

HCC class lecture 14

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“What a piece of work is a man! how noble in reason! how infinite in faculty! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god! the beauty of the world! the paragon of animals!”

Hamlet

“The earth, seems to me a sterile promontory, this most excellent canopy, the air, ..., why, it appears no other thing to me than a foul and pestilent congregation of vapours.

What a piece of work is a man! how noble in reason! how infinite in faculty! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god! the beauty of the world! the paragon of animals!

And yet, to me, what is this quintessence of dust? Man delights not me: no, nor woman neither, ...”

Postrationality

Name borrows “post” from “post-structuralism”.

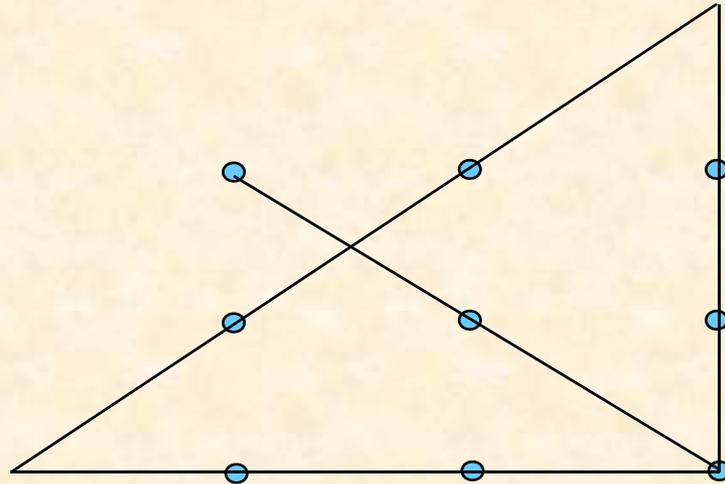
Recall that structuralists look for universal structures in language or culture. Post-structuralists emphasized the importance of context and history.

Rationality is often assumed as a universal structure.

By “rationality” we mean decision-making based on systematic comparison of options using a “utility function”.

A geometry puzzle

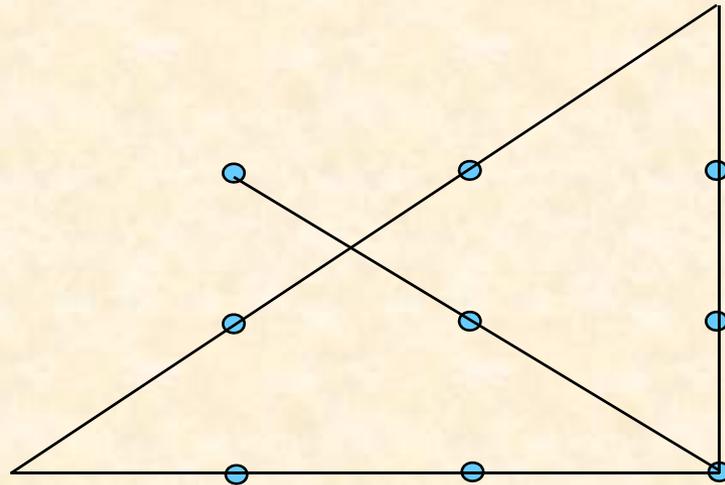
Draw a series of 4 straight lines through all the points below, without lifting pen from paper:



What's going on?

We call this “thinking outside the box” 😊

We seem to be imitating solutions to similar problems rather than systematically exploring the options for this new problem.



Activity Theory 1.0

Activity theory was guided by some core Vygotskian principles:

- A genetic approach.
- Social learning: activities appear first on an inter-personal plane, then on an intra-personal plane.
- Importance of context in activity.
- Language as a tool, speech as symbolic action.
- Tight relation between motive and action.

Activity Theory Gaps:

Activity Theory Gaps:

- Details on learning activities are sketchy:
 - There is a ZPD, but what determines what is doable alone, vs. with help, vs. not at all?
 - There are “genetic” discontinuities in development, but when and why do they happen?
- Activities don't seem to be rich enough to capture common notions of “context”.
- Structure of group activities is still debated: There are several competing extensions.
- An activity provides a map of what actions might happen in a situation, but avoids questions of what will happen.

Activities 2.0

Components:

- Subject/Actors
- Object
- Tools
- Action Chains
- Aspect
- Situations
- Roles/Relations

We are talking about *internal* (mental) models of activity.

Activities 2.0

Components:

- Subject/Actors
- Object
- Tools

These are borrowed from classical AT.

Since we are talking about a specific person's view of the activity, we distinguish that person (the subject) from other actors in the activity.

Activities 2.0

Components:

- Subject/Actors
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Situations are recognizable patterns that frame the activity
(e.g. a chapel frames wedding activity)

Activities 2.0

Components:

- Subject/Actors
- Object
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Occur in many formulations of group activities, e.g. in Engeström's "rules" and "division of labor"

Activities 2.0

Components:

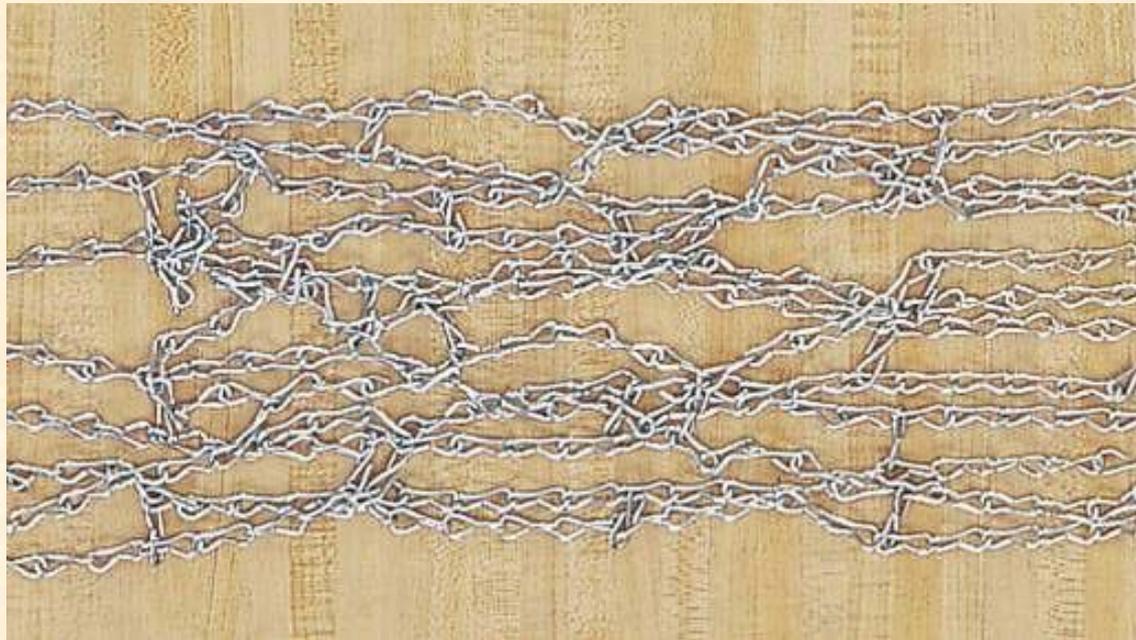
- Subject/Actors
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Action chains are borrowed from E.T.Hall. They are related to the idea of “scripts,” but are more flexible.

Action Chains

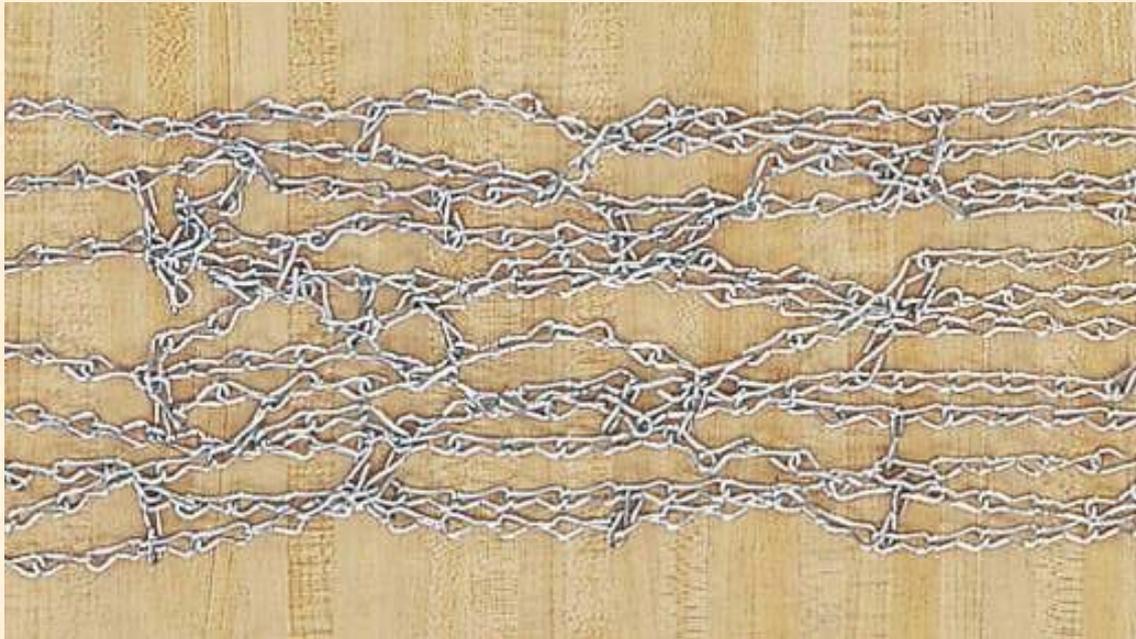
Think of a network of connected links (actions).

Structure is hierarchical, defined by “landmarks” in the chain.



Action Chains

Supports goal-directed behavior, with landmarks as goals.
But also more opportunistic “foraging” behavior.



Action Chains

Examples

- Hand-shaking
- Dialog, e.g. introductions and small-talk
- Musical performance
- Moving around the house
- Starting the car
- Team sports

Action Chains – mental actions

Examples

- Counting
- Pencil-and-paper arithmetic
- Permutation/exploration
- Systematic search
- Matching/assignment
- Meta-cognitive skills in learning

Activities 2.0

Components:

- Subject/Actors
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Aspect is intimately related to action chains. Aspect is the perceptual awareness of “where one is” in the activity, and hence, what to do next.

Aspect

Information needed to keep track of an action chain.

Examples

- Hand-shaking: focuses on the location of the other's hand, whether it is open or closed.
- Music in a band: attend to rhythm (drums) and dynamics.
- Counting: current object, count and a direction of progress.
- Chess: identity of pieces on the squares, location (square) of each piece.
- Introductions: Asked name, inquired about mutual friends, recent activities, opinions on a current event,...

Example: Elder care Activity

Subject: A care-giving relative

Actors: Other relatives, friends, doctors, nurses,...
Pharmacists, insurers,...

Object: The elder's apparent health, as perceived by the subject. In practice only changes in health may be perceptible.

Tools: Drugs, prescriptions, home instruments, medical instruments, claim forms, car, paper drug regimen, time/date triggers. Email, phone, sofa,...

Example: Elder care Activity

Action Chain: Giving medication. From a printed schedule: poll for time, or associate meds with a daily landmark, such as dinner time. Gather pills from list. Give to elder one at a time.

Aspect: Which med batch is current (morning, evening etc.). If handing over pills, do any remain in the hand?

Medication Planning Activity: exercise.

Example: Elder care Activity

Situations:

- Elder's house
- Doctor's office
- Pharmacy
 - Searching Aisles for meds
 - Queuing to pay

Roles and Relations:

- Role: "medication-helper" to cover subject and other actors who help with meds.
- Relation: Connect "4 pm" with giving a batch of meds.

Goals of this work

- Better design principles for unschooled users. Requires charting of quasi-universal activities among schooled and unschooled users.
- Develop interfaces that scaffold and encourage certain “schooled” activities: use of external representations, scheduling, spreadsheets.

And perhaps...

- Scaffold and encourage development of “formal” reasoning action chains. Focus on problem-solving and diagnosis.
- Believable software agents. The model we have described translates naturally into a probabilistic generative model.
Activities can be authored directly, or learning methods applied to evolve activities in response to experience.

Comments?