I can’t make you love me:
A Diachronic Study of (Im)purity in Chinese Analytic Causatives

Yanan Hu, Dirk Geeraerts, Dirk Speelman

University of Leuven
RU Quantitative Lexicology and Variational Linguistics
Where does it come from?

- Bonnie Raitt
- 1991
- “I Can’t Make You Love Me”
- The 500 Greatest Songs of All Time
What’s up with *make*?

Lyrics:

... 'Cause I can't *make* you love me if you don't
You can't *make* your heart feel something it won't

...

Linguistics:

Terasawa (1985)

*make* - pure causative/Cause-type
- agentive causative/Force-type

“the ‘coercive’ meaning (i.e. to force a person to do something by an exercise of influence, authority, or violence) does not develop until much later”

Quotes:

Music *makes* one feel so romantic - at least it always gets on one's nerves - which is the same thing nowadays.

--Oscar Wilde

Chinese *make* and its near-synonyms
Chinese Analytic Causative Construction

我让客人围着桌子坐下。
Wǒ ràng kè rén wéi zhe zhuō zi zuò xià
I CAUSE the guests surround (present tense marker) the table sit down
I asked the guests to sit around the table.

NP1 + VP1 + NP2 + VP2
Causer + CAUSE + Causee + Caused event

Syntactic structure: Subject (NP1) + VP1 + Object (NP2) + Complement (VP2)

Semantic components: Causer, CAUSE, Causee, Caused event
Research Target

CAUSE in analytical construction of Chinese causal expressions

7 forms of monomorphemic realization:

- 使 shǐ
- 令 lìng
- 让 ràng
- 叫 jiào₁
- 教 jiào₂
- 给 gěi
- 要 yào

Auxiliary verbs: make
Research Questions

1. (Im)purity?
   - how to encode
   - significant

2. Types?
   - 2 types
   - more clusters
   - modification

3. Diachrony?
   - first type, next type or co-existence
   - change of types
   - change of causatives’ preference
Operation

Materials:
- Sheffield Corpus of Chinese (Hu, et al 2007) 2,477 observations
- The UCLA Chinese Corpus (Tao and Xiao 2007) 1100BC-2005AD

Factors: 26
- Causer
  1 CrExp
  2 CrSem
  3 CrPers
  4 CrDef
  5 CrIntent
  6 CrCollocSig
- Causee
  7 CeExp
  8 CeSem
  9 CePers
  10 CeDef
  11 CeRole
  12 CrCollocSig

- Causer vs Causee
  13 Coref
  14 CtrlRelation
- Causing Event
  15 Manner
  16 CseNeg
- Caused Event
  17 CsedCstr
  18 CsedSem
  19 CsedNeg
  20 CsedCollocSig
- Causing Event vs Caused Event
  21 TemSep
  22 SpaSep
  23 Implicit
- Causative Construction
  24 SyntFun
  25 Structure
- Lectal Varieties
  26 Time (Period)
Operation

Procedures:

Multinomial Logistic Regression Analysis
   To validate the significance of (im)purity

Multidimensional Scaling (Speelman, Grondelaers & Geeraerts 2003; William Croft & Keith Poole 2008)
   To spot the distribution of the possible types

(Stacked) Bar Plot, Line Chart & Mosaic Plot
   To detect the diachronic change of those types & causatives’ type preference over time
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### How to encode?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Manner</th>
<th>CrIntent</th>
<th>CeRole</th>
<th>TemSep</th>
<th>SpaSep</th>
<th>Implcit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Values</strong></td>
<td>N, Y</td>
<td>Intent, Unintent, Undef</td>
<td>Agt, Expcer, Ptnt, Befiry, Others</td>
<td>N, Y</td>
<td>N, Y</td>
<td>Imp, NoImp</td>
</tr>
<tr>
<td><strong>Hypothesis</strong></td>
<td>No=pure, simple Yes=more than causal meaning, but not to differentiate yet</td>
<td>Intentional=awareness, make efforts Unintentional=objective fact Undefined=could be either</td>
<td>Others=a few, e.g. location Patient/Beneficiary/Experiencer=passive undergoer Agent=actor</td>
<td>No=strong causation Yes=weak causation</td>
<td>Implicative=occurrence of result Nonimplicative =do not entail the occurrence of caused event</td>
<td></td>
</tr>
</tbody>
</table>
**Significant?**

```r
fit1 = multinom(Causatives ~ CrIntent + CeRole + Manner + TemSep + SpaSep + Implict + Time, data = d, maxit = 1000)

vif → TemSep 6.209604

fit2 = multinom(Causatives ~ CrIntent + CeRole + Manner + SpaSep + Implict + Time, data = d, maxit = 1000)
```

Anova(fit2)

Analysis of Deviance Table (Type II tests)

Response: Causatives

<table>
<thead>
<tr>
<th></th>
<th>LR Chisq</th>
<th>Df</th>
<th>Pr(&gt;Chisq)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>1675.75</td>
<td>42</td>
<td>&lt; 2.2e-16</td>
</tr>
<tr>
<td>Manner</td>
<td>420.90</td>
<td>6</td>
<td>&lt; 2.2e-16</td>
</tr>
<tr>
<td>CeRole</td>
<td>314.32</td>
<td>24</td>
<td>&lt; 2.2e-16</td>
</tr>
<tr>
<td>CrIntent</td>
<td>49.06</td>
<td>12</td>
<td>2.039e-06</td>
</tr>
<tr>
<td>SpaSep</td>
<td>40.99</td>
<td>6</td>
<td>2.901e-07</td>
</tr>
<tr>
<td>Implict</td>
<td>17.83</td>
<td>6</td>
<td>0.006669</td>
</tr>
</tbody>
</table>

---

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

<table>
<thead>
<tr>
<th></th>
<th>llh</th>
<th>llhNull</th>
<th>G2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-2344.2828715</td>
<td>-3760.3607371</td>
<td>2832.1557313</td>
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<tr>
<td>McFadden</td>
<td>0.3765803</td>
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<tr>
<td>r2CU</td>
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</table>
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1. **(Im)purity?**
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   - significant

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Combination of Values

<table>
<thead>
<tr>
<th>Manner</th>
<th>CrIntent</th>
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<th>SpaSep</th>
<th>Implicit</th>
<th>Possible types</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Intent, Unintent, Undef</td>
<td>Agt, Expcer, Ptnt</td>
<td>N</td>
<td>Imp</td>
<td>Cause</td>
</tr>
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<td>Intent, Unintent, Undef</td>
<td>Befiry</td>
<td>N</td>
<td>Imp, NoImp</td>
<td>Enable</td>
</tr>
<tr>
<td>Y</td>
<td>Intent</td>
<td>Agt, Ptnt</td>
<td>N</td>
<td>NoImp</td>
<td>Force</td>
</tr>
<tr>
<td>Y</td>
<td>Intent</td>
<td>Agt, Expcer</td>
<td>Y</td>
<td>NoImp</td>
<td>Content</td>
</tr>
</tbody>
</table>
### Examples of the Causative Types

| Example sentences                                                                 | Manner | CrIntent      | CeRole            | SpaSep | Implicit       | Possible types |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 她那张冷若冰霜的面容，同样使神灵们不寒而栗。Her indifferent face CAUSE gods tremble with fear.                                                            | N      | Unintent      | Expcer           | N      | Imp            | Cause          |
| 传统的杂交育种可以使农作物高产或者抗病Traditional hybridization could CAUSE the crop high-yielding or disease-resistant | N      | Unintent      | Befiry           | N      | Imp            | Enable         |
| 我竭力使自己的情绪稳定下来I try my best to CAUSE myself calm down.                                                                                              | Y      | Intent        | Ptnt             | N      | NoImp          | Force          |
| 使军士二千人着软平底木屐前行。…CAUSE 2,000 soldiers march on with flat soft-soled wooden shoes                                                                      | Y      | Intent        | Agt              | Y      | NoImp          | Content        |

……
Multidimensional Scaling

A means of visualizing the clusters of underlying linguistic uniformities within a dataset

Factors=dimensions $\rightarrow$ low dimension space, 2D

Dataset $\rightarrow$ dissimilarity/distance matrix

Gower’s general coefficient of similarity for the explanatory factors (Gower 1971)
Multidimensional Scaling
the positions of the observations
## Identifying clusters

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<td>Agt, Pntnt</td>
<td>N</td>
<td>NoImp</td>
<td>Force</td>
</tr>
<tr>
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<td>Intent</td>
<td>Agt, Expcer</td>
<td>Y</td>
<td>NoImp</td>
<td>Content</td>
</tr>
</tbody>
</table>
Manner
CeRole
Manner (labels) & CeRole (col)

Cause

Enable
## Identifying clusters

<table>
<thead>
<tr>
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</tr>
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<td>N</td>
<td>NoImp</td>
<td>Force</td>
</tr>
<tr>
<td>Y</td>
<td>Intent</td>
<td>Agt, Expcer</td>
<td>Y</td>
<td>NoImp</td>
<td>Content</td>
</tr>
</tbody>
</table>
Manner
SpaSep
Manner & SpaSep

Force

Content
Types of Chinese analytic causatives

Chinese analytic causatives

pure causatives

Cause-type

impure causatives

Enable-type

Force-type

Content-type

……-type
Research Questions

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Types over time
# Types over time

<table>
<thead>
<tr>
<th>Period/Time</th>
<th>Cause</th>
<th>Enable</th>
<th>Force</th>
<th>Content</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5208</td>
<td>0.0556</td>
<td>0.0069</td>
<td>0.3889</td>
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<tr>
<td>2</td>
<td>0.3372</td>
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<tr>
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<td>0.0385</td>
<td>0.0231</td>
<td>0.7846</td>
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<tr>
<td>4</td>
<td>0.4154</td>
<td>0.0769</td>
<td>0.1077</td>
<td>0.3231</td>
<td>...</td>
</tr>
<tr>
<td>5</td>
<td>0.5294</td>
<td>0.0882</td>
<td>0.1544</td>
<td>0.1985</td>
<td></td>
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<tr>
<td>6</td>
<td>0.2612</td>
<td>0.0367</td>
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<td>0.3796</td>
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<tr>
<td>7</td>
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<tr>
<td>8</td>
<td>0.6118</td>
<td>0.1540</td>
<td>0.1081</td>
<td>0.1230</td>
<td></td>
</tr>
</tbody>
</table>
Types over time
Causatives’ preference for the types over time
Diachronic change of their choices

Chinese analytic causatives

pure causatives

Cause-type

Enable-type

Force-type

Content-type

......-type

impure causatives

......-type

$sh\uparrow, ling\uparrow, jiao1\uparrow, jiao2\uparrow$, $rang\uparrow, ge\uparrow, Yao\downarrow$
Conclusion: the big picture?

Chinese analytic causatives

pure causatives

impure causatives

Cause-type

Enable-type

Force-type

Content-type

……-type

grammaticalization

purification

new ones
Thank You!

Any questions and suggestions are welcome.

for further information:
http://wwwling.arts.kuleuven.be/qlvl
yanan.hu@student.kuleuven.be
dirk.geeraerts@arts.kuleuven.be; dirk.speelman@arts.kuleuven.be