AHRC-DFG

From icon to abstraction: how iconicity shapes the lexicon in the visual modality

Booklet of Abstracts

20-21 July, 2023

Programme overview

09:30-10:00	WELCOME (Gerardo Ortega)
	Iconicity and how it shapes the lexicon
10:00-11:00	**Mahesh Srinivasan** University of California, Berkeley
11:00-12:00	**Annika Schiefner** University of Cologne & University of Birmingham
12:00-13:30	**LUNCH**
13:30-14:30	**Chris Laing** Haworth Tompkins, Architect
14:30-15:30	**Gary Quinn** Heriot Watt University
15:30-16:00	**COFFEE BREAK**
16:00-18:00	**Poster session 1**

Friday, 21 July (day 2)

09:45-10:00	RE-CAP (Pamela Perniss)
	Iconicity, lexicon, and learnability
10:00-11:00	**Jenny Lu** University of California, Berkeley
11:00-12:00	**Nia Lazarus** University of Cologne & University of Birmingham
12:00-13:30	**LUNCH**

13:30-14:30	**Marieke Schouwstra** University of Amsterdam
14:30-15:00	**COFFEE BREAK**
15:00-17:00	**Poster session 2**
17:00-18:00	**Discussion led by Marcus Perlman** University of Birmingham

Overview poster presentations

1. **The sound-symbolic value of Thai emphatic Reduplication**
   Ian Joo

2. **Psycho-Semiotic Effects of Internal and External Shapes on Symbols**
   Toshimune Kambara and Maika Hayashi

3. **Iconicity in reciprocals: Evidence from Sign Language of the Netherlands (NGT)**
   Cindy van Boven

4. **The relationship between English words rated as 'iconic' and (iconic) gesture**
   Ellen Wilding Marcus Perlman, Bodo Winter, Jeannette Littlemore

5. **Recurring iconic mapping patterns within and across verb types in German Sign language**
   Marloes Oomen

6. **Concepts of theoretical semantics for the understanding of prosodic imitation**
   Antoine Tholly

7. **Placing signs on the spectrum of iconicity. A comparison of systems of classifying types of iconicity**
   Anique Schüller and Brendan Costello

8. **Multisensoriality in the iconic lexicon of Japanese: an explorative study of ideophones**
   Bonnie McLean, John L.A. Huisman, Arthur Lewis Thompson, and Youngah Do

9. **Does *thin* sound "small" and *heavy* sound "big"? An investigation of the size sound symbolic potential of antonym adjective pairs**
   Melissa Ebert and Aleksandra Ćwiek

10. **Lexical creation in LSQ: What astronomical neologisms reveal about sublexical structure and iconicity**
    Laurence Gagnon

11. **Contrasting eye gaze and torso shift as two markers of role shift in American Sign Language**
    James Waller

12. **How iconicity shapes the lexicon: depiction as a driver of new terminology in Irish Sign Language**
    Rachel Moiselle and Lorraine Leeson

Friday, 21 July (day 2)

1. **Do 14-17-month-old infants use iconicity in speech and gesture to interpret novel words?**
   Suzanne Aussems, Charlotte Devey Smith, and Sotaro Kita

2. **A Different Take on Iconicity: Bodily Resemblance Schematically**
   Jarkko Keränen

3. **Infants can create different types of iconic gestures, with and without parental scaffolding**
   Chloe Osei-Cobbina, Kirsty Green, Marcus Perlman, and Sotaro Kita

4. **Does Iconic Gesture Speed Influence Verb Comprehension in 2-year-olds, 3-year-olds, and Adults?**
   Mingtong Li, Suzanne Aussems, and Sotaro Kita

5. **Shared semiotic origins in the emerging sign language of Guinea-Bissau**
   Mariana Martins

6. **The use of signs referring to punctuation marks in Polish Sign Language (PJM)**
   Weronika Szymańska-Gątarek

7. **Phonological features in the abstraction from gesture to sign: change and persistence**
   Door Spruijt, Pamela Perniss, and Petra Schumacher

8. **Iconicity, shared context and lexical variation.**
   Katie Mudd and Marieke Schouwstra

9. **Children build on what they know: Early phonological networks grow in a rich-get-richer manner**
   Judith Kalinowski, Michaela Vystrcilová, Laura Hansel, Alexander Ecker, and Nivedita Mani

10. **Quantifying systematicity in the American Sign Language lexicon**
    Elana Pontecorvo, Zed Sevcikova Sehyr, Karen Emmorey, and Naomi Caselli

11. **Communicative efficiency shapes the iconicity in silent gesture production**
    Jiahao Yang and Sotaro Kita

12. **Polish Sign Language classifier iconicity in relation to the signers' age**
    Rafał Daras

Invited presentations
Abstracts

Mahesh Srinivasan
University of California, Berkeley

Language learning and the emergence of polysemy across languages

Prevailing theory in language development proposes that—to simplify a challenging learning problem—children initially assume that a new word will carry only one meaning and label a single taxonomic category. Yet although this assumption is thought to support learning, most words in English and other languages violate it, and express multiple, related meanings—a phenomenon called *polysemy* (e.g., thirsty/tasty *chicken*).

In this talk, I will review my research showing that—contrary to current theories — children are able to learn multiple meanings for polysemous words from early in development, and represent them similarly to adults. Moreover, I will present evidence suggesting that polysemy actually helps children overcome some of the challenges inherent to learning new words, by allowing children to use their knowledge of one meaning of a word to (1) guess the referents of new word meanings, (2) infer how those word meanings will be generalized, and even (3) spontaneously anticipate the existence of those meanings.

Evidence that polysemy facilitates lexical development opens a functional explanation for its ubiquity: polysemy may arise in response to the pressure on language to be maximally learnable. From this perspective, we can make sense of cross-linguistic variability in polysemy by considering learning constraints. I will review my research supporting this proposal, which finds that instances of polysemy that more often recur across languages reflect conceptual relations that are easier to grasp. Moreover, I will discuss research suggesting that one pattern of English polysemy that is rare across languages is also difficult for English learners to acquire. Finally, I will close by discussing new research which explores the origins of children's intuitions about polysemy.

Annika Schiefner, Gerardo Ortega, and Pamela Perniss
University of Cologne & University of Birmingham

Iconicity in concrete and abstract concepts: a cross-linguistic comparison of signs and silent gestures

The visual modality affords a high degree of iconic form-meaning mappings (Taub, 2001). This high affordability shapes how concepts are represented in the visuo-manual modality, both in the gestures produced by hearing non-signers and in the lexicon of the sign languages of deaf communities. For

spoken languages, it has been argued that iconicity is ill-suited for the representation of abstract concepts due to its grounding in sensory depictions (Lupyan & Winter, 2018). To better understand whether and to what extent this claim holds for the visuo-manual modality, we investigate how sign languages and silent gestures use iconic strategies to represent concrete and abstract concepts.

We compare signs from British Sign Language (BSL) and German Sign Language (DGS) to silent gestures produced by British and German hearing non-signers. In silent gestures, the use of iconic strategy for concrete concepts was predominantly consistent, and participants had little trouble coming up with gestures. For abstract concepts, in contrast, gesturers were more likely to pass (i.e., were unable to come up with a gesture) and exhibited a high degree of diversity in iconic representation. The comparison with the sign languages showed that concepts with high diversity scores in gestural responses were also likely to use different iconic strategies in BSL and DGS. Reminiscent of Lupyan and Winter's (2018) argument for the spoken modality, we find that abstract concepts appear more difficult to represent iconically in the visual modality. However, even in silent gesture, participants do produce rich and diverse iconic gestural representations for many concepts. The overlap in concepts that show higher diversity in iconic strategy use in sign languages and gestures suggests that concept characteristics, rather than language specific biases, drive the selection of iconic strategies across populations.

Chris Laing
Haworth Tompkins, Architect

What is the sign for 'cantilever'? Or the sign for 'gentrification'? These are common architectural terms, however deaf architects may struggle to talk about these concepts because there is no standardised sign for them. Chris Laing, a British Sign Language (BSL) user, addressed this issue with the creation of Signstrokes, an online facility where he and his team developed a BSL lexicon for architectural jargon. In his talk, Chris will explain the creative process to develop architectural terms in BSL, and how this resource can be used by interpreters and deaf users of BSL.

Gary Quinn
Heriot Watt University

Using iconicity to develop new signs, however, it's not just iconicity!

This presentation will discuss using sign language morphology to unlock science education and to develop new signs for science terminology, which are not yet established terms in the BSL lexicon. The talk will explain why it is important to develop appropriate signs for each specific term, while adhering to the principles of BSL linguistics when creating a new scientific sign, mainly iconicity, but will also explain why it is very important to take time to develop the new signs in semantic 'families'. There may often be a 'root' sign/s or parts of signs. The talks also will show some examples of 'families' and 'root' signs.

It will show what and how to train new participants to the sign development team in basic linguistic principles, including a range of metaphors and other considerations. Also, it will explain how the team develop and expand on work from the earlier period of developing the sign glossary, such as original principles and the purposes of setting up a BSL glossary and the methodology for developing new signs. It will also consider some challenges, such as deciding which new signs to keep, the importance of having definitions in BSL and the effects of sign language variation across the UK, as a result of schoolisation.

Invited presentations
Abstracts (continued)

Friday, 21 July (day 2)

Jenny Lu
University of California, Berkeley

Creative lexical semantic structures in diverse signed languages

Our creativity and efficiency in language use are particularly salient in how we extend word meanings in pluralistic ways. The English word *belt* could reference a buckle or geographic region (e.g., *belt of poverty*). Words often relate to a set of ideas or senses, a phenomenon called polysemy. In this talk, I discuss polysemy in diverse signing contexts, and propose that underlying conceptual structures, iconicity, and pragmatic context shape language forms and use.

The first study explores polysemy in three signed languages: American (ASL), German (DGS), and Japanese (JSL) Sign Languages. We find that signed languages have considerable overlap with spoken languages, but there are systematic differences. For example, in English, the word *beam* refers to either a wooden support structure or ray of light. All signers produced two distinct signs for these meanings as iconicity often blocks the meaning extension (Figure 1). Sign language experience could subsequently shape one's conceptual structure. We also investigate polysemy in the case of a deaf child, who does not sign in ASL but natural signing at home. By referencing Wordnet and the communicative context between the child and adults, we re-coded these gestures and unearthed many more new meaning extensions (using Goldin-Meadow et al., 1994's data). This child spontaneously uses the same gesture form, such as flapping B hand movements, to denote *flying, airplane, bird*, or *butterfly*. These meanings seem to materialize at the pragmatic and contextual level, in addition to the morphological level, where participants converge on shared objects in the environment in order to interpret word meanings. Social context and early-developing concepts about the world both motivate this semiotic system.
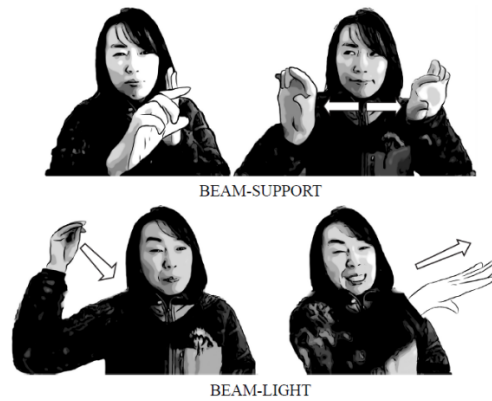
Figure 1. JSL signs for BEAM-support and BEAM-light (English uses the same word, BEAM)

Nia Lazarus, Pamela Perniss, and Gerardo Ortega
University of Cologne and University of Birmingham

PIZZA and SOCIETY are one and the same: An exploratory study of colexification in two sign languages

Colexification exists when a lexical form has multiple (often related) senses. Colexification patterns have been shown to be motivated by the structure of the environment and shared experiences, as e.g. in the colexification of *rain* and *water* across diverse spoken languages (List et al., 2018). However, these two concepts seem unlikely to colexify in sign languages due to iconicity, which is broadly prevalent in the visual-spatial modality. For example, in German Sign Language (DGS, Deutsche Gebärdensprache), the sign RAIN represents drops falling from the sky, but this iconic motivation is not present in the (arbitrary) sign for WATER. As such, we can expect iconicity to influence colexification patterns in a different direction than those currently documented in spoken languages. This study investigates colexification patterns to describe the diverse semantic categories observed in a network of two unrelated sign languages, DGS and British Sign Language (BSL), and to understand how iconicity may influence colexification in the visual modality. A novel experimental design used stimulus video clips of sign forms to collect their associated colexified meanings from deaf users of BSL and DGS. A semantic map was established to highlight colexification clusters and identify possible factors that influence colexification patterns. The resulting colexification network suggests that the colexification of meanings are motivated by either shared semantic or phonological features, or even a degree of overlap between both. In DGS, despite not being conceptually related, PIZZA and SOCIETY are signed using the same phonological features depicting the literal and figurative circular shapes of a pizza and a group of people. Conversely, the BSL signs for PLANE, AIRPLANE, JET, AIR-FORCE and FLY use the same phonological features depicting an aircraft, a concept directly rooted in their semantic relationship. The findings from this study will expand our knowledge of the ways that the body shapes the lexicon in the visual-spatial modality. Additionally, this work offers implications ranging from applications in L1 and L2 sign language instruction, psycholinguistics study, to deep machine learning.

Marieke Shouwstra
University of Amsterdam

Language and iconicity in the lab: experience, learning, and interaction

Language learning can aid the learning of a new language, but the relationship between language and iconicity is complex and has many layers. In this talk, I will discuss experimental work that aims to help us better understand this complex interconnectedness. First, I will point out that apart from an influence of iconicity on learning, there is a relevant force in the opposite direction: experience with iconic language can influence how linguistic signs are perceived. I will present experimental results of a visual learning experiment that supports this view: participants were trained on an artificial language that consisted of point patterns presented together with labels. Participants were more likely to interpret novel point patterns as iconic after being trained on a highly iconic point pattern language than when they were trained on a less iconic language (Sato, Schouwstra & Kirby, 2020).

Subsequently, I will focus on different specific iconic strategies in the gestural domain, and report ongoing experimental work that investigates the influence of shared (cultural) knowledge on the usage of iconic strategies in interaction (Mudd & Schouwstra, in prep).

Important take home messages from this work: (1) iconicity is, at least partly, a subjective phenomenon: whether or not iconic mappings are perceived or recognised can differ from individual to individual, and can be influenced by previous perceptual experience; (2) despite the subjective nature, we can use experimental techniques to investigate statistical patterns in the role of iconicity in language and its use, change, and evolution.

1. The sound-symbolic value of Thai emphatic reduplication

Ian Joo

The Hong Kong Polytechnic University

In Thai, emphatic reduplication is a special type of reduplication where the reduplicant bears the emphatic high tone, regardless of the original tone of the base. This high tone is phonetically different from the normal high tone, such as in /rɔ́ːn/ ร้อน 'hot', because even a high tone base can be reduplicated into an emphatic high tone, which is higher in pitch and longer in duration, as well as being orthographically differently marked by mai tri, such as in /rɔ̇́ːn rɔ́ːn/ ร๊อน ร้อน 'very hot' (Haas 1946). But what is the sound-symbolic value of the Thai emphatic reduplication? What kind of meanings does it emphasize? What types of words most frequently appear in emphatic reduplication? To answer this question, I have gathered emphatically reduplicated words (excluding interjections) that appear at least ten times in the Thai Web 2018 (thTen-Ten18) corpus. Then, I linked each word to one of the concepts retrieved from the Database of Cross-Linguistic Colexifications (CLICS³) (Rzymski et al. 2020), when a corresponding concept is available in CLICS³. CLICS³ is a database consisting of colexification patterns that appear in at least three different language families. I grouped the occurrence frequency of emphatic reduplication by the assigned CLICS³ concept and their colexification "neighbors". Thus, the frequency of concept X is defined as the number of occurrences of emphatic reduplications that are assigned to X plus the number of occurrence of those that are assigned to concepts that are listed as the colexified concept of X in CLICS³. Table 1 shows the frequency of each CLICS³ concept whose frequency is at least 50. By using this methodology, I can classify the meanings of the emphatic reduplications within the broader field of semantically related concepts rather than singleton meanings. Table 1 shows that most of the associated concepts are positive meanings, namely EASY, GOOD, BEAUTIFUL, SWEET, ENOUGH, TRUE, KIND OR POLITE, SMOOTH, TASTY, and HAPPY. From the results, I induce that Thai emphatic reduplication is sound-symbolically associated mainly to positive valence. This is in line with the perceptual bias linking high pitch to positive semantic valence (Barber & Reimer 2021; Jaquet, Danuser, & Gomez 2014).

Concept Frequency
EASY 3647
GOOD 3638
BEAUTIFUL 3385
SWEET 3385
ENOUGH 353
MANY 351
LIGHT (WEIGHT) 294
DIFFICULT 265
OFTEN 262
TRUE 248
KIND OR POLITE 219
SWELL 151
FOR A LONG TIME 145
LONG 141
OLD 99

SMOOTH 90
BIG 86
TASTY 70
SOFT 62
COME 50
HAPPY 50
WHY 50

Table 1: The frequency of CLICS³ concepts in Thai emphatic reduplication

2. Psycho-Semiotic Effects of Internal and External Shapes on Symbols
Toshimune Kambara, Maika Hayashi
Hiroshima University

The purpose of the research was to investigate perceptual and emotional effects of straight and curved lines of internal and external features on symbols. In Study 1, one hundred and twenty-five participants evaluated symbols by using 7-point semantic differential (bipolar) scales associated with valence, arousal, heaviness, and uniqueness. Each symbol involved internal shapes and an external shape (a frame). The internal and external shapes were composed of squares or circles. We prepared four conditions [SC: a square frame and circle(s); SS: a square frame and square(s); CC: a circle frame and circle(s); CS: a circle frame and square(s)]. As results of Study 1, the participants felt that symbols including a squared frame and squared internal shapes (SS) are perceived as heavier and more excited than symbols including a curved frame and curved internal shapes (CC). In Study 2, fifty-seven participants evaluated symbols by using 7-point semantic differential (bipolar) scales linked to valence, arousal, heaviness, and uniqueness. The internal and external shapes were composed of spiky or round shapes. Four conditions were prepared [SpC: a spiky frame and circle(s); SpSp: a spiky frame and spiky shape(s); CC: a circle frame and circle(s); CSp: a circle frame and spiky shape(s)]. In Study 2, there were significant differences among conditions in valence (SpC > SpSp, CC > SpSp, CC > CSp, and CC > SpC), arousal (SpSp > CSp, SpSp > SpC, SpSp > CC, CSp > CC, and SpC > CC), heaviness (SpSp > CC, CSp > CC, and SpC > CC), and uniqueness (SpSp > SpC, SpSp > CC, CSp > CC, and SpC > CC). The current study suggests that people can change sensorimotor and emotional information linked to symbols by adjusting the internal and external structures of symbols.

3. Iconicity in reciprocals: Evidence from Sign Language of the Netherlands (NGT)
Cindy van Boven
University of Amsterdam

This study investigates dual reciprocals in NGT. Analysis of 55 reciprocals extracted from the Corpus NGT (Crasborn, Zwitserlood & Ros. 2008) and 62 elicited reciprocals shows that reciprocity is (optionally) marked on the verb by sequential backward reduplication (N=10) or simultaneous backward reduplication (N=36). Lexical reciprocals are not reduplicated (N=21). Phonological/morpho-syntactic properties of the verb influence reciprocal marking, as in other sign languages (e.g., Pfau & Steinbach 2003; Zeshan & Panda 2011), but cannot explain all observed patterns. The present study approaches reciprocals from the perspective of iconicity, by investigating its role in (i) marking sequential versus simultaneous reciprocal meaning, and (ii) NGT
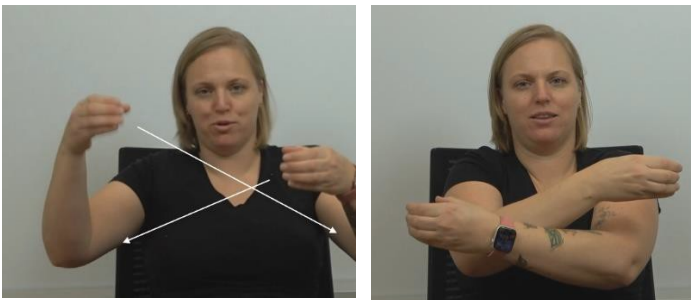
lexical reciprocals.

(i) Sequential and simultaneous reciprocals. While all two-handed verbs in the data remain zero-marked, for one-handed verbs (e.g., GIVE (1a)) we observe a clear relation between reduplication type and reciprocal type (cf. Ergin, Senghas, Jackendoff & Gleitman 2020): simultaneous reciprocals are marked by simultaneous reduplication (1b), while sequential reciprocals are marked by sequential reduplication (1c), although reduplication is generally optional.

(1a)

GIVE(base)

(1b)

GIVE.RECIPROCAL(simultaneous)

(1c)

GIVE.RECIPROCAL(sequential)

(ii) Lexical reciprocals. Lexical reciprocals (except one-handed MARRY) are two-handed and clearly iconic: each hand represents one side of the event (2a). This confirms previous cross- linguistic findings (Börstell, Lepic & Belsitzman 2016). Interestingly, the order of sub-events seems no longer relevant when a form lexicalizes; e.g., TALK-TO-EACH-OTHER (2b) appears to be lexicalized, and it is simultaneous, despite the 'talking' sub-events being sequential.

(2a)
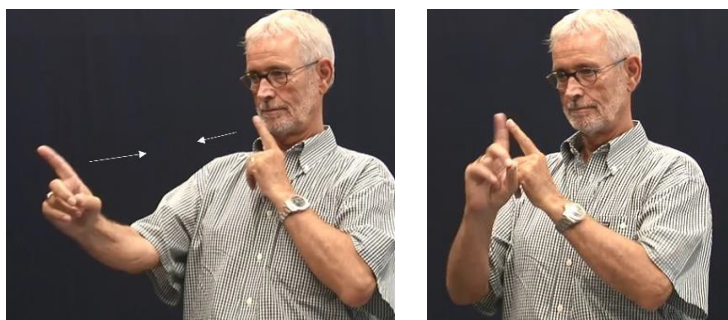
MEET[CNGT0095;01:09]

(2b)

TALK-TO-EACH-OTHER[CNGT0094;02:15]

Adding to previous work on sign language reciprocals, our study demonstrates that in the domain of reciprocity, iconicity is not only visible in the lexicon (lexical(ized) reciprocals), it also impacts the reduplication strategy selected for the formation of the reciprocal. However, when a reciprocal form lexicalizes, this iconicity may be partially bleached. That is, while the order of sub-events crucially impacts the inflection of one-handed verbs, it is no longer at play in lexicalized forms – although they still clearly represent both participants.

4. The relationship between English words rated as 'iconic' and (iconic) gesture
Ell Wilding, Marcus Perlman, Bodo Winter & Jeannette Littlemore
University of Birmingham

Recent research has challenged the assumption that language is arbitrary, finding that iconicity is a fundamental feature of both signed and spoken languages (Perniss, Thompson and Vigliocco, 2010; Dingemanse *et al.*, 2015). Iconicity is found across languages in ideophones, a class of words that use depiction to convey sensory meaning (Kita, 1997; Voeltz and Kilian-Hatz, 2001; Dingemanse, 2012). Research has established a link between ideophones and gesture in various languages (Diffloth, 1972; Kita, 1997; Dingemanse, 2013). Although English has been argued to lack a distinct lexical class of ideophones (Diffloth, 1972; Liberman, 1975; Nuckolls, 2004), studies show that it contains a substantial number of words that native speakers rate as 'iconic', i.e. as "sounding like what it means" (Winter *et al.*, 2022). This study compares the gesture rate of verbs and adjectives rated as highly iconic (e.g. *swoosh, puffy, crispy*), and minimally iconic (e.g. *ordain, rejoin, grateful*) from Winter *et al.* (2022). The data consists of clips from the TV News Archive, a captioned video database of news broadcasts. 4,800 clips of the search terms have been coded for whether a gesture co-occurred with the word, and whether the gesture itself could be interpreted as iconic (Kendon, 2004). For example, when using the iconic word *squish,* some speakers use an iconic gesture by enacting squishing

something between two open hands. Preliminary analysis shows that iconic words have a high gesture rate at 70% (32% of which is iconic), while non-iconic words have a 51% gesture rate (19% of which is iconic). I will consider what the results mean for the assertion that English does not have ideophones, particularly in reference to Dingemanse's (2019) typology of ideophones, arguing that these highly iconic English words have a similar association with gesture.

5. Recurring iconic mapping patterns within and across verb types in German Sign language
Marloes Oomen
University of Amsterdam

Many sign languages share the same basic tripartite verb-classification system (Padden 1988), and it has been claimed that this system is at least partially semantically grounded (Meir 1998/2002). I investigate the extent to which iconicity plays a mediating role in the relationship between verb type and verb semantics by identifying recurring iconic mappings (Taub 2000/2001) across verb forms in German Sign Language (DGS). To establish which event properties are commonly iconically represented in DGS verb forms, and which of those can additionally be associated with verbs of a specific type, 106 verb forms of different types were analyzed. I show that many verb forms involve clearly iconically-motivated handshapes, and I propose that iconic handshapes are predictive of the degree of (semantic) transitivity of events denoted by verb forms: some handshapes make iconic reference to two (or even three) event participants, while others reference only one (cf. Benedicto & Brentari 2004 for classifier predicates). While iconic handshape patterns recur across verb types, how they combine with location and movement specifications differs per type. In body-anchored verbs, the body may iconically take on different roles in relation to the external environment, depending on the handshape mapping involved. Verbs in neutral space represent highly transitive events, with the more agentive participant being iconically foregrounded, or highly intransitive events, characterized by relatively abstract phonological properties. Agreement and spatial verbs have a movement that iconically represents the physical/metaphorical movement of an event participant in space; iconic handshapes may represent additional event participant properties. I thus propose that verb types are associated with different dimensions of transitivity, mediated by iconicity (in line with Oomen 2018). The study thus contributes toward our understanding of the role of iconicity in the relation between verb semantics and verb type in DGS and sign languages with similar systems.

6. Concepts of theoretical semantics for the understanding of prosodic imitation
Antoine Tholly
Sorbonne Université

Imitative prosody is an emerging field of study: associations between prosodic features and meanings is now well attested (Nygaard & al 2009, Perlman & Cain 2014), and some theoretical explanations are given in terms of gestures (Fónagy 1983, Perlman & al 2015), metaphors (Nygaard & al 2009), or blending (Auchlin 2013). In Tholly 2022, we propose both a theoretical and empirical study of this prosodic function (to listen to 200 French examples, classified in 30 meanings and 10 domains, see Tholly 2023). For the prosodic sound symbolism of *magnitude* (Perlman & al 2022), for example, we propose the following theoretical tools for classification, allowing the integration of the imitative function in both the general prosodic system and the syntagmatic analysis of utterances: (I.1.) morphosemanticism 1: *image iconicity* (form-meaning motivation of the sign by similarity) and

diagrammatic iconicity (motivated categorizations of amplifying vs. attenuating forms). Jakobson (1965), Monneret (2014). (I.2.) morphosemantism 2: opposition between iconicity and *indexicality* (Deeley 1994). Diachronic emergence of the emphasis through the *effort code*, one of the biological codes of prosody (Gussenhoven 2004). Source of polysemy. (II.1.) semasiology 1: *polysemy* of the emphasis according to different imitative meanings (great strength, great size, great presence, etc.). An intensive dimension applying to different domains. (II.2.) semasiology 2: emphasis used for quasi *lexical* (thematic, imitative) vs *grammatical* meanings (insistence and intensification). (III.1.) paradigmatic onomasiology 1: emphasis and other imitative signs categorized in the same imitative *domains* (e.g., emphasis, attenuation, excitement, solemnity prosodic signs imitating strength-related words). (III.2.) paradigmatic onomasiology 2: emphasis and other prosodic or verbal signs categorized in the same intensive *dimension*. Delais-Roussarie et al. (2015), Romero (2017). (IV.1.) syntagmatic onomasiology 1: associations by *semantic features* of the imitating prosodic content and the imitated verbal content (according to domain features or dimension features). (IV.2.) syntagmatic onomasiology 2: the dimension or domain features are *activated* either autonomously or contextually as a consequence of the imitative relation (*cf.* indexicality and polysemy). Rastier (2015).

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7. Placing signs on the spectrum of iconicity – A comparison of systems of classifying types of iconicity

Anique Schüller and Brendan Costello
Basque Center on Cognition, Brain, and Language

The traditional view that the relationship between form and meaning of a linguist sign is arbitrary has been undermined by the observation that signs may be iconic, namely, form may be motivated by its meaning (Taub, 2001; Sidhu et al., 2020). Signs are not entirely arbitrary or iconic (Dingemanse et al., 2015; Perniss & Vigliocco, 2014) but fall on a spectrum ranging from highly arbitrary to extremely iconic depending on different properties, and the nature of the relationship between form and meaning. Iconicity can be conceptualized as a matter of degree or of type. To measure how iconic signs are, we collected iconicity ratings for 600 lexical signs of Spanish Sign Language (LSE) from native and non-native deaf signers (40-90 raters per sign) on a scale from 1 (not iconic) to 7 (highly iconic). To categorize what type of iconicity these signs display, we selected two classification systems: one based on Taub's (2001) model, in which iconicity can either be action- or perception-based, with further degrees of abstraction (Perniss & Vigliocco, 2014; Ortega et al., 2020); the second is included in the LSE-Sign database (Gutierrez-Sigut et al., 2015) and categorizes iconicity according to the formal properties of the sign and how they express the sign's meaning. For each of these classification systems, we explore how the quantitative ratings distribute across the different categories. For example, is action-based iconicity rated as more iconic than perception-based? Furthermore, we compare the two classification systems by asking if one system better captures how iconic signs are (as indexed by signers' subjective ratings). These comparisons provide insight into the relationship between degree and type of iconicity, and to what extent classification systems reflect how signers actually perceive iconicity.

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8. Multisensoriality in the iconic lexicon of Japanese: an explorative study of ideophones

Bonnie McLean, John L.A. Huisman, Arthur Lewis Thompson, and Youngah Do
University of Hong Kong

Iconicity is inherently grounded in sensory experience (Winter et al., 2017), yet few studies have explored how sensory information is packaged in iconic words (although see Dingemanse & Majid, 2012; Nuckolls, 2019). Inspired by psycholinguistic work on prosaic vocabulary (e.g. Lynott & Connell, 2009; Speed & Brybaert, 2021), we explore the encoding of sensory information in Japanese ideophones in an online rating task. Ideophones are lexicalised depictions, meaning they employ an analogical mode of representation that invites and affords iconicity (Dingemanse, 2019). Ideophones are highly multisensory, but not all perceptual qualities are equally straightforward to depict in speech (Dingemanse, 2012; McLean, 2021). For example, within visual perception, movement is more represented than shape, and representations of colour are rare. In this pilot study, we adapted the traditional sensory norming model to explore how the iconicity of ideophones determines their encoding of perceptual qualities. We asked 19 native Japanese speakers to rate 45 ideophones for how strongly they evoke different kinds of perceptions. We made two changes to the design of the task. First, while previous studies use five rating scales representing five senses, we used thirteen, adding extra dimensions within the visual and interoceptive senses. Second, rather than using written stimuli, we used video recordings where the ideophone was spoken aloud with accompanying gesture, to model the performativity of ideophones in real language use (Dingemanse, 2013; Nuckolls, 2020). With this task we were able to quantify the multisensoriality of Japanese ideophones, and explore their hierarchical encoding of sensory information. The findings raise questions about the degree to which the hierarchical encoding of sensory information in ideophones is explained by, (1) their iconicity, (2) their use of the vocal modality, and (3) universal cognitive constraints. We invite further explorations in this area from researchers of signed and spoken languages.

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9. Metaphors hidden in plain sight: Naive perception of double mapping in ASL

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Are metaphors transparent to non-signers observing iconic American Sign Language (ASL) signs representing abstract concepts? Across languages, people use metaphor to map abstract ideas (e.g., emotions) onto concrete source domains (e.g., objects, embodied actions) (Lakoff & Johnson 1980). In ASL, abstract concepts often involve both metaphorical and iconic mapping, or double mapping (Taub 2001). Previous transparency studies show that non-signers usually cannot guess exact meanings of signs (Sehyr & Emmorey 2019) but potentially infer higher-level meaning such as transitivity (Bradley, Malaia, Siskind & Wilbur 2022). Naive perception of ASL metaphors may identify visual patterns supporting understanding between deaf and hearing people via double mapping. We hypothesized that hearing non-signers would not guess exact meanings but could approximate the metaphorical underpinnings of signs (e.g., guess *think* for INFORM). Participants (n=149) guessed the meaning of 10 ASL signs randomly selected from a set of 30 signs (Hochgesang, Crasborn, & Lillo-Martin 2021). Each of the signs involve some metaphorical mapping, (e.g., LOCUS OF EMOTION IS THE CHEST) (Taub 2001). Guesses (n=1,360) were coded for conceptual domain (e.g., *body-action*, *emotion*), and analyzed for visual pattern (e.g., handshape, movement). Participant responses suggest they extracted varying construals of concrete meaning from iconic mappings including body parts (e.g., *stomach* for INSTINCT), or actions (e.g., *get-dressed* for ACCEPT-HARD). Evidence of double mapping appeared in about 20% of guesses, seemingly from certain aspects of signs (e.g., touching head, grasping). Emotions represented 20-35% of guesses across signs located near the chest. Non-signers recognized iconic devices used in ASL, likely extracting meaning based on their gestural knowledge and embodied experience. However, double mapping was limited. These

findings suggest that iconic and metaphorical mapping vary depending on language experience and construal of visual patterns across competing iconic domains. Next steps will examine the relationship between perceived transparency of ASL signs and cognitive effort invested in understanding ASL.

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10. Does *thin* sound "small" and *heavy* sound "big"? An investigation of the size sound symbolic potential of antonym adjective pairs

Melissa Ebert *(Humboldt University of Berlin)*, and Aleksandra Ćwiek *(Leibniz-Centre General Linguistics)*

Sound symbolism, "the direct linkage between sound and meaning" (Hinton et al. 1994: 1), attested not only in onomatopoeias, interjections, and ideophones, but also the general lexicon (cf. Blasi et al. 2016, Sidhu et al. 2021, Winter & Perlman 2021), can depict myriads of meanings (cf. Jespersen 1922). One prominent dimension is size sound symbolism, in which smallness is associated with the vowel /i/ and largeness with /a/ and /o/ (cf. Sapir 1929, Johnson 1967, Ohala 1984).

This study investigates the semantic scope of size sound symbolism: Does not only *small* sound "small", but also *thin*; or can only explicit size adjectives exhibit size sound symbolism? We analyze antonym adjective pairs (e.g., *thick/thin, heavy/light, big/small*), identifying semantic dimension (large/small) (cf. Haynie et al. 2014, Fuchs et al. 2019) and occurrence of vowels /i/ vs. /a/ and /o/ per adjective. We expect /i/ to be connected with the small vs. /a/ and /o/ with the large dimension.

Preliminary linear regression results on three antonym pairs in 20 languages (six language families) show significant effects of semantic dimension on vowel occurrence (/i/: = .267, $F(1,118) = 6.362$, $p < .05$, $R^2 = .051$; /a/ and /o/: = -.25, $F(1,118) = 4.345$, $p < .05$, $R^2 = .036$).
Separate regressions on individual antonym pairs show a significant effect of semantic dimension on /i/ in *big/small* (= .65, $F(1,38) = 10.597$, $p < .01$, $R^2 = .218$), yet not for other individual pairs or /a/ and /o/.

These preliminary findings indicate that non-explicit size adjectives are semantically too complex to exhibit size sound symbolism. The results are also in accordance with Blasi et al. (2016: 10820), who identified a significant relationship between smallness and /i/, not largeness and /o/. Smallness might be sound symbolically stronger due to semantic markedness (cf. Fuchs et al. 2019).

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11. Lexical creation in LSQ: What astronomical neologisms reveal about sublexical structure and iconicity

Laurence Gagnon

University of Namur & University of Québec in Montreal

Although iconicity is present in all natural languages, it is known to be pervasive in sign languages; that is, iconicity is present at all linguistic structural levels[1]. Furthermore, it is known to be found primarily in the signs' parameters as well as in their features[2]. The context of

vocabulary emergence, as is the case with the creation of neologisms, enables us to observe the influence of the iconic potential of the visuospatial modality. Therefore, we propose the following question: does the semantic motivation, or more precisely the motivation influenced by iconicity, have an incidence on the signs' parameters for creating astronomical signs in LSQ?

The analysis is based on a corpus of 99 neologisms produced by three LSQ signers to name 49 astronomical concepts based on the [International Astronomical Union list](). The features of three signs' parameters (handshape, movement, and place of articulation (POA)) were described according to their shape features. For each of these features, their semantic contribution was identified[3].

Results show that the semantic domain influenced the neologisms' form. Almost all of them have an iconic association between their form and meaning, but we find that iconicity is not distributed evenly across the parameters of the signs analyzed, nor across the features associated with them. While handshapes are mainly used to depict an entity (71,8%)—often for a spherical object such as a star or a planet—the POA is mostly produced in the neutral space (60,1%) and does not participate in the representation of the referent. All handshapes of signs analyzed include at least one iconic feature in their sublexical structure, which is mainly the [curved] feature of the selected fingers. As for the movement, more

An example of open curved fingers for the sign representing a satellite

than half of them (60,5%) represent the referent's form or the way the referent is moving in the space through its geometrical form.

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12. Contrasting eye gaze and torso shift as two markers of role shift in American Sign Language

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Role shift (and relatedly, constructed action), a perspective-taking device in sign languages, is noted to occur frequently with iconic verbs that appear to enact the action of a character (Davidson, 2015; see Cormier et al., 2015 for overview). In this analysis of role shift in American Sign Language (ASL), we ask whether this association is a genuine word-level effect – role shift is specifically limited to iconic verbs within a sentence. Alternatively, the relation could operate primarily at the utterance-level: iconic verbs and role shift happen to occur in the same utterances. For example, they may both be used in utterances where the signer wants to provide a more vivid description but are not used specifically with each other *within* the description. We analyze data elicited from 12 ASL signers, coding for two markers associated with role shift: eye gaze shift and shift of the torso. Overall, the markers are indeed specifically tracking iconic words, but also find they behave quite differently: eye gaze has relatively high utterance-internal variation and signers shift their eye gaze from one word to the next depending on iconicity or other factors. Torso shifts, however, stretch across longer segments of the utterance – suggesting less sensitivity to properties of individual words. Although they appear to overlap in function – marking role shift and the perspective of a character – eye gaze and torso shift become embedded differently into the structure of signed utterances. When operationalized as eye gaze shift, role shift is tightly associated with iconicity or use of space in individual lexemes. However, torso shift marks boundaries of predicates or even clauses – recalling analyses that treat role shift as a syntactic phenomenon (Lillo-Martin, 2013; Quer, 2005). We discuss possible reasons for this divergence, including salience of iconic motivation and motor efficiency.

1. Do 14-17-month-old infants use iconicity in speech and gesture to interpret novel words?

Suzanne Aussems, Charlotte Devey Smith, and Sotaro Kita
University of Warwick

This study investigated whether 14-17-month-old infants use iconicity in speech and gesture to interpret novel words. Although infants' iconic speech comprehension (i.e., sensitivity to sound symbolism) has been shown to be reliable before their first birthday, their iconic gesture comprehension emerges later. We tested the hypothesis that infants' comprehension of iconicity in the spoken modality bootstraps their understanding of iconicity in the gestural modality. Thirty-six (17 girls, 19 boys) 14-17-month-old infants (M = 16.21 months, SD = 1.15) participated in a preferential looking task in which they heard a novel spoken word (e.g., *zudzud*) while viewing a small and a large version of the same shape (e.g., a square) side by side. All infants were presented with iconic speech and gesture cues matching either the small or the large shape. In the iconic-speech condition, infants received the iconic cue in the novel spoken word (high vs. low pitch) while viewing a neutral gesture. In the iconic-gesture condition, infants received the iconic cue in the gesture (small vs. large hand movements) while hearing a neutral pitch. In the iconic-speech-and-gesture condition, infants received congruent iconic cues in both the novel spoken word and gesture simultaneously (e.g., a high pitch and hand gesture indicating a small object to distinguish a small square shape). The average proportion of looking time towards target shapes did not differ between the three conditions, neither did it differ from chance in any condition, nor was there an advantage of an iconic cue in both speech and gesture than in either single modality. A Bayesian analysis of variance showed that the null hypothesis was 11.6 times more likely to be true than our alternative hypothesis. Thus, in this experimental study, we found no evidence for the hypothesis that infants' early iconic speech comprehension bootstraps their later iconic gesture comprehension.

2. A Different Take on Iconicity: Bodily Resemblance Schematically

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In sign language linguistics, it is commonly agreed that signed language exhibits a high degree of imagistic iconicity (i.e., resemblance based on simple qualities) due to its visual modality: hands and body parts afford strikingly iconic expressions for concrete objects and actions. However, firstly, articulatory feedback for monitoring signing involves both visual and proprioceptive (i.e., internal bodily feeling, including touch) feedback (Emmorey 2009), making proprioceptive iconicity relevant. Secondly, diagrammatic iconicity (i.e., structural resemblance) includes in a single iconic sign more commonly than thought (Keränen forthcoming). For example, in the Finnish sign SMELL, the hand (including skin, shape etc.) and the gas (grey, cloud-like thing) do not visually share simple qualities, but they share the diagrammatic gestalt of those properties. In this study, I consider *diagrammatic* manifestations in the *proprioceptive* aspect of signing, by using the semiotic analysis of single signs from the lexical database, Finnish SignBank. As a result, I preliminarily categorize the types of those manifestations as follows:

1) Tactile substitute (e.g., feeling of grasping the imagined object vs the real object)
2) Human body part – distinct human body part (e.g., two alternating fingers – walking legs)

3) Human body – non-human body (e.g., movement in hands and wings)
4) Spatial diagram (e.g., proprioceptive leftness – an object being on the left side)
5) A touching hand – a touching object (e.g., a finger on the palm – a needle pricking the sole of feet).

This proprioceptive perspective expands the notion of iconicity beyond vision-centric imagistic qualities to contribute to opening research questions for wide-ranging studies in iconicity: how proprioceptive iconicity involves in a phenomenon X. Moreover, diagrammaticity seemingly plays a role in the gradual displacement from imagistic pantomime to a more schematised resemblance and therefore widening referentiality (see Perniss & Vigliocco 2014).

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3. Infants can create different types of iconic gestures, with and without parental scaffolding
Chloe Osei-Cobbina *(Warwick University)*, Kirsty Green *(Warwick University)*, Marcus Perlman *(University of Birmingham)* and Sotaro Kita *(Warwick University)*

Despite the early emergence of pointing, children do not typically produce iconic gestures until later in development. Although research has described this developmental trajectory and focused on some aspects of iconic gesture production such as the tendency for body-part-as-object gestures to emerge before imaginary-object gestures, there has been limited focus on how iconic gestures emerge within interactional contexts. This study identified the first ten iconic gestures produced by five monolingual English-speaking children in a naturalistic longitudinal video corpus and analyzed the interactional context of each gesture. We found that children produced their first iconic gesture between the ages of 12- and 20- months and that gestural types varied. Gestures mostly conveyed information about actions. They consisted of a similar amount of object-in-hand and empty-hand gestures - where empty-handed, gestures tended to favour an imaginary object strategy for transitive actions and, where object-in-hand, objects used were usually, although not always, the conventional object. 34% of children's gestures could have been imitated or derived from adult or child actions in the preceding context, however the majority of gestures were produced independently of any observed model. In these cases, adults often led the interaction in a direction where iconic gesture was an appropriate response. Children learn to produce iconic gestures in interaction with a more competent other who may or may not provide scaffolding. They can represent a referent symbolically before the age of two-years and possess a greater capacity for innovation in gesture production than assumed in prior research. In order to develop our understanding of how children learn to produce iconic gestures, it is important to consider the immediate interactional context. Conducting naturalistic corpus analyses could be a more ecologically valid approach to understanding how children learn to produce iconic gestures in real life contexts.

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4. Does Iconic Gesture Speed Influence Verb Comprehension in 2-year-olds, 3-year-olds, and Adults?
Mingtong Li, Suzanne Aussems, and Sotaro Kita
University of Warwick

Iconic gestures can influence how young children interpret novel verb meanings (Mumford & Kita, 2014). Specifically, iconic gestures representing action referents facilitate 3-year-olds' verb

generalization (Aussems & Kita, 2021). However, previous studies mainly focused on resemblance between an iconic gesture and its referent based on frequently lexicalized features, such as the manner of the action referent, whereas less attention has been given to other resemblance, such as the speed of the action referent. Thus, our project aims to investigate how iconic gesture conveying speed information influences verb comprehension, and how this ability develops over time. We will test 2-year-olds, 3-year-olds, and adults in a verb-action matching task to see whether they can utilize speed information from iconic gestures to comprehend verbs. Participants will watch two versions of the same action video, one played at a fast speed and the other at a slow speed. They will also watch an accompanying iconic gesture video and hear recorded speech introducing a new verb. The iconic gesture video will be presented at three different speeds: fast, normal, or slow. Afterward, participants will select the action video that best matches with the novel verb. We predict that participants will choose more slow action videos in the slow gesture condition, compared to the normal and fast gesture conditions; and will choose more fast action videos in the fast gesture condition, compared to normal and slow gesture conditions. We also predict that 2-year-olds will not be proficient at utilizing gesture speed to comprehend verbs, whereas 3-year-olds will show a pattern similar to adults. We are currently collecting data and will report preliminary results at the workshop. Our findings will contribute to a greater understanding of the role of iconic gestures in language acquisition, by illuminating the developmental trajectory of the utilization of iconic gesture speed.

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5. Shared semiotic origins in the emerging sign language of Guinea-Bissau
Mariana Martins
Leiden University

To what extent do iconic patterns ingrained in human experience and shaped by cultural habits (Cooperrider 2019) impact the emergence of signs? To understand the origins of the 20-year-old autochthonous sign language of Guinea-Bissau (LGG), I follow a cognitive semiotic approach. I compare signs in LGG with signs in two unrelated West African sign languages: Malian and Nigerian SLs. The dataset is 100 lexical items found equally across local dictionaries (Ajavon 2003; Martins & Morgado 2017; Pinsonneault 1999) in a balanced distribution of grammatical and semantic categories. Additionally, signs are cross-referenced with gestural counterparts identified in the literature whenever possible (Brookes & Nyst 2014). Signs are first matched for lexical meaning and then on parameters: handshape, location, movement, orientation and handedness. The degree of similarity between pairs ranges from identical (five parameters) to quite similar (three). Otherwise, they are considered different. As a result, I found that 80% of LGG signs are identical or similar to Malian and Nigerian signs (e.g., BIRD, DRINK, ME, SAME, STOP, COLD). Although many of these are also observed in sign languages and gestures worldwide, 20% seem to be culturally specific to this region (e.g., MAN, BATHE, MORNING, TALK, WHAT, HUNGRY). Such matching pairs express mainly shared iconic patterns, both imagetic (including mapping animal features on the signer's body through personification) and motoric (mostly handling), with 20% each. As expected, deixis (15%) is implicated in body-directed concepts, time and spatial references. Finally, bodily reactions (5%) and embodied abstractions of interactive signs (e.g., STOP and WHAT) and of conceptual metaphors (10% each) seem rooted in human gestural behaviour. Importantly, cultural variation crosscuts all semiotic types, hinting at a gestural substrate shared regionally. The contrastive analysis between historically unrelated cognates allows us to confirm the impact of embodied iconic patterns on an

autochthonous emerging lexicon, discerning general cognitive tendencies from cultural-specific modulations.

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6. The use of signs referring to punctuation marks in Polish Sign Language (PJM)

Weronika Szymańska-Gątarek
University of Warsaw

Many different connections occur between written forms of spoken languages and signed languages. It results in loan words, initialized signs, fingerspelling (Lepic 2015) or sign movement tracing a shape of a written character (Ktejik 2013). Not only written words or letters are being borrowed but also punctuation marks. They are not used in signed communication the way they are in written communication. Sign communication relies on non-manual markers e.g. facial expressions or body movement to indicate the type of an utterance or the ending of it (Dachkovsky, Sandler 2009). However, signs referring to punctuation marks are used in Polish Sign Language (PJM) as lexicalized signs. They address it on a meta level of a discourse or they are used as metaphors. PJM Corpus material includes over 550 hours of multi-tier annotated footage (iLex software), 75 recording sessions with 150 Deaf PJM signers from all over Poland and 15,000 identified PJM lexemes (Rutkowski et al. 2017). The material has been analysed in terms of signs referring to punctuation marks. PJM Corpus allows us to see the signs in many different contexts signed by different informants. Signs like PERIOD, DOT, COMMA, QUESTION MARK and EXCLAMATION MARK where found. They are all iconic in their form. They mimic the way certain punctuation marks are being written. Some of these signs obtain a new metaphorical meaning.

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7. Phonological features in the abstraction from gesture to sign: change and persistence

Door Spruijt, Pamela Perniss & Petra Schumacher
University of Cologne

In creating a phonological system, sign languages inevitably introduce abstraction away from gestural referencing towards conventionalized signs that adhere to the language's phonology (Goldin-Meadow 2012). In between the start and end point, they go through the stage of iconic prototyping, where the iconic strategy is consistent across signers, but the exact formal properties are not (Morgan 2015; Sandler, Aronoff, Meir & Padden 2011; Tkachman 2022). Individual signs, rather than languages as a whole, proceed through these stages: concepts can be referenced by an iconic prototype in the absence of phonology (Morgan 2015) or can exist in a fully operational phonological system and even adhere to it (Sandler, Aronoff, Meir & Padden 2011). On a sublexical level, we may also assume differentiation in the pace of conventionalization, but exactly how each phonological feature is susceptible to this abstraction, remains unclear. We propose a comparison of the formational features and their perceived iconicity in gesture signpairs, to explore abstraction in sublexical parts.

In the absence of diachronic sign language data, in this study, we look at gesture as one of the sources of (emerging) sign languages' lexicon (Goldin-Meadow 2012). By comparing elicited prototypical silent gestures (i.e. gestures with the same iconic motivation in >50% of the participants) to signs, we can simulate the input that leads to the (current) end point of lexical conventionalization. The current dataset comprises prototypical gestures elicited from 16-20 sign-naïve Germans, matched to DGS (German Sign Language) signs with the same iconic motivation. For each pair we will have a

comparison of 16 formational features across all parameters (following the Global SignBank manual (Crasborn, Zwitserlood, van der Kooij, & Schüller 2020), as well as detailed iconicity ratings targeting both the gesture/sign as a whole, and its individual parameters (handshape, location and movement). With this data, we will be able to distinguish between conventionalization of (iconic) for meaning mappings and abstraction away from (iconic mappings in) gestural substrates.

8. Iconicity, shared context and lexical variation
Katie Mudd (Vriej Universiteit Brussels) and Marieke Schouwstra (University of Amsterdam)

Several social factors have been proposed to affect the amount of lexical variation in sign languages. The relationship between iconicity, social structure and lexical variation has yet to be fully explored. Tkachman and Hudson Kam (2020) propose that the use of iconic form-meaning mappings are afforded by shared context (i.e., shared social and psychological information across individuals), allowing for a high degree of variation across a population. Building on modeling work formalizing this theory (Mudd et al., 2022), we will conduct a series of experiments using the silent-gesture paradigm to further study how iconicity and shared context affect lexical variation.

The first experiment lays the foundation by testing the iconic preferences of participants. For "unfamiliar" objects from the NOUN database (Horst & Hout, 2014), participants are asked to select a gesture video from an array that best describes the object (see Fig. 1). The gesture videos correspond to the iconic strategies described by Ortega and Özyürek (2020): one *representing* video, one *drawing* video and two videos depicting plausible *actions* corresponding to the object. In a pilot study we find that the most popular iconic strategy used by participants is the acting strategy and that their preference does not change over time.

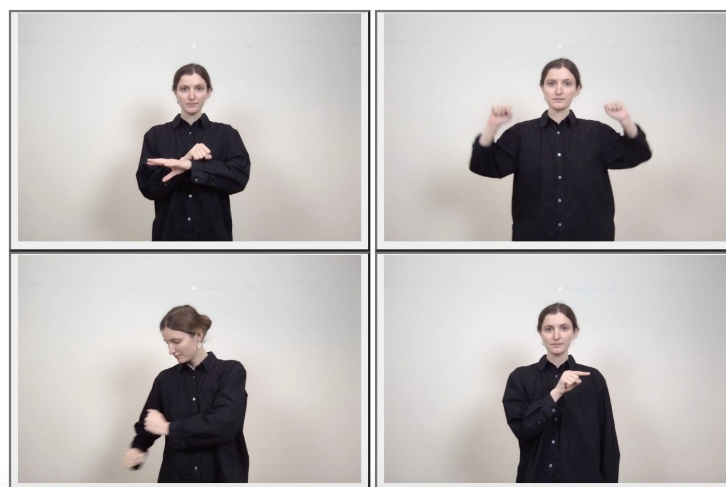Click on the gesture video that best describes the object.

Figure 1. Experiment 1: Participants are asked to select the pre-recorded gesture video that best describes the object. The four gesture videos correspond to the iconic strategies described in Ortega and Özyürek (2020): *representing* in the top left, *acting* (cheering) in the top right, *acting* (mopping) in the bottom left and *drawing* in the bottom right.

The next experiment will study the relationship between shared context and lexical variation by testing dyads in two conditions: in the first, both dyad members are trained on the same descriptions for an object (simulating shared context) and in the second, each member is trained on a different object description (simulating limited context). Dyads then take part in rounds of director-matcher tasks. We hypothesize, based on theory and modeling work, that the limited context condition will yield a sharp decrease in within-dyad lexical variation, as participants are not able to rely on the same iconic mappings for objects.

9. Does form-meaning similarity boost early word learning? A longitudinal network analysis

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In recent years, the basic assumption of the arbitrariness of the sign (de Saussure 1916) has been challenged, especially in the early lexicon, which might be more systematic than was thought. This raises the question of how systematic form-meaning mappings impact word acquisition. Experiments revealed that word learning, category formation and lexical retrieval are leveraged through systematic form-meaning mappings (Imai, & Kita, 2014; Monaghan, Christiansen, & Fitneva, 2011). In contrast, Dautriche et al. (2015) found that children find it difficult to learn words that overlap in form and meaning. However, the limitations of experimental studies are that the research question is addressed by only a few children and limited numbers of trials. Analyses of large (CDI) data complement experimental studies. Network science has proven useful in representing and analysing children's growing vocabularies based on these (CDI) data. However, the networks were created based on data averaged over children (Fourtassi, Bian, & Frank, 2020; Hills, Maouene, Maouene, Sheya, & Smith, 2009; Siew, & Vitevitch, 2020), or only a few children were the basis of the analyses (Laing, 2022). Additionally, the networks were analysed for phonological or semantic similarity of words only – not the combination of both. In this project, based on Norwegian CDI data from wordbank (Frank, Braginsky, Yurovsky, & Marchman 2017), we represent the growing vocabulary of 1,565 individual children as expanding networks. We implement both phonological and semantic networks. Using logistic regression, we identify the influence of phonological and semantic similarity on word learning. The combination of phonological and semantic similarity in multiplex networks allows us to analyse the learning of systematic form-meaning mappings. We hypothesize that the model shows leveraged learning of novel words which are similar to many other words in either form or meaning but not on both levels. Overall, this project enables us to evaluate the effect of similar sounding and/or similar meaning words on word acquisition outside restricted laboratory settings and gives us a broader picture of the arbitrariness of the sign.

10. Quantifying systematicity in the American Sign Language Lexicon

Elana Pontecorvo (*Boston University*), Zed Sevcikova Sehyr (*San Diego State University*), Karen Emmorey (*San Diego State University*), Naomi Caselli (*Boston University*)

Theories of language assume iconicity and systematicity are marginal phenomena. In this study we attempted to quantify the prevalence of iconicity and systematicity (form meaning mappings shared across lexical items). We collected 113,883 semantic free associations from 45 deaf signers. Using an online platform, signers viewed 2,723 ASL signs and then produced three semantically related signs. Signs were labelled by matching to exemplars from ASL-LEX1,2. By combining semantic data with phonological information and iconicity ratings in ASL-LEX, we built 1) a network of the semantic structure of ASL, where signs are related to one another if at least one person freely associated them, and 2) a network of the phonological structure of ASL, where signs are related to one another if they share more than eight phonological features. We found that 76% of the signs in the lexicon were both phonologically and semantically (i.e., systematically) related to at least one other sign. We then classified these systematic relationships as high or low iconicity (the signs were above or below average iconicity on a scale of 1-7). 50% of the signs in the lexicon have iconically systematic relationships to other signs (e.g., food signs are often produced near the mouth). There were also non-iconic systematic relationships (e.g., family signs were not iconic and often produced on the head). We built a model of phonological similarity and found a significant interaction between iconicity and semantic relatedness whereby iconic signs were much more likely to also be semantically related than non-iconic signs (B = -0.06, p < 0.001). These results reveal widespread, systematic alignment between form and meaning in ASL. Iconicity is a driving force behind this alignment. Theories of language must account for iconicity as a possible organizing principle of the lexicon.

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11. Communicative efficiency shapes the iconicity in silent gesture production

Jiahao Yang and Sotaro Kita
University of Warwick

This study concerns the systematic iconicity in silent gesture. Silent gesture is gesture-based communication system created by hearing speakers when communicating exclusively in manual modality. Silent gesture is fundamentally built upon iconicity - gesturers manage to communicate without pre-established form-meaning mapping by employing iconic signs in various ways. Previous cross-linguistic studies have demonstrated gesturers reliably employed the specific gesture with a subtype of iconicity (e.g., when depicting an apple, gesturers prefer to use a gesture which pantomiming eating an apple than any other gesture form) (Hwang et al., 2017; Marentette et al., 2016; Ortega & Özyürek, 2020a, 2020b). The mechanism that underlies the observed systematic iconicity remains unclear. The present study focuses on communicative efficiency as a factor that determines which subtype of iconicity is employed. We propose that individuals select the subtype that can maximize the probability of being understood. To test this prediction, we conducted a pre-registered study that asked 97 comprehenders to guess the meanings of different gestural symbols produced by another group of participants, which allowed us to calculate and compare the communicative values of different gestural symbols produced for the same concept. The result shown that the most frequently produced gesture (i.e., dominant gesture; e.g., an eating gesture for "apple") for a given concept has lower Shannon entropy (i.e., more consistent interpretations across comprehenders) compared to the less frequently produced gestures (i.e., non-dominant gesture; e.g., a shape-tracing gesture for "apple"), and their associated guesses had the strongest semantic relatedness to the correct, target concept, which validates the prediction. Our result indicates communicative efficiency play a role in governing individuals' choice when they are selection subtype of iconicity in silent gesture production.

12. Polish Sign Language classifiers iconicity in relation to the signers' age

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Classifiers in sign languages are considered to be morphemes that are expressed by specific handshapes and that represent objects based on their characteristics (Zwitserlood, 2012, p. 158). They replace noun signs as anaphoric quasi-signs with specific properties, aligned in terms of a particular feature with the antecedent to which they refer (Linde-Usiekniewicz & Łozińska, 2017, p. 174; Łozińska, 2014, p. 74; Rutkowski & Łozińska, 2011, p. 214). As they usually refer to salient characteristics of a particular object, frequent iconic mapping takes place (Taub, 2001, p. 26), although the mapping strategies vary depending on signers' age. A total of 67 recordings of Deaf people (native signers of Polish Sign Language) narrating the content of three comic strips were analysed. The recordings were taken from the Open Repository of the Polish Sign Language Corpus (Wójcicka et al., 2020). The participants were divided into four age groups: 18-30, 31-45, 46-60 and 60+. Each classifier used by the Deaf participants was categorized in terms of its handshape and was assigned to specific objects present on the comic strips. Next, the distribution of handshapes in all the age groups was examined, along with the iconic mapping strategies used by them. The analysis lets us discover, which object properties were the most important ones for the Deaf participants in different age groups and to which body part these were assigned.

AHRC-DFG

From icon to abstraction: how iconicity shapes the lexicon in the visual modality

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