

Proseminar Lexikalische Semantik WS 09/10

Das FrameNet Projekt

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Übersicht

1. Motivation
2. Was ist FrameNet?
3. Frame
 - Lexical Unit (LU)
 - Frame Element (FE)
4. Unberechenbarkeit und Null-Instanziierung von FEs
5. Frame zu Frame Beziehungen
6. Zugriffsmöglichkeiten
7. Multilingualer Einsatz und SALSA

Motivation

- Strukturierung der Daten

Nikola Tesla Factsheet			
Mined from Wikipedia and other sources			
Organized by FrameNet categories			
INVENTION		DEATH	
Cognizer	Invention	Protagonist	Time
Tesla	<u>induction motor</u>	Tesla	<u>7 January</u>
Tesla	<u>RADAR systems</u>		<u>1943</u>
Tesla	<u>experiments to produce X-rays</u>		
Tesla	<u>spark plug</u>		
Tesla	<u>machine for inducing sleep</u>		
SEEKING_TO_ACHIEVE		Place	Cause
Agent	State_of_affairs		<u>heart</u>
Tesla	<u>reduce distance</u>	<u>room</u>	<u>3327 of</u>
Tesla	<u>friendly international relations</u>	<u>the</u>	<u>failure</u>
		<u>Hotel</u>	
		<u>New</u>	
		<u>Yorker</u>	

Fig. 1. Organizing information by meaningful categories.

Was ist FrameNet (FN) ?

- ein lexikografisches Projekt
- Erfassung der semantische und syntaktische Merkmale eines Wort-Tokens in Korpora
- seit 1997 unter der Leitung von Charles J. Fillmore am „International Computer Science Institute“ in Berkeley durchgeführt
- online zugänglich

Frame Semantik

FrameNet basiert auf Frame Semantik
(Fillmore 1976; Fillmore 1985)

- die Bedeutung der Wörter bezüglich Weltwissen
- Organisation der Weltwissen in Frames
- Frame = mentale Repräsentation einer stereotypischen Situation
- Frame Elemente(FEs) = zentrale Rollen in der Situation
- ein Wort evoziert mindestens ein Frame

Evozieren eines Frames

Gehen wir essen?



Evozieren eines Frames

Gehen wir essen?



Frame (Semantischer Rahmen)

- Attribute
 - Name(ID) / Activity, Birth, Leadership ... /
 - Definition
 - semantischer Typ
- hat ein oder mehr Frame Elemente (FEs)
- eine Menge von Lexical Units (LU)

Definition eines Frames

- Einführung der zentralen FEs und ihre Beziehungen zueinander im freien Text

Frame Report (recent data)

[| Top of Frame Index](#) | [Top of Lexical Un](#)

Scrutiny

Definition:

This frame concerns a **Cognizer** (a person or other intelligent being) paying close attention to something, the **Ground**, in order to discover and note its salient characteristics. The **Cognizer** may be interested in a particular characteristic or entity, the **Phenomenon**, that belongs to the **Ground** or is contained in the **Ground** (or to ensure that such a property of entity is not present). Some words in this frame allow alternate expressions of the **Ground** and the **Phenomenon**:

We **SEARCHED** **the yard** **for my contact lens**.

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We **SEARCHED** the yard for my contact lens.

i) ...[police and coastguards *Cognizer*] were **searching** [the coastline *Ground*][for a man *Phenomenon*]....

ii) ...[she *Cognizer*] began to **search** [for a piece of land *Phenomenon*] [in the Cotherstone area *Ground*]

Semantischer Typ eines Frames

- Etiketten für den semantischen Typ können zu jedem Frame angebaut werden.
- ontologische semantische Typen als Hierarchie organisiert

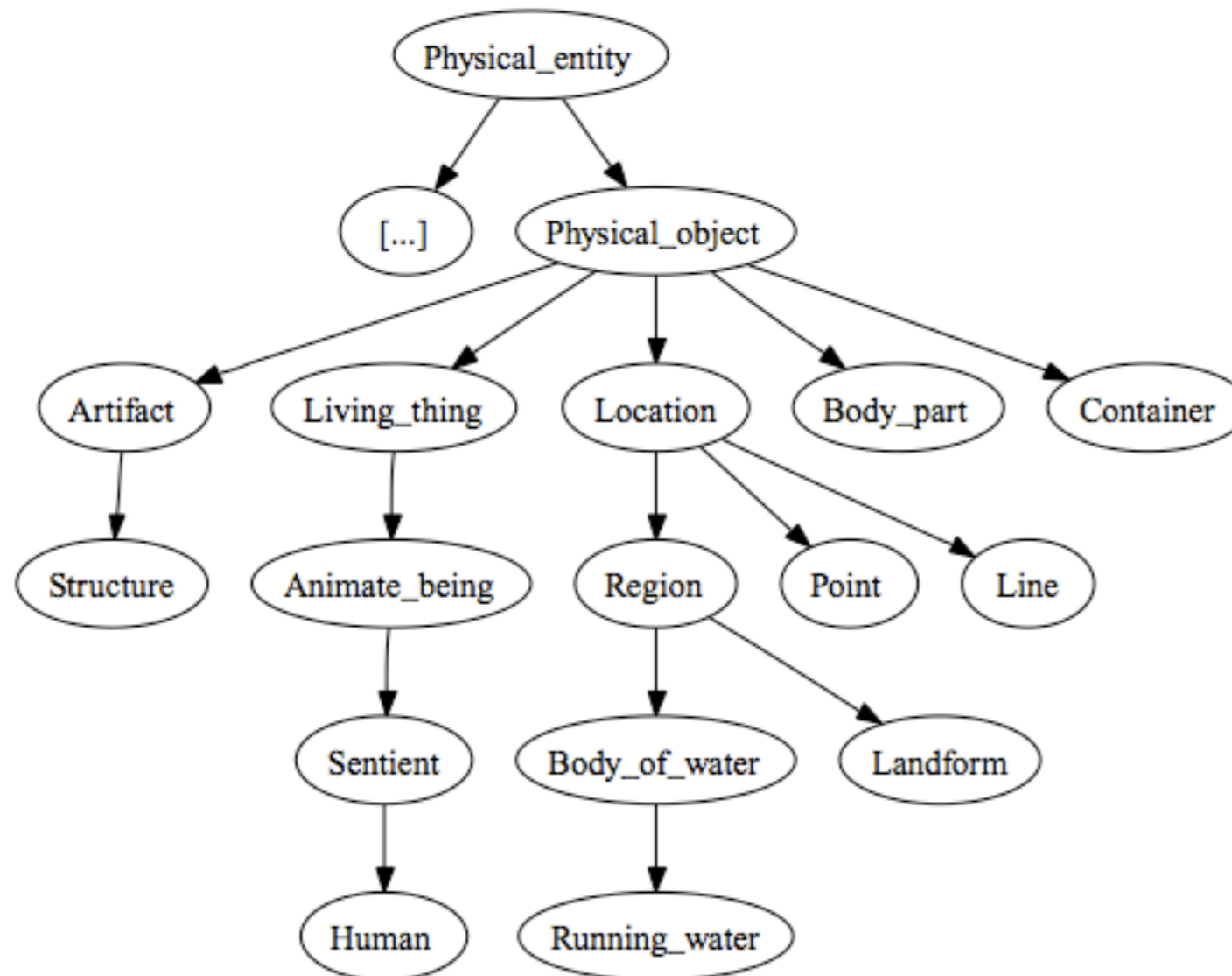


Fig. 2. FrameNet ontological semantic types (selection).

Lexical Unit (LU)- lexikalische Einheit (Cruse 1986)

I. Form

- **Lemma** und assoziierte Wortformen
z.B.: need, needs, needed, needing

2. Bedeutung

- repräsentiert beim semantischen Frame

LU in der FN-Datenbank

lemma: [LexUnit] [Frame](#) [Global](#) [FullText](#) [Frame Rel](#) [FE Rel](#) [Q&A](#) [Home](#) [other Links](#) [AutoEdic](#)

[sea](#)
[seal](#)
[seam](#)
[seamount](#)
[search](#)
[seat](#)
[seated](#)

No.	frames	lemma	pos	disp.	COD/FN def
1	Scrutiny (rel.)	search	N	withFE	COD: an act of searching.
2	Scrutiny (rel.)	search	V	withFE	COD: try to find something by looking or otherwi

No.	frames	lemma	pos	disp.	COD/FN def
1	Scrutiny (rel.)	search	V	withFE	COD: try to find something by looking or otherwise seeking carefully and thoroughly

Display Modes [ALL](#) [FE](#) [KDG](#) [valence](#) [Supp](#) [Ctrl](#)

Num	FE/LUset (sort = FE; Scrutiny, search, V,)
01	Cognizer + Ground + search.V + Phenomenon
01	Cognizer + Manner + search.V + Ground
01	Cognizer + Manner + search.V + Ground + Phenomenon
30	Cognizer + search.V + Ground
03	Cognizer + search.V + Ground + Means
22	Cognizer + search.V + Ground + Phenomenon
04	Cognizer + search.V + Ground + (Phenomenon)
01	Cognizer + search.V + Manner + Ground
01	Cognizer + search.V + Manner + Ground + (Phenomenon)
01	Cognizer + search.V + Manner + (Ground) + (Phenomenon)
01	Cognizer + search.V + Manner + (Phenomenon) + (Ground)
01	Cognizer + search.V + Means + Ground
02	Cognizer + search.V + Phenomenon + Ground

Frame Elements	Core Type
Cognizer	Core
Degree	Peripheral
Direction	Extra-Thematic
Ground	Core
Manner	Peripheral
Means	Peripheral
Medium	Core
Phenomenon	Extra-Thematic
Purpose	Peripheral

- np-vpto

1. The microcomputer then SEARCHES the file to discover any entries indexed using both keywords .
2. Forensic experts SEARCHED the council-run home to help detectives in the manhunt and extra officers have been drafted in .
3. They then SEARCHED the house to find out whether Bland , of Prior Dene , Darlington , was inside .
4. I had heard that name before , and SEARCHED my memory to discover its associations .
5. We could have SEARCHED the seas to see if Bartholomew had survived . "
6. Rebecque SEARCHED the table to find one of the larger scale maps that the Royal Engineers had drawn and distributed to all the army headquarters .
7. The meeting was mostly a ` Fun out of doors " one , so Jill soon went off to SEARCH the wood to complete her collection of ferns .

- np-ppfor

1. Turning , she SEARCHED the crowds for a glimpse of him .
2. His eyes flickered as he looked at her , and she knew he was SEARCHING his mind for a joke .
3. The body was sighted as police and coastguards were SEARCHING the coastline for a man , understood to come from Edinburgh , who had been reported miss
4. He SEARCHED her eyes for a moment , then sighed and held up his hands in surrender . INI
5. Paula SEARCHED his eyes for an answer .
6. Police investigating the death of a woman , whose body was discovered in a car pulled from the River Severn , have been SEARCHING the riverbank for clues .
7. Motes of mica glittered in the beams that bathed me as i SEARCHED the rock above for clues .
8. During the month of November , resident waterfowl can be seen SEARCHING the increasingly barren landscape for food .
9. That afternoon i meant to SEARCH the Bible for information , though I knew little of it .
10. Volker 's glance dismissed their antics as normal as he SEARCHED the bar for Lais .
11. He waited a moment , SEARCHING the walls for sign of some technological trickery .
12. For the first time , Jenna SEARCHED the house for some sign of her father .
13. ` i SEARCHED the house for their mother but she was n't there . "
14. i had been frantically SEARCHING the garden for Toby , and found him , his head stuck through the bars unable to move .
15. ` i SEARCHED the whole town for you . "

Frame Element

- Attribute
 - Name
 - Definition
 - Semantischer Typ
 - Status

Name eines Frame Elements (FE)

- mnemonische Bezeichnung
- Der Name eines FE ist nicht einmalig.
- gleiche Namen in eng zusammenhängenden Frames

Activity

Definition:

This is an abstract frame for durative activities, in which the **Agent** enters an ongoing state of the **Activity**, remains in this state for some **Duration** of **Time**, and leaves this state either by finishing or by stopping. The **Agent's Activity** should be intentional. This frame is intended mostly for the inheritance of common FEs, and to provide the frame structure for the beginning, ongoing, finish, or stop stage of an **Activity**, each of which constitutes a subframe of this frame. This frame should be compared to the Process frame.

Semantic Type Non-Lexical Frame

FEs:

Core:

Activity [Act] This FE identifies the **Activity** in which the **Agent** is engaged.

Agent [Agent] The **Agent** is engaged in the **Activity**.

Semantic Type Sentient

Building

Definition:

This frame describes assembly or construction actions, where an **Agent** joins **Components** together to form a **Created_entity**, which is profiled, and hence the object of the verb.

Jack **BUILT** a new house out of bricks.

We **GLUED** the airplanes together.

Semantic Type Artifact

FEs:

Core:

Agent [Agt] The **Agent** builds a **Created_entity**.

Semantic Type Sentient

Jack **BUILT** a new house.

Created_entity [CrEnt] **Created_entity** identifies the entity that is created in the building.

Semantic Type Artifact

Jack **BUILT** a new house.

Components [Cmpnt] This FE identifies the **Components** that form the **Created_entity**.

Jack built a new house out of old bricks.

Definition eines FE

- beschreibt die Bedeutung eines FE bezüglich des Frames, zu dem es gehört
- Verallgemeinerungen des syntaktischen Musters
- z.B.: *Goal* in dem Frame Filling

Definition:

These are words relating to filling containers and covering areas with some thing, things or substance, the **Theme**. The area or container can appear as the direct object with all these verbs, and is designated **Goal** because it is the goal of motion of the **Theme**. Corresponding to its nuclear argument status, it is also affected in some crucial way, unlike goals in other frames.

Lionel Hutz **COATED** the wall with paint.

Goal [Goal]

Semantic Type

Goal

The **Goal** is the area or container being filled. Goal is generally the NP Object in this frame.

Semantischer Typ eines FE

- Einschränkung für den Kopf der FE füllenden Phrase

Frame Communication und FE *Communicator*

(1) [The catechist_{*Communicator*}] **communicated** with Todd by way of simple communication and a flannel board.

Semantischer Typ eines FE

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(1) [The catechist *Communicator*] **communicated** with Todd by way of simple communication and a flannel board.

(2) [Horses *Communicator*] have a quick eye for slight muscular movements and changes in the posture of their companions and perhaps **communicate** many of their feelings by signalling in some such subliminal manner.

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Communicator [Com]
Semantic Type Sentient

The sentient entity that uses language in the written or spoken modality to convey a Message to another person.

He finds it hard to **COMMUNICATE** with people, not least his separated parents .

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(3) . . . [her letter *Communicator*] **communicated** nothing of her pleasure and love. . .

Status eines FE

- Der Status ist eine Metainformation über die Zentralität des FE
- Core FE sind konzeptuell notwendig für den Frame
- Peripher FE sind dezentrale Elemente wie Ort und Zeit
- Extra-thematische FE gehören nicht konzeptuell zu dem jeweiligen Frame

Unberechenbarkeit der FEs

- Die Semantik der FEs ist unberechenbar von ihrer Form

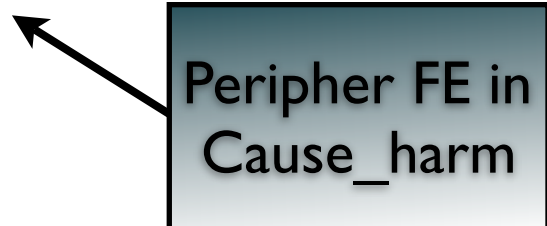
(1) [Spotting a good school *Outcome*] will **depend**[on using information and common sense *Determinant*].

Core FE in
Contingency



(2) . . . [a man *victim*] was **stabbed**[in the face *Body part*] [on a train platform *Place*] [yesterday *Time*].

Peripher FE in
Cause_harm



(3) Drugs seized at [this weekend's *Time*] **rave**[on the outskirts of Northampton *Place*] include ecstasy, cannabis,

Peripher FE in
Social_event



Null - Instantiierung (NI)

- fehlende Core FE werden zu null instantiiert
- Filling

Agent	Core
Theme	Core
Goal	Core

- Constructional Null Instantiation (CNI)

If the site is made of builder 's rubble , COVER it with a foot of topsoil . CNI

- Definite Null Instantiation (DNI)

Place the kumquats or orange slices in a pan , COVER with water , bring to the boil , strain and discard the water . CNI DNI

- Indefinite Null Instantiation (INI)

Did you know that Cecil Beaton could n't even LOAD his own camera ? INI

Beziehungen zwischen Frames

- Vererbung
- Subframe
- Using

Vererbung

- verbindet ein allgemeiner (Elternteil) mit einem spezifischen (Kind) Frame

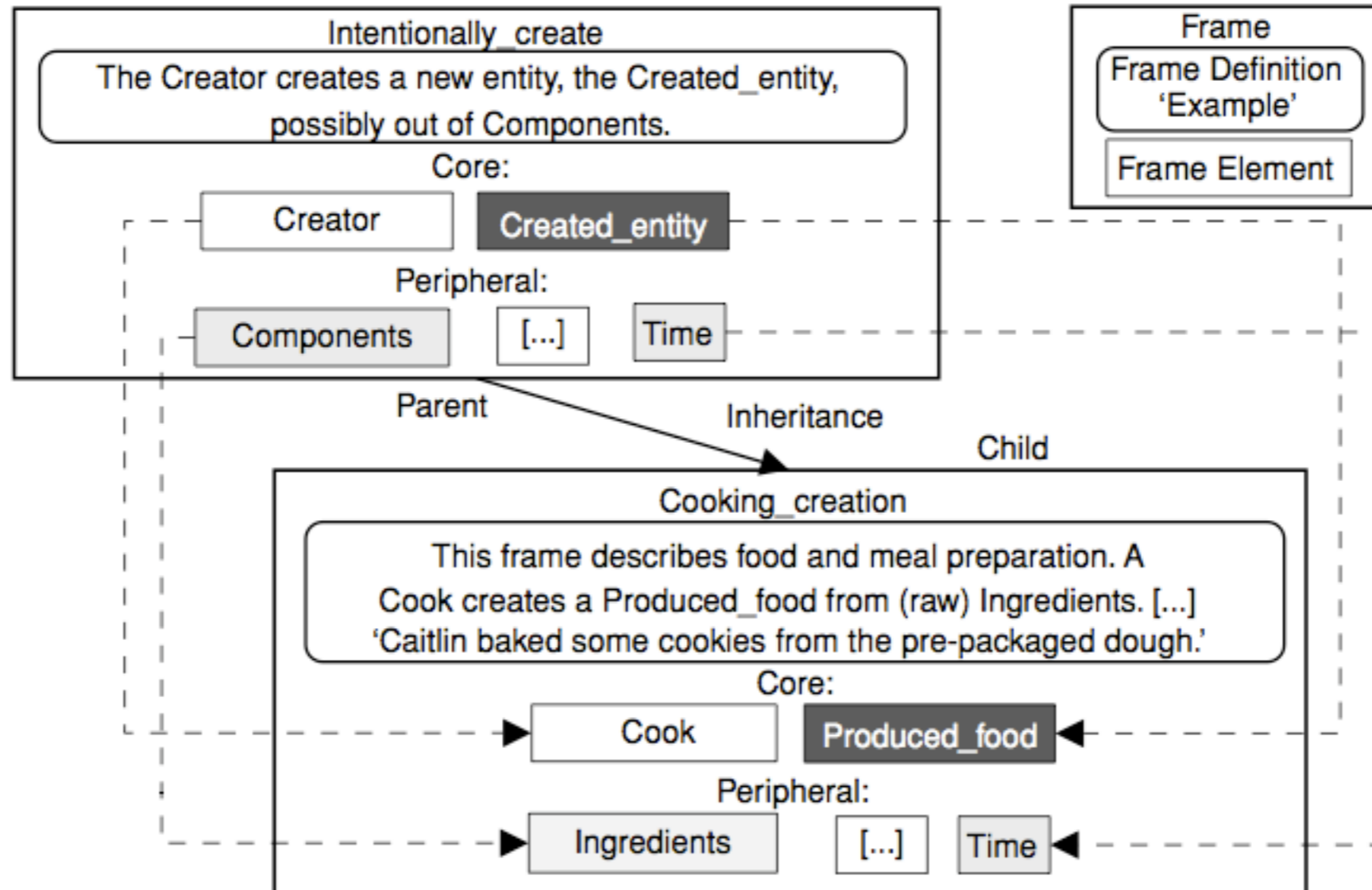
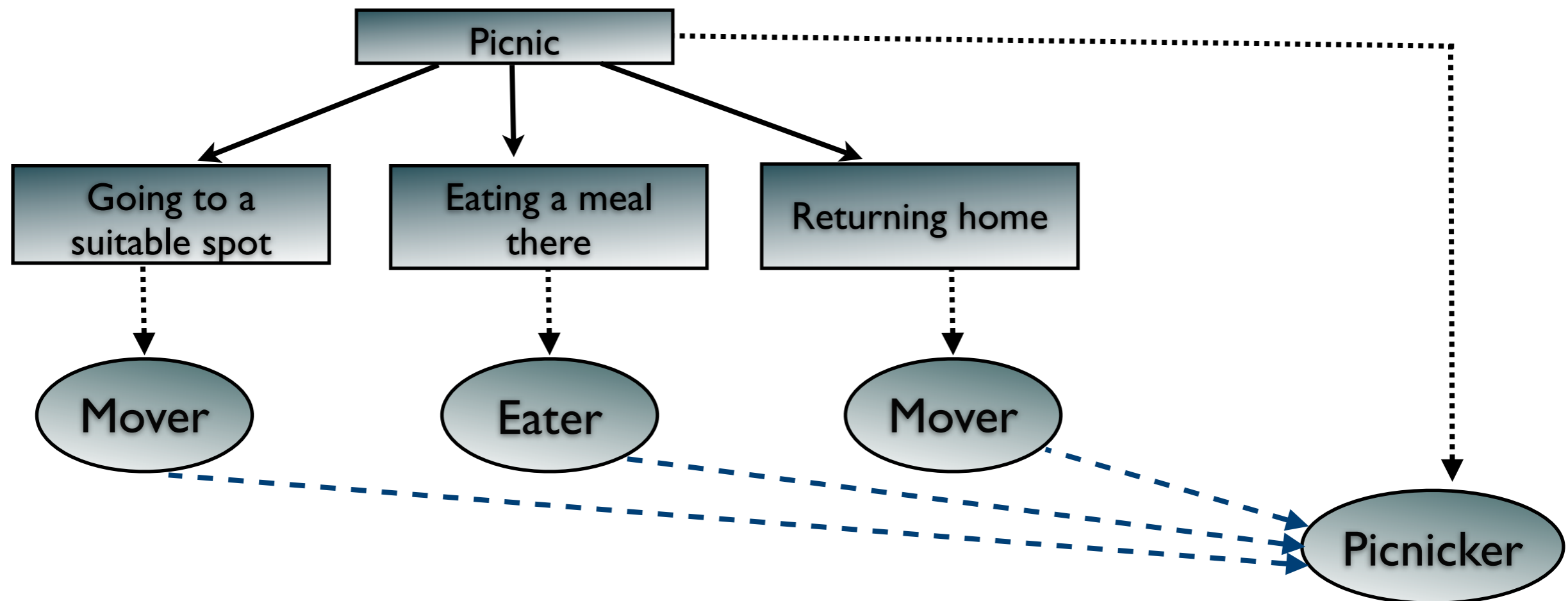


Fig. 5. Frame Inheritance and FE relations: Intentionally_create and Cooking_creation.

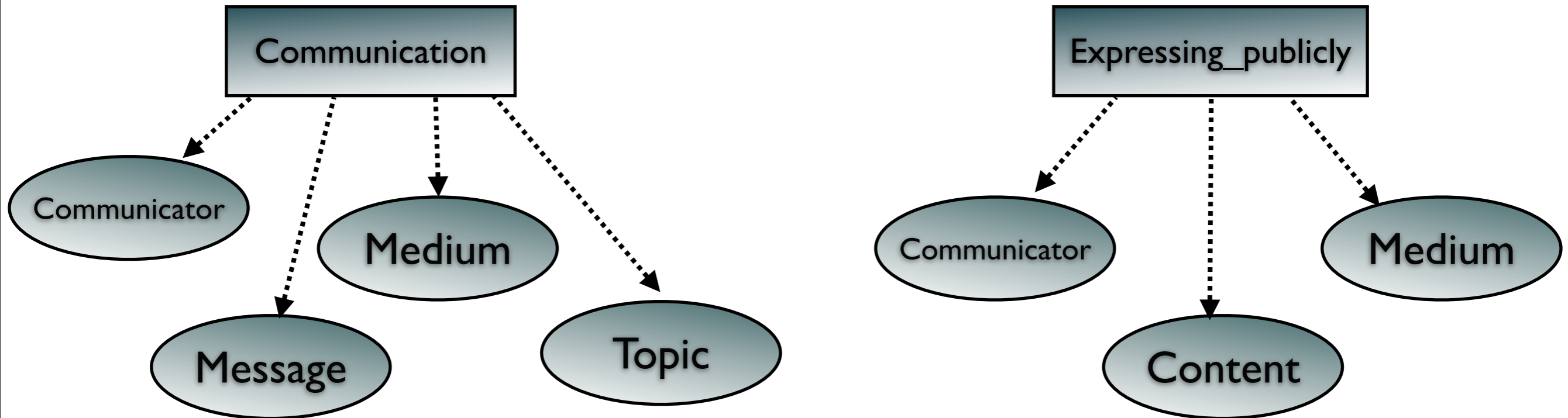
Subframe

- Zerlegung eines komplexen Ereignis in Teilereignisse
- ein Teilereignis ist ein Subframe
- Subframe-FE sind gebunden an den FE aus dem komplexen Frame



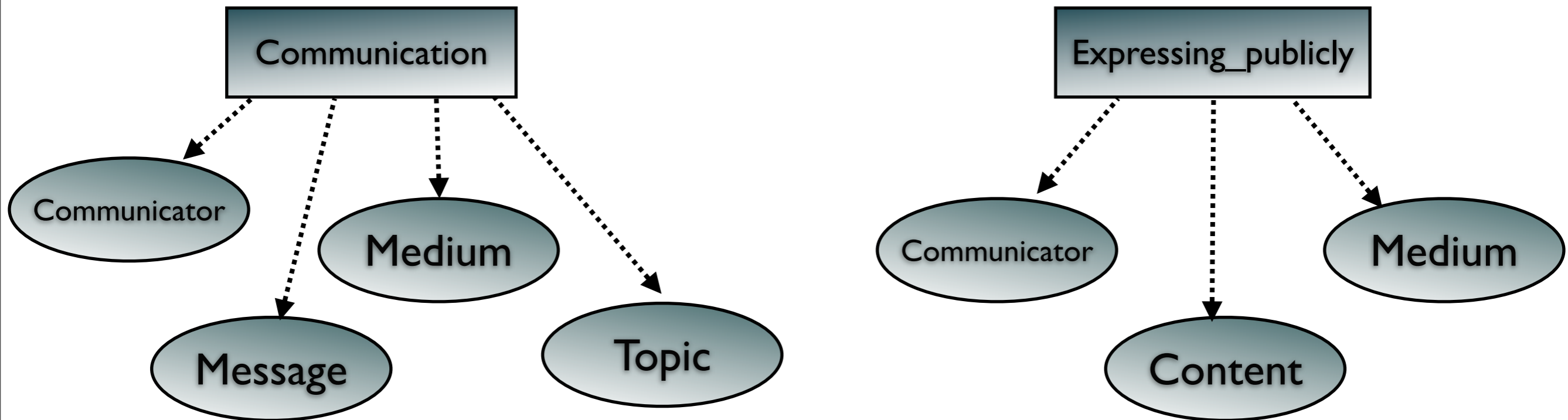
Using

- wie Vererbung aber nicht so strikt



Using

- wie Vererbung aber nicht so strikt



Expressing_publicly **erbt von** Communication. ✗

Expressing_publicly **benutzt** Communication. ✓

Aktueller Status von FrameNet

- mehr als 965 Frames
- mehr als 11 500 Paare aus Frame und ihm evozierenden LUs
- ca. 170 000 annotierte englische Sätze

Zugriffsmöglichkeiten

- per Index auf LU
- per Index auf Frame
- FrameGrapher
- FrameSQL

Multilingualer Einsatz

- Frames sind Konzepte
- Übernehmen aller Frames und ihre Beziehungen
- Einfügung lexikalischer Einheiten der neuen Sprache

SALSA

- Saarbrücken Lexical Semantics Acquisition Project
- annotierte deutsche Texte aus Zeitungsartikeln im FN-Stil
- Erste Version im Oktober 2007
 - mehr als 500 annotierte Verblemmata
 - mehr als 20 000 annotierte Verbinstanzen
- Leitung: Prof. Manfred Pinkal

Zusammenfassung

- Was haben wir kennengelernt?
 - Frame Semantik
 - Frames
 - Lexical Units(LU)
 - Frame Elemente(FE)
- Unberechenbarkeit und NI der FE
- Frame zu Frame Beziehungen

Referenzen

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- Collin F.Baker, Charles J.Fillmore and Beau Cronin: The Structure of FrameNet Database aus *International Journal of Lexicography*
- <http://framenet.icsi.berkeley.edu/>