This Impoverishment rule will not apply when T's Participant feature has a negative value (-), so we don't find *was* leveling with 3p *they* [-Part, -Auth, +Pl]. *Was* leveling with plural DPs is due to a distinct mechanism, as mentioned in footnote (7) above.

(22) Variable Phi Impoverishment rule, Buckie

$$\text{T}_{[+Past, \varphi]} \quad \%{\to} \quad \text{T}_{[+Past, \varnothing]} \quad / \quad \text{T}_{[+Part]}$$

(23) Morphological Impoverishment of phi on T, Buckie

IMPOVERISHMENT →
$$we_{[+Part, +Auth, +Pl]} \dots [be \text{ T}_{[+Past, +Part, +Auth, +Pl]}]$$
$$we_{[+Part, +Auth, +Pl]} \dots [be \text{ T}_{[+Past]}]$$

This rule is relativized to the past tense. Arguably, the past tense is a more marked environment to begin with. Indeed, all English verbs except the copula already show no inflectional distinctions there. Thus, we might predict an implicational generalization such that no dialect of English Impoverishes in the present tense but *not* in the past tense. We return to this prediction in Section 4 below.

3.2.3 Discussion of Adger's (2006) Combinatorial Variability analysis
Adger (2006) adopts a feature co-occurrence restraint that prevents the feature [±Auth] from appearing in the same terminal with the feature [−Part]. Thus, differently from the system proposed in Section 2 above, 3rd person pronouns lack a [-Auth] feature in his theory:

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[8] See also Mittelstaedt and Parrott (2002), who proposed this analysis of *were* for English in general.

(24) Pronominal features of English (adapted from Adger 2006: 508)

	Singular	Plural
1st	*I* = [+Sing, +Part, +Auth]	*we* = [-Sing, +Part, +Auth]
2nd	*you* = [+Sing, +Part, -Auth]	*you* = [-Sing, +Part, -Auth]
3rd	*she* = [+Sing, -Part]	*they* = [-Sing, -Part]

Adger (2006: 518) formalizes an algorithm by means of which children acquire the features of lexical items. This algorithm reduces "optionality, synonymy, and the size of the lexicon," as reproduced below.

(25) Seek Maximal Generalization by

(a)   Generating all n-feature LIs, where n = 1.
(b)   Matching them with forms.
(c)   Rejecting all LIs where it is not the case that a feature bundle can always be mapped to a single form (Reject Optionality); that is, an LI is kept if there is a form which that LI always matches.
(d)   If a feature can always be mapped to a single form, but this creates synonymy, eliminate LIs to reduce synonymy as much as possible (Reject Synonymy).
(e)   Recursing over n = n + 1, with the proviso that if a form has been successfully analysed in the n – 1th step, LIs capturing it in the nth step will be rejected (Minimize Lexicon).

The formalization of such an algorithm is an important step to understanding how speakers assemble feature combinations and map these to morphophonological forms in the process of acquisition. We furthermore agree with Adger (pers. comm.) that this or a similar algorithm can be used to assemble Vocabulary items. Translating Adger's (2006: 521) proposed lexical items into Vocabulary items yields the following for Buckie (homophonous exponents are subscripted for further reference directly below). Notice that these Vocabulary items will not compete for insertion because they are all maximally underspecified, with only one morphosyntactic feature each:

(26) Combinatorial Variability and Vocabulary for [*be* T$_{[+Past, \varphi]}$], Buckie

[+Sing]   ⇔   /wʌz/$_1$

[-Sing]   ⇔   /wəɹ/$_1$

[+Part]   ⇔   /wʌz/$_2$

[-Auth]   ⇔   /wəɹ/$_2$

[+Auth]   ⇔   /wʌz/$_3$

(27) Vocabulary Insertion (←) in Buckie

I ... [*be* T$_{[+Sing, +Part, +Auth]}$]　　　　←　　　/wʌz/$_1$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_2$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_3$

You ... [*be* T$_{[+Sing, +Part, -Auth]}$]　　　←　　　/wəɹ/$_2$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_1$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_2$

$(S)he$ ... [*be* T$_{[+Sing, -Part]}$]　　　　←　　　/wʌz/$_1$

We ... [*be* T$_{[-Sing, +Part, +Auth]}$]　　　←　　　/wəɹ/$_1$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_2$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_3$

You ... [*be* T$_{[-Sing, +Part, -Auth]}$]　　　←　　　/wəɹ/$_1$

　　　　　　　　　　　　　　　　　　　　　　OR /wəɹ/$_2$

　　　　　　　　　　　　　　　　　　　　　　OR /wʌz/$_2$

$They$ ... [*be* T$_{[-Sing, -Part]}$]　　　　←　　　/wəɹ /$_1$

Adger's account can thus derive the variable *was/were* pattern as a result of stochastic choice of Vocabulary items. Crucially, there is no Elsewhere item in this model, and thus there are two important differences from the account we present above: a.) the fact that the 'leveled' **forms** use the item that already has the most heterogeneous distribution (e.g. *was*, being shared by 1sg and 3sg, bears no common feature) and b.) the fact that the 'leveling' **environments** are characterized by markedness. By contrast, these two properties are immediate consequences of our proposed markedness-based Impoverishment account, which leads to 'emergence of the least-specified' as a source of leveling. Adger's (2005) model could essentially generate variable leveling of a wide range of patterns based on the inputs. It is not clear that it could rule out, for example, *am* leveling among 1st and 2nd persons as a possible diachronic endpoint of change.

3.3 *Weren't* and *ain't* leveling on Smith Island, MD: [+Neg] is marked

Smith Island, Maryland (really a small cluster of islands and marshy wetland areas) is located in the Chesapeake Bay on the East coast of the United States. This extremely isolated community is moribund for economic reasons, and erosion coupled with rising sea levels will make the islands uninhabitable in less than a century. Schilling-Estes (1997), Schilling-Estes and Wolfram (1999), Schilling-Estes and Wolfram (2003), and Wolfram and Schilling-Estes (2003) present extensive details on variation and change in progress on Smith Island. In

what follows, we rely on data reported in Schilling-Estes (2000) and Mittelstaedt (2006).

3.3.1 The weren't leveling pattern

In both variationist studies of past-tense *be* carried out to date (Schilling-Estes 2000, Mittelstaedt 2006), leveling to the form *were* with 1sg and 3sg pronominal or DP subjects is completely unattested on Smith Island.[9]

(28) a. * I were scared.
      b. * She were scared.
      c. * The boat were slower.

Both the full (*not*) and contracted (*-n't*) forms of negation are attested with past-tense *be* on Smith Island (example from Parrott 2007).

(29) No it wasn't, I can assure you this John Dunne poem was not in any way shape or form meant as a threat.

However, leveling to the form *were* with the full form of negation is completely unattested on Smith Island.

(30) a. * I were not scared.
      b. * She were not scared.
      c. * The boat were not slower.

On Smith Island, variable leveling to the form *weren't* is very well attested, and used at high levels by the whole population. *Weren't* leveling is attested with 1sg and 3sg pronominal and 3sg DP subjects (examples from Mittelstaedt 2006 and pers. comm.):

(31) a. I weren't able to answer.
      b. I weren't very old.
      c. She weren't that close to you.
      d. He weren't expecting a boat.
      e. The man weren't there every day.
      f. Ma weren't doing no laughing.

The phenomenon of *weren't* leveling is found in various communities in addition to Smith Island; see for example Schilling-Estes and Wolfram (1994), Britain

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[9] We do not discuss Smith Island *was*-leveling in this article. While *was* (and *–s*) leveling is well attested with DP subjects, Schilling-Estes (2000) reports only 5/68 tokens of *was*-leveling with pronominal subjects; Mittelstaedt (2006) found zero attestations of *was*-leveling with pronominal subjects. Whether this dialect has completely lost *was* leveling with pronominal subjects, or whether more data might reveal a pattern of variable leveling restricted to certain pronouns, are questions that will have to be addressed in future research on Smith Island.

(2002), Schilling-Estes and Wolfram (2003), and Wolfram and Schilling-Estes (2003).

3.3.2 *Impoverishment analysis of* weren't *leveling*

To summarize the pattern discussed above, 1sg and 3sg pronouns variably allow the expected form *wasn't* or the leveled form *weren't* on Smith Island. Two observations inform our analysis of this pattern. First, leveling occurs only with the contacted form of negation –*n't*, and never with the full form *not*. This is the result of a locally determined morphological process in the environment of negation; -*n't* is not merely the result of phonological 'contraction' of *not* (Zwicky and Pullum 1983), but is morphosyntactically local to its host terminal $T_{[+Past]}$. Second, *were* is the Elsewhere form of past-tense *be* in Smith Island:

(32) Vocabulary for [*be* $T_{[+Past, \varphi]}$], Smith Island

$$[\text{-Pl}] \quad\quad \Leftrightarrow \quad /w\Lambda z/$$
$$\textit{elsewhere} \quad \Leftrightarrow \quad /w\partial\textrm{ɹ}/$$

Thus, we propose that a variable Impoverishment rule can delete the [±Pl] feature entirely whenever [*be* $T_{[+Past, \varphi]}$] occurs in the same morphosyntactic terminal complex as [+Neg], as indicated using the 'maximal word' notation (M-word = [$_M$ …]) of Embick (to appear-a).

(33) Variable [±Pl] Impoverishment rule, Smith Island

$$T_{[+Past, \pm Pl]} \quad \% \rightarrow \quad T_{[+Past, \varnothing]} \quad / \quad [_M \underline{\quad} +\text{Neg}]$$

In fact, as only [±Pl] is otherwise distinguished, (32) could be generalized to Impoverishment of all phi features on $T_{[+Past]}$:

(34) Alternate variable Phi Impoverishment rule, Smith Island

$$T_{[+Past, \varphi]} \quad \% \rightarrow \quad T_{[+Past, \varnothing]} \quad / \quad [_M \underline{\quad} \text{Neg}]$$

While adopting fairly standard accounts of negation (e.g., Zanuttini 1997) and head movement in the narrow syntax (e.g., Roberts 2001), we would like to remain somewhat agnostic regarding the precise morphosyntactic analysis of –*n't*, pending further research. However, it is crucial that [+Neg] occupy the same M-word as [*be* $T_{[+Past, \varphi]}$] in order to trigger Impoverishment in the morphological component. M-word locality constitutes an important structural constraint on this morphosyntactic operation, and furthermore restricts the range of environments where an 'overload' of marked features can cause Impoverishment.

Again, we stress that [+Neg] is a marked feature (here, we agree with Bresnan, Deo and Sharma 2007). In our model, the presence of [+Neg] within the same M-

word causes variable Impoverishment deletion of phi features in past-tense *be*, yielding the Elsewhere form *were*(*-n't*).

3.3.3 *The* ain't *leveling pattern*

In addition to *weren't* leveling, on Smith Island present-tense *be* and *have* level variably to the form *ain't* in all values of person and number. As in every other dialect of English that we are aware of, there is no independently occurring form *ai* for present-tense *be* or *have* without the contracted form of negation.

(35) *Ain't = be+n't* (attested, Mittelstaedt pers. comm., 2006)

	Singular	Plural
1st	*I **ain't** gonna have nothing*	*we **ain't** sure he's Buck's*
2nd	*you **ain't** gonna cook nothing*	NO DATA
3rd	*he **ain't** gonna do it*	*they **ain't** pretty*
	*she **ain't** very good*	

(36) *Ain't = have+n't* (attested, Mittelstaedt pers. comm., 2006)

	Singular	Plural
1st	*I **ain't** been to DC*	NO TOKENS
		(*Cf. we haven't lost a lot a people*)
2nd	*you **ain't** really accomplished nothing*	NO DATA
3rd	*he **ain't** been home*	NO TOKENS (*Cf. they haven't*
	*she **ain't** been critiqued much*	*come up with a answer*)

Furthermore, the leveled form *ain't* appears where present-tense *do* is ambiguous with *have*—as a finite auxiliary hosting negation with the participial verb of possession *got*.

(37) *Ain't = have+n't (do+n't)* (attested, Mittelstaedt pers. comm., 2006)

	Singular	Plural
1st	*I **ain't** got no Sprite*	*we **ain't** really got any fields*
2nd	*you **ain't** got a thong, do you?*	NO DATA
3rd	*he **ain't** even got a*	NO DATA
	*make sure she **ain't** got no water in*	

On Smith Island there is no *ain't* leveling with any other instances of *do+n't*, and thus we regard (36) as an underlying instance of *have* (despite the tag question "*do you?*").

3.3.4 *Impoverishment analysis of* ain't *leveling*

Before attempting an Impoverishment analysis of *ain't* leveling on Smith Island, we acknowledge that there is a very large literature on contracted negation and *ain't* in English dialects to which we cannot do full justice here: see among others Hazen (1996), Tagliamonte and Smith (2002), and Anderwald (2002, 2003, 2004). This oft-pilloried form has a long history. Walker (2005: 4) provides the following as the first attestation of contracted negation in English, from 1652:

(38) *But **mayn't** I Bar points, being the Challenged?*
(John Tatham, The Scotch Figgaries, or a Knot of Knaves IV, i, Oxford English Dictionary, 1989)

The modern form *ain't* apparently developed from the contractions of "*are + not*, *have + not*, and *am + not*," as attested below (Walker 2005: 4):

(39) a. ***Han't** she tole you, and ha'not I told you...*
(The Sparagus Garden IV.v; Brome, 1635)

　　 b. *wee'l play heads or tails, who goes first, that's fair now, **e'nt** it?*
(The Mock-Tempest IV.ii; Duffett, 1674)

Turning to our own account of *ain't* leveling on Smith Island, the following observations are crucial. First, the existence of *ain't* leveling is still more evidence that the feature [+Neg] is marked, and can trigger (variable) Impoverishment deletion of phi features within its M-word.[10] However, unlike with *weren't* leveling above, *ai* is not obviously an Elsewhere form of *be* or *have*, and never occurs independently of –*n't*. Finally, the form *ain't* doesn't just level across the person and number paradigms of *be* and *have*: rather, it seems that the form *ain't* levels across the distinction between *be* and *have*.

Taken together, these observations about *ain't* require an analysis that includes details about the morphosyntax of verbal auxiliaries, and addresses questions about locally-determined allomorphy (Bobaljik 2000, Adger, Béjar and Harbour 2003). Specifically, *ain't* leveling raises the question of whether *ain't* is a 'monomorphemic' or 'suppletive' form, a kind of allomorph of negation, an allomorph of T, or a portmanteau.
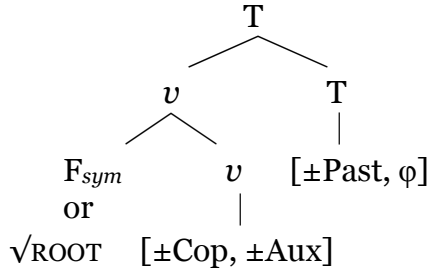
We assume that all verbal auxiliaries consist of a category head little *v* adjoined either to a Root (perhaps in the case of modals like *should*, etc.) or to certain syntactico-semantic features F*sym* that determine each auxiliary's unique semantics, argument structure, and complement selection properties. Little *v* consists of two features: [±Copular, ±Auxiliary]. We claim that the feature-value

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[10] Indeed, we would like to thank Christina Tortora (pers. comm.) for reminding us that all the cases of leveling with –*n't* involve the plural forms of *be/have*, either synchronically (in the case of *weren't*) or historically (in the case of *ain't*). This may support our analysis, since this fact might have to be treated as a coincidence on a non-Impoverishment account, whereas for us these plural forms are the Elsewhere exponents.

[+Cop] entails the feature-value [+Aux]; in other words, the feature-value combination *[+Cop, -Aux] is ruled out because no verbal element can be a copula but not an auxiliary.

(40) Morphosyntax of verbal auxiliaries

```
                        T
                      /   \
                   v         T
                 /   \       |
            F_sym      v   [±Past, φ]
             or        |
          √ROOT   [±Cop, ±Aux]
```

The operation of morphological Fusion (see above) applies to v and $F_{sym}/\sqrt{ROOT}$. Main verbs have the features $v_{[-Cop, -Aux]}$ and are adjoined with $T_{[±Past, φ]}$ through morphological lowering Merger (Embick and Noyer 2001). This allows the insertion of a distinct Vocabulary item at the terminal for $T_{[±Past, φ]}$ (e.g., the exponent $-d$).

(41) Morphosyntactic terminal features of main verbs + $T_{[±Past, φ]}$

$[_M [\sqrt{ROOT}, v_{[-Cop, -Aux]}] T_{[±Past, φ]}]$

The verbal auxiliaries have suppletive Vocabulary, as we saw above. Therefore, $v_{[±Cop, ±Aux]}$ must undergo Fusion with $T_{[±Past, φ]}$, yielding the following morphosyntactic terminals:

(42) Morphosyntactic terminal features of *be, have, do*

be	=	$[T_{[±Past, φ]}, v_{[+Cop, +Aux]}, F_{sym-be}]$	(auxiliary or copula)
have	=	$[T_{[±Past, φ]}, v_{[-Cop, +Aux]}, F_{sym-have}]$	(auxiliary)
do	=	$[T_{[±Past, φ]}, v_{[-Cop, -Aux]}, F_{sym-do}]$	(light verb)
do	=	$[T_{[±Past, φ]}, v_{[-Cop, -Aux]}]$	(*do* support for $T_{[±Past]}$)

This allows the insertion of single Vocabulary items for auxiliaries. The Vocabulary for auxiliaries is repeated here from above, with featural detail added. Recall that the categorical Impoverishment rule for 2sg is in effect on Smith Island, ensuring that the Elsewhere forms *were* and *are* are correctly inserted with the pronoun *you*.

(43) Categorical [-Pl] Impoverishment rule, Smith Island

$T_{[-Pl]}$ → $T_{[Ø]}$ / $T_{[+Part, -Auth, \_\_]}$

(44) Vocabulary for [*be*[+Cop, +Aux], T[+Past, φ]], Smith Island

   [-Pl]   ⇔   /wʌz/
   elsewhere   ⇔   /wəɹ/

(45) Vocabulary for [*be*[+Cop, +Aux], T[-Past, φ]], Smith Island

   [+Auth, -Pl]   ⇔   /æm/
   [-Pl]   ⇔   /ɪz/
   elsewhere   ⇔   /aɹ/

(46) Vocabulary for [*have*[-Cop, +Aux] T[-Past, φ]], Smith Island

   [-Part, -Pl]   ⇔   /hæz/
   elsewhere   ⇔   /hæv/

(47) Vocabulary for [*do*[-Aux] T[-Past, φ]], Smith Island

   [-Part, -Pl]   ⇔   /dʌz/
   elsewhere   ⇔   /du/

[+Neg] can be adjoined to T[Past:±], either through syntactic head movement or morphological Merger (as in Parrott 2007), forming a complex terminal M-word. In this context, the exponent of [+Neg] is *–n't*, while elsewhere the exponent is *not*. In other words, the 'contracted' form of English *not* is really a contextual allomorph of Negation.

(48) Vocabulary for English [+Neg] (Parrott 2007)

   [+Neg]   ⇔   /nt/   /   [M T[Past:±] ___]
   elsewhere   ⇔   /nat/

As above, parallel to past tense *weren't*-leveling in (33), we claim that a variable Impoverishment rule deletes phi features of T[+Past] when it is in the same M-word as marked [+Neg]. The claim that Negation is marked and triggers Impoverishment receives further support in the work of Tubau (in progress), who applies an Impoverishment-based analysis to variation in negative concord in Catalan.

However, for Smith Island *ain't* leveling, we propose an even more drastic Impoverishment rule caused by the M-word-internal environment of marked Negation. This rule deletes not only phi features, but also the [±Cop] feature of T[-Past].

(49) Variable [±Cop] and Phi Impoverishment rule, Smith Island

$$T_{[-Past, \varphi, \pm Cop, +Aux]} \quad \% \rightarrow \quad T_{[-Past]} \: / \quad \quad [_M \_\_\_ +Neg]$$

As a result of (49), *have-* and *be-* contexts will be leveled to *ain't*, losing not only their phi-features but also the [±Cop] distinction. On the other hand, *do-*contexts (which are [-Aux]) will simply undergo variable phi-feature Impoverishment. There is in fact variable leveling to the form *don't* in the 3rd person on Smith Island (attested, Mittelstaedt pers. comm., Mittelstaedt 2006):

(50) a. *he don't care where he's at*
     b. *she don't have the kids*

When (49) operates on the [+Aux] categories corresponding *have* and *be,* however, the resulting terminals become ineligible for insertion by an exponent realizing [+Aux] and [±Cop]. No Vocabulary items can be inserted into the Impoverished terminal because of the Subset Principle ("Insertion does not take place if the Vocabulary item contains features not present in the morpheme"). As seen in (35) and (36), the result of this variable Impoverishment is insertion of *ain't.*

There are two possible analyses of the phonological string *ain't*. First, it could be that the exponent *ai* is a contextual allomorph of $T_{[-Past]}$ when M-word internal with [+Neg]. On this analysis, the [+Neg] terminal realizes its–*n't* exponent independently:

(51) Hypothetical Vocabulary 1 for $T_{[-Past]}$, Smith Island

[-Pl, -Part] ⇔ /z/
else ⇔ /ei/ / [_M ___ Neg]
else ⇔ Ø

The Vocabulary item for *ai* item is more highly specified than Ø —with contextual features rather than substantive features for $T_{[-Past]}$. An objection might be that it is counterintuitive to analyze *ai* in *ain't* as an independent morpheme, because *ai* never appears by itself. For example, Parrott (2007, following Mittelstaedt and Parrott 2002), proposes a suppletion analysis of Smith Island *weren't* leveling, where the entire form *weren't* is inserted by a single non-competing Vocabulary item after late morphological Fusion (Kandybowicz 2007) of the [Neg] and [*be* $T_{[+Past]}$] terminals.

On this Impoverishment analysis, we maintain that *weren't* leveling involves two Vocabulary items, Elsewhere *were* and the negative allomorph *n't*. However, we analyze *ain't* as a single, portmanteau exponent, by hypothesizing a [+Neg] feature in the substantive features of a Vocabulary item for $T_{[-Past]}$:

(52) Hypothetical Vocabulary 2 for T$_{[-Past]}$, Smith Island

[-Pl, -Part]   ⇔   /s/
[+Neg]   ⇔   /eint/
else   ⇔   Ø

This analysis requires morphological Fusion of the tense and negation terminals. Fusion creates a single locus of Vocabulary Insertion for the exponent *ain't*, and additionally prevents the independent insertion of *–n't* in [+Neg]. Certainly this application of Fusion will have to occur late in the morphological derivation (Kandybowicz 2007), after iterated searches and insertions of other Vocabulary items (Parrott 2007).

(53) Morphological Fusion of T$_{[-Past, (-Cop)]}$ and [+Neg]

$$...[_M \, T_{[-Past, (-Cop)]} \, [+Neg] \,]...$$
FUSION →
$$...[_M \, T_{[-Past, (-Cop)]}, \, +Neg]...$$

On this analysis, then, /eint/ is a single exponent Vocabulary item inserted at the severely Impoverished terminal [$_M$ T$_{[-Past, (-Cop)]}$, +Neg]. Again, we stress our point that the marked feature [+Neg] causes variable Impoverishment of not only T's phi features, but of the *v*[+Aux] feature that *be* and *have* share, but that distinguishes these from *do*.

4. Future Directions for Variable Impoverishment Research

To conclude, we would like to pose a few outstanding questions, which we leave for further inquiry. These questions are both empirical and theoretical in nature.

4.1 Markedness of the past tense and Impoverishment

Past tense is generally regarded as being more marked than present tense. As a result, given the overall markedness-based Impoverishment approach to leveling proposed in this paper, we predicted above that a past/present implicational generalization should hold if Impoverishment is triggered by markedness. That is, no dialect of English should show a pattern of leveling in the present tense but not in the past tense. In the SED past-tense patterns that we have inspected in comparison to the present-tense forms reported in Bresnan et al. (2007), this prediction appears to be fairly well supported. For Devon, Wiltshire,[11] Yorkshire, Somerset, Berkshire, Kent, Hampshire, and Sussex counties, leveling is reported in both present- and past-tense paradigms. For Cornwall county, no leveling is

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[11] Unfortunately, we have not been able to attain access the SED's past-tense data for Monmouthshire or Gloucestershire counties.

reported in the present tense, but there is leveling in the past-tense paradigm, consistent with the implicational generalization. Finally, "standard" English leveling to present-tense *are* in the 2sg is reported for Northumberland, Norfolk, and Suffolk counties, but no past-tense data is given for the 2nd person. It is reasonable to assume the same pattern occurs (i.e., *you were*), so that this does not constitute counter-evidence to the implicational generalization. Importantly, there is no dialect with leveling in the present tense in Bresnan et al. (2007) that does not have leveling in the past tense. If the past is marked with respect to the present, and marked environments trigger Impoverishment, this implicational pattern is predicted. More research will be required to determine whether every dialect with variable leveling in the present-tense paradigm also has it in the past-tense paradigm in order to verify this suggestive preliminary empirical generalization.

4.2 *Am* leveling

The model developed above states that (variable) paradigm leveling is the direct result of Impoverishment rules, caused by marked features, that delete distinctive phi and other features, and that the result of this deletion is a wider distribution of Elsewhere exponents. A straightforward prediction of our model is thus that no English dialect should have *am*-leveling, because *am* is not an Elsewhere form. While there are no robust reports of *am*-leveling across a present-tense paradigm, Ihalainen (1991) reports the existence of an unstressed phonologically weak *'m* form of the copula used with plural pronominal subjects in East Somerset dialects. The evidence does not, however, determine that *'m* comes from the copular *am,* rather than being a reduced form of the 3rd person plural pronominal *them;* the latter possibility is certainly a likely interpretation. An additional possible source of evidence for *am* leveling can be found in entries in the SED, such as those for Surrey, which list "are/am" as variant forms for *we*. Importantly, we have not found any instances of categorical *am*-leveling in the plural. As variable Impoverishment theory as formulated here is simply the variably applicable version of an ordinary categorical rule, we might expect to find dialects with categorical *am*-leveling, but none have been found as of yet. Given the wide range of *is*-leveling, *are*-leveling, and *be*-leveling patterns, we take the rarity of *am*-leveling to reflect confirmation of the underlying intuition of our analysis that insertion of highly specified forms cannot be fed by Impoverishment operations.

4.3 Frequency fitting

We have formulated variable rules above as ordinary deletion rules with a structural description and a structural change but simply with a variable probability of application. We have not, however, provided numbers to match the actual probabilities. In "bridging the gap" between formal morphosyntactic theory and the empirical richness of sociolinguistic variation, the question of

whether a mechanistic theory of intra-speaker variation should specifically build in devices for capturing the frequency of variants remains important and open to further discussion. One definite benefit of Adger's (2006) Combinatorial Variaibility theory is that it can model frequency in the proportion of variants. In the original versions of variable rule theory by Labov, Sankoff, Guy, and others, variable rules could have a certain specified probability of application p_a. This could also be implemented our theory, simply by stipulating that a given variable Impoverishment rule has a probability of application p_a. We remain unconvinced that this is indeed the case, because we are concerned that this method of capturing frequencies would simply have a *post hoc* flavor, as the following quotation from Guy can be read under some interpretations.

> *The practice in the field is usually to find out what values are obtained from an empirical study and then 'explain' the values post-hoc. Used in this way, the mechanics of a variable rule analysis become a discovery device, or a kind of summary statistic. But to use this device to test a hypothesis, or to pursue an explanation of the phenomena observed, requires something else in addition to the variable rule mechanisms, namely, a model or theory of the elements and the events of language.* (Guy 1991: 6)

It should be said that Guy (1991) derives the relative frequencies of application of intra-morphemic versus heteromorphemic *t/d*-deletion in an extremely insightful way, by employing the theoretical tools of Lexical Phonology, in which each rule has the possibility to apply on each cycle, thereby predicting that a rule which could have variably applied on two cycles will have a square of the probability of a rule that can only apply on one cycle. Guy's (1991) probabilities thus directly tie the variable application for each morphological unit to language-internal facts about their linguistic structure. An approach within this spirit may eventually be possible in accounting for fine-grained frequency effects in our model, by attempting to connect the probability of a variable rule's application with the degree of markedness of the features that trigger Impoverishment. We might speculate that markedness is not a binary property (±Marked), but rather a gradient quality of a feature, and that, for example [+Author] might be more marked with respect to [-Author] than [+Participant] is with respect to [-Participant]. However, we concur with Adger (2006: 506), who concedes that on any mechanistic theory of variation, "probabilities can be perturbed at the point of use by factors such as recency effects and metalinguistic judgments on the form." In other words, we must always leave open the possibility that language-external social and volitional factors can change variant frequencies in actual usage.

4.4 Cross-linguistic and cross-morphological validation

To conclude, we have examined the variable leveling found only in the English copula system, modeling it in terms of markedness within a post-syntactic

treatment of morphology. Further confirmation of this approach should ideally come from the generality of the applicability of this analysis to empirical data on variable leveling phenomena in other languages and in domains outside of copula systems, such as case morphology and DP-internal concord.

References

1989. Oxford English Dictionary, Second Edition. Oxford: Oxford University Press.

Ackema, Peter, and Neeleman, Ad. 2004. *Beyond Morphology: Interface Conditions on Word Formation*. Oxford: Oxford University Press.

Adger, David, Béjar, Susana, and Harbour, Daniel. 2003. Directionality of allomorphy: A reply to Carstairs-McCarthy. *Transactions of the Philological Society* 101: 109–115.

Adger, David, and Smith, Jennifer. 2005. Variation and the Minimalist Program. In *Syntax and Variation: Reconciling the Biological and the Social*, eds. Leonie Cornips and Karen P. Corrigan, 149-178. Amsterdam: John Benjamins.

Adger, David. 2006. Combinatorial variability. *Journal of Linguistics* 42: 503-530.

Adger, David. in press. Variability and modularity: A Response to Hudson. *Journal of Linguistics* 43.

Anderson, Stephen R. 1992. *A-Morphous Morphology*. Cambridge: Cambridge University Press.

Anderwald, Lieselotte. 2001. Was/were-variation in non-standard British English today. *English World-Wide* 22: 1-21.

Anderwald, Lieselotte. 2002. *I amn't sure – why is there no negative contracted form of first person singular be? In *Anglistentag 2001, Wien*, ed. Dieter Kastovsky. Trier: WVT.

Anderwald, Lieselotte. 2003. Non-standard English and typological principles: The case of negation. In *Determinants of Linguistic Variation*, eds. Günter Rohdenburg and Britta Mondorf. Berlin/New York: Mouton de Gruyter.

Anderwald, Lieselotte. 2004. Local markedness as a heuristic tool in dialectology: The case of amn't. In *Dialectology meets Typology: Dialect Grammar from a Cross-Linguistic Perspective*, ed. Bernd Kortmann, 47-67. Berlin/New York: Mouton de Gruyter.

Arregi, Karlos, and Nevins, Andrew Ira. 2007. Obliteration vs. Impoverishment in the Basque g-/z- Constraint. In *University of Pennsylvania Working Papers in Linguistics, Volume 13.1: Proceedings of the 30th Annual Penn Linguistics Colloquium*, eds. Tatjana Scheffler, Joshua Tauberer, Aviad Eilam and Laia Mayol. Philadelphia: University of Pennsylvania Working Papers in Linguistics.

Beard, Robert. 1995. *Lexeme-Morpheme Base Morphology: A General Theory of Inflection and Word Formation*. Oxford: Oxford University Press.

Bobaljik, Jonathan. 2002. Syncretism without paradigms: Remarks on Williams 1981, 1994. In *Yearbook of Morphology 2001*, eds. Geert Booij and Jaap van Marle. Dordrecht: Springer.

Bobaljik, Jonathan David. 2000. The ins and outs of contextual allomorphy. In *University of Maryland Working Papers in Linguistics, Volume 10*, eds. Kleanthes K. Grohmann and C. Struijke, 35-71. College Park, MD: University of Maryland.

Bonet, Eulalia. 1991. Morphology after Syntax: Pronominal Clitics in Romance, MIT: Doctoral Dissertation.

Börjars, Kersti, and Chapman, Carol. 1998. Agreement and pro-drop in some dialects of English. *Linguistics* 36: 71-98.

Bresnan, Joan, Deo, Ashwini, and Sharma, Devyani. 2007. Typology in variation: a probabilistic approach to *be* and *n't* in the *Survey of English Dialects*. *English Language and Linguistics* 11: 301-346.

Britain, David. 2002. Diffusion, leveling, simplification and reallocation in past tense BE in the English Fens. *Journal of Sociolinguistics* 6: 16-43.

Cedergren, Henrietta J., and Sankoff, David. 1974. Variable rules: Performance as a statistical reflection of competence. *Language* 50: 333-335.

Chambers, Jack K. 2002. *Sociolinguistic Theory: Linguistic Variation and its Social Significance (2nd Edition)*. Malden, MA: Blackwell.

Croft, William. 1990. *Typology and Universals*. Cambridge: Cambridge University Press.

Embick, David, and Noyer, Rolf. 2001. Movement operations after syntax. *Linguistic Inquiry* 32: 555-595.

Embick, David, and Noyer, Rolf. 2007. Distributed Morphology and the Syntax/Morphology Interface. In *The Oxford Handbook of Linguistic Interfaces*, eds. Gillian Ramchand and Charles Reiss, 289-324. Oxford: Oxford University Press.

Embick, David. to appear-a. Linearization and Local Dislocation: Derivational mechanics and interactions. *Linguistic Analysis*.

Embick, David. to appear-b. Variation and morphosyntactic theory: Competition fractionated. *Language and Linguistics Compass*.

Greenberg, Joseph H. 1966. *Language Universals With Special Reference to Feature Hierarchies*. The Hague: Mouton.

Guy, Gregory R. 1991. Explanation in variable phonology: An Exponential model of morphological constraints. *Language Variation and Change* 3: 1-22.

Halle, Morris, and Marantz, Alec. 1993. Distributed morphology and the pieces of inflection. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, eds. Ken Hale and Samuel Jay Keyser, 111-176. Cambridge, MA: MIT Press.

Halle, Morris. 1997. Distributed Morphology: Impoverishment and Fission. *MIT Working Papers in Linguistics*.

Harley, Heidi. in press. The Importance of Impoverishment. In *Phi Theory*: Oxford University Press.

Hazen, Kirk. 1996. The phonological and morphological justification of ain't. In *Sociolinguistic Variation: Data, Theory, and Analysis*, eds. Jennifer Arnold, Renée Blake, Brad Davidson, Scott Schwenter and Julie Solomon, 101-112. Stanford: CSLI.

Henry, Alison. 1995. *Belfast English and Standard English: Dialect Variation and Parameter Setting*. Oxford: Oxford University Press.

Ihalainen, Ossi. 1991. On grammatical diffusion in Somerset folk speech. In *Dialects of English: Studies in Grammatical Variation*, eds. Peter Trudgill and Jack Chambers, 104–119. London: Longman.

Kandybowicz, Jason. 2007. Fusion and PF architecture. In *University of Pennsylvania Working Papers in Linguistics, Volume 13.1: Proceedings of the 30th Annual Penn Linguistics Colloquium*, eds. Tatjana Scheffler, Joshua Tauberer, Aviad Eilam and Laia Mayol. Philadelphia: University of Pennsylvania Working Papers in Linguistics.

Labov, William. 1969. Contraction, deletion, and inherent variability of the English copula. *Language* 45: 715-762.

McFadden, Thomas. 2004. The Position of Morphological Case in the Derivation: A Study on the Syntax-Morphology Interface, University of Pennsylvania: Doctoral Dissertation.

Mittelstaedt, Jennifer, and Parrott, Jeffrey K. 2002. A Distributed Morphology account of weren't leveling. Paper presented at *New Ways of Analyzing Variation (NWAV) 31*, Stanford University, Palo Alto, CA.

Mittelstaedt, Jennifer. 2006. Auxiliary Leveling and Morphological Theory: The Case of Smith Island English, Georgetown University: Doctoral Dissertation.

Müller, Gereon. 2006. Notes on paradigm economy. In *Subanalysis of Argument Encoding in Distributed Morphology*, eds. Gereon Müller and Jochen Trommer: Universität Leipzig.

Noyer, Rolf. 1998. Impoverishment theory and morphosyntactic markedness. In *Morphology and its Relation to Syntax*, 264-285: CSLI Publications.

Orton, Harold. 1962-1971. *Survey of English Dialects*. Leeds: published for the Univeristy of Leeds by E.J. Arnold.

Parrott, Jeffrey K. 2007. Distributed Morphological Mechanisms of Labovian Variation in Morphosyntax, Georgetown University: Doctoral Dissertation.

Pesetsky, David, and Torrego, Esther. to appear. The Syntax of valuation and the interpretability of features. In *Clever and Right: A Festschrift for Joe Emonds*, eds. S. Karimi, V. Samiian and W. Wilkins.

Roberts, Ian. 2001. Head movement. In *The Handbook of Contemporary Syntactic Theory*, eds. Mark Baltin and Chris Collins. Malden, MA: Blackwell.

Rousseau, P., and Sankoff, David. 1978. Advances in variable rule methodology. In *Linguistic Variation: Models and Methods*, ed. David Sankoff, 57-69. New York: Academic.

Sankoff, David. 1978. Probability and linguistic variation. *Synthese* 37: 217-238.

Sankoff, David, and Labov, William. 1979. On the uses of variable rules. *Language in Society* 8: 189-222.

Schilling-Estes, Natalie, and Wolfram, Walt. 1994. Convergent explanation and alternative regularization patterns: *Were/weren't* leveling in a vernacular English variety. *Language Variation and Change* 6: 273-302.

Schilling-Estes, Natalie. 1997. Accommodation vs. concentration: Dialect death in two post-insular island communities. *American Speech* 72: 12-32.

Schilling-Estes, Natalie, and Wolfram, Walt. 1999. Alternative models of dialect death: Dissipation vs. concentration. *Language* 75: 486-521.

Schilling-Estes, Natalie. 2000. Exploring morphological change: The *was/weren't* pattern in Smith Island English. Paper presented at *New Ways of Analyzing Variation (NWAV) 29*, Michigan State University.

Schilling-Estes, Natalie, and Wolfram, Walt. 2003. Language change in "conservative" dialects: The Case of past tense *be* in Southern enclave communities. *American Speech* 78: 209-228.

Smith, Jennifer. 2000. Synchrony and Diachrony in the Evolution of English: Evidence from Scotland, University of York, England: Doctoral Dissertation.

Stump, Gregory T. 2001. *Inflectional Morphology: A Theory of Paradigm Structure*. Cambridge: Cambridge University Press.

Tagliamonte, Sali. 1998. *Was/were* variation across the generations: View from the city of York. *Language Variation and Change* 10: 153-192.

Tagliamonte, Sali, and Smith, Jennifer. 2000. Old *was*, new ecology: Viewing English through the sociolinguistic filter. In *The English History of African American English*, ed. Shana Poplack, 141-171. Malden, MA: Blackwell.

Tagliamonte, Sali, and Smith, Jennifer. 2002. "Either it isn't or it's not" NEG/AUX contraction in British dialects. *English World-Wide* 23: 251-281.

Tortora, Christina, Bernstein, Judy, den Dikken, Marcel , Zanuttini, Raffaella, Dooley, Goldie Ann, and Quirk, Erin. this volume. Subject agreement variation: confronting the hypothesis space with novel data.

Tubau Muntaña, Susagna. in progress. Negative Concord in English and Romance: Syntax-Morphology Interface Conditions on the Expression of Negation, Dept. de Filologia Anglesa i de Germanística, Universitat Autònoma de Barcelona: Doctoral Dissertation.

Walker, James A. 2005. The *Ain't* constraint: *Not*-contraction in early African American English. *Language Variation and Change* 17: 1-17.

Wolfram, Walt, and Schilling-Estes, Natalie. 1998. *American English: Dialects and Variation*. Malden, MA: Blackwell.

Wolfram, Walt, and Schilling-Estes, Natalie. 2003. Parallel development and alternative restructuring: The Case of *weren't* intensification. In *Sociolinguistic Dialectology: Papers in Honour of Peter Trudgill*, eds. Jenny Cheshire and David Britain, 133–153. Amsterdam: John Benjamins.

Wunderlich, D. 1996. A Minimalist model of inflectional morphology. In *The Role of Economy Principles in Linguistic Theory*, eds. C. Wilder, M. Bierwisch and H. M. Gärtner, 267-298. Berlin: Akademie Verlag.

Zanuttini, Raffaella. 1997. *Negation and Clausal Structure*. Oxford: Oxford University Press.

Zwicky, Arnold M., and Pullum, Geoffrey K. 1983. Cliticization vs. inflection: English n't. *Language* 59: 502-513.