

Activity Theory

Shaoke Zhang

Olivier Georgeon

Frank Ritter

1 nov 2017

- Outline
 - Introduction to Activity Theory
 - Philosophical background
 - Main concepts and principles
 - Implications for human-computer interaction

Now, please spend 2 min. (in pairs) doing task 1 and then task 2.

(1) looking up papers on scholar.google.com for your project

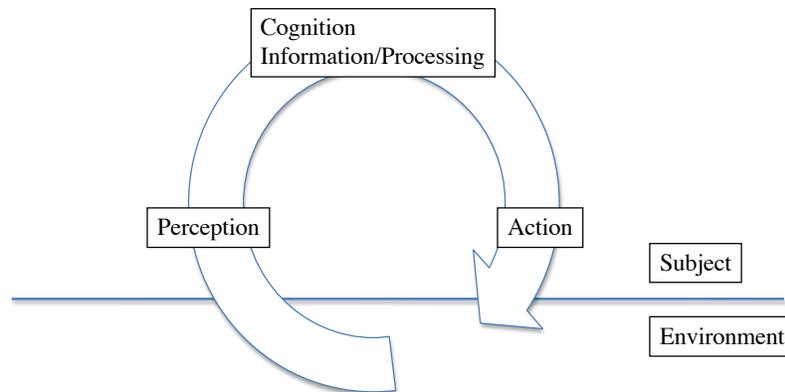
(2) Looking up papers on reddit for your project

What did you find?

- Were you able to get through 2 minutes faster?
- Was the choice of media important?
- Was the tool important?
- Were you paying attention to each other and to others?

Task analysis breaks down here, Activity theory can help

Information-processing approach



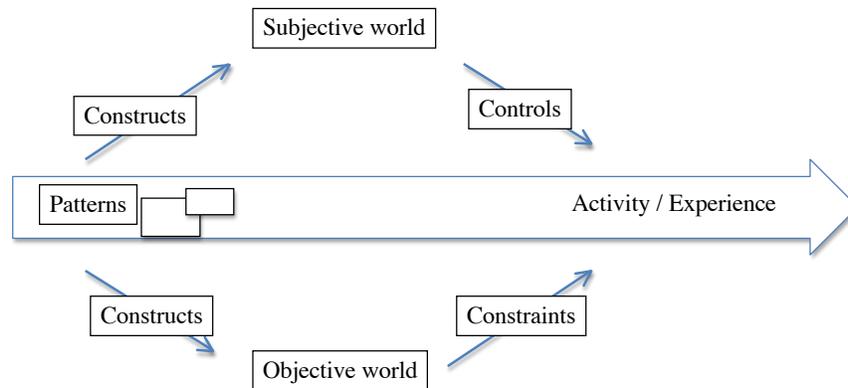
3

Critics (even before Information Processing existed!)

- Martin Heidegger (1889-1976)
 - Behavior is prior to knowledge
 - Phenomenology
- Jean Piaget (1896-1980)
 - Constructivist Epistemology
 - Bottom-up-constructed patterns of behavior
- Lev Vygotsky (1896-1934)
 - Psychological tools

4

Activity-Centered Approach



5

Activity Theory

- The theory evolved from the work of Vygotsky (1896-1934)
- Vygotsky was contemporary of Pavlov, the father of reflexology and then behaviorism
- Vygotsky criticized the mentalist tradition
 - Individual consciousness is built from the outside through relations with others... it must be viewed as products of mediated activity
- Experience is thus not all from individual but from situation

6

Historical background

- Influenced by the Theory of dialectic materialism developed by Marx and Engels

“For Marx and Engels, labor is the basic form of human activity ... Their analysis stresses that in carrying out labor activity, humans do not simply transform nature: *they themselves are also transformed in the process* [my italics]... The tools that are available at a particular stage in history reflect the level of labor activity. New types of instruments are needed to carry out the continually evolving new forms of labor activity”
(Wertsch, 1981p. 134-135)

Thus, tools and experiences that change people important too

7

Vygotsky's statements

- Psychological tools—language, writing, maps etc.—are artificial formations. By their nature they are social
- They are directed toward the control of behavioral processes... just a technical means are directed toward the control of processes of nature
- Emphasis on the mediation by psychological tools in the study of thinking and consciousness

So, not just individual use, but also interactions, reuse, community use

8

Activity Theory's Critique of HCI (and Task Analysis)

- The role of artifact between user and task is ill-understood
- Focus on one user - one computer
 - vs. collaboration, work site, team, organization
- Interaction with system seen as end in itself
 - vs. a small part of a work/activity system
- Task analysis for user interface design
 - fail to capture the complexity and contingency of real-life action

So, TA useful, but far from complete

Or, some say, so far from complete, TA is useless

Activity Theory Examines Developing Situations/Systems

- All the elements of the system are continuously changing.
- Subjects not only use tools, they also adapt them.
- They obey rules, and transform them.
- They divide work and innovate.
- “finger painting” is sometimes a better metaphor than brick laying

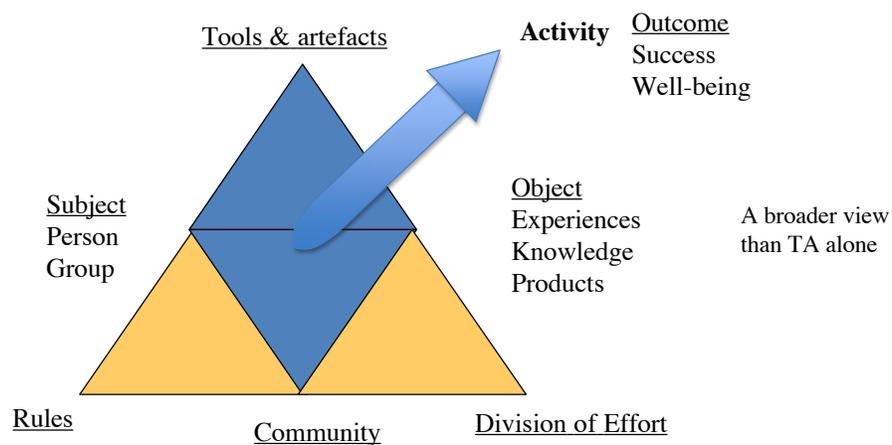
A Perspective of Human Development and Use

- people are socio-culturally embedded actors
 - not processors, or system components
- appropriateness of tools for a collective *practice*
 - *we design new conditions for collective activity*
 - *qualifications, work environment, division of labor*
- conflicts/contradictions in human development
 - *growth of expertise as solution to conflict in use*
- hierarchical analysis of motivated human action
 - *dynamically integrating levels of activity analysis*

11

Activity System

(Engestrom + Webb)



12

Main concepts in Activity Theory

- **Subject:** the individual/subgroup chosen as the point of view in the analysis.
- **Tools:** physical or psychological.
- **Community:** individuals/subgroups who share the same general object.
- **Division of labor:** division of tasks between members of the community.
- **Rules:** explicit/implicit regulations, norms, conventions that constrains action/interaction
- **Object:** “the ‘raw material’ or ‘problem space’ at which the activity is directed and which is molded or transformed into **outcomes**”

1.3

Vision for HCI based on Activity Theory

- **Human**
 - Users are actors having intentions/motivations/needs
- **Interaction**
 - There is a psychological relation between the user and the tool
 - What develops or is important is not always time, but emotions, social connections, trust
- **Computer**
 - A technical system does not immediately constitute a tool for the user. Even explicitly constructed as a tool, it is not, as such, a tool *for the user*,
 - A technical system only becomes a tool through the user’s activity,
 - A tool is never given, the user contributes to its design,
 - A tool in use is not the object of the user’s activity,
 - Tools can have real and important impacts on human activity

1.4

Implications for Design from Activity Theory

- Keep other aspects in mind besides time and task
- Use the previous lists to keep in mind context and type of context and context elements
- The user experience is sometimes work, and sometimes play, and sometimes something else entirely
 - Jobs argues that it is sometimes just new experience, not task analysis: 1:40 to 2:12, tools to start to work back from customer experience, includes model of users, tasks, and activities
<https://www.youtube.com/watch?v=FF-tKLISfPE>
 and includes more than individual experience

References

- Bertelsen O. W. (2003) Activity Theory. In Carroll, J. M. ed., *HCI Models, Theories, and Frameworks: Towards and Interdisciplinary Science*, 291-324. Morgan Kaufmann, San Francisco, CA.
- Collins, P., Shukla, S., & Redmiles. D. (1999) Activity Theory and System Design: A View from the Trenches. *Computer Supported Cooperative Work 11*: 55-80.
- Halverson, C. A. (2002) Activity theory and distributed cognition: Or what does CSCW need to DO with theories? *Computer Supported Cooperative Work, 11*, 243-267.
- Korpela, M, Mursu, A., Soriyan, H. A., and Olufokunbi, K. C. (2002). Information systems development as an activity, *Computer Supported Cooperative Work, 11*, 111-128.