KNOWLEDGE in FORMATION

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Abstract

The aim of this project is the development of a cognitively based, semiotic model of human information processing with applications in 'naive' logical and mathematical symbol processing, natural language parsing, meaningful summarization, ontology design and problem elicitation.

1. Sign processing

- C.S. Peirce introduced nine sign aspects that are involved in any sign interpretation. On the basis of their dependency and subservience, the nine sign aspects can be arranged in a dependency structure.[1]
- Signs are interactions between independent qualities. Sign interpretation is a process revealing interactions as meaningful.

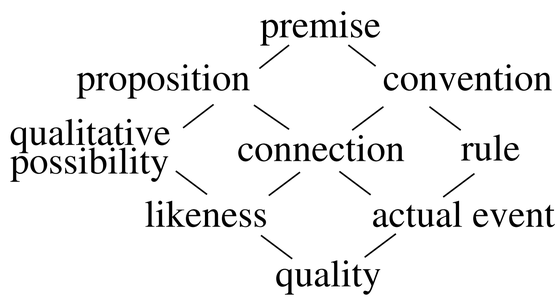

Figure 1: *Peirce's sign aspects in mundane terms*

2. Cognitive processing

- Cognitive activity is a process interpreting interactions between a stimulus and an observer which are in principle independent.
- The stimulus appearing as an *effect* is affecting the observer occurring in some *state*.
- Human interpretation is a process revealing why this effect is occurring to this state.
- In our model we suggest nine interpretation moments (types of event) that must be involved in any interpretation process.

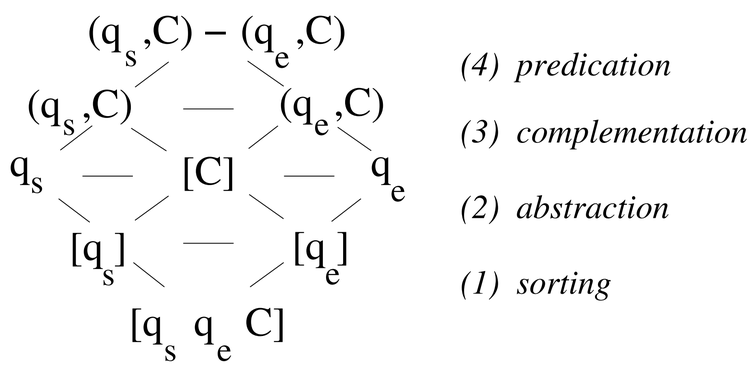

Figure 2: *The proposed model of cognitive processing (q_s=state, q_e=effect, C=memory response). Square brackets indicate that an entity is not yet interpreted as a sign; no bracketing or the usual bracket symbols indicate that some interpretation is already available; horizontal lines denote interactions.*

3. Logica Utens

- A logical analysis of our model shows its completeness.[2,3] All Booelan relations on two variables (state and effect) are generated: We look at the input interaction from *all* possible angles.
- This process is what we call 'naive' logic or our logica utens.

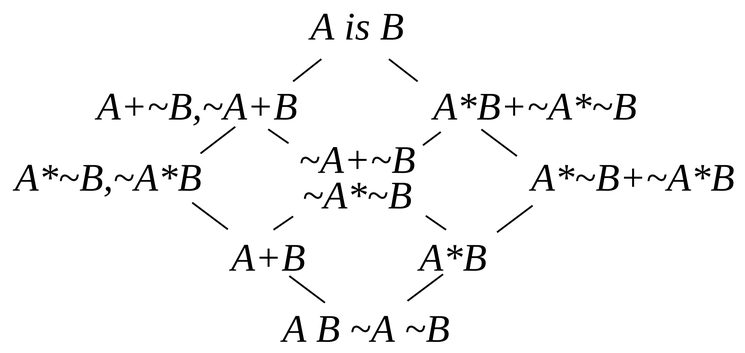

Figure 3: *A logical analysis of the model*

4. Application in humanities

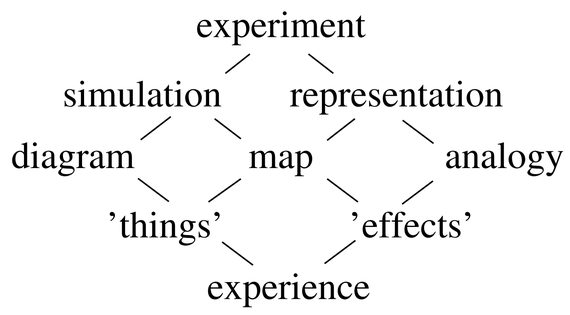

Figure 4: *A semiotic classification of McCarty's concepts*[4]

5. Conclusion

- Through a logical interpretation of our model, sign aspects and interpretation moments can be linked with each other.
- This enables the Peircean dependency of sign aspects to be interpreted as a *process*, and the cognitive model of intepretation as a *meaningful* process underlying knowledge in formation.

References

[1] C.S. Peirce. *Collected Papers*. Harward University Press, 1931–58.

[2] A.J.J.van Breemen and J.J. Sarbo. *The machine in the ghost: The syntax of mind*. Signs – International Journal of Semiotics, 2009.

[3] J.J. Sarbo, J.I. Farkas and A.J.J.van Breemen *Natural Grammar*. in: Semiotics and Intelligent System Development, Idea Group Publishing, 2007.

[4] McCarty, W. *Humanities Computing*. Houndmills, Basingstoke: Palgrace Macmillan. 2005.