

Individual and group understanding of energy in an embodied learning activity

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Locating ideas in Energy Theater

Previous talks:

Ideas about what energy is and does are apparent in Energy Theater.* (define?)

Individual level

e.g.,

Energy is located
in an object

Group level

e.g.,

The total number
of kinetic energy units
is increasing

Locating ideas in Energy Theater

Previous talks:

Ideas about what energy is and does are apparent in Energy Theater.

Individual level



Group level

Understanding Energy Theater as a learning arrangement includes understanding the interplay of these.

Person pushing box, frictionless



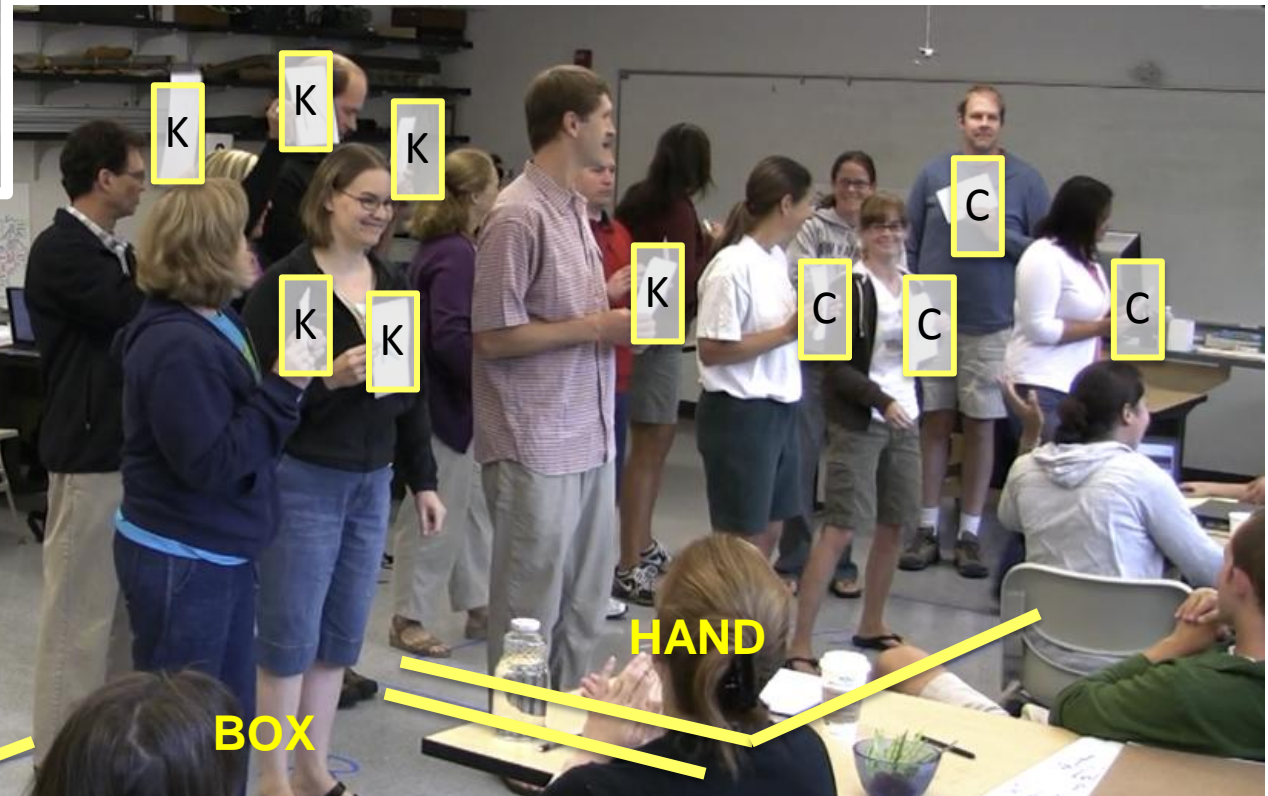
Chemical energy in hands
is transformed
into kinetic energy

Kinetic energy increases
in the hands **and** in the box

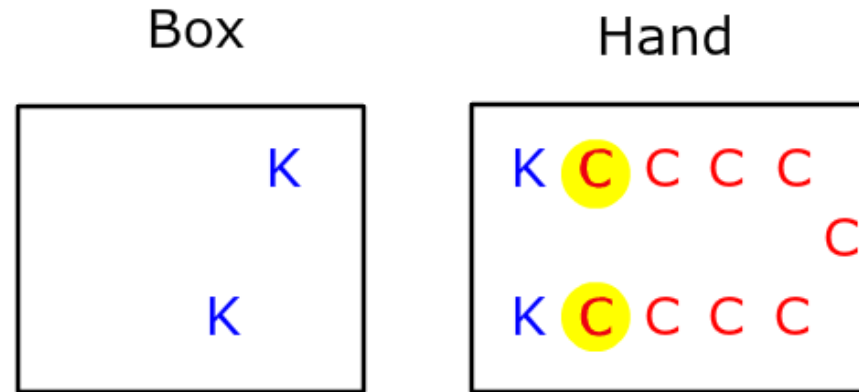
(No thermal energy transactions)

Person pushing box, frictionless

Signs indicate form of energy
(**K**inetic, **C**hemical)



Person pushing box, frictionless



Some C's need to turn into K's in the hand
and some K's in the hand need to go to the box,

in such a way that the total
continually increases in both.

*How do they know
when to do what?*

How to know when to do what?

- ⑨ Observe the special participant.



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How to know when to do what?



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Ordered tagging says when to do what

Two kinds of tagging

“change from C to K”

“go from hand to box”

Types of tagging alternatives in a routine

“change”

“go”

“change”

“go”

“change”

“change”

Context informs appropriate meaning for tagging

“Which turn was it?”

“What form am I?”

“Where am I standing?”

“Was that a tap or a push?”

Cognitive function of tagging

Does tagging

“help people remember what to do”?

No.

An individual’s memory task is reduced, not increased, by the tagging.

The “remembering” function is performed by the **tagging algorithm**, not individuals.

Similarly, signs and floor markings “remember” individuals’ identity

*Hutchins “Cockpit,”
1995*

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Tagging is a cognitive function

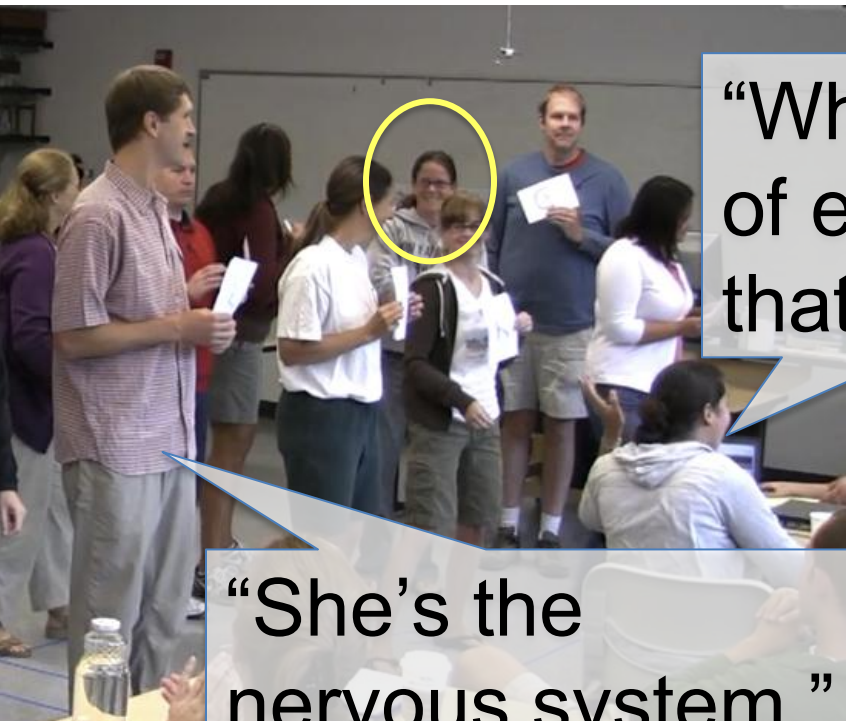


*Hutchins "Cockpit,"
1995*

Cognitive function
located in
biological brains

Cognitive function
located in
tagging algorithm

Status of special participant



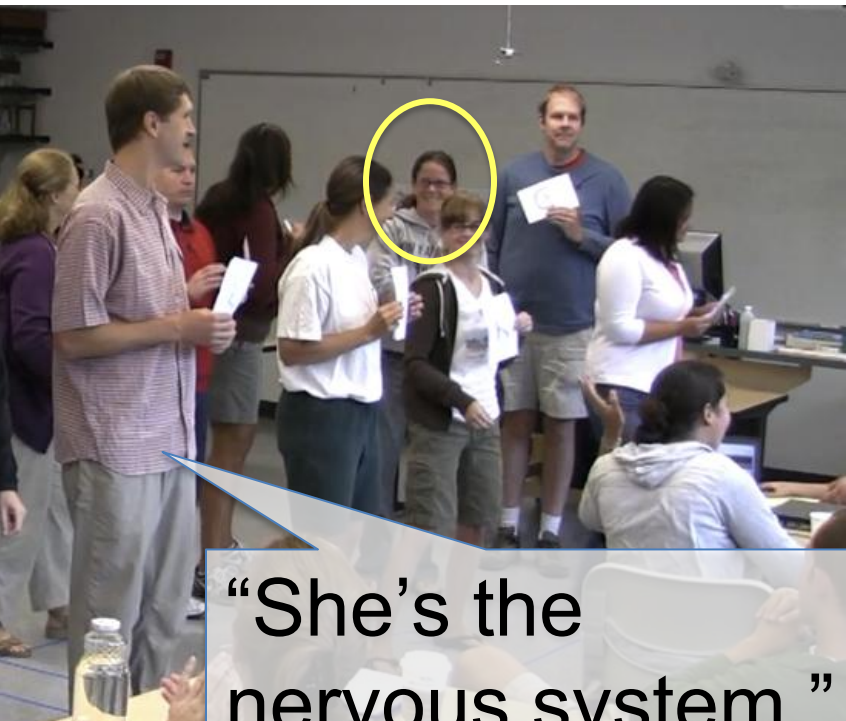
“What kind of energy is that?”

“She’s the nervous system.”

Sends message from cognitive center to body parts



Status of special participant



“She’s the nervous system.”

Sends message from cognitive center to body parts

Cognitive center = tagging algorithm



Body parts = embodied actors

Letting cognition out of the head

- ❖ Allows and promotes direct observation of information being processed
- ❖ Helps us appreciate who/what is responsible for which aspects of information processing
- ❖ Allows cognitive properties of systems to be distinct from those of a biological brain
- ❖ Helps us enjoy and seek different scales of meaningful activity in collaborations

What is learning if not in the head?

How might we measure cognitive progress?



Change in information representation



Inward flow of people from legitimate peripheral participation to central participation