It is the purpose of this paper to investigate the interaction of the modern Javanese Elative Formation (a morphological process) with a number of phonological rules contained in the grammar of the language. This interaction is of theoretical interest for two reasons: First of all, the following investigation reveals that, contrary to what is frequently taken for granted by generative linguists and what appears to be the case in most languages, the grammar of Javanese is indeed organized in such a way that a morphological process (i.e. Elative Formation) must be said, in terms of rule ordering, to follow the operation of a number of phonological processes; Secondly, it is of interest that in Javanese, surface Elative forms exhibit marked opacity with respect to certain phonological rules; however, this apparent opacity, it will be claimed, turns out to be well motivated when the grammar of Javanese is looked at as a functioning whole, with the surface phonological opacity not only operating to preserve certain semantic contrasts, but, at the same time serving in many cases as the distinguishing surface marker of Elative forms.

Elative Formation is a highly productive process in spoken informal Javanese, although it does not appear in either written language or in the more formal levels of speech. By the operation of this process, intensives are formed from primary adjectives, so that for a given adjective (such as aduh 'far') the Elative form may be roughly characterized as 'very X' (e.g. Elat. aduh 'very far'). In very general terms the process by which Elatives are formed may be described as a change of the last vowel in the primary adjective root to tense i or u, the choice of the front or back vowel depending on whether the primary form has a front or back final vowel. We may thus speak of final tense i or u as the characteristic surface marker of Elatives.
Elatives may be formed from nearly all primary adjectives in the language, with a few logical exceptions. Elatives may not be formed from: 1) Adjectives which have some other commonly occurring intensive form (e.g. *tuwa 'old' has the intensive form *tuwak 'very old' and not the expected Elative *tuwu); 2) Adjectives whose meanings are logically not subject to intensification (e.g. *pati 'dead'); 3) Adjectives whose last vowel is _e (schwa) may be intensified only by juxtaposition with banget 'very'.

1.1 Before describing the character of Elative Formation in more detail, some general discussion of Javanese phonology and of specific phonological processes will be helpful. The language possesses the following underlying vowel system:

\[
\begin{array}{c}
i \\
\text{u} \\
\text{e} \\
\text{a} \\
\text{e} \\
\text{o} \\
\text{e} \\
\text{o} \\
\text{a} \\
\end{array}
\]

By the operation of the relevant phonological rules, this underlying system is converted into a surface system consisting of ten sounds:

\[
\begin{array}{c}
i \\
\text{u} \\
\text{e} \\
\text{a} \\
\text{e} \\
\text{o} \\
\text{e} \\
\text{o} \\
\text{a} \\
\end{array}
\]

For ease of notation, throughout the following discussion I will represent this system by the following orthographic symbols:

\[
\begin{array}{c}
\text{I} \\
\text{E} \\
\text{u} \\
\text{e} \\
\text{a} \\
\end{array}
\]

Note that even when basic forms are being cited, upper case letters will indicate tense vowels and lower case letters will be used for lax vowels.

1.2 The phonological rules which will prove relevant to our discussion all involve mutation of underlying vowels. These rules may be summarized as follows:
1.2.1 a/ to o/: Word-final /a/ becomes o.

cf. /dina/ dIno 'day' dInanE 'the day'
/mEdja/ mEdjo 'table' mEdjanE 'the table'
/nèka/ nèko 'come' nèkanI 'come to visit'

1.2.2 Final Closed Syllable Laxing (FCSL): A tense vowel in a final closed syllable becomes lax.

cf. 10rO 'two'; rong jam 'two hours' (/10rO+ng jam/)
télU 'three; télung dIno 'three days' (/télU+ng dIna/)

bagO 'inner bark of the so-tree'; dialectal bagor
kepleh 'drooping'; dialectal kEplE

1.2.3 Vowel Harmony: In a root containing adjacent originally identical non-high vowels, any change affecting one of these vowels must be matched in the other, so that the two are identical on the surface.

cf. sample derivations below in Sect. 1.3 and also
dowo 'long' (/dawa/); dawanE 'the long one'
kepleh 'drooping'; dialectal kEplE

All of the above phonological processes appear to operate with great regularity throughout the language, the only exceptions being obvious foreign borrowings such as bensIn 'gas', nèrsIs 'precise', kornet bIf 'corned beef' and kOlEra (sometimes kOlerah) 'cholera', all of which have alternate "less educated" pronunciations resulting from regular application of the relevant Javanese phonological rules. One very common word appears to be a genuine exception to a/ to o/: Ora 'no' occurs instead of the expected *Oro. In addition, Uhlenbeck (1949) identifies a group of words which may have tense I or U in final closed syllables and are thus exceptions to FCSL. This class is however quite small and appears to be made up of certain exclamations, interjections, onomatopoeic words, animal noises, etc.

1.3 While there is no reason to order FCSL and a/ to o/ with respect to each other, there is evidence that the rule of Vowel Harmony has access to the output of both of these rules. This
evidence consists of the fact that in many cases Vowel Harmony operates to harmonize a penultimate vowel to the last vowel in the root, the character of which can only have been produced through previous application of a' to o' or FCSL. This relationship may readily be seen in the derivation of surface forms such as dowo 'long', gepeng 'flat' and kosong 'empty'; from underlying /dawa/, /gEpEng/ and /kOsOng/:

<table>
<thead>
<tr>
<th>Vowel Harmony</th>
<th>Surface:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a' to o'</td>
<td>dowo</td>
</tr>
<tr>
<td>FCSL</td>
<td>gepeng</td>
</tr>
<tr>
<td>Vowel Harmony</td>
<td>kosong</td>
</tr>
<tr>
<td>Surface:</td>
<td>dowo</td>
</tr>
<tr>
<td></td>
<td>gepeng</td>
</tr>
<tr>
<td></td>
<td>kosong</td>
</tr>
</tbody>
</table>

Thus we may establish the ordering of Vowel Harmony after both FCSL and a' to o' in the grammar of Javanese.

2.0 Having briefly described the phonological rules which will enter into interaction with Elative Formation, it is now appropriate to move on to more thorough consideration of the morphological process of Elative Formation itself, and the interaction of this process with the phonological rules.

2.1 It was stated above that the characteristic surface marker of Elatives is I or U replacing the rightmost vowel of the primary adjective, with the choice between the two markers being determined by the frontness or backness of the corresponding vowel in the primary form. At the same time, Elatives may (usually—cf. Sect. 2.2 below) optionally exhibit an exaggerated drawing out of the characteristic I or U and an accompanying rise in pitch on the final syllable. In fact, in most Elative expressions these prosodic devices are used. However, it should be recognized that these prosodic phenomena, while they occur very frequently and do help to distinguish Elative forms from primary adjectives, especially where there may be ambiguity otherwise, are not in general sufficient to distinguish Elatives; the change in final vowel must be regarded as the true process
of Elative Formation, with the prosodic phenomena playing only an ancillary role.

2.2 In most cases, the operation of Elative Formation is clear and may readily be seen from examples like the following:

<table>
<thead>
<tr>
<th>Primary</th>
<th>Elative</th>
</tr>
</thead>
<tbody>
<tr>
<td>angel 'hard, difficult'</td>
<td>anglIl</td>
</tr>
<tr>
<td>1UwE 'hungry'</td>
<td>1UwE</td>
</tr>
<tr>
<td>ramE 'noisy'</td>
<td>ramI</td>
</tr>
<tr>
<td>abot 'heavy, hard'</td>
<td>abUT</td>
</tr>
<tr>
<td>adoh 'far'</td>
<td>adUh</td>
</tr>
<tr>
<td>IdjO 'green'</td>
<td>IdjO</td>
</tr>
<tr>
<td>djérO 'deep'</td>
<td>djérO</td>
</tr>
<tr>
<td>rIndio 'slow'</td>
<td>rIndio</td>
</tr>
<tr>
<td>résio 'clean'</td>
<td>résio</td>
</tr>
<tr>
<td>wani 'bold, daring'</td>
<td>wani</td>
</tr>
<tr>
<td>alUs 'refined, smooth'</td>
<td>alUs</td>
</tr>
<tr>
<td>1URus 'straight'</td>
<td>1URus</td>
</tr>
<tr>
<td>1UgU 'ordinary'</td>
<td>1UgU</td>
</tr>
</tbody>
</table>

Note that for primary adjectives with mid (tense or lax) final vowel the change to the Elative markers I and U involves raising of the final vowel. In addition, for adjectives with final closed syllables, the Elative form is distinguished from the surface primary form by virtue of the tenseness of the final vowel in the former (cf. adoh with lax mid vowel, but Elat. adUh, with tense high vowel).

For primary adjectives whose final vowel is already high, there can of course be no raising of the final vowel. In such cases, for adjectives with a final closed syllable, the only feature which distinguishes Elatives from primary forms is the tenseness of the marker vowel (cf. rIndio with Elat. rIndio). And in the case of adjectives with word-final I or U the Elative forms are, with respect to segmental characteristics, absolutely identical with the primary forms (cf. wani with identical Elative wani). It is in such cases that the prosodic devices of drawing
out the final vowel and raising the voice pitch must come into play if the listener is to recognize the intensified nature of the adjective he hears. (Recall that these phenomena are more or less optional for Elatives built on adjectives with other final vowels.)

2.3 When the primary adjective has underlying /a/ as its last vowel (which appears on the surface as o if it is word-final) the operation of Elative Formation is slightly less straightforward. Consider the following examples:

<table>
<thead>
<tr>
<th>Primary</th>
<th>Elative</th>
</tr>
</thead>
<tbody>
<tr>
<td>larang 'high in cost'</td>
<td>larIng</td>
</tr>
<tr>
<td>gampam 'easy'</td>
<td>gampIng</td>
</tr>
<tr>
<td>kēras 'hard, harsh'</td>
<td>kērIš</td>
</tr>
<tr>
<td>rōso 'strong'</td>
<td>rōSU</td>
</tr>
<tr>
<td>kēmbō 'insipid, without spirit'</td>
<td>kēmbU</td>
</tr>
</tbody>
</table>

With adjectives ending in (tense or lax) e, o, i or u, it was possible to say that the choice of Elative marker was determined by the frontness or backness of the vowel of the primary adjective; all adjectives in a final front mid vowel for example, whether that vowel was in an open (surface e) or closed (surface o) syllable, formed Elatives by replacing that front vowel with I. However, for adjectives with /a/, such a simple statement is impossible, and it appears that we must distinguish between /a/ in a closed syllable (which forms Elatives in I (cf. larang; Elat. larIng)) and /a/ in open syllables (which is surface o) which forms Elatives in U (cf. kēmbō; Elat. kēmbU). As long as we consider only the underlying forms of the primary adjectives, this split seems rather puzzling. Granted that /a/ is neither a front nor a back vowel in Javanese, why should speakers, having decided on the front vowel marker for Elatives of adjectives with /a/ in a closed syllable, further complicate matters by choosing the back vowel marker for /a/ when it occurs word-finally—or vice versa?
The reader may have already noticed that the choice of \( U \) as the Elative marker for adjectives in word-final /a/ is not so puzzling if, taking a rule ordering approach, we assume that Elative Formation applies after the phonological rule of \( a\# \) to \( o\# \) has already applied. At this point, although /a/ in a closed syllable is still neither front nor back, and may therefore apparently arbitrarily be assigned \( I \) as an Elative marker, the word-final /a/ has already become \( o \), which is clearly a back vowel (and may be treated along with \( o \) from underlying /O/) and therefore should logically have an Elative in \( U \).

3.0 The suggestion of the possibility that there may be reason to order the morphological process of Elative Formation after the phonological rule of \( a\# \) to \( o\# \) leads us to the main topic of this paper: that is, the interaction of Elative Formation with certain phonological processes and the role of this interaction in the grammar of Javanese. In the course of the following section, it will be claimed that, within a framework of rule ordering, there is reason to believe that Elative Formation must apply, not only after \( a\# \) to \( o\# \), but also after FCSL and Vowel Harmony.

3.1 Returning now to consider in more detail the possibility that Elative Formation does not operate until after word-final basic /a/ has already become \( o \) by \( a\# \) to \( o\# \), we need to look at the Elatives corresponding to primary adjectives with two /a/ vowels, the last in word-final position. (Recall that such primary adjectives appear on the surface with two \( o \) vowels, as a result of the operation of \( a\# \) to \( o\# \) and subsequent adjustment of the penultimate vowel to \( o \) by Vowel Harmony (cf. the sample derivation of dowo in Sect. 1.3 above).) Consider for example:

<table>
<thead>
<tr>
<th>Primary</th>
<th>Elative</th>
</tr>
</thead>
<tbody>
<tr>
<td>dowo 'long'</td>
<td>dowU</td>
</tr>
<tr>
<td>loro 'ill, painful'</td>
<td>loroU</td>
</tr>
<tr>
<td>ombo 'large, broad'</td>
<td>omboU</td>
</tr>
</tbody>
</table>
Notice that in the above Elative forms, not only is the Elative marker the $U$ which in general replaces back vowels, but at the same time the penultimate /a/ of the underlying form shows up as surface o. The latter is a situation which only arises through harmonizing of a basic /a/ to a word-final /a/ which has become o by a$#$ to a$$. Thus such Elatives provide strong indication that not only must final /a/ become o before Elative Formation occurs, but that Vowel Harmony must also apply before Elative Formation. Derivation of such forms would thus proceed as follows:

\[
/dawa/
\]

\[a$#$ to a$$_4\]
Vowel Harmony
dawo
dowo
Elative Formation
dawU
dowU
Surface:
dowU

and not, as might generally be assumed, with the morphological process of Elative Formation preceding the phonological rules:

\[
/dawa/
\]

\[a$#$ to a$$_4\]
Vowel Harmony
Surface:
dowU

Therefore consideration of Elative forms from underlying roots of the shape /CaCa/ (where C represents any permissible consonant) seems to indicate that, within a framework of rule ordering, Elatives must be said to follow at least the phonological rules a$#$ to a$$ and Vowel Harmony.

3.2 Similar conclusions may be reached from evidence obtained from the following primary adjective—Elative pairs:

<table>
<thead>
<tr>
<th>Primary</th>
<th>Elative</th>
</tr>
</thead>
<tbody>
<tr>
<td>eleg 'bad'</td>
<td>ellIq</td>
</tr>
<tr>
<td>gepeng 'flat'</td>
<td>gepIng</td>
</tr>
<tr>
<td>groh 'rough, crude'</td>
<td>grobUh</td>
</tr>
<tr>
<td>kosong 'empty'</td>
<td>kosUng</td>
</tr>
</tbody>
</table>
Notice that in these examples the Elative forms contain lax vowels which can only be the result of Vowel Harmony adjusting an underlying tense penultimate /E/ or /O/ to match a final o or o which must have been laxed by FCSL. Thus the derivation of kosUng for example, must have proceeded as follows:

/kOsOng/

FCSL kOsong
Vowel Harmony kosong
Elative Formation kosUng
Surface: kosUng

and not, as might be expected,

/kOsOng/

Elative Formation kOsUng
FCSL kOsung
Vowel Harmony ------
Surface: *kOsung

3.3 Consideration of such examples provides what might be considered additional support for the argument that Elative Formation must follow the phonological rules in question. Recall that the surface Elative markers are always tense i or u occurring in place of the last vowel of the primary adjective. In many cases this means that Elative forms have tense vowels in final closed syllables—that is, in precisely the environment for FCSL. Thus, if Elative Formation introduced its tense vowel markers before the application of FCSL, the latter might be expected to apply, producing a lax surface Elative marker. This of course is not what happens. What does happen (i.e. the tense Elative markers come through to the surface unchanged) is consistent with the introduction of Elative markers after FCSL has already applied. (Note that this ordering has already been established indirectly, since FCSL must precede Vowel Harmony, which was shown above to precede Elative Formation.) Although the same surface result might be obtained by claiming that all Elatives must be exceptions to FCSL, this would only be an added
4.0 The reader has no doubt already discovered for himself the obvious surface opacity with respect to certain phonological rules exhibited by Javanese Elative forms. The fact that Elatives have tense vowels in the exact environment for FCSL is a clear case of opacity of Kiparsky's (cf. Kiparsky (1971)) Type i. That is, Elative forms like angIl, rIndIq, adUh, etc. (from primary adjectives angel, rIndiq, adoh, etc.) have final tense vowels which are in the environment for FCSL, but which nevertheless are still tense.

Kiparsky's Type ii opacity is represented by Elative forms like dowU, kosUng and eI4q (primary adjectives dowo (/dawo/), kosong and eloq) where the nonultimate vowels appear to have undergone changes connected only with Vowel Harmony; but the final vowels which must have conditioned such changes are not present on the surface, having been replaced by the Elative markers I and U, which do not condition Vowel Harmony.

As can easily be seen by comparing the sample derivations of actually occurring and starred Elative forms in Sect. 3.1 and 3.2 above, both of the above instances of opacity with respect to phonological rules arise through the proposed ordering of the morphological process of Elative Formation after the phonological rules in question. Although this situation is quite unusual in several respects, there is good motivation for its presence in the grammar of Javanese.

4.1 I would in fact find it quite reasonable to claim that the unusual interaction of Elative Formation with the phonological rules serves the purpose of producing the very surface forms which we have termed "opaque" and that in this case the apparent opacity has two functions: namely, that of maintaining the distinctness of Elative forms from primary forms; and that of preserving the identity of underlying lexical items. Both of...
these functions would of course contribute to the successful utilization of Elatives by speakers of Javanese.

4.1.1 To see first of all how opacity in Elatives functions to keep them distinct from primary forms of the language, we need only to consider a few Elatives with final closed syllables, such as rIndiq and alUs (primary rIndiq and alus). A hypothetical Javanese speaker-hearer encountering such forms should know immediately that they are not primary words, but have undergone the process of intensification we have been calling Elative Formation. What signals this information to him is the presence of the tense high vowel (i.e. the Elative marker) in the final closed syllable; in primary forms no tense vowels occur in that environment, since they are all laxed by FCSL, and the speaker knows that the only tense vowels in that environment which reach the surface are those introduced by Elative Formation. In other words, it is precisely the fact that Elatives are opaque with respect to the phonological rule of FCSL that allows the speaker to distinguish between primary forms with final closed syllables containing i and u and Elatives.

At the same time, opacity of a different type plays a role in distinguishing certain other Elatives from primary forms (namely those Elatives which correspond to primary forms with underlying shapes like /CECEC/ or /COCOC/). Consider for example the possible reaction of our hypothetical speaker-hearer when he encounters an utterance which includes the words genIng or kosUng. He knows first of all that he has heard an Elative by virtue of the tense marker in the final closed syllable as was just discussed in the above paragraph. However, in this case, in addition to the character of the final vowel, he has yet another signal that what he has heard is an Elative: the vowel configuration of the whole word. He knows that in the penultimate position a lax e or o (from basic /E/ or /O/) comes about only by the operation of Vowel Harmony. However, in Elatives like genIng and kosUng (primary gepeng and kosong)
there is no vowel in the final syllable which might have brought about the laxness of the penultimate vowel, the possible conditioning vowel having been replaced by the Elative marker (Kiparsky's Type ii opacity). The fact that Vowel Harmony is opaque in such forms, together with the fact that this opacity occurs only in Elatives, helps to distinguish Elatives from primary forms.

4.1.2 The above however is more or less a redundant function of Vowel Harmony opacity in Elatives like gepIng and kosUng since the presence of the tense vowel in a final closed syllable might be of itself sufficient indication that such a form is an Elative. The real significance of opacity with respect to Vowel Harmony in such Elatives is, in my opinion, that it functions to allow the Javanese speaker to distinguish between the various possible underlying forms on which an Elative like gepIng or kosUng might be built. In the following paragraphs I will attempt to illustrate the basis for this claim.

4.2 Since Elative Formation involves replacement of final front vowels with I and back vowels with U, it must necessarily result in a certain amount of neutralization of underlying contrasts, with e, i and a in primary final closed syllables all coming out as I in Elatives; and similarly, primary o and u falling together into Elative U. Such a situation could result in a great deal of confusion about the primary source for a given Elative; however, because of the organization of the grammar of Javanese which results in phonological opacity of certain Elatives with respect to Vowel Harmony, a great deal of this potential homonymy and its resultant confusion is avoided.

Consider for example the Elatives EkIr (primary Ekar 'lopsided') and ekIr (primary eker 'impatient for something'). Notice that because of the neutralization brought about by the introduction of the Elative marker vowel, these two forms are identical except for the difference in tenseness of the penultimate vowels; and this difference in tenseness of the vowels
in question has the effect of making each Elative sound more like its corresponding primary adjective and thus giving the hearer an immediate clue to its semantic import. This distinctive difference in tenseness however is a consequence of the opacity of the Elative ekIr with respect to Vowel Harmony. That is, the initial e in this form is lax, even though the lax final vowel (cf. primary ekEr) which must have originally conditioned this laxing has been replaced by the Elative marker i. If the grammar of Javanese were organized differently, so that the opacity in question were eliminated, it would lead to possible homonymy of the Elatives of primary forms of the shape CeCeC, CeCiC and CeCaC, all of which would have Elatives of the shape CECIC. The same possibility of confusion would exist between the Elatives of primary forms of the shape CoCoC and COCuC, but this confusion is again avoided by the ordering of Elative Formation after Vowel Harmony and the resulting opacity which functions to make the penultimate vowel of the Elative identical to the penultimate of the corresponding primary.

Thus it seems that as a result of the unusual position of Elative Formation in the grammar of Javanese, a fair amount of the potential confusion which could result from the neutralizing effect of the derivational process itself is avoided. Although this of course serves mainly to distinguish Elatives corresponding to primary forms of the shapes CeCeC and CoCoC (but cf. also Sect. 4.3.1 below), this is quite significant in light of the fact that, according to Uhlonbeck (1949), roots having identical vowels are by far the most prevalent in the language; and thus the forms affected by the opacity in question must be quite numerous.

4.3 So far in the discussion of the functional role of opacity in Javanese Elatives, I have limited consideration to Elatives corresponding to primary adjectives with final closed syllables. I have done this mainly to facilitate discussion, but also because such forms so clearly illustrate not only the functional
role of opacity with respect to Vowel Harmony, but also the way
opacity with respect to FCSL functions to mark Elative forms.
(While in Elatives with final open syllables, FCSL is of course
not relevant.) At the same time, morphemes with final open
syllables (with the exception of those of the form /CaCa/) are statistically quite rare in Javanese. There are however
certain facts about open syllable Elatives which are relevant
to discussion of the functional role of opacity in Javanese
Elatives.

4.3.1 First of all, just as was the case in final closed
syllable Elatives corresponding to primary adjectives with two
identical non-high vowels (i.e. where Vowel Harmony operates),
open syllable Elatives of primary forms with two /a/ vowels
also exhibit opacity with respect to Vowel Harmony. And this
opacity also functions to avoid possible confusion by making
the Elative sound more like its corresponding primary form.
That is, in the Elative dowU, for example, (primary dowo (/dawa/))
the penultimate o from underlying /a/ can only have arisen
through harmonizing to a final o (from /a/ by a# to o#).
But in the Elative this final o has been replaced by U and the
form is therefore opaque with respect to Vowel Harmony (thus
dowU instead of *dawU). This opacity however has the effect
of making the penultimate vowel of the Elative identical to
the penultimate of its corresponding primary form and thereby
avoiding the possible confusion arising from neutralization of
the final vowel, which would otherwise allow the possibility
that the Elatives of CoCo (/CaCa/) primaries might be segmentally
identical to those of CaCU and CaCO primaries.

4.3.2 There is another way in which a type of opacity in
Elatives of final open syllable adjectives serves to avoid
the possible confusion resulting from partial neutralization
of underlying contrasts. I must limit description of this
particular phenomenon however, since I am not yet sure of the
exact nature of the process involved.
4.3.2.1 It appears that in Javanese words with final open syllables the surface tenseness or laxness of a penultimate vowel may be determined by comparison of that vowel with the word-final vowel. If in the underlying form the penultimate is the same height or higher than the final vowel, then the tense variant of the penultimate occurs on the surface; if it is lower than the word-final vowel, then the lax variant occurs. (It must be emphasized that I am not claiming this to be a rule of the language; it is merely intended to serve as a description of the facts.) Thus for example, we find words of the type COCO, COCE, CICO, etc., where the penultimate is the same height or higher than the final and is thus tense; but CoCI, CoCU, CeCI, etc., where the penultimate is lower than the final and thus the lax variant occurs.11

The Elative corresponding to 10gr0 'loose' is however not *logrU, with the expected lax o, but 10trU, with the penultimate O tense, even though the final vowel (Elative marker) is higher than the penultimate vowel. This of course represents opacity with respect to whatever process determines tenseness or laxness of penultimate vowels in words with final open syllables. At the same time, however, just as with the opacity of certain Elatives discussed above, the result is minimization of the possible confusion caused by Elative neutralization by means of producing a surface Elative with the same penultimate vocalism as its primary counterpart. The opaque vowel configuration of such words may function as a signal to speakers that they are dealing with Elatives and not primary words. This is an especially important consideration for certain Elatives—namely those corresponding to primary adjectives with final U or I—with final open syllables, because, as was mentioned above in Sect. 2.2, such forms are not readily recognizable as Elatives otherwise.
5.0 In conclusion, I would like to summarize what has been revealed about Javanese Elatives in the preceding sections and to suggest some possible ways of looking at the relevant facts of the language as alternatives to the rule ordering approach that was maintained in the body of the paper.

5.1 In summary, then, it has been shown that many Javanese Elatives exhibit Type i and/or Type ii opacity with respect to a number of phonological rules. Because this opacity must arise through (taking a strict rule ordering approach) the unusual ordering of a derivational morphological process after a number of phonological rules, it might be generally concluded that such a situation is extremely unlikely. It was claimed however that, unlikely as it seems, there is good motivation for the existence of such a situation in the grammar of Javanese, since the opacity of certain Elatives probably serves to distinguish them from primary forms and at the same time helps to avoid some of the confusion about underlying distinctions that might otherwise result from the partial neutralization of final vowel contrasts inherent in the process of Elative Formation itself.

5.2 Although I have spoken in terms of rule ordering throughout the paper, there are some alternative approaches that should at least be mentioned.

5.2.1 First of all there is the possibility that Elative Formation is a somewhat strange derivational process that simply operates on surface forms of primary adjectives and replaces their final vowels with Elative markers. This would be entirely consistent with the data presented in this paper and would perhaps account for why all the examples of opacity that I have claimed help to maintain underlying distinctions actually result in making Elatives look as much as possible like their corresponding surface primary forms. Thus such an approach would basically be very similar to the rule ordering one taken in this paper, with the difference that simply claiming that
Elative Formation is ordered after certain phonological rules still leaves room for the possibility that it may be ordered before certain others—even though I know of no phonological rules that must be ordered after it. The surface derivation approach of course by definition precludes this possibility. At the same time the rule ordering approach makes no claims about what the relationship between Elative Formation and any new phonological rules entering the grammar might be; the surface derivation approach however would claim that such phonological rules would of course precede Elative Formation, which would take only surface forms as its input.

5.2.2 Another approach that might be taken in accounting for the facts of Javanese Elative Formation is that of positing some sort of transderivational constraint for the language. It seems that the major effect of ordering Elative Formation after Vowel Harmony is the avoidance of homonymy among certain Elatives by making them sound more like their primary counterparts. However, these same results might be obtained by alternatively claiming that, instead of the suggested ordering, the grammar of Javanese possesses some device that operates during the derivation of an Elative to "look over" to the derivation of its primary form in order to ensure that the final output of the former will have the same penultimate vowel as the final output of the latter. Thus, for example, at that point in the derivation of Elat. *gêpêng* (cf. Sect. 1.3 above) at which Vowel Harmony should apply (but ordinarily could not because the input at this point would be */gEpêng*/), which does not meet the environment for this rule) the grammar would look over to the same point in the derivation of primary *gêpêng* (which at this stage would be */gÊpeng*/), see that Vowel Harmony does apply in the latter, and accordingly lax the penultimate of the Elative in order to ensure surface resemblance to primary *gêpêng*. Note that if this approach were taken, some way would have to be found to account for the opacity of Elatives with
respect to FCSL (cf. Sect. 3.1.2). This problem however could be taken care of by claiming that all Elatives are automatically exceptions to FCSL. Another problem would be that the choice of the \( i \) Elative marker for forms with \( a \) in a final closed syllable and the choice of \( u \) to mark Elatives of primaries with \(/a/\) word-finally would both seem to be completely arbitrary (cf. Sect. 2.3 above).

5.3 This type of transderivational approach to the facts presented in this paper would seem to offer what in my opinion is a rather insightful explanation for the role of phonological opacity in avoiding homonymy in Javanese Elatives. That is, the transderivational approach just described explicitly claims that we are dealing with a case of a language specifically avoiding surface homonymy in Elatives by keeping the derivation of primary adjectives and their corresponding Elatives parallel, so that the primary and derived forms will be as similar to each other as possible at the surface. Although the same ultimate result (i.e. avoidance of homonymy) is obtained by ordering Elative Formation after a number of phonological rules, and even though this result can be cited as justification for the presence of such an ordering in the grammar of Javanese, it seems to me that the explicit claim made by a transderivational analysis about how surface homonymy is to be avoided (i.e. by keeping Elatives as much as possible like their primary forms) is an important insight which is missing from the rule ordering approach.

Because of the enormous power of a device such as the transderivational constraint, and because we as yet know very little about the conditions under which such devices might reasonably be posited for phonology, I am hesitant at this time to make any strong endorsement for a transderivational analysis of Javanese Elatives;\(^{12}\) I would however suggest that such an analysis be at least considered as an alternative to simple rule ordering.
FOOTNOTES

1. I have borrowed the term "Elative" from Uhlenbeck (1949). The analysis of Javanese presented in the present paper is based on data I have gathered in the course of a year spent working with my informant Suharto Prawirookusumo, a native speaker of Javanese from Surakarta.

2. By "morphological" I refer to linguistic processes which are responsible for the creation of words which are clearly segmentally related to primary forms, but which differ in some systematic way in grammatical category or semantic import from those primary forms.

3. Although the literature contains numerous analyses where morphological processes are ordered among phonological rules, as was noted in Wilbur (1973), these special orderings usually involve the morphological process of Reduplication and can be eliminated by acceptance of an identity constraint which, Wilbur convincingly argues, exists between the component parts of reduplicated forms.

4. The discussion in this paper will be limited to bisyllabic stems. This is because the vast majority of roots in the language are of this configuration, with only a limited number of exceptions. (In most cases, stems of more than two syllables are either of foreign origin or the result of compounding, and in both of these cases behavior of the linguistic processes we will be discussing is somewhat aberrant.) In general the whole grammar of Javanese appears to be geared towards dealing with bisyllabic stems.

Throughout the paper I use "final" as synonymous with "last" or "rightmost" when referring to the vowels in a given bisyllabic form. Thus I may use the phrase "final vowel" to refer, for example, to the rightmost vowel in either a form of the shape CVCV, where the vowel in question is really (word) final, or to one of the shape C'VCVC, where the final vowel is not actually word-final. When "word-final" is meant, this will be clearly specified.

5. There is good evidence in the language to indicate that underlying i and u are tense vowels, while a and schwa are lax. The basic character of mid vowels is however somewhat problematic. For the purposes of the present paper I will assume that e and o are underlingly tense; alternatively they could reasonably be regarded as unspecified for tenseness or laxness, with these features being assigned in the appropriate environments by rule. It seems to me that whichever of these characterizations is chosen, the conclusions reached in the present paper will remain in large part unchanged, with only certain details of the phonological rules included in the analysis being contingent on the choice of mid vowel characterization.

It must also be noted that the phonological rules described
below are only preliminary formulations; further investigation will probably lead to some minor changes. Again however, I am confident that these changes will have no effect on the validity of claims made in the present paper. (For detailed discussion and justification of the analysis presented here, the reader is referred to my forthcoming dissertation.)

6 The English glosses of Javanese words used throughout the paper are from either Horne (1961) or Horne (1974).

7 Although it may appear at first glance that this form represents a violation of Vowel Harmony, this is in reality not the case, since Vowel Harmony specifies that the two vowels to be harmonized must have been identical originally. Surface rOSo however comes from /rOSa/, with non-identical basic vowels.

8 In Uhlenbeck (1949) there is a description of Javanese Elatives which differs slightly from that presented here. The main difference lies in the fact that as Uhlenbeck describes it, Elative Formation involves replacement of any vowel in a final syllable ending in q with schwa. Thus he gives on p. 79 the form t̞jea 'near' with corresponding Elative t̞jedo. He at once comments however that this complication in the otherwise simple formation of Elatives seems to be on the way out, with the usual I or U marker appearing more and more frequently in such forms. His prediction seems to be borne out by the fact that my informant has a grammar which has, with only a few exceptions, done away with the complication in question. There is also one other difference between Uhlenbeck's description of Elatives and what I found to be true for my informant: Uhlenbeck claims that primary forms in final /a/ may have Elatives with either I or U as the marker. I found this to be the case only for a very small number of adjectives (e.g. ombu has both ombI and ombU as permissible Elatives), with the U marker clearly being the productive rule for such forms.

9 The language appears to escape confusion in many other cases by what appears to be more or less an accident of distribution. In Javanese (according to Uhlenbeck (1949)) bisyllabic roots with certain vowel configurations are very common, while others are less common and still others are extremely rare. It turns out to be the case that in many instances where a given Elative could theoretically correspond to more than one primary form, one of these forms has a vowel configuration that is at least twice as common as the other, which occurs very rarely. Thus for example, an Elative of the shape CUCUC could conceivably correspond to either of the primary forms CUCUC or CUCuC. However, Uhlenbeck gives the frequency of occurrence of the former type as 356, while the latter type only occurs 35 times. So that, given an Elative like CUCUC, there should in actuality be very little possibility of confusion as to primary forms, with one of the possibilities being very likely to actually occur as a primary adjective, and the other extremely unlikely.
The reader may have noted that the Elatives of CECiC and CECaC forms still fall together. This problem is however partially avoided by the distributional statistics mentioned in the previous note, with the frequency of morphemes of the former type being, according to Uhlenbeck, only 26, while the latter occurs 126 times.

Forms with /a/ appear to behave slightly differently; this however is really an illusion created by the notation being used. Thus we find o in forms like dowo from /dawa/, where according to the principle suggested above there should be a tense penultimate. It happens to be the case however that /a/ actually appears to have the surface realization o in all environments where other vowels have tense variants, so that o may be thought of as the tense variant of /a/. Thus, theoretically dowo could be written dAwA. However I have chosen to represent the tense variant of /a/ with o because it coincides phonetically with the lax variant of /o/.

For discussion of a rather different situation in which a transderivational approach to the avoidance of homonymy is suggested see Kisseberth and Abasheikh (1974).

REFERENCES


