

# FrameNet

The work. The product.

The applications.

*CJFillmore - ICSI/Berkeley*

# Acknowledgements

- International Computer Science Institute
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# Frames and Understanding

Hypothesis: People understand things by performing mental operations on what they already know. Such knowledge is describable in terms of information packets called **frames**.

# The core work of FrameNet

1. *characterize frames*
2. *find words that fit the frames*
3. *develop descriptive terminology*
4. *extract sample sentences*
5. *annotate selected examples*
6. *derive "valence" descriptions*

# DIGRESSION

- Actually there are two contexts in which you will probably be asked to do FrameNet annotations.
  - One is for purely **lexicographic** purposes, where you will choose “good examples” of the use of each word.
  - The other is for **full text analysis**, where you will analyze every word in a text.
- The description that follows concentrates on the lexicographic work

# The core work of FrameNet

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6. *derive "valence" descriptions*



# Finding words that belong in a given frame

- We look for words in the language that bring to mind the individual frames.
- We say that the words **evoke** the frames.

# “Words”?

- But first there’s an enemy we have to deal with: polysemy, lexical ambiguity, multiple meanings of a single “word”.
- Instead of words, we have to work with **lexical units (LUs)**, each of these being a pairing of a word with a sense.

FrameNet is at the “splitting” end of the “splitting” versus “lumping” continuum when it comes to the monosemy/polysemy.

What could count as evidence for the separateness of lexical units with the same form?

# Discernible meaning differences.

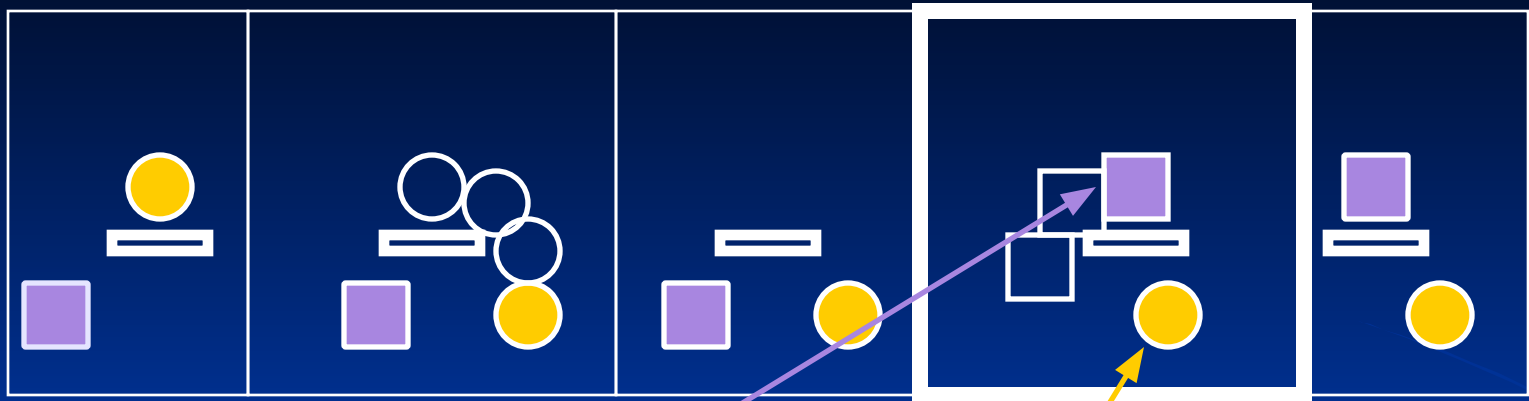
If a word communicates different meanings in different contexts, and the difference isn't explained by the contexts, maybe the word has more than one meaning.

1. *She earns a lot less than she deserves.*
2. *I made a lot of money, but I earned it.*

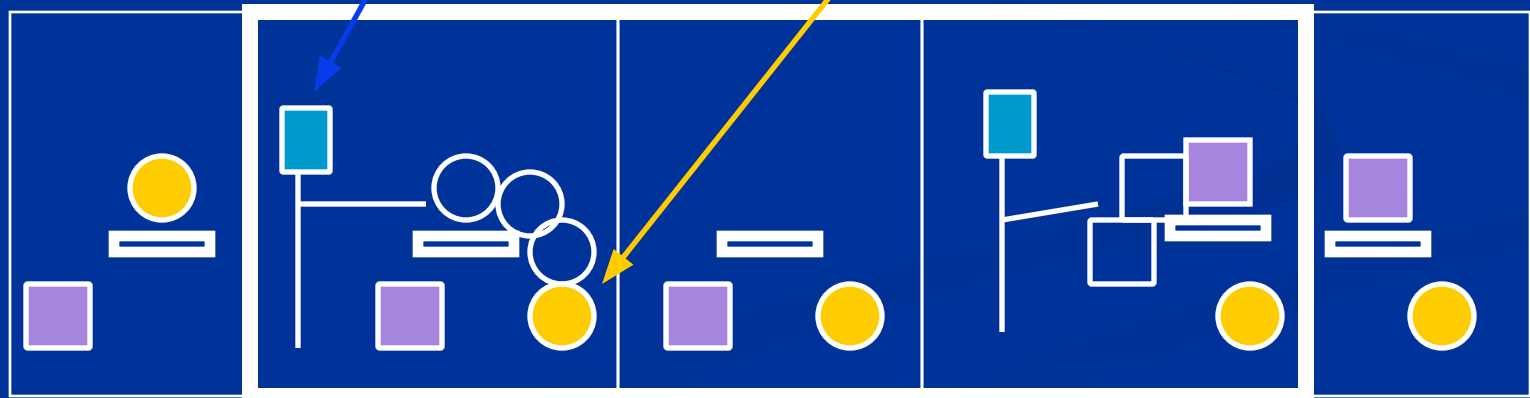
The second sentence conveys the idea that the amount of money earned was appropriate.

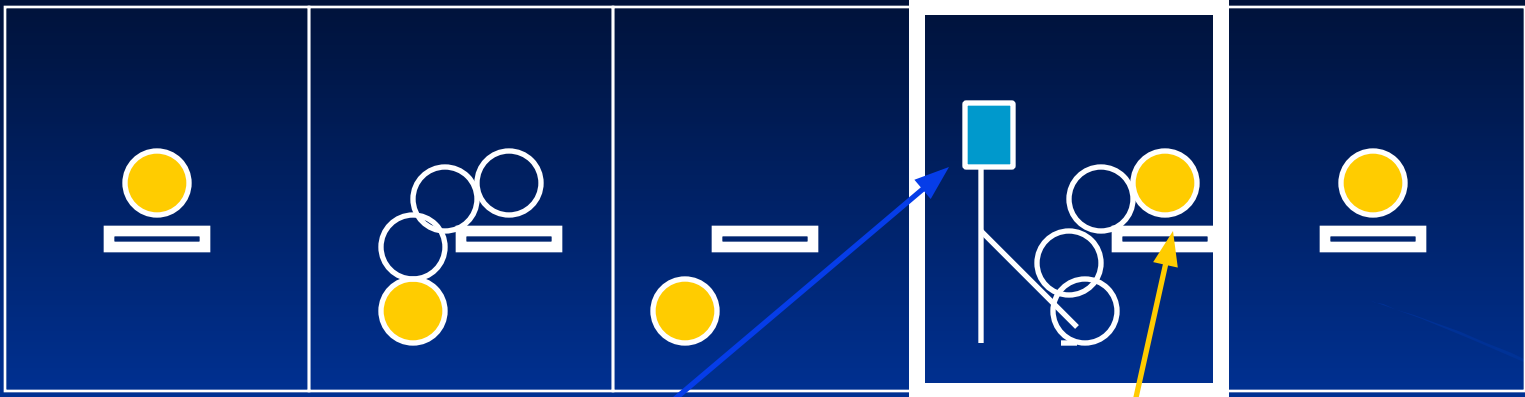
# How many meanings for *replace*?

- put (sth) back where it belongs
- occupy a position formerly occupied by (sth,sbd)
- put something in a position formerly occupied by (sth,sbd)

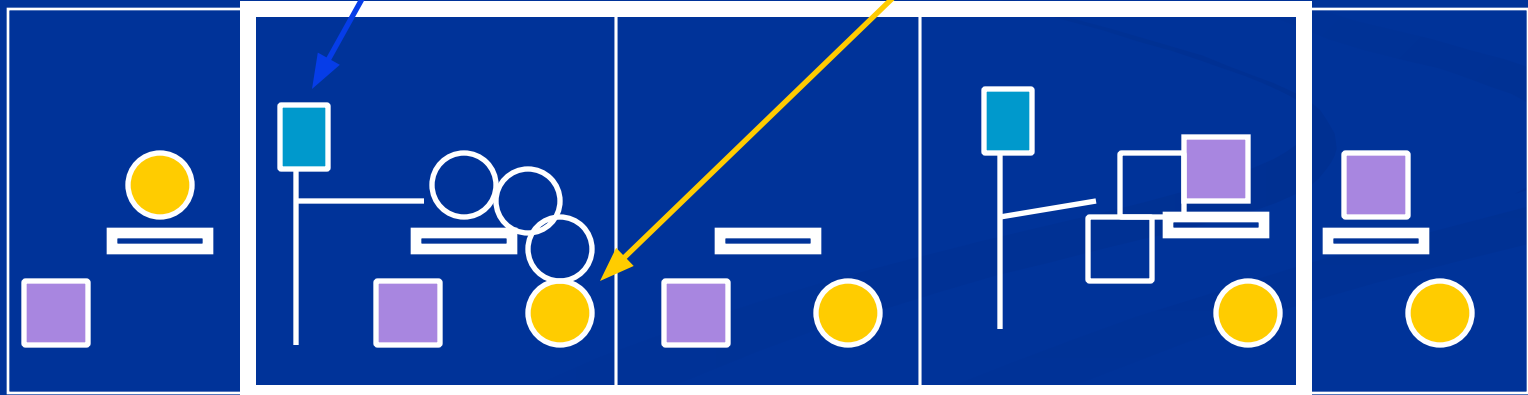


John replaced me.





John replaced the telephone.



# Just having different argument types in grammatical positions isn't enough.

- Subject as Speaker:

*Mom explained ..., you complained ..., she said ..., I insist ..., the dean informed us ...*

- Subject as Medium:

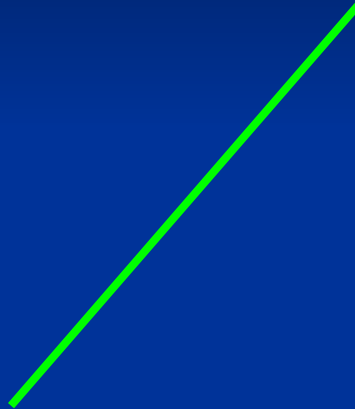
*chapter 2 explains ..., your letter complains ..., the Bible says ..., the law insists ..., the editorial informed ...*

# Those don't require separate senses.

- The “Medium-as-Subject” examples can be thought of as Metonymy. Thus:
  - *Chapter 2 explains ... =*  
*The author explains in Chapter 2 that ...*
  - *Your letter complains that ... =*  
*You complain in your letter that ...*

Speaker as Subject

Medium as Subject



# Here's a different situation:

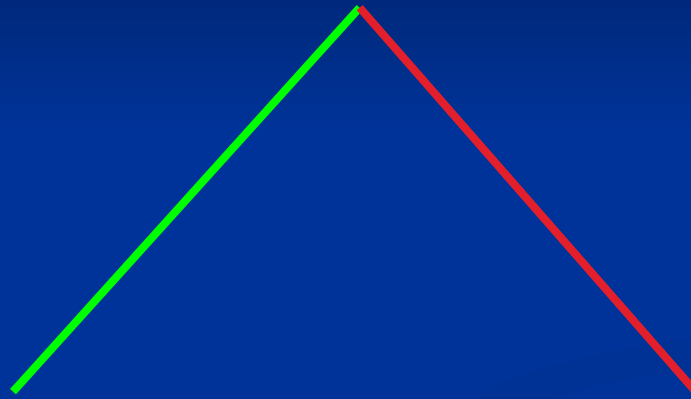
Some - but not all - “verbs of speaking” have a “cognitive” use, identifying sources of beliefs or belief-attitudes, with no communicating implied.

- *The heavy winds explain the number of windmills around here. (\*explicate)*
- *These facts argue in favor of your hypothesis. (\*reason)(\*quarrel)*
- *His repeated absence at meetings suggests that he's not happy with the job. (\*hints)*

Speaker as Subject

Medium as Subject

Fact as Subject



That is, we take the fact that some but not all words in a particular semantic class have special meaning elaborations “argues for” a polysemy interpretation in those cases.

# Different Complementation

Complementation patterns should go with particular meanings of a word.

- Medical sense of *complain*:

*the patient complained [of back pains]*

- Official act sense of *complain*:

*we complained [to the manager] [about X]*

*she complained [that her checks were late]*

# Argument omissibility

- We would argue that the ordinary sense of *give* and the 'contribute' sense of *give* should be separated, since they differ in argument omissibility:
  - *Do you want to meet the Red Cross representative? - I already gave.*
  - *Did you remember a present for your daughter's birthday?*  
*- \*I already gave.*

If a verb has two different event noun derivatives, and they have different meanings that are also found in the verb, that verb should be described as polysemous.

# Nominalization Differences

- *adhere* to a belief: *adherence*  
*adhere* to your skin: *adhesion*
- *observe* a rule: *observance*  
*observe* the kids: *observation*
- *commit* to a cause: *commitment*  
*commit* to an asylum: *commitment*  
*commit* a crime: *commission*
- *deliver* a package: *delivery*  
*deliver* sb. from danger: *deliverance*

# Support verb differences with nominalizations

- *argue*: quarrel sense associated with *have an argument*; reasoning sense with *make an argument*
- *commit*: dedication sense associated with *make a commitment*; crime/sin sense & incarceration sense, no support verb
- *complain*: symptom report: *present a complaint*; kvetch: no support verb; official: *file a complaint*, *register a complaint*

# Lexical Field Membership

- *complain* in medical context links with *présent, symptoms, ailments, etc.*
- *complain* in official context links with *charge, grievance, etc.*
- *complain* in informal context links with *bitch, kvetch, gripe, whine, etc.*

# FN work: characterizing frames

Let's work through the Revenge frame.

# The Revenge frame

The Revenge concept involves a situation in which

- a) A has done something to harm B and
- b) B takes action to harm A in turn
- c) B's action is carried out independently of any legal or other institutional setting

# Vocabulary for Revenge

- Nouns: *revenge, vengeance, reprisal, retaliation*
- Verbs: *avenge, revenge, retaliate (against), get back (at), get even (with), pay back*
- Adjectives: *vengeful, vindictive*

# FN work: choosing FE names

- We develop a descriptive vocabulary for the components of each frame, called **frame elements** (FEs).
- We use FE names in labeling the constituents of sentences exhibiting the frame.

# FEs for Revenge

- Frame Definition: Because of some **injury** to something-or-someone important to an **avenger** (maybe himself), the **avenger** inflicts a **punishment** on the **offender**. The **offender** is the person responsible for the **injury**.
- FE List:
  - **avenger**,
  - **offender**,
  - **injury**,
  - **injured\_party**,
  - **punishment**.

# DIGRESSION

- Notice that we use such situation-specific notions as **injury**, **offender**, etc., rather than limiting ourselves to some standard list of *thematic roles*, like **agent**, **patient**, **goal**, etc.
- First, there aren't enough of those to go around, and if we had squeeze all the distinctions we find into such a list,
  - we would waste too much time finding criteria to do the mapping,
  - and we would have to remember what decisions we'd made.

# FEs for Revenge

- Frame Definition: Because of some **injury** to something-or-someone important to an **avenger** (maybe himself), the **avenger** inflicts a **punishment** on the **offender**. The **offender** is the person responsible for the **injury**.
- FE List:
  - **avenger**,
  - **offender**,
  - **injury**,
  - **injured\_party**,
  - **punishment**.

# Collecting examples

- We extract from our **corpus** examples of sentences showing the uses of each word in the frame.
- Our main corpus is the British National Corpus; we have recently added lots of newswire text from the Linguistic Data Consortium. Total about 200M running words.

Query input:

Search space:

KWIC list:

BNC2:Last, 216 Matches

|                            |            |  |
|----------------------------|------------|--|
| uthors are not supposed to | <avenge>   | themselves in their writings , but they do , |
| hiny boots we presented an | <avenging> | image , clothed in the symbolic colour of    |
| overalls , enhances their  | <avenging> | appearance . bncp=19=224=5 I suspect it is   |
| t his was the vision of an | <avenging> | prophet . bncp=47=101=5 ' It is probable ,   |
| advancing Russians or the  | <avenging> | Poles and Czechs at the end of the war . b   |
| om Havant , will be out to | <avenge>   | their penalty-stroke defeat by Hounslow in t |
| lutionary tribunal , whose | <avenging> | hammer will fall with all its crushing mig   |
| nep=208=572=6 This was the | <avenging> | angel who would steal her lover away from    |
| national humiliation to be | <avenged>  | . bncp=252=98=1 The Nazis seized control ea  |
| s . bncp=277=197=3 Leonard | <avenged>  | that reverse in New Orleans the following M  |
| hose draw , which he later | <avenged>  | , came against Thomas Arguelles two years a  |
| al read from Romans 12 : ' | <Avenge>   | not yourselves , but rather give place unto  |
| e moments of reproachful , | <avenging> | misery , naked desperation , unbearable re   |
| s of the doors so that the | <avenging> | angel can see the blood and ' pass over "    |
| raised in corruption : an  | <avenging> | ghost at many a sick-bedside . " <pb n=92>   |

Context:

Query input:

[[lemma="avenge"]]

Search space:

BNC2

?

Start query

KWIC list:

BNC2:Last, 216 Matches

uthors are not supposed to <avenge> themselves in their writings , but they do ,  
 hiny boots we presented an <avenging> image , clothed in the symbolic colour of  
 overalls , enhances their <avenging> appearance . bncp=19=224=5 I suspect it is  
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 e moments of reproachful , <avenging> misery , naked desperation , unbearable re  
 s of the doors so that the <avenging> angel can see the blood and ' pass over "  
 raised in corruption : an <avenging> ghost at many a sick-bedside . " <pb n=92>

Content

Obviously we need to conduct a more regimented search, grouping examples with related structures.

Query input:

Search space:

KWIC list:

BNC2:Last, 387 Matches

|  |             |  |
|--|-------------|--|
| cp=825=192=5 ' I leave all             | <vengeance> | to God , " Dad had said and now here he w  |
| ack from Hell to exact his             | <vengeance> | . bncp=826=12=1 In other chambers men , 1  |
| Zimbabwe , returned with a             | <vengeance> | and he was obliged to miss some cricket w  |
| ay , but the government 's             | <vengeance> | on those who could not get away was relat  |
| d was inflicting a fearful             | <vengeance> | on all who had supported him . bncp=846=2  |
| The government 's official             | <vengeance> | was less severe than Cumberland 's privat  |
| nd naan bread with all the             | <vengeance> | of people who have n't eaten properly for  |
| 6=287=9 Et Filioque with a             | <vengeance> | . bncp=866=287=10 And talking of children  |
| st of his life hunting for             | <vengeance> | . " bncp=866=608=1 ' He 'll kill you , "   |
| . bncp=885=335=3 Swearing              | <vengeance> | on the villagers , he called them togethe  |
| life . bncp=893=932=11 ' ' <Vengeance> | <Vengeance> | is mine " , saith the Lord . ' ' He 's rig |
| idea has caught on with a              | <vengeance> | . bncp=925=149=2 ' People from the UK are  |
| are back with a <pb n=246>             | <vengeance> | . bncp=934=391=2 Recent research by GALOP  |
| , yet brought home with a              | <vengeance> | to the American people on nightly TV news  |
| were returning with a slow             | <vengeance> | and he confirmed that nonetheless I shoul  |

Context:

Query input:

Search space:

KWIC list:

BNC2:Last, 387 Matches

cp=825=192=5 ' I leave all <vengeance> to God , " Dad had said and now here he w  
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, yet brought home with a <vengeance> to the American people on nightly TV news  
were returning with a slow <vengeance> and he confirmed that nonetheless I shoul

Context

Examples of simple use are swamped by the idiomatic phrase "with a vengeance".

# FN work: annotating examples

- We select sentences exhibiting common *collocations* and showing all major syntactic contexts.
- Using the names assigned to FEs in the frame, we label the constituents of sentences that express these FEs.
- The next slide shows what our software looks like.





- Releasing
- Relinquish
- Relinquish\_have
- Relinquish\_not\_have
- Relinquishing\_scenario
- Removing
- Render\_nonfunctional
- Reparation
- Reporting
- Request
- Reshaping
- Residence
- Revenge
  - FE: Avenger <F1>
  - FE: Degree <G>
  - FE: Depictive <I>
  - FE: Injured\_Party <I>
  - FE: Injury <F3>
  - FE: Instrument <F3>
  - FE: Manner <M>
  - FE: Offender <F3>
  - FE: Place <F3>
  - FE: Punishment <F12>
  - FE: Purpose <F4>
  - FE: Result <E>
  - FE: Time <F2>
  - LU: **avenge.v**
    - Lemma(V)
    - SC: rcoll-brother [1/1]
    - SC: rcoll-death [5/1]
    - SC: rcoll-defeat [5/1]
    - SC: rcoll-father [0/1]
    - SC: rcoll-murder [2/1]
    - SC: np-ppagainst [0/1]
    - SC: np-ppfor [1/2]
    - SC: np-ppon [2/5]
    - SC: np-ppupon [0/1]
    - SC: np-ppwith [1/1]
    - SC: np-ppother [1/2]
    - SC: np-pother [1/1]
    - SC: trans-simple [4/1]
    - SC: pass [4/13]
    - SC: trans-other [3/1]
    - SC: intrans-simple [1/1]
    - SC: intrans-adverb [1/1]
    - SC: other [1/5]

SubCorpus Editor: V-429-s20-rcoll-death (77339)

0 It will do no good to AVENGE my death by killing him . "

1 With this , El Cid at once AVENGED the death of his son and once again showed that any attempt to reconquer Valencia was fruitless while he still lived . DNI DNI

2 His secret ambition was for the Argentine ban to be lifted so he could get to England and AVENGE Pedro 's death by taking out the English and especially one poker-faced Guards Officer . DNI

3 For his distraught family , only hanging would have AVENGED the death of the father of four .

4 In Article 3 of the agreement , each had promised to AVENGE the violent death of the other with the blood of the murderer . DNI

list of FEs for Revenge frame

|   |   |   |   |   |   |  |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|---|---|
| a | v | e | n | g | e |  | P | e | d | r | o | ' | s | d | e | a | t | h |
|   |   |   |   |   |   |  | I | n | j | u | r | y |   |   |   |   |   |   |
|   |   |   |   |   |   |  | O | b | j |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |  | N | P |   |   |   |   |   |   |   |   |   |   |

FE FE GF PT Other Sent

|               |  |                   |     |
|---------------|--|-------------------|-----|
| Avenger <F1>  |  | Degree <G>        |     |
| Depictive <I> |  | Injured_Party <I> |     |
| Injury <F3>   |  | Instrument <F3>   |     |
| Manner <M>    |  | Offender <F3>     | DNI |
| Place <F3>    |  | Punishment <F12>  |     |
| Purpose <F4>  |  | Result <E>        |     |
| Time <F2>     |  |                   |     |









# FN work: summarizing results

- Automatic processes summarize the results, linking FEs with information about their grammatical realization.
- The output is presented in the form of various reports in the public website, in XML format in the data release.

**Revenge**

[avenge.v](#)  
[avenger.n](#)  
[get back at.v](#)  
[get\\_even.v](#)  
[retaliate.v](#)  
[retaliation.n](#)  
[retribution.n](#)  
[retributive.a](#)  
[retributory.a](#)  
[revenge.n](#)  
[revenge.v](#)  
[revengeful.a](#)  
[revenger.n](#)  
[vengeance.n](#)  
[vengeful.a](#)  
[vindictive.a](#)  
[Rewards and punish](#)  
[Ride Vehicle](#)  
[Risk action](#)  
[Rite](#)  
[Roadways](#)  
[Robbery](#)  
[Rope manipulation](#)  
[Rotting](#)  
[Run risk](#)  
[Salience](#)  
[Scalars](#)  
[Scrutiny](#)  
[Seeking](#)  
[Self-motion](#)  
[Sending](#)  
[Sensation](#)  
[Sentencing](#)  
[Separation](#)  
[Setting fire](#)  
[Severity of offense](#)  
[Shapes](#)  
[Shoot projectiles](#)  
[Sign](#)  
[Silence](#)

# avenge.v

## Frame: Revenge

### Definition

FN: inflict harm on somebody in return for an injury or wrong suffered

## Frame Elements and Their Syntactic Realizations

The Frame elements for this word sense are (with realizations):

| Frame Element        | Number Annotated       | Realizations(s)   |
|----------------------|------------------------|---|
| <b>Avenger</b>       | <a href="#">33 exx</a> | NP.Ext <a href="#">25 exx</a><br>--- --- <a href="#">7 exx</a><br>Poss.Ext <a href="#">1 exx</a>                                |
| <b>Injured Party</b> | <a href="#">14 exx</a> | NP.Ext <a href="#">3 exx</a><br>NP.Obj <a href="#">11 exx</a>   |
| <b>Injury</b>        | <a href="#">21 exx</a> | NP.Ext <a href="#">4 exx</a><br>PP.Comp <a href="#">2 exx</a><br>NP.Obj <a href="#">13 exx</a><br>--- --- <a href="#">2 exx</a> |
| <b>Offender</b>      | <a href="#">33 exx</a> | PP.Comp <a href="#">3 exx</a><br>--- --- <a href="#">30 exx</a>   |
| <b>Punishment</b>    | <a href="#">33 exx</a> | PPing.Comp <a href="#">5 exx</a><br>PP.Comp <a href="#">3 exx</a><br>--- --- <a href="#">25 exx</a>                             |

ColorsOff

A **Herefordshire hobgoblin** would **AVENGE** **himself** for any insult by stealing all the family's keys and refusing to return them until his favourite cake had been baked and left on the hob for him to eat. **INI**  
 Others say **she** **AVENGES** **herself** of the insult offered by her erstwhile lover by luring fishermen and other sailors to their doom. **DNI**

revenge.v  
 avenger.n  
 get back at.v  
 get even.v  
 retaliate.v  
 retaliation.n  
 retribution.n  
 retributive.a  
 retributory.a  
 revenge.n  
 revenge.v  
 revengeful.a  
 revenger.n  
 vengeance.n  
 vengeful.a  
 vindictive.a  
 Rewards and punish  
 Ride Vehicle  
 Risk action  
 Rite  
 Roadways  
 Robbery  
 Rope manipulation  
 Rotting  
 Run risk  
 Saliency  
 Scalars  
 Scrutiny  
 Seeking  
 Self-motion  
 Sending  
 Sensation  
 Sentencing  
 Separation  
 Setting fire  
 Severity of offense  
 Shapes  
 Shoot projectiles  
 Sign  
 Silence

## Valence Patterns:

These frame elements occur in the following syntactic patterns:

| Number Annotated             | Patterns  |               |            |               |               |
|------------------------------|-----------|---------------|------------|---------------|---------------|
| <a href="#">2 exx</a> TOTAL  | Avenger   | Injured Party | Injury     | Offender      | Punishment    |
| <a href="#">2 exx</a>        | NP<br>Ext | NP<br>Obj     | PP<br>Comp | ---           | PPing<br>Comp |
| <a href="#">12 exx</a> TOTAL | Avenger   | Injured Party | Offender   | Punishment    |               |
| <a href="#">2 exx</a>        | ---       | NP<br>Ext     | ---        | ---           |               |
| <a href="#">1 exx</a>        | ---       | NP<br>Ext     | PP<br>Comp | ---           |               |
| <a href="#">6 exx</a>        | NP<br>Ext | NP<br>Obj     | ---        | ---           |               |
| <a href="#">1 exx</a>        | NP<br>Ext | NP<br>Obj     | ---        | PP<br>Comp    |               |
| <a href="#">1 exx</a>        | NP<br>Ext | NP<br>Obj     | ---        | PPing<br>Comp |               |
| <a href="#">1 exx</a>        | NP<br>Ext | NP<br>Obj     | PP<br>Comp | PPing<br>Comp |               |
| <a href="#">19 exx</a> TOTAL | Avenger   | Injury        | Offender   | Punishment    |               |
| <a href="#">3 exx</a>        | ---       | NP<br>Ext     | ---        | ---           |               |
| <a href="#">1 exx</a>        | ---       | NP<br>Ext     | ---        | PP<br>Comp    |               |
| <a href="#">1 exx</a>        | NP<br>Ext | ---           | ---        | ---           |               |
| <a href="#">11 exx</a>       | NP<br>Ext | NP<br>Obj     | ---        | ---           |               |
| <a href="#">1 exx</a>        | NP<br>Ext | NP<br>Obj     | ---        | PP<br>Comp    |               |
| <a href="#">1 exx</a>        | NP<br>Ext | NP<br>Obj     | ---        | PPing<br>Comp |               |

- Revenge
- avenge.v
- avenger.n
- get back at.v
- get even.v
- retaliate.v
- retaliation.n
- retribution.n
- retributive.a
- retributory.a
- revenge.n
- revenge.v
- revengeful.a
- revenger.n
- vengeance.n
- vengeful.a
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- Rewards and punish
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- Rope manipulation
- Rotting
- Run risk
- Saliency
- Scalars
- Scrutiny
- Seeking
- Self-motion
- Sending
- Sensation
- Sentencing
- Separation
- Setting fire
- Severity of offense
- Shapes
- Shoot projectiles
- Sign

## Valence Patterns:

These frame elements occur in the following syntactic patterns:

| Number Annotated | Patterns              |               |          |            |               |               |
|------------------|-----------------------|---------------|----------|------------|---------------|---------------|
| 2 exx TOTAL      | I avenged my brother. |               |          |            |               | Punishment    |
| 2 exx            |                       |               |          |            |               | PPing<br>Comp |
| 12 exx TOTAL     | Avenger               | Injured Party | Offender | Punishment |               |               |
| 2 exx            | ---                   | NP<br>Ext     |          | ---        | ---           |               |
| 1 exx            | ---                   | NP<br>Ext     |          | PP<br>Comp | ---           |               |
| 6 exx            | NP<br>Ext             | NP<br>Obj     |          | ---        | ---           |               |
| 1 exx            | NP<br>Ext             | NP<br>Obj     |          | ---        | PP<br>Comp    |               |
| 1 exx            | NP<br>Ext             | NP<br>Obj     |          | ---        | PPing<br>Comp |               |
| 1 exx            | NP<br>Ext             | NP<br>Obj     |          | PP<br>Comp | PPing<br>Comp |               |
| 19 exx TOTAL     | Avenger               | Injury        | Offender | Punishment |               |               |
| 3 exx            | ---                   | NP<br>Ext     |          | ---        | ---           |               |
| 1 exx            | ---                   | NP<br>Ext     |          | ---        | PP<br>Comp    |               |
| 1 exx            | NP<br>Ext             | ---           |          | ---        | ---           |               |
| 11 exx           | NP<br>Ext             | NP<br>Obj     |          | ---        | ---           |               |
| 1 exx            | NP<br>Ext             | NP<br>Obj     |          | ---        | PP<br>Comp    |               |
| 1 exx            | NP<br>Ext             | NP<br>Obj     |          | ---        | PPing<br>Comp |               |

Revenge.v  
 avenger.n  
 get back at.v  
 get even.v  
 retaliate.v  
 retaliation.n  
 retribution.n  
 retributive.a  
 retributory.a  
 revenge.n  
 revenge.v  
 revengeful.a  
 revenger.n  
 vengeance.n  
 vengeful.a  
 vindictive.a  
 Rewards and punish  
 Ride Vehicle  
 Risk action  
 Rite  
 Roadways  
 Robbery  
 Rope manipulation  
 Rotting  
 Run risk  
 Saliency  
 Scalars  
 Scrutiny  
 Seeking  
 Self-motion  
 Sending  
 Sensation  
 Sentencing  
 Separation  
 Setting fire  
 Severity of offense  
 Shapes  
 Shoot projectiles  
 Sign  
 Silence

## Valence Patterns:

These frame elements occur in the following syntactic patterns:

| Number Annotated    | Patterns                      |               |            |               |               |
|---------------------|-------------------------------|---------------|------------|---------------|---------------|
| <u>2</u> exx TOTAL  | Avenger                       | Injured Party | Injury     | Offender      | Punishment    |
| <u>2</u> exx        | NP<br>Ext                     | NP<br>Obj     | PP<br>Comp | ---           | PPing<br>Comp |
| <u>12</u> exx TOTAL | Avenger                       | Injured Party | Offender   | Punishment    |               |
| <u>2</u> exx        | ---                           | NP<br>Ext     | ---        | ---           |               |
| <u>1</u> exx        | ---                           | NP<br>Ext     | PP<br>Comp | ---           |               |
| <u>6</u> exx        | NP<br>Ext                     | NP<br>Obj     | ---        | ---           |               |
| <u>1</u> exx        | NP<br>Ext                     | NP<br>Obj     | ---        | PP<br>Comp    |               |
| <u>1</u> exx        | NP                            | NP            |            | PPing         |               |
| <u>1</u> exx        | I avenged my brother's death. |               |            |               |               |
| <u>19</u> exx TOTAL | Avenger                       | Injury        | Offender   | Punishment    |               |
| <u>3</u> exx        | ---                           | NP<br>Ext     | ---        | ---           |               |
| <u>1</u> exx        | ---                           | NP<br>Ext     | ---        | PP<br>Comp    |               |
| <u>1</u> exx        | NP<br>Ext                     | ---           | ---        | ---           |               |
| <u>11</u> exx       | NP<br>Ext                     | NP<br>Obj     | ---        | ---           |               |
| <u>1</u> exx        | NP<br>Ext                     | NP<br>Obj     | ---        | PP<br>Comp    |               |
| <u>1</u> exx        | NP<br>Ext                     | NP<br>Obj     | ---        | PPing<br>Comp |               |

# Querying the data: meaning to form

Through various viewers built on the FN database we can, for example, ask how particular FEs get expressed in sentences evoking a given frame.

# By what syntactic means is offender realized?

- Sometimes as direct object:
  - *we'll pay you back for that*
- Sometimes with the preposition on
  - *they'll take vengeance on you*
- Sometimes with against
  - *we'll retaliate against them*
- Sometimes with with
  - *she got even with me*
- Sometimes with at
  - *they got back at you*

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It's these word-by-word specializations in FE-marking that make automatic FE recognition difficult.

# Querying the data: form to meaning

Or, going from the grammar to the meaning, we can choose particular grammatical contexts and ask which FEs get expressed in them.

# What FE is expressed by the object of avenge?

- Sometimes it's the **injured\_party**
  - *I've got to avenge my brother*
- .Sometimes it's the **injury**
  - *My life goal is to avenge my brother's murder.*

# Evaluation

- Lexical coverage. We want to get all of the important words associated with each frame.
- Combinatorics. We want to get all of the syntactic patterns in which each word functions to express the frame.

# Evaluation, cont'd

- We do not ourselves collect frequency data. That will wait until methods of automatic tagging get perfected.
- In any case, the results will differ according to the type of corpus - financial news, children's literature, technical manuals, etc.

# What do we end up with?

- Frames
- Lexical entries
- Annotations

# Sample from frames list

Creating, Crime\_scenario,  
Criminal\_investigation, Criminal\_process, Cure.  
Custom, Damaging, Dead\_or\_alive, Death,  
Deciding, Deny\_permission, Departing,  
Desirability, Desiring, Destroying, Detaining,  
Differentiation, Difficulty, Dimension, Direction,  
Dispersal, Documents, Domain, Duplication,  
Duration, Eclipse,  
Education\_teaching, Emanating, Emitting,  
Emotion\_active, Emotion\_directed,  
Emotion\_heat, Employing, Employment,  
Emptying, Encoding, Endangering,  
Entering\_of\_plea, Entity, Escaping, Evading.  
Evaluation Evidence Excreting Execution

# Sample from lexical unit list

- \* augmentation.N (Expansion)
- \* augur.V (Omen)
- \* August.N (Calendric\_unit)
- \* aunt.N (Kinship)
- \* auntie.N (Kinship)
- \* austere.A (Frugality)
- \* austerity.N (Frugality)
- \* author.V (Text\_creation)
- \* authoritarian.A (Strictness)
- \* authorization.N (Documents)
- \* autobahn.N (Roadways)
- \* autobiography.N (Text)
- \* automobile.N (Vehicle)
- \* autumn.N (Calendric\_unit)
- \* avalanche.N (Quantity)
- \* avenge.V (Revenge)
- \* avenger.N (Revenge)
- \* avenue.N (Roadways)
- \* aver.V (Statement)

# Added Value: frame relatedness

- We have ways of linking frames to each other, through relations of
  - inheritance
  - subframe
  - "using"
- We would like to explore how our frame relationships can be mapped onto ontological relations.

# Frame-to-frame relations

- Revenge *inherits* Punishment/Reward
- Revenge *uses* the Hostile\_encounter frame

# Added Value: semantic types

- We also have the means of adding **semantic types** to words, frames and frame elements.
- Some of these:
  - negative vs. positive  
(*disaster* vs. *bonanza*),
  - punctual vs. stative  
(*arrive* vs. *reside*),
  - artifact vs. natural kind  
(*building* vs. *tree*).

# Added Value: support verbs

- In the case of the **event nouns**, we keep track of which verbs can combine with which nouns to signal occurrences of the frame evoked by the noun.
  - take a bath (bathe)
  - have an argument (argue)
  - wreak vengeance,
  - take revenge,
  - exact retribution.

# Comparison with Dictionaries

# American Heritage Dictionary

- **avenge v.**

1. To inflict a punishment or penalty in return for; revenge
2. To take vengeance on behalf of

- **revenge v.**

1. To inflict punishment in return for (injury or insult)
2. To seek or take vengeance for (oneself or another person); avenge

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The FEs of the direct objects are expressed prepositionally; in return for marks the **injury**; for or on behalf of marks the **injured\_party**.

# American Heritage Dictionary

- **avenge** v.

1. To inflict a punishment or penalty in return for [ ]; revenge
2. To take vengeance on behalf of [ ]

- **revenge** v.

1. To inflict punishment in return for (injury or insult)
2. To seek or take vengeance for (oneself or another person); avenge

The **revenge** definer added qualifications on the missing argument, the **avenge** definer didn't.

# American Heritage Dictionary

- **avenge** v.

1. To inflict a punishment or penalty in return for;

revenge ←

2. To take vengeance on behalf of

- **revenge** v.

1. To inflict punishment in return for (injury or insult)

2. To seek or take vengeance for (oneself or another person); avenge ←

**avenge** definer claims **avenge** and **revenge** are synonyms in sense 1; the **revenge** definer claims **avenge** and **revenge** are synonyms in sense 2.

# American Heritage Dictionary

- **avenge v.**

1. To inflict a punishment or penalty in return for; revenge
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- **revenge v.**

1. To inflict punishment in return for (injury or insult)
2. To seek or take vengeance for (oneself or another person); avenge

Both definers include "take vengeance" in their definitions, as if that's more transparent than the simple verb.

# Comparison with WordNet

# We make fewer distinctions.

1. *revenge, avenge, retaliate* -- (take revenge for a perceived wrong; "He wants to avenge the murder of his brother")
2. *retaliate, strike back* -- (make a counterattack and return like for like, esp. evil for evil; "The Empire strikes back"; "The Giants struck back and won the opener"; "The Israeli army retaliated for the Hamas bombing")

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Hard to figure out what motivates distinguishing two senses; personal vs. institutional?

# Does anybody find this useful?

- Frame descriptions as event ontology.  
(Heidelberg)
- FrameNet data for language teaching  
(Sato)
- FrameNet annotations for machine  
learning (SENSEVAL-3 competition)
- FrameNet parsing for question-answering  
(AQUAINT, others)

# FrameNets in other languages?

- Spanish (Barcelona; Carlos Subirats)
- German (Saarbrücken; Manfred Pinkal)
- Japanese (Tokyo; Kyoko Ohara)
- Swedish (Lund; Ake Viberg)

<http://www.icsi.berkeley.edu/~framenet>