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Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistics Society (1986), pp. 485-496

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Observations on Reference Object Geometry
in Emai Path Expressions*

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The semantic analysis of Path expressions has become a topic of linguistic investigation over the last decade (Miller and Johnson-Laird 1976, Jackendoff 1983 and Talmy 1983). Conveyed in English by prepositional forms of the class into, on, in front of and the like, Path notions function as one structural element in the representation of spatial scenes, where in Talmy's terms, the disposition of one object, the Figure, is specified relative to a second, the Reference Object. Though identification of both entities is required for accurate specification of a scene, their complete nature is not and cannot be specified, i.e., knowing whether the house in A man walked through the house is made of brick or wood is not essential to indexing the Figure's motion relative to the Reference Object. Instead, as Talmy argues the elements of a spatial scene are idealized in a schematic, abbreviated form wherein certain aspects of that scene are selected and others disregarded.

As with any schematic representation, it is natural to inquire about the nature of those aspects of a spatial scene which are selected or disregarded by a language. One way to explore this issue is to examine the nature of the constraints governing Path forms and their Reference Objects. For instance, one can normally say walk through the house but not walk through the road. Moreover, Talmy's analysis of English suggests that these constraints have a geometric character of the kind found in the study of topological space. In the following, Path forms in Emai, an Edoid language of Nigeria, are examined in an initial attempt to explore different surface level avenues whereby this geometric character is expressed.

There is a set of verbs in Emai which encode concepts of Motion and Path when occurring alone or with a Manner specifying verb (Schaefer 1985). At the surface level, Path Verbs are immediately followed by

*Preparation of this study was supported at different stages by a Faculty Research Grant from the University of Benin, Nigeria, and NICHD Postdoctoral Training Grant #HD07255 administered by the University of Kansas. Special thanks are due my Emai assistants Francis Egbokhare and Gabriel Egeruan.

complements consisting of either a noun or the grammatical marker vbi and a noun. In order to explore the geometric characteristics which these verbs assume about their Reference Objects, it has proved useful to adopt formulas posited by Talmy as specifying a universal portion of the schemas underlying expressions of motion. Complementing these formulas are language-specific structures that we have attempted to flesh out for Emai. In doing so, four geometric characteristics have come to the fore.

The first characteristic to be considered is the proximity relationship between Figure and Reference Object(RO). To appreciate its role, consider the motion constructions in Table I.[1]

Table I. Path Verb Constructions in Emai.

<u>Qli omqhe</u> la o vbi ukpa-ode.
the man run move into at road
'The man ran onto the road.'
<u>Qli omqhe</u> za vbi oa la shq re.
the man be-located at house run move out
'The man ran out of the house.'
<u>Qli omqhe</u> la se vbi ukpa-ode.
'The man ran up to the road.'
<u>Qli omqhe</u> za vbi oa la raale.
'The man ran away from the house.'
<u>Qli omqhe</u> la shan vbi ukpa-ode.
'The man ran throughout the road.'
<u>Qli omqhe</u> la shan ukpa-ode.
'The man ran through the road.'
<u>Qli omqhe</u> la raa uhai re.
'The man ran past the well.'
<u>Qli omqhe</u> la fan ukpa-ode ze.
'The man ran across the road.'
<u>Qli omqhe</u> la nong udeken.
'The man ran along the wall.'
<u>Qli omqhe</u> la ye oa.
'The man ran toward the house.'
<u>Qli omqhe</u> la lagaa uhai.
'The man ran around the well.'
<u>Qli omqhe</u> la heen oko.
'The man ran up the hill.'
<u>Qli omqhe</u> la kponn oko.
'The man ran down the hill.'

A significant grammatical property of these constructions is the variable distribution of the marker vbi. It occurs with only a subset of Path Verbs. Closer examination of constructions where vbi does occur indicates that the RO is idealized as a point

with respect to which the Figure is in a state of contact, either at the outset of the motion event or at its completion. For instance, the Path Verbs o and sho re, though referring to opposing directions of movement relative to the RO, both demand vbi.

One might object to the association of vbi with contact between Figure and RO by contrasting the examples of se vbi ukpa-ode 'move up to the road' and o vbi ukpa-ode 'move onto the road'. In the former, contact may actually not occur between Figure and RO, just as there may be no contact between Figure and RO in za vbi oa la raale relative to za vbi oa la sho re. However, if the Figure is not actually on the road or in the house in the first member of each pair, he is "at" the road, in a state of proximity which makes no assumption about the geometric character of the RO beyond its idealization as a point in space, ignoring the enclosure quality of oa 'house' and the planar quality of ukpa-ode 'road'.

Path Verbs which do not accept vbi are those where movement of the Figure occurs either on an extent specified as the Reference Object, i.e., fan ze, shan, heen, kpoon; or on an extent defined by the Reference Object, i.e., raa re, nono, ye, lagaa. Not one of these Path Verbs conveys movement initiated or completed "at" a RO idealized as a point in space. The characteristics of pointness and contactness are thus conveyed by a member of the verb complex, vbi, not by the verb itself.

Clarifying this interpretation is the presence of vbi with the Path Verb shan. Notice that shan occurs with and without vbi, the resulting sentences both seeming to refer to movement on the bounded extent ukpa-ode 'road'. Nonetheless, there are shan vbi constructions which more clearly reveal a point and contact quality. For instance, the Figure's movement in (1a) is conceptualized as occurring along an entire expanse of weeds which lead to the road. In contrast, (1b) with vbi conceptualizes the weeds as one position via which the Figure's movement is specified. Establishing this perhaps more definitively is (1c), which has no grammatical counterpart with shan alone, and which more easily allows us to idealize the RO of shan vbi as a point with which there is contact. Our initial understanding of the Table I construction with shan vbi must then be tempered by the realization that the Figure is moving, as in a drunken sway, from point to point, the discontinuous nature of which is obscured by the continuous extent ukpa-ode 'road'.

1. a. Qli om̄ohe la shan iumi ye ukpa-ode.
the man run move thr. weeds toward road
'The man ran through the weeds toward the road.'
- b. Qli om̄ohe la shan vbi iumi ye ukpa-ode.
the man run move thr. at weeds toward road
'The man ran via the weeds toward the road.'
- c. Qli om̄ohe la shan vbi uhai ye ukpa-ode.
'The man ran via the well toward the road.'

A second characteristic is of special interest since it fails to appear as an inherent semantic aspect of Path Verbs. In a language like English, enclosure is a characteristic in great demand, witness phrases such as into the house, and through the tunnel. Some investigators have even established it as the keystone of their analysis (Miller and Johnson-Laird); nonetheless, enclosure is not a characteristic any Emai Path Verb requires of its associated RO. Support for this is derived from the compatibility of the verb o 'move into, onto' with the enclosure noun oa and the planar extent noun ukpa-ode in (2a), and a like compatibility of these nouns with sho re 'move out, off'.

2. a. Qli om̄ohe la o vbi oa/ukpa-ode.
the man run move into/onto house/road
'The man ran into the house/onto the road.'
- b. Qli om̄ohe la shan oa/egbua.
the man run move through house/backyard
'The man ran through the house/backyard.'
- c. Qli om̄ohe la o vbi ekein oa.
the man run move into inside house
'The man ran into the inside of the house.'

Enclosure might also be expected to play a role in other Path expressions, such as the form equivalent to the enclosure sense of through in English. The Emai verb shan conveying this meaning occurs with two- and three-dimensional configurations, as the ROs oa and egbua in (2b) suggest. These and other examples argue that enclosure is a semantic quality ignored by Emai verbs with respect to their ROs.

Though enclosure is not inherent in the meaning of any Path Verb, it can be designated at the surface level. In this case, the Path Noun ekein 'inside' is inserted into the noun phrase of the RO, as shown in (2c).

A third geometric characteristic of Reference Objects occurring with Path Verbs concerns their boundedness. Most Path Verbs require their RO to be a bounded, non-partitive entity. Where this is not the case, syntactic modification of one sort or another is required. For instance, ikpeshe 'beans' is conceptualized in Emai as a mass aggregate of bean units. When it occurs as the RO of a Path Verb that idealizes its RO as a point, the verb complement is restructured such that the single noun ikpeshe becomes the subject of the location verb ri in a Place Clause. Thus (3a) and (3b) without the Place Clause markers ebe and ri would be ungrammatical.

3. a. Qli ofen za vbi ebe ikpeshe ri la sh_o re.
 the rat be at where beans be run move off
 'The rat ran off the beans.'
- b. Qli ofen la ye ebe ikpeshe ri.
 the rat run move toward where beans be
 'The rat ran toward the beans.'
- c. Qli ofen la shan ebe ikpeshe ri.
 'The rat ran through the beans.'

Likewise when a Path Verb demands a bounded extent on which movement must occur, the unbounded aggregate ikpeshe is subject to similar syntactic modification. Therefore, (3c) without the clause markers ebe and ri would be ungrammatical.

Reconceptualizing the boundedness of a RO can be achieved by other syntactic means. In particular, the Path Noun egbe 'side, beside' can occur in collocation with the aggregate noun ikpeshe, as (4a) indicates.

4. a. Qli ofen la ye egbe ikpeshe.
 the rat run move toward side beans
 'The rat ran toward the beans.'
- b. Qli ofen la lagaa ikpeshe.
 'The rat ran around the beans.'

Syntactic modification of ikpeshe and similar nouns is not required with every Path Verb however. For example, no syntactic modification is required with the Path Verb lagaa in (4b), though why only this Path Verb exhibits this behavior is not clear. One might speculate that such exemplars occur since the RO of lagaa fails to act as a bounded extent on which the Figure moves or as a point at or via which movement is defined.

A final characteristic revealed by analysis of Path Verbs centers on an implicit Secondary Reference Object(SRO) as a complement to the Principle Reference

Object(PRO) manifested at the surface level. For some Path Verbs the earth assumes this function. For instance, the axis of the plane on which movement is specified by the Path Verb fan ze must be parallel to the axis defined by the earth. When this is not the case, as when an insect moves along the side of a wall from one end to the other, an ungrammatical structure results, as with udeken in (5), where the Figure moves on a plane perpendicular to the earth.

5. Aenhienmi la fan *udeken/ewa ze.
 cockroach run move across wall/floormat
 'A cockroach ran across the wall/floormat.'

Other Path Verbs also depend on the earth as a SRO, though in a more obvious manner. Take heen and kpoon for example. Each specifies movement on a plane whose axis intersects the plane of the earth. Their PRO specifies the extent on which movement occurs: heen specifying movement away from the horizontal plane of the earth, i.e., 'to ascend' and kpoon specifying movement toward the plane of the earth, i.e., 'to descend'.

Of interest in this regard are constraints affecting heen and kpoon. Both require that the moving Figure achieve his destination: the uppermost and lowermost parts of the hill, respectively. In neither case does the PRO indicate the achieved destination, it instead specifies the bounded extent on which movement occurs. If the movement being specified is not an achievement of this type, for instance motion toward the top of the hill, the top not being attained, then extensive syntactic modification is required. Instead of the heen structure seen earlier in Table I, (6a) would be used, where the verb specifying limited movement on a bounded extent, ye, is combined with a compound noun indicating direction, okpen-okhumi. Similar syntactic modification is demanded when the bottom of the hill is not achieved, but movement is in a downward direction on the hill, as in (6b) with the compound okpen-otqi. It should be noted that in these compounds, the SRO maintains a degree of presence at the surface, since the forms okhumi and otqi also mean 'sky' and 'ground', respectively.

6. a. Oli omöhe la ye okpen-okhumi oko.
 the man run move toward top hill
 'The man ran toward the top of the hill.'
 b. Oli omöhe la ye okpen-otqi oko.
 'The man ran toward the bottom of the hill.'

Our investigation now turns to positional expressions. In constructions of this type, a noun or a noun in combination with other grammatical elements expresses the Path by which a Figure can be located. Most Path Nouns in Emai are derived from body part terms, though a few have their source in more general terms of the environment, earth and sky, while still others at the surface level show syntactic complexity in addition to semantic extension. Those forms involving lexical derivation only are shown in Table II.

Table II. Path Noun Constructions in Emai.

<u>Q</u> li ughu	ri	vbi	okhumi	udo.
'The vulture is above the stone.'				
<u>Q</u> li udo	ri	vbi	okpen-ot <u>o</u> gi	oko.
'The stone is at the bottom of the hill.'				
<u>Q</u> li udo	ri	vbi	idama	ukpa-ode.
'The stone is in the middle of the road.'				
<u>Q</u> li ughu	ri	vbi	agban	eda.
'The vulture is at the edge of the river.'				
<u>Q</u> li ughu	ri	vbi	egbe	oa.
'The vulture is beside the house.'				
<u>Q</u> li udo	ri	vbi	eggeengeen	itebu.
'The stone is below the table.'				
<u>Q</u> li udo	ri	vbi	isao	isi oa.
'The stone is in front of the house.'				
<u>Q</u> li udo	ri	vbi	uokho	isi oa.
'The stone is behind the house.'				
<u>Q</u> li udo	ri	vbi	esg-ese	isi eli areo.
'The stone is between the idols.'				

An observation concerning the syntax of these forms is pertinent. Each requires the marker vbi in contrast to Path Verb constructions; yet, not all express contact between the Figure and RO itself, as one would expect from our earlier analysis. Instead, contact is specified relative to an area abstracted from the RO, amending in some manner an immediate proximity relationship.

Support for the latter contention is the unmarked positional construction, shown in (7), whose chief features are the location verb ri, the marker vbi and a RO. As examination of the two ROs in (7) suggests: vbi idealizes its RO as a point, ignoring the enclosure quality of oa and the planar quality of ukpa-ode.

7. Oli udo ri vbi oa/ukpa-ode.
 the stone be at house/road
 'The stone is in the house/on the road.'

Besides being idealized as a point, the RO occurring in the neutral form exists in a state of contact with the Figure. With either RO in (7) the Figure udo must exist in a proximity relationship best captured by the neutral preposition 'at', not 'beside' 'top' etc. Hence the interpretation of vbi as indicating a proximity relationship of contact is constant across the two types of Path expressions examined herein.

A further point along these lines is that only a particular geometric aspect of the RO dictates the appropriate interpretation. For example, the version of (7) with oa cannot mean that the Figure object is on the house, the roof for example or beside it, where it may still be 'at' the house; the Figure must be in the house. Similarly, the version with ukpa-ode cannot mean that the Figure is for some reason in the material of the road. It is as if in the unmarked structure the Figure is positioned with respect to a RO as prototypically construed.

The unmarked structure, as we have seen, expresses a relationship of contact between Figure and Ground. This is not the only manner in which a contact relationship can be indicated in positional structures. For example, addition of the Associative marker isi to the egbe construction in Table II expresses a contact relationship wherein the Figure is affixed to the side of the house, as in (8).

8. Iogn ri vbi egbe isi oa.
 feather be at side ASSOC house
 'A feather is on the side of the house.'

Despite the meaning of this construction, it is only with the Path Noun egbe that the Associative marker indicates contact between Figure and RO. For example, expressions in Table II with the Path Nouns isao 'front' uokho 'back' and ese-ese 'among' employ isi obligatorily but do not specify immediate contact of Figure and RO. Moreover the behavior of isi is puzzling due to its variability in Table II. Though the formal facts are on record, it is not clear why isi manifests this variable distribution, i.e., what meaning isao, uokho and ese-ese have in common that would exclude the meanings of egbe 'side', agban 'edge of' and others where isi does not occur. It is thus

obvious that the presence of isi is not a consistent barometer of a relationship of immediate contact, as presence of vbi is not. Nonetheless, these two grammatical forms affect a proximity relationship differently: the immediate proximity level indicated by vbi is weakened by the presence of a Path Noun, whereas the addition of isi to a Path Noun construction can serve to intensify the proximity relationship between Figure and RO.

Another surface level strategy for specifying contact between Figure and RO involves a more complex clause level specification of the RO noun phrase. Take the okhumi udo example in Table II for example, which specifies only that the vulture is above the stone. In the event that the vulture is actually touching the stone, then the syntactic restructuring shown in (9) is required: an ebe clause with the verb kpen and the grammatical marker li. In this example, the form isi plays no role and the contactness suggested by vbi is ignored in view of the Path Noun okhumi.

9. Qli ughu ri vbi ebe o kpen okhumi li udo.
 the vulture be at where it next top to stone
 'The vulture is on top of the stone.'

Moving to another characteristic discussed for Path Verbs we come to enclosure. As shown earlier in this section, one need not specify the enclosed nature of an object with the unmarked locational construction, ri vbi N. In order to indicate enclosure, however, the Path Noun ekain, as in (10), is available and its associated RO must be capable of being idealized as an enclosure, since substitution of the noun ebe 'leaf' for oa in (10) leads to ungrammaticality. Enclosure, therefore, is a feature of geometric character which is available for emphatic but not obligatory marking.

10. Qli omghe ri vbi ekain oa.
 'The man is inside the house.'

Of all Path Nouns, it is only ekain 'inside' which has this optional status. For purposes of RO idealization, ekain is thus different from its paradigmatic brothers and sisters, which are obligatory at the surface level when the geometric selection they express is being conveyed.

In contrast to the similar behavior of Path Nouns and Verbs regarding enclosure is their differing behavior with respect to RO integrity. No Path Verb requires that its RO be a non-integrated dispersed entity. One of the Path Nouns, however, requires that

its RO be idealized in this manner. When, for instance, the RO occurring with ese-ese 'among' is marked as an integrated entity with the singular determiner qli in (11), the resulting sentence is ungrammatical. Only the plural determiner eli, reflecting a diffuse, partitive RO is acceptable.

11. Oli udo ri vbi ese-ese isi *qli/eli areo.
 the stone be at among ASSOC the idol
 'The stone is among the idols.'

A less severe partitioning of ROs is found with a number of other Path Nouns. Instead of partitioning among entities, these Path Nouns partition a single RO and advance one portion, for example front, top, as relevant for locating the Figure. Path Nouns from Table II performing this function include isao 'front', uokho 'back', egbe 'side', okhumi 'above', and egeengeen 'below'.

A final characteristic of Path Nouns to which our attention is drawn concerns the use of Secondary Reference Objects. For some Path Nouns such as okhumi 'above', one might assume that the earth and its vertical plane provide the orientation for locating the Figure. To a degree this is true, but there are constructions which indicate that this aspect of meaning can be ignored. Thus in contrast to the okhumi construction in which the Figure is located on a vertical orientation relative to the RO, there is the construction in (12a), where localizing the Figure requires orientation on the horizontal, not vertical plane. A similar contrast prevails with okpen-otoi in (12b).

12. a. Oli evbo ri vbi okpen-okhumi ukpa-ode.
 the village be at forward road
 'The village is up ahead on the road.'
 b. Oli evbo ri vbi okpen-otoi ukpa-ode.
 'The village is back down the road.'

The degree to which a vertical orientation, i.e., the earth as SRO, is equally primary for okhumi and okpen-otoi is unclear however, since only the former, by demanding additional lexical units to form a compound referring to a horizontal orientation, reveals its initial embedding in the vertical.

A number of other Path Nouns also assume the earth as a Secondary Reference Object, though these are less susceptible to modification. The forms in question refer to one and only one portion of the RO, as that object is positioned relative to the earth. Thus egbe

'side' can only refer to an axis perpendicular to the earth, not horizontal and parallel. Likewise, the earth as SRO plays a role in the meaning of isao 'front' and uokho 'back' and eeengeen 'below'.

In the preceding examples the Secondary Reference Object has been implicit, discovered by positioning the Figure in various spatial arrangements. Another set of Path expressions exhibit explicit reference to a SRO and in fact do not employ a Path Noun. For convenience, these expressions can be discussed in terms of two subsets, both employing the grammatical marker li seen in a few earlier constructions. In one set, the grammatical marker li relates the PRO to a pronoun indicating the SRO, the latter being the speaker and his location. The particular orientation of the speaker in this case is projected onto the PRO and by this means the Figure is localized. Consider example (13), where uhai is the PRO and the pronominal forms ean 'here' and evbo 'there-yonder' indicate different speaker orientations leading to the resultant meanings 'nearside, this side' in the former and 'farside, that side, beyond' in the latter.

13. a. Oli omöhe ri vbi ebe o kpen ean li uhai.
 the man be at where it next here to well
 'The man is on this side of the well.'
- b. Oli omöhe ri vbi ebe o kpen evbo li uhai.
 the man be at where it next there to well
 'The man is on that side of the well.'

In the other set, the grammatical marker li relates the PRO to a compound noun indicating the Secondary Reference Object, which again is the speaker. In this case the speaker's left or right orientation is projected onto the PRO. In (14) the compound nouns ogon-obo, literally 'crooked hand', and obo-odign 'hand senior', serve to project a left or right orientation onto uhai 'well' and thereby localize the Figure. It thus appears that only the speaker as SRO, not the earth, attracts explicit surface level designation.

14. a. Oli omöhe si kpen ogon-obo li uhai.
 the man be next lefthand to well
 'The man is to the left of the well.'
- b. Oli omöhe si kpen obo-odign li uhai.
 the man be next righthand to well
 'The man is to the right of the well.'

In the preceding, geometric concepts reflected in constraints governing Path forms and their associated

Reference Objects in Emai were investigated. As suggested by Talmy, these constraints reveal topological characteristics such as proximity, boundedness, enclosure, in addition to notions of orientation imposed by Secondary Reference Objects. Of particular interest, however, was the manner in which these characteristics were expressed at the surface level, e.g., optional marking of the enclosure property of a Reference Object, obligatory marking of the speaker as Secondary Reference Object. These it is hoped will serve as a further basis for cross-linguistic exploration of the types of lexicalization processes which support the schematic nature of spatial representations.

FOOTNOTES

1. Emai data are presented in the orthographic form suggested in Schaefer(n.d.), which reflects general IPA conventions except for the use of vb for a voiced bilabial approximant, y for a voiced alveopalatal affricate and the indication of tone only where it serves the purpose of disambiguation.

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