

How the
Obscure Features Hypothesis
leads to
Innovation Assistant Software

Tony McCaffrey (UMass Amherst)

&

Lee Spector (Hampshire College)

A New Cognitive Theory of Innovation

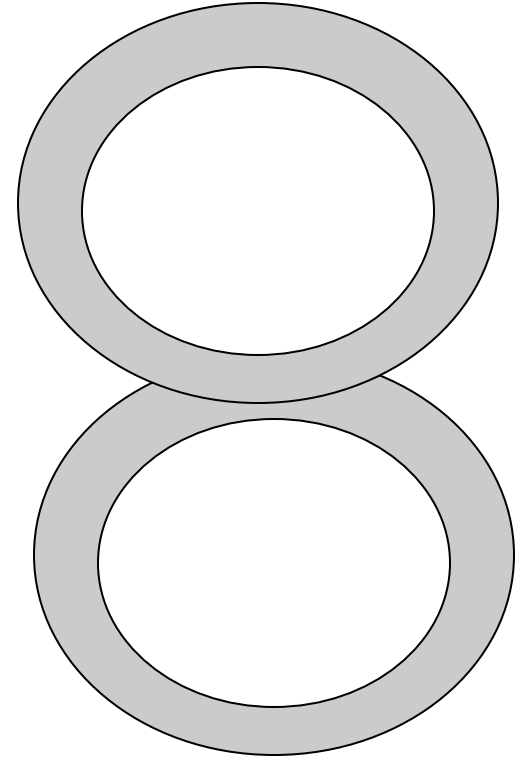
The *Obscure Features Hypothesis* (OFH):

almost all innovative solutions result from two steps:

- (1) noticing a rarely noticed or never-before noticed (i.e., obscure) feature of the problem's elements
- (2) building a solution based on that obscure feature.

Two Rings Problem: **Fasten the steel rings together**

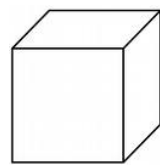
Steel rings six inches in diameter and each weighing three pounds



long candle



match



cube of steel
(2 inches per side)

If the OFH is true,

then systematically searching through the features of an object might help us find the obscure features.

Problem (e.g., candle)

A candle's features might be

unlimited (my aunt collects candles) or even

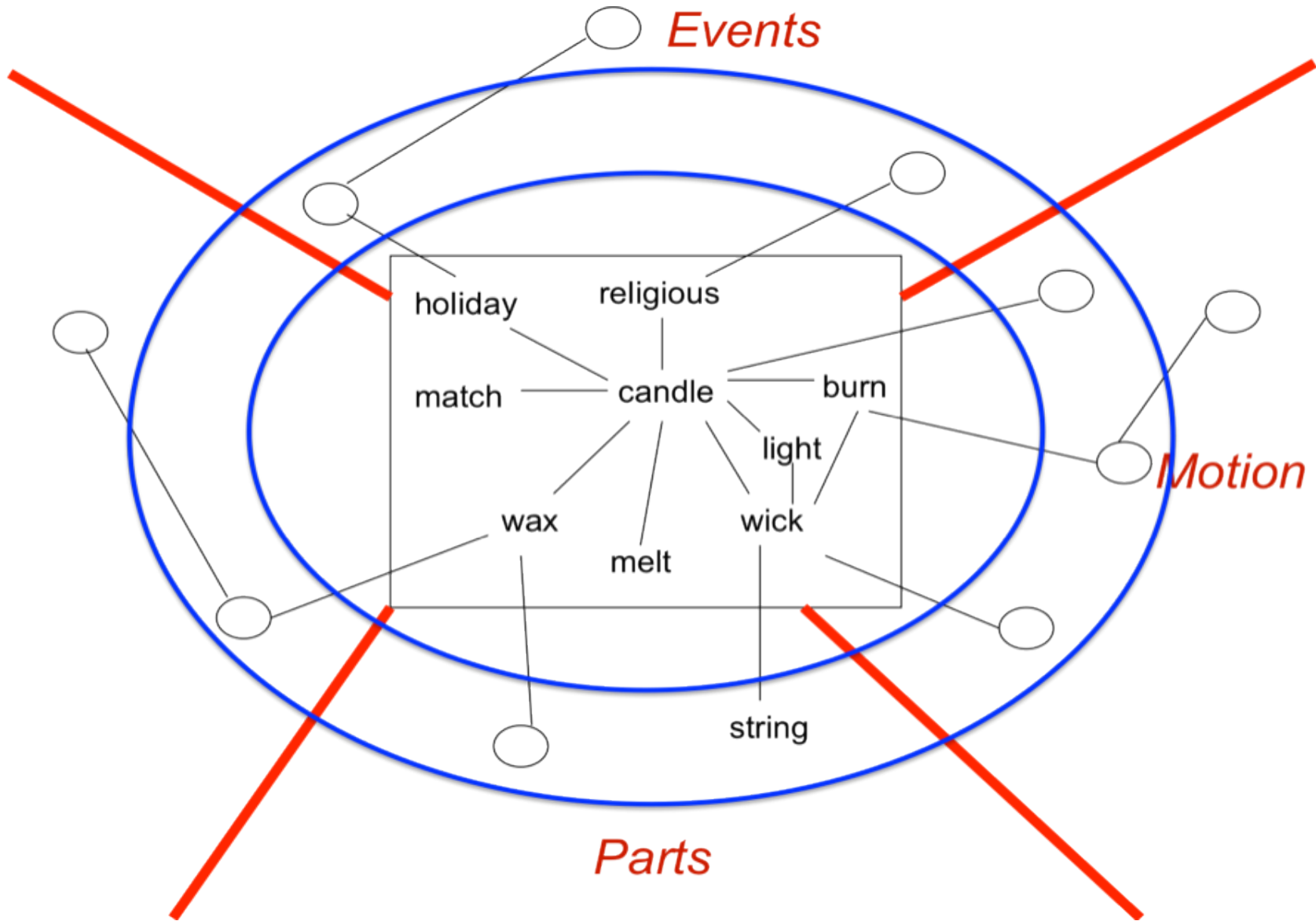
infinite

(candles generally weight less than 50 pounds,
less than 51 pounds, etc.)

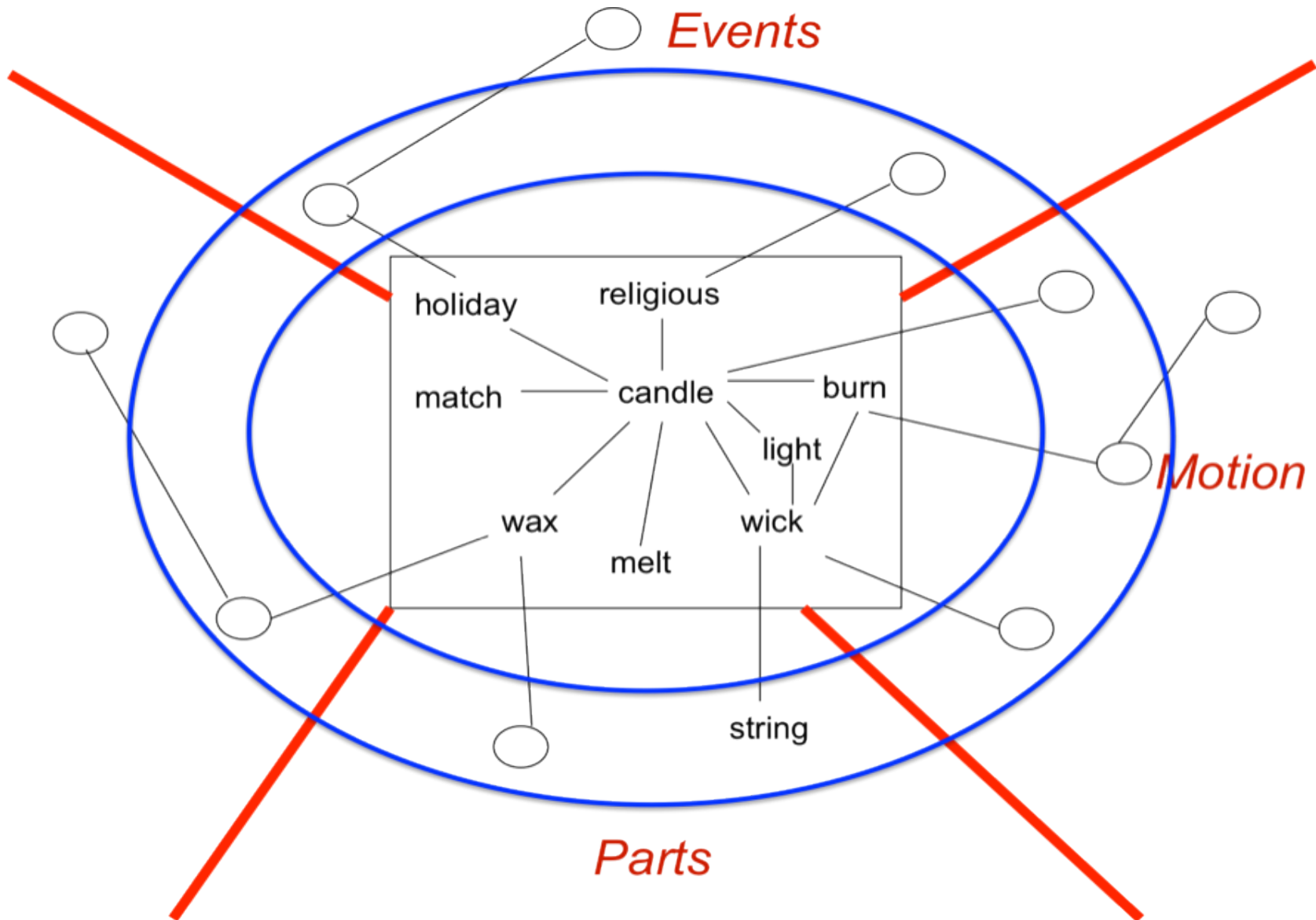
Problem:
Need to Limit the Search

Solution:
Two Principles

Just Outside the Box Hypothesis (blue rings):
Limits the distance



Feature Types Taxonomy (red lines):
Limits the direction



Feature Types Taxonomy (red lines):

Limits the direction

- **Taxonomy currently has 32 categories**
- **Form a probability distribution based on which types have been most helpful in the past**

Innovation Assistant (IA) software

Embodies:

Just Outside the Box Hypothesis
probability distribution based on
the *Feature Type Taxonomy*

Has recently helped create workable solutions to
real-world problems:

adhere a coating to Teflon
detect roadside bombs

Innovation Assistant (IA) software

Creates a human-machine interaction

that is more innovative
than a human working alone

by guiding humans
to the obscure members
of the most promising feature types
for the problem at hand.