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BUCLD 46 Abstracts at-a-glance

Keynote Address

Taking diversity seriously in language development research: What we can learn from Japanese language acquisition.

Reiko Mazuka

Languages in the world are diverse, yet the vast majority of language development research has been done with English and some other European languages. The resulting bias makes it difficult to determine whether relevant features are specific to those languages or apply broadly across typologically different languages.

The talk will present results from studies with Japanese infants (including cross-linguistic comparison) that challenge or complement previous findings, especially with regard to the acquisition of segmental contrasts, the emergence of phonological grammar, and the role of infant-directed speech. For example, it is known that in English, Dutch, and other European languages the coronal stop /t/ occurs more frequently than labial /p/ or dorsal /k/. This has led to a hypothesis that coronal articulation is universally unmarked and easier to both produce and hear than dorsal or labial articulations. For such a hypothesis to hold up, however, it would need to hold true for languages in which /t/ occurs less frequently than /p/ or /k/, otherwise it may simply be an effect of frequency. Japanese, it turns out, provides a way to support the hypothesis and rule out frequency, as Dutch and Japanese babies show similar asymmetrical discrimination patterns between /t/ and /p/, despite the relatively low frequency of /t/ in Japanese.

The talk will discuss results from these and related studies, highlighting the importance of studying diverse languages to disentangle fundamental questions pertaining to acquisition.

Plenary Address

Bootstrapping the syntactic bootstrapper

Anne Christope

Young children have long been thought to acquire first the sounds of their native language (phonology), then its words (lexicon), then the way in which words are organized into sentences (syntax). This corresponds to what they produce: first they babble (between 6 and 12 months), then they speak in isolated words (1-2 years), and then they start combining words together. However, the pioneering work of Lila Gleitman has shown that young children start gathering syntactic information much earlier than initially thought, and that they use it to facilitate their learning of word meanings – the syntactic bootstrapping hypothesis (Gleitman, 1990).

Although a wealth of experiments show that infants are able to use the syntactic contexts in which unknown words appear to infer something about their potential meanings, what remains unclear is how children learn which syntactic contexts correspond to which conceptual features – for instance, how do they figure out that words occurring in noun contexts usually refer to objects, and how do they learn the characteristics of noun contexts in their language? Children might learn these by generalizing from a handful of words for which they already have a meaning, a semantic seed. This hypothesis is backed up by computational work, showing that this learning mechanism is feasible, as well as experimental work, showing that toddlers are indeed able to learn syntactic contexts in this way.

Student Workshop

Open science without sharing (all of) your data: Case studies from Lookit and your research

Melissa Kline Struhl

Sharing more than the text of a journal article is a powerful way to improve the replicability of your work and increase the impact of your scholarship. But many studies in language acquisition research involve at least two big hurdles to sharing data. The first is identification risk - if a dataset is shared, how easily can someone figure out the identity of a participant? What kinds of harm could happen if they did? And the second is the fact that we work with children and thus have a higher burden of responsibility to our participants. But our data is also a precious resource, and language acquisition researchers have been sharing data - and reaping the enormous scientific benefits - for decades before the modern 'open science movement.' Lookit (http://lookit.mit.edu) is an online data collection platform for studies with infants and young children, handling tens of thousands of video sessions from over 50 institutions. This workshop will talk about how Lookit supports sharing and protecting data, along with specific examples of making decisions with data that present special risks and benefits. You will leave this workshop with a framework for how to 'do open science' when you can't share (all of) your data on the open internet.

Symposium

Pragmatic deficits in children with autism spectrum disorder

Jeanette Schaeffer*;
Ianthi Maria Tsimpli & Eleni Peristeri;
Francesca Panzeri, Greta Mazzaggio, Beatrice Giustolisi, Silvia Silleresi, & Luca Surian;
Rama Novogrodsky* & Natalia Meir

Although language is not included in the diagnosis of ASD, pragmatic language difficulties are dominant in the disorder. This symposium discusses three studies on monolingual and multilingual children with ASD, representing various languages. It suggests that pragmatic language ability provides a critical angle for exploring social communication and social interaction in children with ASD. We will discuss the importance of distinguishing between parts/types of pragmatics, and between language-universal and language-specific properties of pragmatics in order to discuss the question as to whether sub-domains of pragmatics interact with other domains of language and/or cognition or not. Finally, we will argue for the importance of developing a baseline assessment for pragmatic abilities in ASD.

*Symposium organizers

Accepted Presentations

‘And togezer vee vill rule ze vorld!’ The interplay between children’s language attitudes and media representations of foreign accents

Thomas St. Pierre; Mariam Galytskyy; Elizabeth Johnson

Historically, cartoons have tended to disproportionately depict villains with foreign accents compared to heroes. We investigated whether listeners (both children and adults) associate foreign accents with cartoon villains (Experiment 1), and whether positive media exposure to non-native accents reduces children’s linguistic biases (Experiment 2). In Experiment 1, 7- to 9-year-old children (N = 80) and adults (N = 76) watched pairs of animated clips featuring native- and foreign-accented voice actors each playing a hero and a villain, and were asked to indicate which character the voice actor’s voice was better suited for. Both children and adults were significantly more likely to find foreign-accented voices better for villain roles than native-accented voices. In Experiment 2 (N = 84), we found no evidence of reduced language biases after brief exposure to nice/heroic cartoon characters with foreign accents; in follow-up work, we are investigating whether more protracted exposure to heroic, foreign-accented cartoons leads to a reduction in language biases.

“A blue square table” or “a square blue table”? Adjective ordering preferences in elicited child and adult production

Lydia Grohe; Petra Schulz

This study investigates whether children and adults follow the adjective ordering preferences (AOP) argued to hold universally for attributive adjectives. AOP are commonly explained via hierarchies of notion-based classes, which state a preference for orders such as SIZE > SHAPE and SHAPE > COLOR. Theoretical arguments and experimental evidence, however, suggest that some adjective classes such as SHAPE-COLOR allow both orders. A novel elicited production task tested whether children and adults show an ordering preference for SIZE-SHAPE and SHAPE-COLOR adjectives. 96% of the adults preferred the order SIZE > SHAPE, but regarding SHAPE-COLOR they did not exhibit any preference. 69% of the AAN-producing children preferred the order SIZE > SHAPE, and 67% preferred the unpredicted order COLOR > SHAPE. Adults’ lack of a preference for SHAPE-COLOR indicates that at least this section of the hierarchy is not as rigid as postulated. The child data suggest that the AOP are not uniformly available from early on as a default option.

“I know what they will do next!” Evaluating contributions of theory of mind to reading comprehension in school-aged children

Danielle DeNigris; Rita Obeid; Patricia Brooks

The simple view of reading (Hoover & Gough, 1990) suggests that reading comprehension is a product of decoding and oral language skills. Recently, Dore et al. (2018) proposed that theory of mind also contributes to the development of reading comprehension. To evaluate this hypothesis, we assessed reading comprehension, decoding skill, oral language ability (receptive vocabulary and grammar), and theory of mind in a community sample of school-age children (M age 8y;2m, SD 1y;3m). We used a nonverbal (comic-strip) “Attribution of Intentions” task to assess theory of mind. Results of regression models aligned with the simple view of reading, but also supported the theory of mind hypothesis. Accuracy in attributing intentions accounted for unique variance in reading comprehension after controlling for the other variables. The results suggest commonalities in how people draw inferences and build mental models regardless of whether information is conveyed in pictorial or textual formats.

100,000 words encountered unevenly over six months of everyday infancy

Sarah Goulding; Caitlin Fausey; Erica Wojcik

The spatiotemporal distributions of repeated encounters with a noun matter for learning, yet we know little about the nature of these distributions across everyday extended timescales. Here, we assess whether repetitions of over 2,000 word types are evenly distributed across episodes sampled from six months of an infant’s everyday life using the new SAYcam dataset, which consists of audiovisual at-home head camera recordings, sampled one hour twice a week for two years. We analyzed over 100,000 word tokens transcribed from the speech that one infant encountered between 6 and 12 months of age and quantified the extent to which 2,338 lemmatized word types were distributed evenly across one-hour episodes. Overall, higher frequency words were more evenly dispersed than lower frequency words. Interestingly, word types with similar frequencies nevertheless varied in their episode-to-episode profiles. Ongoing analyses examine the relationship between the dispersion profiles of seen objects and heard words.

A computational analysis of language delay and intervention

Libby Barak; Zara Harmon; Naomi Feldman; Jan Edwards; Patrick Shafto

Children with Developmental Language Disorder produce bare forms for past-tense longer than their Typically Developing peers (e.g., walk instead of walked). Intervention efficiency increases when more verb types are used in treatment. Computational models have mostly relied on DLD-specific design to replicate this period and have yet to evaluate the properties of effective intervention. We propose that difficulty in recording infrequent associations limits DLD learning. We propose a minimal modification to the parameterization of a well-tested model of morphology learning that replicates and explains the extended bare form production and also makes predictions regarding which interventions are most effective. We provide the first account of the usability of computational models in developing DLD interventions. Our results suggest that DLD learning is delayed by a difficulty in tracing form-meaning association of lower frequency and points to distributional properties that support effective intervention that highlights this co-occurrence pattern.

A cross-linguistic bias in motion path encoding

Anna Papafragou; Myrto Grigoroglou; Megan Johanson

Spatial-semantic theories highlight two major types of motion paths: bounded paths, where the ground object falls at the path endpoint (e.g., The ball went to the tree), and unbounded paths (or directions), where the ground object does not fall on the path but would if the path were extended some unspecified distance (e.g., The ball went towards the tree). Inspection of spatial term inventories suggests that, across languages, bounded path terms seem to be more numerous and semantically more specific compared to unbounded path terms. We systematically tested whether a bias for bounded paths characterizes early motion descriptions in two typologically distinct languages (English, Greek.) Results reveal a cross-linguistically robust bias for encoding bounded over unbounded motion paths in children (but not in adults who offered more complete descriptions), despite cross-linguistic differences in path encodings. Our findings confirm the importance of bounded events and event endpoints in language and cognition.

A full parse or a shallow structure in L2? An ERP study of anaphora in successive-cyclic wh-movement in L1-Mandarin/L2-English

Kyle Swanson; Laurent Dekydtspotter

The Full Parse Hypothesis (FPH) from Dekydtspotter, Schwartz and Sprouse (2006) argues that L2 speakers compute complete syntactic representations in real time for unfolding input. In contrast, the Shallow Structure Hypothesis (SSH) from Clahsen and Felser (2006) argues that L2 speakers cannot compute "hierarchical detail and more abstract elements of syntactic structure" (p. 32) online. To test these competing claims, this study investigates whether L1-English speakers and L1-Mandarin/L2-English speakers compute anaphora in successive-cyclic wh-movement in incremental sentence processing. Participants read 30 quadruples in an RSVP task while EEG was recorded. In L1 speakers, ERPs reflecting binding-theoretic distinctions arise only at the site of intermediate and tail wh-copies. In L2 speakers, ERPs reflecting binding-theoretic distinctions explode in number at the site of an intermediate wh-copy. These findings suggest that L2 speakers can compute complete syntactic representations in real time, thereby supporting the FPH and providing counterevidence to the SSH.

A preliminary investigation of acoustic enhancement of speech production in preschoolers in challenging communication environments

Hoyoung Yi; Bailey Snyder; Delaney DiCristofaro; Taylor Warwick; Kendyl Brooks

When speaking, talkers naturally adapt their speech production to promote successful communication in various scenarios. It has been well established that noise-adapted speech and listener-oriented clear speech improve speech intelligibility by increasing acoustic-articulatory outcomes in adults. We investigated if young children can produce speech modifications in response to noise (NAS) and when instructed to speak clearly (CS) with a conversational partner who pretends to have visual and hearing impairments. Spontaneous speech analysis with three different speaking styles including conversational speech (CO), NAS, and CS produced by ten monolingual English-learning children, ages 3-5 years was completed (the 3-year-old-group: 3, the 4-5-year-old-group: 7). A "spot the difference" task was performed to elicit spontaneous speech in the three different speaking styles. These results show children as young as 3–5 years old have demonstrated some ability to produce acoustically different speaking styles. We will further examine speech intelligibility when judged by adult listeners.

A reinforcement learning approach to speech category acquisition

Craig Thorburn; Ellen Lau; Naomi Feldman

Adults struggle to learn non-native speech categories in many experimental settings (Goto, 1971), but learn efficiently in a video game paradigm where non-native speech sounds have functional significance (Lim and Holt, 2011). Behavioral and neural evidence from this and other paradigms point toward the involvement of reinforcement learning mechanisms in speech category learning (Harmon et al., 2019; Lim et al., 2019). We formalize this hypothesis computationally and confirm that our reinforcement learning model simulates adult data from Lim and Holt (2011). Moreover, we show that the same model captures infant data from conditioned headturn experiments (Kuhl, 1983), suggesting that reinforcement learning could play a key role in speech category learning in infants as well as adults.

Acquiring ‘hard’ spatial prepositions: The case of between

Dimitrios Skordos; Megan Johanson; Anna Papafragou

Cross-linguistically, 'between' is difficult to learn. The difficulty appears to be linguistic; between requires a plural landmark NP unlike other spatial prepositions. Since transitive syntax (“be acorp the N”) promotes the acquisition of novel spatial prepositions, we ask whether transitive syntactic frames (“be acorp the N1 and the N2”) facilitate between construals compared to intransitive frames (“be acorp”). We use Greek 'anamesa' because it allows both frames. We confirm children’s difficulties with between in production and comprehension. Nevertheless, children succeeded in acquiring between when visual and linguistic information was present. Transitive syntax led to similar performance as intransitive syntax. We attribute the lack of syntax effects to the fact that our paradigm established the spatial nature of 'acorp'. Once children’s hypothesis space was restricted to spatial/relational terms, additional effects of transitivity were eliminated, as the spatial/relational meaning of the novel term was already established leaving little for transitivity to accomplish.

Acquisition of negation across ten typologically diverse languages

Sakine Çabuk-Ballı; Jekaterina Mazara; Paul Widmer; Sabine Stoll

Acquisition of Negation across Ten Typologically Diverse Languages

Languages differ significantly in the way they express negation and so far, we know very little about how language specific factors influence the learning process. In this study, we focus on the role of morphosyntactic dependency of negator morphemes and analyze the acquisition of various kinds of negators in a large-scale cross-linguistic study. We ask when children approach adult level flexibility in their use of negation marking. We analyze longitudinal naturalistic corpora of ten grammatically maximally diverse languages to find out whether there is an effect of morphosyntactic dependency on the rate of acquisition. Our results show that morphosyntactic dependency plays a key role during the acquisition of negation and children are sensitive to structures with less complex morphosyntactic properties while making generalizations. Results from our typologically diverse sample of languages suggest potentially universal developmental trajectories as well as language specific trajectories.

Acquisition of stable variation: A corpus study of English subject-verb agreement

Cynthia Lukyanenko; Karen Miller

Children tend to regularize variation when learning artificial languages, sometimes even variation conditioned on social or linguistic factors, yet linguistic variation persists. We analyze agreement variation in naturalistic child-directed and child English (e.g., There are/'s the cherries) to better understand when children regularize variation. We extracted sentences with tensed forms of be and 3rd-person plural subjects from the Sarah and Nina corpora in CHILDES, and from child and caregiver speech during a Search-and-Find task. Sentences were coded for verb-form (singular/plural) and for likely conditioning variables: speaker (caregiver/child), sentence-type (there/where/here/other) and order of subject and verb (SV/VS). Two findings emerge: there is substantial agreement variation in both input and child speech, and the factors conditioning children's and adults' production of variation sometimes differ. This suggests that children are acquiring the variation in their input but treat some factors as better foundations for generalization than others, leading them to differ from adults.

An automated classifier for child-directed speech from LENA recordings

Janet Bang; George Kachergis; Adriana Weisleder; Virginia Marchman

Child-directed speech (CDS) has been proposed to have a differential role versus other-directed speech (ODS) in supporting children's language learning. However, typically human listeners have pain-stakingly hand-coded CDS from ODS. Here, we used hand-coded audio segments for CDS/ODS in over 1,000 hours (12,931 segments) from families' day-long recordings with their 18- to 25-month-old children (79 English, 74 Spanish). We then tested and trained an automated classifier to determine audio segments with a high likelihood of CDS/ODS. Using a 5-fold cross-validation on 90% of the segments, we achieved an overall AUC of .73 with an AUC of .68 on a held-out 10% test set. Finally, we found comparable correlations between CDS/ODS and child vocabulary when using classifier-derived predictions vs. hand-coded segments of CDS/ODS (Weisleder & Fernald, 2013). The availability of these classifiers will greatly facilitate how we examine children's speech environments in different languages and communities.

Are non-native speakers sensitive to microvariation in anaphora resolution? The case of Italian learners of European Portuguese

Joana Teixeira; Alexandra Fiéis; Ana Madeira

This study investigates the interpretation of subject pronouns in L2 EP by Italian native speakers, to examine whether learners are sensitive to microvariation in anaphora resolution in these null subject Romance languages. Participants were 20 adult EP native speakers, 15 upper-intermediate, 15 advanced and 15 near-native Italian adult learners of L2 EP. They were administered two multiple-choice tasks (speeded and untimed) with a 2x2 design crossing the following variables: animacy of the matrix object (animate vs. inanimate) and type of embedded pronominal subject (overt vs. null). Results indicate that learners become progressively sensitive to microvariation as L2 proficiency increases. However, their performance remains permanently unstable in the areas where the L1 and the L2 differ, which is only visible in the speeded task. Our findings challenge the ideas that only overt subjects are persistently problematic in L2 acquisition and that the L1 plays a minor role in anaphora resolution.

Associations between shared book reading at home and white matter organization in kindergarten in relation to subsequent language and reading abilities

Kelsey Davison

The present longitudinal study examined shared book reading and white matter organization in kindergarten in relation to subsequent language and reading outcomes among 83 typically-developing children. Characteristics of shared book reading at home, assessments of language abilities, and DTI/MRI were acquired at the start of formal schooling. Behavioral follow-up of language and reading abilities was completed at the end of second grade. White matter organization (as indicated by fractional anisotropy (FA)) was estimated for key bilateral pathways of interest. Correlation analyses first reveal significant, positive associations between the amount of time children are read to weekly and FA of the posterior segment of left AF, as well as LI for the anterior segment of the SLF. Furthermore, LI for the SLF is associated with measures of subsequent sight word reading and reading rate in second grade. All results are significant when controlling for age and socioeconomic status (SES).

Bilingual infants learn cognates more rapidly than non-cognates

Lori Mitchell; Rachel Ka-Ying Tsui; Krista Byers-Heinlein

Cognates are thought to have a special status in the bilingual adult lexicon, but are they also acquired more quickly in bilingual infant vocabulary development? This study collected CDI data longitudinally from French-English bilingual infants from 16 to 30 months. We compared the proportion of cognate translation equivalents (e.g., English “banana” and French “banane”) to the proportion of non-cognate translation equivalents (e.g. English “apple” and French “pomme”) that infants produced. Results showed that infants produced significantly more cognates than non-cognates, and that the cognate advantage strengthened across development. This finding held even when controlling for potential confounds between cognate and non-cognate vocabulary items such as normative age of acquisition. These results indicate that bilingual infants leverage phonological similarity in vocabulary acquisition. Consistent with previous findings, vocabulary development may be facilitated for bilingual infants learning phonologically close language pairs compared to infants learning more distant language pairs.

Bilingual toddlers' comprehension of sentences with code-switched adjectives

Lena Kremin; Casey Lew-Williams; Krista Byers-Heinlein

Bilingual children hear sentences that contain words from both languages, also known as code-switching. Investigating how bilinguals process code-switching is a crucial component in understanding bilingual language acquisition, because young bilinguals experience processing costs and reduced comprehension when encountering code-switched nouns. Studies have yet to investigate if processing costs are present when toddlers encounter code-switches at other parts of speech within a sentence. The current study examined how 30 young bilinguals (age range: 37 – 48 months) process sentences with code-switches at an uninformative adjective before the target noun (e.g., "Can you find la jolie [the pretty] cow?). Surprisingly, bilingual toddlers accurately identified the target object in both sentence types, contrasting with previous findings that sentences containing code-switching lead to processing difficulties. The syntactic location of a code-switch and the information it carries may contribute to bilingual toddlers' sentence processing.

Can Indirect Positive Evidence be Used in the Domain of Inflectional Morphology? Naïve English-speaking Learners' Understanding of Mandarin Plural Marking

Ying Li; Heather Goad

When the L2 being acquired is a subset of the learner's L1, direct positive evidence that a construction is ill-formed in the target grammar isn't always available. We thus probe the role that indirect positive evidence (IPE) may play: evidence from errors in the learner's L1 made by native speakers of the learner's L2. We test whether naïve English-speaking learners of Mandarin can use plural deletion errors in the English productions of Mandarin speakers to conclude that plural isn't marked in Mandarin. Participants listened to an English-medium dialogue between Mandarin and English speakers. For the Mandarin speaker, 24 nouns in plural contexts were produced as singulars. After learning 12 Mandarin words for singulars, participants were tested on their word-learning using singular and plural pictures as prompts. 8/21 participants used IPE: they deduced from errors in the dialogue that the names they learned for singular items were appropriate in plural contexts.

Caregiver phonetic input supports infants' learning of sound categories: The role of voice onset time distribution in natural phonological acquisition

Minji Nam; Youngon Choi; Yoonsung Kim; Reiko Mazuka

The present study explored whether mothers' voice onset time (VOT) distribution in their speech can support their infants' development of sensitivity to target sound categories in the natural phonological acquisition of Korean. The majority of sound categories in Korean have tri-modal distributions and have undergone a diachronic change in their primary acoustic cues, causing the phonetic input to vary between speakers of different generations. Input support can be important for phonological acquisition in such a complex phonetic environment. We observed that individual mother's VOT distance specifically predicted their 7–9-month-olds' ability to discriminate the target stop contrast (fortis vs. lenis), even after controlling for the infants' age. The farther apart the VOT distances between categories, the more sensitive their infants were to those categories. This relationship was only observed in infant-directed speech and with the VOT distribution, demonstrating the direct link between maternal VOT distribution and their infants' phonological learning.

Changing facts in children's counterfactual reasoning

Ioana Grosu; Ailís Cournane

This study uses a novel method to test counterfactual reasoning and comprehension, using causal network models to precisely characterize non-target child responses. When children give non-target answers to counterfactual questions, what are the changes they allow to the actual world model? We find that unlike adults, early school-age children change facts in the model, possibly in an effort to maintain outcomes. We consider the following hypotheses: compared to adults, children maintain the same facts and laws (H0), give up more facts (H1), give up more laws (H2), or neither (H3).

This study yields four principal findings. First, 5-8-year-old children significantly differ from adults when responding to counterfactual questions, corroborating previous studies. Second, when children are asked to reason over scenarios in which a character has a specific goal, they are over-sensitive to the goal, and depart from parsimonious models of counterfactuals, unlike adults. Third, children's ability to produce target counterfactual judgments does not vary significantly depending on the law of the system, at least for the three laws in the present study. Fourth, and most importantly, despite both changing the law or changing the non-antecedent fact both being possible ways to force the goal (giraffe sliding), children significantly prefer to change facts over aspects of laws - supporting H1.

Child-directed speech: Prosodic modulations in word learning contexts and effects on children's lexical development

Jinyu Shi; Yan Gu; Gabriella Vigliocco

This study investigated how English caregivers prosodically modulated their speech when talking about toys that were (1) known vs. unknown to children (3-4.33 years), and present vs. absent in the environment. The results showed that unknown words were spoken with slower speaking rate and wider pitch range than known words; labels produced in the toys-present condition were spoken with faster speaking rate and higher mean intensity; caregivers used higher mean pitch and intensity, wider pitch and intensity range when talking to younger children than older children. Regression analysis of prosodic modulation and word learning revealed that the degree of mean pitch modulation for unknown words relative to known words correlated with children's immediate word learning outcome, concurrent vocabulary size and predicted vocabulary size one year later. Thus English caregivers modify their prosody when the situation is more demanding for children, and that helpful modulations could assist children in word learning.

Children develop causatives despite pervasive ellipsis: Evidence from Turkish

Guanghao You; Ebru Ger; Moritz Daum; Sabine Stoll

In this study, we investigate the role of object ellipsis in the learning of two prevalent types of causatives, namely lexical and morphological causatives. We take Turkish as a test case, which employs both types of causatives and allows for ellipsis of arguments. The results show that the ellipsis in child-directed speech is pervasive in both causatives, with morphological causatives exhibiting a substantially lower proportion of ellipsis. However, by examining children's developmental trajectory, we show that lexical causatives develop with a pattern strikingly similar to the general development of verbs, whereas morphological causatives develop more slowly, despite less object ellipsis and explicit morphological marking. The findings suggest that argument structure may not play a major role in the learning of causatives. Our general conclusion is that children acquire causatives despite the challenge posed by pervasive ellipsis.

Children learn interdependencies within inflectional paradigms by productive rule formation: Evidence from Icelandic

Sigríður Björnsdóttir

This paper provides a case study of how children discover interdependencies in inflectional paradigms, using grammatical gender and plural formation in Icelandic as a test case. I demonstrate, using corpus-based and experimental methods, how children draw a categorical distinction between productive and unproductive patterns in both gender and plural formation in Icelandic. Icelandic has a 3-gender system (masculine, feminine, neuter) and four cases (nominative, accusative, dative, genitive). Plural formation in Icelandic cross-cuts gender and inflection classes. A corpus analysis, using a learning model (Yang, 2005; 2016) was used to predict productivity in the correspondences between gender and plural forms in Icelandic. The predictions were put to the test in an elicited production task with two conditions: Productive and unproductive. In the productive condition, both children and adults made a categorical choice of gender and plural suffix, whereas in the unproductive condition, they assigned gender to and pluralized nouns at random.

Children's acquisition of new/given markers in English, Hindi, Mandinka and Spanish

Vishakha Shukla; Madeleine Long; Vrinda Bhatia; Paula Rubio-Fernández

Languages have different ways of marking new and given referents, and these markings can be obligatory or optional. Here we tested the Optionality Hypothesis, according to which the acquisition of optional markers is protracted relative to obligatory ones, in four typologically diverse languages (English, Hindi, Mandinka and Spanish). In Hindi, the numeral 'one' ('ek') can be used optionally to introduce new referents. Based on diachronic and semantic evidence, we hypothesized that 'ek' is undergoing grammaticalization into an indefinite article, and that due to its optionality, its acquisition should be protracted relative to the other languages. The results of a narrative-elicitation task with 5-year-olds and adult controls supported the Optionality Hypothesis across the four languages. In addition, a follow up study with 5- and 10-year-old children and adult controls from Delhi and Gorakhpur confirmed that Hindi speakers use the numeral 'ek' to introduce new characters, suggesting an ongoing process of grammaticalization.

Children's acquisition of variable differential object marking in Spanish

M. Cole Callen; Karen Miller

When presented with variable input in an artificial language, children tend to overgeneralize one variable form over the other (e.g., Hudson Kam, 2015; Newport, 2020). However, in naturalistic contexts, children often match the probabilistic patterns of variation in their input (e.g., Smith et al., 2009). In this corpus-based study, we investigate preschool-age Spanish-speaking children's acquisition of variable differential object marking (DOM). In adult Spanish, DOM is constrained probabilistically by the animacy and definiteness of the direct object. We find that older children (>3;0) show more adult-like knowledge of the definiteness constraint on DOM than younger children (<3;0). However, both age groups show adult-like knowledge of the animacy constraint. Additionally, younger children follow the verb-specific patterns found in their input more closely than older children. We discuss our findings in light of previous proposals regarding children's acquisition of variable forms in both artificial grammar learning and naturalistic settings.

Children's coarticulatory patterns reflect undifferentiated articulatory strategies

Dzhuma Abakarova; Aude Noiray

Coarticulatory effects in speech vary across development but the sources of this variation remain unclear. This study investigated whether developmental differences in intra-syllabic coarticulation degree could be explained by age differences in articulatory strategies. To address this question, we first compared the tongue configurations of 3-to 7-year-old German children to those of adults. We found that younger speakers use less differentiated articulatory strategies to achieve alveolar constrictions than adults. The observed developmental differences were then examined through simulations with Task Dynamic Application. We found that child productions of lingual consonants were best modeled by gestural specifications corresponding to undifferentiated control of TT and TB. Finally, we provided evidence that child-like simulated utterances are characterized by greater coarticulation degree than adult-like simulated utterances. Results provide evidence that differences in articulatory strategies contribute to age-related differences in coarticulatory effects.

Children's comprehension of possessive and adversative passives in Japanese: Examining alternating hypotheses

Megumi Ishikawa; Utako Minai

Children's non-adult-like passive comprehension motivated several hypotheses regarding the source of their difficulties. Grammar-based hypotheses (A-chain Maturation Hypothesis; Theta-transmission Hypothesis) attribute their challenges to still-developing grammar, predicting that syntactically more complex passives elicit poorer comprehension. The Incremental Processing Hypothesis argues that children undergo extra processing burden yielded by revision in building passive structure, predicting that processing passives is overall more taxing than actives. A recent hypothesis proposed for Japanese, the Noncanonical Assignment Hypothesis, claims that non-canonical particle-Theta-role combinations in passives create processing burden that increases as the number of NPs increases, predicting that passives containing more NPs cause more difficulties in children's comprehension. The current study examined these alternating predictions, examining Japanese-speaking 5-year-old children's comprehension of passives, including Japanese-specific passive constructions, possessive passives and adversative passives. Results were most consistent with the prediction by the Noncanonical Assignment Hypothesis, calling for further research regarding precisely why the number of NPs matters.

Children's interpretation of superlatives in full and fragment answers

Lyn Tieu; Zheng Shen

Cross-linguistically, sentences containing superlatives like "Donkey bought the biggest photo of Kangaroo" allow up to three possible readings: an 'absolute' reading (ABS) (Of all the photos of Kangaroo, Donkey bought the biggest one), a 'relative reading with NP-external focus' (REX) (Donkey bought a bigger photo of Kangaroo than others did), and a 'relative reading with NP-internal focus' (RIN) (The biggest photo that Donkey bought was of Kangaroo, not of someone else). Previous developmental work has focused on the ABS and REX readings. Using a Truth Value Judgment Task, we investigated the availability of the RIN reading in English-speaking adults and 4-year-olds. The results reveal that adults access the RIN reading of superlatives in elided fragment answers but not in full declaratives, while 4-year-olds can be led to accept the RIN in full sentences. We discuss pragmatic/processing explanations for the children's performance.

Children's understanding of entailment in conditionals

Irene Canudas Grabolosa; Elena Pagliarini; Gennaro Chierchia; Luca Bonatti

In this study, we examine children's sensitivity to abstract entailment patterns in upward (UE) and downward (DE) entailing contexts. 94 3-to-6-year-old children were tested in an online experiment and compared to 34 adult controls.

We manipulated two factors: entailment (UE vs DE) and set relations (subset vs superset). We created cartoon-like movies in which the main character specified his/her actions with a conditional sentence, and we asked participants to infer about the consequent of the conditional. In two conditions (UE-subset and DE-superset) inferring that it was satisfied was invalid; in two other conditions (UE-superset and DE-subset) it was valid.

Results showed that both adults and children are sensitive to entailment contexts, but drew more valid inferences in UE than in DE contexts. We suggest that his asymmetry resembles some results found in studies of visual memory, which indicates that the phenomenon extends beyond the linguistic domain.

Children's use of subphonemic information in homophone processing

Erin Conwell; Gregor Horvath; Allyson Kuznia; Stephen Agauas

This study examined the use of the subphonemic information that disambiguates apparently homophonous sequences during online sentence processing. Forty-eight English-speaking children listened to sentences containing either lexical homophones (e.g., bat) or embedded homophones (e.g., the first syllable of the word hamster), while looking at a four-quadrant visual display that included both the intended meaning of the homophone and its foil. All auditory stimuli had been edited such that the target word came either from a different utterance with the same meaning or from a different utterance with the other meaning. Their eye movements were continuously tracked during listening. Children were faster to fixate the target image on those trials where the homophonous sequence had been spliced from a token of the same meaning for embedded homophones, but not lexical homophones. This may be due to differences in the subphonemic information available in the different types of homophones.

Cognitive control and comprehending passives in Mandarin preschoolers with and without risk for DLD

Yue Ji; Li Sheng; Li Zheng

Sentences with non-canonical word orders, such as passives, cause greater comprehension difficulties among English-speaking children with DLD than their typically developing (TD) peers. These difficulties may be attributed to deficits in cognitive processes involved in processing passives which requires re-assignment of thematic roles. Here we investigated the role of cognitive control in comprehending passives in Mandarin-speaking preschoolers at risk for DLD (the AR group) and their TD peers. Both groups completed a sentence comprehension task followed by a Shape School task. The AR group lagged behind their TD peers in both tasks. Results from TD children revealed the contribution of inhibitory control to understanding passives, providing new evidence for the impact of cognitive control on sentence processing. However, this impact was not found in children at risk for DLD, suggesting differences in the coordination of language and cognitive skills in children with and without risk for DLD.

Comparing parent and examiner topic initiation and maintenance during interactions with minimally and low verbal individuals with autism

Neshat Darvishi; Hazel Baker-Harvey; Mihaela Barokova; Helen Tager-Flusberg

Verbal abilities of minimally and low-verbal (MLV) children/ adolescence with autism spectrum disorder (ASD) have been proposed as an optimal intervention target. Earlier research has demonstrated that MLV individuals with ASD use more lexically diverse speech with their parents compared to examiners. We compared parents and examiners topic initiation and maintenance in semi-structured activities with 22 MLV youth with ASD based on natural language sampling (NLS). Parent and examiner topics differed in duration and frequency of accepted topic per minute, potentially relating to parents' higher amount of speech and more frequent speech than examiners during NLS with their children. Child frequency of utterance per minute, not number of different words, was correlated with adult topic characteristics for both examiners and parents. The correlations between topic manipulation strategies and child expressive language indicate that topic manipulation may be an avenue to influence children's amount of produced speech, but not lexical diversity.

Comparing syntax processing in different language learners: A syntactic priming study of L1 child speakers and L2 adult speakers

Sophie Hardy; Ema Ushioda; Katherine Messenger

We investigated syntax processing in different language learners in order to develop a more unified understanding of language development. We recruited 60 participants per five speaker groups that vary in age, language background and proficiency: L1 English adults; L1 English 3-4-year-olds; L1 English 7-9-year-olds; L2 English low proficiency adults; L2 English high proficiency adults. Participants completed a dialogue priming task in which they alternated describing pictures of transitive verb events with the experimenter. The experimenter described their prime picture according to a script (active vs. passive syntax): we measured the likelihood of the participant repeating the prime syntax when describing their subsequent target picture. Group comparisons indicate that lexically-independent priming increases with language proficiency, but that lexically-dependent priming increases with age. This supports accounts in which different mechanisms contribute towards different priming effects, and suggests that these same mechanisms underlie language processing and learning across a diverse range of speakers.

Complementizer use in declaratives and long-distance wh-object questions

Dana McDaniel

This study reports on the use of the complementizer 'that' in English-speaking children's and adults' production of declarative structures with a complement clause (e.g. "The queen thinks (that) the dog will lift the monster") and corresponding wh-object questions (e.g. "Who do you think (that) the dog will lift?"). Participants were 19 5- and 6-year-olds and 32 adults. Both groups used 'that' more in declaratives than in wh-object questions, and the children used 'that' in declaratives more than the adults did. A further finding was the almost complete absence of 'that' in children's wh-object questions, as well as the lack of non-adult-like medial wh-structures reported in other research. Children's adult-like production of wh-structures suggests that the inclusion of declaratives in the protocol reduced the sentence planning burden. The findings are interpreted as supporting accounts attributing child and adult complementizer use, as well as children's non-adult-like wh-structures, to the sentence planning process.

Comprehension of temporal conjunctions in monolingual and heritage Greek children: The event-semantic kindergarten-path effect

Christos Makrodimitris; Petra Schulz

According to the iconicity principle, sentences are easier if the clause order follows the sequence of events; evidence regarding an iconicity advantage for before and after-sentences is mixed. We tested how Greek monolingual and heritage children interpret before-/after-sentences in iconic and non-iconic scenarios. Assuming interpretation patterns to hold universally, we expected the same effects of iconicity in both groups. The monolingual children outperformed the heritage children, but their interpretation pattern was identical, with better comprehension of iconic than of non-iconic sentences for after, but not for before. We argue that this asymmetry results from an event-semantic kindergarten-path: non-iconic after-sentences are more difficult than their iconic variant, because the sentence-medial conjunction forces the listener to integrate a subordinate event into the main clause event and to revise the initial event order. In non-iconic before-sentences, sentence-initial before serves as an early cue signaling the non-iconic order, so no reanalysis is needed.

Consequences of lexical variability in learners' early vocabularies

Caitlin Richter

Lexical acquisition, even when measured simply as children's vocabulary size, is tightly related to morphosyntactic development. However, the precise nature of the relationship between particular lexical items and grammatical generalisations is critical to debates on theories of language acquisition and representation.

Although variability in the content of children's lexicons is readily apparent in production data, most research on individual differences concerns higher-level properties like the proportion of vocabulary items belonging to different categories, while word-level studies on large datasets tend to emphasise whatever commonalities can be found. This study therefore measures (dis)similarity of children's early vocabulary contents in twelve languages, aiming to reframe how lexical variability is viewed in word-learning research.

Results indicate that substantially dissimilar word inventories lie behind children's highly consistent patterns of structural generalisation. Any theories of language acquisition must be able to accommodate this insensitivity or resilience of grammar acquisition to lexical variability.

Consequences of phonological variation for word segmentation

Caroline Beech; Daniel Swingley

Computational models of word segmentation have typically been tested using input that is much less variable than actual speech. To address this limitation, we tested three existing models using more and less realistic phonological transcriptions. Across models, both overall performance and the numerical differences between algorithms decreased using the more realistic, direct phonological transcription, which does not assume every word is always pronounced in the same canonical way. Additionally, network analysis of model output under conditions of more realistic input shows that even correct segmentations demonstrate a complex, many-to-many relationship with speakers' intended words. Many "minimal pairs" were actually the same intended word, and many identical transcriptions came from different intended words. These results bring to the foreground new questions about infants' grasp of phonology and highlight that although statistically-based segmentation appears somewhat robust to variability, it does not tell infants how to build a lexicon of word types.

Cortical oscillations in pre-verbal infants track rhythmic speech and non-speech stimuli

Aine Ni Choisdealbha; Adam Attaheri; Sinead Rocha; Natasha Mead; Helen Olawole-Scott; Perrine Brusini; Samuel Gibbon; Panagiotis Boutris; Christina Grey; Sheila Flanagan; Usha Goswami

A key feature of infant-directed speech (IDS) is that the slowest modulations of its amplitude envelope contain more energy than in adult-directed speech. These slow modulations, around 2Hz, may provide a basic rhythmic scaffold for infant neural speech representation. To examine how well the developing brain tracks these slow auditory rhythms, 6-month-olds were presented with 2Hz drumbeats and repeated syllables from a female speaker. Using recorded EEG from 30 infants, we examined inter-trial coherence (ITC), which can be used to show how similar the oscillatory EEG response is across trials and find temporal changes in EEG power. Statistical results show that while there was similar ITC at 2Hz and at an unrelated frequency (7Hz) in a silent comparison condition, there was greater ITC at 2Hz relative to 7Hz in both the drumbeat and syllable conditions. Thus, the infant brain can track 2Hz rhythmic acoustic landmarks in speech and non-speech stimuli.

Cross-community differences in bilingual infants' experience with language switching

Jessica Kosie; Rachel Ka-Ying Tsui; Taylor Martinez; Andrea Sander-Montant; Laia Fibla; Christine Potter; Krista Byers-Heinlein; Casey Lew-Williams

Language switching is a key feature of bilingual infants' early experience, but studies have yet to explore how switching varies across communities and interaction contexts. In the current study, we directly compared switching in everyday speech to 18- to 35-month-old infants across two bilingual communities (Spanish-English in the US and French-English in Canada) and two contexts (with a single caregiver versus multiple household members present). When a single caregiver was present, Spanish-English infants experienced more switching than French-English infants. However, when multiple household members were present, the total amount of switching was similar across the two communities. Closer examination of switching dynamics revealed that, with multiple household members present, Spanish-English infants experienced more within-speaker switching while French-English infants experienced more across-speaker switching. These results underscore the importance of considering the nature of switching that infants encounter and provide insight into the diversity of bilingual infants' everyday language experience.

Cross-language priming effects through a new distributional lens

Adel Chaouch-Orozco; Jorge Gonzalez Alonso; Jon Andoni Duñabeitia; Jason Rothman

Mean-based analyses are ubiquitous, usually avoiding skewness/outliers. Yet, commonly, the main effect locates at the distribution tail. Distributional analyses overcome these drawbacks while providing unique insights into cognitive processes.

Priming may occur because of the prime activating the target's features (headstart effect). This is reflected by distributional shifting. Alternatively, prime and target may form a compound cue, which facilitates the lexical decision; priming would be larger in higher quantiles (skewness).

Monolingual masked priming research reports a headstart effect, with conflictive evidence with cross-language stimuli. Further, i) no study has investigated cross-language unmasked priming distributionally; ii) monolingual results are inconclusive.

We employed cross-language masked and unmasked priming LDTs, exploring L2 development, word frequency, and cross-language semantic alignment.

We found a headstart effect with masked primes and a compound cue effect with unmasked ones. Word frequency and semantic overlap influenced compound cue creation.

These results highlight the informative uniqueness of distributional analyses.

Cross-linguistic influence online: An eye-tracking study on pronoun resolution in simultaneous bilingual Turkish-Dutch children

Chantal van Dijk; Anna Aumeistere; Susanne Brouwer; Ton Dijkstra; Sharon Unsworth

In this study we investigated whether pronoun interpretation preferences from a null subject language, Turkish, influence online and offline pronoun interpretation preferences in a non-null subject language, Dutch, in Turkish-Dutch bilingual children. Furthermore, we investigated whether language dominance moderates the strength of such cross-linguistic influence (e.g., van Dijk et al., 2021). We measured children's behaviour using an eye-tracking task (visual world paradigm) in combination with a picture selection task. German-Dutch bilingual and Dutch monolingual children served as control groups. We found evidence for cross-linguistic influence from Turkish in the Turkish-Dutch children's fixations when we took children's language dominance profile into account. The more balanced children were in their languages, as opposed to being Dutch-dominant, the less they fixated on the Turkish-preferred non-topic referent. We observed a similar although non-significant pattern offline. We discuss our findings in terms of structural co-activation and inhibition (e.g., Hartsuiker & Bernolet, 2017; Hopp, 2017).

Declarative and imperative points by infants can be distinguished by accompanying preverbal vocalizations

Johanna Schick; Carmen Saldana; Thayabaran Kathiresan;
Volker Dellwo; Klaus Zuberbühler; Sabine Stoll

Pointing gestures are among the first intentional expressions of human infants. However, only little is known about the role point-accompanying vocalizations play. In our study, we tested whether point-accompanying prelinguistic vocalizations differ in terms of their acoustic characteristics when comparing declarative with imperative points. Our data consists of naturalistic daylong recordings of four Shipibo-Konibo children aged 14, 16, 17 and 20 months. First we explored whether point-accompanying vocalizations can be classified in terms of their spectral information (MFCC's). Using a supervised category classification, our model resulted in a 76.5 % accuracy of correct classification, suggesting acoustic differences. Second, a perception experiment with 80 Swiss-German speaking participants revealed that listeners from a different culture are able to correctly categorize prelinguistic vocalizations above chance without perceiving any visual information.

Our findings suggest that prelinguistic pointing vocalizations differ between declarative and imperative pointing acts and are understood by adults independently of linguistic background.

Definitional skills in children with Developmental Language Disorder: Delayed or deviant?

Ifigeneia Dosi; Zoe Gavriilidou

This study aims to investigate the development of definitional skills of nouns in children with/without DLD considering noun categories (simple vs. compound and concrete vs. abstract) and to address the question about delayed or deviant definitional skills. It also investigates a possible link between breadth and depth of vocabulary knowledge in (non-)impaired children. Thirty-two monolingual children (5;5-12 years old) were tested and divided into three groups [DLD group and two age- and language-matched control groups (CG)]. The results exhibited that the DLD group produced fewer formal definitions compared to both CG; while abstract and compound words were more demanding particularly for the DLD group. Correlations between vocabulary (breadth) and definitional skills (depth) were detected only in the age-matched CG. Our findings suggest that DLD children's definitional skills seem to be delayed rather than deviant and the correlation between breadth and depth of vocabulary knowledge may take time to emerge.

Detecting definiteness: On the L2 acquisition of the Mandarin plural marker [–men]

Jue Wang; Bonnie D. Schwartz

Following Lardiere's (2009) Feature Reassembly Hypothesis, L1-English L2ers of Mandarin establish an initial morpholexical mapping between the Mandarin plural marker [–men] and the English plural [–s]. Mandarin [–men] is restricted to [+human, +definite] nominals and is ALWAYS OPTIONAL. This gives rise to a serious learning challenge: retreat from the less-constrained plural-marking requirements transferred from English in the absence of (i) transparent positive evidence, (ii) explicit instruction, and (iii) consistent/reliable indirect negative evidence. A contextualized Acceptability Judgment Task, crossing "Definiteness of the nominal" (Definite vs. Indefinite) with "Suffixation on the nominal" ([–men] vs. Ø), has so far been administered to 16 high-intermediate L1-English adult L2ers of Mandarin. Results show that they were not sensitive to the definiteness constraint of [–men], unlike the 24 native controls. This finding corroborates Lardiere's (2017) conjecture that optionality in the morphological realization of features---which leads to their low detectability---could be a source of (L2) acquisition difficulty.

Do children learn from reformulations in non-pedagogical contexts?

Megan Waller; Nazbanou Nozari; Dan Yurovsky

How do children stop making linguistic errors, like overregularizing the plural of mouse as mouses? When children produce an incorrect irregular form (e.g. “those are mouses”), adults often reformulate that phrase with an implicit correction (e.g. “yes, those are mice”). Experiments have shown that children learn novel irregular forms better from reformulations than from positive evidence alone. However, these studies explicitly task children with learning a new word, and may thus increase the salience of implicit corrections. In a task focused on counting rather than word learning, we asked whether 3 and 4-year-olds could use these corrections to improve their production of irregular words that they were already learning in their native language. Relative to a Repetition condition, Reformulations did not improve performance, and may have actually hindered it. These results suggest important limits on the generalizability of the utility of implicit negative evidence for children's language learning.

Do children use pragmatic (goal) information to compute event culmination?

Ariel Mathis; Anna Papafragou

Some theorists argue the semantic approach that the perfective aspect in English semantically indicates event culmination. Others suggest pragmatic considerations contribute to culmination, but the specifics remain unknown. Across two experiments, we directly test whether pragmatic context, specifically knowledge of an agent’s goals, affects event culmination interpretations for both adults and children. Participants read or heard one of three context sentences containing an agent’s goal that required varying levels of event culmination, saw a picture of a partly complete event, then responded to a Yes/ No question with telic-perfective predicates. In line with a pragmatic approach to event culmination, adults integrate higher-order goal information when interpreting perfectivity; however, children fail to do so. We hypothesize that these failures might indicate difficulties with the relevance calculations bridging the agents’ goal and the sub-event in the question (e.g., the real-world knowledge that peeling an orange is needed to eat it).

Do Japanese children randomly place the theme argument of an unaccusative verb in the subject position and the object position?

Hiroyuki Shimada; Tetsuya Sano

According to Han et al. (2016), Korean speakers do not arrive at one common grammar regarding a string-vacuous movement, V-raising over negation; they randomly choose between V-raising-grammar and non-V-raising-grammar because the crucial evidence is sparse. Given this, it is expected that Japanese children place an internal argument of unaccusatives randomly in the subject position and the object position since the NP-movement of unaccusatives in Japanese is also a string-vacuous movement and Japanese lacks decisive ques for the EPP such as expletives in child-directed speech.
By using children's interpretations of disjunction in negative sentences, we show that Japanese children aged 5-6 years raise the theme argument of an unaccusative verb to the subject position. This suggests that the EPP holds innately/universally. The age 5-6 may not seem to be so young, but given the relevant input's sparseness, the suggestion seems tenable.

Does using 'babytalk' predict more talking with infants? Infant-directed prosody in the TalkBank LENA corpus

Henny Yeung; Elise McClay; Emma Hutchinson

Infant-directed speech (IDS) in North America has distinct prosodic properties compared to adult-directed speech (ADS), including higher mean pitch and pitch variability, and slower speech rates. Laboratory studies propose that this prosodic enhancement of IDS facilitates language learning. Yet it is unknown whether prosodic changes to IDS are actually correlated with other measures of 'healthy' language input in the home. We asked here whether prosodic markers of 'babytalk' (raised pitch, increased pitch variability, and a slower speech rate) are indeed correlated with more conversational parent talk in naturalistic recordings. We conducted a corpus analysis of the IDSLabel Dataset from TalkBank, which has several daylong LENA recordings. Results suggest that prosodic markers of 'babytalk' are indeed related to the number of parent-infant communicative exchanges, but in surprising ways. Pitch-related IDS enhancement was associated with less conversational engagement, while speech rate slowing was associated with more engagement.

Domino effects of bilingualism in Autism Spectrum Disorders? Executive functions, complement clauses and Theory of Mind

Stephanie Durrleman; Ianthi Maria Tsimpli; Eleni Peristeri

The current study investigates the mediating effect of complement clauses in the relation between executive functions (EF), vocabulary and Theory of Mind (ToM), in monolingual and bilingual children with ASD and high language proficiency (as indicated by vocabulary). Seventy children (Mean age: 10;4) participated: 35 bilingual children with ASD (ASDbi), and 35 monolingual children with ASD (ASDmono). ToM was measured through a low-verbal false belief task. Children's expressive vocabulary was measured through a standardized test. Executive functions were tested through a 2-back updating task. The results reveal positive effects of bilingualism on ASD children's ToM, updating and complement repetition skills. Mediation analyses indicate that boosts in EF associated with bilingualism explain improved ToM in ASD, in particular in the most proficient bilinguals (as indicated by higher vocabulary). Complements contribute to mediating the EF--> ToM relation in ASD bilinguals, suggesting a beneficial domino effect associated with dual-language exposure.

Early lexical knowledge in infants primarily exposed to overheard speech

Ruthe Foushee; Mahesh Srinivasan

An extensive literature suggests that children learn best from the speech that caregivers direct to them (child-directed speech, or CDS), compared to other speech that they overhear. We adapted Bergelson & Swingley's (2012) method for testing infants' earliest lexical associations (here, high-frequency nouns and greeting terms). Common-Noun trials presented item-pairs of one animate and one food-related image (e.g.,baby-corn, horse-soda), while Greeting trials presented pairs of faces corresponding to distinct Tseltal terms of address (e.g.,older-man—younger-woman). Our results provide evidence of early context-specific word knowledge in infants who are rarely exposed to directed speech and social language knowledge necessarily acquired through overhearing.

Early sign language exposure does not prevent acquisition of spoken language

Elana Pontecorvo; Michael Higgins; Joshua Mora; Amy Lieberman; Jennie Pyers; Naomi Caselli

While concerns about bilingualism have largely been resolved for hearing children, some still argue that exposure to sign language might “lock the brain into a vision-only configuration” that prevents spoken language acquisition (e.g., Giraud & Lee, 2007). Existing evidence suggests that sign language supports spoken language acquisition in deaf children with deaf, fluent signing parents (Davidson et al., 2014; Hassanzadeh, 2012), but doubts persist as to whether the pattern generalizes to the majority of deaf children who have hearing parents who are second language signers. In a study of 58 deaf children with hearing parents, we found no evidence that learning ASL led to poorer spoken English vocabulary skills. Rather, ASL and English vocabulary were positively correlated. These results confirm that learning sign language does not harm spoken language acquisition. Instead, increased fluency in ASL during the first years of life is positively associated with stronger English skills.

Effects of bilingualism on language and social perception: Evidence for specificity

Sarah Rajendra; Paul Quinn; Leher Singh

In the first year of life, the perceptual systems of infants adapt to social experience. Infants become less sensitive to non-native speech sounds, and infants growing up in monoracial environments show a preference for their own-race faces. Previous research has suggested that bilingualism modifies perceptual adaptation to speech, as well as increases social openness to race in early childhood. The present study aimed to investigate whether bilingual experience increases openness in the speech and race domains of infants in the first year of life. Forty-three 10-12 month-old infants with varying exposure to English and Mandarin. Infants were presented with a speech discrimination task testing sensitivity to non-native Hindi contrasts, and a visual race preference task. Results from the two tasks suggest that openness to speech and race was predicted by increased exposure in that specific domain, pointing to an underlying domain-dependent mechanism of perceptual openness.

Effects of hearing loss on children's processing of word onsets and codas

Rosanne Abrahamse; Nan Xu Rattanasone; Katherine Demuth; Titia Benders

Pre-schoolers with hearing loss (HL) may not have access to all the acoustic cues necessary for distinguishing words. This study investigated how children with normal-hearing (NH) HL processed word Onset minimal pairs (bin/pin) and word Coda (map/mat) minimal pairs compared to non-minimal Control pairs (pear/bib). We used a Looking While Listening paradigm with eye-tracking to investigate the time-course of looking at the target word upon hearing it in a two-picture context. We used cluster-based permutation tests to analyse our looking curves. Findings suggest that, in contrast to the NH children, who show no differences in speed and certainty between conditions, children with HL remain more uncertain about the target for Onsets, despite processing Control and Onset minimal pairs equally fast. They also seem to process Coda pairs more slowly than Onset pairs. Our results imply that coda representations may be less developed in children with HL.

Effects of verb argument structure and voice on L2 sentence processing of psych verbs

Shaohua Fang; Alan Juffs

This study investigated the effects of verb argument structure and voice on Chinese- speaking learners' processing of English sentences containing psych verbs and agentive verbs. The tasks included an acceptability judgment task (AJT), a self-paced reading (SPR) task, and its follow-up comprehension questions. Results from the AJT suggested that both L1 and L2 learners generally had the knowledge of those structures crossing verb type and voice. The reading time results showed that L2 learners successfully integrated information from verb argument structure and clause voice during sentence processing. Such an integration was also observed in learners' off-line interpretation of thematic roles of NPs during sentence comprehension. No clear influence of L2 proficiency was found across tasks. The current research expands our understanding of L2 sentence processing as to how real-time processing and actual interpretation are constrained by information encoded in verb argument structure and clause voice.

Electronic media, language input, and language output in Latinx infants

Katie Lindekugel; Naja Ferjan Ramirez

The present study examines the effects of electronic media exposure on parental language input and infant language development in a socioeconomically diverse sample of bilingual Latinx families with infants between 7 and 19 months of age. Using Language ENvironment Analysis (LENA) technology and parental questionnaires, exposure to electronic media was measured in two ways; parental language input and infant language production were measured by a combination of LENA automatic language measures and manual annotation of daylong audio recordings. We found that socioeconomic status (SES) was negatively correlated with electronic media exposure. Further, electronic media exposure was negatively correlated with and predictive of the frequency of parent-infant turn taking, as well as the frequency of infant language vocalizations, but not the volume of parental talk (adult word count) in general. Together, these results suggest that electronic media exposure negatively impacts infant vocal activity by reducing parent-infant turn-taking.

English-learning children hear and use multiple meanings for words in early speech

Jessica Mankewitz; Stephan Meylan; Sammy Floyd; Hugh Rabagliati; Mahesh Srinivasan

Many theories hold that children initially expect that a word will have only one meaning; this expectation is thought to facilitate vocabulary development, based on the assumption that most words that children encounter will be unambiguous. To test this assumption, we collected the first large-scale estimate of word meanings in the home language learning environment by annotating CHILDES transcripts with meanings (senses) from the WordNet database. Using Bayesian logistic mixed effects regressions, we find that English-speaking adults use multiple word meanings in child-available speech, and that children themselves produce multiple meanings per word, even among their earliest words. These models reveal an increase in the diversity of meanings used by children over developmental time. Finally, we identify patterns of polysemy which are particularly prevalent in child-direct and child-produced speech.

Even simultaneous bilinguals do not quite reach monolingual levels of proficiency in syntax

Wei Li; Joshua K. Hartshorne

While there is no doubt that children raised bilingual can become extremely proficient in both languages, theorists are divided on whether bilingualism is effectively monolingualism twice (the "Two Monolinguals in One Brain" hypothesis) or differs in some fundamental way from monolingualism. A strong version of the "Two Monolinguals" hypothesis predicts that bilinguals can achieve monolingual-level proficiency in either (or both) of their languages. We conducted a meta-analysis and a bootstrap simulation to examine if simultaneous bilinguals reach monolingual levels of proficiency in syntax. The analyses provide multiple lines of evidence that simultaneous bilinguals do not (on average) reach the same level of proficiency as monolinguals, even in their primary language. The null results in some prior studies are consistent with statistical power levels for those studies.

Examining referent salience in native and non-native pronoun resolution: An online eye-tracking study

Tingting Wang; Utako Minai; Alison Gabriele

This study investigated two cues that have been argued to modulate referent salience in native speakers: subjecthood and pronominalization. Three conditions were created by manipulating the two cues: (1) Baseline condition, where subjecthood is the only relevant cue; (2) Pronominalized subject condition, where the two cues coincide as the subject is pronominalized (3) Pronominalized object condition, where the two cues diverge. We tested native English speakers (N = 47) and advanced Chinese-speaking learners of English (N = 36, in progress), using a picture verification task with visual-world eye-tracking. Results showed that both groups displayed a strong subject preference in both the Baseline and Pronominalized subject conditions, while in the Pronominalized object condition, both groups showed a weakened subject preference. Similar patterns were also reflected in their eye fixations. Our results suggest that L2 learners can integrate multiple cues for evaluating referent salience and show qualitatively similar patterns to native speakers both offline and online.

Exploring systematicity in the developing lexicon with phonological networks

Catherine Laing

Research has accounted for similarity in phonological acquisition through network analysis (Siew & Vitevitch, 2020). This approach considers two possible models: preferential attachment (PAT; new words attach to the most well-connected forms in the network) and preferential acquisition (PAQ; new words attach to multiple similar forms). Existing evidence shows some support for PAT (Siew & Vitevitch, 2020) when connections between target forms (i.e. car /kɑɹ/ ~ clock /klɑk/ ~ cat /kæt/) are analyzed.

Here I analyze connectivity between infants' actual productions (car /kæ/ ~ clock /kæ/ ~ cat /kæ/). Drawing from 5 infants aged 0;11-2;6 in the Providence corpus (Demuth et al., 2006), phonological distance between >100,000 words and i) the target form (e.g. clock, /kæ/ vs. /klɑk/) and ii) all other words produced by each child (e.g. cat /kæ/ vs. clock /kæ/) is observed. Evidence supports existing findings for a stronger role for PAT over PAQ in early acquisition.

Family socio-economic status predicts infant speech perception

Leher Singh; Jean Yeung

Prior research attests to disparities in children's vocabularies on account of familial socio-economic status (SES). The weight of the evidence for this relationship draws from investigations of children's word knowledge after they begin to talk in relation to demographic factors. In the present study, across two experiments, infants' sensitivities to sounds that distinguish words in their language were measured in relation to SES. In a first study, infants were tested on auditory discrimination of native sounds via visual habituation. In a second study, infants were tested on their sensitivity to sounds when learning new words. Family SES contributed unique variance to infants' phonetic sensitivities both in auditory discrimination in the first year of life and in word learning in the second year of life. These studies suggest elemental aspects of word knowledge, specifically, sensitivity to sound contrast that differentiate words, may be associated with variation in SES.

Fast-mapping labels onto sets in two-year-olds

Chen Cheng; Lisa Feigenson; Melissa Kibbe

Infants can track sets of up to three objects, yet acquiring the meanings of number words takes years. We investigated a potential mechanism that may support number word acquisition: the ability to map labels onto sets of objects. We showed 2-3-year-olds two sets of blocks (a set of two and a set of three) and gave the sets unique verbal labels. We found that, when sets had been labeled with novel words (Experiment 1) or number words (Experiment 2), children searched in a box for the correct number of blocks after hearing that one of the sets was hidden in the box, and their success did not rely on extant number word knowledge (Experiment 3). However, children failed to apply those labels to sets of new objects. Our results show children fast-map labels onto sets, but may not generalize those labels to sets of the same quantity.

From insubordination to subordination in child language acquisition: A pragmatic and constructional bootstrapping account

Seiko Fujii

This paper, based on a corpus analysis, shows that conditional utterances both produced and heard by children start with the antecedent-only reduced construction (RDC) and the integrated evaluative construction (IEC), which precede the full bi-clausal construction (FBC). It argues that the pragmatic functions common among CONSTRUCTION TYPES serve to bootstrap the acquisition of the bi-clausal conditional construction. More crucially, what makes this bootstrapping possible is the overarching CONSTRUCTIONAL SCHEME that exhibits pragmatic and formal commonalities. I thus propose a constructional bootstrapping that supports a pragmatic bootstrapping as well as the morphological acquisition in RDC and IEC as a springboard for the more complex FBC. This analysis accounts for the reversed path of insubordination to subordination in L1 acquisition. Historically, antecedent-only reduced constructions normally develop later, based on bi-clausal constructions in clause-linkage: that is, from propositional to textual and intersubjective. Language learning reverses the path from intersubjective and textual to propositional.

From lexical frames to syntactic categories

Kevin Liang; Charles Yang

An important task that children must face during language acquisition is the formation of syntactic categories from individual words. Distributional cues such as frequent frames have proven effective but their utility under realistic learning conditions remains unclear. Because frames are lexical in nature, they result in a proliferation of word classes that do not correspond to recognized syntactic categories. We propose that the Tolerance Principle, a mathematically precise method of language learning, can be used to combine lexical frames into category frames defined over syntactic categories. Furthermore, category frames can be effectively and efficiently combined with other cognitive and linguistic cues. Our model produces highly accurate syntactic categories when tested on child-directed English, Mandarin, French, and German corpora.

From word recognition to word learning: Comparing online speech processing in typically developing and late-talking 2-year-olds

Alexander LaTourrette; Sandra Waxman; Elizabeth Norton; Adriana Weisleder

As infants reach their second birthday, their language skills are typically undergoing dramatic growth; however, two-year-olds known as “late talkers” have atypically small expressive vocabularies despite otherwise typical cognitive and medical profiles. Here, we assess word recognition and learning for 2-year-old late talkers ($n = 40$) and typically developing peers ($n = 64$). We demonstrate that late and typical talkers are similarly accurate in their use of familiar nouns to identify referents, though typical talkers orient to the referents more quickly. Typical talkers also show faster processing efficiency for familiar verbs (e.g., “You can eat the banana”), as well as more accurate looking overall. However, late talkers successfully used familiar verbs’ selectional restrictions to identify both familiar and novel referents, and to learn new nouns from these familiar verbs. These results suggest late talkers exhibit slower lexical processing across multiple classes of words; nevertheless, they can successfully leverage familiar verbs to learn novel nouns.

Habla conmigo, papá: Fathers' language input in bilingual Latinx families

Josie Andert; Melissa Baralt; Naja Ferjan Ramirez

Fathers play an invaluable role in the cognitive and linguistic development of their children. Yet, recent research with monolingual English-speaking families found that infants heard significantly fewer words and significantly less parentese from fathers compared to mothers; importantly, fathers' but not mothers' parentese predicted infants' vocalizations, demonstrating the unique and critical role that fathers' language input may play in their infant's linguistic development. In the present study, we expand this research to infants of Latinx descent who hear Spanish and English in their homes. Using Language ENvironmental Analysis (LENA) we replicate the parental language input gap observed in the previous study, with mothers speaking 1.9x more words than fathers. However, fathers' word counts predicted infant vocalizations and parent-infant turn taking. Our results further our understanding of father's unique contribution to their infant's language development across populations that are linguistically and socioculturally distinct.

Hearing and deaf ASL-English bilinguals show typical early bilingual development

Corina Goodwin; Janina Piotroski; Diane Lillo-Martin

We report spoken English developmental statistics for 2-4-year-old deaf children who were exposed to American Sign Language from birth, and used a cochlear implant for improved access to sound. Unlike most other studies, we compared them to hearing sign-speech bilinguals. This comparison is apt because speech-speech bilinguals often perform below monolingual averages, since bilinguals' knowledge is divided across two languages. Spontaneous language produced in naturalistic sessions was recorded, transcribed, and analyzed using the KidEval CLAN program. The two groups generally scored alike across the age range on measures including VOC-D, MLUm, and IPSyn. We conclude that early differences in language development should be expected between monolinguals and bilinguals, including children learning a signed and a spoken language. Research which concludes that sign language exposure harms DHH children's spoken language development, but has not considered these children as bilingual, can be detrimental when used to influence language policies for DHH children.

Hearing loss, prediction and subject-verb agreement: are is a cue, is is not

Benjamin Davies; Rebecca Holt; Katherine Demuth

Predicting upcoming words and morphemes facilitates rapid language comprehension. However, children with hearing loss (HL) often experience delays acquiring spoken language in areas which may support prediction. It was not known whether they could predict using subject-verb (SV) agreement. Twenty-five Australian English-speaking school-aged children with HL and 30 with normal hearing (HN) participated in an eye-tracking task. Visual stimuli were pictures of solitary animals (singular) and animals as a group of five (plural). Auditory stimuli were predictable (“is/are the wallawallamoony duck(s) quacking”) or unpredictable (“see the wallawallamoony duck(s) quacking”). Logistic curves were fit and analysed using a linear mixed-effects model. A significant interaction was found between predictability and number, but no differences were found between groups: both looked to the target earlier for predictable plural targets only. Thus, school-aged children with HL did, and did not, predict using SV agreement, just like their NH peers.

How children ask questions across languages

Kazuko Yatsushiro; Chiara Dal Farra; Aurore Gonzalez; Johannes Hein; Silvia Silleresi; Alicia Avellana; Aijun Huang; Johnson Ilori; G. Gayathri; Maria Guasti; Uli Sauerland; Lilla Pintér

In this study, we investigated how children produce wh-questions in five languages: German, Hungarian, Malayalam, Mandarin, and Yoruba.

These languages represent diverse properties that may affect the acquisition of wh-questions: wh-in-situ (Malayalam and Mandarin); verb-final (German and Malayalam); case-marking on at least some wh-phrases (German, Hungarian, and Malayalam), word-order flexibility (German and Malayalam).

We found that (i) subject questions are easier for children than object questions--this was true also for languages without overt wh-movement; (ii) the question word "what" made questions easier, (iii) complex "which N" phrases are more difficult for children than simpler "who" and "what" questions to produce, and this was true across languages, and (iv) pronominal subjects make object questions easier than full NPs. Work is ongoing to extend our study to wider range of languages.

How old is too old? The effect of age of acquisition on subject-verb agreement in young child L2 learners

Michele Goldin

In monolingual (L1) acquisition, children produce subject-verb agreement at a remarkably young age though earlier in Spanish than in English. Simultaneous bilingual (2L1) children's production follows the same pattern in each language. In child and adult second language (L2), though, agreement morphology is prone to residual optionality due to age of acquisition (AoA) effects.

Cross-linguistically, monolinguals produce inflected verbs before they comprehend verbal morphology (Johnson et al., 2005; Miller & Schmitt, 2014). This contrasts with adult L2ers who display higher accuracy in comprehension before production, but it is unknown if this comprehension-production asymmetry also exists for child L2ers. This study explores the effect of AoA in early L2 acquisition and finds that the age of 4 may be the pivotal moment at which we see differences in morphosyntactic development. L2 acquisition at age 3 more closely resembles 2L1. L2 acquisition at age 5 more closely resembles adult L2.

How social cues index discourse topics to promote word learning

Crystal Lee; Casey Lew-Williams

Prior research suggests that social cues promote word learning in children, usually by exposing children to a word-object association with vs. without a social cue. But within a discourse, social cues are not always cleanly associated with referents. This raises a key question: how do social cues shape word learning beyond cue-label co-occurrences, such as when caregivers produce social cues across time in a discourse? We examined how word labels and eye-gaze interactively support 4- and 5-year-olds' word learning during brief exposures to successive discourse topics. We found that children can use social cues to learn words over boundaries of a discourse, demonstrating word learning beyond individual exposures to a labeling event and a social cue. This investigation provides a foundation for studying how social information is exploited during word learning: namely, when social cues do not perfectly co-occur with labeling events, and when information is encoded across multiple utterances.

iCatcher: A freely available neural network approach for automated coding of young children's eye movements

Yotam Erel; Christine Potter; Sagi Jaffe-Dax; Casey Lew-Williams; Amit Bermano

Measuring infants' looking behavior offers an invaluable tool for assessing real-time language comprehension. Despite the ubiquity of gaze-related methods in the study of language development, current techniques either involve laborious (and at times imprecise) coding or expensive eye trackers that may increase data loss or require calibration phases that are impractical for infants. As a solution, we used state-of-the-art computer vision methods to perform automatic gaze estimates from low-resolution videos. At the core of our approach lies an artificial neural network that classifies gaze directions in real time. We tested our method, called iCatcher, on data collected using the looking-while-listening (LWL) procedure, where toddlers view pairs of pictures and hear sentences labeling one image. Using a large dataset of manually-annotated videos from prior research, we demonstrate that the accuracy of iCatcher approximates that of human coders and replicates the results of a prior study.

Increases in speed and accuracy of children's online word recognition measured via a large-scale, open database of developmental eye-tracking data

Martin Zettersten; Annissa Saleh; Naiti Bhatt; Dan Yurovsky; Tian Linger Xu; Sarp Uner; Angeline Sin Mei Tsui; Rose Schneider; Stephan Meylan; Virginia Marchman; Jessica Mankewitz; Kyle MacDonald; Bria Long; Molly Lewis; George Kachergis; Benjamin deMayo; Alexandra Carstensen; Mika Braginsky; Veronica Boyce; Claire Bergey; Michael Frank

The ability to rapidly recognize words and link them to referents in context is central to children's early language development. This ability, often called word recognition in the developmental literature, is typically studied in the looking-while-listening paradigm, which measures infants' fixation on a target object (vs. a distractor) after hearing a target label. We present a large-scale, open database of infant and toddler eye-tracking data from looking-while-listening tasks. The goal of this effort is to address theoretical and methodological challenges in measuring vocabulary development. While generalizing word recognition ability across items is typically challenging in individual datasets, we demonstrate how the Peekbank database can be used to estimate gradual, item-independent growth in online word processing skill across development. Future efforts will expand the scope of the current database to advance our understanding of participant-level and item-level variation in children's vocabulary development.

Language dominance predicts direct and indirect crosslinguistic influence in existential constructions in Spanish and Catalan

Sílvia Perpiñan; Adriana Soto-Corominas

This study reports an oral production experiment investigating the expression of existentiality in the Catalan of adult Catalan-Spanish early bilinguals (N = 58) with comparable proficiencies but different language dominance. The results show qualitative differences among the bilinguals in existential predicate selection and in their supply of partitive pronouns, modulated by language dominance. Balanced Bilinguals as well as Spanish dominant bilinguals significantly produced more estar (in detriment of ser-hi and haver-hi) not only in locative contexts, where Catalan already presents optionality regulated by semantic differences, but also in existential constructions, where this optionality does not exist. We argue for indirect cross-linguistic influence, when the bilingual perceives certain structural overlap within constructions, mediating the influence from one structure to another one and expanding the limits of cross-linguistic influence. The qualitative differences found among bilinguals challenge the idea of a bilingualism continuum in Catalan-Spanish bilingualism with an identical mental representation.

Infant preference for natural phonetic cue trading relations

Marc Antony Hullebus; Tom Fritzsche; Alan Langus; Adamantios Gafos; Barbara Höhle

When listeners decide whether they hear a /d/ or a /t/, they do not exclusively rely on individual acoustic-phonetic cues, but rather on the interactions of multiple cues with one another. The perceptual relation between voice onset time (VOT) and first formant (F1) onset frequency is present in several languages as well as non-human species and has been suggested to originate not from language experience but rather from general auditory processes. The current experiment finds that infants at 6 months already prefer listening to syllables where these cues interact in an expected, ‘natural’ way compared to syllables where the expected cue relation has been reversed. This early sensitivity to natural relations between VOT and F1 cues provides support for a language-independent basis of the relation and its role in early phonological development.

Infants show increased neural tracking of intonation during natural infant-directed speech

Katharina Menn; Christine Michel; Lars Meyer; Stefanie Hoehl; Claudia Männel

Adults interact with infants using infant-directed speech (IDS), which benefits infants' language development. This IDS benefit has been argued to reflect enhanced amplitude modulations at the frequency of intonation (< 3 Hz), which is critical for word segmentation. While IDS is known to facilitate electrophysiological tracking of speech by infants, it remains unclear whether this results specifically from intonation or other factors, such as the syllabic rhythm. To test this, we compared infants' tracking of IDS and ADS at both the intonation rate (1–3 Hz) and the syllable rate (3.3–8.3 Hz). Parents described objects to their 9-month-olds (n = 30) while infants' EEG was recorded. Our analyses revealed significant speech–brain coherence at both syllabic and intonation rates. In addition, we found significantly higher speech–brain coherence for IDS as compared to ADS at the intonation rate, but not the syllabic rate—indicating that the IDS benefit arises primarily from enhanced intonation.

Infants' perception of repetition- and diversity-based regularities in speech: A meta-analysis of neural evidence

Jessica Gemignani; Anna Martinez-Alvarez; Caroline Nallet; Lucie Martin; Alessia Pasquini; Judit Gervain; Irene de la Cruz-Pavía

In order to acquire grammar, infants need to extract regularities from the speech input. Research using near-infrared spectroscopy (NIRS) suggests that different types of regularities undergo different developmental paths. While newborns exhibit a robust capacity for detecting repetition in speech sequences (e.g. AAB: mumuba, in which A = A), encoding sequences with no repeated elements (e.g. mubage) is reported only at 6 months. Using a meta-analytic approach that aggregates all published and unpublished NIRS studies (k = 19), we evaluated the developmental trajectory of these two regularities. We found significant meta-analytic effect sizes for repetition-based structures both in newborns and older infants (6-9 months). By contrast, the meta-analytic effect size was only significant at 6-9 months for diversity-based structures. These results confirm that infants detect repetition in speech from birth, but are not yet able to encode diversity.

Influence of preschool entry and maternal talk on dual language development

Marissa Castellana; Laura Winstone; Viridiana Benitez

A majority of dual language learning children in the United States live in low-income households, a factor negatively linked with language development. Previous research suggests that caregiver talk might serve as the link between income and language in bilingual environments. This study examines a sample of Mexican-American mothers and their children (N = 121, 44% female) from low-income households and assesses how children's dual vocabulary knowledge is influenced by 1) preschool enrollment and 2) the quality of early maternal talk. Mother-child dyads attended laboratory visits at 2-, 3-, and 4.5-years to assess the quality of maternal talk from a five-minute free-play (at 2-years), expressive vocabulary knowledge in English and Spanish (at 3- and 4.5-years), and preschool enrollment (at 4.5-years). Results show that the quality of maternal talk is positively linked with Spanish vocabulary outcomes without negatively affecting English, and preschool entry is positively linked with English vocabulary outcomes without negatively affecting Spanish.

Interacting effects between phonotactic probability and phonological neighborhood density in word learning in Swedish school-aged children

Emil Holmer; Erik Witte

Previous studies suggest that the convergence between high phonotactic probability (PP) and high phonological neighborhood density (ND) might represent optimal conditions for word acquisition in young children. In the present study, we investigated how PP and ND influence word learning in typically developing school-aged children in Sweden. Participants were pupils from Grade 1, 3, and 6. Sixteen novel words and accompanying, unfamiliar visual objects were introduced to participants across two aurally presented stories, each consisting of three episodes ending with an object-naming test. Multiple logistic regression was used to investigate the influence of ND and PP, as well as their interaction, upon the probability of correct naming of the objects. Independent of Grade and episode, a positive effect of PP was observed at a high level of ND, but the effect was negative at a low level of ND. Thus, our findings replicate and extend previous observations on this topic.

Intervention in the absence of lexical restriction: Effects of pronoun type on relative clause comprehension

Anamaria Bentea; Stephanie Durrleman

Difficulties with object relatives (ORs) are reduced when the embedded subject is a pronoun, rather than a lexical noun. The intervention locality account (Friedmann et al. 2009) argues that facilitation stems from the absence of lexical restriction (LR) on the subject pronoun intervener. 52 French-speaking children (4 to 5yo) took part in a study investigating whether intervention effects arise in ORs with an LR object and (i) pronominal interveners matching in other features than LR with the object or (ii) mismatching with the object on a feature yet unexplored in French, namely person. Results reveal poor performance in ORs with pronominal interveners matching on phi-features. ORs with pronominal interveners mismatching in person were comprehended significantly better. This confirms that a mismatch in person is a relevant featural distinction in French for computing intervention locality and suggests that differences in finer-grained features than LR suffice to explain children's difficulties with ORs.

Investigating overt subjects in topic continuity: An online study on the effects of language dominance and length of L2 residence in late L1 attrition

Dobrinka Genevska-Hanke

This study investigates the use of null (NS) and overt pronominal subjects (OS) in topic-continuity (TC) contexts in late L1-attriters of Bulgarian, speaking German as their L2. 20 bilinguals and 10 monolinguals did a self-paced reading task, in which either NS or OS were implemented in TC contexts (timed acceptability judgments were also taken). The bilinguals were late attriters with LoR of 5-20 years in Germany, Bulgarian-dominant and German-dominant, where LD was calculated experientially on the basis of patterns of language use (questionnaire data). The results show that monolinguals and Bulgarian-dominant bilinguals are slower than German-dominant bilinguals after OS in TC. Statistical analyses yielded significant effects of condition and the interaction of condition/group ($p < 0.05$). This underscores the impact of LD and is supported by the acceptability judgment data. In contrast, LoR did not yield significant differences. Accordingly, LD seems to better predict the relevant late L1-attrition effects.

Investigating the potential of using mobile apps in remote developmental research

Nicola Gillen; Serene Siow; Irina Lepădatu; Jelena Sučević; Kim Plunkett; Mihaela Duta

We present a study investigating the feasibility and efficacy of a mobile app to measure receptive vocabulary in toddlers. Our sample consisted of 153 toddlers ranging from 12- to 36-months-old. Parents of the toddlers first completed a report of their child's vocabulary knowledge then completed, with their toddler, a 2AFC receptive vocabulary task using the OxfordBabylab app at home on their own touchscreen device. We found using an app to be feasible with toddlers especially those aged 20-months and over who had a higher completion rate and provided substantially more valid responses compared to younger toddlers. We also found the app to have high efficacy in measuring receptive vocabulary as response accuracy was well above chance and toddlers were highly likely to respond significantly more accurately to words which parents reported as known. For 'unknown' words, response accuracy was also above chance suggesting parental reports may underestimate receptive vocabulary knowledge.

Is Developmental Language Disorder associated with slower processing speed across domains?

Nicole Zapparrata; Patricia Brooks; Teresa Ober

Processing speed has been linked to various linguistic abilities, including articulation, lexical access, vocabulary knowledge, and reading comprehension, suggesting it might serve as a global indicator of individual differences in language abilities. This meta-analysis ($k = 48$; $m = 143$) used Robust Variance Estimation (RVE) to evaluate whether slower processing speed is associated with Developmental Language Disorder (DLD), as indicated by simplistic reaction time (RT) measures. Moderators included stimuli type (linguistic/non-linguistic), stimuli modality (auditory/non-auditory), and response modality (verbal/nonverbal). The overall effect indicated slower processing speed in DLD groups ($g = .49, p < .001, CI = .40; .58$) relative to age-matched peers. None of the moderators approached significance, in support of the generalized slowing hypothesis. Simplistic nonverbal/non-linguistic RT-based measures may potentially serve as a clinical marker for diagnosing DLD, and are adaptable to various and diverse linguistic profiles. These findings have implications for how we assess, diagnose, and treat DLD.

Is it easier for children to learn English if their native language is similar to English?

Jocelyn Chan; Joshua K. Hartshorne

Intuitively, it's easier to learn a second language that is similar to your first. This certainly seems to be true for adults. The situation is less clear for children, who are generally more successful at language learning. Most studies examine only a handful of languages and/or focus on a specific phenomenon (e.g., inflectional morphology), making it difficult to see the overall picture. We present results of standardized tests of second-language English learners from English-language international schools. Results for younger learners (age-of-acquisition 5-10) show no difference in learning trajectory based on similarity of first language to English. Later learners show a slight advantage for learners whose first language is more similar to English, though the interaction did not reach significance ($p = .06$). Implications are discussed.

Kind-relevant information supports the fastmapping of novel labels

Cristina-Ioana Galusca; Krisztina Andrási; Gergely Csibra

For any given object, how are different types of information connected in children's memory, and does parallel knowledge affect the fast mapping of novel information? In three experiments, we assessed if presenting labels and facts (kind- or individual-relevant) together or separately influences their retention immediately and after one week. During an object-matching game, 4-year-olds incidentally heard novel labels and facts about novel objects, that were presented separately for different objects (Experiment 1), together for the same object at the same time (Experiment 2), or together but with a time interval in between (Experiment 3). Only kind-relevant facts were remembered after one week in Experiments 1 and 3. When labels and kind-relevant facts were presented together at the same time (Experiment 2), both types of information were remembered after a delay. Our findings show that kind-relevant facts support labels in children's long-term memory.

L2 acquisition of singular/plural interpretation of Japanese bare nouns

Tokiko Okuma

This study investigates L1 English speakers' acquisition of singular/plural distinction for bare nouns in Japanese partitive constructions. Bare nouns in Japanese partitive constructions represent systematic number-sensitivity. In a partitive construction in which a bare noun precedes a partitive, the noun is interpreted as singular or plural. However, in a reverse partitive construction in which a bare noun follows a partitive, the noun is only interpreted as plural. Extending the work of Okuma (2019), the present study aims to clarify two points: (i) whether the semantic restriction on reverse partitives holds true; and (ii) whether L1 English speakers of L2 Japanese can acquire it. The results of the picture-based Truth Value Judgment Task thus far suggest two points. First, the semantic restriction exists in the grammar of native Japanese non-linguists. Second, the semantic restriction can be acquired, suggesting that advanced L2 learners can successfully acquire subtle interpretative differences in their L2.

L2 acquisition of the Japanese associative plural marker tati

Keisuke Kume; Heather Marsden

This study investigates whether L2 learners can acquire an interpretive constraint on the Japanese associative plural marker -tati in numeral classifier constructions. Whereas it allows both associative and regular plural readings in the post-nominal construction, the associative reading is not available in the pre-nominal construction. The study targeted learners with two different L1s: Korean, which has a corresponding associative marker whose interpretation is similarly constrained in numeral classifier constructions; and English, whose plural marker -s does not have an additional associative meaning. English speakers face a poverty-of-stimulus problem (lack of evidence in input or instruction) in acquiring the incompatibility of the associative reading with the pre-nominal construction, unlike Korean speakers, with L1 transfer assumed. However, the results of an acceptability judgement task suggest that the target property is acquirable, irrespective of the L1. The English-speaking group's acquisition supports the view that Universal Grammar is operative at the L2 syntax-semantics interface.

Language contact is part of language emergence: Noun phrase ordering in Nicaraguan Sign Language

Molly Flaherty; Savithry Namboodiripad; Susan Goldin-Meadow

In this paper we investigate a prediction from the artificial language learning literature, preference for harmonic ordering of noun phrase elements, in a new natural language: Nicaraguan Sign Language. Contrary to what one might expect from lab-based studies, while we find an initial preference for harmonic ordering, we find a changed preference towards non-harmonic orders just a few years later. We propose language contact (with Spanish) as an explanation for this unexpected shift and discuss support for this position from the language contact literature. We recognize that contact between spoken and signed languages is an ideologically charged area as communities fight for recognition and access to signed languages. We present the case that this is due to deficit models towards multilingualism and language contact and seek to open a discussion of what we can gain by including language contact in our models of language emergence and evolution.

Language-specific label-referent disambiguation in 4-month-old infants

Amanda Saksida; Alan Langus

Words that infants hear occur in situations where more than one meaning or referent is possible, and learning new words requires disambiguation of the intended meaning. We investigated whether the ability to disambiguate the referent of novel words is present considerably earlier than presently thought. We designed a language-guided looking-paradigm to test 4-month-old infants' ability to direct their gaze to the intended referent of novel words when two visual referents were possible, when auditory labels were disyllabic nonsense words (Experiment 1) or sinewave analogues (Experiment 2). Results show that infants discriminated auditory labels in both experiments, but only show looking preference to correct referents when labels were words (Experiment 1). We argue that some ability to map labels to referents in ambiguous situations is present during the first months of life, that it is facilitated by linguistic stimuli and cannot be explained by purely domain-general associative or perceptual learning.

Late first language acquisition alters the organization of the phonological system of American Sign Language

Shai Nielson; Rachel Mayberry

Evidence shows that late first language (L1) acquisition affects linguistic processing, but effects on phonology have not been systematically investigated. We analyzed phonological errors of signers with varied L1 age of acquisition (AoA) of American Sign Language (ASL) as they repeated signs. AoA was the only predictor of error rates. Analysis of error patterns of participants by phonemic variables revealed that signers with earlier L1 acquisition closely followed the pattern seen for native and second language signers with a prioritization of location and movement over handshape. The error pattern of late L1 signers, however, was unique with a prioritization of handshape over movement and location. Because error patterns can reveal the organization of the phonological system, this unique error pattern for late L1 signers suggests late L1 acquisition may alter how ASL phonology is organized. This could affect lexical access and phonological structure and have downstream effects on morphosyntactic comprehension/production.

Learning constraints on wh-dependencies by learning how to efficiently represent wh-dependencies: A developmental modeling investigation with Fragment Grammars

Niels Dickson; Lisa Pearl; Richard Futrell

It's hotly contested how children learn constraints constraints on wh-dependencies, called syntactic islands. When learning this knowledge, a prerequisite is knowing how to represent wh-dependencies so that constraints can be hypothesized over those representations. Previous work has explained disparate sets of syntactic island constraints by assuming different wh-dependency representations, without a unified dependency representation capturing all these constraints. We implement a modeled learner who learns a Fragment Grammar (FG) representation of wh-dependencies that best accounts for the input data while being as compact as possible. This efficient wh-dependency representation can then be used to generate any wh-dependency's probability, and so predict acceptability patterns for stimuli sets that reveal syntactic island knowledge. We find that the identified FG can generate the attested acceptability judgment patterns for nearly all syntactic islands previously investigated, highlighting how implicit knowledge of wh-dependency constraints can emerge from trying to learn to efficiently represent wh-dependencies more generally.

Learning morphology with inductive bias: Evidence from infixation

Colin Wilson

In acquiring morphology, the learner faces the challenge of identifying both the form of morphemes and their location within words. We conducted a series of artificial morphology experiments, with stimuli modeled after infixation patterns in Austronesian languages, to investigate the hypothesis that learners are biased toward coarse-grained prosodic distinctions when generalizing from exposure to novel morphemes. Participants were familiarized with the plural of a fictional language from a small number of auditorily presented singular/plural pairs (e.g., betu ~ biletu, mido ~ limido). They repeated the plural during familiarization, then generated spoken plurals for unfamiliar singulars (e.g., fruni, ebo) in a free-response test. Although the familiarization examples were highly ambiguous as to the target morphological process, participants systematically generalized infixation in a way that closely mirrored language typology both with respect to location and form/location covariation. Strong inductive biases guide learning of morphology from minimal exposure.

Learning structure-role alignments without linguistic bias: A computational exploration

Jackson Petty; Robert Frank

The mapping between structural position and thematic roles in ditransitive constructions raises a learning problem: why don't learners generalize to passive double object structures the position-role mapping found in the more frequent passives of transitives, where the subject is THEME instead of GOAL? Does the input provide sufficient data to avoid this incorrect, and cross-linguistically unattested, result? Or does learning this pattern require a language specific innate bias? We approach this question computationally, studying whether a language model, BERT (Devlin et al. 2018), exhibits knowledge of position-role mappings in active and passive ditransitive structures. BERT lacks explicit linguistic bias for position-role mappings, so its knowledge must derive from training data or domain-general biases. We probe BERT's knowledge of position-role mappings using predictions in a masked language modeling (cloze) task, and find that pre-trained language models exhibit evidence for shared knowledge of position-role mappings across distinct voices and lexical items.

Learning subcategorization properties of attitude verbs in wh in-situ languages

Nick Huang; Yu'an Yang; Valentine Hacquard; Jeffrey Lidz

Part of learning a verb involves learning its subcategorization requirements, e.g. whether it selects only interrogative clausal complements, declarative complements, or both. In the context of attitude verbs, learning these requirements is a prerequisite for syntactic bootstrapping, in which learners use syntactic cues to infer the semantics of these verbs, which describe mental states that are hard to learn from physical contexts alone. However, in certain wh in-situ languages, like Mandarin, it may be difficult to distinguish an interrogative complement from a declarative complement containing a wh-phrase (that scopes over the whole sentence), since both complements are string-identical. Failure to correctly disambiguate these complements might cause complications for both syntactic bootstrapping and parsing sentences with embedded wh-phrases. With a Mandarin corpus study, we show that this learning problem is only apparent: there are other syntactic and speech act cues that can help with disambiguation.

Learning verb meanings using cross-situational and linguistic information

Yayun Zhang; Andrei Amatuni; Ellis Cain; Xizi Wang; David Crandall; Chen Yu

Learning verbs is challenging because it is difficult to infer the precise meaning of a verb when there are a multitude of relations that one can derive from a single event. To study this verb learning challenge, we used children’s egocentric view collected from naturalistic toy-play interaction as learning materials and investigated how visual and linguistic information provided in individual naming moments as well as cross-situational information provided from multiple learning moments can help learners resolve this mapping problem using the Human Simulation Paradigm. Our results show that learners benefit from seeing children’s egocentric views compared to third-person observations. In addition, both visual information extracted from the current trial and statistical information accumulated from previous trials facilitate learning. Learners are also able to integrate visual and linguistic information both within and across learning situations to reduce the ambiguity in the space of possible verb meanings.

Lexical richness and syntactic complexity in children's story writing

Yaling Hsiao; Nicola Dawson; Nilanjana Banerji; Kate Nation

The ability to use complex words and sentences is a hallmark of language development. Writing, particularly, is a form of production that employs richer vocabulary and more complex grammar. In this study, we investigated the developmental trajectory of children's writing using a large corpus of 10000+ stories written by 5-13 year-olds in the UK. We computed 30 lexical richness and 14 syntactic complexity measures previously developed. While most of these measures predicted the growth of literacy approximated by children's school years, a principal component analysis showed that lexical richness, particularly lexical diversity, explained the most variance. The second component consisted of mainly syntactic complexity measures. This suggests that the ability of using a diverse vocabulary and, to a lesser degree, complex structures, characterises the trajectory of written language development. We also report keyword analysis and frequency of relative clauses to further investigate the lexical and syntactic development of children's writing.

Linguistic consequences of toing and froing: Factors that modulate narrative development in bilingual returnee children

Maki Kubota; Vicky Chondrogianni; Adam Clark; Jason Rothman

This longitudinal study examined the development of narrative abilities in Japanese-English bilingual returnee children. Returnees are children of immigrant families who spend a significant portion of their formative developmental years in a foreign language context before returning to their homeland. The returnees did a narrative task in both their L1 (Japanese) and L2 (English) immediately upon their return to Japan and a year after. The results showed that children who continued to receive English exposure better maintained their English microstructure (i.e., Type-Token Ratio and Verbs per Utterance) despite being re-immersed in the Japanese environment. Moreover, the age of return to the Japanese environment and relative proficiency predicted the development of their Japanese microstructure (i.e., MLU, Fluency, Type-Token Ratio) and macrostructure. Our study is the first to track both languages of returnee children over time, revealing that different background variables affect the change in their L1 and L2 narrative abilities.

Listening, fast and slow: L2 learners' online processing and offline knowledge of allophony

Megan Dailey; Camille Straboni; Sharon Peperkamp

Native listeners use allophonic cues to facilitate word recognition. There is evidence that second language learners have knowledge of allophonic cues in their L2 (Ito & Strange, 2009; Shea & Curtin), but it is unknown whether they exploit this knowledge during word recognition. We test French learners of English on both their online processing and offline knowledge of English nasal vowel allophony, using a visual world paradigm task and a gating task. Target stimuli are 21 nasal-oral pairs that are identical up to the onset of nasality in the first vowel (e.g., camera vs. cactus). Gating results show that the French rely on vowel nasality to restrict lexical access. Preliminary eye-tracking results suggest that the French group do not use vowel nasality to predictively rule out oral competitors. Together, our results suggest that knowledge of an L2 allophonic contrast does not necessarily result in a native-like predictive processing strategy.

Mapping evidential meanings onto different forms

Dionysia Saratsli; Anna Papafragou

Evidential expressions (i.e., those encoding the speaker's information source), just like other mental state terms, are generally assumed to be hard to learn, some theories attributing this to conceptual difficulties while others to mapping difficulties between linguistic expression and concepts. Using experimental setups that pose identical conceptual demands, we ask adult learners to map evidential meanings onto a novel linguistic (verb/morpheme, Exp.1) or non-linguistic form (a red frame, Exp.2). Through these experiments, we offer evidence for a novel argument concerning the role of mapping factors in the acquisition of evidentiality: what makes evidential expressions easy or hard to learn, regardless of their conceptual presuppositions, lies in the transparency of the correspondence between different linguistic – and even non-linguistic - forms and evidential meanings.

Maternal education and work status impact infant word learning ability

Rong Huang; Wenqian Robertson; Tianlin Wang

The current study examined how maternal education (low, middle, and high) and working status (working vs. stay-at-home) jointly impact young children's vocabulary development and novel word learning ability. One hundred and eight (51 males) 24-month-olds completed a Mutual Exclusivity (ME) task in the lab, which assessed their novel word learning ability. Their caregivers completed the MCDIs Words & Sentences and provided family demographics including maternal education and work status. Two-way ANOVAs indicated that there were no significant main effects or interactions on infants' productive vocabulary. Interestingly, there was a main effect of MaternalEducation on ME, $F(2,72) = 5.01$, $p = .009$, $\eta 2 = .12$, and an interaction of the two factors, $F(2,72) = 4.34$, $p = .017$, $\eta 2 = .11$. Across three maternal education groups, 2-year-olds with working mothers do not differ on their concurrent productive vocabulary size or their ability to learn new words. Implications were discussed.

Mothers' descriptions of referents are linked to children's communicative competence

Ezgi Yıldız; Berna A. Uzundağ

Describing a specific entity in a way that leads to the correct identification of that referent among similar others is required for successful referential communication. Although many studies investigated children's language development in relation to the input they receive, the relation between mothers' descriptions of referents and children's referential communication skills remains understudied. In the present study, we investigated the relationship between mothers' referential descriptions and children's success in describing pictures among competitors in preschool ages when referential communication skills are still developing. In two separate tasks, where the goal was to describe target pictures among similar others, we measured mothers' descriptions targeted for their children and children's descriptions targeted for the experimenter. Our results revealed that children provided more accurate initial descriptions and needed fewer attempts to describe pictures if their mothers described pictures in fewer attempts and provided clear initial descriptions when talking with their children.

Mothers' use of tactile cues for word learning is attuned to infants' development

Eon-Suk Ko; Rana Abu-Zhaya; Eun-Sol Kim; Kyung-Woon On; Taehyeong Kim; Amanda Seidl

We tested the hypothesis that caregivers modify alignment and co-occurrence of speech with touch based on infant age via a cross-sectional sample of 35 Korean mother-infant interactions at different developmental stages (pre-lexical, early-lexical, and advanced-lexical). We marked the start and the end of the touch events in video. We focused our analyses on the alignment of words with touches, the co-occurrence of these two signals, and the duration of touches with and without accompanying speech. We found that frequency of word-touch alignment and word + touch co-occurrence is significantly higher in speech addressed to pre-lexical infants than to older children. Further, the duration of touches was found to be longer when presented with words than when used alone. The strong effect of developmental stage on word-touch alignment and word + touch co-occurrence found in our study provides support to the hypothesis that mothers' use of touch during linguistic interactions is linked to infants' development.

Moving beyond "nouns in the lab": Using naturalistic data to understand why infants' first words include uh-oh and hi

Kennedy Casey; Christine Potter; Mira Nencheva; Casey Lew-Williams; Erica Wojcik

Why do infants learn some words earlier than others? Primarily informed by lab-based studies of noun-to-object mapping, current theories prioritize visual referent stability when predicting early acquisition. However, abstract, routine-based non-nouns (e.g., uh-oh, hi)—hereafter 'everyday words'—are among the first in infants' vocabularies. We combined a behavioral experiment with naturalistic observational research to explore how infants learn and represent these understudied words. We found that standard eye-tracking measures failed to capture infants' comprehension, so we moved beyond the constraints of a lab setting and analyzed the real-world scenes surrounding utterances of everyday words. This ecologically-motivated corpus-based research revealed that everyday words rarely co-occurred with consistent visual referents, making early acquisition difficult to reconcile with dominant word learning theories. Our findings instead point to complex non-visual input patterns that could contribute to early learnability. Overall, this investigation underscores the value of using naturalistic data to broaden theories of early word learning.

Narrative and morphosyntactic competence in bilingual Urdu-speaking children in Hong Kong and Pakistan: First language attrition and incomplete acquisition

Saboor Hamdani; Rachel Kan; Angel Chan; Natalia Gagarina; Sharon Armon-Lotem

This study considers two major issues in childhood bilingualism: L1 attrition and incomplete acquisition. It examines a group of school-age bilingual ethnic minority (EM) children in Hong Kong acquiring Urdu as L1 and compares their narrative and morphosyntactic abilities with L1 Urdu-speaking age peers in Pakistan. Results support the idea that some language abilities are more/less affected by input conditions, with narrative macrostructure being less dependent on specific language experience/abilities, while morphosyntactic competence being more sensitive to input effects. Specifically, the EM children performed significantly worse than their controls in morphosyntax and showed limited progress with age, which can be interpreted as a support for incomplete acquisition rather than attrition. This presentation not only presents evidence from a new language pair (L1 Urdu, L2 Cantonese) but also promotes our new Urdu-MAIN and Urdu-SRep and demonstrates the promise of using our new LITMUS tools/materials to support online testing.

Narrative profiles of individuals with typical development and Down syndrome

Isabel Neitzel; Martina Penke

Previous investigations have indicated that narration might be particularly challenging for individuals with Down syndrome (DS), a group that suffers from cognitive and morpho-syntactic impairments.

Narrative data of 33 typically-developing (TD) children aged three, five and nine years and 28 individuals with DS (mean age 14;05 years, mean nonverbal mental age 5;03 years) was evaluated using a nonverbal picture-book and the Narrative Scoring Scheme (NSS).

A particularly pronounced step in narrative development by age nine is evident for the categories referencing skills and mental/emotional state descriptions although scores of nine-year-olds remain on point-level 3 (developing). Individuals with DS achieved a mean NSS-score over all categories (13.07) that is comparable to five-year-old TD-children (13.09), indicating mental age-appropriate narrative performance.

Narrative abilities of individuals with DS stay behind their chronological age in all aspects and they show a particular weakness in conclusion (story ending). This points to clinical implications for this population.

Negative and positive transfer of tones: Vietnamese speakers' perception of tones and recognition of (tone) words in L2 Mandarin

Jiang Liu; Eric Pelzl

We tested the effects of L1 transfer of native language tones on the learning of L2 tones at both the phonological level and (phono)lexical level.

Native Vietnamese speakers who had achieved advanced proficiency in L2 Mandarin completed tone identification and lexical decision tasks in Mandarin. The tone identification tested categorization of Mandarin tones in isolated syllables, disyllables, and clipped syllables. As expected given Vietnamese tone categories, participants were less accurate for Tones 1 and 4. Lexical decision tested participants' ability to detect changes in vowels and tones to reject fake Mandarin words (e.g., real word fa1yin1 'pronunciation' vs. vowel nonword fu*1yin1 vs. tone nonword fa2*yin1). Given the presence of tones in Vietnamese, we expected similar performance for both nonword conditions. Results showed exactly this (vowel nonwords m = 69.6%; tone nonwords m = 68.6%).

These results illustrate strikingly different patterns of cross-linguistic transfer from those seen for L1 English speakers in previous studies.

Non-native early ASL input from parents to deaf children acquiring ASL still supports ASL vocabulary growth

lauren berger; Amy Lieberman; Jennie Pyers; Naomi Caselli

Most prelingually deaf children are born to hearing parents who do not already know a sign language like American Sign Language (ASL), and second language signers likely vary in fluency. In this study, we investigated how variation in parent ASL fluency affects vocabulary acquisition in deaf children. Using mixed-effects logistic regressions, we found a positive relationship between parent ASL skills and child ASL expressive vocabulary size. We also confirmed prior findings that the child's age of first ASL exposure is positively related to their ASL receptive vocabulary size. Put together, we suggest that the quality of language input children receive matters, but parent language fluency is not the sole determinant of children's sign language vocabulary acquisition. Rather, deaf children are capable of acquiring proficiency in ASL even with non-native input from their parents.

Non-uniformities in the development of presupposition projection in if-conditionals

Sherry Yong Chen; Cindy Torma; Athulya Aravind

The way presuppositions project in (indicative) conditionals is non-uniform: while conditional antecedents, just like negation, are “holes” for presuppositions, letting the overall sentence inherit wholesale any embedded presuppositions, conditional consequents are “filters”. Despite the central role that projection plays in the semantics of presupposition, little is known about its development. We fill this gap by examining preschool-aged children’s command of asymmetric presupposition projection in if-conditionals. We found that 5-year-olds appropriately treat the antecedent as a “hole” but the consequent as a “filter”. 6-year-olds' response pattern is more adult-like: both adults and 6-yos have access to a presupposition-suspension mechanism (local accommodation) that allows them to suspend the presupposition projected from the antecedent, which is not available to younger children. Finally, 4-year-olds exhibited above-chance performance in both environments, leaving open a few interpretational possibilities which we aim to tease apart in ongoing work.

Nonword repetition patterns in a culture with infrequent child-directed speech

Meg Cychosz

This study examines how phonological processing skills, measured via nonword repetition, develop in a culture with low rates of child-directed speech (CDS). In cultures with frequent CDS, nonword repetition accuracy (1) increases with chronological age and (2) decreases with increased stimuli length. Does infrequent CDS in this community mitigate these developmental patterns? And, within this community with infrequent CDS, do children who hear more CDS have stronger nonword repetition accuracy? N = 56 bilingual Quechua-Spanish children, aged 3;0-11;0, heard and repeated Quechua and Spanish nonwords; N = 36 also completed daylong recordings to measure child-directed speech exposure.

Results replicated well-known findings in nonword repetition: children got better at the task with age and found shorter words easier to repeat than longer. Children who were exposed to more CDS also performed better. Extending nonword repetition to this sociocultural setting provides novel insight into the role of input upon phonological processing and development.

Not as hard as it looks? Linguistic, and not conceptual, ability drives negation acquisition

Victor Gomes; Rebecca Doherty; Daniel Smits; Susan Goldin-Meadow; John Trueswell; Roman Feiman

For English-speaking adults, no and not express truth-functional negation. For children, this might be hard to learn because negation is not directly observable. While most children produce no as early as 16mo, they initially use it to express Nonexistence (Absence; e.g., “No more”) and Rejection/Prohibition (Negative affect; “No veggies!”). Children only reliably produce Denials (truth-functional negation, e.g., “That’s not Mommy”) around age 2½ , when they also begin producing not. By age 3, Denials become the most frequent usage This developmental trajectory raises two possibilities for why expressions of truth-functional negation are especially hard to learn: learners could face (1) a conceptual limit, lacking the cognitive capacity to represent truth-functional negation, but able to represent absence and negative affect; or (2) an information limit, with Denial uses having fewer observable contextual correlates than the others, even if children have all the relevant concepts. We provide data that supports the latter.

Not-OR versus NEITHER: Logical inferences in child Greek

Vina Tsakali; Marina Mastrokosta; Despina Oikonomou

Previous research reports that young children consistently assign a conjunctive interpretation on disjunction-OR under the scope of negation, irrespectively of whether the target-language shows a preference for a negation over disjunctive meaning (e.g. English, French, Greek), or for a disjunctive over negation meaning (e.g. Japanese, Hungarian) based on Szabolcsi’s (2004) typology. Thus, indirect evidence suggest that children interpret negated-OR similarly to NEITHER-NOR-operator. However, the research on the development of the semantics of negated-conjunction (NEITHER-NOR) have received limited attention.

We study the development of AND, NEITHER-NOR and NEGATED-OR on Greek aiming at shedding light on their developmental similarities and differences.

We ran a picture-matching comprehension task on children aged 4-8 and according to our results, younger children perform significantly worse on AND and NEITHER-NOR than older children, while the development of AND is not flawless. The preference rate for an inclusive = conjunctive interpretation on NEG-OR is significantly higher than the exclusive-interpretation.

Object wh-questions with psych verbs are easy in child Spanish

Victoria Mateu

It has been argued that children perform better with subject over object wh-questions because of intervention (Friedmann et al., 2009). Spanish psych verbs like ‘gustar’ (‘please’) have a dative object (experiencer) that asymmetrically c-commands the nominative subject (theme) (Cuervo, 2003). In this study we evaluate the predictions of intervention by testing 4-6-year-olds on d-linked wh-questions with actional and psych verbs. Results from the picture-matching task reveal that while Spanish-speaking children display the typical S > O asymmetry with actional verbs ($p < .001$), they show an O > S asymmetry with psych verbs ($p < .001$). Moreover, children perform worse when the subject and object match in number features (i.e., SG-SG), but only in wh-questions that involve intervention, just as expected under a structural account such as featural Relativized Minimality (Rizzi, 2004). Our conclusion is strengthened by our corpus study, which shows children underuse the SVO order with ‘gustar’ compared to their input ($p < .001$).

Object wh-questions with unknown verbs are transitive for 20-month-olds

Laurel Perkins; Yuanfan Ying; Alexander Williams; Jeffrey Lidz

Prior work finds that 18-19-month-olds represent fronted wh-phrases as arguments with known verbs. Here, we show that 20-month-olds do the same when interpreting unknown verbs. In a task adapted from the Violation-of-Expectations paradigm, infants (19;0-22;0) see dialogues with novel verbs in object wh-questions (e.g. "What is the girl gonna gorp?"), intransitive polar questions ("Is the girl gonna gorp?"), or transitive polar questions ("Is the girl gonna gorp the toy?"). At test, infants view a 2-participant event (e.g. a girl knocks over a tower) and we measure how long they look. Infants who heard wh-question dialogues attended similarly to the test events as infants who heard canonical transitive dialogues; infants who heard intransitive dialogues exhibited different looking behavior from the other two conditions. Thus, 20-month-olds treat object wh-questions with a novel verb as transitive when relating them to 2-participant scenes, suggesting that they might use wh-dependency representations to feed verb learning.

On the acquisition of scalar and additive inferences with focus scalar particles Evidence from Spanish incluso ‘even’ and ni siquiera ‘not even’

Elizabeth Heredia Murillo; Angeliek van Hout; Hamida Demirdache

This study explores whether Spanish L1 learners are sensitive to both scalar and additive inferences triggered by Focus-Scalar Particles (FSPs) incluso ‘even’ and ni siquiera ‘not even’. The scalar inference is based on likelihood, while the additive inference is sensitive to alternatives. Previous studies have looked at them independently, but not at both inferences in tandem. The present study addresses this gap by investigating to what extent children Spanish L1-learners know the different meaning components of positive vs. negative FSPs.

On the relation between cross-linguistic influence, between-language priming and language proficiency in bilingual children

Sharon Unsworth; Chantal van Dijk

Bilingual children regularly produce utterances in one language influenced by their other language. For instance, Romance-Germanic bilingual children sometimes produce ungrammatical N(oun)-Adj(ective) orders in their Germanic language (e.g., apple green) under influence of their Romance language (e.g., pomme verte) (Nicoladis, 2006). In this study, we investigated (i) whether cross-linguistic influence resulting in ungrammatical utterances can be primed between languages in French-Dutch bilingual children and (ii) whether the strength of priming effects are related to bilingual proficiency. We observed priming from French into Dutch (*appel groen/apple green), but not from Dutch into French (*verte pomme/green apple). The French-to-Dutch priming effect became stronger the lower children’s bilingual proficiency was. The first observation suggests that priming is the mechanism behind cross-linguistic influence (e.g., Serratrice, 2016). The last observation suggests that ungrammatical structures may not be shared between bilingual’s languages, in contrast to recent accounts on second language acquisition (e.g., Hwang et al., 2018).

Over-acceptance of English stative progressives by Mandarin native speakers

Chung-yu Chen; Tania Ionin

This study examines whether L1-Mandarin L2-English learners overextend progressive -ing marking to statives like have. The Aspect Hypothesis (Andersen & Shirai, 1996) states that progressive marking is not extended to statives, except when the L1 has overt progressive marking and allows stative progressives (or an imperfective marker that L2-learners map to -ing). Mandarin imperfective markers (progressive zai and durative/stative -zhe) are largely incompatible with individual-level statives like have and resemble, but largely compatible with stage-level statives like hate and love (Smith, 1997; Xiao & McEnery, 2004). Unlike results from two corpus studies (Fuchs & Werner, 2018; Zeng et al., 2019), results from an Acceptability Judgement Task showed L1-Mandarin L2-learners over-accepted stative progressives, including verbs that were incompatible with zai/-zhe. Thus, instead of L1-Mandarin lexical transfer, L2-learners' over-acceptance is probably due to overextensions from statives which do allow progressive marking, like depending, loving, and wanting, which are increasingly common in English.

Parent coaching is linked to accelerated vocabulary acquisition: A one-year follow-up study

Elizabeth Huber; Naja Ferjan Ramirez; Neva Corrigan; Patricia Kuhl

Differences in early language input account for considerable variation in child language outcomes. In a recent intervention study, parent coaching was linked to increases in turn-taking and 'parentese' speech, as well as increased growth in infant babbling through 14 months, and greater child word production at 14 and 18 months. Here we follow up with the same group of children and find that the intervention is also associated with faster growth in productive vocabulary from 18 to 30 months, as well as enhanced lexical and grammatical learning a full year after the end of intervention. Parent-child turn-taking at 14 months strongly predicted productive vocabulary at 2 years, even after controlling for prior receptive and productive vocabulary, highlighting an ongoing benefit of increased turn-taking for individuals across a range of early ability levels. Together, these results suggest that early enrichment of parent-child interactions has long-lasting effects on child language development.

Parental use of causal language for preterm and full-term children: A longitudinal study

Salih Özdemir; Aslı Aktan-Erciyes; Tilbe Göksun

Young children do not produce many causal structures. One reason could be the limited amount of causal language input children receive. The present study investigates how frequently parents produce causal structures, and whether neonatal status (being born preterm, before 37 weeks of pregnancy) is related to the language input parents provide to 35 Turkish-learning preterm and full-term children across three time points (14 months, 20 months, and 26 months). Parents' speech during free play were coded for causal conjunctions, lexical and morphological causatives. The results indicate that total causal input did not change from 14 to 20 months, but increased at 26 months. Regardless of neonatal status, lexical causatives were used more than morphological causatives and causal conjunctions. Our findings suggest that parents may tailor their speech to use more causal language and incorporate different types of causatives by 26 months of age.

Paternal and maternal parentese and infant vocabularies: A longitudinal corpus analysis

Kaveri Sheth; Naja Ferjan Ramirez

The prevalence of parentese, an acoustically exaggerated parental speech style, predicts infants' babbling and word production up to 24mo, suggesting that it enhances learning. However, our current understanding of the role of parentese is based almost exclusively on maternal contributions, although we have long known that fathers also produce parentese. Using naturalistic daylong recordings, this longitudinal study compares the quality and quantity of maternal and paternal parentese at 6 and 24mo. At both timepoints, mothers used a higher quantity of parentese than fathers. However, fathers, but not mothers, increased their quantity and quality of parentese between 6 and 24mo, as their infants became more competent language users. Further, qualitative features of paternal, but not maternal parentese were predictive of infant 24mo vocabularies. These findings demonstrate that fathers engage in language that is attuned to their infants, and that paternal parentese may play a unique role in infant language development.

Phonetic variation in coronals in English infant-directed speech: A large-scale corpus analysis

Ekaterina Khlystova; Adam Chong; Megha Sundara

Documenting phonetic variation in naturalistic IDS is critical in order to make theoretical and computational modeling of phonological acquisition ecologically valid. We phonetically annotated ~31,000 of the most common segments of English in naturalistic IDS from the Providence Corpus to quantify variation and evaluate how predictable English coronal segments are in the everyday speech directed to infants. We found that canonical variants are the most frequent variant for /d/, /s/, /z/, and /n/, but not for /t/. By comparing the distribution of positionally expected variants against the observed variants for /t/ and /d/, we show that unexpected variants are also common. We discuss the implications of these results for infants' ability to identify the canonical (phonemic) variant from a set, and uncover when and where positionally-governed phonetic variants must surface.

Phonological and orthographic parafoveal processing in Russian children and adults

Anastasiya Lopukhina; Nina Zdorova; Anastasiia Kaprielova; Nina Ladinskaya; Olga Vedenina; Sofya Goldina; Ksenia Bartseva; Olga Dragoy

Parafoveal processing allows readers to get some information about the word before fixating on it. In the present study, we investigate the reliance on phonological and orthographic information from the parafoveal region while reading in Russian-speaking children and adults. We tested 67 second-graders, 62 fourth-graders, and 70 young adults using the invisible boundary paradigm. We analyzed participants' fixation duration on the target words in five conditions with different previews: an identical target word, a pseudohomophone, a transposed-letter preview and two control previews. We found that second-graders relied on both phonological and orthographic information in the parafoveal area. Fourth-graders and adults relied only on orthographic information.

Pointing in parent input during interactions with deaf children in American Sign Language

Julia Leary; Paris Gappmayr; Amy Lieberman

How do parents use pointing cues to connect sign labels to their referent objects during play interactions in American Sign Language (ASL)? In ASL, pointing cues and language input are both produced manually. A sign label and corresponding point to an object occur in sequence, and children must alternate gaze to connect the label to its referent. Recorded play interactions of 24 deaf children (mean 35 months) and their parents were analyzed to identify episodes of pointing in parent language production. We identified 513 pointing episodes, 291 contained labels and were categorized by the timing of the label relative to the point. The most common sequence was point-label, with the label-point-label sequence type being the most successful. Our findings suggest that parents use a range of sequential pointing sequences to connect labels to referents, and these sequences are likely important for word learning in ASL.

Pragmatic inference and social cognition in acquiring (and remembering) word meanings

Katherine Trice; Dionysia Saratsli; Anna Papafragou; Zhenghan Qi

Children can map words to meanings via pragmatic inferences; however, previous works studied in-the-moment mappings over retention (Gollek & Doherty, 2016). We examine how children retain novel words in pragmatic-inferential (IC) vs. direct-mapping (DMC) contexts. Children (4-8) learned word which could either be uniquely mapped to an object – DMC – or required pragmatic inference to select a referent – IC. The immediate recall of these words and their retention (post 15-minute Theory of Mind (ToM) task) were tested. While there were no significant differences between DMC and IC for either recall or retention in children below 6, retention data in older children demonstrated an advantage of IC. Across the whole sample, word retention in IC was positively predicted by age. This relationship was partially mediated by ToM. Thus, the facilitation effect of pragmatic computation on meaning retention grows with age and developing social cognitive skills play an important role.

Predictive effects of number-marked verbs and copulas in Czech 2-year-olds

Filip Smolík; Veronika Bláhová

Two experiments investigated whether Czech 2-year-olds comprehend number marking on copulas and lexical verbs, and whether they use it to predict the upcoming words. Children heard sentences such as “Where is/are in the picture the horse/frogs?” (Exp. 1) or “Where jump/s on the screen the frogs/horse?” (Exp. 2) while watching a pair of pictures, one showing a single item (e. g. horse) or a small group (e. g. frogs). Two-year-olds showed predictive processing of copula number, and linguistically more advanced children at this age also showed predictive processing of number-marked lexical verbs. Number marking on verbs is thus comprehended and used by children even in a language with flexible word order and complex inflectional paradigms such as Czech, even when marked with bound affixes on lexical verbs.

Preschoolers’ comprehension of focus: The role of contextualization in non-exhaustive interpretation

Lilla Pintér; Balázs Surányi

Previous research has uncovered that children typically do not compute the exhaustivity inference of cleft(-like) syntactic constructions at adult-like levels before seven years of age. However, it is not known whether preschoolers’ non-exhaustive interpretations are merely due to their difficulties in accurately identifying the focus and its relevant alternatives in the context, or they (also) reflect some deeper-running limitation hindering the computation of the exhaustivity inference itself. We address this question in a comprehension study of five-to-six-year-old Hungarian children, consisting of two sub-experiments based on sentences containing a clefted focus. The findings suggest that the presence of a preceding wh-question enhanced children’s exhaustive interpretations in Sub-experiment2 less than it helped their congruent focus-corrections in Sub-experiment1. The limited role of contextual cues in preschoolers’ exhaustivity inference associated with focus contrast it with scalar implicatures, despite the fact that the logical structure of the two types of inferences is essentially the same.

Prevalence of long passives in child Mandarin: Input and grammatical intervention

Minqi Liu

Previous studies report low frequency of long passives (i.e., passives with a logical subject) in child languages. For instance, English-speaking children rarely produce long passives and even Sesotho-speaking children, who acquire passives early, mainly produce short passives. Our corpus study of Mandarin found an opposite result. Mandarin-speaking 2-6yos produce significantly more long passives than short passives. We believe this is an effect of input because Mandarin child-directed speech for 2-6yos demonstrates a similar high frequency of long passives. However, children's production of long passives does not match their input in all respects: Mandarin-speaking children – but not adults – overwhelmingly produce long passives with two arguments that have mismatched animacy features. We propose that the prevalence of long passives with mismatched animacy in child Mandarin is an effect of grammatical intervention, which gets alleviated by the featural mismatch between the moving and the intervening elements in the syntactic derivation.

Principle C in L2 acquisition: Reconstruction effects

Mayuko Yusa; Bonnie D. Schwartz

Reconstruction effects exhibit mismatches between surface syntax and associated semantic interpretations. Specificational pseudoclefts---as in *[What he-i really missed was John-i's dog]---are cases of reconstruction; despite [he-i] not c-commanding [John-i's] in surface syntax, Principle C disallows coreference as a consequence of reconstructing [he really missed] to its pre-moved position. Our TVJT study---inspired by Kiguchi & Thornton's (2016) L1 acquisition study---tests adult L1-Japanese L2ers of English (JLEs) for reconstruction effects in English specificational pseudoclefts, contrasting two conditions where a pronoun linearly precedes the antecedent: the [what] Pseudocleft condition, where coreference is disallowed due to reconstruction; the [while] Adverbial condition, where it is allowed. Results show that JLEs and native English controls (ENCs) reject coreference only in the Pseudocleft condition. This suggests that for JLEs, just like for ENCs, Principle C is operative in pseudoclefts, where only reconstruction will create the requisite c-command relation (i.e. surface properties such as linearity do not suffice).

Processing of information structure and scrambling by L2 speakers

Myeong Hyeon Kim

This study investigates whether adult L2 learners can develop native-like sentence processing strategies. It tests the Interface Hypothesis (Sorace & Filiaci 2006) by investigating whether Chinese speaking L2 learners of Korean use morphosyntactic (case-marking) and/or non-syntactic (information structure) information when processing scrambled sentences, as compared to native Korean speakers. The main task is an online self-paced reading task. There were two independent variables: word order (canonical vs. scrambled) and information structure (new-given vs. given-new). The results indicate that L2 learners can use case-marking information during online sentence processing. However, native and L2 speakers differ from each other regarding use of information structure during online processing. Native speakers tend to associate information structure with scrambled sentences, while L2 learners do not show such processing pattern. In this respect, it can be claimed that the locus of difficulties in L2 sentence processing could be due to the interface between syntax and pragmatics.

Production of /i/ and /ɨ/ by Russian-English bilingual children: Effects of language experience

Evgeniya Maryutina; Suzanne van der Feest; Valerie Shafer

This study is the first to investigate the production of the Russian vowel contrast /i/-/ɨ/ by Russian-English bilingual children. We hypothesize that the /i/-/ɨ/ contrast may be particularly challenging for bilingual children who have more limited exposure and variability in their Russian input. This is also an interesting test case regarding the debate on the contrast's phonological status. We collected production samples from Russian-English simultaneous bilingual children living in New York City, with at least one Russian-speaking parent. Participants were tested online in a picture-naming and sentence-repetition task. We acoustically analyzed productions of /i/ and /ɨ/ (~120 tokens per participant) focusing on formant frequencies. Our results show that not only an early age of acquisition but also extensive experience with the language is required for accurate acquisition of Russian /ɨ/ in production. We will discuss this dataset in the context of the debate on the phonemic status of /ɨ/.

Quantifier spreading and the role of prosody in children and adults: An eye tracking study

Kiwako Ito; Utako Minai; Adam Royer

Studies have revealed that the quantifier spreading (Q-spreading), children's incorrect falsification of a universally-quantified sentence based on an 'extra-object' picture, persists into adulthood, and that children adhere to the initial commitment of Q-spreading. To examine the error patterns across wider age groups, we tested children, adolescents and adults with a picture-verification eye-tracking task. We also examined whether the prosodic prominence affects their immediate responses and comprehension. Whereas adults' comprehension was ceiling, children/adolescents (age 4-17) varied in response patterns, splitting into: 'Adult-like responders (consistently adult-like)', 'Q-spreaders (consistently showing Q-spreading)', or 'Shifters (changed from Q-spreading to adult-like)'. The effect of prosodic prominence on eye movement emerged later for children/adolescents than adults. While adults looked at the extra-object infrequently, 'Q-spreaders' showed frequent looks throughout the session, but 'Adult-like responders' and 'Shifters' exhibited reduced looks, suggesting that avoidance and correction of Q-spreading requires inhibition of the visual attention to the extra-object.

Quantifying the syntactic bootstrapping effect in verb learning: A meta-analytic synthesis

Anjie Cao; Molly Lewis

We present a meta-analysis of the syntactic bootstrapping phenomenon in verb acquisition -- the proposal that young children use syntactic information in a sentence to infer the meaning of a novel verb (Naigles, 1990). Aggregating across 60 experimental conditions (N = 849 children), we found a small but significant syntactic bootstrapping effect (d = .24) and some evidence for publication bias. Surprisingly, the effect did not get stronger with participant age, but was moderated by predicate type: the effect was larger for transitive, relative to intransitive sentences. Relative to other word learning strategies, syntactic bootstrapping was comparable to meta-analytic effect size estimates of sound symbolism and cross-situational learning but smaller than mutual exclusivity and gaze following. Our findings suggest constraints on the role of syntactic bootstrapping in verb acquisition.

Refining the scope of syntax- vs. pragmatics-driven non-target sentence productions in German-speaking children with ASD

Maja Stegenwallner-Schütz; Andrea Zukowski; Flavia Adani

Many children with Autism Spectrum Disorders (ASD) demonstrate difficulties with the production of syntactically complex structures, but the source of this difficulty is still a matter of debate. The current study uses a question-answer-paradigm to elicit subject- and object relative clauses, with the aim to determine the potential source of difficulty for children with ASD (N = 17). Based on their performance on standardized language assessment, eight children were assigned to the group of children with ASD with language impairment (ALI). The syntactic nature of non-target responses, such as passive RCs and matrix clauses, became apparent, in particular among the ALI group, because they are appropriate with regard to the Question under Discussion, which was made explicit through the elicitation question in our task. The effect of the syntactic complexity manipulation on the frequency of target and non-target responses supports their interpretation as a means to avoid of syntactic complexity.

Regular and irregular noun plurals in German-speaking individuals with Down Syndrome

Martina Penke

According to dualistic approaches to inflection, regular and irregular inflection rely on two independent modules of the language faculty: a computational component where regular affixation is carried out, and a storage component – the mental lexicon – where irregular inflected forms are stored and retrieved (Pinker, 1999). The dualistic view presupposes deficits that selectively affect only one of these components sparing the other. It has been argued that Down syndrome (DS) constitutes a case in point (Penke, 2019). We present data on regular and irregular German noun plurals that were elicited from 31 children/adolescents with DS and a control group of 24 monolingual typically-developing (TD) children. The data indicate that regular plural inflection is selectively affected in individuals with DS, a finding in accordance with a dualistic view to inflection.

Relations between parental education and real-time sentence processing efficiency among Chinese preschoolers

Ran Wei; Gigi Luk; Meredith Rowe

Early disparities in children's lexical processing efficiency across socio-economic-status (SES) divides have profound implications for their language acquisition. However, there is limited research on the sources of individual differences in preschoolers' sentence processing. The current study examines whether parental education, a key component of SES, is associated with sentence processing efficiency among Chinese preschoolers. Participants were 35 Mandarin-native-speaking five-year-olds and their parents living in China. Children's sentence processing efficiency was measured using the Visual World Paradigm during which they were presented with visual scenes paired with agent-action-patient sentences (e.g., "The monkey lives in the forest"). Findings indicate that children whose parents completed college education more successfully anticipated the semantically contingent patient of a sentence based on the agent and the action. These findings are the first to demonstrate an education-based disparity in Chinese children's sentence processing efficiency.

Resumption facilitates L1-Koreans' L2 production of English relative clauses

Fred Zenker; Bonnie D. Schwartz

This study tests Hyltenstam's (1984) hypothesis that resumption facilitates L2 relative clause (RC) processing by examining a case in which resumptive RCs are ungrammatical in both the L1 and the target language. Preliminary results from an oral production task targeting direct object RCs show that both intermediate-to-advanced L1-Korean L2ers of English and L1-English controls produce resumptive object RCs at higher rates as the syntactic environment grows more difficult for relativization, from main clause to complement clause to WH-island. The effect is magnified for L2ers relative to native speakers. In a written acceptability judgment task, the same participants assign relatively low ratings to resumptive object RCs across the same three environments, in both English and (for L2ers) L1-Korean. Together these findings indicate that resumption does not represent an acceptable means of relativizing direct objects for either group but it can still facilitate RC production when there is strain on the processor.

Searching for morphological productivity

Caleb Belth; Sarah Payne; Jordan Kodner; Charles Yang

Morphological rules are often identified with statistical dominance, but in most languages, a morphological category consists of multiple forms: each may be defined over a subset of words and often also has exceptions. We propose a computational model for learning such productive morphological rules which recursively applies the Tolerance Principle in a best-first search for productivity. We demonstrate that this model is able to acquire morphological processes both in cases where one rule is clearly dominant (e.g. English past tense), and cases where there is no statistically dominant rule and the search space must be recursively subdivided (e.g. German noun plurals and Chinese Classifiers). Our model generalizes significantly better than the state-of-the-art neural network mode on developmentally appropriate amounts of data for each of these three languages, and the rules extracted are recognizably rules proposed in the descriptive literature.

Selection and reassembly of uninterpretable features in L2 acquisition: Evidence from wh-questions

Takayuki Kimura

This study explores whether Japanese learners of English and Chinese learners of English can overcome problems with feature reassembly and feature selection by investigating the acquisition of wh-questions in English. The results of the acceptability judgment task and elicited production task suggest that intermediate learners have problems with feature reassembly/selection, employing an operation existing in their L1 (e.g. scrambling and topicalization), but advanced learners overcome these problems. Consequences will be discussed with reference to the Representational Deficit Hypothesis (Hawkins & Hattori, 2006; Tsimpli & Dimitrakopoulou, 2007), the Feature Reassembly Hypothesis (Lardiere, 2008, 2009), and the role of UG.

Sensitivity to fine-grained phonetics details in childhood: Differences between first- and second-language learners

Félix Desmeules-Trudel; Elizabeth Johnson; Craig Chambers

Studies have shown that children's gradient perception of speech sounds influences word recognition. In adults, second language (L2) words are gradiently recognized depending on within-category variability. We investigated whether English-speaking and French-speaking five-year-olds were sensitive to within-category variability in newly-learned French-like words containing nasal and oral vowels.

Five-year-old children successfully learned nonwords at above-chance levels by guessing which of two depicted creatures were auditorily labelled and receiving feedback. In a recognition task, children heard a nonword in one of three conditions that varied in duration of nasalization, and selected the corresponding referent. English-speaking children displayed categorical responses (i.e., not sensitive to within-category variability), and French-speaking children showed gradient responses (i.e., sensitive to within-category variability).

These results support the hypothesis that within-category variability can be used for word recognition in childhood, but that L2 recognition abilities depend on the presence of phonological contrasts in the first language.

Sibs and bibs - Older siblings and infant vocabulary development

Lindsay Hippe; Naja Ferjan Ramirez

This longitudinal, corpus-based study aims to uncover interactions between the presence of older siblings and infant vocabulary development. Studies show a generally negative impact of older sibling presence on infant vocabulary growth. In the present study, we examine twenty-four English-speaking infants recorded with Language ENvironment Analysis (LENA) on two weekend days when they were 6, 10, 14, 18, and 24 mo old. We found that infants with older siblings were exposed to a lower amount of parentese and engaged in a lower number of conversational turns than infants without older siblings. However, the CDI productive vocabularies of the infants analyzed in this study were not significantly affected by the presence of older siblings nor the occurrence of speech from other children. Thus, we are manually analyzing the recordings to identify sibling input variables that may be conducive to infant vocabulary growth and allow infants with siblings to "catch up."

Sign language socialization in three indigenous Mesoamerican communities: A qualitative comparative study

Lynn Hou; Laura Horton; Austin German; Jenny Singleton

This talk presents a cross-cultural qualitative study of sign language socialization practices in three indigenous Mesoamerican communities. We adopt a strengths-based approach in our analysis, focusing on ways in which variable attitudes about deafness, disability, and language support the socialization of deaf and hearing children who are part of signing families. We analyze spontaneous multi-party conversations between the children and their caregivers for their visual communicative behaviors: attention-getting communicative behaviors, physical arrangement in space to accommodate signing, and withholding gaze to manage signed interactions. We identify several beliefs that influence various communicative behaviors: (1) whether children should be addressed directly through sign, (2) whether visual communication behaviors are modeled and “taught” to child signers, and (3) if children are expected to learn visual communication behaviors through observation. We find substantial diversity in those behaviors across these communities and discuss how the behaviors contribute to socialization into visual signing communicative ways.

Sluicing in the L2 English of L1 Japanese speakers

Akari Ohba; Bonnie D. Schwartz

The internal structure of sluicing varies: For English, WH-movement and TP deletion (e.g., Ross, 1969); for Japanese, deletion of a Top(ic)P(hrase) from a cleft retaining a Foc(us)P(hrase) (e.g., Hiraiwa & Ishihara, 2012). This difference is made manifest in multiple sluicing: Because English disallows multiple WH-movement, it disallows "Genuine Multiple Sluicing"---*[Mary showed someone something, but I don't know who what]---whereas Japanese allows it since it allows multiple foci in clefts. However, "PP Multiple Sluicing" is acceptable even in English---[Mary showed something to someone, but I don't know what to whom]---because the second WH-phrase can undergo rightward movement (Lasnik, 2014). Our AJT experiment tests L1-Japanese L2ers of English and English native controls on Genuine Multiple Sluicing vs. PP Multiple Sluicing. Results show that both groups reject the former but accept the latter. This indicates that despite its invisibility in the input, L2ers can come to know the internal structure of English sluicing.

Sound-category learning and memory skills in neurotypical adults and adults with language-learning disabilities

Carolyn Quam; Benjamin Carlstrom; Molly Franz; W. Todd Maddox

Adults with a history of childhood language-learning disabilities (LLD) often experience language-learning impairments in adulthood. This study tests the procedural-deficit hypothesis (PDH), which proposes that language learning in individuals with childhood LLD is impacted by a particular impairment to procedural memory, which subserves implicit learning. To test this hypothesis, we designed sound-category structures based upon work on visual category learning: an "information-integration" structure argued to be best learned implicitly, and a "rule-based" structure argued to be learned explicitly. We also tested sound discrimination and procedural-memory, working-memory, and declarative-memory skills. Supporting the PDH, LLD participants showed a selective impairment to procedural but not declarative memory; and to implicit but not explicit sound categorization. However, they also showed impairments to working memory and duration discrimination. Unexpectedly, declarative memory was associated with implicit sound categorization, and working memory with explicit sound categorization. Results suggest multiple memory systems are impaired in LLD.

Speech perception slopes across the first year of life: Maturation of consonant perception, but not vowel perception, predicts lexical skills at 12 months

Annika Werwach; Gesa Schaadt; Hellmuth Obrig; Angela Friederici; Claudia Männel

Infants' preferential reliance on consonants versus vowels in word recognition from 8 months predicts later lexical outcome. This predictive value, however, has not been evaluated for infants' longitudinal trajectories of consonant and vowel perception. We here longitudinally studied maturational trajectories of consonant and vowel discrimination abilities as predictors of later lexical outcome. At 2, 6 and 10 months, we measured infants' discrimination abilities by electrophysiological mismatch responses (MMR) to consonant and vowel deviants. At 12 months, we assessed infants' lexicon through parental report. Using second-order latent growth models, we tested the maturational slopes of MMRs as predictors of word production and perception. The consonant MMR slope significantly predicted word production and perception, whereas the vowel MMR slope did not. Note that the consonant MMR slope had additive predictive value beyond the single-time point MMRs. These results confirm a prominent role of consonant discrimination for word learning from early on.

Statistical regularities in child-directed speech depend on children's age

Alan Langus; Mireia Marimon; Amanda Saksida; Natalie Boll-Avetisyan; Barbara Höhle

Statistical learning in language acquisition was originally conceived as a gateway to speech segmentation in the absence of pre-existing knowledge about the language to be acquired. Recent corpus studies have begun to question the universality of TPs by showing that the most successful statistical segmentation strategy for a given language depends on the specific language under question. Here we argue that TPs in the linguistic input do not only depend on the specific language to be acquired, but also on the age of the child, the input is directed to. To investigate how speech register influences statistical regularities in the input, we compared IDS and CDS from 7 languages (German, Estonian, Italian, Dutch, English, Greek, Hungarian) to children of varying ages. We find that the statistical make-up of linguistic input changes as children get older, with better segmentation observed with language-specific and not universal statistical regularities.

Strengths in comprehending grammatical aspect among Mandarin-exposed preschool children with ASD

Qianqian Xie; Yi (Esther) Su; Letitia Naigles

Pervasive omission of morphosyntactic production including grammatical aspect has been identified among children with autism spectrum disorder (ASD) exposed to typologically different languages. Does such impairment stem from their grammatical deficits (i.e., utilizing aspect markers to encode aspectual meaning) or the contextual/pragmatic difficulties in communications inherent to ASD? Tovar et al. (2015) reported that grammatical aspect is a strength in English-exposed preschoolers with ASD. In this study, preschoolers with ASD exposed to Mandarin Chinese, a language with limited morphosyntactic devices, exhibited similar strengths in using the perfective morpheme le and the imperfective (durative) morpheme zhe to distinguish between completed and ongoing events during sentence comprehension. Thus, across languages, comprehension of grammatical aspect is preserved in preschoolers with ASD, which suggests that their less frequent usage of aspectual morphemes in production may stem from the inherent context/pragmatic impairments at the core of the ASD symptoms rather than represent fundamental grammatical deficits.

Syntactic bootstrapping mental verbs and perceptions verbs with limited morphosyntactic cues

Daoxin Li

This study presents a corpus analysis to examine whether there is reliable distributional information in the input for learners to acquire the semantic difference between belief verbs and perception verbs, taking Mandarin Chinese as a case study. Research has found that language learners can use argument types to restrict the possible meanings of novel verbs via syntactic bootstrapping. However, cross-linguistically, belief and perception verbs often share the property of taking either noun phrases or sentences as complements, although they do differ in their meanings. How do children learn the semantic difference? Through examination of eight CHILDES corpora, we found that there are reliable morphosyntactic cues to distinguish between belief and perception verbs in Mandarin. The results suggest the distinction between belief and perception verbs is learnable through distributional cues; and that syntactic bootstrapping could be a universal learning strategy, as it is feasible even in a language with impoverished morphosyntax.

Syntactic constraints and medial wh-questions in child Brazilian Portuguese

Elaine Grolla

Children sometimes produce ‘medial questions’ (MQs): long-distance wh-questions with an extra wh-element in intermediate [Spec,CP]. Because they are grammatical in adult languages (e.g.,German), but not necessarily in the child’s language, it has been proposed that they reflect a possibility in Universal Grammar. We present evidence that children’s MQs cannot be due to a non-target grammar setting. In adult languages displaying MQs, they aren’t possible with factive verbs and negation. If children’s MQs are constrained by the same UG mechanisms that constraints MQs in adult languages, they should not produce MQs in factive and negative islands. We tested 21 children acquiring Brazilian Portuguese in an elicited production task in which they had to produce long-distance WH-questions with factive verbs and negation. Children produced MQs in these conditions, indicating that they aren’t constrained by the same syntactic restrictions on MQs operating in adult languages. Children’s productions are best explained as performance errors.

Tamil children's comprehension of recursive locatives and relativized sentences

Usha Lakshmanan

The current research investigated Tamil children's comprehension of recursive locatives and relativized sentences using a picture-cum-story task and a sentence-picture matching task to determine whether the evidence supports a two-step acquisition path ([1] Direct-Recursion with a conjunctive interpretation and [2] Indirect-recursion) or early emergence of indirect-recursion as previously reported for recursive-possessives in Child Tamil. The results indicated early emergence of indirect-recursion for locatives (< 5 years), which may stem from the fact that Tamil requires relativization for embedding within locatives. As for the relativized sentences, children (< and > 5 years) performed similarly, sometimes interpreting them accurately and sometimes misinterpreting them as coordinatives. The children's misinterpretations may be due to their having been garden-pathed because of the non-scrambled (SOV) word-order used. While further research involving relativized sentences with the scrambled OSV order is needed, the children's success on recursive locatives, involving relativization, supports early emergence of indirect-recursion in relative clauses.

Tense acquisition in Williams syndrome: The interaction of rules with long-term memory impairment

Rennie Pasquinelli; Barbara Landau

Children with Williams syndrome (WS) have been reported to have an intact grammatical system, correctly applying the past tense suffix -ed to nonce verbs, but impaired memory, potentially leading to difficulty storing irregular forms. We asked how this profile affects the mastery of past tense morphology. In Study 1, we examined corpus data containing spontaneous productions from children with WS and mental-age matched controls. Both groups made errors on regular and irregular verbs, but WS participants made more regular errors than controls. In Study 2, WS participants completed a Wug test and a test of hippocampal memory function. WS participants showed persistent errors through age 44 on regular and irregular verbs. Performance on the memory test positively correlated with accuracy on the Wug test. Our data are not consistent with a dual-route model of past tense acquisition, and instead point to a less strict division of memory and rule-based grammar.

Testing intervention effects in acquisition of wh-argument questions by Mandarin-speaking preschoolers

Deming Shi; Xiaolu Yang

The Intervention Effect (IE), induced by the movement of a [+NP]-feature-bearing wh-word across an intervening subject with the same feature, is argued to hinder children's comprehension in object-which[+NP] questions, but not in other types of wh-argument questions in overt wh-movement languages (e.g., Friedmann et al., 2009). In order to examine IE in wh-in-situ languages, the present study investigated comprehension of shui 'who'-questions and na-yi-ge 'which one'-questions in Mandarin-speaking children aged 3;2-5;11 using a character selection task. Test sentences were 40 wh-questions, divided across a two-by-two design with [±NP] Feature on wh-words (who[-NP], which one[+NP]) and Syntactic Position of wh-words (subject, object), with 10 sentences in each of the four conditions. The results revealed no significant effect of [±NP] Feature nor Syntactic Position in children's responses. No subject-object asymmetry was identified for either shui 'who'-questions or na-yi-ge 'which one'-questions. These findings indicate the absence of [NP]-induced IE in Chinese wh-argument questions.

The acquisition of antonymous dimensional adjectives by Italian preschoolers

Elena Pagliarini; Alice Barlassina; Emanuela Sanfelici

This work investigates the comprehension of three antonymic adjectival pairs grande/piccolo 'big/small', lungo/corto 'long/short', and alto/basso 'tall/little' by three- to five-year-old Italian-speaking children and by a group of adults. We asked whether polarity affects the comprehension of antonymic adjectives and how children's comprehension develops with age. We found that while the positive members were mastered in an adult-like fashion from age 4, all children till age 5 still differed from adults in the comprehension of the negative members. This asymmetry may be accounted for in terms of markedness (Clark 1970) as well as under a negation theory of antonymy (Heim 2006; Büring 2008).

The acquisition of case systems in typologically diverse languages: Children gradually generalize abstract grammatical rules

olivier rüst; Marco Baroni; Sabine Stoll

Children initially develop a language that is item-specific, where grammatical phenomena are centered around rote-learned lexical items. The question how children become productive after this item-specific phase is, however, still under-researched.

We ask how children become productive in the use of case-marking. We hypothesize that productivity emerges gradually, independent of the case system of their native language. We test this hypothesis in two steps: In Study 1, we simulate the learning process implementing different learning hypotheses, i.e. we test item-specific learning against instant generalization (rule-based learning). In Study 2 we test the hypothesis in naturalistic longitudinal corpora of three typologically diverse languages: Russian (Indo-European), Japanese and Chintang (Sino-Tibetan).

Results of these studies provide evidence that stem-case combinations are gradually generalized towards more abstract schemata and are not subject to immediate generalization as assumed in rule-based approaches.

The acquisition of verb argument realization in Mandarin Chinese

Shu Yang; Jidong Chen

This study examined whether the argument realization in early child and caregiver speech of Mandarin Chinese follows the Preferred Argument Structure (PAS) (Du Bois, 1987, 2003) and the additional Mandarin-specific discourse-pragmatic features (Chui, 1992), and if children and adults are similarly influenced by the same discourse-pragmatic factors such as information status and animacy. A total of 8899 utterances containing the top 15 frequent verbs from two naturalistic longitudinal corpora of two monolingual Mandarin-learning children (0;8 to 3;9) were extracted and coded for the grammatical roles, information status, and animacy of the verb arguments. The results show that Mandarin child and adult speech follows the PAS patterns (Du Bois, 1987; Chui 1992), and are modulated by the same discourse-pragmatic factors similarly. Mandarin-acquiring children are sensitive to discourse-pragmatic factors and input usage in argument realization from as young as three, supporting the discourse-pragmatic and usage-based probabilistic approaches to language and language acquisition.

The adult-like nature of early negative auxiliaries

André Eliatamby; Virginia Valian

This corpus study investigates the productivity of English-learning children's early negative auxiliaries. Previous studies have suggested that children's first sentential negators are limited to don't, can't, not, and, no; if so, children's early representations of *don't* and *can't* may be underlyingly different from those of negative auxiliaries that emerge later. To explore such possibilities, we analyze the range, distribution, and productivity of negative and positive auxiliaries used by children and parents in two longitudinal corpora. We conclude that early uses of don't and can't are true negative auxiliaries. Extending claims against distinct developmental stages of negation, we suggest there is no stage-like development within the negative auxiliary class. Negative auxiliaries, including early uses of don't and can't, are acquired early. We attribute the apparent "emergence" of later auxiliaries to three factors – corpus density, the number of auxiliaries a child has acquired, and a general increase in negation usage.

The child acquisition of voices in Paiwan

Kaiying Lin; Yu-tzu Chang; Kamil Deen

We present the first-ever investigation of the acquisition of the Paiwan language, an endangered Austronesian language spoken by 15,000 people (UNESCO) in the mountainous areas of southern Taiwan. We investigate children's word order and voice comprehension abilities in simple declarative clauses, and find that while comprehension was generally poor (indicative of the endangered status of this language), children did show elevated comprehension of the pattern in which the verb is in agent voice and the agent argument follows the patient, contra the widely attested typological preference for agents to precede patients. Our conclusions are two-fold: intergenerational transmission in this endangered language is weak, suggestive of its threatened status, but that children nonetheless show preferences for patterns that are emblematic of other Austronesian languages.

The comprehension of grammaticalized implicit meanings in SPCD and high-functioning ASD children: A comparative study

Balazs Suranyi; Veronika Svindt

High-functioning autism (HFA) and social pragmatic communication disorder (SPCD) are two neurodevelopmental disorders that often present differential-diagnostic difficulties, especially in childhood. In the pragmatic domain a central question concerns whether their differences are qualitative or quantitative in nature. Using a sentence-picture verification task, we explored 4-to-9-year-old SPCD and HFA children's comprehension of highly systematic, grammaticalized implicit meanings (implicatures, presuppositions and entailments) associated with different uses of sentence focus. In target sentences the truth/falsity of the explicit and implicit meanings were varied. SPCD children performed significantly more poorly than TD controls, while HFA children fell in between TD controls and SPCDs, without significantly differing from either. Importantly, while HFAs' score exhibited an association with their ToM results, the performance of SPCDs showed a correlation with their receptive grammar skills. These results are suggestive of qualitative divergences in the cognitive developmental mechanisms that underlie the semantic-pragmatic impairments in the two clinical groups.

The development of voice onset time in bilingual Italian-German children

Theresa Bloder; Valerie Shafer; Tanja Rinker

Research with bilingual children has shown great variability in the development of Voice Onset Time (VOT) (e.g. Kehoe, 2014). By combining neurophysiological and behavioral measures we examine VOT in the two languages of bilingual Italian-German speaking five-year-olds and a control group of monolingual German peers. VOT is a salient phonological feature in many languages that has often been used to study the impact of bilingualism on speech production as its specific realization differs across languages (e.g. Kupisch & Lleó, 2017; Lein, Kupisch, & van de Weijer, 2015). German and Italian also differ in that respect, with German contrasting short lag VOT with long lag VOT and Italian contrasting short lag VOT with voicing lead. We examine whether young bilinguals' phonetic/ phonological systems for the two languages develop independently or whether the two languages influence each other, and what role language input plays in the formation of these phonetic/ phonological categories.

The developmental trajectory of grammatical gender: Evidence from Arabic

Hawra Alali

There is a well-documented bias among children to disproportionately rely on morphophonological cues to determine noun gender classes (Karmiloff-Smith, 1979; Perez-Pereira, 1991; Gagliardi & Lidz , 2014; Culbertson et al., 2019). However, it is unclear when and how children overcome this bias and approximate an adult-like weighting of morphophonological, semantic and syntactic cues for grammatical gender classes. The current study set out to uncover this developmental trajectory by studying the acquisition of gender in Arabic.

The results of two experiments with 265 native Arabic-speaking participants of five age groups confirmed the previously reported bias for morphophonological cues in 2- to- 3-year-old Arabic children. Yet, even children in this group were sensitive to the semantic cues provided by the natural gender of the human referent. The development of grammatical gender from that stage therefore involves adjustments in cue weighting rather than discovery of the cues.

The early meaning of conditionals

Myrto Grigoroglou; Patricia Ganea

Children acquire conditionals late for reasons that are poorly understood. One possibility is because conditionals have multiple meanings. For instance, the statement “If Jill goes out without an umbrella, she will get wet” is logically true when Jill goes out without an umbrella and gets wet (conjunction), when she goes out with an umbrella and does not get wet (biconditional) and when she goes out with an umbrella and (still) gets wet (conditional). Here, we employ a new paradigm to test these interpretations in young children. Eighty 3-6-year-olds and twenty adults were asked to match an if-then statement with one of two pictures: one depicting a scenario where the conditional is false vs. one of the three scenarios where the conditional is true. Adults were successful with all three interpretations. Children had a conjunctive interpretation since age 3 but the development of the other two interpretations was particularly protracted.

The effect of cognates on bilingual infant vocabulary trajectories: A study using bilingual CDIs of English and one additional language

Serene Siow; Nicola Gillen; Irina Lepadatu; Gonzalo Garcia-Castro; Daniela Avila-Varela; Nuria Sebastian-Galles; Kim Plunkett

Previous research in bilingual infant vocabulary has suggested that more similar languages are easier to learn. Our sample included 12 to 36-month-old bilingual toddlers (N = 566, cross-sectional data) growing up with English and one additional language (AL). We collected Communicative Development Inventories (CDIs) in English and the AL for each child. We calculated each child's total vocabulary size (English vocab + AL vocab) in comprehension and the percentage of known concepts where they understood both translation equivalents. If close languages are easier to learn, we expect that the total vocabulary size of children learning language pairs with many cognates will be larger than that of children learning languages with few cognates, and will be made of more translation equivalents. Our predictions were supported in the data. These findings support our hypothesis that similarity between a bilingual's two languages can be linked to advantages in learning translation equivalents.

The effect of frequency and salience on the acquisition of infrequent morphemes

Jekaterina Mazara; Sabine Stoll

Frequency of occurrence in the input is a main factor determining the ease of acquisition in first language learners. However, little is known about the factors relevant for the acquisition of low-frequency items. We examine the use of aspectual markers in a longitudinal corpus of Chintang (Sino-Tibetan, Nepal) children (ages 2;1-4;5). Only 7.7% of all Chintang verbs are overtly marked for aspect. Chintang has three aspect markers, one of which is substantially more frequent than the others. One of the low-frequency markers is positionally and prosodically more salient, appearing at the word-boundary.

Using a Bayesian beta-binomial model, we assess the distribution and flexibility of use of aspectual markers in the input and children's production. Our analysis shows that the most frequent marker is acquired earliest, as predicted. For the low-frequency markers, position, segmentability and uniformity are better predictors of ease of acquisition.

The effect of input modality on children's experience-based language learning: An online syntactic priming study

Leone Buckle; Katherine Messenger; Holly Branigan; Laura Lindsay

Children's linguistic input facilitates their language development but do children learn from the input of online interactions (via audio + video or audio only) in the same way? We conducted an online syntactic priming experiment in which 58 three-year-olds (Mage = 3;6) and 62 five-year-olds (Mage = 5;7) alternated describing pictures with an experimenter who used active (a cat chased the dog) and passive (the dog was chased by a cat) primes. Pictures were embedded within a PsychoPy experiment and shown via screen-share on a Microsoft Teams call. Half the participants received input from the experimenter via video + audio while the remainder received input via audio only. Priming effects in both age groups were unaffected by input modality, though older children produced more passives overall. This evidence suggests that children learn from syntactic input provided by online interactions and supports the use of online syntactic priming experiments to study children's language learning from speech input.

The impact of child-directed language on children's lexical development

Shiyu Dong; Yan Gu; Gabriella Vigliocco

This study investigated (1) whether and how English caregivers adjust their speech (i.e., mean length of utterances, lexical diversity, lexical sophistication, sentence types, and deixis) according to different contexts, children's knowledge, and age, and (2) which certain aspects of speech input predict children's immediate learning of novel words and vocabulary size. We studied a semi-naturalistic corpus, in which English caregivers talked to their children (3-4 years old) about toys that were present or absent, and known or unknown to the children. We found that caregivers flexibly adjusted various aspects of their speech to maintain an informative and engaging learning environment. Furthermore, we found that rich lexicon and yes-no questions predict better immediate word learning and concurrent vocabulary size, and lexical diversity, lexical sophistication and fragments predicted vocabulary size one year later (but were mediated by children's concurrent vocabulary size). In conclusion, higher quality of caregivers' language predicts better word learning.

The interpretation of Chinese plurals by children

Yi Liu; Kook-Hee Gil

We investigate how children interpret plurality in the absence of obligatory marking in their L1, more specifically the inferences that the use of optional overt plural marking can trigger. We tested pre-school Chinese children in their interpretation of bare nouns (BNs) and -men plurals in positive and negative contexts. The results reveal children interpreted BNs with an inclusive reading in both positive and negative contexts; for -men Plurals, the inclusive reading was dominant by two thirds in the positive context, and it was almost the only interpretation in the negative. We conclude that BNs are similar to bare plurals in languages with obligatory plural marking. We analyse -men as a weak marker which, while highlighting the exclusive reading of the plural, is not strong enough to override the base meaning. It also supports the findings that all nominals crosslinguistically are number neutral whether or not they have overt plural marking.

The lexical skills of Maltese bilingual preschoolers having different socioeconomic backgrounds: Effects of primary caregiver language input

Roberta Baldacchino; Daniela Gatt

A higher SES is associated with enriched child-directed language input (e.g., Rowe et al., 2012). This paper will report on a study which sought to explore the associations between SES, caregiver language input and lexical skills in Maltese-dominant children. Thirty-eight typically-developing 3;04-3;08-year-old children were recruited along with their primary caregivers. A compound SES measure categorised the caregiver-child dyads in low, medium or high SES groups. The children's receptive and expressive lexical skills in both Maltese and English were assessed using receptive picture name judgement and picture naming tasks. Samples of caregiver language input were obtained from naturalistic adult-child play sessions that took place in the participants' homes. Counts of tokens (total words) and types (unique words) in caregiver input were derived, serving as measures of input quantity and quality. Results showed associations between the quantity and quality of caregiver input and SES, implying an influence on second language lexical abilities.

The optimal period for learning new function words in children

Sarah Massicotte-Laforge; Rushen Shi

We hypothesized that functional items enter into the lexicon during the initial few years of life when basic phrase structures are being acquired, and after this optimal period, the class is closed, disfavouring new members. In a preferential looking experiment, French-learning 24- and 30-month-olds were exposed to a pseudo-determiner ‘guin’ and French determiners ‘un’, ‘des’, ‘ton’ co-occurring with pseudo-nouns. Subsequent familiarization sentences contained all non-words, with ‘guin’ preceding a new pseudo-noun ‘felli’. Test trials presented ‘le felli’ (“the felli”) versus ‘tu felli’ (“you felli”). Results: 24-month-olds, but not 30-month-olds, learned the pseudo-determiner and used it for categorization. Thus, unlike content words, which are open for new members throughout life, the optimal period for learning new functors is the initial two years, after which children become less inclined to accept new functors. We propose that children start disfavouring new functors when their rudimentary phrase-structure representations are in shape (by 2.5 years).

The Recursive Set-Subset Ordering Restriction Overrides Adjective Ordering Restrictions: Evidence from Romanian 4-year-olds and adults

Adina Camelia Bleotu; Tom Roeper

Our paper brings experimental evidence from Romanian 4-year-olds and adults that orderings of adjectives which reflect hierarchical structure and entail the recursive set-subset ordering (RSSO) are stronger than universal crosslinguistic adjectival ordering restrictions (AOR). We used a forced choice preferential naming task, to see how participants would name groups of objects/animals in contexts which required going against the AOR. Regardless of whether the adjectives named color or size, participants chose to place set adjectives closer to the noun than subset ones. For instance, in a context where they identified green leaves out of a set of big leaves of various colors, children and adults preferred to name them "frunze mari verzi" (‘green big leaves’), even if the natural order would be "frunze verzi mari" (‘big green leaves’). Thus, we argue that RSSO reflects the core structure-building capacity of Merge, taking priority over the AOR.

The role of infants' point-following skills on the relation between mothers' pointing and infants' word comprehension

Sura Ertaş; Ebru Ger; Sümeyye Koşkulu; Aylin Küntay

The present study examined whether mothers' pointing frequency at 12 months predicts their infants' word comprehension at 14 months and whether infants' point-following skills at 12 months moderates this relationship. We longitudinally examined the interactions of 38 Turkish-speaking mother-infant dyads from different SES backgrounds. We used the decorated room paradigm to measure pointing frequency and the point-following paradigm to measure infants' point-following skills at 12 months. We used MacArthur-Bates Communicative Development Inventory-Turkish to test infants' word comprehension at 14 months. We regressed infants' word comprehension ability on mothers' pointing frequency, infants' point-following category (binary coded as 'follower' vs. 'non-followers), and their interaction. We found a significant interaction effect. Mothers' pointing frequency was predictive of infants' word comprehension only for infants who were 'followers' of pointing. The ability to follow others' pointing might allow more opportunities for infants to give attention to objects pointed and more likely to learn about them.

The role of L1-L2 similarity in L2 predictive processing: An ERP study

José Alemán Bañón; Clara Martin

We used EEG to investigate how L1-L2 similarity modulates L2 predictive processing. Participants read predictive stories in English that made a genitive construction such as "his mother" likely in an upcoming continuation. We tested English L2ers with either Swedish or Spanish as their L1. In English and Swedish, third-person singular possessives mark the possessor noun's natural gender. In contrast, Spanish possessives mark the possessed noun's number/grammatical gender.

24 English native speakers and 32 Swedish-speaking learners yielded an N400 effect for unexpected possessives, which might reflect difficulty with the retrieval of an unexpected form/semantic feature. In contrast, 25 Spanish-speaking learners elicited a P600 for unexpected possessives, possibly reflecting difficulty with the integration of a possessive pronoun that mismatched the possessor's gender. Results suggest that L1-L2 differences with respect to the features encoded in the activated representation impact learners' predictions.

The role of shared variation on the acquisition of variable rules

Yiran Chen; Kathryn Schuler

Children are known to regularize variation in some contexts and to learn and match variation in others But precisely what leads children to acquire rather than regularize variation is not well understood. Researchers have used experiments to demonstrate that children and adults are less likely to regularize in cases where variation is conditioned or exposure is increased. However, none have found learners to match variation as precisely as shown in the developmental sociolinguistic literature. In the present work, we ask whether variation shared by a community contributes to learners acquiring the constraints on its use. Our results suggest that learners acquire the constraints on variation more accurately when it is shared by a community of speakers (Exp1), even when those speakers do not match the community-level pattern precisely (Exp2). When a rule is variable at the community-level, but not for individual speakers, learners are more likely to regularize (Exp3).

The wh-phrase should go where? Modeling the acquisition of question variants in English

An Nguyen; Colin Wilson

When being exposed to multiple variants of the same grammatical target, preschoolers tend to only produce the dominant variant. For example, despite having exposure to fronted information-seeking, in-situ information-seeking, and in-situ echo questions, preschoolers only produce the dominant fronted wh-questions in both spontaneous speech and elicited tasks. We modeled this acquisition pattern in the case of wh-question using non-parametric Bayesian and investigated specifically the effect of the input size N and the learner's parsimony bias α. The model showed a developmental trajectory that closely matched the empirical results and was more sensitive to N than to α. The interaction between N and α suggests that the regularizing pattern in wh-question acquisition may be due to an initial parsimony bias for learning a smaller number of categories, which can be overridden after sufficient exposure to the variable pattern to learn multiple variants in a way that matches the adult pattern.

Thiamine supplementation for lactating mothers benefits language processing in infants at risk of thiamine deficiency

Dare Baldwin; Jeffrey Measelle; Lauren Gallivan; Anna Sanchirico; Netanel Weinstein; Hou Kroeun; Prak Sophonneary; Kyly Whitfield

Millions of infants in regions such as Southeast Asia are at risk of thiamine deficiency, which undercuts neuro-cognitive development. In the context of a double-blind, randomized, controlled trial, we undertook the first experimental test of a relationship between infants' access to thiamine and their language-processing ability. 335 lactating Cambodian mothers were randomly assigned to receive capsules containing either 0, 1.2, 2.4, or 10mg of thiamine daily, from 2 to 24 weeks postpartum. We measured infants' language processing at 24 weeks via attentional enhancement to infant-directed (IDS) versus adult-directed speech (ADS). Maternal thiamine supplementation displayed a dose-response relationship to the magnitude of infants' IDS-elicited attentional-enhancement. Only infants whose mothers received the 10mg daily supplement displayed a statistically significant IDS-related attentional enhancement. These findings showcase the value of the IDS task for monitoring the integrity of infants' language processing, and underscore the importance of adequate thiamine for ensuring infants' optimal language development.

Timing and power in gap filling in nonnative vs. native French

Laurent Dekydtspotter; Kate Miller; Michael Iverson; Yanyu Xiong; Kyle Swanson; Charlene Gilbert

Clahsen and Felser (2018) proposed delayed structural versus lexical/semantic information in L2 processing. We examined the intrinsic activity of the brain in cell-assembly synchronizations for fillers and gaps implicating (unselected) Modifiers (1a/a') versus (selected) Complements (1b/b') at the embedded-clause edge dit que 'said that' in native and nonnative French.

(1) a/a′ Quelle décision le concernant est-ce que Paul/Lydie a dit que Lydie/Paul avait rejetée sans hésitation?

(1) b/b′ Quelle décision à propos de lui est-ce que Paul/Lydie a dit que Lydie/Paul avait rejetée sans hésitation?

'Which decision regarding/about him did Paul/Lydie say that Lydie/Paul had rejected without hesitation?'

Delayed structural versus lexical constraints in nonnative processing was not supported in filler-gap synchronizations. We found more power to Modifiers in natives but to Complements in nonnatives in the beta band, suggesting nonnative processing focused on lexical specifications in computations. L2 processing seems better characterized by a greater focus on lexical specifications.

Toddlers fail to use prosodic information to guide their interpretation of novel verbs in ellipsis sentences

Leticia Schiavon Kolberg; Alex de Carvalho; Anne Christophe

Toddlers use prosodic information to constrain parsing, however this ability varies depending on whether they are presented with familiar or novel words. While a recent study demonstrated that children exploit prosodic information to distinguish between transitive vs. ellipsis sentences containing familiar verbs, the present study investigated whether French 30-42-month-olds can use prosody to constrain their interpretation of a novel verb ('dase') inside ellipsis "[The baby 'dased'!][The mommy too!]" vs. transitive sentences "[The baby]['dased' the mommy too!]". Children were presented with dialogues containing one of these two types of sentences, and then were asked to "find who's dasing" while watching two videos: a two-participants causal action vs. a one-participant action. The results showed that children in both conditions interpreted the novel verb as transitive, looking longer towards the causal action. This suggests that children's ability to use prosody for parsing/word learning is affected by the type of sentences tested.

Toddlers with ASD anticipate words during real-time language processing

Kathryn Prescott; Janine Mathee-Scott; Tracy Reuter; Jan Edwards; Jenny Saffran; Susan Ellis Weismer

Recent theories posit that differences in predictive ability may underlie language difficulties in children with ASD. However, previous studies testing this framework have largely focused on school-aged children. To address this limitation, the present study employed an established looking-while-listening task to examine predictive language processing among young (3- to 4-year-old) children with ASD (n = 34) and language-matched typically-developing (TD) children (n = 34). Children viewed two images (e.g., a cake and a ball) and heard sentences which enabled predictions (e.g., Eat the cake) and neutral sentences (e.g., Find the cake). Results indicated that receptive language (but not diagnostic status) is positively associated with predictive processing ability. These novel findings extend previous evidence from older children. By examining predictive language processing among a younger cohort of children, this study informs the ongoing debate regarding the role of prediction ability in language development among both TD and ASD populations.

Tolerance for distributivity? Children's interpretation of plural expressions in Dutch

Irene Mognon; Else Hagen; Anna de Koster; Petra Hendriks

Whereas adults strongly prefer a collective interpretation for sentences with definite plurals like "The girls are washing a dog", children frequently select a distributive interpretation and take the sentence to mean that multiple dogs are being washed separately (e.g., Syrett & Musolino, 2013; De Koster et al., 2017). One explanation for this pattern is that adults block the distributive interpretation via the generation of an implicature, but children fail to generate this implicature (Dotlacil, 2011; de Koster et al., 2017). Children's apparent failure to generate implicatures has been argued to be an effect of their pragmatic tolerance in binary judgment tasks (Katsos & Bishop, 2011). Ternary judgment tasks are argued to better reflect their adult-like pragmatic competence. In this study, we tested 50 Dutch-speaking children aged 7-10 and 20 adult controls on their interpretation of sentences with definite plurals in a ternary judgment task.

Translation equivalents are not special in bilingual infant vocabulary development: Evidence from a quantitative model

Rachel Ka-Ying Tsui; Ana Maria Gonzalez-Barrero; Esther Schott; Krista Byers-Heinlein

Contrasting theories have proposed to explain translation equivalent learning in bilingual infants: that they are avoided, enhanced, or independent of learning the corresponding word in the other language. We developed a novel quantitative model that conceptualizes translation equivalents as the joint probability of learning the word in each of the infant's two languages. The number of translation equivalents an infant produces at a given age was therefore modeled as a function of infants' vocabulary size in each language and the number of potentially learnable words at the infant's age. Our model provided an excellent fit to vocabulary data collected from 201 French–English bilingual 18- to 33-month-olds. Parameter estimates suggested that translation equivalent learning is neither avoided nor enhanced, but instead that translation equivalents are learned independently from one another. Translation equivalents are not special in bilingual infant vocabulary acquisition, but are expected outcomes of independently learning words in two languages.

Two roles for development in language change: The case of English of and -s possessives

Erin Hall; Ana Pérez-Leroux

This study examines child acquisition of English possessives, which vary between the Saxon genitive -s and the preposition of. The -s genitive is currently gaining in frequency in many dialects, as speakers increasingly apply this form to certain types of inanimate possessors. Using an elicited production task, we investigate age and animacy effects on possessive use. Results show that the youngest children (4-6) use the genitive significantly more often than adult controls overall; the middle group (7-9) does not differ from adults, but a marginal increase in genitive use is observed in the older group (10-12). These results suggest two distinct roles for development in language change: overgeneralization of the genitive by young children, and pre-adolescent incrementation of the change towards -s.

Types of passive voice in children's books and child-directed speech

Ruth Altmiller; Kathleen Corriveau; Sudha Arunachalam

The passive is notoriously late acquired by English learners. One potential contributing factor to its difficulty is its low frequency in English child-directed speech (CDS). However, children with greater access to books may hear more passives because children's books contain more complex syntax than CDS, including more passives (Montag, 2019). If book text supports passive acquisition, it may be because some passive types are more helpful than others. We analyzed children's books and CDS, both addressed to children ages 3 to 5 years, and we coded passive types in detail, distinguishing adjectival passives from verbal passives, and coding the verbs for lexico-semantic properties following Nguyen and Pearl (2017). Our results indicated no significant differences in frequency of different types of passives in children's books compared to CDS, suggesting that at least for 3- to 5-year-olds, book exposure alone is unlikely to account for individual differences in passive competence.

Typology vs structure: Transfer in L3 Italian

Martine Gallardo; Silvina Montrul

In L3 acquisition one or both previously acquired languages may selectively transfer. Two recent models, the Typological Primacy Model (TPM) (Rothman, 2011) and the Linguistic Proximity Model (LPM) (Westergaard, 2019) make different claims about what conditions multilingual transfer: typology for the TPM and abstract structural similarity for the LPM. The present study tests these models by comparing three groups: an L1 Spanish - L2 English - L3 Italian group, an L1 English - L2 Italian group, and an L1 Italian control group to determine if typology or abstract structural similarity is the chief factor conditioning transfer in the acquisition of L3 Italian. Results from performance with Differential Object Marking and Psych Verbs demonstrate that each structure was subject to transfer from a different language, supporting the LPM's granular, structure-driven view of transfer over the typologically driven view of the TPM.

Uh what did you say? Children's parsing preferences are altered by experience with disfluent sentences

Cindy Chiang; Toben Mintz

Children can be primed by a structure they have recently heard and subsequently produce or anticipate the same structure. This effect is more likely to occur when primes are surprising. However, disfluencies (*thee uh*) frequently co-occur with surprising sentences. Moreover, recent work suggests that children may anticipate alternative sentence structures when encountering disfluencies. This anticipation could lead to differences in how well expectations align with the input and, consequently, differences in how likely children are primed. However, whether disfluencies modulate priming effects has not been explored. In a preferential looking study using Lookit, we examine this possibility with three-year-olds and five-year-olds. We found preliminary evidence that five-year-olds' parsing preferences can be altered by disfluent primes. When five-year-olds heard primes with disfluencies, they did not prefer the prime structures they recently heard as strongly. The nature of this effect depended on how consistently the speakers produced the prime structure.

Unlearning L1 options and incomplete acquisition: The case of CLLD in Italian and Romanian

Liz Smeets

This project investigates the acquisition of CLLD by English and Romanian near-native speakers of Italian and English and Italian near-native speakers of Romanian. While English does not instantiate CLLD, Italian and Romanian do, but the languages differ in the contexts in which it is used. The L2 learning task depends on properties of the L1; English learners of Italian or Romanian have to acquire the syntax and function of CLLD from scratch (topicality for Italian and specificity for Romanian), Romanian learners of Italian and Italian learners of Romanian have to reconfigure the mapping of the relevant feature onto the syntactic structure. Results show that while English near-native speakers of Italian or Romanian perform target-like, Romanian learners of Italian and Italian learners of Romanian show persistent L1 effects. Specifically, difficulties with feature reconfiguration may pertain when negative evidence is required to unlearn L1 options.

US Spanish-English bilingual speakers transfer glottal stops at word junctures

Gemma Repiso Puigdelliura

This study examines phonological language transfer from English into Spanish in the bilingual child and adult production of word-external consonat-to-vowel sequences. While Spanish speakers produce close junctures by resyllabifying the coda consonant into the following syllable (i.e., un oso [u. no.so] ‘a bear’), English speakers optionally insert a glottal stop between the consonant and the vowel in prosodically prominent positions (e.g., an [ˈʔæ]pple). 112 child and adult bilinguals from the US and Mexico participated in a word production task eliciting function + content words (e.g., un hombre ‘a man’). Our study shows that US Spanish-English bilinguals transfer glottal stops at /C#V/ sequences and that they do so more often between the ages of 5 to 8 years. That is, US Spanish-English bilinguals show phonological transfer in word-external phonological processes and this transfer is more robust during language maturation (5-8 y.o.).

Verb type, but not event structure, affects children's pronoun interpretation

Amanda Rose Yuile; Fisher Cynthia; Laura Wagner

Adults preferentially link pronouns with prior grammatical subjects, but also link pronouns with goals rather than sources of preceding transfer events (Arnold, 2001); this goal bias increases when the transfer is aspectually marked as complete (handed vs. was handing; Kehler & Rohde, 2013). We used a passage-completion task to ask whether and when children use verb-type and event structure (aspect) to interpret pronouns. In Expt-1, adults and 5- and 6-year-olds showed an overall bias toward subject interpretations and effects of verb-type. Adults, but not children, showed a significant effect of aspect. Expt-2 tested 5- and 6-year-olds, confounding tense with aspect; children again showed an effect of verb-type, but not aspect. Our results provide new evidence for early-developing effects of broad event category on reference expectations, and for two developmental changes: The subject bias increased from childhood to adulthood, and aspectual markings of event structure did not affect children's pronoun interpretation.

Verbal/non-verbal referential acts and information status in Mandarin-speaking children's conversation

Kanyu Yeh; Chiung-chih Huang

The study examined verbal/non-verbal referential acts of Mandarin-speaking children at age five to understand whether and how the children distinguish referents of different information status in the two modalities. Results showed that the children produced mostly verbal-only acts and verbal-non-verbal combinations. Their referential choices in both modalities were influenced by information status. They used more cross-modal acts to refer new referents and more verbal-only acts to indicate old referents. The children chose more informative forms, including nominal forms, and pronominal forms with gestures for new referents, while they used more reduced forms such as null forms for old referents. Furthermore, their cross-modal acts were more likely to convey complementary information for the identification of new referents, and to express supplementary information for old referents. The findings demonstrated the children's referential ability across modalities, and suggested that their referential choices in both modalities may reflect their communicative and pragmatic ability.

Wearing causation on its sleeve: Overt CAUSE in child French causatives

Fabienne Martin; Yining Nie; Artemis Alexiadou; Maria Teresa Guasti

Children have been shown to use overt causative marking superfluously, using a double causative ('make show') to express the meaning of lexical causatives ('show'), that we assume to have the representation [CAUSE ResultP] in adult and child grammar. Alexiadou, Guasti and Sauerland (2021) proposed that children are biased towards a one-to-one correspondence between conceptual structure and language, and that commissive errors in child language are overt realizations of a complex conceptual structure `compressed' in adult language. We hypothesize that children producing superfluous causative marking map [CAUSE] to the overt causative and [ResultP] to the embedded verb. We therefore expect commissive marking to appear only when the expressed meaning is causative. We tested this hypothesis on child French through an examination of productions of 'faire' + infinitive in the CHILDES database. Our results support our approach to commissive causative productions as the overt realization of each conceptual component of a lexical causative structure.

What counts as seeing? Young children's comprehension of Direct Perception and Inference reports

E. Emory Davis; Barbara Landau

Young children can reason about direct and indirect visual information, but fully mapping this understanding to linguistic forms encoding the two knowledge sources appears to come later in development. In English, perception verbs with small clause complements ("I saw something happen") report direct perception of an event, while perception verbs with sentential complements ("I saw that something happened") can report inferences about an event. In three experiments, we examine when 4-9-year-old English-speaking children have linked the conceptual distinction between direct perception and inference to different complements expressing this distinction. We find that unlike older children or adults, 4-6-year-olds do not show an understanding in comprehension that see with a sentential complement can report visually-based inference, even when syntactic and contextual cues make inference interpretations highly salient or when asked about their own experiences. This suggests a prolonged developmental trajectory for learning the syntax-semantics mapping of perception verbs like see.

When do children become able to revise in an adult-like manner? Examining the role of cognitive control and socioeconomic background in children's ability to revise

Matthias Lebreton; John Trueswell; Alex de Carvalho

During spoken language comprehension, 4-to-6-year-olds have difficulty revising incorrect interpretations. Although around 8-to-9 years, children start to revise misinterpretations, it remains unknown when they become able to revise like adults, and what determines individual differences in this ability is debatable. Some recent research on individual differences suggests that errors in revision reflect immature cognitive control skills whereas others suggest they reflect variation in linguistic knowledge. To explore this issue, here we investigated how cognitive control skills and socioeconomic background, as a proxy for language variation, relate to revision within the same children, from 8 to 12 years. Our results show that only after age 10, children become fully able to revise like adults. Across development, children from higher-SES backgrounds revised mispredictions better than their lower-SES peers. This suggests that variation in revising after age 8 may be related more to linguistic knowledge and socioeconomic factors than to cognitive control.

Why is ambiguity detection in kindergarten a predictor of later reading abilities?

Violette Bigot; John Trueswell; Alex de Carvalho

Recent studies demonstrated that 5-to-6-year-olds' abilities to detect and solve ambiguities in speech is a strong predictor of their later reading abilities in first-to-third grade. However, the origins of this relationship remain unclear. For some researchers, success in ambiguity detection/resolution is reflective of global language knowledge, while for others, it is reflective of cognitive control skills. In this study, we examined the contributions of oral language knowledge, SES, and cognitive control skills to children's ability to detect ambiguities and the relationship among all these factors to early reading development. Our results show that 5-to-6-year-olds vary greatly in their ability to detect both lexical and structural ambiguities. Moreover, regression analysis revealed that children's cognitive control skills is the strongest predictor of kindergarteners' ambiguity resolution abilities. This is the first study demonstrating that the ambiguity detection task designed to predict reading performance in children is also reflecting their cognitive control skills.

Working memory and syntax

Jhovana Sandoval Estrada; Michel Zuñiga Espinosa; John Grinstead

Does the argument/adjunct distinction matter for children's developing working memory abilities? Developmental working memory/syntax research does not take this distinction into account. Do argument and adjunct clauses have the same relationship to working memory? Do they have the same relationship to measures of morphosyntax, such as mean length of utterance (MLU), and to measures of lexicon, such as Number of Different Words (NDW)? 60 typically-developing monolingual Spanish-speaking children provided unstructured and Frog Story language samples. The Argument Index measures from the spontaneous sample predicted auditory working memory and the Adjunct Index measure predicted lexical and morphosyntax measures calculated from the Frog Story sample. Our results are consistent with the hypothesis that saturation of the matrix verb's predicate and satisfaction of its syntactic selection requirements require greater working memory resources than does the addition of a freely-combining adjunct to a sentence.