

The 6th China International Forum on Cognitive Linguistics

Language, Culture and Mind:

10 lectures on development, evolution and cognitive linguistics

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Lecture 4

From signal to symbol to system: the
emergence of language



An evolutionary- developmental puzzle

- Many of the neuro-cognitive prerequisites for language, and some cultural prerequisites, are present in non-human communication and/or cognition
- Humans share a large proportion of genetic material with non-human animals
- But evolutionary modern human natural languages are qualitatively different from any other communication system



An outline solution

- The evolution of language (from proto-language) was mainly dependent upon extra-somatic, socio-cultural processes
- Language is a normative, conventional system
- Language development and evolution must be conceptualized in an epigenetic and socio-naturalistic framework



What is Epigenesis?

- The role of the environment in development is constructive, not just selective.
- An initial repertoire is elaborated through experience of a relevant environment
- Plasticity and informational openness yields to (relative, not complete) rigidity and informational closure



The cognitive-functional approach to language development

- To learn a language is to learn to communicate symbolically
- Symbolic communication involves a conventional mapping from conceptualization to expression
- Natural languages are flexible, multi-level symbolic systems



Conceptualization and Expression

- Expression (form) is motivated by conceptualization (content)
- Conceptualization is shaped by expression
- Linguistic conceptualization is contextually situated in a universe of discourse

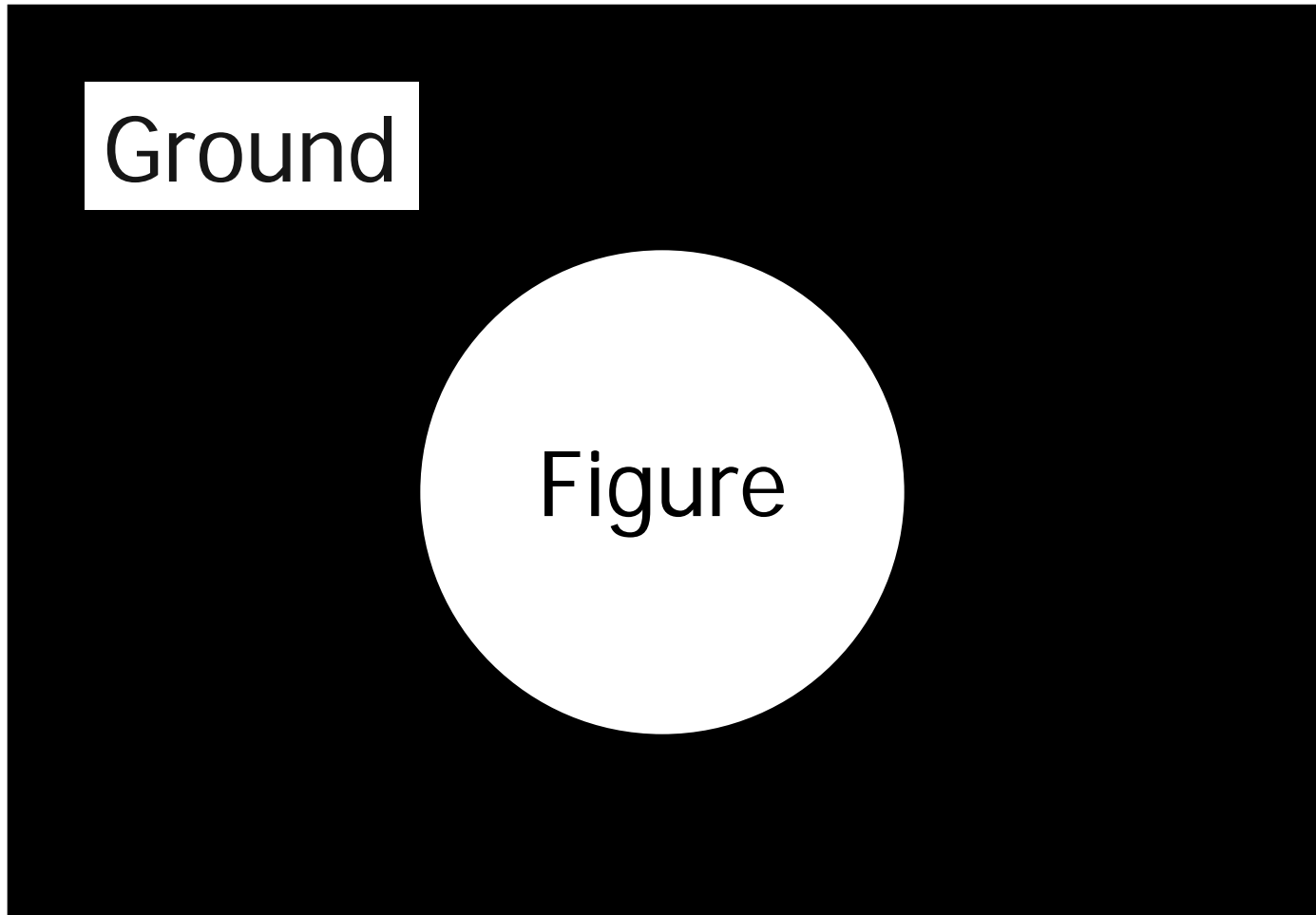


Grammar

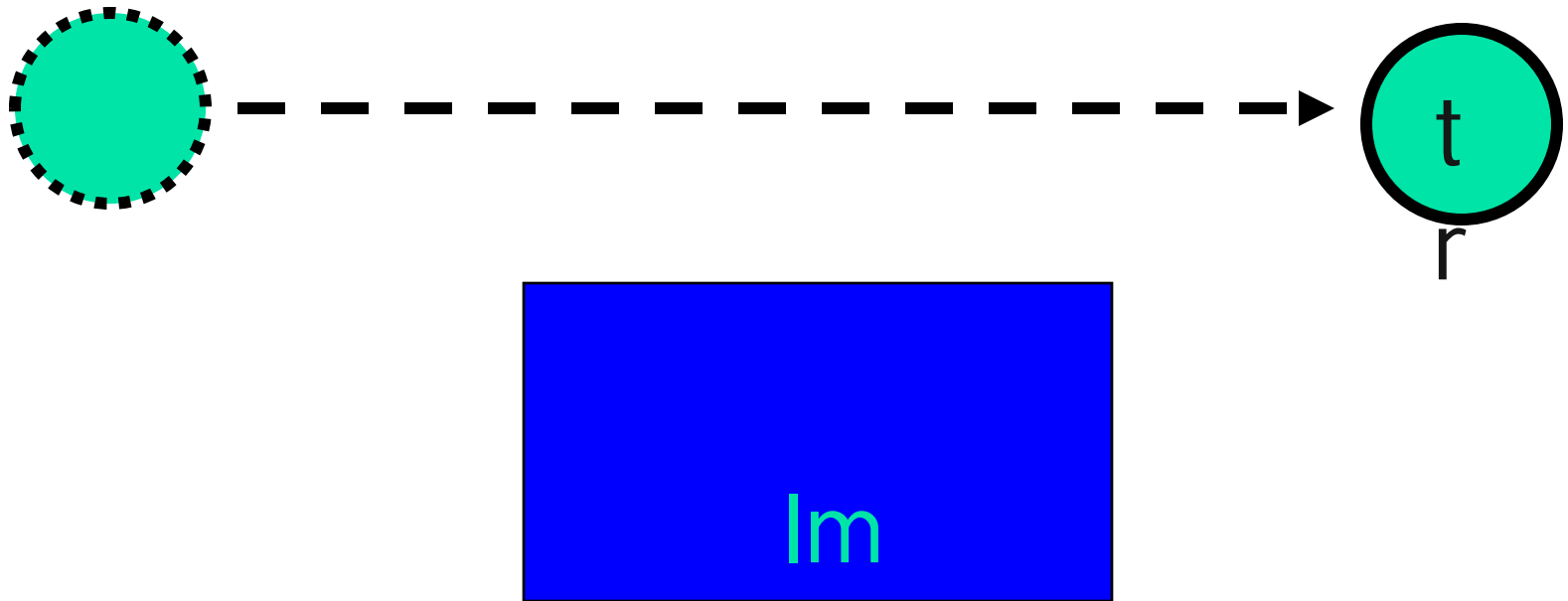
- Grammar is not merely a system of rules at the level of form or expression.
- Grammar is a conventional system of mappings from conceptualization to expression
- Learning syntax is continuous with learning lexicon and morphology

Figure and Ground

(Edgar Rubin 1914)



Trajectory and Landmark (Langacker)





Principles of cognitive-functional motivation

- Iconicity and Analogy
 - Word order frequencies in the languages of the world
 - Noun->Verb
 - the street is closed off
 - the street is coned off
- Figure / Ground Organization
 - The lamp is over the table
 - The table is under the lamp



Principles of cognitive-functional motivation

- Topic / Comment Organization
 - The table is under the lamp
 - Under the lamp is the table
- Perspective and Profiling
 - The girl in the picture
 - The girl on the poster
 - The boat on the lake
 - The boat in the lake
 - Kinship terms



Complexity in human natural languages

- Grammatical complexity

Although beyond nouns and verbs it is not certain that any other grammatical classes are universal, all languages employ a rich variety of grammatical structure.

- Symbolic complexity

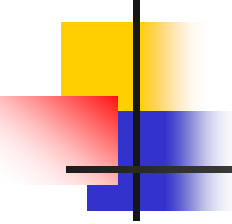
Flexible construal and alternate conceptualization

Displacement: Reference to spatially and temporally remote, imaginary, and unobservable things and events, **employing systematic constructional means to do so.**



Cognitive and pragmatic complexity

- Constructional resources specify
 - Location and relations (static and dynamic) in space and time
 - Manner of movement or occurrence
 - Probability, certainty, obligation, evidentiality
 - Speaker, hearer and third parties
 - Logical and coherence relations between discourse units
 - Number, definiteness and/or classification
 - The performative force of the speech act



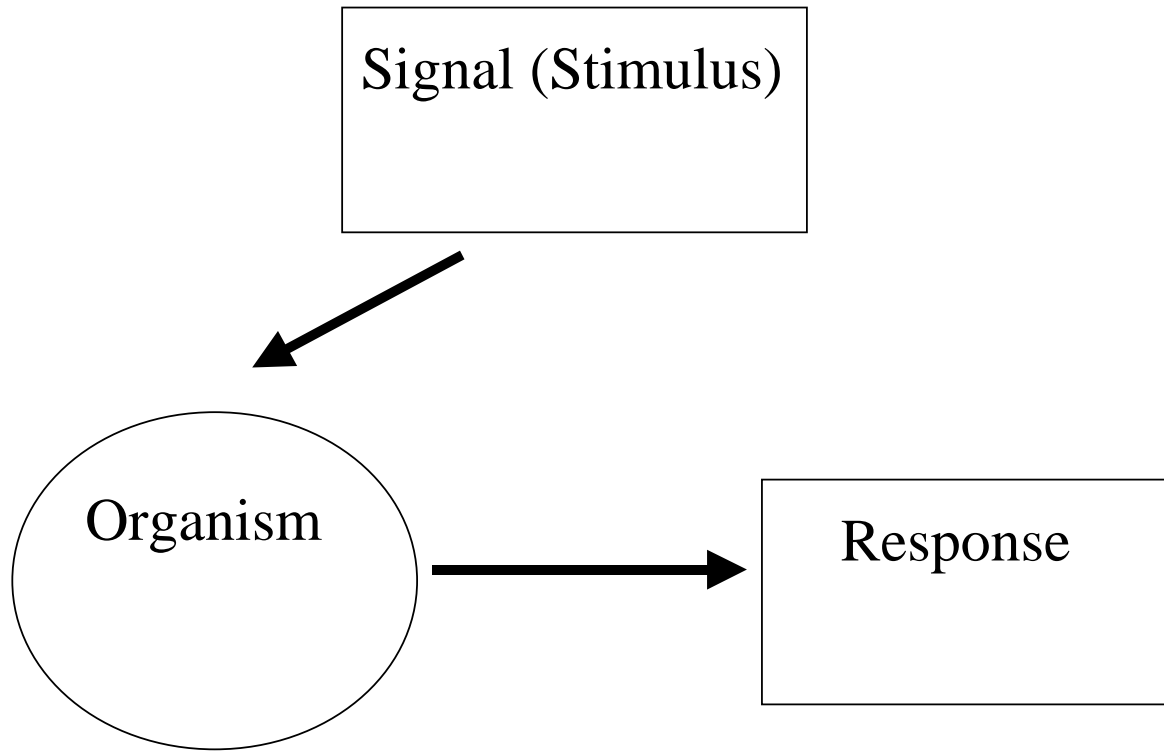
Flexible construal and symbolic power: some examples

- The cup is on the saucer
- The saucer is under the cup
- The tunnel goes from Dover to Calais
(Fictive or virtual motion: Talmy)
- The competition will run throughout the entire weekend
- The speaker is running out of time
(Lakoff and Johnson)

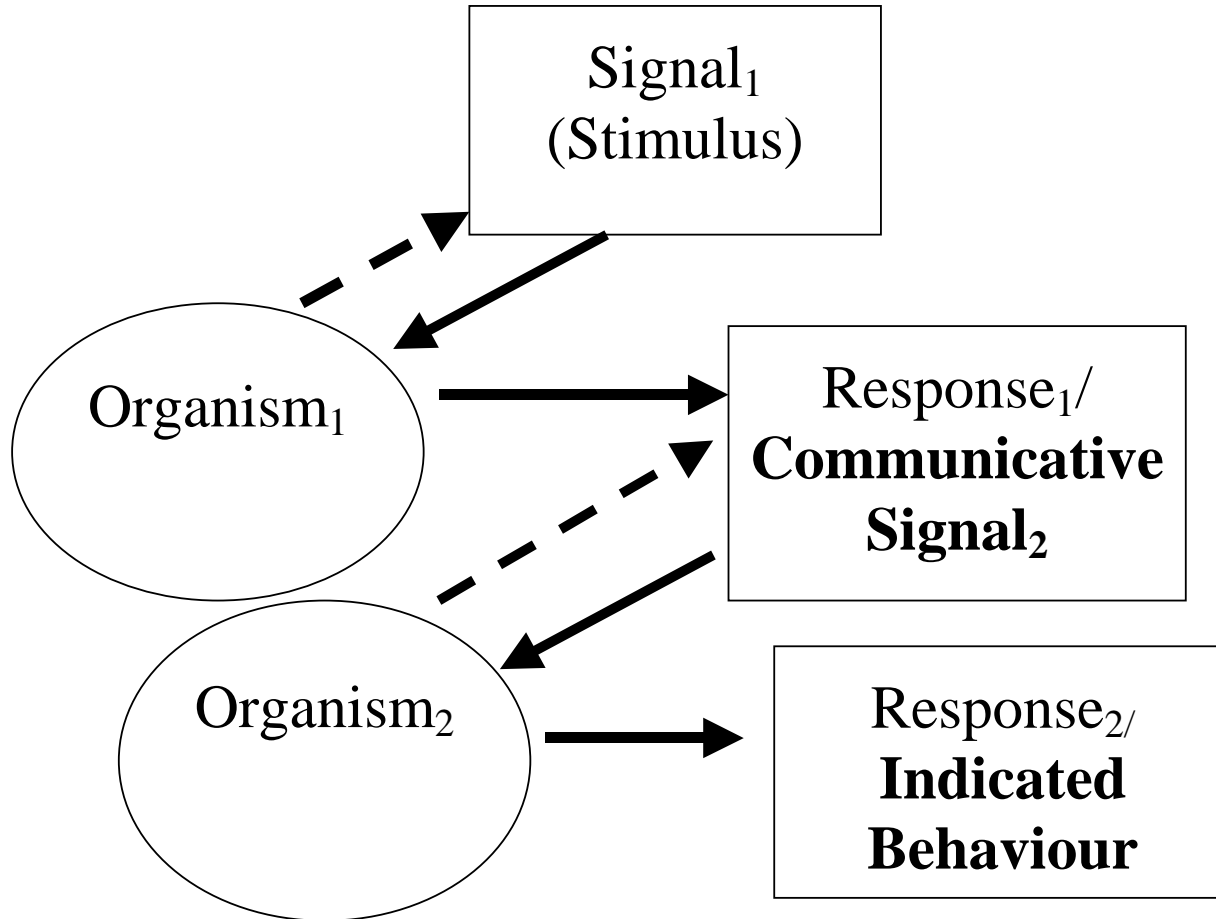
Signals vs. Symbols: (1)

Signals

- A signal is an instruction (possibly coded) to behave.
- A communicative signal is a stimulus emitted under stimulus control, usually by a conspecific
- Signalling is communication by the co-ordination of individual behaviour
- Signals are by definition indexical
- Communication by signals is ubiquitous in the animal world. Humans do it too.



A Non-communicative Signal

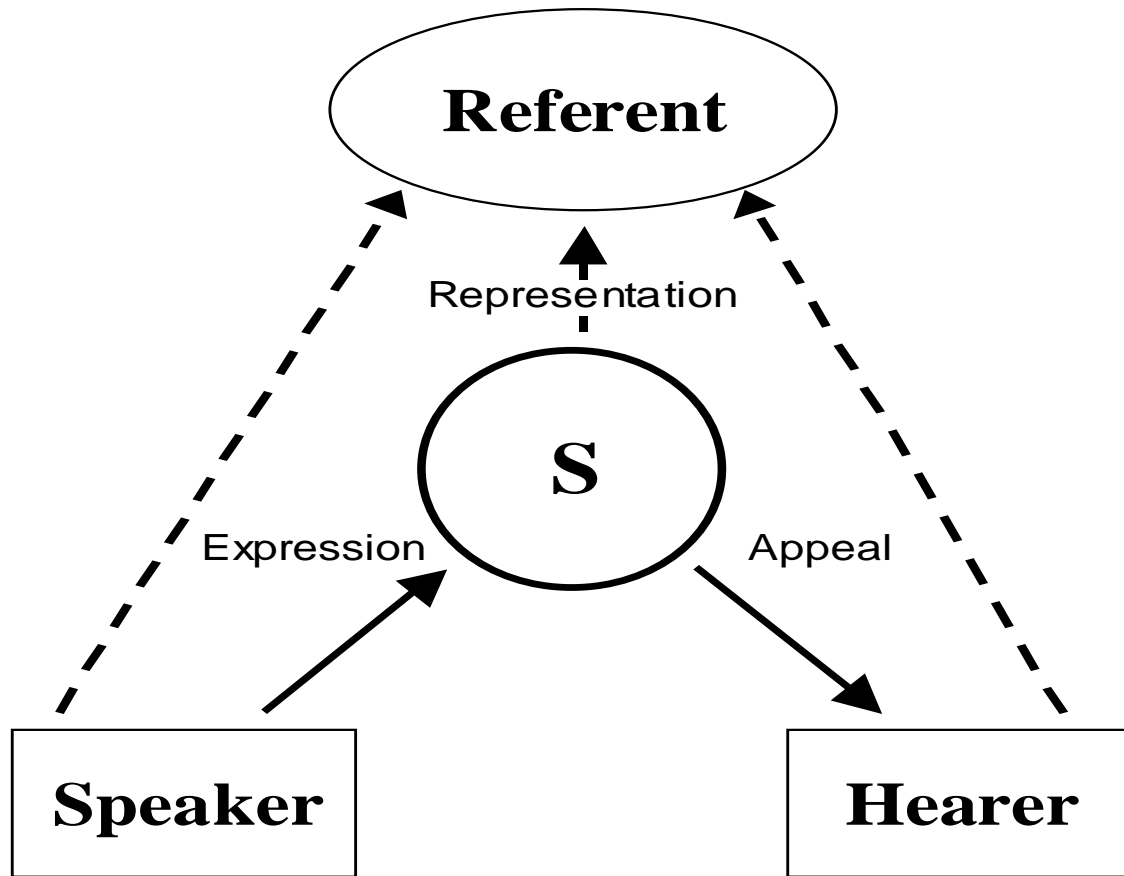


A Communicative Signal
(Broken lines represent attention)

Signals vs. Symbols: (2)

Symbols

- **Conventional symbol systems** are grounded in an intersubjective meaning-field.
- Symbols are **representational**. Speakers represent, through symbolic action, some segment or aspect of reality for hearers.
- This representational function is unique to symbolization, and is precisely what distinguishes a **symbol** from a **signal**.
- Symbolic representation is **intentional**.



Karl Bühler's Organon
Model of Language
(slightly modified)



Intersubjectivity and Symbols

- A symbol directs or guides, not the behaviour of the receiver, but her understanding: **construal**, or minimally **attention**.
- This can only occur within an intersubjectively shared field of **joint reference** (minimally, joint attention; maximally, a symbolically constructed Universe of Discourse).



Intentionality and Symbols: 3 meanings of intentionality

- Intentionality as purposiveness or goal-directedness
- Intentionality as directedness to the world, or reference.
- Intentionality as orientation to others as “minded” beings, perspectivally situated experiencers



Symbolic communication is intentional in all three senses

- It is the purposive use by a speaker of a symbolic sign to manipulate or direct the mental orientation (construal, or, minimally, attention) of a hearer with respect to an intersubjectively shared referential situation.
- Indices and icons can therefore also be symbols, when used symbolically (representationally). Cf. pointing. Signals are always, by definition, indexical.



The evolutionary emergence of symbolization: a scenario

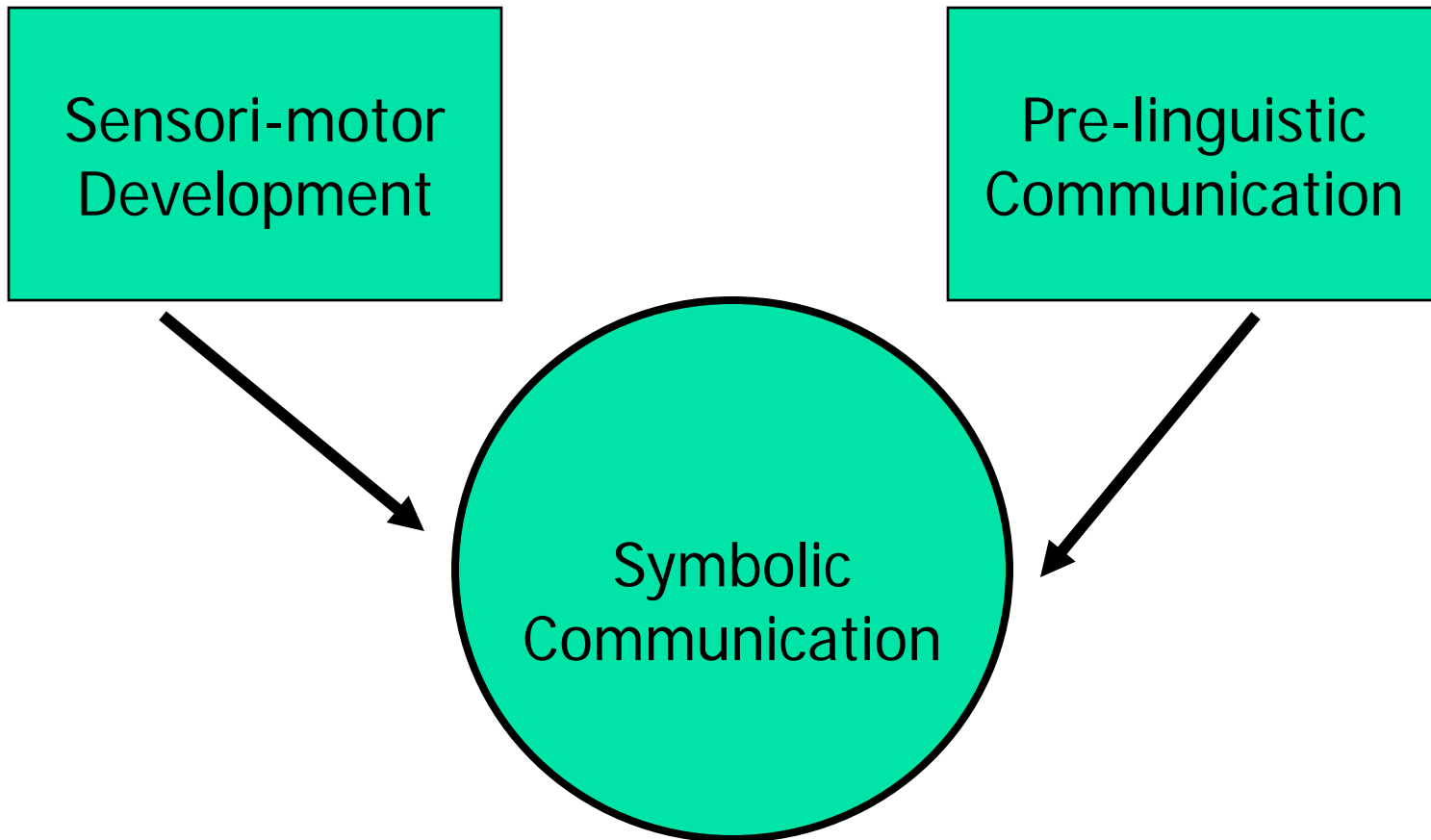
1. The receiver comes to pay attention to the sender as the source of communicative signals.
2. The sender comes to pay attention to the receiver as a recipient of communicated information.
3. The receiver comes to pay attention to the evidential reliability of the sender's signals as a source of information, by checking what the sender is paying attention to, or doing.
4. The sender comes to pay attention to the receiver's readiness to reliably act upon the information sent, by paying attention to what the receiver is paying attention to, or doing.



The dual grounding of language

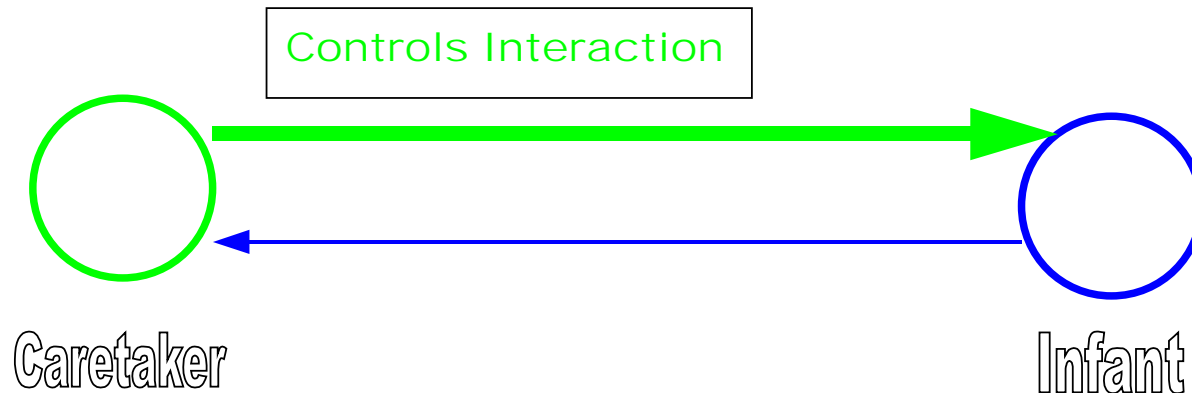
- **Sensori-motor Grounding:** embodied grounding in the perceptuo-motor system in its ecological niche
- **Discursive Grounding:** embodied grounding in pre-linguistic communication

The convergence of two lines of development (Vygotsky)



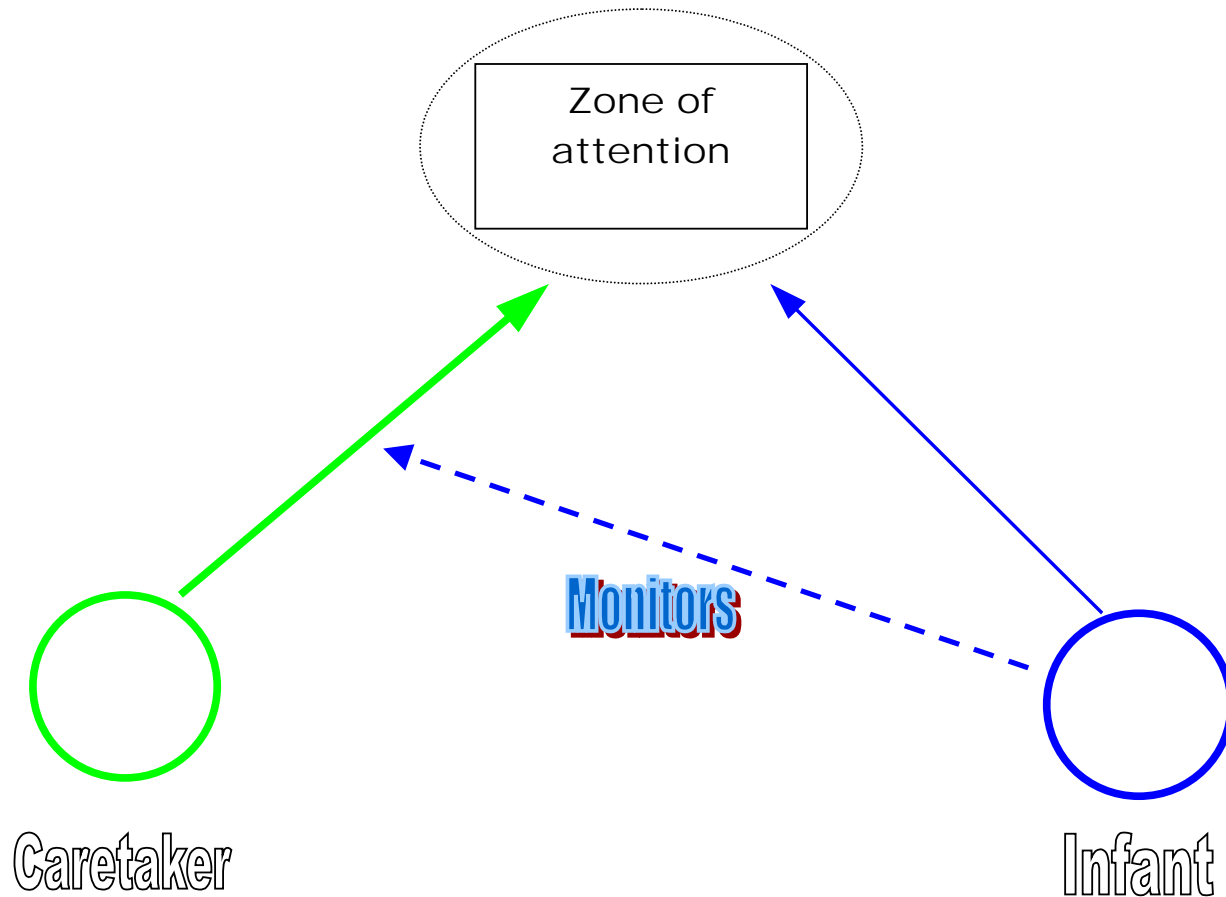
Primary Intersubjectivity

(Neonates: Trevarthen et al.)



Gaze Following

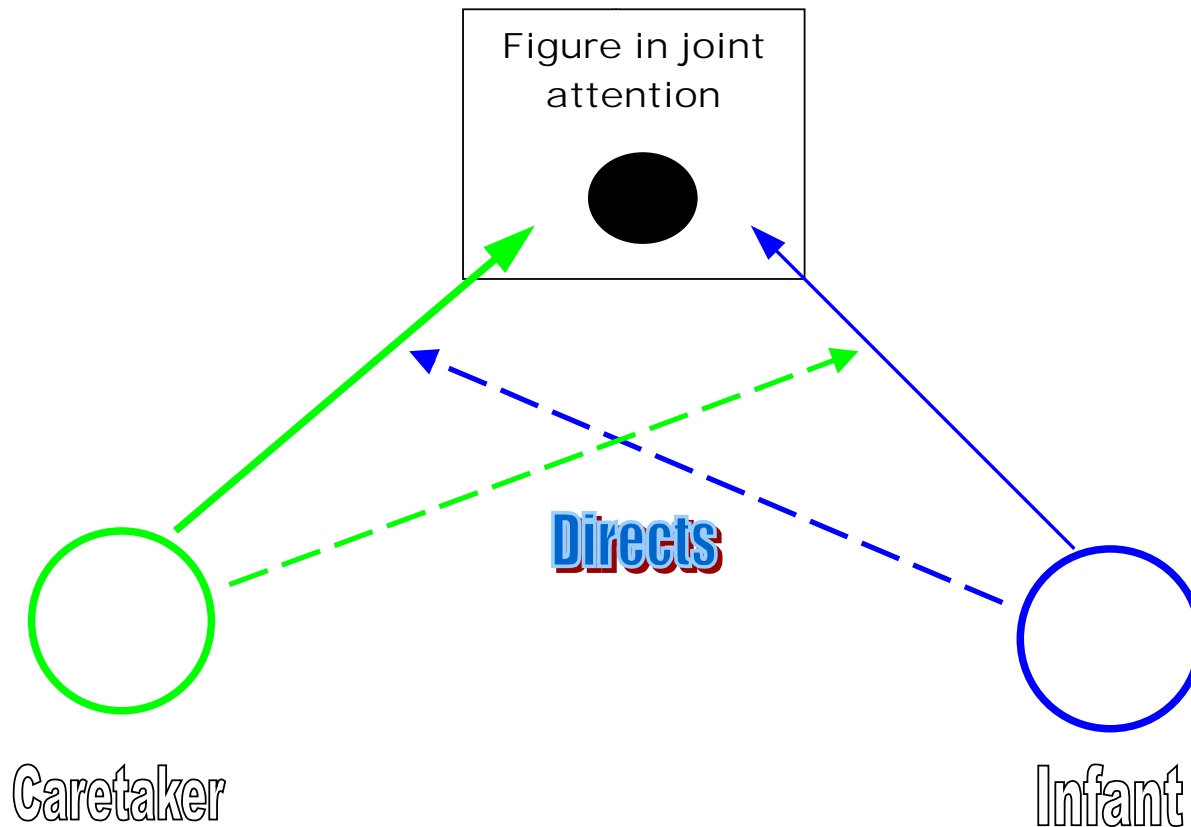
6 mo., Scaife and Bruner,
Butterworth et al.



Joint Attention

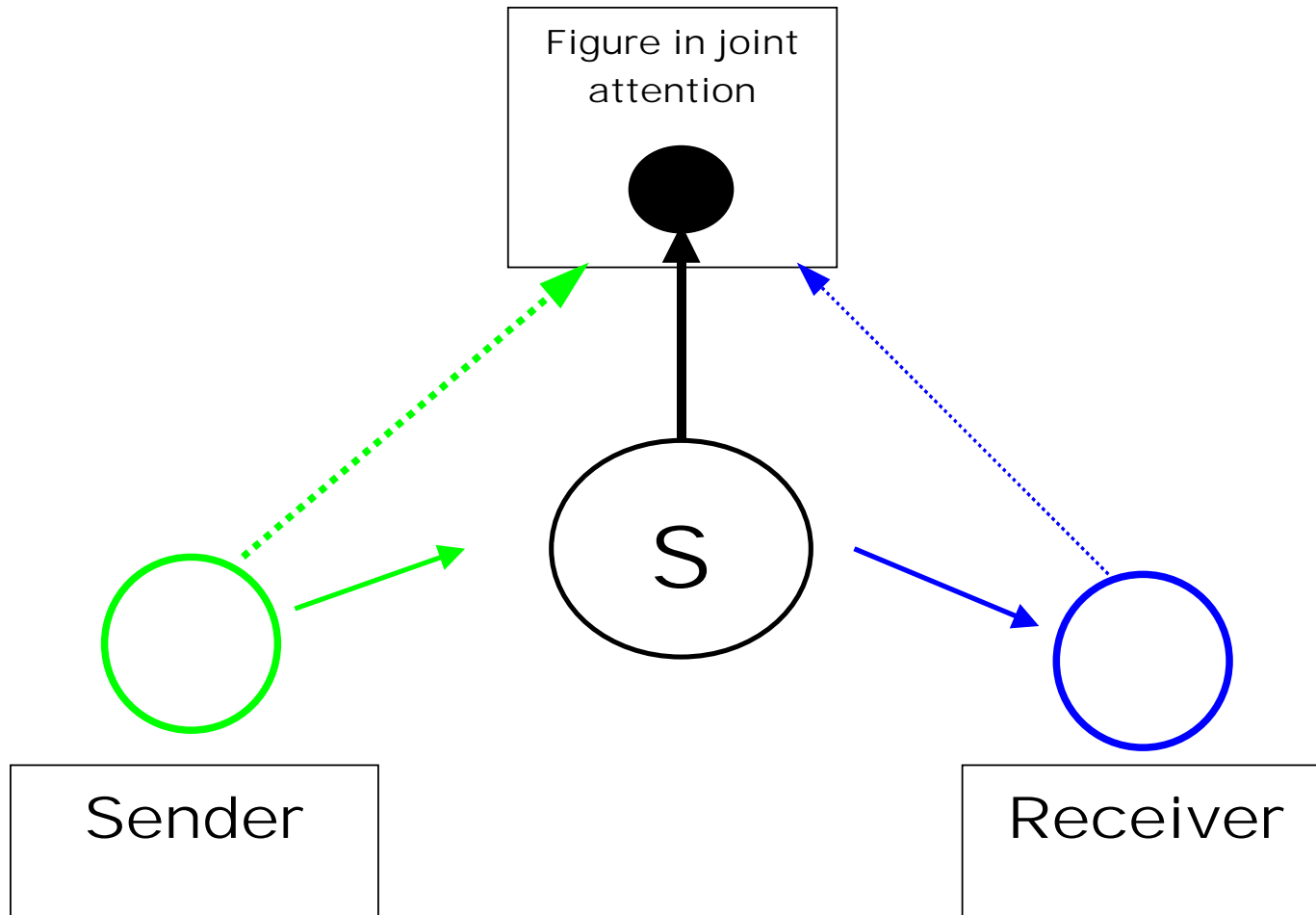
9-10 mo.

“Secondary Intersubjectivity”



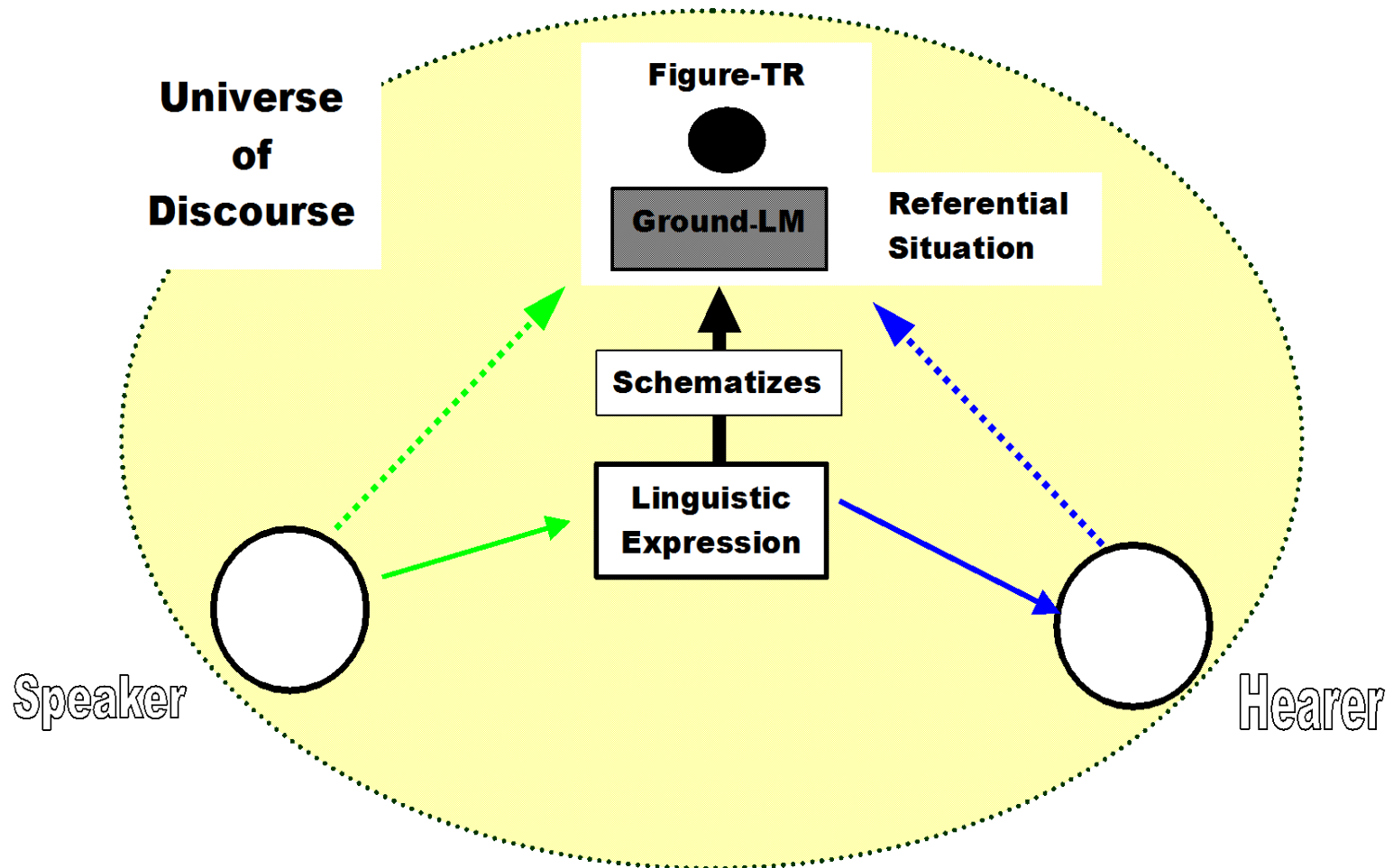
Semiotic Mediation

Referring by symbolizing



Linguistic Conceptualization

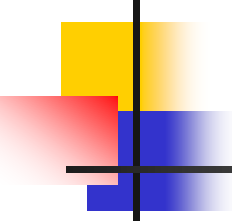
Construing through construction





The emergence of symbolic communication in infancy

- The primacy of intersubjectivity (first supported by signal-sensitivity).
- Primary intersubjectivity is not (initially) intentional.
- Intentionality emerges first in praxic action, then in communicative action.
- Intentionality co-develops with intersubjectivity.



From proto-symbol to linguistic symbolization

- The three crucial characteristics of linguistic symbolization are successively emergent:
 - Intentionality and Intersubjectivity
 - Conventionalization
 - Elaboration (yielding systematicity and productivity)

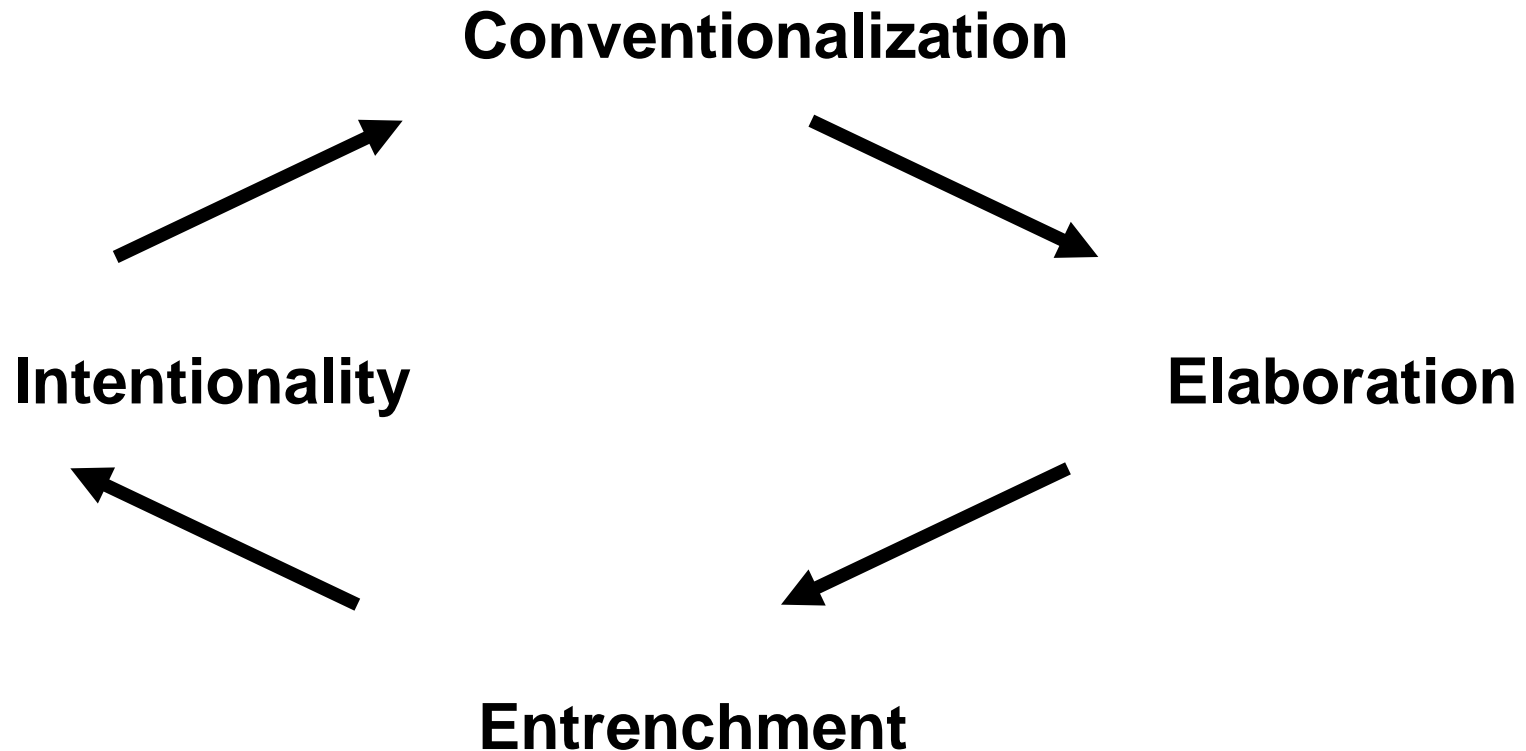


Cognitive-functional principles motivating grammaticalization

- **Lexical item → Grammatical item**
- **Iconicity and analogy based upon imagery and experience**
 - E.g. Space → Time
- **Elaboration of mental spaces, perspective and profiling**
 - E.g. Relative clauses, possessives etc.
- **Reduction of morphological marking, lexeme becomes morpheme**



The Schema of Grammaticalization in Language Evolution





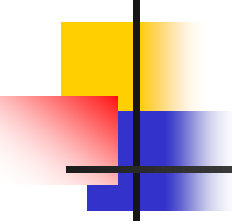
A Constructionist theory of language development and evolution

- The semanticization of thought
- The grammaticalization of speech
- The schema of elaboration in ontogenesis recapitulates that in language history
- However, stages of development are not recapitulated



When did evolutionary modern human languages emerge?

- Anatomically and genetically modern humans date from 200-150 ky BP
- The "symbolic cultural revolution" dates from 100-40 ky BP
- **HYPOTHESIS:** For most of the history of our species, it was not a "language user" but a proto-language user. Language is a modern cultural invention



The process of symbolic elaboration in socio-cultural evolution

- HYPOTHESIS: the "symbolic revolution" involved the co-evolution of praxic intentionality and intersubjectivity
- Neither of these are specifically human, but the elaboration of joint reference to flexible construal is specifically human
- The niche of infancy was the key site of the evolution of symbolization

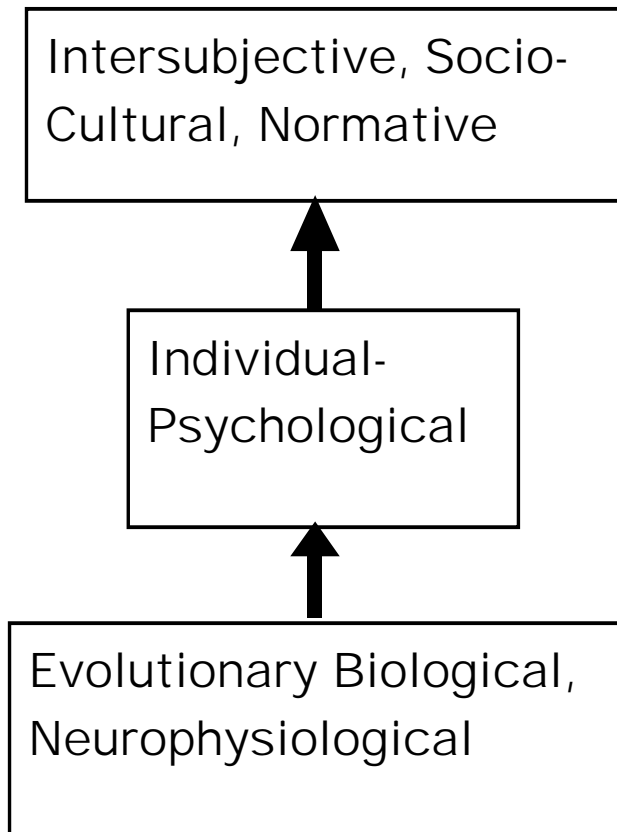


Infancy, language and society

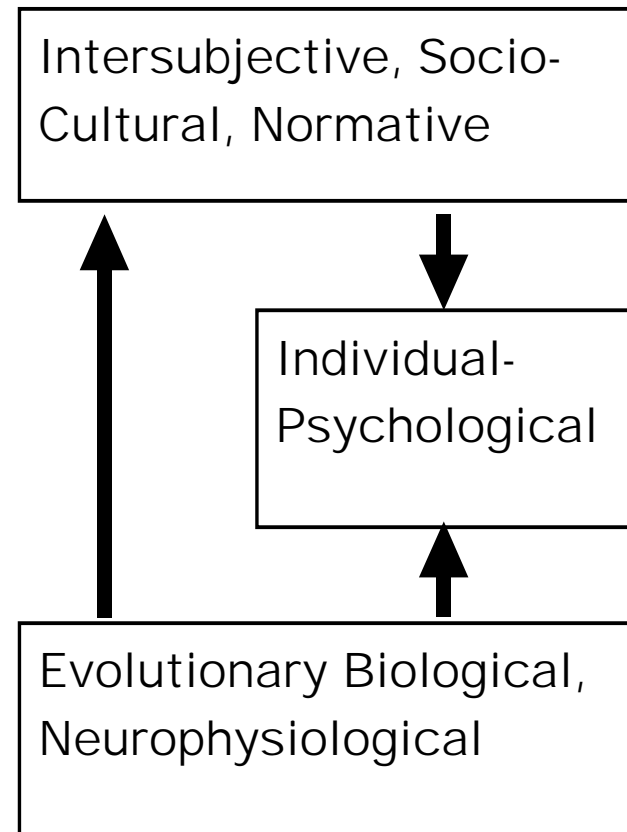
- The emergence of (proto-) symbolization recruited joint attention capacities subsequently selected for in infancy
- The cultural elaboration of the symbolic capacity to evolutionary modern languages was driven by requirements for perspectivization and flexible construal attendant on social complexification
- Acquisition is facilitated by early plasticity in epigenetic development, not programmed as a "critical period"

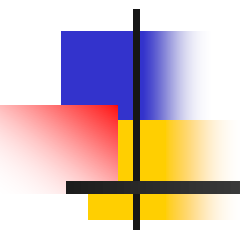
Two Views of Evolution and Development

The Traditional View



The Alternative View





Thank you