1 Introduction

One of the fundamental differences between *come* and *go* is the perspective that the speaker has on the motion. With *come*, the motion is towards a perspective point, but with *go*, the motion is away. This perspective point can be identified with the speaker or another salient individual, often the hearer.

Pima (Uto-Aztec; central Arizona) does not have a lexical distinction between *come* and *go*. Instead, it uses a series of deictic particles that indicate distance and direction of some figure from a deictic center (Saxton and Saxton, 1969; Shapira, 1979; Zepeda, 1983; Madsen, 2001). These particles attach to the basic verb of motion him ‘go’ to convey they sense of *go* and *come*. They also attach most other predicates. Investigation of these particles reveals that the grammar tracks the location and orientation of speech act and event participants. Furthermore, in order to use these particles, speakers must be capable of fairly sophisticated of spatial calculations, the results of which can be expressed through a concise grammatical particle.

The goal of this paper is to describe the deictic particle system and mention some of the basic features and parameters necessary to use them. Extra emphasis will be placed on two aspects of the system which have not been widely discussed in the deixis or locative literature: direction of action and sequence of orientation.

2 Methodology

The deictic particles were investigated via two basic techniques. Both mainly involved the posable Simpson’s dolls shown below, but also other random props were used as the need or opportunity arose.

---

\(^{1}\)I would like to thank my Pima teacher Mr. Virgil Lewis for all his hard work and good humor. Without him, this paper would not have been possible. This paper has also benefited greatly from comments from Mike Galant, Eric Jackson, Marcus Kracht, Brook Lillehaugen, Pam Munro, Ed Stabler, Gianluca Storto, and Tim Stowell. All mistakes remain my own. The work for this paper was partially funded by a grant from the American Philosophical Society.

\(^{2}\)There are also uses based on the temporal dimension and emotional distance, but these will play no role here.
From left to right: Homer (H), Marge (M), Maggie (m), Bart (B), Lisa (L), and Santa’s Little Helper (d).

The most frequently used technique was to arrange the dolls, then prompt with one or more English sentences. The other technique was to give the speaker the dolls in one heap, give a fabricated Pima sentence, then ask him to arrange the dolls to match the sentence. If the sentence was not acceptable Pima, the speaker corrected it and then arranged the dolls.

3 Morphosyntax

The following table gives the morphological forms of the deictic particles.

<table>
<thead>
<tr>
<th></th>
<th>Undefined</th>
<th>Front Towards</th>
<th>Behind Away</th>
<th>Side Orthogonal</th>
<th>Out of sight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximate</td>
<td>'i</td>
<td>–</td>
<td>'im</td>
<td>'in</td>
<td>–</td>
</tr>
<tr>
<td>Distal</td>
<td>–</td>
<td>'ab</td>
<td>'am</td>
<td>'an</td>
<td>–</td>
</tr>
<tr>
<td>Greater Distal</td>
<td>–</td>
<td>gab</td>
<td>gam</td>
<td>gan</td>
<td>gad:</td>
</tr>
<tr>
<td>Iconic Distal</td>
<td>–</td>
<td>gaab</td>
<td>gaam</td>
<td>gaan</td>
<td>–</td>
</tr>
</tbody>
</table>

1. Distance – the distance between the figure and the deictic center
   (a) **Proximate** ‘i – generally within reach of the deictic center, but can be further if used in contrast with a distal
   (b) **Distal** ‘a – generally out of the reach of the deictic center, but not always
   (c) **Greater Distal** ga- – like the distal, but emphasizing a greater degree of distance
   (d) **Iconic Distal** gaa- – like the greater distal, but degree of distance is iconically related to the length of the vowel

2. Direction – a rough estimate of the angle between figure and deictic center
   (a) **Undefined** – direction is not an issue due to the closeness of the individual. This can only be used with the proximate.
   (b) **Front/Towards** -b – in front of or towards the deictic center
(c) **Behind/Away** - *m* – behind or away from the deictic center

(d) **Side/Orthogonal** - *n* – to the side of the deictic center or in a direction neither towards nor away; i.e., perpendicular or parallel

(e) **Out of Sight** - *d* – not directly visible. This is never obligatory, but is used to emphasize non-visibility. This can only be used with the greater distal.³

3. The particles attach to the left edges of PP’s and VP’s (Hale et al., 1977) The map below and the corresponding examples illustrate the basic use and syntactic structure. In (1), the figure (Homer) is facing the deictic center (the speaker) when he coughs. The same is true in (2), where the figure is the dog and the deictic center is again the speaker.

In the maps, a single arrow represents the direction an individual is facing, a double arrow is the direction of motion. If there is no arrow, then direction is irrelevant. A slash represents that one individual is on top of another.⁴

<table>
<thead>
<tr>
<th>H</th>
<th>L/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td>↑</td>
<td>S</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

(1) Homer 'at [VP 'ab 'i'ho ].
Homer AUX:PF D:FR cough(PF)

‘Homer coughed (facing me).’

(2) Lisa 'o dai- cug [PP 'ab gogs daam ].
Lisa AUX sit -CONT D:SD dog on

‘Lisa is sitting on the dog (which is facing me).’

### 4 Semantic Types

The location related uses can be divided up into four essential classes.

---

³ *Gad*: is most commonly used in temporal expressions to mean ‘last’, i.e., *gad*: 'i cukug 'last night’.

A. **Basic Location** – the location of an event or event participant relative to the deictic center

<table>
<thead>
<tr>
<th></th>
<th>d</th>
<th>↑</th>
<th>S</th>
<th>↑</th>
<th>S d</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3a)</td>
<td>(3b)</td>
<td>(3c)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(3)  

a. Gogs 'o ’ab bool daam keek.  
    dog AUX D:FR ball on.top stand  
    ‘The dog is standing on the ball (in front of me).’

b. Gogs 'o ’am bool daam keek.  
    dog AUX D: BK ball on.top stand  
    ‘The dog is standing on the ball (behind me).’

c. Gogs 'o ’an bool daam keek.  
    dog AUX D: SD ball on.top stand  
    ‘The dog is standing on the ball (off to my side).’

B. **Line of Sight** – the direction the figure is looking relative to the deictic center.

<table>
<thead>
<tr>
<th></th>
<th>d</th>
<th>↑</th>
<th>S</th>
<th>→ d</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4a)</td>
<td>(4b)</td>
<td>(4c)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(4)  

a. Gogs 'o ’ab bool daam keek.  
    dog AUX D:FR ball on.top stand  
    ‘The dog is standing on the ball (in front of me and facing me).’

b. Gogs 'o ’am bool daam keek.  
    dog AUX D: BK ball on.top stand  
    ‘The dog is standing on the ball (in front of me but facing away from me).’

c. Gogs 'o ’an bool daam keek.  
    dog AUX D: SD ball on.top stand  
    ‘The dog is standing on the ball (in front of me but facing perpendicular to me).’
C. **Direction of Motion** – the direction the figure is moving relative to the deictic center.

<table>
<thead>
<tr>
<th>m ↓</th>
<th>H ↑</th>
<th>m ⇒ H ↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>H ↑</td>
<td>m ↑</td>
<td>m ⇒ H ↑</td>
</tr>
<tr>
<td>S ↑</td>
<td>S ↑</td>
<td>S ↑</td>
</tr>
</tbody>
</table>

(5a) (5b) (5c)

(5) a. Maggie ’o ʼab wui him heg Homer.
Maggie AUX D:FR towards walk DET Homer
‘Maggie is walking towards Homer (and towards me).’

b. Maggie ’o ʼam wui him heg Homer.
Maggie AUX D:BK towards walk DET Homer
‘Maggie is walking towards Homer (away from me).’

c. Maggie ’o ʼan wui him heg Homer.
Maggie AUX D:SD towards walk DET Homer
‘Maggie is walking towards Homer (perpendicular to me).’

Direction of Motion is distinct from Line of Sight. This can be seen by constructing situations where someone is moving backwards. Which of the two possibilities is used in a given sentence appears to be based on whether the direction the individual is moving or facing is more salient in the context. In (6), the pig is walking backwards towards the speaker. The deictic indicates the direction the pig is facing, rather than the direction it is moving. In (7), the boy is moving towards the speaker (as is the dog), though he is facing away. The deictic indicates the direction the boy is moving.

<table>
<thead>
<tr>
<th>b ↑</th>
<th>d ↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>P ↓</td>
<td>B ↓</td>
</tr>
<tr>
<td>S ↑</td>
<td>S ↑</td>
</tr>
</tbody>
</table>

(6) (7)

(6) Koji ’at ʼam bool ’amjed: ’atshp hii.
pig AUX:PF D:BK ball from backwards go(PF)
‘The pig is backing away from the ball (facing away from me).’

(7) Bart ’o ʼab œvai-med: heg gogs Homer wui.
Bart AUX:IMP D:FR drag -CONT DET dog Homer towards
‘Bart is dragging the dog towards Homer (towards me).’

D. **Direction of Action** – the direction of action between agent and patient relative to the deictic center.

In the first two examples below (8a,8b) it is unclear whether the deictic indicates the subject’s line of sight or the direction of action. The deictic in (8c) cannot indicate the
line of sight. Potentially, it could be analyzed as showing the location of the event (in front of the speaker), but this is not likely given the first two, which are also in front of the speaker, but are indicating something else.

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>L</td>
<td>B</td>
<td>L</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

(8a) (8b) (8c)

(8)  a. Lisa 'at  'am shoñi heg Bart.
     Lisa AUX:PF D: BK hit  DET Bart
     'Lisa hit Bart.'

     b. Lisa 'at  'ab shoñi heg Bart.
     Lisa AUX:PF D: FR hit  DET Bart
     'Lisa hit Bart.'

     c. Lisa 'at  'ab shoñi heg Bart.
     Lisa AUX:PF D: FR hit  DET Bart
     'Lisa hit Bart.'

Another example. The dog is hiding behind a ball, and Homer is looking for it. The deictic particle can encode the direction between Homer and the dog, even if Homer is not facing that direction. In this case, you cannot observe anything physical passing between the two participants.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>d</td>
</tr>
<tr>
<td>b</td>
<td>b</td>
</tr>
<tr>
<td>d</td>
<td>H</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

(9a) (9b)

(9)  a. Homer 'o 'ab gaak heg gogs.
     Homer AUX D: FR seek  DET dog
     'Homer is looking for the dog (which is between Homer and me).'

     b. Homer 'o  'am gaak heg gogs.
     Homer AUX D: BK seek  DET dog
     'Homer is looking for the dog (which is away from me).'

In order to use the deictic particles, the speaker must keep track of the following information:
5  PERSPECTIVE SHIFTS

1. the locations of speech act and event participants
2. the directions the participants are facing
3. the directions the participants are moving
4. the directionality of the relationships between the participants

The first three can be directly observed. The fourth must be calculated by the speaker based on the locations of the participants and the meaning of the predicate.

5  Perspective Shifts

Typically, the deictic center is identified with the speaker. This is the situation in all the examples above. However, under certain circumstances, the deictic center can shift to another individual. When this happens, the speaker puts himself in the other individual’s position to determine directionality and distance.

5.1  Empathy Shift

One of the conditions for the shift is that the speaker empathizes with the other individual. Empathy with an event participant is most common, though occasionally empathy with the addressee occurs. In (10), Pam is identified as the deictic center, and the particle locates the desk in front of her: ‘ab would not have been appropriate from the speaker’s or listener’s point-of-view. It is not simple to draw a map for this context, because Pam was quite far away and out of sight of the speech act participants. In (11), the deictic center is Marge, and the particle locates Homer directly behind her. All event participants were perpendicular to the speaker.

<table>
<thead>
<tr>
<th>← M ← H</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑</td>
</tr>
<tr>
<td>S</td>
</tr>
<tr>
<td>(11)</td>
</tr>
</tbody>
</table>

(10) Pam ’o  cikpan ’ab ’e= mišiš ’ab.
Pam AUX work  D:FR REFL= table at
‘Pam is working at her desk.’
(11) Homer ’at  ’im ’ees heg votonaj heg Marge.
Homer AUX:PF P:BK steal DET button:3 DET Marge
‘Homer stole Marge’s button from her.’

5.2  Sequence of Orientation

Shift of deictic center can be forced by the grammar. Similar to sequence of tense, sequence of orientation is when a deictic particle in an embedded clause is interpreted relative to
the information of the higher clause. If a verb reports the perspective of its subject, then in any embedded clause, the deictic center is shifted to that subject. This shift is obligatory. In both sentences in (12) the deictic in the matrix clause has the speaker as the deictic center, but the matrix subject is the deictic center in the embedded clause. It is not possible to retain the speaker’s perspective in the embedded clause.

<table>
<thead>
<tr>
<th>D</th>
<th>H</th>
<th>L</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>L</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(12a)  a. i. Bart 'o  'am 'aagid heg Lisa mash heg gogs 'am keek
Bart AUX D:SD tell DET Lisa C:AUX:RSY DET dog D:SD stand
Homer veegaj.
Homer behind
‘Bart, is telling Lisa that the dog was standing behind Homer (facing orthogonal to himi).’

ii. *Bart 'o  'am 'aagid heg Lisa mash heg gogs 'am keek
Bart AUX D:SD tell DET Lisa C:AUX:RSY DET dog D:FR stand
Homer veegaj.
Homer behind
‘Bart, is telling Lisa that the dog was standing behind Homer (facing me).’

b. i. Bart 'o  'am 'aagid heg Lisa mash heg gogs 'am keek
Bart AUX D:SD tell DET Lisa C:AUX:RSY DET dog D:FR stand
Homer veegaj.
Homer behind
‘Bart, is telling Lisa that the dog was standing behind Homer (facing himi).’

ii. *Bart 'o  'am 'aagid heg Lisa mash heg gogs 'am keek
Bart AUX D:SD tell DET Lisa C:AUX:RSY DET dog D:SD stand
Homer veegaj.
Homer behind
‘Bart, is telling Lisa that the dog was standing behind Homer (facing orthogonal to me).’
Verbs explicitly stating the perceptions of another, like ñe?id ‘see, look at’ have the same effect. The deictic center of an embedded deictic is the perceiver mentioned in the matrix clause. In the examples below, the particles are in a relative clause headed by the object of the main clause. The deictic center is based on the subject of the main clause (Marge), since her perspective is being relied on.

<table>
<thead>
<tr>
<th>B</th>
<th>D ← M</th>
<th>B → ← D ← M</th>
</tr>
</thead>
<tbody>
<tr>
<td>✷</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>S</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

(13a) a. Marge ‘o ñe?id heg gogs mo ’an ki‘ikash heg viappoi.
   Marge AUX see DET dog C:AUX D:SD bite DET boy
   ‘Marge is looking at the dog that’s biting the boy (while facing off to her side).’

b. Marge ‘o ñe?id heg gogs mo ’am ki‘ikash heg viappoi.
   Marge AUX see DET dog C:AUX D:BK bite DET boy
   ‘Marge is looking at the dog that’s biting the boy (while facing away from her).’

To account for the perspective shifts, there needs to be a hidden parameter that identifies the deictic center for any given clause. This perspective parameter can vary among the participants according to the speaker’s sympathies. Some languages are probably more strict. (See Taylor (1988) for discussion along these lines.) This parameter is reset to a new value when embedded under a predicate that makes reference to an individuals perspective.

6 The Broader Picture

An adequate description of deictic particles in Pima requires a substantial set of features and parameters. Most of these features and parameters have already been observed in other languages, though Pima offers some new insights.

The grammar must be able to encode information about each speech act and event participant regarding their location, orientation, and direction of motion. These are the basic ingredients necessary for determining distance and direction, which are commonly used throughout languages. What Pima adds to this is the direction of action usage: the ability to determine a path from agent to theme, and to relate that path to a deictic center. The basic issues here are the same as determining the direction an individual is moving relative to the speaker, just in this case the path does not represent physical motion.

It is well established in the literature that the speaker can vary the reported perspective on the event. The difference between come and go was mentioned above, and Rood (2003) reports that variation in perspective can be indicated in Lakhota by postposition choice. Thus, the existence of empathy shift is not surprising, though the extension of the shifts to event participants is noteworthy. What appears to be genuinely new is the sequence of orientation facts. I am not aware of another language for which grammatically forced
perspective shifts have been reported. However, given that similar forced shifts are found with tense and person (Schlenker, 2003), it perhaps should be expected that perspective shifts can be forced as well. (For further discussion of this, see Kracht and Smith (in prog.).

References


Kracht, Marcus and Marcus Smith, in prog. “Sequence of Orientation”.


