

Interpersonal Embodied Synchrony in Face-to-face Communication

—As a Visualization Method of BA—



Yoshihiro MIYAKE

Tokyo Institute of Technology

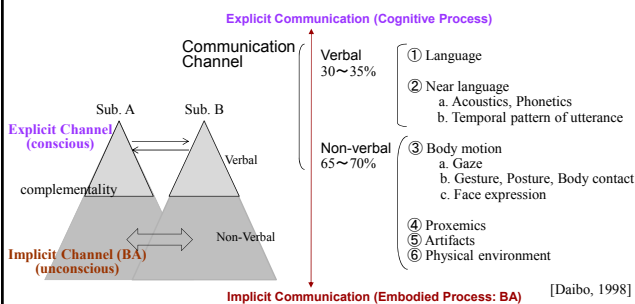
E-mail: miyake@dis.titech.ac.jp
URL: <http://www.myk.dis.titech.ac.jp>

Contents

1. Enlargement of Human Communication Channel
2. Relationship between Embodied Synchrony and Empathy
3. Embodied Synchrony in Social Communication
4. Neuroscientific Model of Embodied Synchrony and Empathy
5. Embodied Synchrony in Japanese Culture

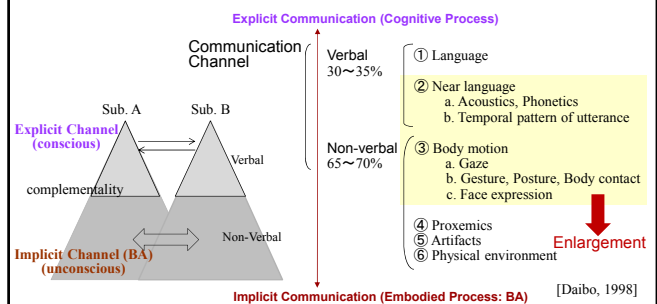
Human Communication Channel

We interact with many people in daily life, and this affects our behaviour and thinking. These interactions have been considered not only from the viewpoint of verbal and **explicit (conscious) interaction** but also with respect to nonverbal and **implicit (unconscious) interpersonal interaction**.



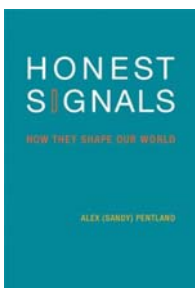
Human Communication Channel

We interact with many people in daily life, and this affects our behaviour and thinking. These interactions have been considered not only from the viewpoint of verbal and **explicit (conscious) interaction** but also with respect to nonverbal and **implicit (unconscious) interpersonal interaction**.

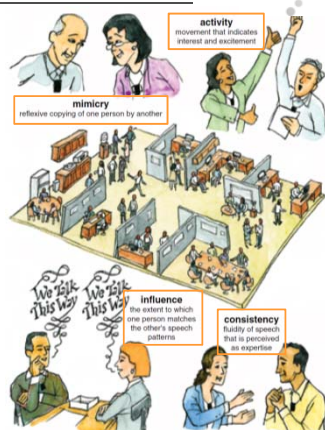


Importance of Non-verbal Communication

Alex Pentland
MIT Media Lab



Honest Signals: How They Shape Our World
The MIT Press (2010)



Human Communication Channel

We interact with many people in daily life, and this affects our behaviour and thinking. These interactions have been considered not only from the viewpoint of verbal and **explicit (conscious) interaction** but also with respect to nonverbal and **implicit (unconscious) interpersonal interaction**.

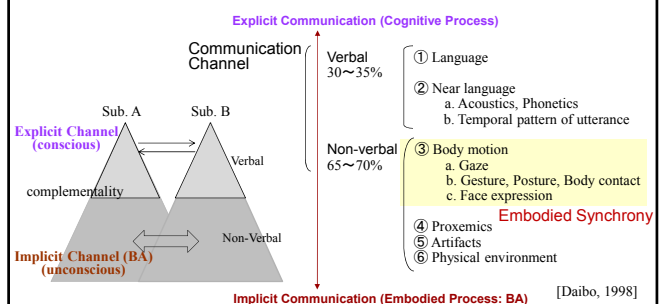
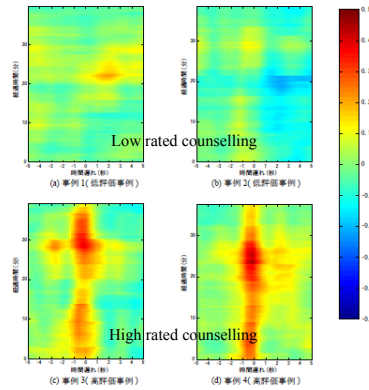




Fig. 1. Two-day-old neonate moving synchronously with adult speaking. "Come over and see who's over here." The transcription read vertically shows that the infant's configurations of movement coincide with the articulatory segments of the adult's speech. Definition of descriptive notation: *F*, forward or flex (depending on body part); *H*, hold; *D*, down; *E*, extend; *C*, close; *R*, rotate inward; *RO*, rotate outward; *AD*, adduct; and *U*, up. Lower case letters refer to speed: *s*, slight; *f*, fast; and *v*, very slight.

Condon & Sander
1974

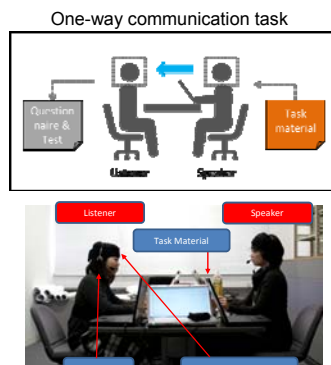
Neonate's motor behavior synchronized with adult's utterance

Nagaoka & Komori
2008

Positive correlation between body movement synchrony & positive evaluation of counsellor-patient relationship in psychotherapeutic counselling



1. Enlargement of Human Communication Channel
2. Relationship between Embodied Synchrony and Empathy
3. Embodied Synchrony in Social Communication
4. Neuroscientific Model of Embodied Synchrony and Empathy
5. Embodied Synchrony in Japanese Culture



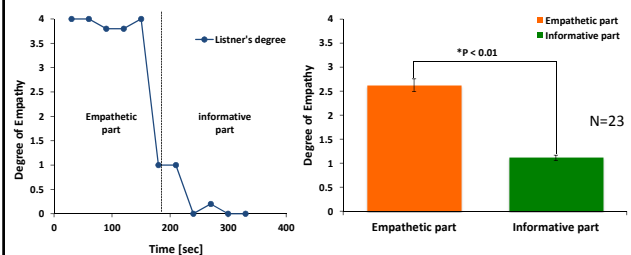
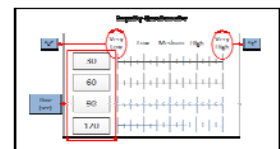
Inoue, Y., Ono, E., Kwon, J., Motohashi, M., Ikari, D., Ogawa, K., Miyake, Y., "Head motion synchronization in the process of consensus building," Proc. of the 2013 IEEE/SICE Int. Symp. on System Integration (SII2013), Kobe, Japan, pp.70-75 (2013)

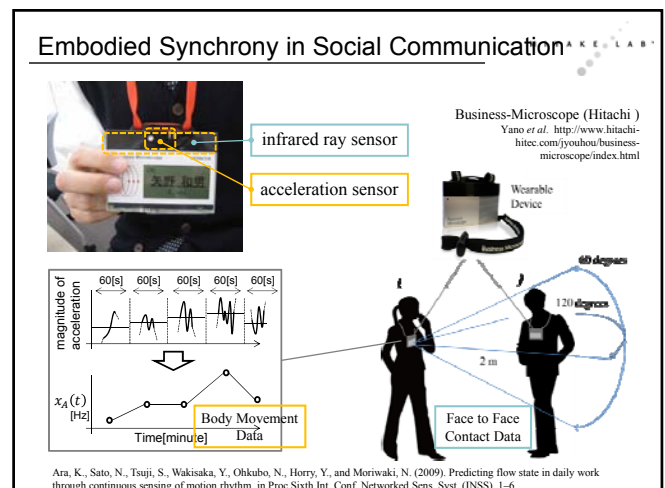
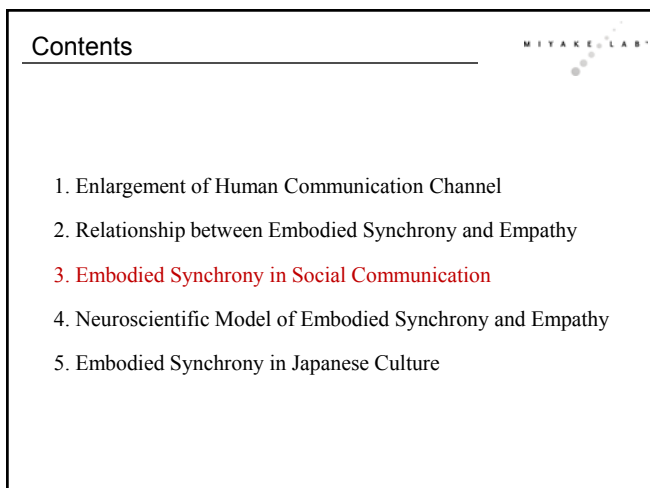
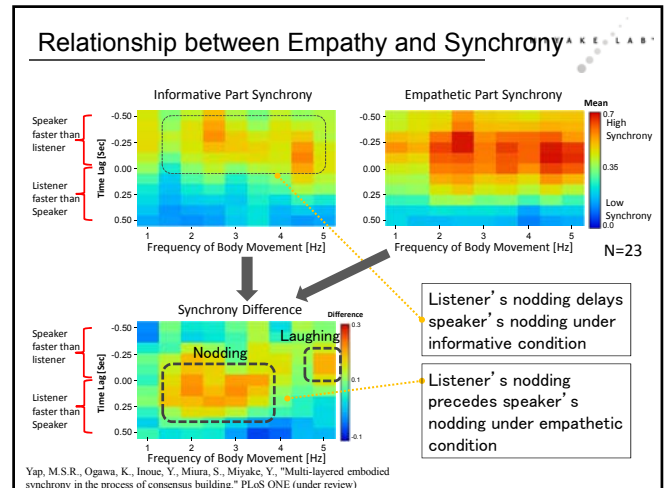
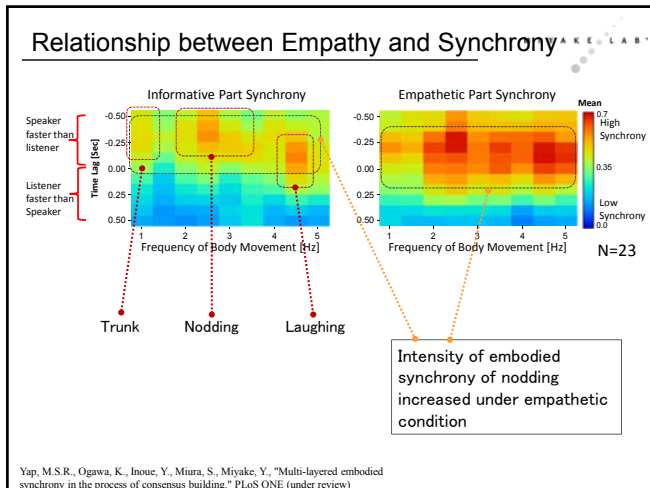
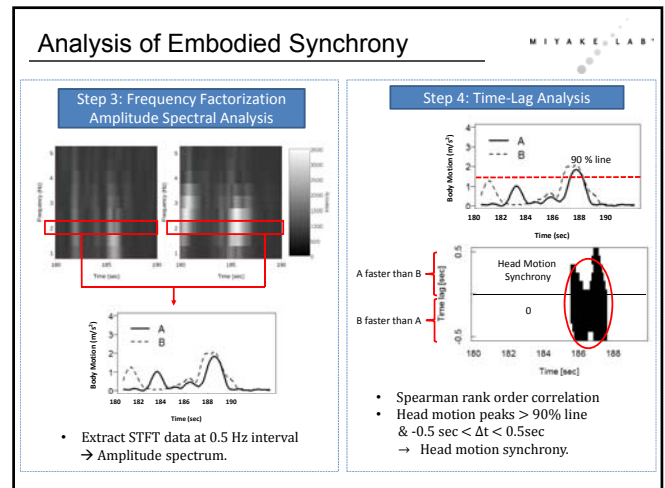
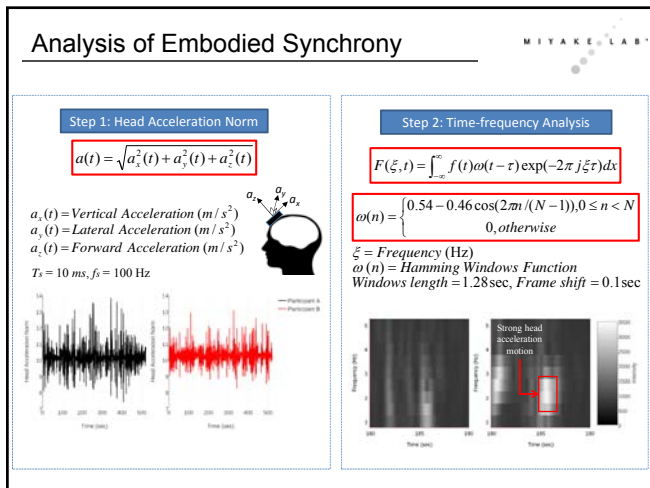
Empathetic

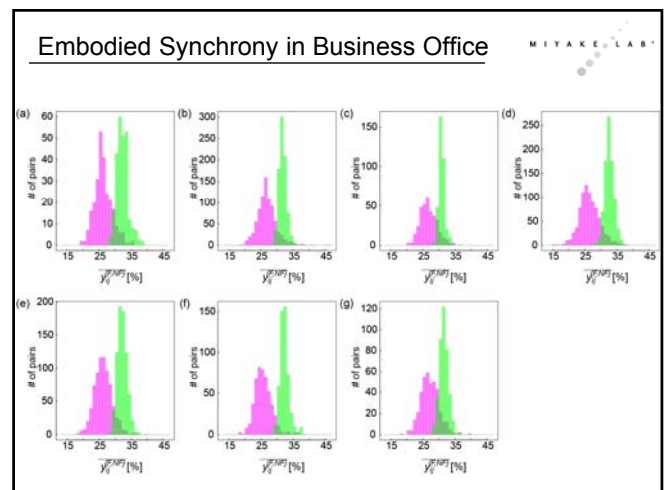
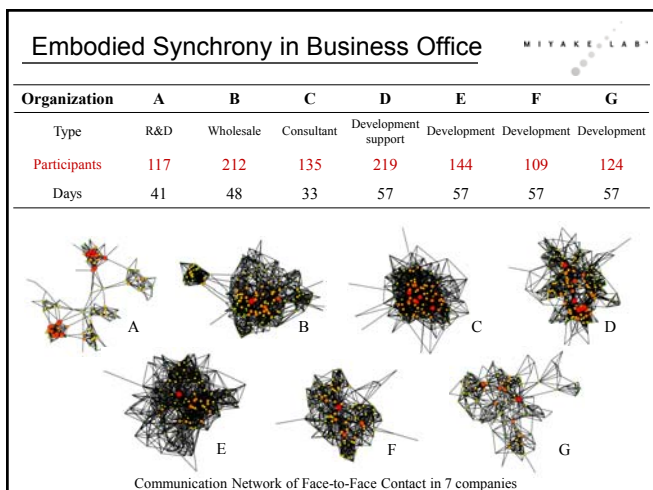
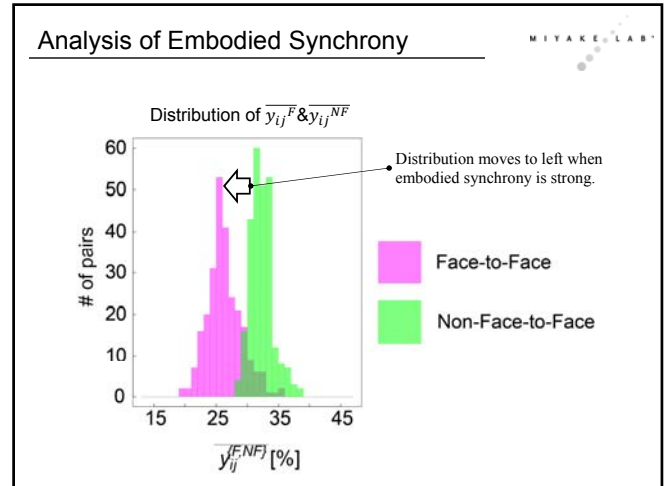
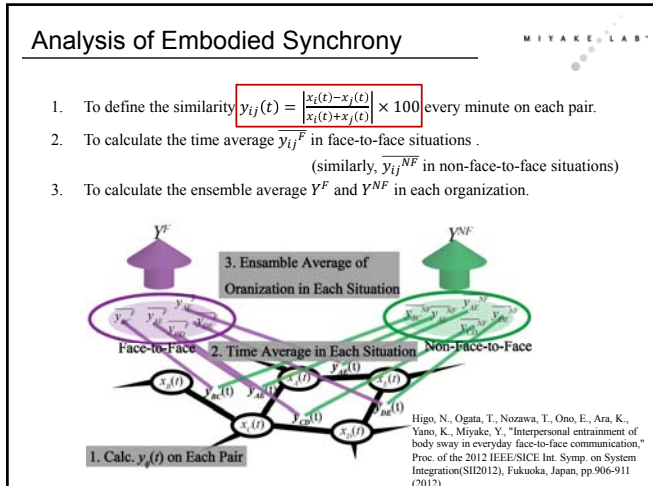
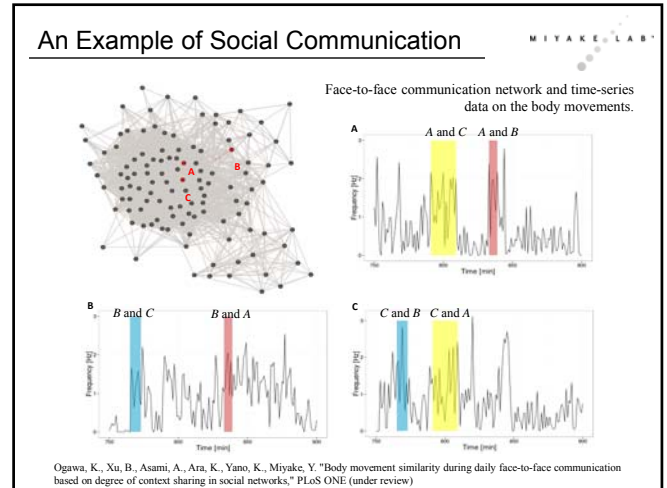
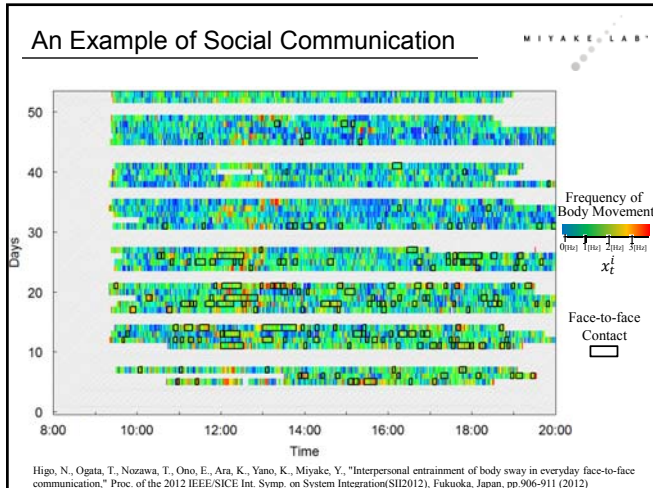
Informative

huff

- Listener listens to playback for voice recorder every 30 seconds, and rates degree of empathy with speaker.
- Calculate mean degree of empathy for empathetic and informative part ("Very Low" : 0; "Very High" : 4)



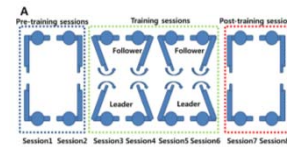




Contents

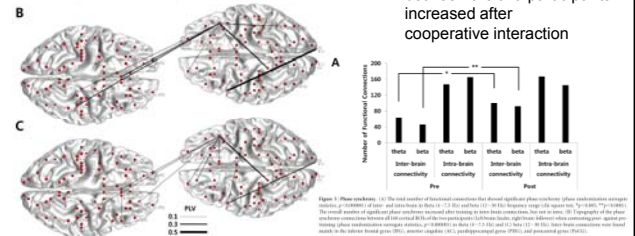
1. Enlargement of Human Communication Channel
2. Relationship between Embodied Synchrony and Empathy
3. Embodied Synchrony in Social Communication
4. **Neuroscientific Model of Embodied Synchrony and Empathy**
5. Embodied Synchrony in Japanese Culture

Interpersonal Synchrony of Brain Activity



Yun, Watanabe & Shimojo, 2012

synchrony of both fingertip movement and neural activity between the two participants increased after cooperative interaction

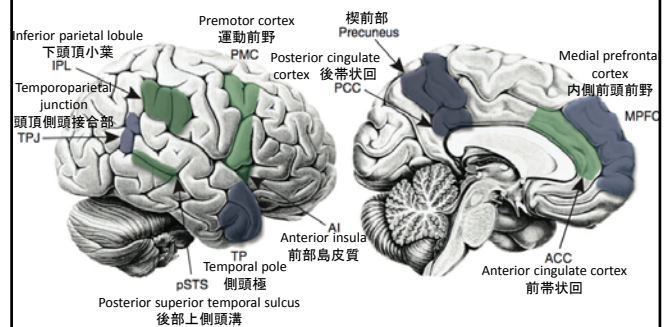


Neuroscientific Model of Empathy

“Preston and de Waal (2002) proposed a **neuroscientific model of empathy**, one which suggests that **observing** or **imagining** another person in a particular emotional state **automatically activates** a representation of that state in the observer, along with its associated autonomic and somatic responses.”

(Singer & Lamm, 2009, *Ann NY Acad Sci*)
(Preston & de Waal, 2002, *Behav Brain Res*)

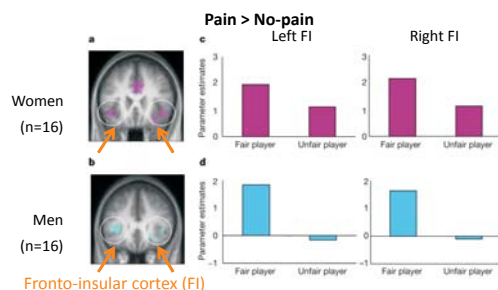
Brain Areas associated with Empathy



(Zaki et al., 2012, *Nat Neurosci*)

Singer et al., 2006, Nature

Empathic neural responses are modulated by the perceived fairness of others



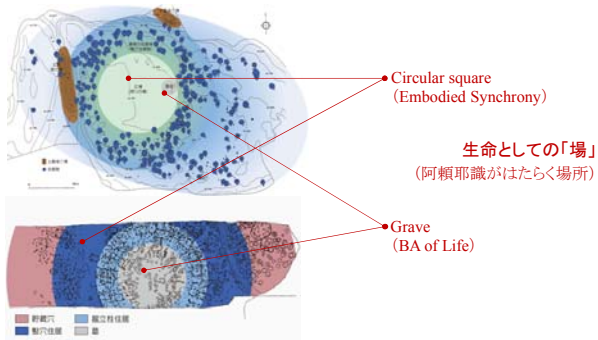
(Singer et al., 2006, *Nature*)

Contents

1. Enlargement of Human Communication Channel
2. Relationship between Embodied Synchrony and Empathy
3. Embodied Synchrony in Social Communication
4. Neuroscientific Model of Embodied Synchrony and Empathy
5. **Embodied Synchrony in Japanese Culture**

Embodied Synchrony in Japanese Culture

Festival and Prayer space in the Jomon period (B.C.10000~B.C.500)



Embodied Synchrony in Japanese Culture

Festival and Prayer space in the Jomon period (B.C.10000~B.C.500)



Embodied Synchrony in Japanese Culture

Festival and Prayer space in the Jomon period (B.C.10000~B.C.500)

