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The Image-Schematic Structure of Pointing

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Overview

The research described in this poster uses one of the central theoretical constructs of cognitive linguistics—embodied image schemas—to analyze the idealized cognitive model (ICM) associated with the most basic of human gestures: pointing (see Kita, 2003).

The poster introduces the relevant image schemas, examines the prototypical case of pointing in human discourse, and looks at how pointing works in less prototypical cases, including pointing with eye gaze and pointing in signs and on clocks.

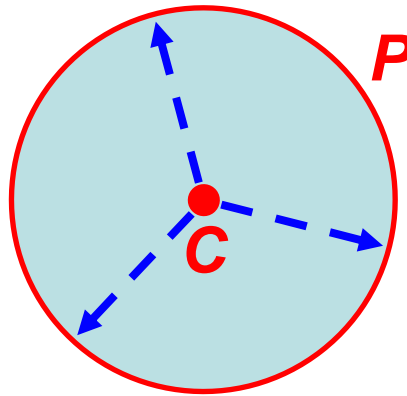
Embodied Image Schemas

Embodied image schemas are recurrent patterns in perceptual-motor experience that derive from our bodily interaction with the physical world (Johnson, 1987; Lakoff, 1987; Lakoff & Johnson, 1999). As a result, they have a generally spatial or force-dynamic character.

The simple patterns of embodied image schemas give structure to the idealized cognitive models through which we make sense of the world. In human interaction, the idealized cognitive model (ICM) for pointing is structured by the *center-periphery* schema, the *extension* schema, and the *source-path-goal* schema. Because pointing structures a visual search for a referent, the *proximity* schema also comes into play.

The center-periphery schema

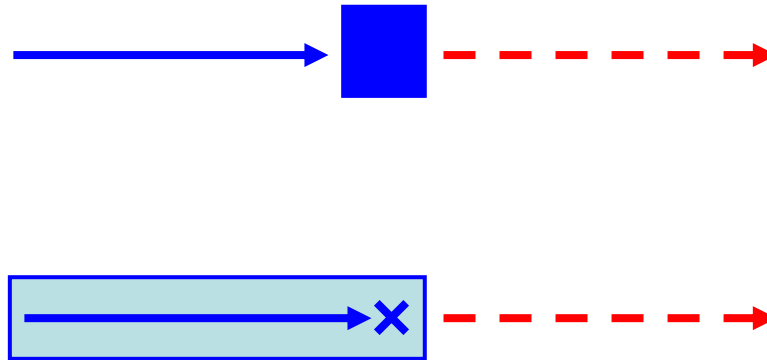
The *center-periphery* schema has three elements: an entity, a center, and a periphery.



The center is essential and important, the periphery less so. The center is also the source of impetus or animus that drives the periphery.

The extension schema

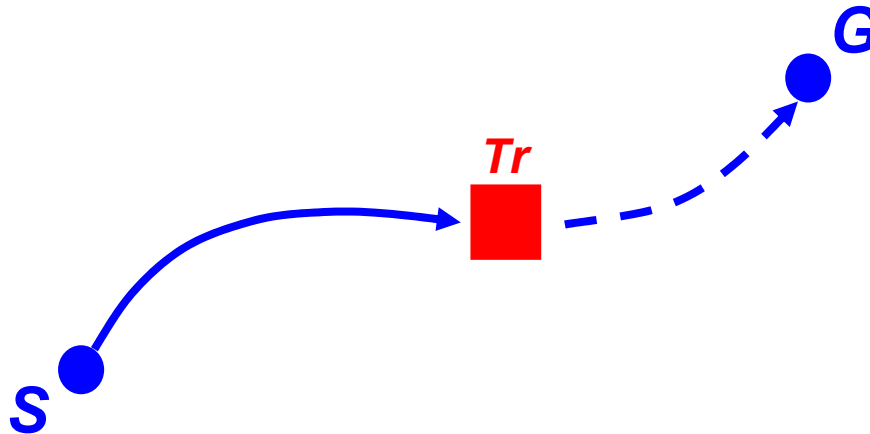
The *extension* schema extends or continues a trajectory of motion.



The moving entity may be the object itself or it may be the locus of visual attention when scanning along a stationary object that has spatial extent, as in fictive motion (below).

The source-path-goal schema

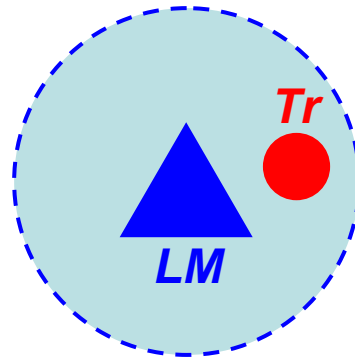
The *source-path-goal* schema defines a path of directed motion. The schema has the following elements: a trajector (moving object), a source (origin or starting point), a goal (destination or endpoint), and a path (series of contiguous locations from source to goal).



At any moment in time, the trajector occupies some position along the path as it moves from the source toward the goal. The *source-path-goal* schema plays a key role in fictive motion (below).

The proximity schema

The *proximity* schema consists of two entities, one construed as a trajector and the other as a landmark. The trajector draws near the landmark or occupies a position near it.



A trajector moving along a path is proximal to the source near the start of motion and proximal to the goal near the end of motion.

Fictive motion

In fictive motion (Talmy, 2000), the object itself does not move. What does move is the locus of visual or mental attention; this motion is structured by the *source-path-goal* schema (above).

A narrow object tends to be scanned along its length, construing one end as the source and the other as the goal. Compare (1) and (2):

(1) *The fence runs from the barn to the house.*

(2) *The fence runs from the house to the barn.*

When scanning proceeds in a consistent direction, its trajectory can be continued beyond the end of the scanned object via the *extension* schema (above).

The Idealized Cognitive Model for Pointing

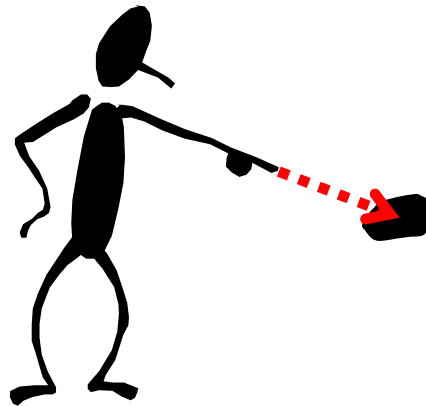
Pointing is a communicative act that structures a search for a referent. For a point to function, both pointer and addressee must share the idealized cognitive model (ICM) of pointing and understand that a particular action or sign is to be construed as an instance of pointing.

The communicative act

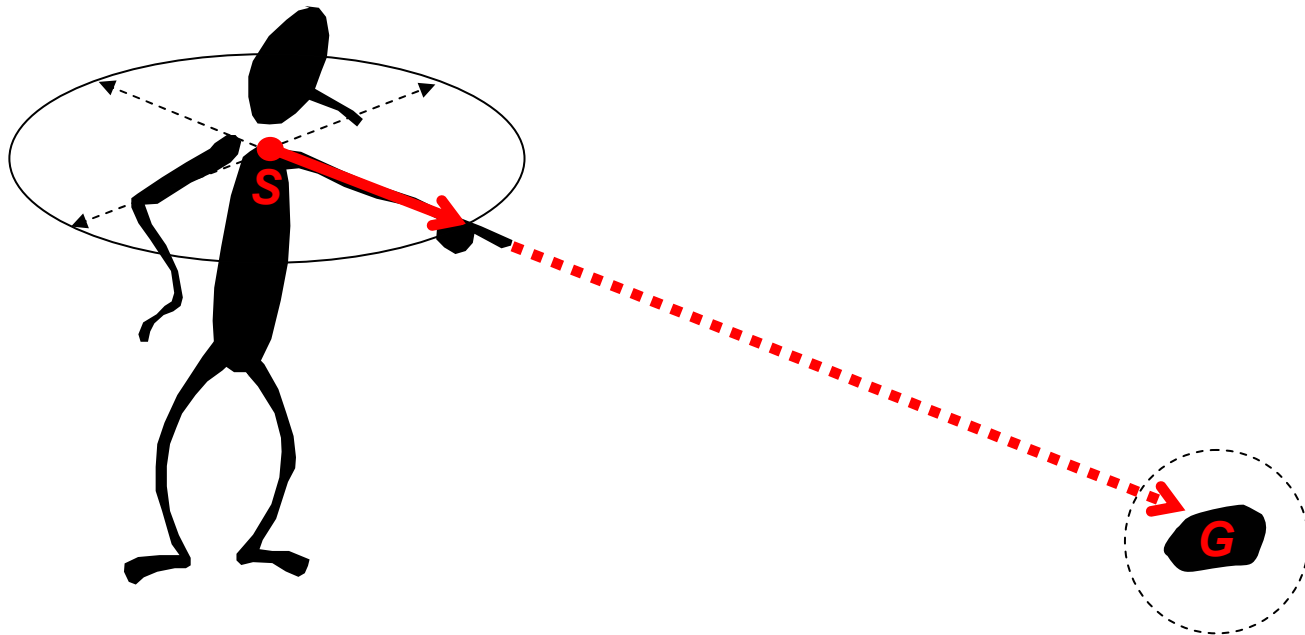
As a communicative act, pointing inherits elements and relations from the ICM of communication. These include a communicator, an addressee, a communicative intent, and a message being communicated. The ICM of pointing construes these in the following way: The communicator uses a part of the body to direct attention toward some intended referent. The addressee performs a visual search for the referent. Locating the referent provides a component of the message being communicated. The visual search is guided by the structure of the point as described below.

The visual search

In order to interpret a point, the addressee must understand that the pointing hand itself is not the focus of attention, as it is for emblems (such as V-for-victory). Instead, the pointing gesture is a structuring element and cue for a visual search. This search involves the kind of visual scan discussed for fictive motion (above). The scan originates in the pointer's body, extends beyond it, and ends at the referent.



This visual scan is structured by aligning the *source-path-goal* schema with the *center-periphery* and *extension* schemas. The *center-periphery* schema locates the source in the pointer's body (origo). The scan follows a path along the extended body part. The *extension* schema continues the scan beyond the end of the body part along the same trajectory. The expected referent acts as a goal. This goal may not be explicitly known until it is encountered. Because the scan is part of a visual search, the *proximity* schema helps to determine likely referents.



Non-prototypical cases

Eye-point

In an eye-point, the visual scan follows the direction of gaze, i.e., where the pointer looks. Gaze following is a familiar social practice: it is how humans monitor what others are attending to. A successful eye-point occurs when both communicator and addressee construe the look as an instance of pointing and interpret it in terms of the Pointing ICM.



“four equal parts”
*(successive looks to each part
while the hands are occupied)*

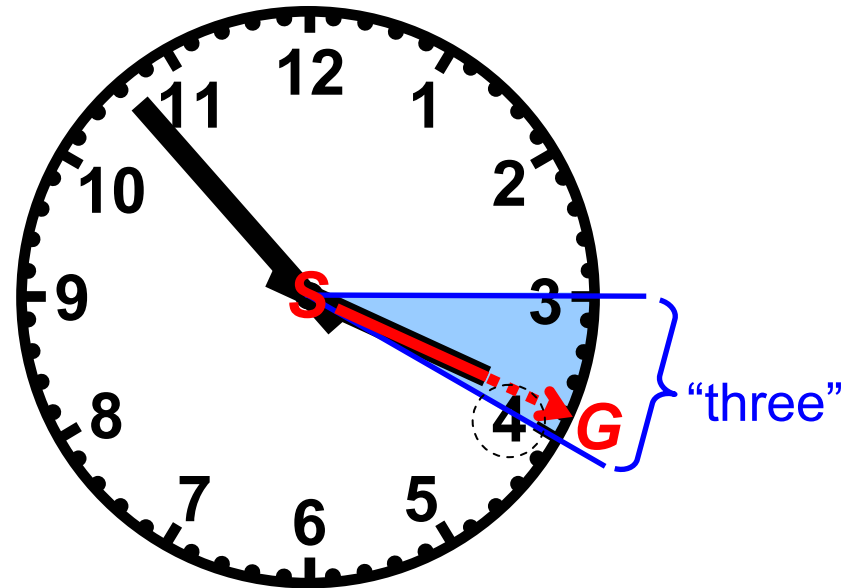


Sign with arrow

A real arrow is fired by an archer along a path toward an intended target. This event exhibits parallel image-schematic structure to the Pointing ICM but without the communicative intent. When used on a sign, an arrow directs an addressee engaged in a search along a path toward the goal. To be understood as a point, the arrow must be interpreted in terms of the Pointing ICM as an intentional communicative act by an implicit communicator not actually present.

Clock

In clock-hand pointing, the *source-path-goal* schema aligns with the *center-periphery* structure of the clock face. The visual scan moves along the clock hand and beyond (via *extension*) until it encounters a location along the outer dial. Here the common association of pointing with *proximity* leads to errors: at 3:53, the hour hand points nearest the 4. The current hour is properly read using a *container* schema: if the pointed-to location lies between the 3 and the 4, the hour is read as “three” (Williams, 2004).



Conclusion

Pointing is a communicative act that guides an addressee's visual search for a referent. Interpreting a point involves recognizing its communicative function and applying *center-periphery*, *extension*, and *source-path-goal* image schemas to direct the visual scan. A *proximity* schema may also be used to help locate a referent.

Because pointing can function in the absence of *center-periphery* structure (in signs with arrows), in the absence of *extension* (in the case of a touch-point), and in association with *containment* rather than *proximity* (in reading clock hours), it might be argued that the *source-path-goal* schema alone is necessary and sufficient for pointing. Such an argument misses the point. Pointing is a radial category centered around an idealized cognitive model that characterizes human social interaction. It is from this prototype that the other cases are derived.

References

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