

# CLS-MPI Iconicity Focus Group Workshop

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*Types of iconicity in language use, development, and processing*

## Abstracts



Max Planck Institute  
for Psycholinguistics

CLS | Centre for Language Studies



Donders Institute for Brain, Cognition and Behaviour

*July 6-7, 2017*

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# Programme overview

## Thursday July 6

<b>09:15-09:30</b>	<b>WELCOME (Gerardo Ortega)</b>
	<b>Linguistics &amp; Psycholinguistics 1</b>
09:30-10:10	Kimi Akita <i>Decomposing the lexical iconicity hierarchy for ideophones</i>
10:10-10:50	Mark Dingemans <i>Moving beyond bouba and kiki: cross-linguistically attested iconic mappings in spoken languages</i>
<b>10:50-11:20</b>	<b>BREAK</b>
	<b>Linguistics &amp; Psycholinguistics 2</b>
11:20-12:00	David M. Sidhu & Penny Pexman <i>What kinds of meanings are iconic? Effects of semantic neighbourhoods and sensory experience on iconicity</i>
12:00-12:40	Marcus Perlman, Hannah Little, & Robin L. Thompson <i>Modality driven encoding of iconicity in signed and spoken vocabulary: A Comparison between British Sign and English</i>
<b>12:40-13:40</b>	<b>LUNCH</b>
13:40-14:40	Poster session 1
	<b>Neuroscience</b>
14:40-15:20	Linda Drijvers <i>The neural mechanisms of how iconic gestures boost degraded speech comprehension</i>
15:20-16:00	Karen Emmorey <i>Neurophysiological effects of iconicity in American Sign Language</i>
<b>16:00-16:30</b>	<b>BREAK</b>
16:30-17:30	Discussion (Gabriella Vigliocco)

## Friday July 7

<b>09:15-09:30</b>	<b>RE-CAP (Mark Dingemans)</b>
	<b>Evolution</b>
09:30-10:10	Tessa Verhoeve <i>Iconicity and systematicity in the emergence of sign language structure</i>
10:10-10:50	Gerardo Ortega <i>Types of iconicity, combinatorial strategies, and semantic categories in pantomimes across cultures</i>
<b>10:50-11:20</b>	<b>BREAK</b>
11:20-12:20	Poster session 2
<b>12:20-13:20</b>	<b>LUNCH</b>
	<b>Acquisition</b>
13:20-14:00	Pamela Perniss <i>How much iconicity do children get?: Taking stock of iconicity in child-directed language</i>
14:00-14:40	Spencer D. Kelly <i>What role do co-speech gestures play in foreign language learning?</i>
14:40-15:20	Mutsumi Imai <i>Symbol grounding and de-grounding in language acquisition and evolution: The case of sound-symbolism</i>
15:20-16:20	Discussion (Asli Özyürek)
<b>16:20-17:20</b>	<b>BORREL</b>

# Overview poster presentations

## Thursday July 6

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- 1 Degrees of Iconicity in Predicative Reduplication**  
Ponsford, D. & Li, Y.
- 2 Debunking Phonaesthemes: The Absence of Iconicity**  
Thompson, A.L.
- 3 The Thunder Rolls: Iconicity and Ideophones in Chinese meteorological Expressions**  
Van Hoey, T.
- 4 Iconicity in Prosody in Spoken Interaction**  
Ogden, R.
- 5 'r' is for rough: Iconicity in English and Hungarian Surface Descriptors**  
Winter, B., Sóskuthy, M. & Perlman, M.
- 6 Does Language Experience affect Perceived Iconicity?**  
Occhino, C., Anible, B., Morford, J. & Wilkinson, E.
- 7 The Influence of Iconic Linguistic Expressions on Spatial Event Cognition across Signers and Speakers: An Eye-Tracking Study**  
Manhardt, F., Brouwer, S., Sümer, B., Karadöller, D.Z. & Özyürek, A.
- 8 The Role of Iconicity in Lexical Retrieval in a Signed Language: Evidence from Phonological Fluency Tasks in British Sign Language**  
Marshall, C., Vinson, D., Beese, L. & Atkinson, J.
- 9 Iconic Representation of Event Structure in ASL and Gesture**  
King, R. & Abner, N.
- 10 Combining Categorical and Gradient Information in Sign and Spoken Communication**  
Lu, J. & Goldin-Meadow, S.

## Friday July 7

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- 1 The Role of Iconicity Type in the Creation versus Acquisition of an Emerging Sign Language Lexicon**  
Senghas, A., Zola, C. & Pyers, J.
- 2 Negotiated Iconicity in Interactive Silent Gesture Communication**  
Micklos, A.
- 3 Measuring Iconicity in an Evolving System**  
Motamedi, Y.
- 4 The Sources of Iconic Representations in the Novel Created Sign Lexicons (NCSLex)**  
Tkachman, O. & Hudson Kam, C.L.
- 5 Iconicity vs. Systematicity in Artificial Language Learning**  
Nielsen, A.K.S., Simner, J., Kirby, S. & Smith, K.
- 6 Iconicity in Pointing Gestures: Work in Progress on a Gesture Typology**  
Hassemer, J.
- 7 The “Iconic-Metaphoric-Deictic-Beat Quartet” Revisited: Are there Really Non-iconic Co-speech Gestures?**  
Jehlička, J. & Lehečková, E.
- 8 Who Did What? How Iconic Gestures Help Young Children to Encode Action Events**  
Aussems, S. & Kita, S.
- 9 Iconic Representational Strategies in Children’s and Adults’ Gestures and Signs: A Common Taxonomy for Coding Narratives**  
Di Renzo, A., Proietti, M., Slonimska, A. & Capirci, O.
- 10 Iconic Representation of Form and Function in Pantomime and Gesture**  
Marentette, P. & Inaba, C.

### Linguistics & Psycholinguistics

#### **Decomposing the lexical iconicity hierarchy for ideophones**

*Dr. Kimi Akita (Nagoya University)*

09:30-10:10

Some words are more iconic than others. The “lexical iconicity hierarchy” (or LIH) attempts to capture the grammatical and developmental difference between different semantic types (or iconicity levels) of ideophones, such as phonomimes (ideophones for sound), phenomimes (ideophones for visual or textural information), and psychomimes (ideophones for internal experience) (Akita 2009, 2013). Despite the wide range of supportive data, the hierarchy involves some nontrivial problems, including its partial applicability and its potential polydimensionality. This paper argues that the reported grammatical/developmental correlates of the LIH can and should instead be explained by more general principles and constraints, such as a semantic map for iconic signs (cf. Dingemanse 2012), the interclausal relations hierarchy (Van Valin and LaPolla 1997), and word learning biases (Laing 2015). This reexamination will reveal which part of the LIH remains intact and which phenomena may still be ascribed to lexical iconicity.

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#### **Moving beyond bouba and kiki: cross-linguistically attested iconic mappings in spoken languages**

*Mark Dingemanse (Max Planck Institute for Psycholinguistics)*

10:10-10:50

Most experimental approaches to sound symbolism or iconicity in speech have used pseudowords with strikingly little diversity in form and meaning, from Sapir’s mil and mal for size to Köhler’s maluma and takete (and later, bouba and kiki) for one aspect of shape. Many far-reaching claims about the nature and extent of iconicity in speech are based on this very small corner of the possibility space. Here I use evidence from ideophones, vivid sensory words found in many of the world’s languages, to explore types of iconicity attested in natural spoken languages. The iconic patterns found in ideophone systems around the world provide existence proofs of many sound–symbolic mappings beyond the well-worn ones studied in pseudowords: a natural laboratory inviting further experimentation in psycholinguistics and in studies of learning and communication. I use a set of 240 experimentally vetted ideophones from five languages to identify the iconic cues that are most effective (as measured by performance in forced choice and learning tasks), and analyse them in terms of the affordances of meaning and modality.

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#### **What kinds of meanings are iconic? Effects of semantic neighbourhoods and sensory experience on iconicity ratings**

*David M. Sidhu and Penny M. Pexman (University of Calgary)*

11:20-12:00

Research has demonstrated that words vary in their relative proportion of iconic and arbitrary components (e.g., Perry, Perlman, & Lupyan, 2015). Perry et al. quantified this by having participants rate the iconicity of nearly 600 words. Here we examined those ratings to see if there are semantic features that predict the iconicity of a given concept’s word form. In particular, we tested the predictions that: 1) concepts with less dense semantic neighbourhoods (ARC; Shaoul & Westbury, 2010) can afford to have more iconic forms (without risking ambiguity), and 2) that concepts with a greater amount of sensory features (SER; Juhasz & Yap, 2013) would be more mappable, and thus have more iconic forms on average. We found evidence for both of these predictions. Interestingly, these results were observed for adjectives and verbs, but not nouns. This suggests that different factors might be relevant for these different word types.

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## **Modality driven encoding of iconicity in signed and spoken vocabulary: A Comparison between British Sign Language and English**

*Marcus Perlman (Max Planck Institute for Psycholinguistics), Hannah Little (Max Planck Institute for Psycholinguistics), & Robin L. Thompson (University of Birmingham)*

12:00-12:40

Signed languages are widely assumed to be more iconic than spoken languages, but there has been little direct comparison between them. We compared the iconicity of British Sign Language (BSL) and English vocabulary using previously collected iconicity ratings. In both languages, we found iconicity is relatively high in verbs. However, in English, iconicity is high in adjectives but low in nouns, whereas in BSL, it is high in nouns but low in adjectives. Our results suggest that speech affords iconicity for meanings related to non-visual sensorimotor properties, whereas sign affords iconicity for visual meanings. Both modalities may afford iconicity for motion and action. This conclusion is supported by a stronger relationship between iconicity and concreteness in BSL, although this does not extend robustly to imageability. Altogether, our findings show that iconicity may be distributed across the vocabularies of BSL and English in accordance with their respective visual and auditory modalities.

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## **Neuroscience**

### **The neural mechanisms of how iconic gestures boost degraded speech comprehension**

*Linda Drijvers (Max Planck Institute for Psycholinguistics)*

14:40-15:20

Face-to-face communication integrates auditory input, such as speech, with visual input, such as iconic co-speech gestures. These iconic gestures can enhance speech comprehension in adverse listening conditions. In this talk, I will address how the neural integration of iconic gestures and speech for both native and non-native listeners is modulated by speech degradation and native listener status, and how this can be indexed by modulations of event-related potentials, such as the N400. Furthermore, I will address how modulations of low- and high-frequency oscillatory activity in language, motor & visual areas of the brain support gestural enhancement of degraded speech comprehension. In this work, we demonstrated a mechanistic role for oscillatory brain dynamics in engaging brain areas that contribute to multimodal semantic integration and show that low- and high-frequency oscillations with distinct spatiotemporal characteristics can predict the degree of integration of audiovisual information in a semantic context.

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### **Neurophysiological effects of iconicity in American Sign Language**

*Karen Emmorey (San Diego State University)*

15:20-16:00

Recent work suggests that iconicity may play a role in the evolution, acquisition, and processing of both signed and spoken languages. My colleagues and I are using Event-Related Potentials (ERPs) to investigate the possible role of iconicity in modulating the temporal neural dynamics of single sign recognition in American Sign Language (ASL). Our first study aims to identify electrophysiological components associated with lexical frequency, concreteness, and iconicity. This work capitalizes on a large database of ~1000 ASL signs rated for subjective frequency and iconicity. We recorded ERPs from deaf signers and hearing nonsigners while they watched video clips of 400 ASL signs. Deaf signers performed a semantic categorization task, monitoring for rare signs (10% of trials) that referred to persons (e.g., DOCTOR, GIRL). Hearing nonsigners monitored for a rare repeated sign (10% of trials). The neural response to lexical frequency and concreteness paralleled the effects observed for spoken words, i.e., more negative-going N400-like responses for low vs. high frequency signs and for concrete vs. abstract signs. Iconic signs exhibited a unique neural signature (relative to non-iconic signs): a more negative anterior response, right-lateralized, and starting later than the concreteness/frequency effects. None of these effects were observed in sign-naïve participants. A second study is in progress and examines neurophysiological effects of structure-mapping on the integration of iconic signs and referent pictures. This study is an ERP adaptation of Thompson et al. (2009) which found that response times in a picture-sign matching task were faster when a property iconically represented in the

sign (e.g., a bird's beak) was made salient in the picture compared to when the property was not highlighted (e.g., a bird in flight). If the effects of iconicity occur during semantic activation, then we should see effects on the N400 component. However, if the reaction time effects occur during later decision-based processes, then iconicity effects should be on the later P3 component. A third possibility is that picture-sign alignment effects arise during an earlier form processing stage, in which case effects might occur on an N250/N300 complex. Overall, these studies aim to identify the neural consequences of the pervasive lexical iconicity observed in signed languages.

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## **Presentation abstracts Friday July 7**

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### **Evolution**

#### **Iconicity and systematicity in the emergence of sign language structure**

*Tessa Verhoef (Max Planck Institute for Psycholinguistics)*

09:30-10:10

In sign languages and gesture, systematic preferences have been found for the use of different iconic naming strategies when representing tools. In this talk, I will present experiments that were conducted to explore the influence of biases in gestural representation on the emergence of conventionalized patterns in sign languages. The first experiment maps out the initial biases people have for pairing ACTION and OBJECT concepts related to tools (e.g. 'using a toothbrush' and 'a toothbrush') with HANDLING (showing how you hold it) and INSTRUMENT (showing what it looks like) strategies in an online experiment with 720 participants. In line with earlier findings (Padden et al., 2015; Ortega & Ozyurek, 2016), we show that non-signers have a strong preference for HANDLING forms. We also find a strong preference for mapping HANDLING to ACTION and INSTRUMENT to OBJECT, demonstrating clear biases for use of iconic strategies. The second experiment investigates the effects of these biases on the learnability of artificial languages. In addition to reflecting naturalness on an item by item basis, languages can also vary in systematicity across sets of items (i.e. the extent to which all ACTIONS pattern the same way, and all OBJECTS pattern the same way). As expected, we found unsystematic languages to be harder to learn than systematic ones. Surprisingly, languages that are systematic, but with a mappings that violates the bias, seem just as learnable as systematic languages. Moreover, participants seem to need only a few examples before they detect and accept the unexpected pattern. The patterns we see in natural sign languages are often only partially systematic though, therefore the third experiment explores the learnability and direction of change in artificial languages that merely show tendencies towards systematic patterns. Here we see a clear influence of the tension between initial preferences and systematicity. Together, these studies help improve our understanding of the subtle interplay between learning biases and gestural preferences and how these affect the emergence of patterns in language.

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#### **Types of iconicity, combinatorial strategies, and semantic categories in pantomimes across cultures**

*Gerardo Ortega (Centre for Language Studies Radboud University & MPI)*

10:10-10:50

In this experiment we used a pantomime generation task to explore the cognitive dispositions that shape communication in the absence of language. We found that two groups from geographically distant cultures (Mexican and Dutch) aligned systematically different types of iconic depictions (i.e., acting, drawing, representing) to specific semantic categories, and implemented combinatorial strategies to mark distinctions. The striking similarities between both groups suggest that these depictions stem from cognitive biases rather than social conventions. The strong preference for the acting strategy supports theories claiming that gestures originate from action simulations. We argue, however, that when the different types of iconic depictions alone cannot mark subtle semantic distinctions (e.g., 'drinking' vs. 'mug'), gesturers resort to additional strategies such compositionality to disambiguate their meaning. These results bare strong resemblance with how actions and different types of objects are represented in emerging sign languages.

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## Acquisition

### **How much iconicity do children get?: Taking stock of iconicity in child-directed language**

*Pamela Perniss (Brighton University)*

13:20-14:00

Understanding how children acquire language remains one of the great challenges of research in the language sciences. A large body of research has been dedicated to studying the mechanisms that help children learn to map words to objects and events in the world. Most of this work has been underpinned by the long-standing assumption that label and referent are linked by arbitrary convention alone. However, in addition to being indisputably arbitrary, language is also fundamentally iconic (maintaining transparent links between form and meaning, e.g. meow, crash, drip). Recent evidence has shown that children are sensitive to iconic mappings and that iconic mappings may bootstrap word acquisition. For iconicity to be used by the child in vocabulary learning, it has to be present in the language input they are exposed to. This talk focuses on the use of iconicity in child-directed language across modalities: British Sign Language (BSL), rich in iconic forms due to the affordances of the visual modality, and English, where iconicity has the potential to be present not just in the phonology, as in onomatopoeia like meow, but also in co-speech gestures (e.g. a stirring gesture when talking about stirring something) and in prosody (e.g. lengthening the vowel in taaaall to talk about a really tall person). We suggest that caregivers exploit iconicity to highlight salient properties of referents, and that iconicity may be especially useful in contexts where referents being talked about are not present, and where iconicity can serve to bring the referent to the mind's eye. An analysis of the type and amount of iconicity used in child-directed language is crucial for understanding the role of iconicity as a strategy supporting referential mapping.

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### **What role do co-speech gestures play in foreign language learning?**

*Spencer Kelly (Colgate University)*

14:00-14:40

It is now well established that iconic gestures combine with speech to form a fundamentally integrated system of meaning during language production and comprehension. In the present talk, I explore the role of iconic and metaphoric co-speech gestures in foreign language learning on two linguistic levels of analysis: semantics and phonetics. The research reveals clear evidence that gestures are tightly integrated with speech during vocabulary learning, but this relationship is murky at lower levels of processing. These contrasting results suggest that gestures may be designed to connect to the content of speech during foreign language learning—and likely also native language processing—but they do not appear so well suited to connect to its form.

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### **Symbol grounding and de-grounding in language acquisition and evolution: The case of sound-symbolism**

*Mutsumi Imai (Keio University)*

14:40-15:20

Language is a system of abstract symbols. To address the symbol grounding problem (Harnad, 1998), which is directly linked to key problems in language acquisition and evolution, we need to consider not only how children map their physical and sensory experiences to the first set of symbols but also how they de-ground from “here and there” and climb the ladder into an inter-connected system of abstract concepts, which are largely language-specific. In this talk, I first explore how pre-verbal infants break into the world of symbols with the help of sound symbolism, presenting results of a series of experiments using EEG and NIRS. I then discuss how sound symbolism can develop into language-specific systems, each of which has its own way in mapping meanings to sounds, based on the results of an experiment that elicited production of sound symbolic words in Japanese and English speakers. I finally discuss how children de-ground from direct iconicity and immerse into conventional language, much of which does not contain apparently sensible sound symbolism, reporting a study examining the transition of the use of sound symbolism in child-directed speech.

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### 1. Degrees of Iconicity in Predicative Reduplication

*Ponsford, D. & Li, Y.*

This study operationalises the notion of degree-of-iconicity, and applies it to the uses of reduplication in predication. Forty-three functions are recognised within a database covering 113 languages. We identify five features of total reduplication that may be exploited to express a function iconically: identity of form, greater magnitude of form, discrete forms, proximity of form, and sequential arrangement of forms. We rate each function according to the number of features exploited, taking this to reflect degree-of-iconicity. Within pairs of semantically similar functions (determined on the basis of polysemy), the set of formal features exploited iconically by one function is always a subset of the features exploited by the other. Interpreted diachronically, this means that iconicity always changes in one direction. By this approach we arrive at a detailed picture of the paths along which the use of reduplication is extended.

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### 2. Debunking Phonaesthemes: The Absence of Iconicity

*Thompson, A.L.*

With etymological evidence, I show that phonaesthemes are not iconic but historically arbitrary. I answer “What is Iconicity?” by narrowing iconicity to imitative origin. For example, gl- in *glug* (draining) is iconic and, given imitative properties (velar + liquid), equivalents might exist cross-linguistically. But the gl- phonaesthetic relation to illumination is language-specific. I argue that phonaesthemes are arbitrary patterns derived from systematic relationships between arbitrary words. Whereas linguistic iconicity is derived from imitative depictions of the real-world. I also argue that, unlike phonaesthemes, systematic patterns in iconicity are imitative expressions shaped by phonotactics. While resonance can be depicted with any nasal, phonotactic regulations determine which segment is appropriate e.g., *boom*, \**buŋ*. Unlike phonaesthetic patterns, onomatopoeic patterns (1) cannot form semantic classes (e.g. resonance is a percept) and (2) lack etymological roots. Without imitative evidence, phonaesthemes cannot be iconic. Linguistic iconicity should be limited to phonotactics and imitative origin.

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### 3. The Thunder Rolls: Iconicity and Ideophones in Chinese meteorological Expressions

*Van Hoey, T.*

The semantic domain of meteorological expressions in Chinese provides a demonstration of the interplay of iconic patterns on two different levels: general conception vs. culture/language specific; and iconicity across or within different modalities. With data from dictionaries, e.g. *Handian 漢典* and *WordNet*, the cross-cultural salient phenomenon of weather-related expressions involves both (a) 'normal vocabulary' and (b) ideophones. (a) Chinese displays cross-linguistic types of iconicity, but the logographic writing system exhibits many iconic properties absent in e.g. Latin based scripts. Traditional Chinese character classification allots a category to iconic characters that serve as indices for many other characters. Meteorological basic level items essentially stem from five different iconic semantic radicals: rain (雨), sun (日), thunder (轟), cloud (云), and wind (風). (b) Weather ideophones often show synaesthesia. They can be imagically motivated for their phonology, and indexically for their written form. The interplay between these conceptual poles proves of interest for the discussion.

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#### **4. Iconicity in Prosody in Spoken Interaction**

*Ogden, R.*

Research into iconicity in conversational speech is lacking. This is partly because those working on the phonetics of talk-in-interaction have been concerned to explore the sequential and social underpinnings of prosody in conversation, while those working on iconicity have tended to use experimental frameworks, which abstract away the complexities of conversation. Drawing on a body of research into the phonetics of talk-in-interaction, which is grounded in participants' own displayed orientations alongside social and sequential order, we will argue that while there is evidence for prosodic iconicity, there are also elements of arbitrariness and linguistic organisation. Iconicity plays a role in participants' sense-making practices, but that the evidence from interactional studies shows that the position of a turn in a sequence of talk is also critical. Thus iconicity is just one of the ways in which participants in conversation make sense of one another's utterances.

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#### **5. 'r' Is for Rough: Iconicity in English and Hungarian Surface Descriptors**

*Winter, B., Sóskuthy, M. & Perlman, M.*

This study looks at English and Hungarian touch words that describe surfaces. We correlate phonological properties of these words with roughness norms collected by Stadtlander and Murdoch (2000). In both languages, we find that /r/ is associated with rough meanings and /l/ with smooth meanings, for example, rough and prickly describe rough surfaces in English, érdes and szúrós in Hungarian. An experiment with nonce words such as rorce and snilk confirms that English speakers are sensitive to this pattern. An analysis of 27 Indo-European languages shows that this roughness iconicity can be found across the entire IE language family. The fact that Indo-European languages, including English, exhibit the same pattern as Hungarian, an unrelated language, suggests that the association between /r/ and roughness is rooted in genuine iconicity. We propose that there is a cross-modal correspondence between the roughness of surfaces and the intermittent airflow in the production of trilled /r/.

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#### **6. Does Language Experience affect Perceived Iconicity?**

*Occhino, C., Anible, B., Morford, J. & Wilkinson, E.*

Recent research on iconicity ratings has suggested that rather than being objectively measurable, iconicity is subjectively constructed in the minds of signers. This suggests that language experience affects construals of iconic mappings. To investigate this hypothesis, non-signers rated images of signs (with glosses) for iconicity. Subsequently, L1-ASL expert signers and English-ASL L2 novice signers viewed ASL sentences containing the same ASL signs and responded with a keypress when they detected target handshapes. Reaction times were significantly modulated by non-signer iconicity ratings for novices, but not for experts. Signers with lower proficiency identified handshapes in signs with higher iconicity ratings more quickly, but signers with higher proficiency identified both high and low iconicity signs at equal speeds. These results suggest iconicity differs along several dimensions, and that language experience does affect construals of iconicity. We suggest that attention to the definition and operationalization of iconicity will be crucial to future investigations.

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#### **7. The Influence of Iconic Linguistic Expressions on Spatial Event Cognition across Signers and Speakers: An Eye-Tracking Study**

*Manhardt, F., Brouwer, S., Sümer, B., Karadöller, D.Z. & Özyürek, A.*

In sign languages, spatial encodings are iconic and analogue to the real event, while in spoken languages they are arbitrary and categorical. The present study investigates whether encoding of spatial events differs between signers and speakers. In an eye-tracking experiment, we compared visual attention of signers and speakers to left-right spatial configurations during planning of static event descriptions. We presented visual displays with four pictures. Each picture included the same two objects which were in different spatial relations to each other. An arrow indicated which picture participants had to describe. Experimental conditions contained either left AND right configurations in one display (i.e. Contrast condition) or left OR right configurations in one display (i.e. No-Contrast condition). The difference between the conditions was the presence of the contrast competitor (left/right). We

predicted that signers would be less likely to look at this competitor in the Contrast condition than speakers. Preliminary results confirmed this prediction. This study provides first evidence that sign languages' iconic structure may influence the way signers conceptualize left-right spatial configurations.

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## **8. The Role of Iconicity in Lexical Retrieval in a Signed Language: Evidence from Phonological Fluency Tasks in British Sign Language**

Marshall, C., Vinson, D., Beese, L. & Atkinson, J.

We investigated the role of iconicity in 14 signers of British Sign Language (BSL), who were asked to generate as many signs as they could in one minute to three phonological categories: the "above the shoulders" location, the index point handshape, and the claw handshape. The signs they produced were rated for iconicity on a scale from 1 (not-at-all iconic) to 7 (highly iconic) by 20 native signers. As predicted, signs produced to the most productive category, "above the shoulders", had higher mean iconicity ratings compared to signs in the other two categories, and we found a moderate and positive association between productivity and iconicity across all three categories. With respect to the clustering of responses, we found that signs within a cluster received higher iconicity ratings than signs that fell outside a cluster. These findings suggest that iconicity aids lexical retrieval during the phonological fluency task in BSL.

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## **9. Iconic Representation of Event Structure in ASL and Gesture**

King, R. & Abner, N.

In ASL and other signed languages, telic predicates (events with natural endpoints, e.g., DEVOUR, BURP) have been associated with formational boundary marking whereas atelic predicates (events lacking natural endpoints, e.g., STRETCH, APPLAUD) lack such marking (Wilbur & Malaia, 2008). Iconic event structural mappings in signed languages may be the consequence of both (a) universal communicative pressures shaping information expression in the visual modality and (b) grammaticalization of these pressures as language conventionalization. Here, we investigate the tradeoff between grammaticalization and universal communicative pressures in the production of ASL predicate signs and spontaneous gestures of non-signers. We found robust evidence of boundary-marking in telic predicates and increased repetition in atelic predicates in both ASL and gesture. In ASL, but not gesture, telic predicates had higher compositeness than atelic predicates, which may relate the morphological treatment of complex sign form properties that arises only under linguistic conventionalization.

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## **10. Combining Categorical and Gradient Information in Sign and Spoken Communication**

Lu, J. & Goldin-Meadow, S.

How do we define "gesture?" Speakers produce hand movements as they talk, and those hand movements are typically considered gestures. However, this criterion loses its usefulness for sign language, where hand movements are themselves linguistic. Our goal is to explore gesture in signed communication. We asked speakers and signers to describe objects in two contexts: (1) communicators are likely to use lexical labels to describe the objects, and (2) communicators are likely to have difficulty describing the objects with labels and will thus exploit other means. We found that speakers used hand gestures in the second context. Signers gradually modified their signs in this context (not only their hands but also their mouths), overlaying a gestural component onto their linguistic signals. Speakers and signers thus both turn to depictive devices when their language fails them, but the particular devices they use are shaped by the modality constraints of their language.

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### **1. The Role of Iconicity Type in the Creation versus Acquisition of an Emerging Sign Language Lexicon**

*Senghas, A., Zola, C. & Pyers, J.*

We considered whether diachronic change in the prevalence of iconicity in sign languages is driven by language learning, and whether such changes are mediated by iconicity type, e.g., pantomimic or perceptual. We compared signs from 2007 and 2017 produced by a signer (35y) representing the first-cohort of learners of an emerging sign language in Nicaragua (NSL) to those produced by a signer (20y) representing the second-cohort. In this way, we compared how signs changed as they were passed down vs. used over time. Most signs, particularly high-imageability concepts, exhibited iconicity, with first-cohort signs exhibiting more pantomimic iconicity and second-cohort signs, more perceptual iconicity. Cross-cohort 2007 comparisons reveal that more signs decreased in iconicity (45%) than increased (14%), with pantomimic signs decreasing the most. Iconicity did not decrease overall from 2007 to 2017. These patterns suggest that iconicity is useful during language creation, but compromised during transmission to new learners.

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### **2. Negotiated Iconicity in Interactive Silent Gesture Communication**

*Micklos, A.*

The manual modality affords a number of iconic strategies for representing referents. Silent gesture studies have found that hearing non-signers tend to signal meanings with action-variant gestures. However, many of these studies have gesturers produce signals in isolation. What effect might interaction have on these signals in terms of maintaining, eliminating, or modifying iconic strategies? Participants played an interactive, iterated referential communication game which required disambiguating noun-verb pairs using silent gesture. Negotiating participants innovated noun markers that distinguished noun gestures from verb gestures that relied on the same iconic strategy: action-based. For instance, noun-verb pairs with high or low affordance for manipulability were signaled with a “handled” handshape or were acted out, respectively. When negotiating alignment to gestural forms, participants’ biases for action-based iconicity were strengthened. Rather than trending toward abstraction, action-based iconicity is maintained, supporting recent findings on the effect of interaction.

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### **3. Measuring Iconicity in an Evolving System**

*Motamedi, Y.*

Data from natural language and experimental research has suggested that signals become less iconic over time. However, objective measures for iconicity, particularly in evolving systems are not yet widespread, and often diverse in their operationalisation. I present a study using data collected from a silent gesture task that investigates iconicity in the systems, using both qualitative analysis and iconicity ratings from naive viewers. Furthermore, I contrast iconicity ratings based on the task instructions given to participants, to understand how the framing of a judgement task may affect the ratings that participants produce and point to how participants perceive iconic aspects of signals.

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### **4. The Sources of Iconic Representations in the Novel Created Sign Lexicons (NCSLex)**

*Tkachman, O. & Hudson Kam, C.L.*

Core lexicons of unrelated sign languages overlap to a degree that is unheard of in spoken languages (up to 20-30%, see McKee & Kennedy 2000, Guerra Currie et al. 2002, Kastner et al. 2014). Many researchers propose that the affordances of the visual-manual modality make it easier to directly represent salient features of referents (see Perniss Thompson, & Vigliocco 2010). This does not explain, however, why the same features of the referents are favored for representation in unrelated sign languages. We investigate sources of iconic representations by asking 50 sign-naïve, hearing people (ages 19-72) to invent signs for 100 familiar objects belonging to different conceptual

categories (e.g., man-made vs. natural, animate vs. inanimate, etc.). We found that different conceptual categories favored different types of iconicity. The results suggest that as participants coined iconic representations, they did not choose forms randomly, but converged on a restricted set of iconic representations suitable for a particular conceptual category.

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## **5. Iconicity vs. Systematicity in Artificial Language Learning**

*Nielsen, A.K.S., Simner, J., Kirby, S. & Smith, K.*

Recently, a number of experimental studies have shown that word learning is facilitated by both systematic and iconic associations between words and meanings. To date, few experiments have explicitly explored the degree to which increased learnability is driven by iconicity versus systematicity. Here we present the results of two studies testing the differences in learnability between artificial lexicons that are either ‘conventionally’ systematic, or both systematic and iconic. In the first study we find that both conventional and iconic systematic lexicons are equally learnable, but iconic mappings provide an early learnability advantage. We also find that mixing iconic and non-iconic mappings can interfere with learning, which is supported by the results of Experiment 2.

Our data suggest a more fine-grained interpretation of how form and meaning affect word learning, and this calls for a re-evaluation of how systematic and iconic associations influence language learning.

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## **6. Iconicity in Pointing Gestures: Work in Progress on a Gesture Typology**

*Hassemer, J.*

This poster shows work in progress on a gesture typology that embraces an interaction of iconic and deictic aspects across types. Gesture types are defined by the spatial operations that are necessary to understand bodily action as a specific gesture (Hassemer, 2016). This typology is modular, such that it exhibits the overlaps and differences among related types. The gesture type Drawing, for example, is constituted by exactly one additional operation in comparison to Pointing At Location: trace leaving (Fig. 1; Mandel, 1977; Hassemer, 2016). The operation of trace leaving is thus the constituent that affords to “superimpose an iconic display on a deictic point” (Goodwin, 2003:229). The poster includes illustrating the modular nature of the gesture typology at the example of a range of pointing gestures and graphical illustrations of the proposed spatial operations, both in a schematic fashion and applied to empirical data from multiple corpora.

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## **7. The “Iconic-Metaphoric-Deictic-Beat Quartet” Revisited: Are there Really Non-iconic Co-speech Gestures?**

*Jehlička, J. & Lehečková, E.*

The poster presents outcomes of a cross-linguistic multimodal corpus-based study of co-speech gestures and their relation to grammatical structure in English and Czech. The primary focus of our study was to explore links between grammatical and lexical-semantic features of constructions accompanied by gestures, and formal features of the co-speech gestures appearing during spontaneous speech production. Thus, we explored iconic nature of co-speech gestures captured in a highly ecologically valid environment. Our data come from two comparable multimodal corpus samples of English and Czech interactions.

The main outcomes of the analysis were threefold:

(i) there are significant associations between some lexical-semantic features and gestures’ formal features and (ii) the character of these associations differs across languages. (iii) the iconic link has been observed across all types of gestures – not only in the “proper” iconics.

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## **8. Who Did What? How Iconic Gestures Help Young Children to Encode Action Events**

*Aussems, S. & Kita, S.*

Previous research has shown that seeing iconic gestures at the recall stage influences how children remember events, but not whether seeing iconic gestures influences how children encode events. In an experiment with 72 three-year-olds we investigated whether encoding events while seeing iconic gestures leaves children with a stronger memory representation of these events. Twelve videos of actors moving across a scene in an unusual manner were presented with either iconic gestures depicting how the actors moved, interactive gestures, or no gesture. Children's recognition memory of the actors and their actions was tested. Children in the iconic gesture condition remembered actors and their actions better than children in the control conditions. Importantly, the benefit of iconic gesture on actor memory increased as more of the actor was depicted in gesture. To conclude, seeing iconic gestures while encoding events facilitates children's memory of those aspects that are selectively highlighted by iconic gestures.

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## **9. Iconic Representational Strategies in Children's and Adults' Gestures and Signs: A Common Taxonomy for Coding Narratives**

*Di Renzo, A., Proietti, M., Slonimska, A. & Capirci, O.*

The capacity of iconizing the practical and perceptual experiences of the world is reflected in the two ways of signifying in Sign Languages (SL): 'telling and showing' with the use of the Highly Iconic Structures (HIS), or 'telling without showing', using lexical units (LU) and pointing. The way of signifying in Spoken Languages increases its iconicity with the presence of gestures. The aim of this study is to compare in a narrative context the range of representational techniques and HIS in co-speech gestures, produced by 20 hearing speakers, with those in sign language, produced by 20 deaf signers. A common procedure to code signed and gestural data has been defined. Results showing interesting equivalences across the two taxonomies of analysis, provide a unified methodology to analyze gestures and signs and give scholars the possibility of investigating the similarities between the iconic principles on which their representation of reality are based.

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## **10. Iconic Representation of Form and Function in Pantomime and Gesture**

*Marentette, P. & Inaba, C.*

Are some iconic representations more basic than others? We explored the production of two types of iconicity (form, function) in gestures (cue: TELL) and pantomimes (cue: SHOW) of children and adults. Adults differentiated the cues and primarily represented function, though this differed slightly by cue. Children did not distinguish the two cues: they gestured with speech for both cues. Children represented function infrequently. This study replicates findings about representation of form and function. Two new findings are considered: children do not differentiate the cues SHOW and TELL in their use of co-speech gesture. Pantomime is more likely to involve a representation of function. Since children do not differentiate it from gesture, they may be less likely to produce iconic representations of function than adults. Supporting this interpretation is our finding that adults produced slightly more representation of form in their co-speech gesture than in pantomime.

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# CLS-MPI Iconicity Focus Group Workshop

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*Types of iconicity in language use, development, and processing*



Max Planck Institute  
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