Kick-off Symposium
Infancy Research from Asia

Speakers:

Chutamanee Onsuwan (Thammasat Univ., Thailand)
Youngon Choi (Chung-Ang Univ., Korea)
Shelley Xiuli Tong (Univ. of Hong Kong, Hong Kong)
Masahiro Imafuku (JSPS postdoctoral fellow / Univ. of Tokyo, Japan)
Ayaka Ikeda (Kyoto Univ., Japan)
Hoshinori Kanazawa (JSPS postdoctoral fellow / Univ. of Tokyo, Japan)
Yusuke Moriguchi (Kyoto Univ., Japan)

Host:
Reiko Mazuka (RIKEN)

Language:
English

Admission:
Free

Registration:
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Laboratory for Language
Development
RIKEN BSI

8th Aug. 2017
10:00～17:00

Ikenohata Research Bldg.
3F Conference Room
RIKEN Brain Science
(2-1 Hirosawa, Wako City
Saitama, Japan)

「アジアから発信する赤ちゃん研究」　キックオフシンポジウム

Time Table	
10:00-10:05	Opening Remark(Dr.Mazuka)
10:05-10:50	Cracking Chinese orthographic codes: Statistical learning as a key to understanding developmental dyslexia in Chinese.　　　(Dr. Tong)
10:55-11:35	The perception-production link and eye contact effects in infant's vocal imitation.　　　(Dr. Imafuku)
11:35-11:50	General Discussion
11:50-12:50	Lunch Time
12:50-13:30	Embodiment and sensorimotor interaction in early developmental stage.　　　(Dr. Kanazawa)
13:30-14:15	Emergence of Korean infants' ability to discriminate the three-way stop contrasts: Contribution of initial biases and nature of input.　　　(Dr. Choi)
14:20-15:00	Sensitivity to linguistic registers in Japanese children.　　　(Ikeda)
15:00-15:20	Coffee Break
15:20-16:05	Production and perception patterns of Thai lexical tones: Current data from Thai children, adults, and hearing-impaired individuals.　　　(Dr. Onsuwan)
16:05-16:45	Development of executive function during early childhood.　　　(Dr.Moriguchi)
16:45-17:00	General Discussion
17:30-20:00	Reception for Exchange of Opinions at Hirosawa Club

Access：
埼玉県和光市広沢2-1
理化学研究所
池の端棟(C56)3F会議室

●Official HP・URL：
http://lang-dev-lab.brain.riken.jp/symposium.html

★事前登録がお済の方：

西門守衛所受付にて「アジア乳幼児研究のシンポジウム」にご参加の旨とお名前・ご所属をお伝えください。守衛より入構証が手交されます。

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西門守衛所受付にて「アジア乳幼児研究のシンポジウム」にご参加の旨とお名前・ご所属をご記帳ください。守衛より入構証が手交されます。

（お手数ですが、会場でも記帳にご協力お願いいたします）

Cracking Chinese orthographic codes: Statistical learning as a key to understanding developmental dyslexia in Chinese.

Dr. Shelley Xiuli Tong
The University of Hong Kong, Hong Kong

Despite the diversity of word-spelling patterns and regularities that exist in different orthographies, it has been commonly reported that orthographic learning, or the process of acquiring word-specific orthographic patterns and general pattern-like orthographic regularities that govern word-specific representations, is fundamentally important to word reading development in Chinese, a non-alphabetic orthography. In this talk, I will report three experiments examining statistical learning of the three key aspects of Chinese orthographic regularities (i.e., positional, phonetic, and semantic regularities) in Chinese children with and without developmental dyslexia. We tested groups of Chinese children (children with dyslexia (mean age 10.8 years), age-matched controls and reading-level matched controls (mean age 8.53 years) in three artificial orthographic learning experiments that assessed learning of positional, phonetic and semantic information of unlearned novel characters. All three groups of children exhibited significant learning of positional regularities, phonetic regularities and semantic regularities of novel characters. Children with dyslexia showed statistical learning that was comparable with age-matched control and reading-level matched children when learning positional and phonetic regularities, but their performance on learning semantic regularities was significantly worse than that of age-matched controls. These findings suggest that statistical learning is a potential mechanism that underlies Chinese orthographic learning, and that children with dyslexia have challenges in some, but not all, statistical learning tasks. In accordance with these findings, we proposed a statistical learning account of orthographic learning that incorporates language-general and language-specific constraints of statistical learning of a novel orthography.

The perception-production link and eye contact effects in infant's vocal imitation.

Dr. Masahiro Imafuku

JSPS postdoctral fellow/The University of Tokyo, Japan

Vocal imitation plays a fundamental role in human language acquisition from infancy. Little is known, however, about which factors facilitate this ability. Two candidate factors involve (1) the infant's observation of the mouth (i.e., imitating sounds using one's own mouth is best facilitated by observing the mouth of the speaker producing these sounds), and (2) the speaker directing their gaze towards the infant (i.e., providing a direct cue for communicative intention towards the infant). We recorded the eye movements of 6-month old infants who participated in experiments involving vocal imitation. As a result, we found that infant's tendency to vocally imitate videos of a speaker increased as a function of their looking time towards the speaker's mouth. Furthermore, we found that infants produced more vocal imitation when videos of the speaker involved directly looking towards the infant rather than away from the infant. These findings confirm that the link between speech perception and production is facilitated by infant's observation of the speaker's mouth, and the speaker's gaze towards the infant.

Embodiment and sensorimotor interaction in early developmental stage.

Dr. Hoshinori Kanazawa

JSPS postdoctral fellow/The University of Tokyo, Japan

Complex interactions between the body, environment and nervous system may contribute to developmental changes in the sensorimotor networks that support behavioral performance. Despite the accumulating evidence supporting this kind of concept, how sensorimotor experiences guide early human development remains unclear. One of the reasons is the lack of quantification of sensorimotor networks and related factors during infancy. In this talk, I will introduce some novel techniques and theoretical background that lead us to a deep understanding of early sensorimotor development. The main topic is the quantification of the information structures of sensorimotor networks in spontaneous movements of human neonates and infants. We estimated muscle outputs and proprioceptive feedbacks by the combined use of experimental data of whole-body kinematics and a musculoskeletal model of the human infant. In addition to investigating developmental change, we compared these observational data with simulated whole-body infantile movements in silico to deepen our understanding. These novel approaches can provide a mechanistic understanding of sensorimotor development through complex interactions between the body, environment and nervous system.

Emergence of Korean infants' ability to discriminate the three-way stop contrasts: Contribution of initial biases and nature of input.

Dr. Youngon Choi
Chung-Ang University, Korea

On conventional accounts, infants can discriminate most phonetic contrasts innately, and learn to conflate similar sounds not contrasted in the native language [1]. How this learning happens is not well understood, partly because the range of contrasts tested is too limited. We tested Korean infants' discrimination of three-way stop contrasts. Korean's stop contrasts vary along the positive voice onset time (VOT) spectrum: fortis, lenis, and aspirated (e.g., */p*u/*, */pu/*, and */phu/*). Interestingly, while older Korean speakers use VOT to distinguish lenis and aspirated stops, younger speakers use F0 [2]. Analysis of Korean mothers' production revealed that although fortis and aspirated differed primarily in VOT, lenis stops differed both in VOT and F0. Young English learning infants are sensitive to VOT cues [3]. If young infants' early discrimination is based on certain innate acoustic cues, but not all possible phonetic cues, we predict that young Korean infants should be able to discriminate fortis from aspirated stops, but the other pairs should only be discriminated by older infants. Using visual habituation, we tested 4-6-month-old Korean infants on discrimination of fortisaspirated, lenis-aspirated, and fortis-lenis pairs. Infants discriminated the fortis-aspirated pair (N=24, $F(1, 20) = 9.229$, $p = .006$), but not the fortis-lenis pair (N=22, $F(1, 18) = 0.04$, $p = .952$) or the lenis-aspirated pair ($F(1, 21) = 1.051$, $p = .317$). Only 10-12-month-olds successfully discriminated the lenis-aspirated pair ($F(1, 23) = 7.393$, $p = .012$). These results confirm our prediction that Korean infants can discriminate the stop contrasts that are based on the VOT cue early on, while it takes about 10 months before they can exploit the F0 cues as well. Since infants are exposed to both older and younger speakers, their input for lenis-aspirated pair is mixed. This is likely to contribute to the difficulty for discrimination of this contrast for younger infants.

Sensitivity to linguistic registers in Japanese children.

Ayaka Ikeda
Kyoto University, Japan

In order to become a mature language user, children need to acquire not only language abilities, but also communicative competence. One component of communicative competence is using linguistic registers, which reflect changes in speech that depend on the situation, especially the status of the listeners and the listener-speaker relationships. If a register selection error was made, the error may sometimes be interpreted as rude behavior and make a bad impression on others. That is, linguistic registers help in smooth communication with others and therefore it is necessary to acquire them at a certain point during development. In this presentation, I will report two studies about children's sensitivity to linguistic registers. The first study examined a sprout of understanding of the linguistic register rules in toddlers. The second study examined older children's understanding of the meaning of a register selection in social situations and their evaluation of people who make errors in register selection. The development of the understanding of linguistic registers will be discussed.

Production and perception patterns of Thai lexical tones: Current data from Thai children, adults, and hearing-impaired individuals.

Dr. Chutamanee Onsuwan
Thammasat University, Thailand

Different perspectives from tonal production and perception data of young children (YC), normal-hearing adults (NHA), and adults with hearing impairment using hearing aids (HIA-HA) and those using cochlear implants (HIA-CI) will be given (based on our recent work in Thai). Tonal identification in Thai is generally robust. It took up to –24dB SNR for NHA performance to lower to 64 percent (intelligibility). Moreover, tone perceptual errors were much lower compared to initial and final consonants. When enhancing the tones, NHA produced significantly higher F0 values (rather than modifying tonal contours) for all five tones in noise condition. At the age of 2–3, YC were able to produce and differentiate the tones, but they did not achieve the mastery until later. Interestingly, it is suggested that order of perceptual development of the five tones did not progress in the same fashion as their production. Lastly, our preliminary results confirmed that tonal perception was greatly affected in HIA-HA and HIA-CI, and when it comes to tonal identification, both groups did not seem to significantly benefit from the hearing devices. Although F0 is regarded as primary acoustic/perceptual cue for Thai tones, our data suggested that influences such as diachronic stability and frequency of occurrence should not be overlooked.

Development of executive function during early childhood

Dr. Yusuke Moriguchi

Kyoto University, Japan

Executive function refers to the higher-order cognitive control process for the attainment of a specific goal. Extensive neuroimaging research in adults has revealed that the lateral prefrontal cortex plays an important   role in executive function. However, the neural mechanism of executive   function in young children is still unclear. My colleagues and I have examined the relationship between the development of cognitive shifting and the lateral prefrontal cortex in young children using near-infrared   spectroscopy (NIRS). In cross sectional and longitudinal studies, we found that the development of cognitive shifting was strongly correlated with the activations in the lateral prefrontal cortex. Moreover, our training program improved behavioral performances and the activations in the lateral prefrontal cortex during cognitive shifting task. Finally, we showed the relationship between the COMT gene and the cognitive shifting in young children. I'll discuss future direction in the research areas.