Interdisciplinary Collaboration from Psychological Perspectives

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Our group

- Masuo Koyasu
  - Professor of Cognitive Development
- Takashi Kusumi
  - Professor of Cognitive Psychology
- Sakiko Yoshikawa
  - Professor of Cognitive Psychology
- Satoru Saito
  - Associate Professor of Cognitive Psychology
- Michio Nomura
  - Associate Professor of Cognitive Science
- Yusuke Takahashi
  - Assistant Professor of Educational Psychology

Cognitive Psychology

- A discipline that explores the nature and organization of (broadly defined) human cognition
  - e.g., perception, memory, learning, thinking, decision-making, cognitive control, self control
  - including emotional / social aspects

- Cognitive Design

Two aspects of cognitive design

- Design activities
  - Creative activities based on a set knowledge of human cognition
  - Cognitive theories of design
- Design of cognitive / psychological models
  - Tools of psychological research to understand the nature of human cognition
  - Design of cognitive functions

Cognitive theories of design

- Any design created for humans must consider the characteristics and constraints of human cognitive functions.
- One of the possible contributions of cognitive psychology or, more broadly, psychological science, is to examine the characteristics and constraints of cognitive functions in a variety of contexts

Masuo Koyasu

- The mental function has two different vectors: imagination and verification. To design an original machine or a unique building depends primarily on imagination. During the course of actualizing the design, verification is needed to check whether a machine or a building is feasible or not, filling the gap between conception and reality. In dementia, their imagination is known to be strong enough to suppress verification. On the other hand, in the pervasive developmental disorder, their imagination is rather weak and they have some stereotypic tendency to repeat the same kind of procedures. To investigate such kinds of disorders is another important task of cognitive psychology.

- Specific research targets are
  - Theory of multiple intelligences
  - Theory of mind
  - Development of executive function,
  - Media education,
  - Children's drawing

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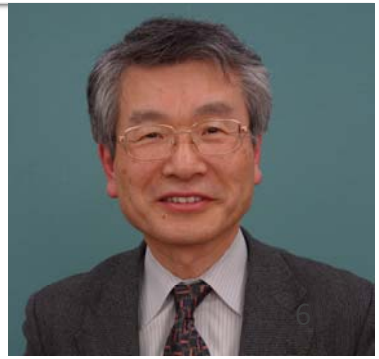
Cognitive Development



Takashi Kusumi

- Our research group have been working on research related to learning environment and communication design. In particular, I have been researching the cultivation of critical thinking, the learning environments of working people as they develop expertise, and metaphors and communication, using a variety of research methods, e.g., laboratory experiments, surveys and multivariate data analysis.

- Specific research targets are
  - Enhanced critical thinking via learning environments and its cultural differences
  - The role of critical thinking in risk communication on food safety
  - Promotion of learning through architectural design in school and library
  - Expertise in workplace and practical knowledge
  - Virtual reality communication for education and patient support group

Cognition and language Lab

Satoru Saito

- Our research group examines the nature and organization of human memory – especially, working memory and semantic memory - and their roles in complex cognitive activities, using a variety of techniques in experimental psychology, e.g., dual-task methodology, error-induction technique (in language processing and action), individual differences analyses, chronometric measurements, and an eye-tracking technique.

- Specific research targets are
  - The role of working memory in control of thought and action - broadly in executive control
  - Serial order memory in verbal and visuospatial domains
  - The role of long-term knowledge in working memory
  - Feature binding in working memory
  - Relationship between working memory and language processing

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Memory Science Lab

Michio Nomura

- Whether and how a wide range of factors such as developmental, genetic, socio-environmental, and all of these interactive mechanisms are involved in psychological process? Nomura Laboratory addresses these questions employing a variety of methods such as brain imaging (fMRI, NIRS), genotyping and behavioral paradigms. In addition to bridge the gaps between psychology, neuroscience and molecular biology, overall goal of the lab is to create a new research field in human sciences.

- Specific research targets are
  - Dynamics of gene-environmental interaction
  - Human communication
  - Emotion recognition
  - Biological substrates of self-regulatory control

System for genome sequence analysis

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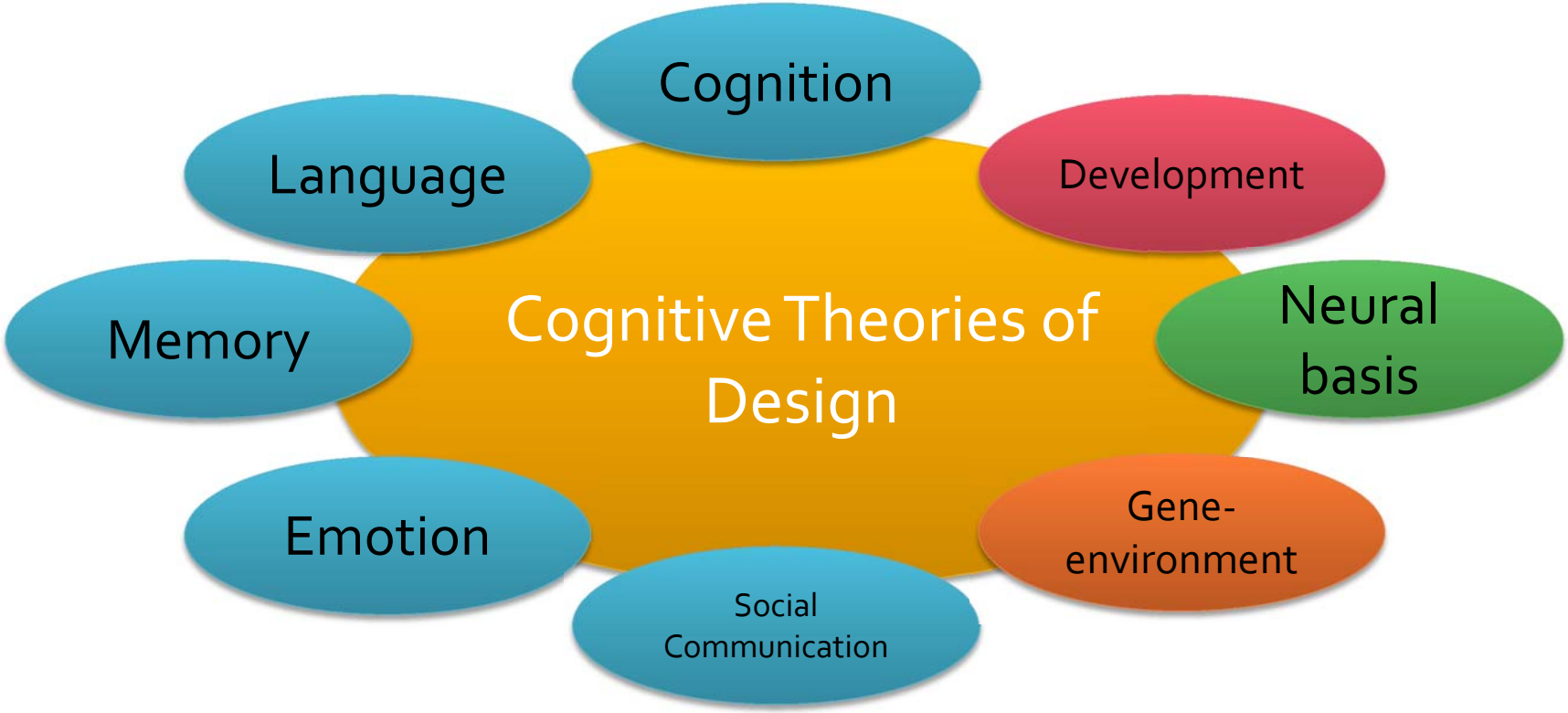
Social Life Science Lab

Cognitive theories of design



Design of cognitive functions

- Psychological models of the human cognitive system are examples of cognitive architecture or neurological/computational design.
- "Cognitive design" is one of several research paradigms found in cognitive psychology/psychological science.

Possible contributions

- The psychological disciplines can contribute to the study of design
  - by providing cognitive theories of design
  - by engaging in exploration of the construction and dynamics of cognitive architecture or neurological/computational design