What causes causatives?
A multifactorial study based on a parallel corpus

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Outline

1. Theoretical background: the causative continuum
2. Multifactorial analysis
   • Parallel corpus
   • Conditional inference trees
3. Explanation: iconicity and economy
   • Corpus evidence
   • Typological evidence
   • Experimental evidence
4. Conclusions
The causative continuum

Lexical <> Morphological <> Analytic (Periphrastic)

The causative continuum

Lexical <> Morphological <> Analytic (Periphrastic)

e.g. *kill*, *break*

The causative continuum

Lexical <> Morphological <> Analytic (Periphrastic)

e.g. *kill, break*  e.g. Turkish *öldür*- “kill”  
from *öl-* “die”

The causative continuum

Lexical <> Morphological <> Analytic (Periphrastic)

e.g. *kill, break*  
e.g. Turkish öldür- “kill” from öl- “die”  
e.g. *cause X to die,*  
*make X disappear*

The causative continuum

Lexical <> Morphological <> Analytic (Periphrastic)

e.g. *kill*, *break*  
e.g. Turkish öldür- “kill”  
from öl- “die”  
e.g. *cause* X to die,  
*make* X disappear

most compact  
FORM  
least compact

The causative continuum

Lexical <-> Morphological <-> Analytic (Periphrastic)

e.g. kill, break    e.g. Turkish öldür- “kill”    e.g. cause X to die, make X disappear
from öl- “die”   

most compact    FORM    least compact

most direct causation    MEANING    least direct causation

Example

• LC: I raised the cup to my lips. [Causer acting directly]

• AC: I caused the cup to rise to my lips. [Causer acting indirectly, e.g. using telekinesis]

(Haiman 1983: 784)
Dixon’s (2000) multifactorial account

<table>
<thead>
<tr>
<th>More compact causative forms</th>
<th>Less compact causative forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. non-causal verb describing a state</td>
<td>non-causal verb describing an action</td>
</tr>
<tr>
<td>2. intransitive (or intransitive and simple transitive) non-causal verb</td>
<td>transitive (ditransitive) non-causal verb</td>
</tr>
<tr>
<td>3. Causee lacking control</td>
<td>Causee having control</td>
</tr>
<tr>
<td>4. Causee willing (‘let’)</td>
<td>Causee unwilling (‘make’)</td>
</tr>
<tr>
<td>5. Causee partially affected</td>
<td>Causee fully affected</td>
</tr>
<tr>
<td>6. Causer acts directly</td>
<td>Causer acts indirectly</td>
</tr>
<tr>
<td>7. Causer achieves the result intentionally</td>
<td>Causer achieves the result accidentally</td>
</tr>
<tr>
<td>8. causation occurring naturally</td>
<td>causation occurring with effort</td>
</tr>
</tbody>
</table>
Token-based typology

• It is impossible to understand the impact of several highly correlated semantic and syntactic variables based on one or two examples from every language.*

• We need many examples and multivariate statistical methods.

*Cf. Levshina (To appear) in *Folia Linguistica* 50(2).
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<table>
<thead>
<tr>
<th>Language</th>
<th>Genus</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>Chinese</td>
<td>Sino-Tibetan</td>
</tr>
<tr>
<td>Finnish</td>
<td>Finnic</td>
<td>Uralic</td>
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<tr>
<td>French</td>
<td>Romance</td>
<td>Indo-European</td>
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<tr>
<td>Hebrew</td>
<td>Semitic</td>
<td>Afro-Asiatic</td>
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<td>Indonesian</td>
<td>Malayo-Sumbawan</td>
<td>Austronesian</td>
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<td>Japanese</td>
<td>Japanese</td>
<td>Japanese</td>
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<tr>
<td>Russian</td>
<td>Slavic</td>
<td>Indo-European</td>
</tr>
<tr>
<td>Thai</td>
<td>Kam-Tai</td>
<td>Tai-Kadai</td>
</tr>
<tr>
<td>Turkish</td>
<td>Turkic</td>
<td>Altaic</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>Viet-Muong</td>
<td>Austro-Asiatic</td>
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ParTy corpus

• a Parallel corpus for Typology
• subtitles of films and TED talks
• mostly Indo-European languages, but also other major languages (Chinese, Turkish, Finnish, Indonesian, Japanese, Thai, etc.)
• all languages aligned with English
• downloadable files at [www.natalialevshina.com/corpus.html](http://www.natalialevshina.com/corpus.html)
• work in progress...
Data set

• 344 causative situations found in the English segment of the corpus
• Coded for various semantic and syntactic variables (mostly based on Dixon’s parameters)
• Translations in the 10 languages are found and coded into 3 types of constructions (Analytic, Morphological or Lexical)
Variables (1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
<th>Example(s)</th>
<th>Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caused Event Aktionsart</td>
<td>Non-action</td>
<td>John killed Bill.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>Action</td>
<td>He walked the baby upstairs.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Number of main arguments</td>
<td>2</td>
<td>John killed Bill.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>John made Bill kill Mary.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Causee having control</td>
<td>No</td>
<td>John killed Bill.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Bring your friends!</td>
<td>Longer form</td>
</tr>
<tr>
<td>Making or Letting</td>
<td>Let</td>
<td>She let him go.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>Make</td>
<td>John killed Bill.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Willing Causee</td>
<td>No</td>
<td>John caused Bill to die.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>The police let him go.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Variable</td>
<td>Values</td>
<td>Example(s)</td>
<td>Expectations</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>----------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Causer acting directly</td>
<td>Yes</td>
<td>He cut his finger.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>He had his hair cut.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Causer acting intentionally</td>
<td>Yes</td>
<td>She wrote a paper.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>It makes me happy.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Causer acting forcefully</td>
<td>No</td>
<td>He got him to do it.</td>
<td>Shorter form</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>He forced him to do it.</td>
<td>Longer form</td>
</tr>
<tr>
<td>Causer involved in caused</td>
<td>No</td>
<td>John killed Bill.</td>
<td>None</td>
</tr>
<tr>
<td>event</td>
<td>Yes</td>
<td>Bring your friends! (and come, too)</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Values</td>
<td>Example(s)</td>
<td>Expectations</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Coreferentiality</td>
<td>Yes</td>
<td>He killed himself. He killed Bill.</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polarity</td>
<td>Pos</td>
<td>She let him do it. She didn’t let him do it.</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semantics of Causer</td>
<td>Anim</td>
<td>She made him stay. The rain made him stay.</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Inanim</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semantics of Causee</td>
<td>Anim</td>
<td>John let Mary go. John let it go.</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Inanim</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example from Avatar

Original

- ENG: Don't shoot, you'll piss him off.

Translations

- FRA: Ne tirez pas. Vous allez l'énerver. (Lexical)
- TUR: Ateş etme. Ateş etme. Onu kızdıracaksın. (Morphological, from kızmek ‘become angry’).
- VIE: Đừng bắn. Cậu sẽ làm nó nổi điên đó. (Analytic)
Proportions of types of causative constructions in 10 languages

FIN  FRA  HEB  IND  JPN  RUS  THA  TUR  VIE  ZHO

Lex  Morph  Ana
## Examples of constructions

<table>
<thead>
<tr>
<th>Language</th>
<th>Lexical</th>
<th>Morphological</th>
<th>Analytic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>sha “kill”</td>
<td>-</td>
<td>ràng “let, make“ + Pred</td>
</tr>
<tr>
<td>Finnish</td>
<td>tappaa “kill”</td>
<td>odotu-tt-aa “make wait”</td>
<td>antaa “give” + V1</td>
</tr>
<tr>
<td>French</td>
<td>tuer “kill”</td>
<td>-</td>
<td>faire + Vinf</td>
</tr>
<tr>
<td>Hebrew</td>
<td>harag “kill” pa’al</td>
<td>hotsi “take out” hiph’il</td>
<td>natan “give” + le-Vinf</td>
</tr>
<tr>
<td>Indonesian</td>
<td>mem-bunuh “kill”</td>
<td>meng-ingat-kan “remind”</td>
<td>membuat “make” + Pred</td>
</tr>
<tr>
<td>Japanese</td>
<td>korosu “kill”</td>
<td>ikar-ase-ru “make angry”</td>
<td>V_te + morau “get”</td>
</tr>
<tr>
<td>Russian</td>
<td>ubit’ “kill”</td>
<td>-</td>
<td>zastavit’ + Vinf</td>
</tr>
<tr>
<td>Thai</td>
<td>kaa “kill”</td>
<td>-</td>
<td>tham hai “do give” + Pred</td>
</tr>
<tr>
<td>Turkish</td>
<td>açısından &quot;open&quot;</td>
<td>öl-dür- “kill”</td>
<td>V_mA_DAT + izin ver- “allow”</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>giết hai “kill”</td>
<td>-</td>
<td>làm “do” + Pred</td>
</tr>
</tbody>
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Conditional inference trees: analytic vs. lexical in Turkish
Features that ‘favour’ AC (vs. LC)

<table>
<thead>
<tr>
<th>Feature</th>
<th>FIN</th>
<th>FRA</th>
<th>HEB</th>
<th>IND</th>
<th>RUS</th>
<th>THA</th>
<th>TUR</th>
<th>VIE</th>
<th>ZHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caused Action (vs. non-Action)</td>
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<td>3 arguments (vs. 2)</td>
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<td>Controlling Causee</td>
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<td>Letting (vs. making)</td>
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<tr>
<td>Willing Causee</td>
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<tr>
<td>Animate Causee</td>
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<tr>
<td>Non-intentional Causer</td>
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<tr>
<td>Inanimate Causer</td>
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</tbody>
</table>
Features that ‘favour’ MC (vs. LC)

<table>
<thead>
<tr>
<th></th>
<th>FIN</th>
<th>JPN</th>
<th>TUR</th>
</tr>
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<tr>
<td>Letting (vs. making)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Non-intentional Causer</td>
<td></td>
<td></td>
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<tr>
<td>Indirectly acting Causer</td>
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<td></td>
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Iconicity of cohesion

- “Meanings that belong together more closely semantically are expressed by more cohesive forms” (Haspelmath 2008: 2)
- If cause and effect are closely integrated semantically (e.g. direct causation), the elements that express them will be formally integrated, too.
Economy vs. iconicity

• The iconicity-based account (directness/indirectness) doesn’t explain the multidimensional character of variation.
• A better explanation may be the Principle of Economy: Shorter constructions tend to refer to more frequent causative situations, and longer ones to less frequent causative situations (Haspelmath 2008).

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Corpus evidence

• Santa-Barbara Corpus of Spoken American English (Du Bois et al. 2000-2005).

• A sample of 103 causative situations from seven informal spontaneous dialogues.

• Coded for the semantic and syntactic variables that have been found to be important in the cross-linguistic study.
Frequencies of causation types

- Caused Event
- Number of arguments
- Making or Letting
Frequencies of causation types
Frequencies of causation types

- Intentional Causer
- Animate Causer
- Causer Acting Directly
Interim conclusion

• The causation types that are associated with less compact causative forms cross-linguistically are also the rarer causation types in usage.
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Typological evidence

• Data base of causative constructions in 83 typologically diverse languages.

• 25 instances of contrasting causatives expressing direct vs. indirect, plus contact vs. distant, factitive vs. permissive or assistive causation, etc.

• \( \text{CAUS}_1 \) (more direct) and \( \text{CAUS}_2 \) (less direct).
### Typological evidence

<table>
<thead>
<tr>
<th>Difference in Length (Economy)</th>
<th>Difference in Cohesion (Iconicity)</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{Caus}_1$ shorter than $\text{Caus}_2$</td>
<td>$\text{Caus}_1$ and $\text{Caus}_2$ equally cohesive</td>
<td>14</td>
</tr>
<tr>
<td>$\text{Caus}_1$ shorter than $\text{Caus}_2$</td>
<td>$\text{Caus}_1$ more cohesive than $\text{Caus}_2$</td>
<td>9</td>
</tr>
<tr>
<td>$\text{Caus}_1$ and $\text{Caus}_2$ equally long</td>
<td>$\text{Caus}_1$ and $\text{Caus}_2$ equally cohesive</td>
<td>2</td>
</tr>
</tbody>
</table>
Typological evidence

<table>
<thead>
<tr>
<th>Difference in Length (Economy)</th>
<th>Difference in Cohesion (Iconicity)</th>
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<tbody>
<tr>
<td>Caus₁ shorter than Caus₂</td>
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e.g. Hindi (Kulikov 1993: 130):

*paṛh-nā* ‘to study’

Cx₁: *paṛh-ā-nā* ‘to teach’ (contact causation)

Cx₂: *paṛh-vā-nā* ‘to have [someone] to study’ (distant causation)
### Typological evidence

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</tr>
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<td>Caus₁ and Caus₂ equally cohesive</td>
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</tr>
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</table>

e.g. Korean (Patterson 1974: 9–10)

**Cx1:** `emeni-ka Yenghi-eykey say-os-lul **ip-l-ess-ta.**`

- mother-SUBJ Yenghi-IO new-clothes-DOBJ wear-CAUS-PAST-DEC
- ‘Mother caused Yenghi to wear the new clothes.’ [direct]

**Cx2:** `emeni-ka Yenghi-eykey say-os-lul **ip-key** ha-ess-ta.`

- mother-SUBJ Yenghi-IO new-clothes-DOBJ wear-COMP CAUS-PAST-DEC
- ‘Mother caused Yenghi to wear the new clothes.’ [indirect]
Typological evidence

<table>
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<td>9</td>
</tr>
<tr>
<td>Caus₁ and Caus₂ equally long</td>
<td>Caus₁ and Caus₂ equally cohesive</td>
<td>2</td>
</tr>
</tbody>
</table>
Interim conclusions

• Length is more relevant for variation of causatives than cohesiveness.

• Thus, the economy-based explanation should be preferred to the iconicity-based one.
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Experimental evidence

• Artificial language learning experiment (learning a language spoken by aliens)

• The training set contained causative situations of two types:
  - A UFO blinks with yellow light, from above, and a cactus disappears/appears/grows/shrinks. Frequent (80%).
  - A UFO blinks with blue light, from the left side, and a cactus disappears/appears/grows/shrinks. Rare (20%).

• Types of morphological causatives: with prefixes *ga-*/*gara-* (yellow light and frequent) and *te-*/*tere-* (blue light and rare)

• Free variation of allomorphs, i.e. no rules when to use the shorter or longer forms.
Hypothesis

• The participants will tend to produce the shorter form (i.e. ga-/gara-) when describing the more frequent causative situations and the longer form for the less frequent causative situations (i.e. te-/tere-).

<table>
<thead>
<tr>
<th></th>
<th>Long form</th>
<th>Short form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent situations</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Rare situations</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Participants

• Recruited via LinguistList and other networks
• So far, 26 people with diverse L1: Czech, English, German, Italian, Russian, etc.
• Nobody guessed about the purpose of the experiment.
• The subjects, as good linguists, were trying hard to find the rules, but were frustrated and probably angry with me.
Preliminary results

[Bar chart showing subjects for 'Short', 'Equal', and 'Long' categories with 'Frequent' and 'Rare' labels.]

Subjects

- Short
  - Frequent: 15
  - Rare: 10

- Equal
  - Frequent: 6
  - Rare: 4

- Long
  - Frequent: 5
  - Rare: 6
Interim conclusions

• Overall, subjects tend to prefer shorter forms.
• However, subjects more strongly prefer shorter forms when the meanings are more frequent.
Outline

1. Theoretical background: the causative continuum
2. Multifactorial analysis
   - Parallel corpus
   - Conditional inference trees
3. Explanation: iconicity and economy
   - Corpus evidence
   - Typological evidence
   - Experimental evidence
4. Conclusions
Conclusions

• Variation of causatives is multidimensional and cannot be reduced to the distinction between direct and indirect causation, neither cross-linguistically, nor within a separate language.

• Although there is cross-linguistic variation in the prominence of specific variables, the direction of the form-meaning association remains the same.

• These findings is best explained by the functional Principle of Economy. This claim is supported by corpus-based, typological and experimental evidence.
Thanks!

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The slides are available from 
www.natalialevshina.com/presentations.html

If you want to make/let your students do the experiment online, I’ll be happy to send you the link!