Facet Analysis and Semantic Frames

Rebecca Green
Senior Editor, Dewey Decimal Classification
Dewey Editorial Operations Program Manager
Facet analysis vs. semantic frame analysis

• What is the nature of the conceptual structures that they identify?
• How similar are the techniques they use?
• How similar are the conceptual structures they produce?
• Are facets and frame elements essentially the same thing?
NATURE OF THEIR CONCEPTUAL STRUCTURES
Facets

- Top-level characteristics of division by which vocabulary of field is derived from overall field
- Logical / semantically cohesive categories underlying vocabulary of field
Semantic frames

- Script-like conceptual structures that describe particular types of situations/objects/events along with their participants and props
- Participants and props are frame elements
- Situations/objects/events are gestalts, in which understanding any element of frame is dependent on understanding all other elements of frame
Semantic frame example

- Sentencing frame (subframe of Criminal process): Sentence is imposed on Convict by Court (often represented by Judge) for Offense.
- Judge Duncan SENTENCED Marty to five years in prison for illegally smuggling protected reptiles.
ANALYTIC TECHNIQUES
Facet analysis

• Identify terms from field’s literature (e.g., article titles, glossary entries, textbook, subject heading list)
• Semantic factor terms to identify underlying semantic components
• Organize into groups, based on characteristics of division that differentiate each term
• Highest-level groups at end are the facets
Frame semantic analysis

• On basis of corpus evidence, identify word senses that can be used to talk about the same situation
• Annotate sentences containing these word senses to identify semantic roles played by noun phrases syntactically related to verbs that evoke frame / to identify predicate-argument structure on semantic level
• Recurring semantic roles are identified as frame elements
Frame semantic analysis example

• VERDICT frame: A Judge gives a Finding with respect to the Charges against the Defendant.

• Sample annotated sentences:
  – Yew ACQUITTED and discharged the accused on all charges.
  – A Brazilian court has CONVICTED a logger of operating illegally on Indian land.
  – An Old Bailey jury FOUND the woman not guilty of child cruelty.
  – A Spanish Supreme Court judge CLEARS Prime Minister Felipe Gonzalez of involvement in the assassinations of Basque separatists during the 1980s.
COMPATIBILITY OF RESULTS
Performing arts

- Form of art
- People
  - Creators
  - Technicians
  - Performers
  - Audience
- Production
- Processes and techniques
- Subject
- Style
- Space and time

- Type of performance (e.g., film)
  - [Behind-the-scenes] Personnel (e.g., writers, producers, stage hands)
  - Performer
  - Audience
  - Performance
  - Medium (channel through which performance is transmitted)
  - Score
  - Script (directions for performers)

From Antony Croghan faceted classification

From FrameNet Performing_arts frame
Education

- Educands
- Schools
- School, college and university officers
- Curriculum
- School, college and university management
- Teaching aids

... From London Education Classification

- Student
- Institution
- Teacher
- Subject
- Skill
- Fact
- Precept
- Course
- Educational material

... From FrameNet Education_teaching frame
Education—cont.

- Students' work
- Teaching profession
- Educational psychology and measurement
- School buildings
- Equipment

- Qualification (e.g., degree, certificate)
- Professional or vocational role (goal of training)

*From London Education Classification*  
*From FrameNet Education_teaching frame*
FACETS = FRAME ELEMENTS?
Similarities and differences

• Both seek semantic roles / logical categories
• Both derived from textual input, but . . .
  – Facet analysis
    • Analyzes terms in (usu. technical, scholarly) literature; caters to business, professions, academia; specialized by subject
    • Used to organize literature
  – Frame semantic analysis
    • Analyzes sentences from balanced corpora; caters to diverse array of people, ordinary folks; specialized by linguistic phenomena
    • Used to inform NLP tools
thank you

Rebecca Green
Senior Editor and Dewey Editorial Program Manager
greenre@oclc.org