Despite the emphasis placed on paradigms in many recent papers on morphology and phonology, we believe that linguists are, for the most part, using “paradigm” as a convenient cover term for a variety of distinct morphological issues. For example, much discussion within OT of “paradigm uniformity” uses “paradigm” to point to issues of allomorphy between “related” forms of a stem or root that do not crucially rely on paradigms in any demonstrable sense. These discussions employ paradigms to provide a set of forms that might be related via output-output constraints. Similarly, recent proposals enforcing anti-homophony between paradigm cells hinge not on paradigm structure per se, but rather on claims about output-output correspondence relations between forms.

Here we review another claim that paradigms play a role in the theory of morphology: Andrew Carstairs-McCarthy’s work on what he calls the “No Blur Principle” (1994). Through an examination of Carstairs-McCarthy’s analysis of Polish (Carstairs-McCarthy and Cameron-Faulkner (2000)), we demonstrate that “No Blur” is a claim directly about the organization of inflectional classes of stems, not about paradigms in the usual sense from the literature. We argue that even if “No Blur” were supported as a principle, it would provide no evidence for the reintroduction of paradigms as a functional concept within morphological theory. However, we also demonstrate that “No Blur” is in certain ways inconsistent with Carstairs-McCarthy’s (hereafter, C-M’s) general theory of morphology. In particular, to give “No Blur” empirical force, C-M must assume (i) that a given stem may belong to only one inflectional class, i.e., that inflectional classes neither are organized into a hierarchy of classes and subclasses nor cross-classify the set of stems, and (ii) that paradigms may not include accidentally homophonous affixes. But C-M’s own analysis of Polish effectively violates the first assumption and his treatment of syncretism within paradigms violates the second. We demonstrate that the driving force behind C-M’s analyses is really just the standard working assumptions of morphologists: avoid accidental homophony and maximize generalizations. With these principles, we are led to accounts of syncretism that effectively de-Blur paradigms in the relevant cases. Thus, when the empirical situation is examined, No Blur adds nothing to the auxiliary principles that would be necessary in any case.

2. Blurring, Contrast and the Information Content of Affixes

C-M (1994) assumes that a fundamental principle governing all language learning is Eve Clark’s Principle of Contrast that “<e>very two forms contrast in meaning.” (737) He notes (ibid.) that “<i>f the principle is at all close to being correct, exact synonyms should be nonexistent or rare… Yet when we focus on inflectional affixes rather than
complete wordforms, exact synonymy is apparently wide-spread…. Even in English … we can identify three distinct suffixed realizations for the past participle form of the verb 
\((-e)n, -(e)d, \text{ and } -t\) and various nonsuffixed realizations (vowel change as in sang … and more radical stem allomorphy …). So inflectional morphology seems hard to reconcile with the Principle of Contrast…” Nevertheless, C-M sets out to show that there is “way of reconciling the principle with the inflectional facts.”

In a spirit similar to that behind pedagogical grammars, C-M assumes that the data about inflections of a language are stored by speakers in the form of paradigms, and hence, in acquiring language, speakers acquire a set of paradigms. He defines the notion of paradigm relevant for purposes of his discussion as:

\textbf{Paradigm}\textsubscript{1}: the set of combinations of morphosyntactic properties or features (or the set of ‘cells’) realized by inflected forms of words (or lexemes) in a given word-class (or major category or lexeme-class) in a given language. [739]

That is, the units under discussion are the complexes of grammatical features whose phonetic exponents are the different affixes. On this view, the cells of a paradigm are derivative notions, defined in terms of “morphosyntactic properties.”

As C-M notes, this view of paradigms and the Principle of Contrast appears to give rise to an obvious objection. For example, the three affixes of the English participle 
\(-e)n, -(e)d, \text{ and } -t\) are “in competition” in the sense that “they realize exactly the same morphosyntactic properties and … the contexts in which they occur (i.e., the lexemes to which they attach) are not distinguishable in any nonarbitrary fashion (e.g., phonologically or semantically).” This set of competing affixes and innumerable similar competing affix sets familiar to morphologists “thus constitute clear prima facie evidence that the Principle of Contrast does not apply to inflectional morphology.” (740)

C-M observes that it is possible to construe competing affixes as obeying the Principle of Contrast, “inasmuch as they contrast in respect of the inflection classes with which they are associated.” (740) In other words, English \(-en\) is not just an exponent of the Past Participle, but rather the exponent of the Past Participle for the class of verbs \textit{take, break, choose, drive, prove}, and about 50 others, whereas \(-t\) is the exponent of Past Participle for the class: \textit{burn, learn, buy, mean, keep}, and about 35 others, etc. The recognition of inflectional classes of verbs does not render the different affixes appropriate for each class distinct semantically, as long as meaning is construed in the normal fashion. But since C-M does not want these semantically identical suffixes to constitute counter-evidence to Clark’s Principle, he amends Clark’s Principle as requiring phonetically distinct forms to contrast not in meaning, but rather in ‘information content,’ where ‘‘information content’ should be understood as embracing not just extralinguistic meaning, such as plurality or pastness, but also interlinguistic information such as gender or stem shape.” (741)

C-M is fully aware of the obvious objection to this move, which is that “<i>t renders inflection class diversity consistent with the Principle of Contrast only at the
expense of trivializing the principle entirely.” (741) He proposes to avoid this consequence by “saying that a given affix can have a given inflection class as part of its information content only if that affix is uniquely associated with that inflection class.”

Any two affixes which are each restricted to one inflection class will differ in information content… their coexistence is therefore consistent with the <Principle of Contrast>. But if we find two or more affixes each of which appears in more than one inflection class then they will not differ in information content … and their coexistence will be inconsistent with the principle. … Within any set of competing classes, each affixal realization for every cell must be either (a) peculiar to one class, or (b) the only realization for that cell which is shared by more than one class [the class default in case (b)]. (742)

This stipulation about affixes – completely internal to C-M’s theory of morphology – is codified as the No Blur Principle:

Within any set of competing inflectional affixal realizations for the paradigmatic cell, no more than one can fail to identify inflection class unambiguously. (742)

In evaluating the No Blur principle, one must keep in mind the procedure C-M uses for creating and displaying paradigms of noun and verb inflections. For nouns, for example, a full set of nouns from a language is first divided according to classifications that make a difference in the grammar; so, for example, a given stem might be of a particular gender, where gender triggers agreement and is thus relevant beyond the allomorphy of inflections. Within each class identified by this criterion, a two-dimensional matrix can be drawn, the rows of the matrix corresponding to sets of morphosyntactic features, such as case and number, expressed by inflection. For each class of nouns, a collection of allomorphs for particular sets of case and number features – e.g., Nominative Plural, Dative Singular – further divides the nouns into columns of inflectional classes, identified solely by the allomorphs the nouns take for combinations of case and number features (see e.g. the example in (6) below). Nouns belong to the same inflectional class – the same column – if they take exactly the same set of affixes for expressing the various combinations of case and number that are overtly realized in the language. On this view, inflectional classes emerge as columns in paradigms of forms. Inflectional classes become more interesting when there are implicational relations among the allomorphs for sets of words, e.g., if “takes –a in the Dative Singular” implies “takes –e in the Locative Singular.”

This understanding of inflection class provides the backdrop for explaining what kinds of paradigms are supposed to be ruled out by No Blur. Two such organizations of inflectional classes are relevant here, one in which inflectional subclasses appear to nest within inflectional classes and one in which inflectional classes cross-classify a set of words. Both of these are prima facie violations of No Blur. The imaginary paradigm in (1) illustrates the first case disallowed by No Blur; the subparadigm of Polish nouns in (2) illustrates the second. In (1) the allomorphs of the Dative suffix classify nouns into
two groups, “takes –a in the Dative” and “takes –b in the Dative” while the allomorphs of the Locative classify nouns into four groups, “takes {-c, -d, -e, or -f} in the Locative.” Within each of the classes determined by the Dative allomorphs, there are two subclasses determined by the Locative allomorphs. Since, in this paradigm, the Dative suffixes fail to identify their inflectional classes unambiguously (they appear in two classes each), the subclass case violates No Blur.

(1)

<table>
<thead>
<tr>
<th>Class</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dative</td>
<td>a</td>
<td>a</td>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>Locative</td>
<td>c</td>
<td>d</td>
<td>e</td>
<td>f</td>
</tr>
</tbody>
</table>

The second type of paradigm that violates No Blur, one in which inflectional classes cross-classify words, is shown in (2) — a sub-part of the Polish paradigm in (6) that we will examine in the central portion of this paper. Here there are two classes of nouns identified by the allomorphs of the Dative suffix, “takes –owi in the Dative” and “takes –u in the Dative.” In addition, there are two classes identified by the allomorphs of the Locative suffix, “takes –e in the Locative” and “takes –u in the Locative.” These classes identified by the Dative and Locative suffixes are apparently independent, so they cross-classify the Polish nouns. That is, being of the “takes –owi in the Dative” class does not predict which class a noun will be in with respect to the Locative and vice versa. Since Dative and Locative suffixes do not unambiguously identify the class (column) of a Polish noun, the paradigm in (2) is Blurred, in violation of No Blur.

(2)

<table>
<thead>
<tr>
<th>Class</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dative</td>
<td>-owi</td>
<td>-owi</td>
<td>-u</td>
<td>-u</td>
</tr>
<tr>
<td>Locative</td>
<td>-e</td>
<td>-u</td>
<td>-e</td>
<td>-u</td>
</tr>
</tbody>
</table>

To provide No Blur with empirical teeth, C-M needs two additional assumptions: one that prevents a stem from appearing in more than one inflectional class and one that disallows accidental homophony between affixes. We show below that C-M effectively violates the first assumption in his treatment of the “information content” of a stem, where information content is the notion that links No Blur to the Principle of Contrast. In addition, in offering no account of syncretism between rows of a paradigm, C-M effectively violates the assumption preventing accidental homophony as well. If C-M allowed stems to belong to more than one inflectional class, we could redraw the paradigm in (1) as in (3). Now each of the Locative suffixes uniquely identifies a class, indicated by the capital letters at the top of each column, while each of the Dative suffixes uniquely identifies the numerical class at the top of each column.
Note that under C-M’s approach to paradigmatic organization, the affixes themselves organize the stems into classes – columns – and the labels on the columns are not significant. Thus re-labeling the classes in (1) as in (3) would not change the fact that the paradigm is blurred in the technical sense. However, when C-M relates No Blur to the Principle of Contrast, he gives content to the label of the inflectional class – the informational content of a class-identifying affix involves the class as an entity that can be referred to. Once classes are features with “information content,” one needs to ask whether stems may or may not belong to more than one class, since they may in fact be both, e.g., class 1 and masculine.

In a similar manner to the transformation of (1) into (3), the paradigm in (2) would be effectively de-Blurred as in (4), where the Dative allomorphs determine the numerical classes, 1 or 2, and the Locative allomorphs the letter classes, A or B.

(4)

<table>
<thead>
<tr>
<th>Class</th>
<th>1, A</th>
<th>1, B</th>
<th>2, A</th>
<th>2, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dative</td>
<td>-owi</td>
<td>-owi</td>
<td>-u</td>
<td>-u</td>
</tr>
<tr>
<td>Locative</td>
<td>-e</td>
<td>-u</td>
<td>-e</td>
<td>-u</td>
</tr>
</tbody>
</table>

Again, the labeling of the columns reveals how the affixes cross-classify the sets of stems here. As long as class membership is “information content,” class labels are meaningful within the grammatical system and the labeling in (4) provides an analysis consistent with No Blur. An additional principle would be required to rule out this sort of analysis in which stems belong to more than one inflectional class.

If unique affixes could be homophonous, then we could de-Blur the paradigm in (1) as in (5), recognizing two distinct Dative suffixes that happen to both be pronounced “a” (the “b” suffix would then be the default Dative suffix as allowed under No Blur). Now the two Dative suffixes pronounced “a” each uniquely identify an inflectional class (1 and 2).

(5)

<table>
<thead>
<tr>
<th>Class</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dative</td>
<td>a₁</td>
<td>a₂</td>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>Locative</td>
<td>c</td>
<td>d</td>
<td>e</td>
<td>f</td>
</tr>
</tbody>
</table>

3. Blurring in the Polish Nominal Declension

A tour of the Polish masculine singular noun paradigms discussed in Cameron-Faulkner & Carstairs-McCarthy (C-F/C-M) 2000 demonstrates how these additional assumptions against homophony and against belonging to more than one class are
necessary to give force to No Blur (we reproduce the transcription of the Polish data from
the cited article).

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{Class} & \text{1} & \text{2a} & \text{2b} & \text{3} & \text{4} \\
\hline
\text{Nom} & \text{profesor}+ & \text{Polak}+ & \text{kon}+ & \text{pies}+ & \text{pan}+ \\
\hline
\text{Gen} & \text{profesor}+a & \text{Polak}+a & \text{koni}+a & \text{ps}+a & \text{pan}+a \\
\hline
\text{Dat} & \text{profesor}+owi & \text{Polak}+owi & \text{koni}+owi & \text{ps}+u & \text{pan}+u \\
\hline
\text{Inst} & \text{profesor}+em & \text{Polaki}+em & \text{koni}+em & \text{ps}+em & \text{pan}+em \\
\hline
\text{Loc} & \text{profesor}+z+e & \text{Polak}+u & \text{koni}+u & \text{psi}+e & \text{pan}+u \\
\hline
\text{Voc} & \text{profesor}+z+e & \text{Polak}+u & \text{koni}+u & \text{psi}+e & \text{pani}+e \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|c|}
\hline
\text{Class} & \text{5} & \text{6} & \text{7} \\
\hline
\text{Nom} & \text{kupiec}+ & \text{dwór}+ & \text{kraj}+ \\
\hline
\text{Gen} & \text{kupc}+a & \text{dwor}+u & \text{kraj}+u \\
\hline
\text{Dat} & \text{kupc}+owi & \text{dwor}+owi & \text{kraj}+owi \\
\hline
\text{Inst} & \text{kupc}+em & \text{dwor}+em & \text{kraj}+em \\
\hline
\text{Loc} & \text{kupc}+u & \text{dworz}+e & \text{kraj}+u \\
\hline
\text{Voc} & \text{kupcz}+e & \text{dworz}+e & \text{kraj}+u \\
\hline
\end{array}
\]

Summary of affixes
\[
\begin{array}{|c|c|c|c|c|c|c|}
\hline
\text{Class} & \text{1} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\hline
\text{Nom/Acc} & - & - & - & - & - & - & - \\
\hline
\text{Gen/Acc} & a & a & a & a & a & u & u \\
\hline
\text{Dat} & owi & owi & u & u & owi & owi & owi \\
\hline
\text{Inst} & em & em & em & em & em & em & em \\
\hline
\text{Loc} & e & u & e & u & u & e & u \\
\hline
\text{Voc} & e & u & e & e & e & e & u \\
\hline
\end{array}
\]

The nouns represented by the examples in (6) are masculine lexemes from what
are known as the \( o \)-stems in traditional grammars of Polish. Not all masculine nouns fall
into these inflectional patterns; for example, a subclass of masculine nouns share endings
with the feminine \( a \)-stems in the singular. The endings in (6) are shared by neuter nouns,
except that neuter nouns take the ending \( -o \) in both the Accusative and Nominative. This
syncretism reflects a more general feature of the Slavic languages where the Accusative
has the same exponent as the Nominative, if the noun is inanimate, and the same
exponent as the Genitive, if the noun is animate. (See Gunkel (2003) for a recent account
of the Polish noun paradigms.)

Note that the stem allomorph before the Locative and Vocative \( -e \) suffixes is
always distinct from the stem allomorph in the Nominative, Genitive, Dative and
Instrumental. While the shift in stem-final consonant from the Gen/Dat/Instr stem to the
stem used before \( -e \) has traditionally been treated as the result of the phonological
process of palatalization, and while the final consonant before the \( -e \) is “functionally
palatal” within the phonology of Polish, the palatalization rule that yields the \( -e \) stem
from the base stem is not phonetically transparent.
As C-F/C-M point out, the paradigm as shown in (6) violates No Blur in a number of places. Consider just the Dat row of the paradigm. Since both -owi and -u occur in more than one noun class, both fail to identify their inflectional class unambiguously. No Blur allows one such “default” affix per cell (row), but it specifically prohibits more than one; all other affixes in a cell must “identify inflection class unambiguously.” Since neither -owi nor -u is a “class identifier,” the distribution of affixes in the Dative cell of (6) is contrary to No Blur. A formally identical violation of No Blur is found in the Genitive.

As explained above, to generate an apparent violation of No Blur, C-F/C-M require two additional assumptions. The first is the constraint that inflectional class features cannot cross-classify stems, with each stem potentially belonging to more than one class. A striking feature of the classes (1-7) in (6) is that they seem to be organized around the distribution of the –u allomorphs of the various case suffixes. Suppose we assigned class features to the nouns in (6) according to the appearance of -u, so class A has -u in the Gen, class B, -u in the Dat, class C -u in the Loc and class D, -u in the Voc. All the nouns in (6) would belong to the superclass Z, i.e., the traditional o-stem class that determines all the non –u allomorphs of the case/number affixes. The 7 classes in (6) would now be identified by the following features:

(8)

<table>
<thead>
<tr>
<th>Class</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

The “information content” of the Loc -u would be, [masc, sing, Loc, Z, C], of the Gen -u, [masc, sing, Gen, Z, A], and so forth. Technically, in a framework like Distributed Morphology, the affixes themselves would realize the case and number features on a terminal node from the syntax; the gender and inflectional class features would be contextual and would refer to features of the stem to which the case/number node has been attached. So, for example, -u would realize the features [Dat, sing] in the environment of [Z, B] (gender is irrelevant here, but relevant as a contextual feature for the realization of the Nom suffix on class Z (o-stem) nouns).

On this analysis, the Principle of Contrast is obeyed: each affix has unique information content. Each -u affix in any row of the paradigm in (6) is a “class identifier,” although the class features cross-classify the nouns (the non -u affix in each row would be the default for class Z stems). -u in the Loc row identifies class C, -u in the Gen row class B, and so forth.

As explained above however, a crucial assumption of C-M’s work on paradigms is that inflectional class structure is “flat,” i.e., that inflectional class features do not cross-classify stems. The classes emerge as columns in paradigms organized on the basis of the distribution of allomorphs, without considering classes as possible features of stems; classes derived in such a manner will not “nest” or cross-classify stems. On such a view, a noun can’t be both class Z and class A, for example. However, in order to relate No Blur to the Principle of Contrast, C-M equates the “information content” of
class features with the information content of features like “masculine” and “singular” and “Dative Case.” This moves inflectional classes from being epiphenomenal by-products of paradigm organization into being something to which the grammar may refer. In C-M’s analysis – and in anyone’s analysis – affixes must have information content that involves the conjunction of such features as [Dative and Singular]. If affixes are associated with conjunctions of features with “information content,” and inflectional classes are information content, then inflectional class features may be conjoined with the information content of affixes and the information associated with stems. Inflectional class features may thus cross-classify stems. But if inflectional classes can cross-classify stems, No Blur becomes empirically vacuous; it can always be satisfied as we have done in (8), by allowing each affix to define an inflectional class.

C-M clearly believes that inflectional classes are special; although a stem may have many different features (gender, form, animacy, etc.) that could serve as contextual triggers of affixal allomorphy, each stem must belong to only a single inflectional class, where such classes are defined solely in terms of their effect on allomorphy. Each of the other feature types – gender, form, and animacy, for example – have implications beyond allomorphy (syntactic agreement, phonology, and semantics respectively). Inflectional classes are defined only by allomorphy and only trigger allomorphy.

Once No Blur is recognized to depend on a stipulation about inflectional classes, it loses any connection to the Principle of Contrast or any other independently motivated principle or consideration. Call this stipulation the “Single Inflectional Class Principle.” We do not need both No Blur and the Single Inflectional Class Principle; the former depends on the latter, and the latter by itself would cover the empirical ground C-M attributes to No Blur. A Single Inflectional Class Principle is directly related to the account of inflectional allomorphy but only derivatively related to paradigms. The empirical force of No Blur, then, does not rely on paradigms or paradigm structure.

As explained above, the second assumption necessary to provide empirical teeth to No Blur is that there is no accidental homophony in a row (cell) of a paradigm. If each -u in the Dat row of the paradigms, for example, were a distinct affix, homophonous with the other -u, there would be no Blur in the Dat row – each -u would be a class identifier.

However, as just discussed, for No Blur to be related to the Principle of Contrast, inflectional class must be treated on par with case and number under the notion of “information content.” Thus there should be no difference, in principle, between the vertical (case) and horizontal (class) dimensions in the paradigm in (6) – both dimensions represent differences in information content. But if the vertical and horizontal dimensions are equivalent, and we cannot have homophony in the horizontal dimension (in a row), we should not have homophony in the vertical dimension either. However, C-F/C-M claim that there are multiple homophonous -u’s in the vertical dimension: a Gen -u, a Dat -u, a Loc -u, and a Voc -u. In fact, for C-F/C-M the Gen -u and Dat -u are distinct class identifiers that identify different classes. If homophonous affixes, -u and –u, can express Gen and Dat respectively, why can’t homophonous –u and –u, express class A and class B respectively?
In sum, C-F/C-M require two major assumptions to give No Blur empirical content: stems may belong only to a single inflectional class and there may be no accidental homophony in a paradigm. The first assumption already covers the empirical ground of No Blur but is not in any way related to the Principle of Contrast or to paradigm structure. The second assumption is massively violated by C-F/C-M in their own analysis of Polish.

Recall that the paradigm in (6) appears to violate No Blur. Of course C-F/C-M do not explicitly conclude that (6) satisfies No Blur because No Blur is empirically vacuous. Rather, according to C-F/C-M, the appearance of Blur in (6) is a misperception. Instead of being categorized into the seven classes shown in (6), Polish (masculine singular o-stem) nouns can be re-categorized into the three classes in (9).

(9)

<table>
<thead>
<tr>
<th>Class</th>
<th>1/2/5</th>
<th>3/4</th>
<th>6/7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gen</td>
<td>a</td>
<td>a</td>
<td>u</td>
</tr>
<tr>
<td>Dat</td>
<td>owi</td>
<td>u</td>
<td>owi</td>
</tr>
<tr>
<td>Inst</td>
<td>em</td>
<td>em</td>
<td>em</td>
</tr>
<tr>
<td>Loc</td>
<td>u ~ e</td>
<td>u ~ e</td>
<td>u ~ e</td>
</tr>
<tr>
<td>Voc</td>
<td>u ~ e</td>
<td>u ~ e</td>
<td>u ~ e</td>
</tr>
</tbody>
</table>

There is an error in table (9) from C-F/C-M (2000). As can be seen from (6), the Vocative affix for classes 3/4 is -e, not -u-e (-u alternating with -e) as in (3). As we show below, this seemingly minor oversight has serious consequences. In (9) as given, it looks as if the choice of Loc and Voc suffixes is completely independent of the organization of the stems into the three inflectional classes (columns). C-F/C-M claim that the choice of –e in the Loc or Voc is in fact independently determined by consideration of the available stem allomorphs for a noun (see below) and independent from inflectional class. To the extent that choice of –e correlates with other affix allomorphy and thus falls into the inflectional class system, C-F/C-M’s analysis is undermined.

Putting aside the Loc and Voc exponents for the moment, it is obvious that in (9) in the Gen, -u is the class-identifier as it figures with nouns of one class only, whereas -a, which figures with two classes is the class-default. By the same reasoning, in the Dat, -u is the class-identifier, whereas -owi is the class-default.

While the recategorization of affixes in (9) thus satisfies No Blur and, according to C-F/C-M, therefore also Clark’s Principle of Contrast, this is done at the cost of treating the Gen -u quite differently from the -u of the Dat. The fact central to the Polish nominal paradigm (6), that -u is the default suffix for the entire paradigm, is totally lost sight of in C-F/C-M’s analysis. As remarked above, on their analysis this is a case of accidental homophony (which is not allowed to avoid No Blur on the horizontal dimension). Karl Verner noted in 1876, 101 “linguistics cannot totally rule out accident, but accidents en masse like here … it cannot and must not countenance.” The fact that the
No Blur Principle forces us to countenance such instances of accidental homophony en masse suggests that there is something fundamentally wrong with the principle.

In fact, as we now show, C-F/C-M’s proposed analysis of Polish fails on their own terms. As displayed in (6), -u is found in the Loc with stems of classes 2, 4, 5, and 7, whereas -e occurs with stems of classes 1, 3, and 6. These same suffixes figure also in the Vocative, but here -u appears in classes 2 and 7, and -e appears elsewhere. Since in both Loc and Voc neither affix is a class identifier, this distribution of affixes violates No Blur. In order to account for this affix distribution without Blur, C-F/C-M introduce a subclassification of stems into those that do and those that do not have “majority and minority alternants.” As is clear from (6), the form of the stem taking Loc or Voc –e is always distinct from the form used in other cases. The –e stem involves a final consonant change that is the result of the phonological process of palatalization. C-F/C-M suppose that choice of -e is connected with the existence of the palatalized stem alternant rather than with declension class; that is, in a sense the marked palatalized stem chooses the –e allomorph rather than the –e allomorph triggering palatalization. They remark that “here -e occurs, the stem alternant that accompanies it is a minority alternant peculiar ... to the Vocative and possibly also the Locative. On the other hand, where -u occurs, its stem alternant is the same as the one generally found elsewhere in the ... paradigm.” (823) Choice of -e vs. -u for Loc and Voc, then, is not a matter of declension class. Rather, across the classes in the paradigm in (6), -e will attach for Voc or Loc if there exists a “minority stem alternant” for that case for that stem, with -u attaching elsewhere. The suffix -e thus differs “in information content” from -u, where information content, as noted above, specifically includes stem shape. The distribution of -e vs. -u in the Loc and Voc therefore is predictable within a declension class and these affixes no longer violate No Blur.

From the description above, it may be difficult to unpack all the information that C-F/C-M are attributing to Polish stems or to see the way the information inter-relates. First, one must know for each stem whether or not it has a minority stem alternant for the Voc and for the Loc. The existence of a minority stem form for the Voc does not entail the existence of a minority stem form for the Loc, as seen in classes 4 and 5 in (6). C-F/C-M point out that this knowledge about stem alternants requires a comparison with other forms of a noun, since the minority stem alternant does not simply end in a palatal consonant – it must contrast with a nonpalatal stem form elsewhere in the paradigm. Traditionally this alternation in stem form for the Cases expressed by -e has been explained by referring to the rule of Polish phonology that spreads the feature [-back] from -e to the immediately preceding consonant (for discussion see Gussmann 1980, Rubach 1984, Czaykowska-Higgins 1988, and Szpyra 1995). This in turn triggers several other phonological rules which account for the fact that before the -e affix noun stems end with ‘palatal-type’ consonants, contrasting with the form of the stems before other suffixes.

Second on the C-F/C-M account, in addition to assigning the features [+/-minority stem alternant Loc] and [+/-minority stem alternant Voc] to each noun, we must further stipulate that Loc -e attaches to stems that have a minority stem alternant in the
Loc, whereas Voc -e attaches to stems that have a minority stem alternant in the Voc. Finally, both Loc and Voc -e must also actually choose the minority stem alternant. This third stipulation doesn’t follow from the second on an account like C-F/C-M’s, since generalizations about minority stem alternants are independent of actually choosing such alternants; for example, Dat -u will only attach to stems with a Voc minority stem alternant, although the Dat –u does not choose this alternant.

It is at this point that the error in table (9) becomes critical. C-F/C-M’s analysis crucially depends on the forms of the Voc and Loc being independent of the three inflectional classes in (3) – it is only on this assumption that they may claim that the choice between -e and -u in the Loc and Voc does not involve inflectional class and cannot Blur the paradigm. The intuition is that one will learn whether a stem has a minority alternant in the Loc and/or Voc by hearing these forms – they are not productively generable from the majority alternant by a phonological rule triggered by the –e suffix. The distribution of the –u allomorph of the Voc and Loc suffixes is thus not connected to the distribution of –u elsewhere in the paradigm, which is governed by inflectional class.

However, note from the paradigm in (6) that the allomorphy of the Voc suffix – the choice of –u or –e – is not independent of the distribution of –u elsewhere in the paradigm: the presence of -u in the Dative, with a majority stem alternant, predicts the Voc in -e with the minority stem alternant (this is not shown in (9), reproduced from C-F/C-M (2000)). One must be able to predict from the existence of a single stem (the majority stem) with -u in the Dat that a minority stem will exist for the Voc, and presumably one must also be able to predict the “minority stem” form of the Voc stem with the -e suffix from the “majority” stem form. Since the distribution of –u (vs. –e) in the Voc is in fact connected with the inflectional class system that accounts for the distribution of –u elsewhere in the paradigm, the Voc allomorphy is a matter of inflectional class and should Blur the paradigm. The C-F/C-M analysis fails to draw the connection between inflectional class, “is in class 3/4 in (9),” and the form property, “has a minority stem alternant in the Voc.” It is also not clear whether the C-M system should allow implicational generalizations that go from inflectional class to “intrinsic” features of stems like phonological form (i.e., features with implications beyond inflectional allomorphy). While the No Blur paradigm might be comfortable with (default) statements relating, e.g., gender to inflectional class (Polish masculine nouns fall into the o-stem class by default), it should probably not allow implications from inflectional classes to gender or form, such as, “class 3/4 implies minority stem alternant in the Voc.” Allowing implications of this sort treats inflectional class on par with other features and not simply as the consequence of paradigmatic organization. If inflectional class features could participate in such implications equally with, e.g., gender, it would be a mystery why they would obey the Single Inflectional Class principle. As explained above, since a stem can be class 3/4 and masculine, it should be able to carry both a class A and a class B feature, were class features like other features.
4. Syncretism, Impoverishment and a Distributed Morphology Analysis

We conclude this note by sketching an alternative account of the Polish facts which successfully captures the generalizations that C-F/C-M note, as well as the syncretism across Cases that they fail to acknowledge. This account treats all the nouns in (6) as belonging to the same declension class, the o-stems, and it is not necessary that these nouns only be masculine (as most of (6) is the same for neuter nouns of the same declension), nor that all masculine nouns fall into this class (as they do not in Polish). The alternative account is based on the theory of Distributed Morphology, DM (see, e.g., Halle and Marantz 1993, Halle 1997).

In DM it would be assumed that each Case ending of the Polish declension is composed of a set of morphological features, including Case and number features. In the PF branch of the grammar, Vocabulary Items are inserted into the terminal nodes bearing Case and number features and thereby realize these features. The Vocabulary Items are underspecified with respect to the morphosyntactic feature bundles that they may realize. All Vocabulary Items (VIs) compete for insertion into any given node; the most highly specified item whose features do not conflict with the features at the node wins the competition and is inserted (the familiar “elsewhere” condition). The Case VIs for the Polish nouns under discussion are given in (10). We assume that a full analysis of Polish would decompose the Cases into Case features that cross-classify the cases according to syntactic generalizations and in accordance with patterns of syncretism across Polish nominal paradigms. For present purposes, we provide just a cover label for each Case. This leads to an accidental homophony between Loc and Voc -e, which calls out for a feature system in which the decomposition of both Loc and Voc would include some feature X that -e could mention.

\[(10)\]
\[
a. \ [Nom] \leftrightarrow \text{Null} \quad \text{(more probably the vowel “yer” \hspace{1cm}}
\[
\hspace{1cm} \text{familiar from the analysis of Slavic languages)}
\]
\[
b. \ [Gen] \leftrightarrow /a/
\]
\[
c. \ [Dat] \leftrightarrow /owi/
\]
\[
d. \ [Inst] \leftrightarrow /em/
\]
\[
e. \ [Loc] \leftrightarrow /e/
\]
\[
f. \ [Voc ] \leftrightarrow /u/ \quad \text{(default)}
\]
\[f. \ [ ] \leftrightarrow /u/ \quad \text{(default)}
\]

Since, with the exception of the default VI, listed last, the items in (10) each have a single specified Case feature and cover all the Polish Cases under discussion, there will never be occasion to select the default -u. We know, however, that the default in (10) figures in various Cases. Given the way competition among affixes drives the insertion of VIs, we can implement formally the insertion of the default exponent -u by “impoverishment”, i.e., by deleting the Case features in morphemes when they attach to stems of a particular class. Since the distribution of the default -u is not completely predictable from the phonological form of the stems in this declension, we need to mark the stems that trigger
impoverishment of the various Case features by a diacritic (disregarding here any subregularities leading to generalizations about the distribution of these diacritics across stems). If a stem impoverishes the Case feature X, we give it the feature [-X]. With that notation, the relevant impoverishment rules are listed in (11). When a stem deletes the Case feature on the Case/number suffix, the default in (10) will be the only VI eligible for insertion.

\[(11)\]

i. Gen $\rightarrow$ $\emptyset$ / [-Gen] + ______

ii. Dat. $\rightarrow$ $\emptyset$ / [-Dat] + ______

iii. Loc $\rightarrow$ $\emptyset$ / [-Loc] + ______

iv. Voc $\rightarrow$ $\emptyset$ / [-Voc] + ______

If the four impoverishment features, [-Gen], [-Dat], [-Loc], and [-Voc], are all independent, a stem could have none of the features, all of the features, one of the features, or any combination of two or three of the features. If the features cross-classified the stems in this way, there would be 12 subclasses in (6), not the 7 shown, thus not all possible combinations of impoverishment features are exemplified. The classes in (6) are defined by the sets of impoverishment features shown in (12). The reader may note that (12) is effectively identical with (8) – the impoverishment features serve to describe the distribution of the default -u across the subclasses of Polish stems from this particular declension class (the o-stems).

\[(12)\]

1. null
2. [-Loc, -Voc]
3. -Dat
4. [-Dat, -Loc]
5. -Loc
6. -Gen
7. [-Gen, -Loc, -Voc]

The restrictions on the distribution of impoverishment features suggests that the Polish o-class obeys the following implicational generalizations among its features:

\[(13)\]

a. *[-Gen,-Dat] No noun impoverishes both Gen and Dat
b. *[-Dat,-Voc] No noun impoverishes both Dat and Voc
c. -Voc $\rightarrow$ -Loc Nouns that impoverish Voc, impoverish also Loc
d. [-Gen,-Loc] $\rightarrow$ -Voc Nouns that impoverish Gen and Loc impoverish also Voc (in addition to these generalizations, neither Nom nor Instr nor Acc impoverish)

Note that these generalization express knowledge about syncretism across cases. So, for example, speakers that hear a form with -u in the Vocative can predict from (13c) that the noun will also take -u in the Locative. For present purposes, the most important generalization is the one that prohibits impoverishment in both the Dative and the
Vocative in the same stems, (13b). This means that a speaker hearing -u in the Dative will predict -e in the Vocative for the same stem, since the -u in the Dative implies [-Dat] and (13b) prohibits a stem from carrying both [-Dat] and the [-Voc] feature that would trigger -u in the Vocative. As indicated above, this generalization means that, contra C-F/C-M, the distribution of -e vs. -u in the Vocative is connected with the distribution of -u in other Cases, and thus -e~u in the Vocative does Blur the declension classes in a Carstairs-McCarthy-style paradigm.

Our analysis of Polish consists of the following pieces: (i) a set of 6 Case endings for the Polish nouns in this inflectional class in (11), (ii) a set of 4 impoverishment rules that account for the syncretic distribution of the default -u in (12), (iii) a set of 4 generalizations about the distribution of the impoverishment rules that further restrict the distribution of -u in (13), and (iv) the literature on Polish phonology that explains the palatalization processes triggered by the Loc/Voc -e suffix. We have shown that the combination of (iii) and (iv) is superior to C-F/C-M’s account of stem allomorphs and affixes in the Loc and Voc Cases, most obviously because it connects these Loc/Voc facts to the distribution of the default -u throughout the paradigm (as we pointed out, C-F/C-M require in addition a double stipulation that -e attaches to stems that have a minority stem alternant and also chooses to attach to this alternant). Our analysis also accomplishes what C-F/C-M totally overlook: an account of syncretism along the vertical dimension of a paradigm. However, as explained above, in order to give No Blur empirical content, C-F/C-M must assume a principle avoiding “accidental homophony” in both the vertical and horizontal dimensions of a paradigm. Thus the fact that they allow homophonous -u’s in the vertical dimension while disallowing homophonous -u’s in the horizontal dimension undermines their analysis.

5. Inflectional Classes and Features

We conclude by re-examining what “No Blur” really claims about paradigms. As C-M points out, if we disallow accidentally homophonous affixes and we disallow the assignment of stems to multiple inflectional classes, then a blurring affix will be one which covers two or more classes of stems, when another affix occurs in the same row of the paradigm as the “default” for that row. Formally, then, blurring shows up as the necessity to include a disjunction of features in the information content of an affix – this affix attaches to {class A, class B} (the curly brackets, as usual for rule notations, indicate a collapsing of two different environments with the exception of the material in the brackets, and thus a lack of a generalization that might unify the bracketed material). For example, in (6), if –owi is treated as the default Dat marker, -u would be marked as attaching to class 3 or class 4 stems. This kind of disjunction shows that some generalization about syncretism is being missed; why does not a single affix cover these two classes (what do the classes have in common such that the affix should attach to both of them)? That is, No Blur doesn’t rely on paradigms in any crucial sense; it’s simply a statement about trying to maximize generalizations (avoid disjunctions) in morphological analysis.
Clearly Carstairs-McCarthy is right in emphasizing that principles of language acquisition ultimately should explain facts about the distribution of forms across the paradigms generated by the inflectional features of a language. In particular, we have no real idea about how a child assigns features to Vocabulary Items or separates stems into declensional classes. Until we have a better specific understanding of what the child brings to language acquisition (other than the principles of Distributed Morphology), we can do no better than endorse the traditional assumptions that the child seeks to minimize homophony and maximize generalizations. As explained in detail above, Carstairs-McCarthy fails to demonstrate that further principles are required. He needs these traditional assumptions in any case, and they fully cover the relevant examples without recourse to additional principles such as “No Blur.”

We are still left with the question of whether the principles of grammar include a prohibition against stems belonging to more than one “arbitrary” inflectional class. Note that our own DM analysis of Polish connects the subclasses of the o-stems to impoverishment rules deleting Case features prior to Vocabulary Insertion. We do not know whether impoverishment-triggering features would have the same status as arbitrary inflectional class features in Carstairs-McCarthy’s view and thus whether our analysis violates the kind of Single Inflectional Class principle that he seems to require. Consider the class of Polish masculine nouns that behave like a-stems (i.e., like most feminines) in the singular but like o-stems in the plural; this behavior does not seem remarkable from a cross-linguistic perspective and it does involve individual stems belonging to more than one inflectional class. Thus we do not hold out much hope that a principle prohibiting membership in multiple inflectional classes will survive detailed analyses of inflectional morphology cross-linguistically, but we do not wish to draw any general conclusions about the principle from the small body of Polish data examined here.

References


