Structure Mapping: A Theoretical Framework for Analogy

- Previous accounts of analogy have emphasized the role of similarity, for instance, the number of features that two compared concepts share
  - This has difficulty accounting for analogies such as "an axiom is like a table leg", where the two objects have a no or little featural similarities.
- Perhaps then we can account for more if we incorporate the different sorts of relations that objects can maintain between eachother (e.g. an axiom supports a theory, and table leg supports a table; if one is removed then the larger structure collapses, etc)
  - Thus, we can think of analogical thinking as the act of comparing the abstract structure between different object relationships, while (potentially) ignoring the actual features of the objects themselves
- This approach yields a continuum of analogical relationships:
  - Objects or concepts can be literally similar when they have many matches on features as well as relationships
  - A proper analogy is usually a comparison in which concepts share some number of relations (but also do not share some number of relations). The number of similar features is usually negligible.
  - An abstraction can be thought of as an analogy in which the base domain contains few if any concrete features, and in which the number of relations NOT mappable from the base to the target is close to 0.
- However, we need a way to describe how people choose the right relationships in evaluating an analogy, for example in the analogy "a freeway is like a stream"
  - Superficially, freeways and streams are both long, but people are unlikely to draw that specific inference from this analogy
  - The more likely inference is that freeways are like streams because they both transmit "stuff" in a long and typically unobstructed path
  - Thus we are comparing the simple relationship $\text{LONG}(x)$ to the more complex one $\text{AND}[	ext{TRANSMIT}(x), \text{LONG}(x)]$
  - The systematicity principle says that more embedded and connected the relationship mapping is, the more likely it is to be selected as the interpretation of the analogy
- Potential problems/issues with the account:
  - What happens when two interpretations are equally as "embedded"? Why do people still choose one or the other?
  - How do you determine (empirically) the systematicity or embeddedness of an interpretation?
  - Why can't relationships be construed as features?
  - What about analogies like "He's like an Ox"? 
    - Both are mammals, but we tend to infer that instead both are strong. Why?
  - Interpretation of analogy is probably sensitive to discourse context, and its not clear how this theory would accommodate that