STATISTICAL DEMONSTRATION OF A MEANING: THE SWAHILI
LOCATIVES IN EXISTENTIAL ASSERTIONS

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Data involving the locative morphemes pa-, ku- and mu-
in Swahili, a Bantu language of East Africa, are discussed. The existential use of these forms (as in the English 'there is/there are') is focused on. Locatives in Swahili are semantically distinct whereas speakers of Swahili claim no distinctiveness for the same forms when used existentially. A statistically analysis of contextual variables of existentials is presented and it is shown that in fact the choice of pa-, ku- and mu- in existential contexts is not arbitrary as native speakers suggest.

1. Introduction

This paper will address the methodological problem of determining whether a contrast in meaning between two forms is preserved even in contexts where none is reported by native speakers on direct questioning. We will demonstrate the use of a statistical technique to establish that the forms are in fact being used contrastively even in these contexts. The results of this method will also provide support for a particular semantic analysis. We will conclude that where there are differences in surface form it is profitable to look for differences in meaning even if these are not immediately obvious.

2. The Analytical Problem

In Swahili, forms that are regularly used to refer to place—that

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1 An earlier version of this paper was presented to the Sixth Conference on African Linguistics in April, 1975, under the title "Swahili existentials: a semantic analysis of locatives", and appears in Diver [1975]. I would like to express my thanks to Professor William Diver and to Professor Erica Garcia, Wallis Reid, and David Zubin for critical comments on an earlier draft. Special thanks to the latter for help with the Chi-square table.
is, locatives—are also used where there is no apparent reference to place. For example:

(1) a. Aliweka kitabu hu-KU.
    this-LOC.
    'He kept the book *somewhere around here*.\(^2\)

   b. Na kama mchumba angali kigoli, basi ha – KU – na
      neg. LOC. 'associated with'
      kizuizi cha kumwona kila mara. [Uz 103]
      obstacle
      'And if the fiancée is still a girl, then there is not
      [any] obstacle to seeing her every time [the young
      man goes to her home].'

(2) a. Aliweka kitabu ha-PA.
    this-LOC
    'He kept the book *right here*.'

   b. Ha – PA – na
      neg. LOC. 'assoc.d with' need
      haja hata kidogo ya kuona haya. [Kf 47]

(3) a. Aliweka kitabu hu-MU
    this-LOC
    'He kept the book *inside here*.'

   b. Ndani yake [chungu] MU – na
      LOC.'assoc.d with' egg
      yai viza. [KG 58]
      'Inside it [the pot] there is a rotten egg.'

The third pair of examples differs from the other two in that the locative notion of "insideness", associated with the spatial meaning of mu, appears in both examples. This pair thus bridges the semantic gap

\(^2\)Examples (1a), (2a) and (3a) and their translations are taken from Zawawi [1971:106] (underlining mine [ECM]). All other examples in the paper are from Swahili writings, identified by initials followed by page number. For fuller references, see bibliography.
between locative expressions and so-called "existential" expressions.\(^3\) Since there is no doubt that we have the same mu in (3a) and (3b), the question naturally arises: do we not also have the same pa and ku in the other pairs?\(^4\)

On this point, native speaker intuition does not provide a clear guide. Although pa and ku produce a difference in message when substituted for each other in locative expressions:

\[(4)\]
\[a. \text{ Aliweka kitabu hu-KU.} \]
\[\text{'He kept the book somewhere around here.'} \]
\[b. \text{ Aliweka kitabu ha-PA.} \]
\[\text{'He kept the book right here.'} \]

Language consultants\(^5\) report that they can be interchanged in existential expressions without appreciable effect:

\(^3\)Although there seems to be no empirical basis for claiming that "existential" is a grammatical category of Swahili, I will continue to use this term below to refer to the class of contexts in which a locative is prefixed to the associative particle na (in non-present tenses, with the auxiliary verb kuwa 'be'), followed by a noun, where the English translation is generally 'there is an X'.

\(^4\)It will be recognized that a similar analytical problem arises in English, as well as in other languages: English there appears in both locative and existential expressions. The question whether English existential there is (a replacement for) a locative expression (as argued in e.g. Fillmore [1968], Juno [1971], Kimball [1973] and others) or something else (Jespersen [1949], Perlmutter [1967], Allan [1971], Bach [1974] and others) continues to generate controversy. It has also been argued that there is a "universal" relationship between locatives and existential expressions (e.g. Lyons [1967]). The purpose of this paper is not to take a stand on these issues, but rather to deal directly with the analytical problem which occurs in Swahili, i.e. the semantic relationship between the forms used in the a. examples and those used in the b. examples above, and that between the locatives pa and ku in existential contexts.

\(^5\)Three first speakers of Swahili from Zanzibar, one second speaker from Moshi.
(5) a. \[ \text{Ha-} \left\{ \begin{array}{l} \text{PA-na} \\ \text{KU} \end{array} \right\} \text{haja hata kidogo ya kuona haya.} \]

'There is not any need at all to feel embarrassed.'

b. Na kama mchumba angali kigoli, basi ha-\left\{ \begin{array}{l} \text{KU-na} \\ \text{PA} \end{array} \right\} kizuiizi cha kumwona kila mara.

'And if the fiancee is still a girl, then there is not [any] obstacle to seeing her every time.'

If "intuitive" judgments were the only data on which to base semantic analysis, we would have to conclude that pa and ku do not contrast in meaning in existential expressions. Since they clearly do contrast in locative expressions, the formal similarity between the locatives in the a. examples and those in the b. examples would have to be a coincidence, i.e. we would have to set up the homonyms \( \text{pa}_1 \) (locative) and \( \text{pa}_2 \) (existential); \( \text{ku}_1 \) (locative) and \( \text{ku}_2 \) (existential). This is essentially the position taken by Perrott [1972:147] and Ruzicka [1960:211], who feel that the use of locatives in existential expressions is "idiomatic", having no semantic relation to the original spatial meanings of the locatives.\(^6\)

Authors who affirm that the forms used in the a. examples are "the same as" those used in the b. examples (Meinhof [1948], Ashton [1944], Gregersen [1967], Christie [1970]) do not confront the problem of the apparent lack of semantic contrast between pa and ku in example (5).

In summary, although there is a formal (morphological) similarity between the forms used in locative and those used in existential expressions in Swahili, the question of their semantic relationship needs closer examination because (a) reference to a literal place may not be apparent in the message; (b) language consultants do not report a contrast between pa and ku in existential expressions, although they do in locative expressions.

\(^6\)Neither of these authors comments on the difference, if any, between "idiomatic" (existential) pa and "idiomatic" ku.
3. Methodology

The kind of distribution we will examine is the tendency for a form to occur in semantically compatible contexts.

Language is a device of communication. For effective communication it is desirable that utterances have semantic coherence. We therefore expect that when a particular form is used, there will often be something else in the linguistic context whose presence can be explained by its semantic compatibility with that form.\(^7\)

In what follows we will isolate variables in the linguistic context which are semantically compatible with one or the other of the forms under study, and will show that the distribution of ku and pa with respect to these variables can be explained by their respective locative meanings. The general procedure is as follows:

(6) a. Make a hypothesis about the meaning of a form.
   b. Choose one or more contextual variables suggested by their semantic association with the meaning being tested.
   c. On the basis of the hypothesized meaning, predict the direction of statistical skewing of the form with respect to the chosen variable(s).
   d. Count the frequency of co-occurrence of that form with the variable(s).

If we find that the distribution of the form is consistently skewed in the expected fashion, we have found support for the hypothesized meaning.

Note that the variables are chosen only on the basis of their semantic relevance to the hypothesized meaning. The meaning leads both to the choice of pertinent variables and to predictions about how the form will skew with respect to these variables. For example, suppose that the contrast in meaning between \( \emptyset \) and suffixed \(-s\) on English nouns (e.g. bird/birds) were not intuitively obvious, and that we had adopted the hypothesis that they mean 'one' and 'more than one' respectively. Quantitative expressions such as five, many would would be a semantically relevant variable to correlate with \(-s\) and \( \emptyset \),

\(^7\)See also Garcia [1975:44] for discussion of this point.
because there is an apparent semantic association between this variable and the hypothesized meanings. On the other hand verb tenses would not be a semantically relevant variable: there is no apparent semantic association between e.g. the meaning 'one' and past tense. Therefore the statistical method outlined above cannot be used as a discovery procedure for a meaning, but only as a test of a hypothesis.

It will be apparent from the results of this statistical method that ku and pa are used in existential expressions in conformity with their locative meanings.

4. Meanings of the Locatives

We have assigned the following meanings to the Swahili locatives:

(7)  

mu: a space differentiated with respect to insideness
pa: a space viewed as simple and homogeneous, i.e. an undifferentiated spot
ku: any kind of space, i.e. one whose structure is left unspecified

It is suggested in (7) that the Swahili locative system classifies spaces according to degree of spatial differentiation—that is, the meanings refer to spaces which are defined with increasing precision. On a scale of increasing differentiation, the locatives fall in the order ku, pa, mu. This relationship has an effect on their distribution. In general, the more precise a meaning is, the more restricted are the contexts to which it is appropriate. Given that in existential contexts considerations of a specific, literal place may not be of primary importance, we would expect the relative frequency of the loca-

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8 I am not claiming that there could not possibly be such a relationship. Conceivably, entities which are individuated might correlate with tenses denoting relative importance, or present relevance, of an action. However this connection would be extremely indirect and thus not especially appropriate for testing the meaning 'one.'

9 For a detailed justification of this analysis, the reader is referred to Contini [1974].
tives in this context to be in inverse proportion to their relative degree of spatial precision. And in fact the distribution of locatives in the existential sample used for this study is 59% ku, 36% pa, and 5% mu.

The meaning of ku both includes and exceeds those of pa and mu: on the one hand spaces which can be referred to by pa or mu can also be referred to by ku: 10

(8) a. Uani KU-a bwana Ali KU-likuwa kama ua wowote yard- LOC-of LOC(subject) like etc. place -past-/be/

   tu wa shamba. [MKW 10]

   'The yard of Mr. Ali KU(subject)-was like any [ordinary] yard of a farm.'

Cf: b. PA-le chini ya mti PA-likuwa PA-kitumika LOC-that under of tree LOC(subject)-LOC(subject)- LOCP past- 'be' 'being used'

   kama marikiti ya watu wa Giningi. [KG 69]

   'That place under the tree PA(subject)-was being used as a market by the people of Giningi.'

c. Tulipokuwa ṭukicheza KU-le ndani nikastuka na LOC-that inside

   kusema 'Jamani tumekwisha fungiwa!' [RS 4]

   'While we were playing there [that-KU] inside, I started and said, "Friends we've been closed in!"'

10 This is something of an oversimplification: the substitution of ku for pa or mu leads to a loss of information, which in some cases produces a difference in message (as in example (4) above). However with sufficient redundancy in the context ku can refer to spaces which are indistinguishable from those referred to by pa or mu, as in example (8).
Cf: d. Wakati sisi tulipokuwa tukicheza MU-le ndani,  
LOC-that inside  
yule bwana mwene shamba alikuja akamkuta kaka yangu  
amesimama karibu ya pango. [RS 2]  
'At the time when we were playing there [that-MU]  
inside, the man who owned the farm came and found  
my brother standing near the cave.'  
on the other hand, ku may refer to spaces for which neither pa nor  
mu would be appropriate:  

(9) Kunako vifundo vya mikono yake kafunga singa za mikia  
y ya ng'ombe zilizokuwa zikining' inia mpaka viganjani  
{  
KU-ake.  
?PA his  
?MU  
} palms-place  
[KG 45]  
'Around his wrists he had tied cow tail hairs which waved  
[down] to/around his palms.'  

The question we will address below is in what ways the more  
precise spatial meaning of pa and the less precise meaning of ku  
affect their distribution in existential sentences.  

5. Statistical Evidence  
A count was made of all the ku and pa existentials in six  
short novels by different Swahili authors  
and in two issues of the  

11 This meaning relationship is similar to that described in Harries  
[1965]: 'The locative affix of Class 17, -ku- or ku-, can be said  
to include within its wider range of meaning the particular location  
expressed by either class 16 [pa] or class 18 [mu] affix'. However  
Harries does not specify what the range of meaning is nor what kinds  
of locations are expressed by pa and mu. Certainly the traditional  
definitions as given in e.g. Ashton [1944] do not point to an including relationship.  
12 For references, see bibliography.
weekly magazine *Nchi Yetu* (in all, 550 pages of running text), a total of 281 examples of which the total number of *ku*-existentials was 173, and of *pa*-existentials 108.

Semantically relevant variables were chosen based on the hypothesized meanings for *pa* and *ku* given in (7) above. The first is as follows:

(10) Contextual variable I: concrete vs. abstract entities

Prediction I:

*Pa* should favor contexts where a **concrete**, or readily localizeable, entity is said to exist, while *ku* should favor entities which are **abstract**, or not readily localizeable.

*Pa* designates a "spot". The kind of entity most likely to occupy a spot is a concrete entity. On the other hand, *ku* refers to a structurally undefined space. An abstract entity is more likely to be associated with this type of space than with a particular spot.

Note that *pa* and *ku* do not themselves mean "concrete" and "abstract" respectively. ¹³ These are attributes of the entity whose existence is being predicated. The classification of entities as concrete or abstract is being used as a convenient measure of relative localizeability and thus of relative compatibility with the spatial meanings of *pa* and *ku*.

To illustrate, here are examples of each type of noun:

(11) a. Zaidi ya vitu hivyo palikuwa na *msahafu mkuukuu*. [KG 25]  
'Besides these things there was a worn Koran.'

'In [the country of] Kufikirika there is disease and death, but in [the country of] Pepo there is health and eternal life.'

¹³ In particular, the use of these terms should not be confused with their use by Christie [1970], who makes a distinction between "abstract" and "concrete" locations (attributed to Lyons [1968]) as an argument for a relationship between locatives and possessives.
In example a., the word msahafu 'Koran' would be counted as referring to a concrete entity. In the second example the words maradhi 'disease' and mauti 'death' would be counted as abstract. I also included under the general category of "abstract" such nouns as wind, darkness, which are not localizeable although it could be disputed whether they were abstract. The results of the count are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Clearly Abstract</th>
<th>Clearly Concrete</th>
<th>Indeterminate</th>
<th>Total Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA</td>
<td>36% (39)</td>
<td>53% (57)</td>
<td>11% (12)</td>
<td>100% (108)</td>
</tr>
<tr>
<td>KU</td>
<td>52% (89)</td>
<td>35% (61)</td>
<td>13% (23)</td>
<td>100% (173)</td>
</tr>
</tbody>
</table>

(total abstr. 128) (total concr. 118) (total indet. 35) (total 281)

p < .005

The table in (12) can be read in two ways: first of all, if we look at the overall distribution of pa-existentials, we find that the majority (or 53%) are used to predicate the existence of concrete entities, while only 36% predicate the existence of abstract entities. We also find the distribution of ku to be almost the mirror image of that of pa: while 52% co-occur with abstract nouns, only 35% co-occur with concrete. This skewing conforms with the prediction.

If we now look at the category "concrete" taken by itself, it appears that the total number of examples (reading down, a total of 118 concretes) is split fairly evenly between pa and ku: there are 57 examples with pa and 61 with ku. That is, while it is true that pa admits mostly concretes, the reverse is not the case. Here we must of course take into consideration the higher overall frequency

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14 The indeterminate category represents existentials of a certain type, fairly common in Swahili, which has no word for "no one". The established way of expressing the message "no one came", for example, is hakuna/hapana aliyejuja 'there-is-not one-who-came'. In these cases I was uncertain whether to consider the noun involved as "concrete" or "abstract".

15 Raw figures are given in parentheses.
of **ku** in the sample, but this statistic still deserves a comment.

As mentioned above, **ku** is the including member of the locative system. In other words, the meaning of **ku** makes no claim about what type of space is being referred to. While this makes **ku** the most compatible of the locatives with abstract entities, it does not make it **incompatible** with concrete entities. **Pa**, on the other hand, does have a meaning which is **less compatible** with entities which are not intrinsically localizeable. Therefore we find the skewing much more extreme in the Abstract column, where **ku** exceeds **pa** by more than two to one (89 to 39).

We conclude that the distribution of **pa** and **ku** with respect to abstract and concrete entities is skewed in a way which is consistent with their locative meanings.

Let us now move on to the next variable:

(13) **Contextual variable II:** particular location mentioned vs. not mentioned

**Prediction II:**

**Pa** should be relatively favored and **ku** relatively dis-favored in existential contexts where a particular location is specified.

As mentioned above and as illustrated in examples (1b) and (2b), in existential assertions consideration of the literal place where something exists is not always of primary importance. However when a place is explicitly identified in the context as the location where something exists, given a choice between a more precise spatial meaning (**pa**) and a less precise one (**ku**), we expect the more precise meaning to be chosen. We therefore predict that **pa** and **ku** will skew with respect to explicit reference to a place in the context. Here is an example:

(14) **Katikati mbele ya mlango wa nyumba, baina ya sehemu mbili za bustani, PA-likuwa na muasmini mkubwa uliozaa sana.** [KG 12]
'In the middle in front of the door of the house, between the two sides of the garden, there was a jasmine tree in full bloom.'

Here 'in the middle in front of the door of the house' and 'between the two sides of the garden' are counted as specific places. The results of this count are as follows:

<table>
<thead>
<tr>
<th>Place mentioned</th>
<th>Place not mentioned</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA 44% (48)</td>
<td>56% (60)</td>
<td>100% (108)</td>
</tr>
<tr>
<td>KU 18% (30)</td>
<td>82% (143)</td>
<td>100% (173)</td>
</tr>
</tbody>
</table>

(total men. 78) (total not men. 203) (total 281)

p < .005

Here again, the figures represent percentage of the total sample. For example, of all pa-existentials, 44% co-occurred with a specific place-referent, but only 18% of the ku examples did. That is, pa is more than twice as likely as ku to co-occur with an explicit place-referent.

This table can also be read in another way: in the context of an explicit place referent (reading down, a total of 78 examples), pa is used 62% of the time, ku 38%, in spite of the higher overall frequency of ku in the sample. Where no place is mentioned, pa is used only 30% of the time, ku 70%.

We conclude that the locative meanings hypothesized for pa and ku correctly predict their relative skewing with respect to the variable of explicit mention of place.

Next variable:

(16) Variable III: plural vs. singular nouns

Prediction III:

Pa-existentials should be used less often than ku to assert the existence of plural entities.

A homogeneous space by definition has no internal structure: no particular points falling within this space, nor any subdivision of the
space may be singled out without losing homogeneity. The kind of entity which is most properly associated with such a space is an individual entity, which itself defines the space. A plurality of entities is made up of several individuals, each of which may be expected to define its own spot: "no two things can occupy the same place at the same time". A plurality of entities thus conflicts with a homogeneous spatial interpretation, and we therefore expect that pa-existentials will be less frequent than ku-existentials in contexts where reference is made to a plurality of entities.

The results of this count are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Plural</th>
<th>Singular</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA</td>
<td>13% (14)</td>
<td>87% (94)</td>
<td>100% (108)</td>
</tr>
<tr>
<td>KU</td>
<td>32% (56)</td>
<td>68% (117)</td>
<td>100% (173)</td>
</tr>
</tbody>
</table>

As can be seen from the plural column, the probability that ku will co-occur with a plural noun is nearly three times as great as that for pa. Further, in the context of plural nouns pa is used only 20% of the time (14 examples), ku 80% (56 examples).

In this count we have presented data bearing directly on the geometric meaning assigned to pa. This geometric meaning—namely, homogeneous, undifferentiated space—leads to the inference that only a single space, and therefore a single entity, is being referred to. Pa is therefore avoided in contexts where reference is made to a plurality of entities. Other meanings assigned to pa such as 'definite place, position' [Ashton 1944:126], 'place near some object' [Myachina 1960:23] would not predict the skewing with respect to singular/plural nouns.

For this count, abstract nouns which are pluralia tantum such as mauti 'death' were counted as singular, because they do not refer to aggregates of bodies.
6. **On Randomness**

It might be argued (despite the Chi square) that all forms are skewed in their distributions and that the skewings reported above could be the result of chance. To test whether any arbitrarily chosen contextual factor will show a skewing, I also made a count of the ku/pa contrast with respect to nouns containing the letter d:

(18) Variable IV: nouns containing d vs. nouns not containing d

**Prediction IV:**
Neither pa nor ku will show a significant skewing with respect to nouns containing the letter d.

Here are the results of this count:

<table>
<thead>
<tr>
<th>Contain d</th>
<th>Do not contain d</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA 11.1% (12)</td>
<td>88.9% (96)</td>
<td>100% (108)</td>
</tr>
<tr>
<td>KU 11.5% (20)</td>
<td>88.5% (153)</td>
<td>100% (173)</td>
</tr>
</tbody>
</table>

p > .995

The purpose of (19) is to show that distributions can be random. The meanings hypothesized for pa and ku did not lead me to predict any kind of skewing with respect to the letter d. And in fact, there is none.

A further point: even if the results of one test were due to chance, the likelihood that random factors would lead ku and pa to skew in the predicted manner in all tests is extremely low, i.e. if one were to claim that forms will always show some skewing or other (or that non-randomness is itself random), there would still be no explanation for the fact that the skewings all point in the same direction.

We conclude that observed skewings do in fact correlate with semantic characteristics of the forms being used.

7. **Apparent Counterexamples**

The statistical method corrects for idiosyncratic local variables affecting the use of forms in particular examples. We will now discuss
these cases, i.e. instances where the forms were used contrary to the predictions.

One may ask why $\text{pa}$ is ever used with plurals or abstract nouns. Let us first discuss plurals: although it was argued above that a plurality of entities would lead to a de facto differentiation of space (each individual defining its own spot), nevertheless it is not impossible to imagine several entities occupying the same place, especially if it is known that the place being referred to is extensive. And in fact "existential" $\text{pa}$ does occasionally occur with plural nouns. For example:

(20) "Unamjua mtu ye yote aliyekuona ukiua?" Hatibu akajibu, "La, labda palikuwa na watu pale nje lakini wakati nilipotoka nje hapakuwa na mtu hai ndani wala nje." [SH 22]

"'Do you know anyone who saw you [in the act of] killing?" Hatibu answered, "No, maybe there were people there outside [of the house], but by the time I went out there was not a person alive inside or out.'"

Here the place itself is mentioned, pale nje or 'there outside'. Since an area thus defined, while homogeneous, is nevertheless extensive enough to accommodate several people, there is no contradiction in using $\text{pa}$.

However, if the plurality of entities in question is reinforced by additional lexical specification (such as numerals, words like 'several', 'various', conjoined noun phrases, etc.), then the implication that they all occupy the same space is that much less likely. For example:

(21) Kwa juu ya daraja hizo kulikuwa na milango mmoja mbali kidogo na mwensiwe. [KG 85]

'Over these steps there were two doors which were situated one a slight distance from the other.'

Indeed, we find that such reinforced plurals occur much more frequently with $\text{ku}$ than with $\text{pa}$. Of the total number of examples of reinforced plurals in my sample (27 in all), only four were associated with $\text{pa}$, while 23 occurred with $\text{ku}$. 
As to the occurrence of pa with abstract nouns, which are non-localizeable, the difference between it and ku is more difficult to pin down quantitatively. There may be other factors affecting the use of pa in these cases. For example, although a noun may be considered "abstract" on the basis of its dictionary definition, in some contexts an abstract noun may be viewed as localizeable in a precise spot. For example:

(22) Hili jembe langu, siliachisapa, lazima liende pale
    nyumbani, la sivyopatakwa na mambo. [SH 25]

    'This hoe of mine, I won't leave it here, it must go there
to the house, otherwise there will be trouble.'

Here it is clear that the "trouble" will occur at the (homogeneous) spot where the speaker is located. However in order not to prejudice the results I kept strictly to a context free categorization of nouns for Prediction I.

Another variable possibly affecting the use of pa with abstracts is emphasis. A pa-existential may convey a slightly more emphatic flavor than a ku-existential, even when no specific place is intended, or when reference is made to an object which is not intrinsically localizeable. By indicating that something is associated with a homogeneous place, even if this is not literally true—perhaps because of this fact—the speaker is able to convey a certain emphasis on the existence (or non-existence) of that entity. The use of metaphor generally has such an effect: if we say 'John is a dog' it is more emphatic than saying 'John is a man' (if John is in fact a man). Indeed, almost half of the abstract sample for pa (16 out of 39) consists of such emphatic expressions as hapana shaka 'there is no doubt' and hapana ila ... 'there is no [alternative] but...' (as in hapana ila yeye ndiye allyekwiba 'there is no alternative but that he is the one who stole [it]' [KG 82]), which inflated the abstract figures to some extent.

Note that the predictions made above should not be construed as "rules of government": LOC -> pa / [+N [+singular [+concrete ...]]]. Such a rule
would make these features part of the meaning of \( \text{pa} \), which would clearly be false, since we do have cases of \( \text{pa} \) being used with abstract nouns, plurals, etc. The predictions state the nature of a coherence relationship, which is necessarily relative. The skewings give a measure of this relationship, but it may not be possible to isolate all the factors relevant to the use of a form in every individual case.  

8. Conclusion

To recapitulate: our statistical analysis of contextual variables has revealed that:

1. \( \text{Pa} \) existentials are relatively skewed toward contexts where the entity whose existence is predicated is concrete, while \( \text{ku} \) existentials are skewed toward abstract entities.
2. \( \text{Pa} \) more than \( \text{ku} \) existentials favor contexts where a particular location is explicitly mentioned.
3. \( \text{Pa} \) more than \( \text{ku} \) existentials avoid plural nouns.

If \( \text{ku} \) and \( \text{pa} \) were in fact freely interchangeable in existential contexts, as our language consultants appeared to suggest, we would have expected the choice between them to be arbitrary, and their distribution to be random. We find that not only is this not the case, but the departures from randomness in all cases lend support to the spatial meanings hypothesized for the locatives. We therefore conclude that the same forms are being used in both locative and existential contexts.

Underlying the analysis presented above are the following assumptions about language:

(a) that grammatical forms have constant meanings;
(b) that differences in form should lead one to check for differences in meaning;
(c) that meanings can be tested by means of statistical analysis of semantically relevant contextual variables;

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17 See also Garcia [1975:495 ff] for a discussion of this subject.
(d) that speakers may not be consciously aware of the meanings they
are manipulating; therefore, "intuitive" judgments about meaning con­
trasts may not accurately reflect usage. 19

Semantic hypotheses must be validated by observation of actual
language use, not on the basis of intuitions.

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dam: North Holland.


19 These assumptions derive from the theoretical framework known as
"form-content" grammar, an approach to the semantics of grammatical
systems being developed at Columbia by Professor William Diver and
his students. For a general introduction to the theory, see Diver
[1975], introduction; Garcia [1975:Ch. 2]. For a detailed application
of the theory, cf. Garcia [1975]. Other studies of Swahili
within this framework are Leonard [1973], Port [1972] and Contini
[1974]. For additional application of quantitative analysis of con­


Swahili References used for quantitative analysis of context:


