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### Adding a sense of hiatus to information systems

Humans use various communications media—telephones and letters, to name a couple. Information systems, including e-mail, are now an essential part of our lives. But because communication via information systems is still in its development stages, information isn't always conveyed accurately. In some cases, these problems can even lead to conflicts in human relationships. These problems occur because information systems lack a human perspective. From the perspective of psychology—my area of expertise—I'd like to address the development of an information system with a human perspective. It's not an approach typically taken by researchers with engineering backgrounds.

What's an action that is "easy to empathize?"

One of my research goals is developing a symbiotic system that users interact with in more empathetic ways in human communication, various things like pauses and social cues are highly important. But people rarely consider these factors when trying to coordinate human users and machine operations. To understand what "empathizing" really means, I've studied how breathing influences the enunciation of words and coordinated gestures in human communication.

### Information sharing as a determining factor

The theoretical backdrop of this research is the idea of "invariants" in affordance theory often discussed by ecophysicologists. Stimuli from the environment change continuously for observers, but some things remain the same. These are called invariants. For example, imagine putting a straight stick halfway into water. The straight stick looks bent at the water surface. How can we verify that the stick is straight without pulling it out of the

water? If we rotate the stick around the center axis of the section of the stick above the water, the stick should continue to appear bent at the same section and at the same angle, assuming the stick is straight. In other words, regardless of the relationship to the water surface, based on an “invariant in motion”—the invariant here being the stick appearing the same when it’s rotated—we can conclude that the stick is straight. In addition, invariants appear the same at all times to all people. Without sharing information on a target or phenomenon in the environment, we can’t start communicating from a common reference point or share information on things in the environment. Detecting invariants is the cornerstone of communication. And it’s also true for man-machine communication.

My goal is to help develop value-added information communication technologies by introducing psychological perspectives like affordance theory into information systems.

(Interviewed and summarized by Asako Murakami)