

Analogy as Exploration
IJWCC08

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Analogy in Boden's model

In Boden's model, we have

- Exploration
- Transformation
- (recently) Combination

Analogy usually viewed as a mechanism of transformation

Problems with transformation

It's been shown (e.g., Wiggins) that transformation can only be understood as meta-level exploration.

So potential Occam elimination of that category altogether.

But where does that leave analogy?

Can analogy arise through exploration alone?

Concept-combination model

Assume conceptual-space exploration involves constructing concepts from constituents.

Assume those constituents are themselves concepts (or can be viewed as such)

So exploration = concept combination

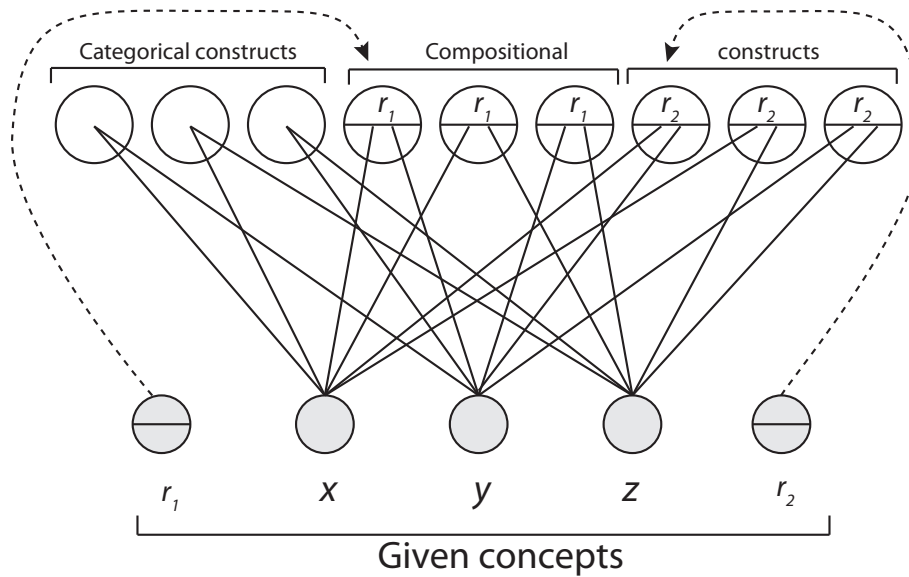
Categorical v. compositional construction

Distinguish ‘complete’ from ‘incomplete’ concept combination.

- Complete combination: constituent concepts treated as instances of a single entity.
- Incomplete combination: constituents treated as elements of an ensemble.

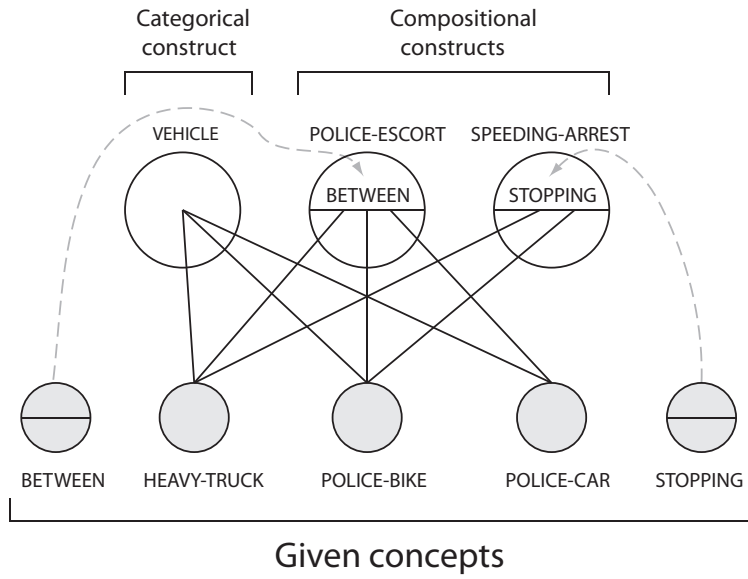
‘Categorical’ construction (aka generalization/abstraction)
v. ‘compositional’ construction (aka schema-acquisition).

Directly constructable concepts



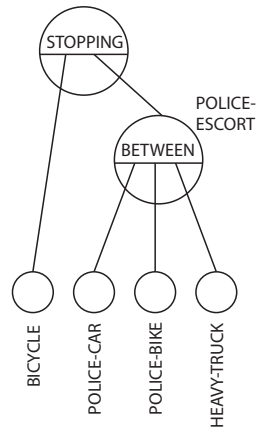
Maps out the set of two-constituent constructs which can be formed from x , y and z using r_1 and r_2 .

With some labels...

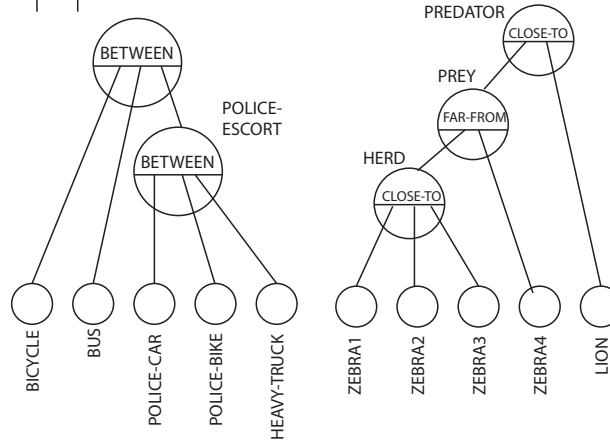


Indirectly constructable concepts (hierarchies)

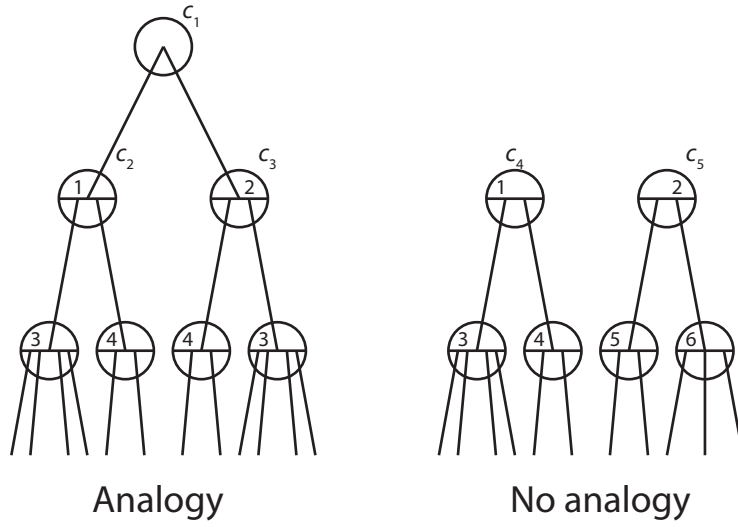
Hierarchical construction



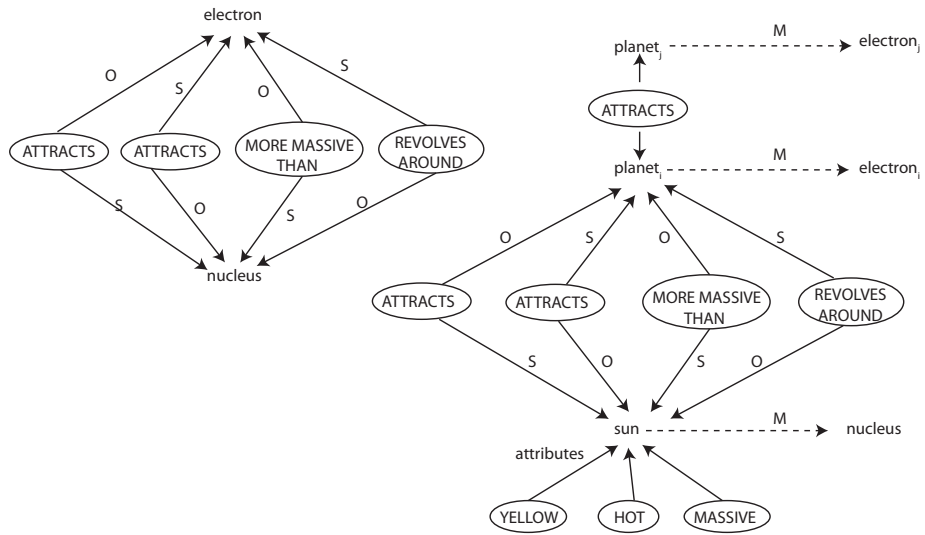
Recursive, hierarchical construction



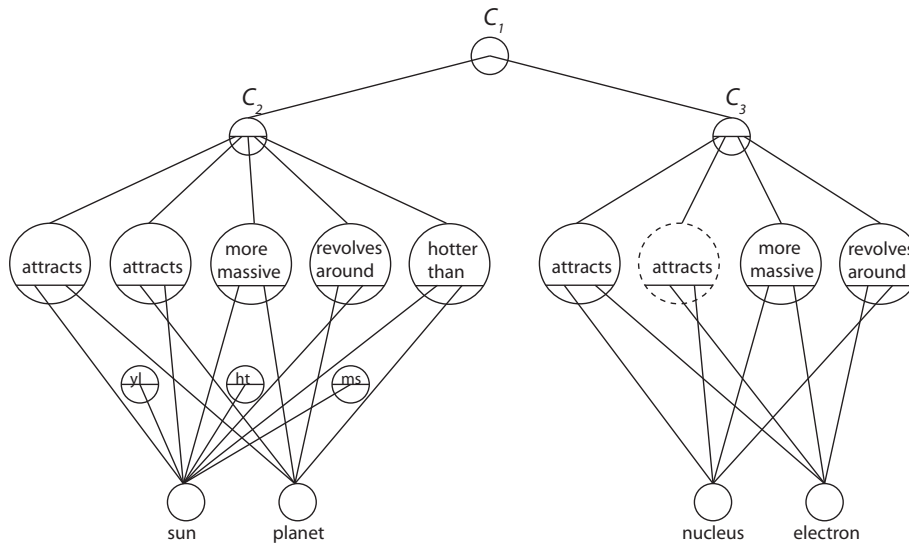
Analogy as conceptualization



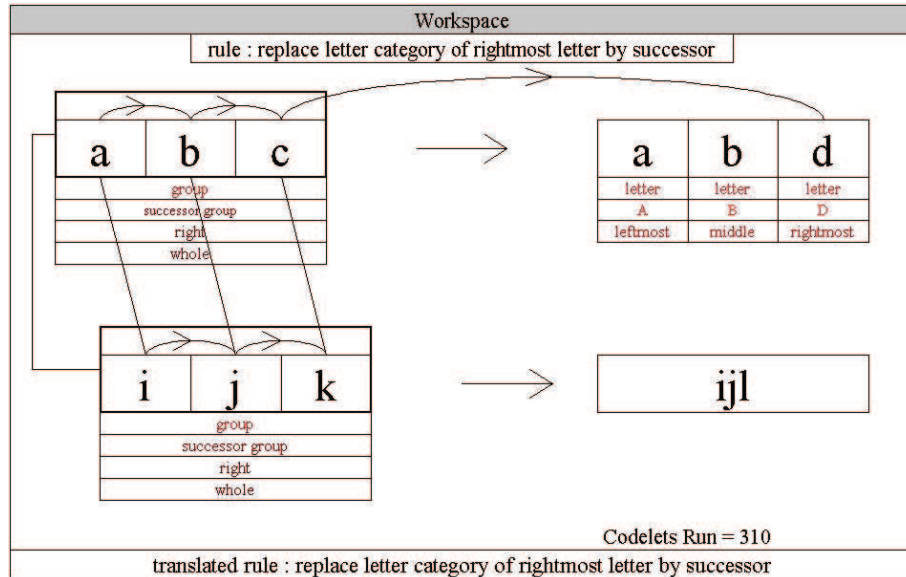
Rutherford



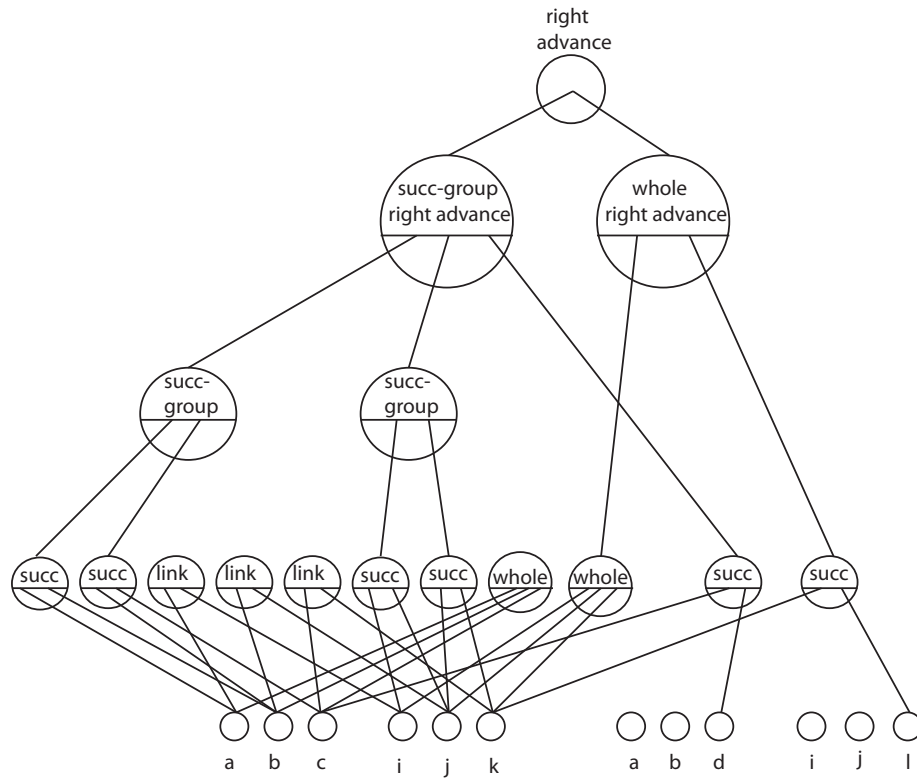
Transfer through categorical construction



Analogy in Copycat



Copycat analogy as conceptualization



Summary

Do not necessarily need to treat analogy as a specifically transformational act.

Cannot use analogy as evidence that transformation is significant.