

Homology in Joint Attention

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Plan

1. The scope of joint attention

2. The phenomena

- Joint (dyadic) engagement
- Joint visual attention (triadic engagement)
 - Gaze following
- Joint representational and conceptual attention
 - The role of language
- Joint linguistic attention
 - The role of syntax

3. Summary and conclusions

The Scope of Joint Attention

- Human knowledge is largely shared, cultural knowledge (most often shared through language)
- Shared knowledge depends on joint attention or attention that is shared with others to common object
- Joint attention has its roots in the first year of life as evidenced by joint engagement and sharing of attention
- Throughout life, it remains a fundamental organizer of human interaction

Can the concept of homology help us to understand the continuity and variability in the phenomena of joint attention?

Sidebar: What is an 'object' ?

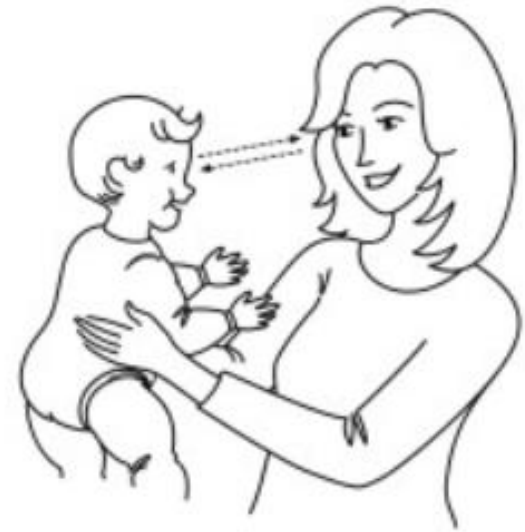
- Objects can be actual present physical things
- They can also be:
 - people
 - events (e.g., actions)
 - properties
 - nonpresent things (absent in space or time)
 - imaginary and counterfactual things
 - propositions
 -
- Language may be used to represent all of these

The Phenomena

- Joint engagement and object interest
 - interest in people
 - interest in objects
- Joint visual attention
 - sharing attention with people to objects
- Joint representational attention
 - sharing attention with people to nonpresent objects
- Joint linguistic attention
 - Sharing attention to ideas across space and time

Joint Engagement (2-6 months)

Dyadic interaction: affectively arousing face-to-face interactions involving turn-taking and variety of actions including facial expressions, vocalizations. Infant's focus is on mother or away. Mother's focus is on infant. Turn-taking moves from supported to coordinated.

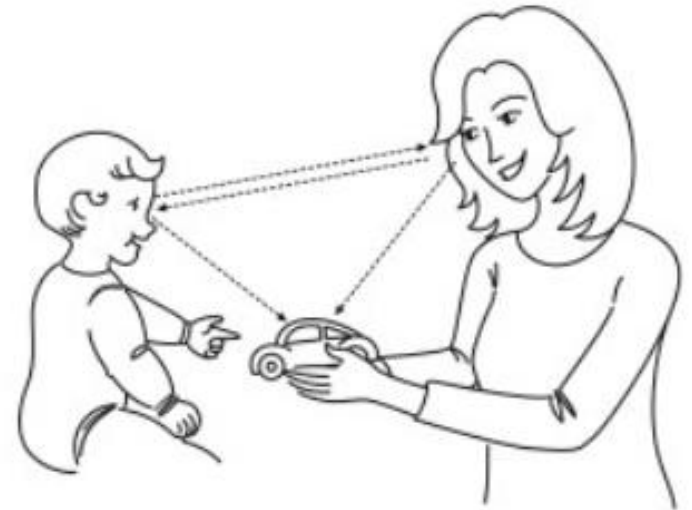


Object interest (5 months on)

- Maturation of
 - Visual perception
 - Posture (e.g., sitting unaided)
 - Motor control (e.g., visually guided reaching)
- Leads to object manipulation

Joint Visual Attention (8-12 months)

Triadic interaction: objects become inserted into dyadic interactions. Involves *joint engagement* and *object interest*. Both participants use actions to maintain joint engagement (showing, giving etc.). Maintenance of joint engagement moves from supported to coordinated. Both participants attend to both of the other two components of the triadic situation. Certain actions (e.g. pointing) begin to be used specifically to maintain joint attention.



Functions of Triadic Interactions

- Social interest
 - Using objects to enhance interaction with people
 - Using people to enhance object interest
- Object interest
 - Finding out about objects (epistemic, affective)
 - Desires and intentions towards objects (conative)
- Classic example – pointing
 - Protodeclarative - showing
 - Protoimperative - demanding

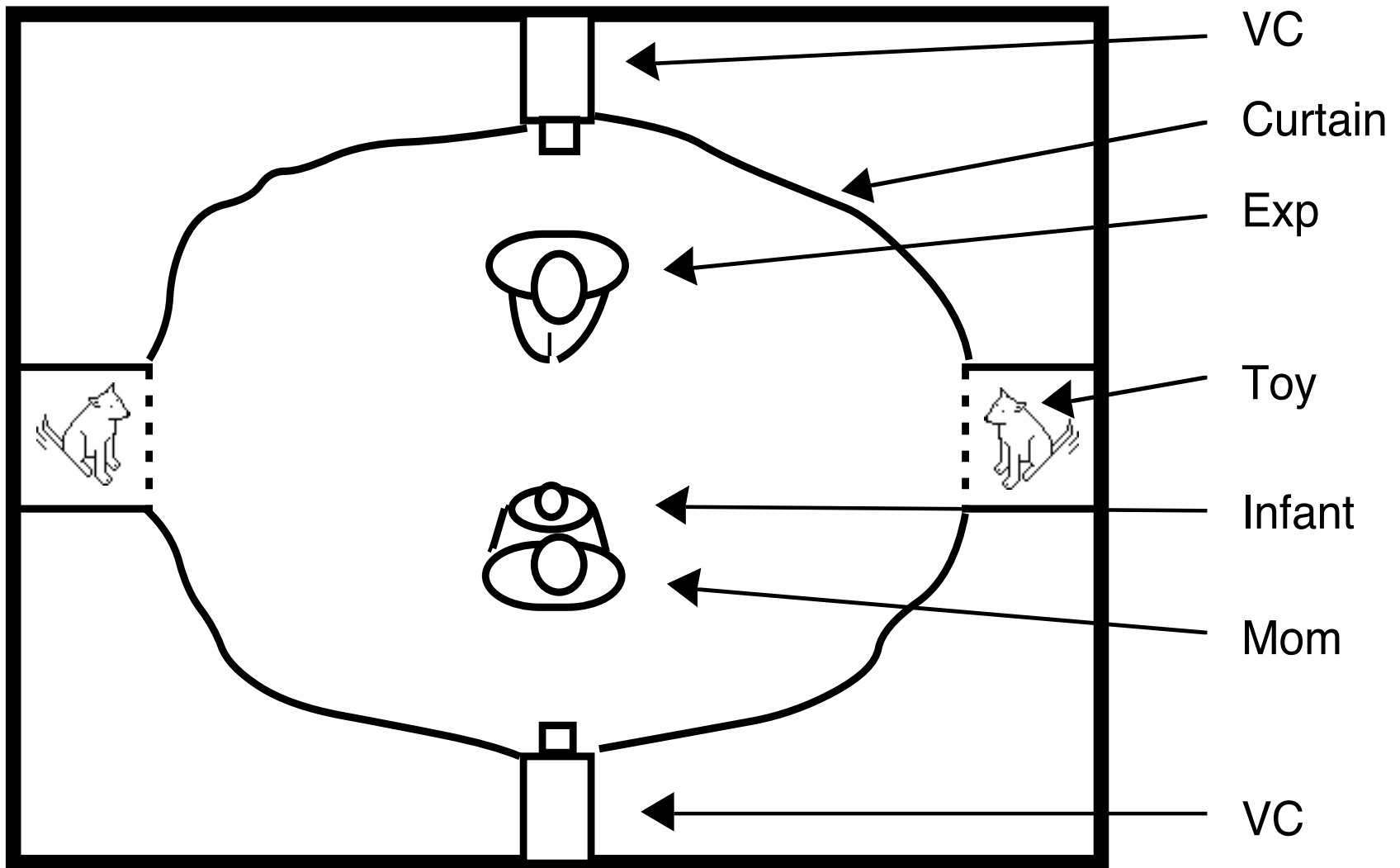
Gaze Following

- Triadic interactions normally established through gaze following or looking where someone else is looking.
- Gaze following shows protracted development from 6 to 18 months of age

Research on Gaze Following - The Basic Paradigm

- Infant seated face-to-face with experimenter
- Adult engages infant and then turns to fixate a target on one or other side of the room
- Infant given opportunity to respond
- Adult again attempts to engage infant in face-to-face interaction
- Multiple trials to both sides perhaps under different conditions

Schematic of Our Lab Set-up



Research on Gaze Following

- Gaze following with different gaze cues
- Gaze following under different target conditions
- Gaze following under different social conditions
- Gaze following to different regions of space
 - Changes reveal integration of developing spatial awareness with triadic interaction.

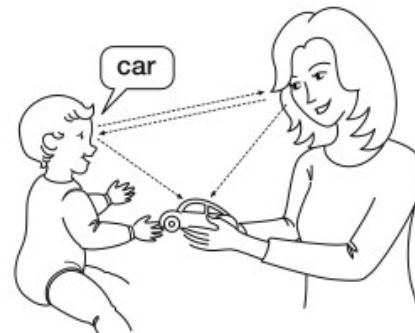
Manipulation of Spatial Layout

- **3 months***: Follow gaze to correct side so long as there is a target **within the visual field** (e.g. D'Entremont et al., 1997; D'Entremont, 2000).
 - Attentional cueing
- **9 months**: Follow gaze to targets **outside** the visual field (e.g. Corkum & Moore, 1998)
- **12 months**: Follow gaze to **particular** target to which adult turns (e.g. Butterworth & Cochran, 1980).
- **12-18 months**: Follow gaze to **hidden** targets - behind barriers and in containers (e.g. Caron et al., 2002; Moll & Tomasello, 2004).
 - Absent objects

*not associated with joint engagement

Joint Representational and Conceptual Attention

- Attention to absent objects requires representation, i.e. that the object be ‘held in mind’ when not perceptually available. Representation is vastly facilitated through medium of language (words)
- Words initially acquired for concrete present objects.
- Much research has shown how word learning is facilitated by joint attention contexts (e.g., Tomasello & Farrar, 1986; Akhtar et al., 1996; Moore et al., 1999).



Joint Attention and Word Learning

Tomasello (2003, p.8): “linguistic symbols are social conventions by means of which one individual attempts to share attention with another individual by directing the other’s attentional or mental state to something...”

- But word learning also enables concepts by aiding abstraction across instances. Joint attention with words is joint *conceptual* attention.
- Joint attention enables language acquisition and in turn is enabled by it.

Representation and Imagination

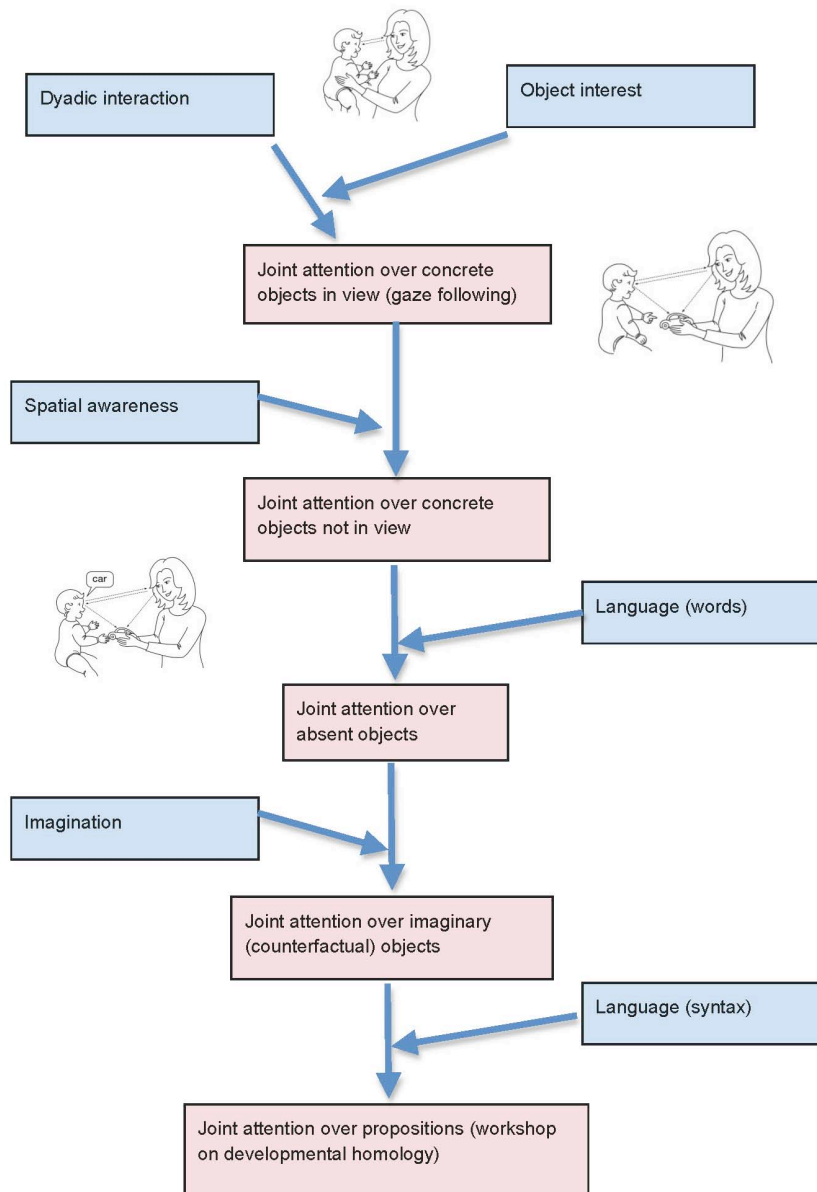
- Imagination is the capacity for counterfactual thinking.
- First manifest by end of the second year of life in pretense
- Objects now include possible (or even impossible) objects not just actual (present or absent) objects

Joint Linguistic Attention

- Language quickly becomes the medium for triadic interactions in general. Language serves both as the object and as the means to interact over that object. Joint linguistic attention at a distance, both temporal and spatial
- Simple constructions
 - Word combinations (develops by 24 months)
 - Basic structure is ‘topic-comment’ (or ‘given-new’), where the topic is the object (sometimes called the ‘shared’ or ‘common ground,’ e.g., Clark) and the comment is the new attitude expressed towards it
 - This structure is soon captured through syntax, e.g. word order

Joint Linguistic Attention

- Complex constructions
 - Joint attention to propositions – modality
 - Deontic modality: “You must feed the cat every day”; (homologous with protoimperative triadic interaction)
 - Epistemic modality: “I think the ball rolled under the couch” (homologous with protodeclarative triadic interaction)
- From there, it is but a small step to debates about the value of the concept of homology to developmental psychology



Homology in Joint Attention

- The roots of complex human discourse are evident in the simplest triadic interactions of infancy.
- Throughout this development, key elements are *conserved*:
 - The focus on an object
 - The engagement with others – using others to enhance object interest and using objects to enhance interactions/relationships
- While other other elements *change*:
 - The nature of the object – from actual concrete present things to counterfactual abstract, linguistically represented concepts
 - The nature of the interaction - from face-to-face behaviorally enacted to linguistic discourse at both spatial and temporal distance