A defining property of human language is compositionality: our capacity to combine and recombine meaningful units to create and interpret innumerable complex expressions. How did this capacity arise and evolve? Does it exist in other species? In this workshop, we approach compositionality and its evolution from a multidisciplinary perspective.

The uniqueness of language has been repeatedly challenged by comparative studies with other species, such as birds, which recombine melodic units, and non-human primates, which combine elements to create multimodal signals. However, to date, evidence for combination and recombination of meaningful signals in other species is vanishingly scarce. Is there compositionality in communication of nonhuman primates? In humans, sign languages exploit our presumably ancient gestural capacity and mold it into language. What can newly arising sign languages teach us about the nature of compositionality and its emergence? What is the relation between co-speech gesture and compositionality in contemporary spoken language? The workshop seeks the roots of compositionality as the quintessential property of language by bringing together researchers from linguistics, sign languages, gesture, and primate communication.
Workshop program (click here to see abstracts)

9:00-9:10  Introduction and Welcome


10:10-10:40 Sotaro Kita (Warwick University). Young Children Make their Gestural Communication more Compositional: Evidence from Nicaraguan Sign Language and Silent Gestures by Hearing Children.

10:40-11:00 COFFEE

11:00-11:20 Irit Meir† and her Legacy: A Tribute. Wendy Sandler (University of Haifa)

11:20-11:50 Kate Mesh, Rose Stamp, & Svetlana Dachkovsky (University of Haifa). Pointing Toward Grammaticalization: Conventionalization of Pointing in Emerging Sign Languages.

11:50-12:00 QUICK BREAK

12:00-12:40 Klaus Zuberbühler (St. Andrews University). Combinatorial Capacities in Primates.

12:40-13:00 Katja Liebal & Linda Oña (Free University of Berlin). Compositionality in Chimpanzee Communication?

13:00-13:20 DISCUSSION
Abstracts:

**Wendy Sandler** (University of Haifa)

*Compositionality and the grammar of the body*

There is no question that compositionality is a defining feature of human language – spoken and signed. Aspects of this compositional structure are universal across modalities, and are therefore sometimes assumed to be hardwired in our species. Unlike spoken languages, sign languages wear their composition on their articulators; there is a direct correlation between visible articulations and linguistic structures. Exploiting this correlation, I will provide evidence to suggest that the components of language and their combination are more plastic than is often assumed. Specifically, traditional linguistic components of phonology, morphology, and syntax interact differently in signed and spoken languages, constrained by the human body.

For example, duality of patterning, not discernible in early sign language emergence (Sandler et al 2011), is less ‘dual’ even in established sign languages than in spoken languages (Johnston & Schembri 1999; Meir et al 2007; Padden et al 2013, Lepic et al 2016). That is, due to the iconic potential for compositional symbolization in sign languages, meaning plays a much more pervasive role in determining explicitly phonological elements of lexical signs than of spoken words (recent studies of iconicity in spoken phonology notwithstanding) -- blurring the traditional robust bifurcation between phonological and morphological levels of patterning. We see similar melding between morphological and syntactic components in sign languages, due to the potential of bound morphemes manifested by the two hands to articulate independent propositions simultaneously. Our recent work on the bodily expression of intense emotion (Cavicchio & Sandler 2015, Cavicchio et al under review) shows that in this ancient, nonlinguistic system as well, humans are compositional communicators. Rather than dismissing the body’s contribution (Chomsky 2005; cf. Fitch 2017 for an opposing view), we may well learn more about the structure and evolution of language by acknowledging that the body plays a central role.

**Marieke Schouwstra** (University of Edinburgh, Scotland)

*Building meanings: compositionality of human language, and its evolution*

Compositionality is seen as a key feature of human language. It describes the mechanism by which complex structures and complex meanings are related to each other: the meaning of a complex expression is determined by the meanings of its constituents and the way in which they are put together. This characterisation has been a firm assumption among many linguists, but it is not the only possible view on language. I will describe the linguistic and philosophical background of the principle of compositionality, by sketching why human language is often described as compositional, and what the alternatives might be. Subsequently, I will look briefly at how cultural evolution experiments can help us answer the question, how compositionality came about.
Sotaro Kita (University of Birmingham, UK)

Young children make their gestural communication system more compositional: Evidence from Nicaraguan Sign Language and silent gestures by hearing children

One of the key features of language is its compositionality, in the sense that complex information is conveyed by a combination of signals that encode components of the complex information. I will argue that one reason this complexity arose is that young children tend to make their communication system more compositional. Because all languages are learned by young children, this tendency becomes a universal feature of language. We will focus on how gestural communication systems express manner and path of motion events (when something rolls down, “rolling” is manner and “down” is path). When young children (4-5 year olds) gesturally express motion events with manner and path, they tend to separate manner and path into separate gestures, and combine them in a linear sequence. This was seen in Nicaraguan Sign Language, a new sign language created by deaf children (Senghas, Kita & Özyürek, 2004) and silent gestures by young hearing English speakers (Clay, Pople, Hood, & Kita, 2014). Among young hearing English speakers, this tendency was stronger for those whose spoken language ability is weaker (but still within a normal range; Clay & Kita, under review), suggesting that compositionality develops more readily when children may have to rely more on the gestural modality.

Kate Mesh, Rose Stamp & Svetlana Dachkovsky (University of Haifa).

Pointing toward grammaticalization: Conventionalization of pointing in emerging sign languages.

The pointing gesture is understood to be one of the earliest means of directing attention to objects and locations, in both ontogenesis and phylogensis (Butterworth & Morissette, 1996). Pointing is not accomplished by the hands alone; it appears in a composite of bodily signals, including gaze direction, head and torso movement, and facial expressions, among others (Hadjikhanian et al, 2008; Kita, 2003).

Researchers studying signed languages have proposed a grammaticalization chain for pointing, originating in points toward present, concrete entities and ending with points toward empty space that serve such abstract functions as establishing reference and marking relative clauses (Pfau & Steinbach, 2006). However, little empirical evidence has been accrued to support the claims made about the development of abstract pointing functions during signed language emergence.

We present such evidence, drawing from a dataset of co-speech gestural pointing as well as pointing signs from four emerging sign languages of varying ages and stages of development. We find that multiple signals in the pointing composite—including gaze direction, head movement, and internal movement of pointing signs—are reduced or eliminated during the development of abstract pointing. The manual component that remains is free to be incorporated into new composite linguistic constructions.
Klaus Zuberbühler (University of St. Andrews, Scotland)

**Combinatorial capacities in primates**

Do primates have syntax-like abilities? One line of enquiry is to test how subjects respond to different types of artificial grammars. Results have revealed neural structures responsible for processing combinatorial content, shared between non-human primates and humans. Another approach has been to study natural communication, which has revealed a wealth of organisational principles, including merged compounds and sequences with stochastic, permutated, hierarchical and cross-modal combinatorial utterances. There is solid experimental evidence that recipients can attend to such combinatorial features to extract meaning. The debate is whether animal communication can also be compositional, insofar as whether signallers assemble meaningful units to create utterances with novel meanings.

Katja Liebal & Linda Oña (Free University of Berlin)

**Compositionality in chimpanzee communication?**

Researchers using a comparative approach to language evolution are highly interested in answering the question whether precursors to human language are present in other primates. Therefore, they investigate the commonalities and differences between various features of human language and non-human primate communication. One important feature of human language, compositionality, lends language a high degree of flexibility and is thought to be a uniquely human characteristic. Therefore, the aim of this study was twofold. We studied visual multimodal expressions in our closest living relative, the chimpanzee, and investigated (1) whether gestures had consistent ‘meanings’, as is typically assumed in current research, and (2) whether hand gestures and facial expressions recombined to create different complex meanings. In our analysis, ‘meaning’ was attributed to signals on the basis of both context of use and response of recipients.

Specifically, we focused on two variations of the extended arm gesture in isolation and in combination with two facial expressions, the bared teeth face and the funneled lip face in two semi-wild chimpanzee groups. With respect to our first research question, we found that, typically, the context in which a gesture and facial expression are used has a strong influence on the recipient’s response. That is, the same combination of arm gesture and facial expression receives affiliative responses in positive contexts but nonaffiliative responses in negative contexts. This finding contradicts the recent trend of assigning specific ‘meanings’ to chimpanzee gestures. Interestingly, a different arm-face combination in our study was not affected by context, suggesting that different combinations have different interpretations. All in all, the study suggests that we have only begun to understand the richness of meaning and interaction between different visual chimpanzee signals and their combinations. In contrast with studies seeking compositionality in vocal sequences alone, we suggest that our findings, while not yet supporting compositionality, serve to underscore the importance of a compositional and multimodal approach to understanding the communication of chimpanzees and other species.