

Railway Safety and Security – Two Sides of the Same Coin ? !

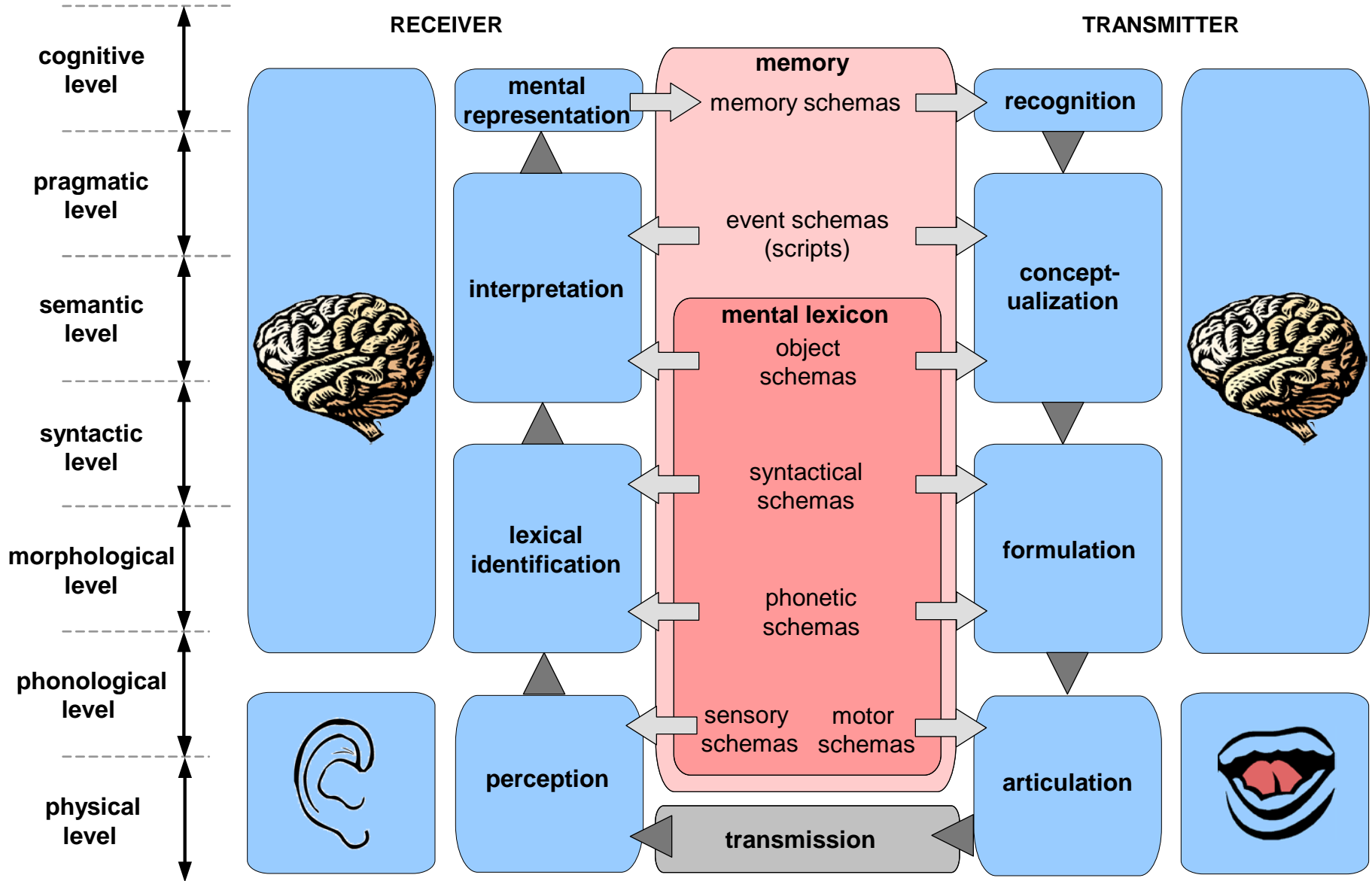
- Introduction
 - The role of communication
 - Motivation for terminology work
- Methodical foundation
 - The metamodel of a linguistic sign
- Application
 - Formalization of the risk concept
 - Formalization of the safety concept
 - Formalization of the security concept
- Conclusion

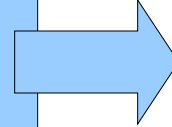
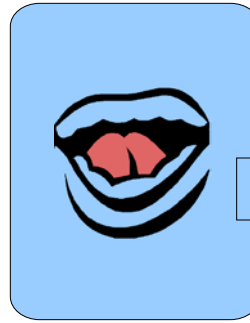
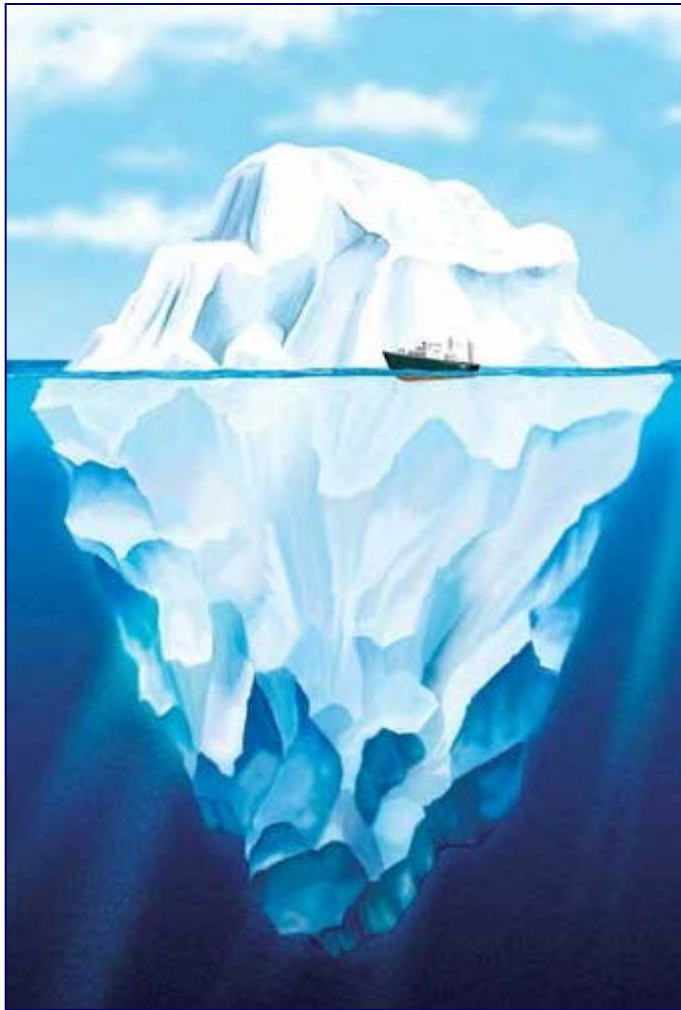


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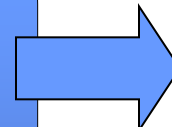
Introduction

Pitfalls of communication

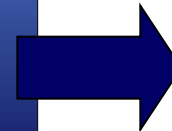




- A concept's **designation** is just the tip of the iceberg.
- What really matters is underneath the watersurface . . .



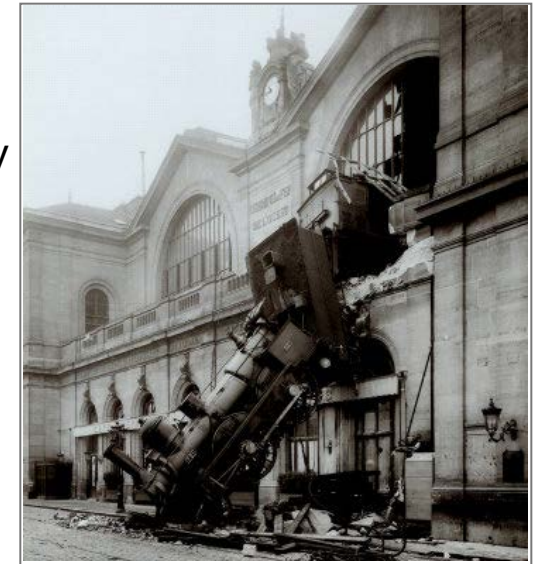
- The **meaning** of a concept is often tacitly assumed:
 - intension
 - extension
 - relations



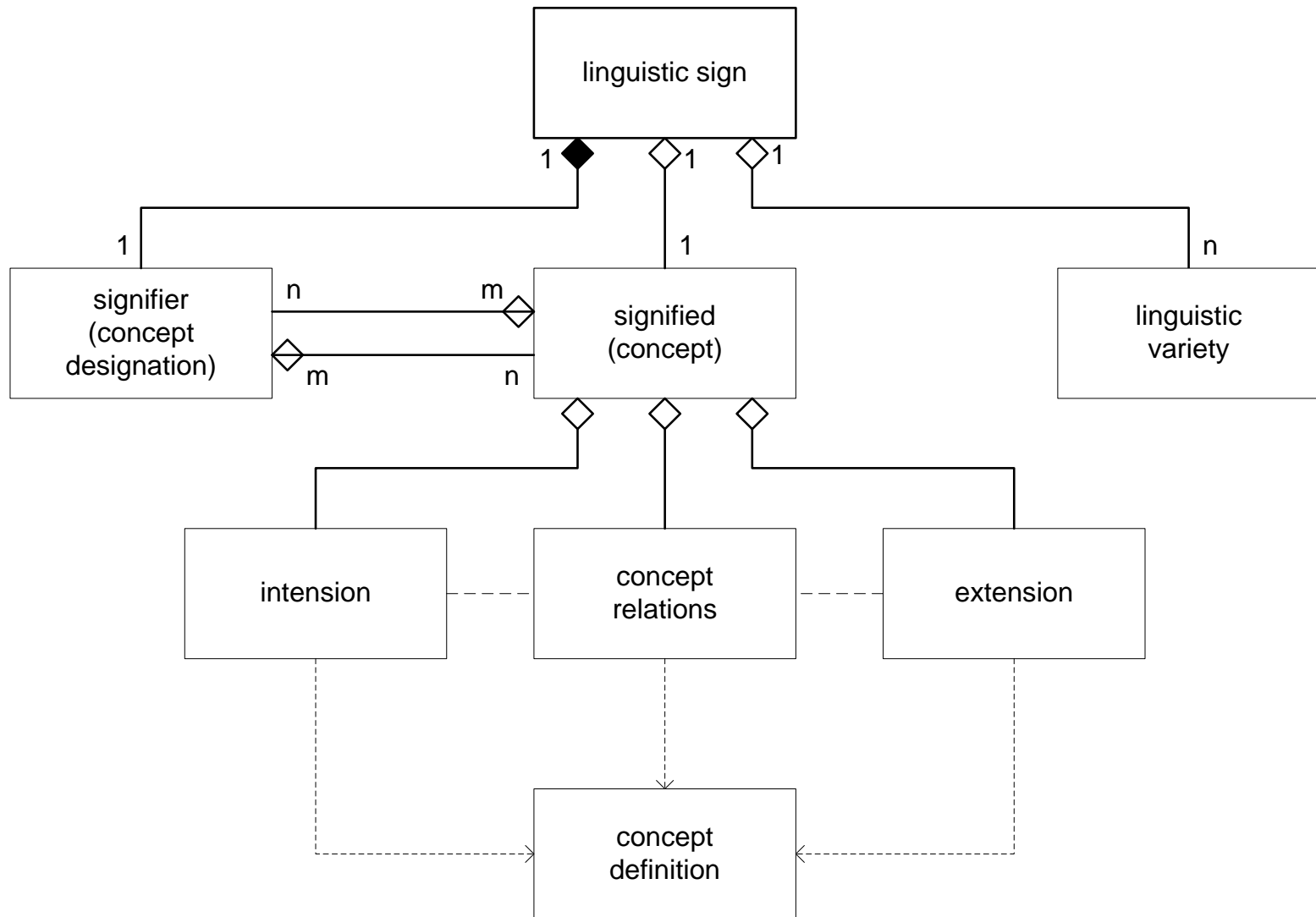
- A **formalized** concept model helps to overcome lexical ambiguities!

General situation:

- language use in railway engineering is blurry
- there is a lack of a consistent and harmonized terminology
- **ambiguity:** different words have multiple meanings
 - „argument“ \Rightarrow process or result?
 - „specification“ \Rightarrow process or result?
- **inconsistency:** standards are contradictory
 - "fault" expressed by IEC 61508-4
 - “fault” expressed by IEC 60050(191)
- **semantic vagueness:** terminological definitions are imprecise
 - What characteristics describe the severity of a minor or major injury?
 - Duration of clinical treatment [hours]
 - Time of convalescence [weeks]
 - Reversibility of injury [boolean]
 - Regain of full capacity to work [boolean]
- **context dependence:** standards are contradictory
 - “signal” in communications engineering
 - “signal” in railway engineering

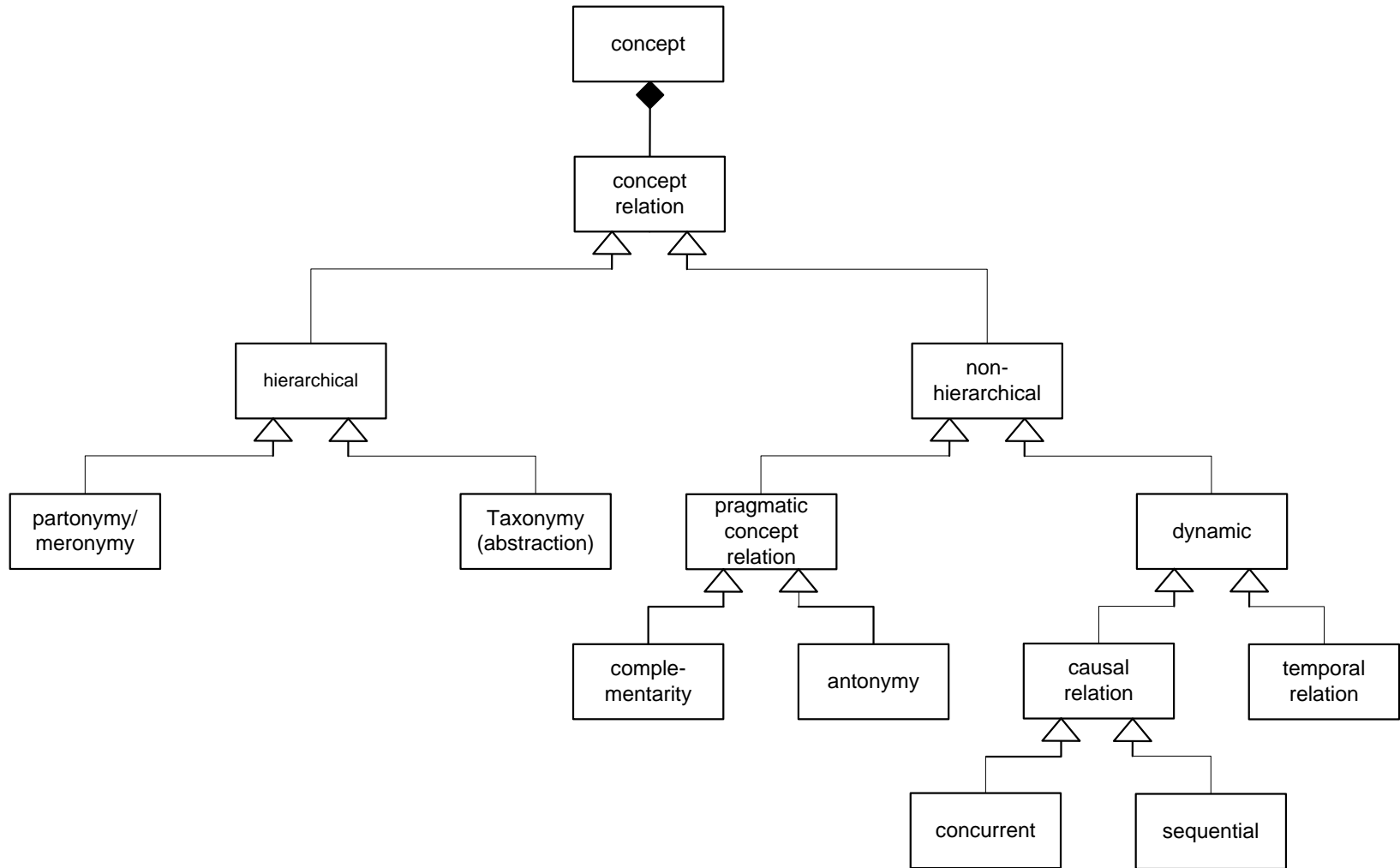


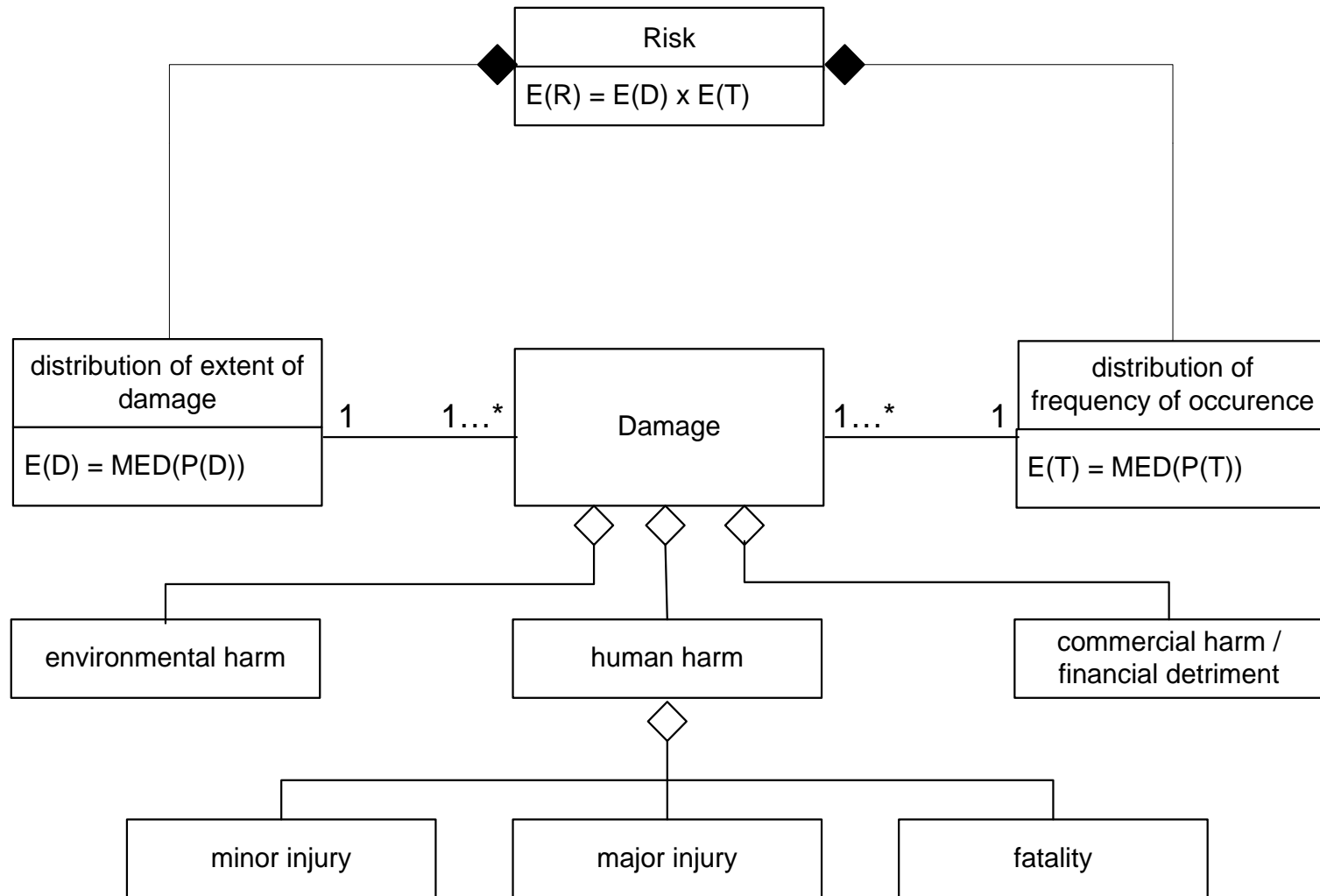
October, 22nd 1895: Montparnasse train accident

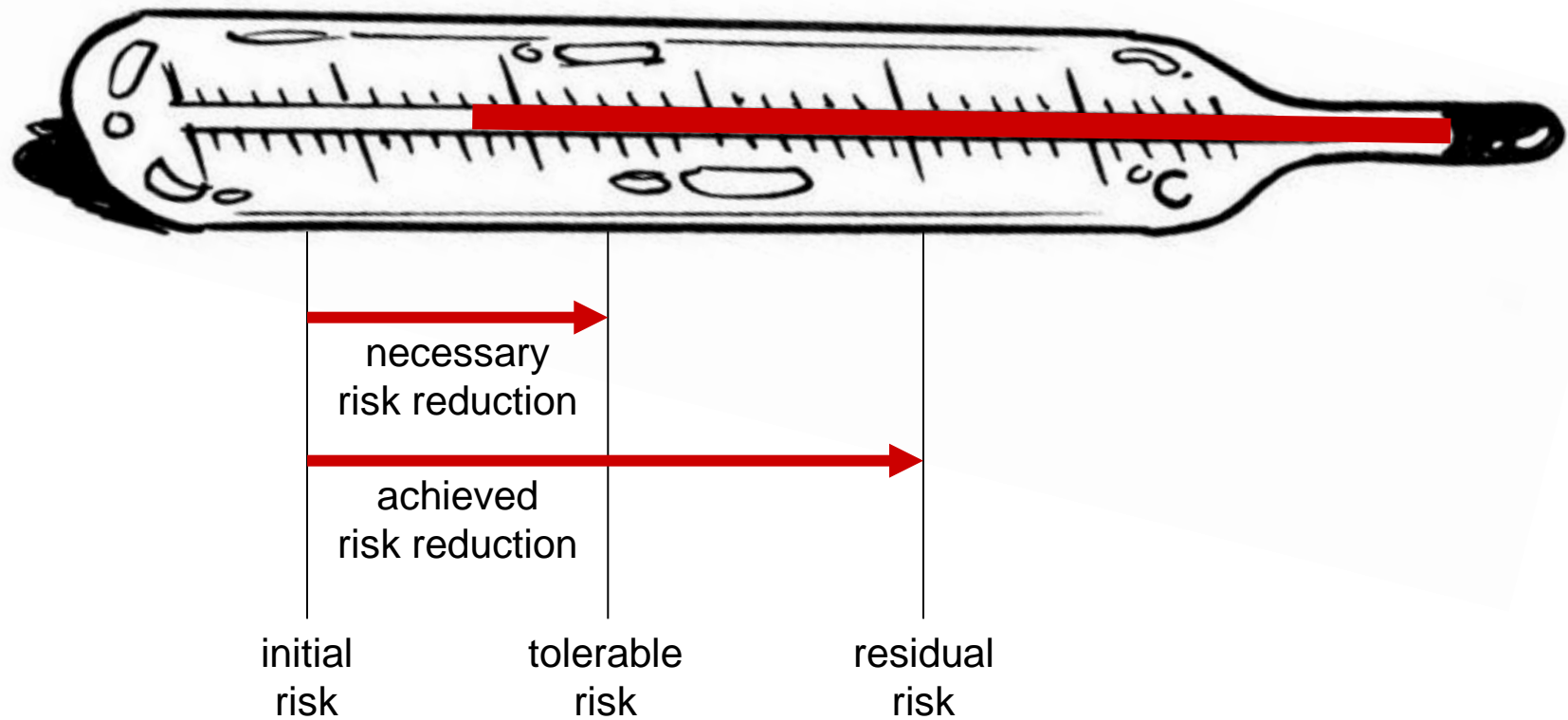


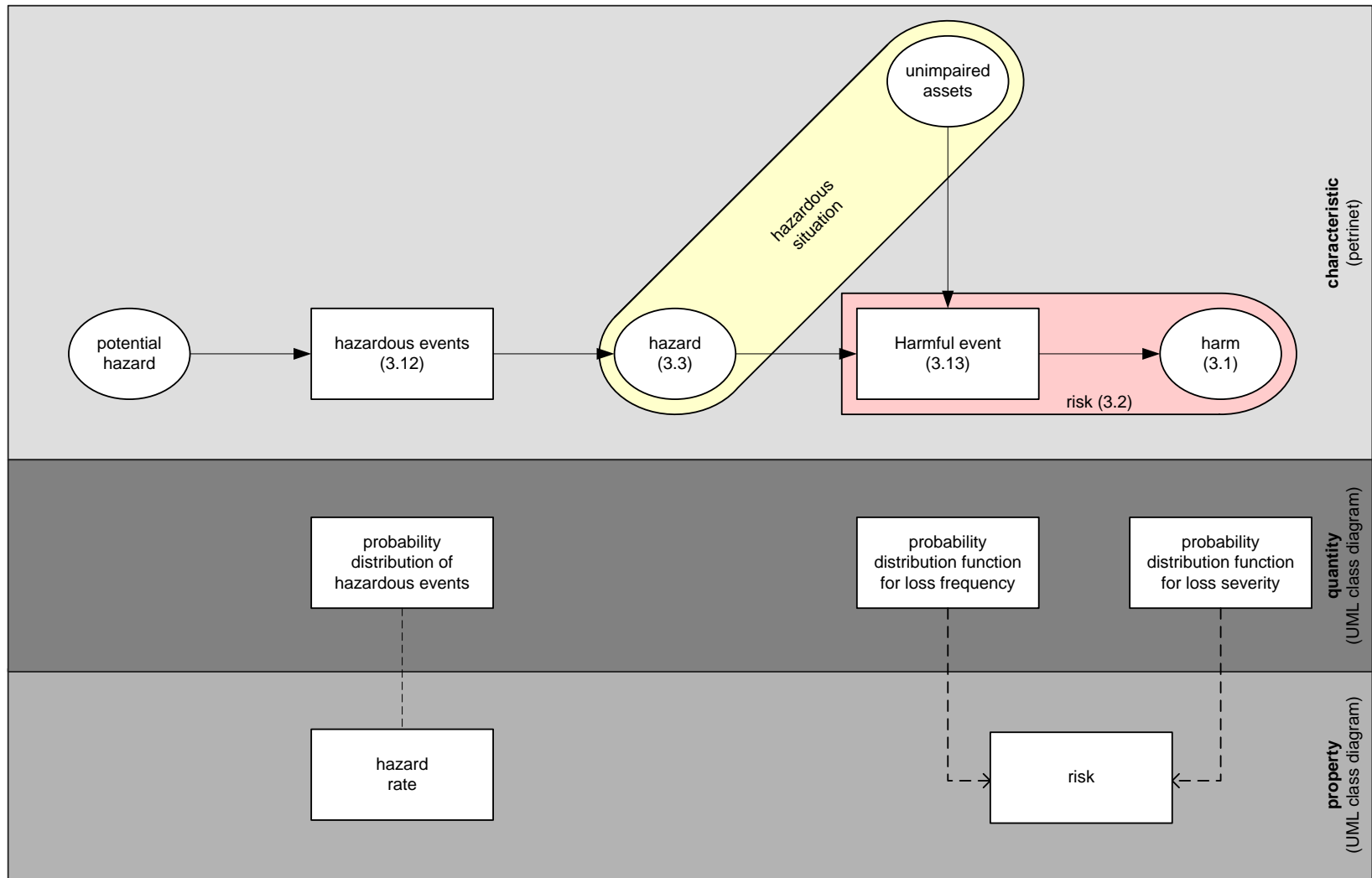
Methodical foundation

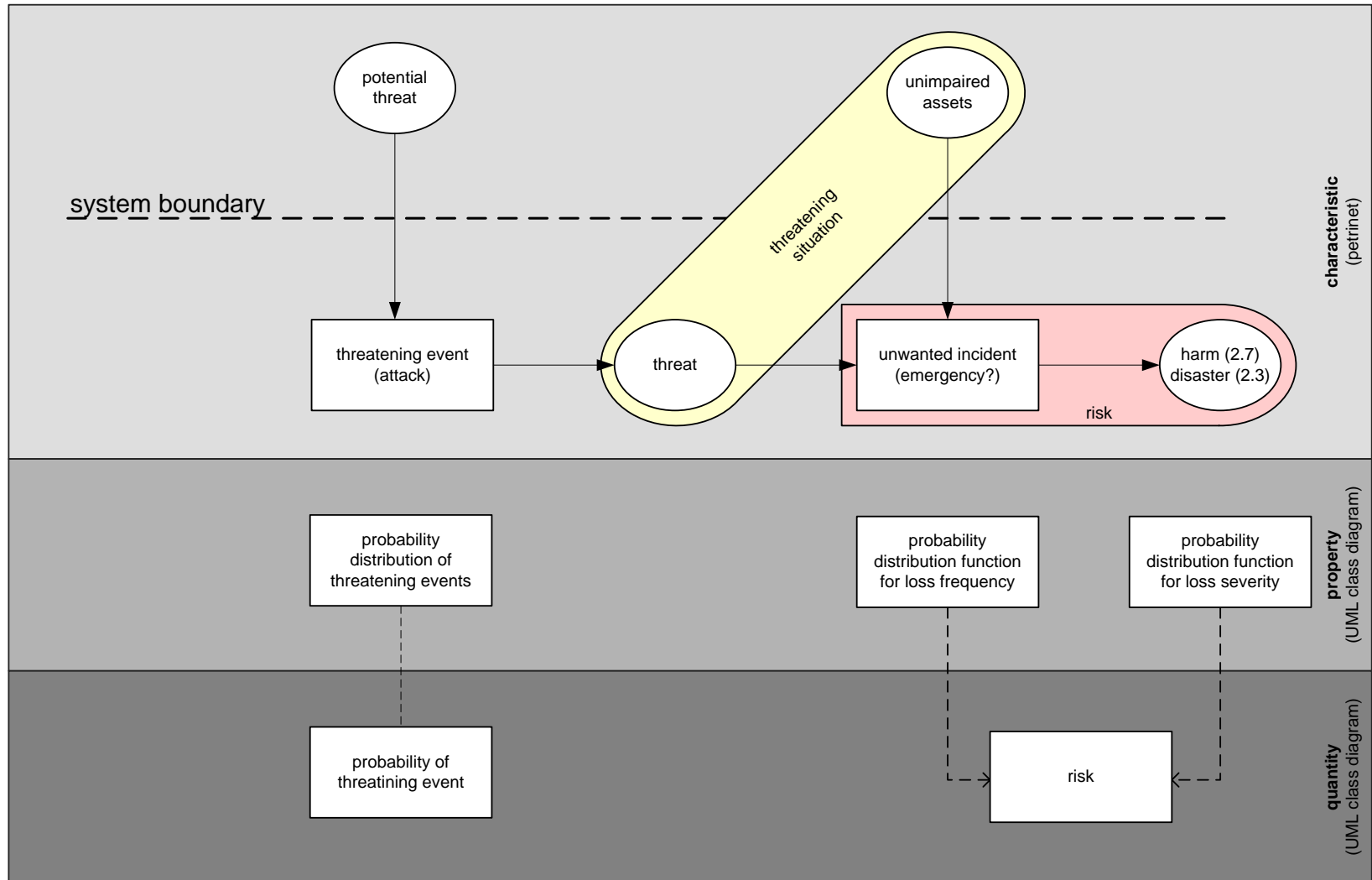
Relations within a concept system





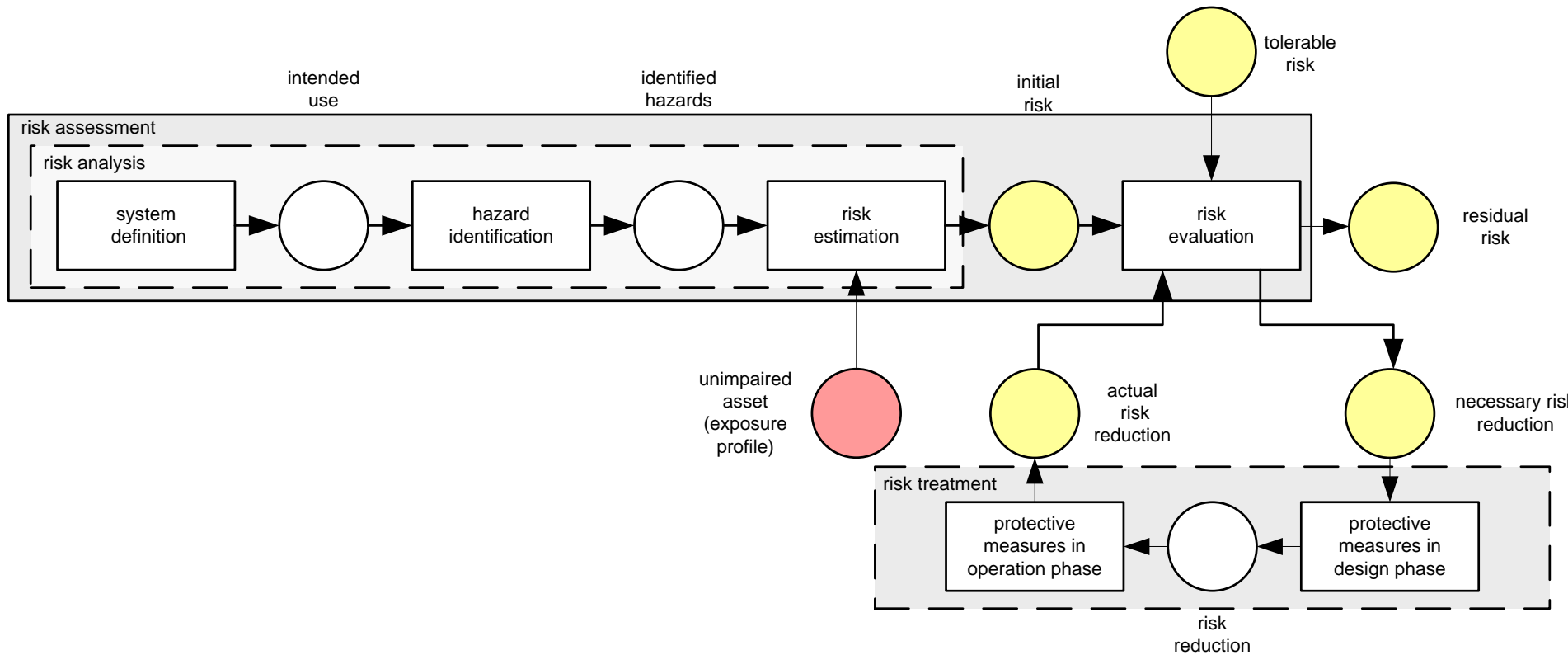






Application

Iterative process of risk assessment and risk reduction (risk control)





Tack för uppmärksamheten!



Thank you for your attention!