

# Verbs and their modifiers — a pilot study on German *schlagen*



Wilhelm Geuder & Ekaterina Gabrovska  
SFB-Colloquium, 7 Jan 2016

# Overview



## Today's topics:

- 1 Project B09 and (ad)verb semantics
- 2 Analysing *schlagen*: variation in agentivity
- 3 *Schlagen* and the problem of "affectedness"
- 4 Directionality and the target argument,  
with a conclusion on the meaning of *schlagen* and *hit*

## Overarching questions:

- *Challenges for Frame modelling?*
- *How are attributes reflected in modification data?*

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# Project B09: Verbs and their Modifiers

## 1) The semantics of adverbial modification (by adjectives):

- distinguishing modifier types; defining "manner" as opposed to other event-related predications

### Analysing modification as the interaction of two frames

- rules of construal that explain how manner modifiers target attributes of the event and restrict their values; and other construals of the same adj.

## 2) Lexical semantics of verbs:



- determine the availability of attributes according to lexical meaning or inferences
- structuring of attributes into domains, correlations among them
- ontological status of attributes / "manners" that are being referred to (discuss commonalities with degrees)

# Project B09: Verbs and their Modifiers

## 1) The semantics of adverbial modification (by adjectives):

- distinguishing modifier types; defining "manner"  
— as opposed to other event-related predications

- Manner modifiers target frame attributes in specific conceptual domains.

## 2) Lexical semantics of verbs

- Examples of **domains** (yielding "verb classes" if verb meanings are in one single domain):
  - dimension of measurement (verbs: *wiegen* / *weigh...*)
  - localisation / path (verbs of directed motion: *enter*, *pass by*)
  - manner of movement (verbs: *rollen* / *roll*, *steigen* / *climb*, *rise*; *schwimmen* / *swim*, *float...*)
  - force exertion (verbs: *swim*; ***schlagen* / *hit***)

# Verbs and their modifiers: a pilot study on *schlagen*

- The verb *hit* is remarkable in that it is not resultative ( $\neq$  *break*) but appears to belong to the class of semelfactives (like *knock*, *flap*, etc.)
- It shows constructional variation with different meanings, including  $\pm$ agentive pairs (but no anticausative).

- German counterparts: *schlagen* and *treffen*.

No 1:1 correspondences between German and English wrt. verbs and constructional variation:

<i>He fell and hit the pavement with his head.</i>	"Er schlug... <b>auf</b> das Pflaster"
<i>The car went off the road and hit a tree.</i>	" <b>prallte/traf</b> (gegen) einen Baum"
<i>He hit the table with his fist.</i>	"Er schlug <b>auf</b> den Tisch"
<i>He hit his fist onto the table.</i>	"... <b>mit</b> der Faust auf den Tisch"
<i>He hit the ball to the other side of the field.</i>	"schlug den Ball in die gegnerische Hälfte"

## *schlagen*: What has been done so far

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- A first study on *schlagen* and variation with respect to the implication of force features: Goldschmidt & al. (2015, Tbilissi)
- B09: Establishing conceptual domains involved in *schlagen*, and semantic variation according to different syntactic patterns
- B09: Preliminary collection of modifiers that occur with *schlagen* in corpora

Problems with detecting adverbial adjectives in German corpora which are not yet solved:

- Tagged corpora provide a classification " $\pm$ attributive"; but " $-$ attributive" is not congruent with "adverbial".
- B09/C10 currently working on machine learning solutions

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Adj \ Constr.		1 UNACC.	2 RESULTV	3 TRANSTV	4 OBLIQ	5 ?case?	5aDBL acc	5b DBL dat
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begeistert	12	keine	3	keine	3	1	keine	5
stark	11	1	keine	6	3	keine	keine	1
grausam	9	keine	keine	9	keine	keine	keine	keine
sacht	8	1	keine	keine	2	keine	keine	5
scharf	7	keine	2	keine	1	1	keine	3
liebepoll	6	keine	1	1	1	keine	1	2
bewusst	6	keine	keine	3	1	1	keine	1
beherzt	6	keine	5	keine	1	keine	keine	keine
blindwütig	5	keine	keine	keine	3	keine	keine	2
lässig	4	1	2	keine	1	keine	keine	keine
verbissen	4	keine	1	3	keine	keine	keine	keine
hemmungslos	4	keine	1	1	1	keine	1	keine
quer	3	1	keine	keine	keine	keine	1	1
schwungvoll	3	keine	1	keine	1	keine	keine	1
schräg	2	1	keine	keine	1	keine	keine	keine
schwach	2	keine	1	keine	1	keine	keine	keine
geschickt	2	keine	keine	1	keine	keine	1	keine
unbewusst	2	keine	keine	keine	keine	keine	keine	2
hektisch	1	keine	keine	keine	1	keine	keine	keine
herzlich	1	keine	keine	keine	keine	keine	keine	1
	601	32	63	129	176	47	32	122

## 2

# *Schlagen* and its subjects

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- Fillmore (1970): *hit* may occur with agentive or "instrument" subjects.  
*John hit the tree with a rock / A rock hit the tree.*
- Actually, instruments are hardly acceptable as subjects of *schlagen*:

*Der Hammer schlug ein Loch ins Parkett*

= *The hammer [was flung across the room and]  
made a hole in the parquet*

≠ *Somebody hammered on the parquet*

The German example involves a theme subject, which has to be distinguished from instruments (contrary to Vogel 2013).

# *Schlagen* and its subjects

- Theme subjects

- in transitive structures

*Der Hammer schlug ein Loch ins Parkett*

- and also with unaccusative structures:

*Ein Meteorit schlug in den Gemüsegarten (ein).*

a meteorite ... into the vegetable.patch

The minimal *schlagen* scene:

a theme moving forcefully against a **TARGET.THEME**

The classification of constructions into intransitive / unaccusative presents problems, however:

# *Schlagen* and its subjects

- Unaccusative structure with animate subject (here, PPs with *mit /with* are not instruments but specify a part of the theme):

*Er fiel und schlug mit dem Kopf auf das Pflaster*  
He fell and "hit" with his head [onto] the pavement

- Unaccusative or intransitive structures with inanimate subjects:

i. *Der Regen ist / hat gegen das Fenster geschlagen.*  
The rain 'is' / 'has' against the window 'hit'

ii. a. *Ventile **sind** gegen die Kolben **geschlagen** und abgebrochen.*  
valves 'are' against the pistons 'hit' and broken.off

b. *Da haben sich 2 Schrauben gelockert (...) und  
2 screws became loose [in the gears of a tractor]... and  
die Schraubenköpfe **haben** gegen die Vorderachse **geschlagen**  
the heads.of.the.screws 'have' against the front.axis 'hit'*

# *Schlagen* and its subjects

- Unaccusative or intransitive structures with inanimate subjects:
  - i. *Der Regen ist / hat gegen das Fenster geschlagen.*

## Conclusion:

- The minimal scene THEME→ITARGET comes in 2 variants; inanimate subjects with agent-like properties seem possible.
- ...probably depending on whether the moving entity is conceptualised as a bearer of 'impetus', or as moving passively.  
(cf. Geuder & Weisgerber 2008)

- Consequence: Different types of "agentivity" with different degrees of involvement, and hence of event complexity.

# *Schlagen* and its subjects

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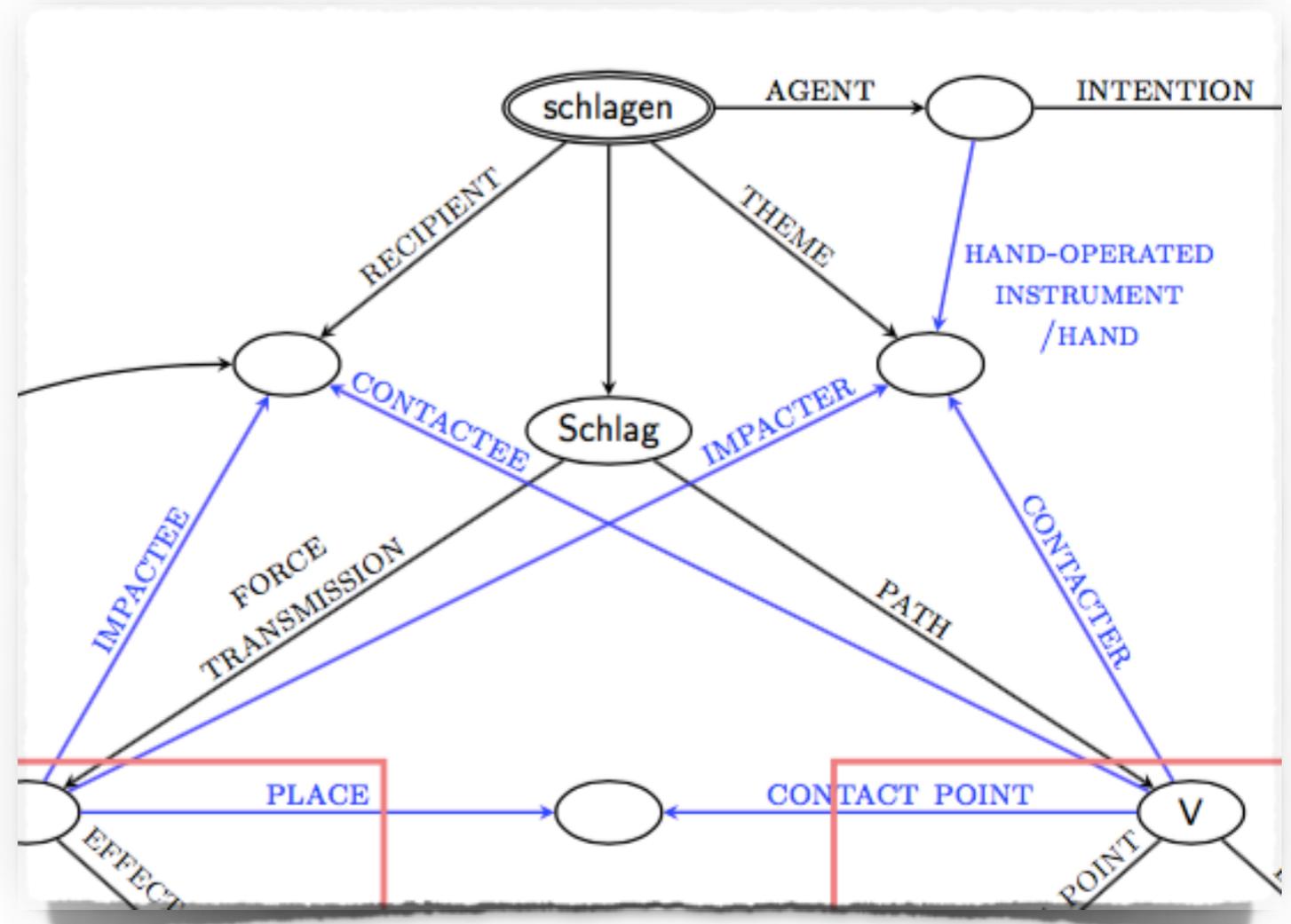
- Consequence: Different types of "agentivity" with different degrees of involvement, and hence of event complexity.
  - Caus(er): a detached participant, does not interact with the process:  
*Der Wind schlug die Fenster zu*  
the wind slammed the windows shut
  - Agent (possibly using an instrument): not part of the impact, but interaction with manner features of the event  
*Der Bauer schlug mit der Faust auf den Tisch*  
The farmer hit with his fist onto the table
  - Theme with impetus of its own: not separable from the impact:  
*Wellen haben gegen die Kaimauer geschlagen*  
waves have against the quay hit

# Questions for Frame modelling?

Preliminary thoughts on Frame modelling of *schlagen*

(Goldschmidt, Gabrovskaja, Gamerschlag, Petersen & Geuder forthcoming. 2016):

- General problem of how to integrate argument roles vis-à-vis conceptual domains.
- Specifically, to which extent is the agent independent of the core event?



# *Schlagen* and its subjects: patterning of modifiers?

- Our sample may not be representative, no statistics done so far.)
- No analysis for the factor "animateness" conducted so far.)
- From preliminary inspection:
  - Adjective meanings clearly involving agency / intentionality are absent from unaccusative constructions in our sample (viz. *brutal*, *wütend*, *spielerisch*). Otherwise, details of the semantics of the adjectives are not yet known (e.g. whether *kräftig* should be agentive or not)
  - Apparently, no modifier is specific to the class UNACC.

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### 3

## *Schlagen* and the problem of "affectedness"

- The prototypical example: a simple transitive construction.

*Wenn ein Bauer einen Esel hat, dann schlägt er ihn.*

*If a farmer owns a donkey, then he beats it.*

- Generalisation on German *schlagen*:

i. *Der Bauer schlug den Esel.*

*The farmer hit the donkey.*

ii. \* *Der Bauer schlug den Tisch.*

<sup>ok</sup>*The farmer hit the table.*

iii. *Der Bauer schlug den Tisch in Stücke.*

*...smashed it to pieces.*

"Some languages resist expressing the surface [i.e., TARGET] as a direct object, especially when inanimate, apparently requiring a high degree of 'affectedness' for objecthood." (Levin 2015)

Note: This only holds when the object depends on the verb (ii.). In a resultative construction (iii.), the effect disappears: here, the object is thematically dependent on the result predicate.

# *schlagen* and the problem of "affectedness"

- |   |                                   |
|---|-----------------------------------|
| i. <i>Der Bauer schlug den Esel.</i>              | <i>The farmer beat the donkey</i> |
| ii. * <i>Der Bauer schlug den Tisch</i>           | <i>The farmer hit the table</i>   |
| iii. <i>Der Bauer schlug den Tisch in Stücke.</i> | <i>...smashed it to pieces.</i>   |

- Lundquist & Ramchand (2012): This is a regular phenomenon involving a whole group of verbs (viz. verbs for *kick, push...*).

Hypothesis:

- The direct object has to be affected, in the sense that it undergoes change; hence (iii.) represents the standard case,
- For animate entities, affectedness can be posited due to their experiencing a situation, even in the absence of a result predication; so the interpretation of (i.) can be aligned with (iii.).

- Question 1: What exactly is different with English *hit*?

- Question 2: Does the animateness effect arise from coercion into an affected reading?

# *schlagen* and the problem of "affectedness"

- i. *Der Bauer schlug den Esel.*                      *The farmer beat the donkey*
- ii. \* *Der Bauer schlug den Tisch*                      *The farmer hit the table*
- iii. *Der Bauer schlug den Tisch in Stücke.*      *...smashed it to pieces.*

- Re problem 1: The effect is verb-specific, not language-specific. Parallelism between E. *hit* / G. *treffen* and E. *knock* / G. *schlagen*.

*Knock* allows a direct object only in resultative constructions (or with idiosyncratic meanings):

- a. *Mike had knocked his leg against a table*
- a.' # *Mike knocked his finger*                      [idiosyncratic meaning: hurt]
- b. *He knocked a couple of nails into the door*
- c. *They knocked him to the ground*
- d. *They knocked a hole for the doorway.*      [: create]
- e. *They knocked loudly (at the door).*

# *schlagen* and the problem of "affectedness"

- Problem 1: The effect is verb-specific, not language-specific. Parallelism between E. *hit* / G. *treffen* and E. *knock* / G. *schlagen*.
  - *Treffen* and *berühren* (*touch*) do not impose an animateness / affectedness constraint on their objects:  
*The car went off the road and hit a tree. / ...traf (gegen) einen Baum.*

## Hypothesis:

- Verbs like *hit* and *treffen* assign a semantic role "location of impact" to their objects. ⇒ No affectedness/animacy restrictions.
- *schlagen* assigns ( / would want to assign) a semantic role "antagonist of forceful impact", which cannot be expressed as a simple direct object.

# *schlagen* and the problem of "affectedness"

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*Der Bauer schlug den Esel.*

*The farmer beat the donkey*

\* *Der Bauer schlug den Tisch*

*The farmer hit the table*

- Question 2: Does the animateness effect arise from coercion into an affected reading?
  - Hypothesis: It rather seems to come with a polysemic variant of the verb. In German, simple transitives with *schlagen* occur in a large variety of idiomatic readings; the construction with animate objects may be one such variant, specifically denoting an interaction of two sentient beings

# *schlagen* and the problem of "affectedness"

Lexicalised collocations with *schlagen* allow inanimate and even unaffected objects (cf. c) in a simple transitive construction:

**a) Created objects** (productive)

*ein Loch / einen Krater schlagen* 'to make a hole / crater'

**b) Cutting wood**

*Vorerst darf kein gesundes Holz mehr geschlagen werden,*

'For the time being, no healthy wood may be [cut / felled] ,

*sondern nur beschädigte Bäume.*

but only damaged trees'

**c) With musical instruments** (unaffected)

*die Trommel schlagen* ('to beat the drum')

*die Laute / die Orgel schlagen* ('to play the lute / organ')

**d) Defeat**

*Das Computerprogramm schlägt jeden menschlichen Spieler*

The computer programme beats any human player

# *schlagen* and the problem of "affectedness"

Lexicalised collocations with *schlagen* allow inanimate and even unaffected objects (cf. c) in a simple transitive construction:

- a) **Created objects**
- b) **Cutting wood**
- c) **Musical instruments**
- d) ***Defeat***

Hypothesis:

- The simple transitive variants of *schlagen* are lexicalised variants.
- This list includes the scenario which shows the animacy constraint.

- e) **'Violence involving sentient participants'**

# *schlagen* and the problem of "affectedness"

- Note: The animateness constraint extends to **subjects**. This points to a more narrow meaning than just affectedness of the object:

i. *Ein zurückschnellender* *Zweig* { *traf* / ? *schlug* } *mich*.  
A rebounding twig hit me.ACC

ii. *Eine Welle* { *traf* / ? *schlug* } *mich* *heftig*.  
A wave hit me.ACC hard

- It is only the simple transitive construction that shows this constraint:

iii. *Ein zurückschnellender* *Zweig* *schlug* *mir* *ins Gesicht*  
A rebounding twig slapped me.DAT in the face

iv. *Die Wellen* *schlugen* *mir* *heftig* *entgegen*  
The waves struck me.DAT hard in (my) way  
'The waves struck hard against me'

## *schlagen* and the problem of "affectedness"

Hypothesis: The simple transitive variants of *schlagen* are lexicalised variants. This includes a variant "acts of violence involving sentient participants".

i. ? Ein zurückschnellender      Zweig schlug mich.  
A rebounding                      twig hit me.ACC

• Note also: animate subjects are only required in the constructional meaning "violence among sentient beings", but not in transitive constructions with other kinds of affected objects, like created objects:

Der Hammer traf gegen die Wand und schlug dort ein Loch.

The hammer hit against the wall and (knocked?) there a hole.

# *schlagen*: Interim summary

Components (domains) that could be separated:

- a. Movement + Impact (of theme and target)
- b. Agency, including use of instruments
- c. Effect
- d. "Violence among sentient beings": ...effect / intention / moral evaluation?

i. *Ventile **sind** gegen die Kolben **geschlagen** und abgebrochen.*

valves 'are' against the pistons 'hit' and broken.off

a

ii. *Er fiel und schlug mit dem Kopf auf das Pflaster*

'He fell and "hit" with his head [onto] the pavement'

a

iii. *Der Meteorit schlug einen Krater.*

...made a crater

a, c

iv. *Der Bauer schlug mit der Faust auf den Tisch.*

The farmer beat his fist on the table

a, b

# *schlagen*: Interim summary

Components (domains) that could be separated: may be masked by expression of other features

a. Movement + Impact (of theme and target)

b. Agency, including use of instruments : variable

c. Effect usually compositional, or lexicalised

d. "Violence among sentient beings": ...effect / intention / moral evaluation?

: lexical variant, d added on top of a,b

v. *Der Bauer schlug den Tisch mit der Axt in Stücke.*

a, b, c

...hacked the table to pieces with the axe.

vi. *Der Bauer schlug den Esel (mit dem Stock) (auf den Rücken)*

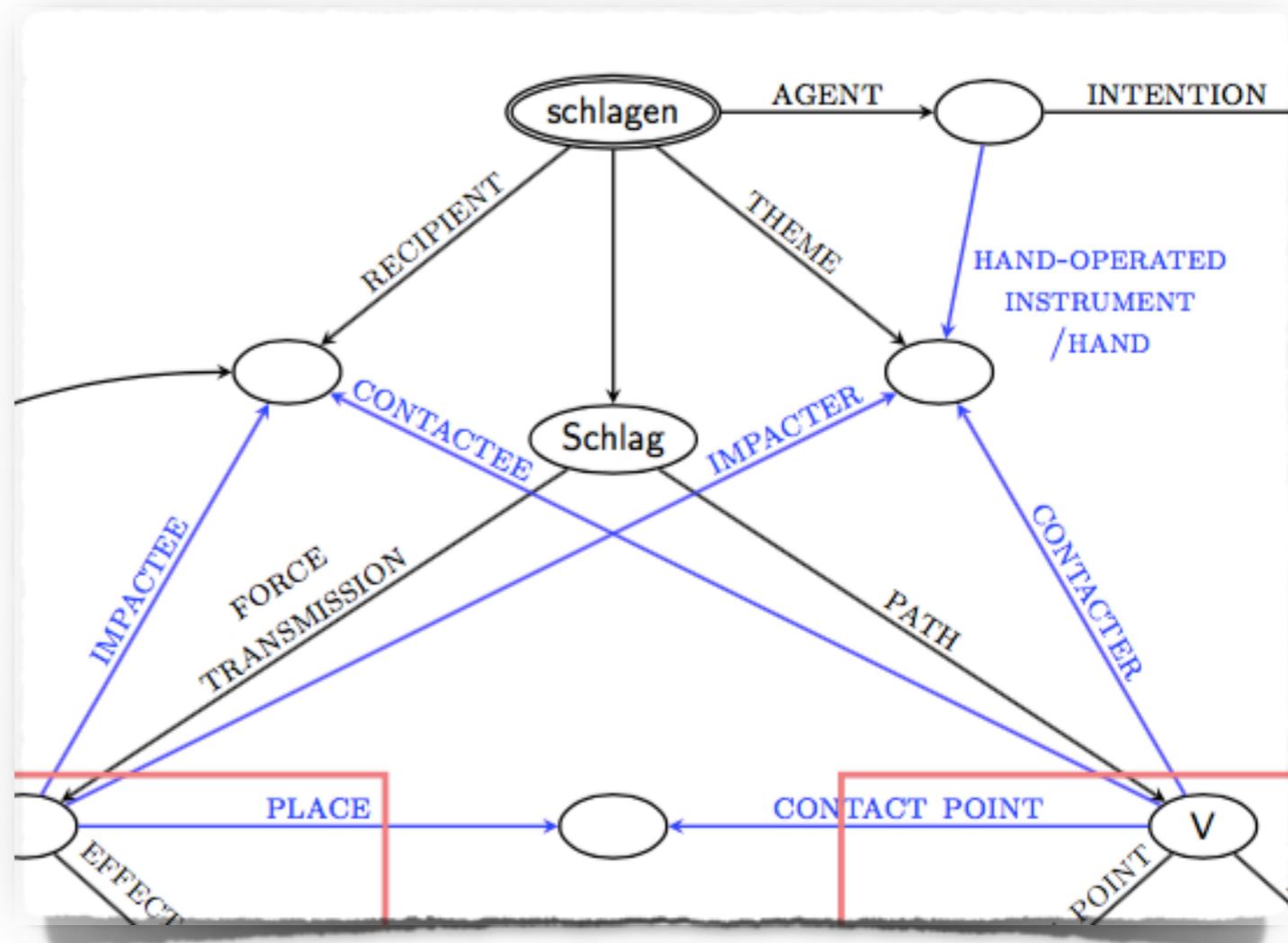
The farmer beat the donkey with the stick on its back.

a, b, d

# Questions for Frame modelling?

- *Schlagen* should consist of a core scene ("Schlag" in our first attempt), combined with other components / domains ...
- Some of these would come in via semantic composition, some others would be due to lexical variants richer in meaning.
  - Dealing with polysemy remains a desideratum...

- Modifiers of a "core scene" should be observed with other variants, too, but not vice versa. [✓ : No modifier specific to UNACC]



# *Schlagen* and affectedness: patterning of modifiers?

- The modifiers *brutal* and *grausam* (*cruel*) show a clear peak in the simple transitive construction.
- They are arguably the only adjectives in the sample that refer to a moral dimension of action and need two sentient participants in this.

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# 4

## Directionality and the target argument

### German allows for the "target" not to be contacted

- Construction with *nach*:

the feature 'contact' is not specified any more.

(i) a. *Der Mann schlug nach Peter.*

The man hit at Peter.

b. *Maria schlug nach dem Hund.*

Maria hit at the dog.

(ii) *Maria schlug nach der Fliege, und traf sie.*

M. ['hit'/] aimed at the fly and hit it.

[cf. ... ?? aber traf sie ]

but

Contact is  
neither asserted  
nor excluded  
[but is at issue].

# Directionality and the target argument

- ... Construction with *nach*: the feature 'contact' is unspecified...

(iii) *Der Mann schlug nach Peter, traf aber Otto.*

The man aimed at Peter, but hit Otto instead.

- **Compare: English conative construction:**

(iv) *He hit at the table.*

Does German *nach* also mark a conative construction?

(v) a. *Er schlug nach den Kameras.* but ??*Er schlug die Kameras.*

He hit at the cameras.

He hit the cameras.

b. *Sie schlug nach seiner Hand.* but ??*Sie schlug seine Hand.*

She hit at his hand.

She hit his hand.

: No, this could not be called an "alternation"

# Directionality and the target argument

**Construction with *in Richtung*: the feature 'contact' is unspecified.**

(i) *Er schlug in Peters Richtung (traf aber Otto)*

He "?" in Peter's direction (hit however Otto)

'He aimed at Peter (but hit Otto instead).

(ii) *Er schlug kräftig in meine Richtung.*

He ? strongly in my direction.

(force-related modifiers possible in the absence of contact)

**Can we hit in English in the same way?**

(iii) *The ball was hit in his direction.*

⇒ *The ball was hit !*

(iv) *He hit out at the robber.*

(special particle verb)

# Directionality and the target argument

## Construction with *Ins Leere/Nichts/Nirgendwo*: No contact.

(i) *Der Stock schlug ins Leere/Nichts/Nirgendwo.*

The stick beat into the void.

(ii) *Er schlug ins Leere/Nichts/Nirgendwo.*

He beat into the void.

How about English? Can we hit nowhere?

# Directionality and the target argument

## Construction with *daneben*: contact is unspecified.

(i) *Er schlug daneben* (und der Schlag ging ins Leere)  
He 'hit beside' [= missed] (and the blow went nowhere)

(ii) (*Er versuchte, einen Nagel in die Wand zu schlagen, aber*  
*er schlug daneben und traf seinen Finger*

He 'hit beside' and hit his finger

at any rate, no  
contact with the  
relevant object.

(iii) *Er schlug heftig daneben*  
He 'hit beside' vigorously

(force-related modifiers)

- Similarly: *vorbei schlagen* "hit past [something]"

# Movement paths and localisation of contact

- **Prepositional complement with *auf/gegen*:**  
**contact point = end point of the path**

(i) *Er schlug auf/gegen den Tisch.*  
He hit on/against the table.

- **With *durch* (through): contact point  $\neq$  end point**

(ii) a. *Er schlug mit der Faust durch den Tisch.*  
He hit with his fist through the table.

b. *Ein Stein schlug durch das Fenster.*

A stone "hit" through the window

(i.e., flew through the window, smashing the pane).

# Summary on movement paths

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- *Schlagen* does not specify whether a target is contacted or not. However, movement is always present as a component.
  - The German constructions support the assumption that contact and movement should be treated as separate meaning components of the verb *schlagen*.
- In German, contact depends on the interpretation of the individual directional adverbial (PP etc.).
  - In contrast, in English, the contact feature can be left unspecified only by the use of the conative alternation of *hit* or the phrasal verb *hit out*.

# The target argument in resultative constructions

*(this section was omitted in the talk)*

**Resultative constructions also indicate that the role of the target is different with *schlagen* and *hit*:**

- A constraint on the interpretation of the resultative construction in English (Erteschik-Shir & Rapoport 2010):

The target has to be realised. Either the direct object or the reference object of the PP provide the location of the impact.

(i) *He hit his fist into the palm of his other hand.*

– The PP introduces the target.

(ii) *He hit the ball into the hole.*

– Here, the PP cannot provide a target (i.e., antagonist).

– Then, the direct object must be the target of hitting.

# The target argument in resultative constructions

- No such restriction in German:

(i) *Sie schlug den Staub aus den Kleidern*

she beat the dust out of the clothes.

- Compositional interpretation of *Kleider* / *clothes* as target is not possible because of the source preposition *aus*.

cf. role of *aus* in (i)/(ii)

(ii) *Der Aufprall schlug mir das Gebiss aus dem Mund.*

the impact 'hit' me.DAT the denture out of my mouth.

- The denture is not the target.
- Its relation to the hitting event is unspecified

German allows nonthematic direct objects with *schlagen*, and constructions where the target is not expressed at all.

# The target argument in resultative constructions

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- Roles of the direct object in German resultative constructions:

- (i) Target (stationary)

*Sie schlug das Glas kaputt* (She smashed the glass to pieces).

- (ii) Target, + movement effected by the hit

*Sie schlug den Nagel in die Wand* (She hit the nail into the wall).

- (iii) Moving object / instrument

*Sie schlug mir ihre Faust in die Magengrube* (...the fist into the guts).

- (iv) Moving object / pure effected movement

*Der Aufprall schlug mir das Gebiss aus dem Mund.*

# Summary on German resultative constructions

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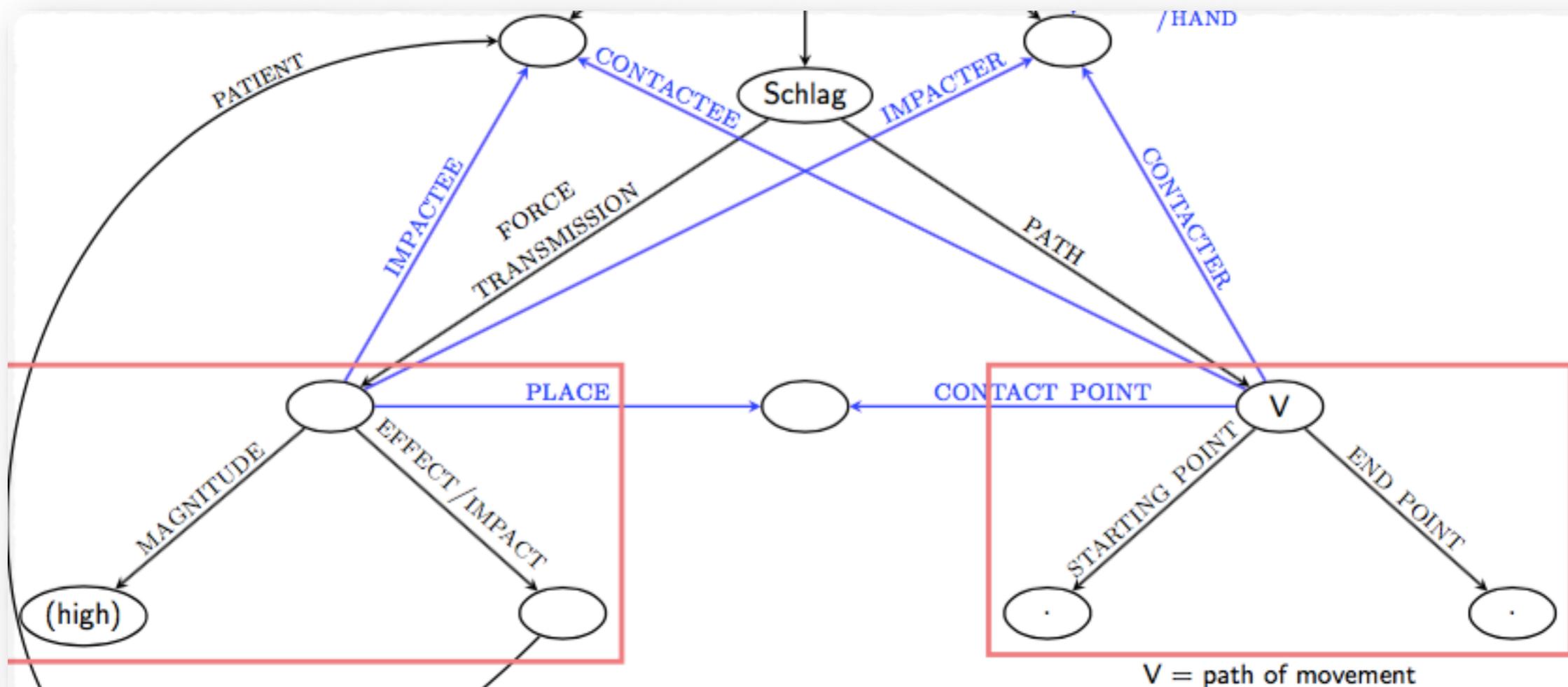
- The object of the resultative construction is licensed by the change-of-state component, i.e. compositionally, not lexically.
- The direct object in a directional resultative always represents an entity in motion — however, the relation between this movement and the "force+contact" component is unspecified.
- Participants of the core event (esp. the target) may have to be reconstructed via inference.

All the previous findings converge on the generalisation that, unlike *hit*, the meaning of German *schlagen* is not about the localisation of an impact.

(so, eventually, *Vogelschlag* is *birdstrike*, not *birdhit*)

# Questions for Frame modelling?

- Force dynamics and spatial relations as two different domains.
  - Their correlations have to be captured
  - however, these are subject to lexical/constructional variation.



Adj \ Constr	1 UNACC	2 RESULTV	3 TRANSTV	4 OBLIQ	5 ?case?	5a DBL acc	5b DBL dat	
heftig	106	7	3	37	23	15	7	14
leicht	62	2	1	19	11	7	7	18
kräftig	60	1	6	5	27	8	1	12
brutal	59	keine	8	31	3	3	3	11
wütend	58	keine	14	2	34	keine	keine	8
hart	51	12	3	12	13	3	3	5
sanft	47	2	1	5	15	3	6	15
fest	29	2	5	3	12	2	1	4
spielerisch	18	keine	1	2	3	3	keine	9
wild	13	1	2	2	6	keine	keine	2
begeistert	12	keine	3	keine	3	1	keine	5
stark	11	1	keine	6	3	keine	keine	1
grausam	9	keine	keine	9	keine	keine	keine	keine
sacht	8	1	keine	keine	2	keine	keine	5
scharf	7	keine	2	keine	1	1	keine	3
liebepoll	6	keine	1	1	1	keine	1	2
bewusst	6	keine	keine	3	1	1	keine	1
beherzt	6	keine	5	keine	1	keine	keine	keine
blindwütig	5	keine	keine	keine	3	keine	keine	2
lässig	4	1	2	keine	1	keine	keine	keine
verbissen	4	keine	1	3	keine	keine	keine	keine
hemmungslol	4	keine	1	1	1	keine	1	keine
quer	3	1	keine	keine	keine	keine	1	1
schwungvoll	3	keine	1	keine	1	keine	keine	1
schräg	2	1	keine	keine	1	keine	keine	keine
schwach	2	keine	1	keine	1	keine	keine	keine
geschickt	2	keine	keine	1	keine	keine	1	keine
unbewusst	2	keine	keine	keine	keine	keine	keine	2
hektisch	1	keine	keine	keine	1	keine	keine	keine
herzlich	1	keine	keine	keine	keine	keine	keine	1
	601	32	63	129	176	47	32	122

**Schlagen: path and force modifiers?**

en Dank!

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