

# Changing the world vs. changing the mind

## Distinctive collexeme analysis of the causative construction with *doen* in Belgian Dutch and Netherlandic Dutch\*

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The article focuses on the syntactic variation in the Netherlandic and Belgian national varieties of Dutch with regard to the causative construction with *doen* “make”. On the basis of the recently developed quantitative method of distinctive collexeme analysis applied to large syntactically parsed corpora of Belgian and Dutch newspapers, the authors detect the regional difference in the meaning of the construction. The analyses of the lexemes that fill the three main slots of the construction reveal that the Netherlandic causative *doen*, quantitatively more restricted in use, is also semantically poorer. Namely, it specializes in causation patterns that involve changing one’s mind, whereas its Belgian counterpart demonstrates a more varied semantic palette. The article also deals with the problem of a possible corpus bias, which may affect the results of this kind of analysis, and solves it by a verification of the conclusions in a thematically balanced corpus.

### 1. Introduction

This paper is a contribution to a promising, though comparatively underdeveloped field of variational syntax. We believe that the recent tendency towards creation of large syntactically parsed corpora should stimulate studies in this field. One of the main aims of this article is to demonstrate some of the potential benefits, as well as pitfalls, of this approach.

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The study focuses on variation between the two national varieties of Dutch spoken in the Netherlands and in the northern part of Belgium (Flanders). There have been studies of the phonological differences between the national varieties (e.g. Verhoeven 2005), as well as of their divergence in lexicon (Geeraerts et al. 1999) and in grammar (e.g. de Sutter 2005; Tummers et al. 2005; Grondelaers et al. 2008). In the syntax-related works mentioned here, the regional variation was treated alongside various semantic, pragmatic and other phenomena that influence the use of the constructions.

The Dutch causative constructions have already attracted researchers' interest (e.g. Verhagen & Kemmer 1997; Stukker 2005; Speelman & Geeraerts 2009). However, these studies focus on the differences between the causative construction with *doen* "make" (*doen*-CC) and the other Dutch analytic causative with *laten* "let, make". To our knowledge, the regional variation of the semantics of the *doen*-CC has not been explored yet. Our research aims to fill this gap by providing an account of this variation on the basis of a corpus-based statistical technique, distinctive collexeme analysis (Gries & Stefanowitsch 2004).

The article begins with an introduction into the structure and meaning of the *doen*-CC. Section 3 discusses the method and data that we use, followed by the results of a series of analyses. After that, we report the results of a control test that was performed to detect a possible corpus bias. The article concludes with a summary of our findings and some questions for future research.

## 2. The Dutch causative construction with *doen*

We would like to begin the discussion of the construction in question with some examples:

- (1) *De aardbeving deed de muren trillen*  
"The earthquake made the walls shake"
- (2) *Zijn kapsel doet me denken aan een vogelnest.*  
"His hairstyle makes me think of a bird's nest"

According to Kemmer & Verhagen 1994, the construction consists of several slots:

- the auxiliary predicate (*doen*)
- the Effected Predicate, which describes the caused event. It is *trillen* "shake" in (1) and *denken* "think" in (2)
- the Causer, which initiates the causation. In (1), the Causer is *De aardbeving* "the earthquake", and in (2), it is *Zijn kapsel* "his hairstyle"

- the Causee, i.e. the entity that performs the caused event. The Causees in (1) and (2) are *de muren* “the walls” and *me* “me”, respectively
- the Affectee, or the ultimate affected entity. It appears only in case of transitive Effected Predicates, which are quite rare in the *doen*-CC.

As studies by Verhagen & Kemmer (1997) and Stukker (2005) show, the *doen*-CC prototypically refers to physical and affective causation. Both of these causation types involve a physical entity as the initiator of the causation (the Causer), but the end points of the energy flow (most often, the Causees) differ. In the case of physical causation, as in (1), another physical entity is affected; while affective causation (2) involves a mental entity (an animate) as its end point.

However, even a quick look at real language data is enough to encounter causation patterns with *doen* that fall outside this scheme. In (3), the Causer and the Causee are neither physical nor mental; (4) implies a mental caused event but the Causee is inanimate:

- (3) *Chávez' uitspraken deden de olieprijs gisteren met 1 procent stijgen.*  
 (De Morgen, October 2001)  
 “Chávez’ statements made the oil price go up by 1 per cent yesterday”
- (4) *Maar die zekerheid heeft de twijfel nooit kunnen doen verdwijnen.*  
 (De Morgen, April 2004)  
 “But that certainty has never been enough to make the doubt go away”

Therefore, an identification of a causation type according to the properties of the participants is sometimes problematic. In this paper, we will distinguish between the causation patterns that involve changing one’s mind like in (2) and (4), and those that refer to changing the state of affairs outside the mind, as in (1) and (3).

The study by Speelman & Geeraerts (2009), based on the Corpus of Spoken Dutch (CGN), has shown that the *doen*-CC is preferred in the Belgian variety in comparison with the *laten*-construction, the other Dutch analytic causative. Actually, the *doen*-CC is less frequent in Netherlandic Dutch (see the data in Section 3). That invites another question, which is the key issue of this article: if there is any difference in the constructional meaning between the varieties.

### 3. Method and data

To detect the semantic difference between the Netherlandic and Belgian *doen*-CC, we used the method of distinctive collexeme analysis (Gries & Stefanowitsch 2004; Wulff 2006; Wulff et al. 2007). It belongs to the family of corpus-based

collostructional methods developed by S. Th. Gries and A. Stefanovitsch (e.g. Stefanowitsch & Gries 2003). Distinctive collexeme analysis is a technique designed specifically to compare two constructions by finding the slot fillers (distinctive collexemes) that are significantly attracted by one construction and repelled by the other. One can examine two near-synonymous constructions in one variety, like *go-V* vs. *go-and-V* in Wulff 2006, or formally identical constructions in two varieties, e.g. the *into-causative* in British and American English (Wulff et al. 2007). In the latter case, Wulff and her co-authors speak of different meaning construction in the two varieties, i.e. subtle differences in the way the semantic potential of the construction is realized to reflect culturally salient patterns of behaviour.

Our material constituted a part of two large newspaper corpora of Dutch and Flemish quality newspapers: Twente Nieuws Corpus (TwNC), and Leuven Nieuws Corpus (LeNC). Both corpora were syntactically parsed with the Dutch Alpino parser (Bouma et al. 2001), which allowed us to retrieve the lexemes that fill the Causer, the Causee and the Effected Predicate slots in the *doen-CC*. We neglected the Affectee slot because only a very small part of occurrences of the *doen-CC* have a transitive Effected Predicate. The material that we used dated back to 1999 and 2000. Table 1 shows the total number of tokens in each subcorpus and the number of the occurrences of the construction in the subcorpora. The data reveal that the *doen-CC* is significantly more frequent in Belgium than in the Netherlands.

**Table 1.** Overview of data

	the Netherlands	Belgium
Total number of tokens	113 mln.	120 mln.
Number of occurrences of <i>doen-CC</i>	5 470	12 493

$$\chi^2 = 2341.23, p < 0.001$$

For every slot, we carried out a distinctive collexeme analysis. To do so, four values were automatically calculated for each collexeme. Table 2 shows these values for the Effected Predicate *denken* ‘think’ as an example.

**Table 2.** The data for *denken* ‘think’ in the Effected Predicate slot in the Netherlands and Belgium

	the Netherlands	Belgium
<i>denken</i> in <i>doen-CC</i>	599	563
other verbs in <i>doen-CC</i>	4 871	11 930
<b>Totals</b>	5 470	12 493

The next step involved applying Fisher's exact test to find the collexemes that were significantly attracted to the *doen*-CC in each variety. The cut-off p-value for distinctive collexemes was 0.05. We also used the negative log-transformation of the p-values to make the interpretation more intuitive; the more significantly a collexeme is attracted, the higher log-transformed value it has. The results of these analyses are presented in the following sections.

#### 4. Results of the distinctive collexeme analyses

##### 4.1 The Causer slot

In the Netherlandic subcorpus we found 47 distinctive collexemes, versus 21 in the Belgian data. Table 3 presents the top ten nouns (the pronominal slot fillers were ignored as not interpretable) with the largest log-transformed p-values in both varieties:

Table 3. The top 10 distinctive collexemes (nouns) in the Causer slot in the two national varieties of Dutch

The Netherlands		Belgium	
Collexeme	- log(p)	Collexeme	- log(p)
<i>beseft</i> 'awareness'	6.55	<i>dioxinecrisis</i> 'dioxin crisis'	8.44
<i>speler</i> 'player'	6.55	<i>feit</i> 'fact'	6.60
<i>boek</i> 'book'	6.40	<i>daling</i> 'decline'	5.97
<i>collega</i> 'colleague'	5.94	<i>overname</i> 'taking-over'	5.79
<i>onderschatting</i> 'underrating'	6.33	<i>combinatie</i> 'combination'	5.94
<i>besluit</i> 'decision'	5.94	<i>groei</i> 'growth'	5.71
<i>uitgever</i> 'publisher'	5.94	<i>stijging</i> 'rise'	4.17
<i>vrouw</i> 'woman'	5.49	<i>vraag</i> 'demand'	4.04
<i>ministerie</i> 'ministry'	5.35	<i>vergrijzing</i> 'ageing'	3.77
<i>ruzie</i> 'quarrel'	4.75	<i>operatie</i> 'operation'	3.77

The most apparent conclusion is that the Netherlandic variety seems to favour human Causers (*speler* "player", *collega* "colleague", *uitgever* "publisher", *vrouw* "woman", *ministerie* "ministry"), unlike the Belgian subcorpus. It must be noted that some of the distinctive collexemes are also more salient for the corresponding culture, like *dioxinecrisis*, the dioxin crisis that had a significant impact on the Belgian economy and politics in 1999. The scope of this paper doesn't allow us to

examine closely the regional lexical variants and culturally specific concepts; we can only state that they were infrequent in our data and, consequently, unlikely to distort the picture. A more serious observation is that the Belgian collexemes include a lot of words that can be interpreted as economy-related terms (*daling* “decline”, *combinatie* “alliance”, *overname* “taking-over”, etc.), which implies that there is risk of bias in our data. This issue will be addressed in Section 5, where an additional test will be carried out to check our conclusions.

**Table 4.** Distribution of semantic classes of the distinctive Causers in the Netherlands and Belgium.

Semantic classes with examples	the Netherlands	Belgium
Abstract Entities ( <i>beseft</i> ‘awareness’)	79.75	68.08
Humans ( <i>vrouw</i> ‘woman’)	49.12	3.38
Artefacts ( <i>schilderij</i> ‘painting’)	18.14	0
Material Objects ( <i>gezicht</i> ‘face’)	10.41	0
Sounds ( <i>toon</i> ‘tone’)	6.68	0
Animals ( <i>dier</i> ‘animal’)	3.56	0
Ambiguous ( <i>deel</i> ‘part’)	3.42	0

Table 4 displays the distribution of semantic classes (which are each illustrated by an example) among the distinctive collexemes in the two varieties. The numbers are sums of the log-transformed p-values for all distinctive collexemes that belong to the given semantic class. As Table 4 indicates, abstract nouns are the most prominent slot fillers for both varieties, but the picture is more diverse in the case of the Netherlandic data, where the human Causers are also well represented, which supports our previous intuitive conclusion. Interestingly, the Netherlandic distinctive collexemes also include sounds and artefacts (the latter are information carriers, in fact), which we could consider as stimuli of human cognition. In addition, if we compare the abstract nouns in the Netherlandic and Belgian lists, we will find out that the Netherlandic ones relate to cognition (*beseft* “awareness, understanding”, *onterschatting* “underrating, underestimation”, *besluit* “decision”), whereas the Belgian distinctive collexemes mostly refer to social phenomena (e.g. *dioxinecrisis* “dioxin crisis” and *vergrijzing* “ageing”).

#### 4.2 The Causee

The same analysis was carried out for the Causee slot. The total number of distinctive collexemes in the Netherlandic data was 70 versus 41 for the Belgian

subcorpus. These numbers are larger than in the case of the previous slot, and the log-transformed p-values are also somewhat higher, as can be seen in Table 5.

**Table 5.** The top 10 distinctive collexemes (nouns) in the Causee slot in the two national varieties of Dutch

The Netherlands		Belgium	
Collexeme	– log(p)	Collexeme	– log(p)
<i>gezondheidsklacht</i> ‘health complaint’	12.04	<i>belletje</i> ‘bell’	28.14
<i>invloed</i> ‘influence’	12.01	<i>vraag</i> ‘question, demand’	19.62
<i>hart</i> ‘heart’	10.98	<i>aandeel</i> ‘share’	15.69
<i>waarschuwing</i> ‘warning’	7.34	<i>aantal</i> ‘number’	14.91
<i>adem</i> ‘breath’	7.14	<i>tij</i> ‘tide’	14.14
<i>stemming</i> ‘state of mind’	6.63	<i>speculatie</i> ‘speculation’	10.50
<i>Amsterdam</i>	5.94	<i>regering</i> ‘government’	9.47
<i>winstwaarschuwing</i> ‘profit warning’	5.94	<i>prijs</i> ‘price’	8.43
NAVO (NATO)	5.94	<i>probleem</i> ‘problem’	7.71
<i>klacht</i> ‘complaint’	5.94	<i>inflatie</i> ‘inflation’	7.26

A larger number of the collexemes allows us to apply a more fine-grained semantic classification. In particular, we subdivided the class of abstract nouns into Events, Mental States/Objects and Quantitative Concepts (units of measurement, monetary units, etc.). The results of the semantic classification of the distinctive Causees can be found in Table 6.

**Table 6.** Distribution of semantic classes of the distinctive Causees in the two varieties

Semantic classes with examples	the Netherlands	Belgium
Messages ( <i>waarschuwing</i> ‘warning’)	51.31	0
Humans ( <i>luisteraar</i> ‘listener’)	47.58	18.39
Physical Objects & Phenomena ( <i>belletje</i> ‘bell’, <i>wind</i> ‘wind’)	34.93	61.49
Body Parts & Processes ( <i>hart</i> ‘heart’, <i>adem</i> ‘breath’)	26.56	0
Mental States & Objects ( <i>vrees</i> ‘fear’, <i>gedachte</i> ‘thought’)	21.94	5.11
Events ( <i>invoering</i> ‘introduction’)	18.85	31.56
Quantitative Nouns ( <i>aantal</i> ‘number’)	0	86.92
Ambiguous nouns ( <i>wereld</i> ‘world’) and smaller classes	57.24	40.87

The data suggest that one can speak of prominence of the causation patterns that involve changing one's mind in the Netherlandic *doen*-CC. Not only Humans and their Body Parts and Processes are more distinctive of the Netherlandic variety, but also Messages and Mental States/Objects, which are profiled against the same base, in Langacker's terms (1987), which is a human being as a Communicator and Experiencer. The next section is intended to shed more light on this issue.

#### 4.3 The Effected Predicate slot

The Effected Predicate slot yielded a total number of distinctive collexemes comparable with the one of the Causee (the Netherlandic list totals 55, and the Belgian one has 61), but their degree of attraction to the regional variant of the construction is even higher. We suggest that this tendency can be explained by the priority of the caused event in the meaning construction in comparison with the causing event, represented by the Causer. Table 7 lists the top ten most attracted infinitives for each variety.

Table 7. The top 10 distinctive collexemes in the Effected Predicate slot in the Netherlands and Belgium

The Netherlands		Belgium	
Collexeme	$-\log(p)$	Collexeme	$-\log(p)$
<i>denken</i> 'think'	123.20	<i>dalen</i> 'go down, decrease'	40.80
<i>vóorkomen</i> 'seem'	88.98	<i>stijgen</i> 'go up, increase'	34.46
<i>gelden</i> 'count'	64.50	<i>rijzen</i> 'arise'	27.19
<i>schudden</i> 'shake'	52.06	<i>toenemen</i> 'increase'	20.26
<i>uitgaan</i> 'go out, be circulated'	47.41	<i>rinkelen</i> 'ring'	16.53
<i>toekomen</i> 'arrive, be sent'	28.52	<i>daveren</i> 'shake'	16.38
<i>staan</i> 'stand'	25.22	<i>nadenken</i> 'think, ponder'	15.46
<i>geloven</i> 'believe'	22.91	<i>draaien</i> 'turn, run'	12.25
<i>besluiten</i> 'decide'	22.64	<i>verliezen</i> 'lose'	11.78
<i>verbleken</i> 'fade'	20.34	<i>stoppen</i> 'stop'	11.73

To be able to generalize over the long lists of data, we again carried out a semantic classification. This time we used Levin's (1993) verb classes, with some minor adjustments.<sup>1</sup> To measure the divergence between the varieties, we calculated the

1. Namely, we added several classes of cognition-related verbs, such as Cogitation (e.g. *denken* "think"), Memory (*vergeten* "forget") Epistemic Attitude (*twijfelen* "doubt") and Awareness (*weten* "know"); we also set apart verbs of Oscillatory Motion (*trillen* "shake").



difference for each semantic class by using the following simple formula:  $Distance_{SEM} = \sum(A_{V(SEM)})_{NL} - \sum(A_{V(SEM)})_{FL}$ , where  $A_{V(SEM)}$  means the degree of attraction (negative log-transformed p-value) of a verb that belongs to the given class  $SEM$ . Table 8 lists the ten semantic classes that diverge the most.

**Table 8.** The difference in distribution of semantic classes of the distinctive Effected Predicates in the two varieties (top 10)

Semantic Classes	The Netherlands	Belgium	Distance
Change of State	29.20	180.68	-151.48
Cogitation	152.40	19.74	132.66
(Dis)Appearance & Occurrence	156.80	79.30	77.50
Existence	94.00	20.46	73.54
Oscillatory Motion	59.96	16.38	43.58
Emission	52.57	23.06	29.51
Assuming Position	25.22	0	25.22
Aspectual	0	23.98	-23.98
Epistemic Attitude	22.91	0	22.91
Communication	24.38	3.77	20.61

The data reported in Table 8 corroborate the previous observations and show the predominance of the caused events that involve a human Cognizer/Experiencer in the Netherlandic *doen*-CC (Cogitation, Epistemic Attitude, Communication). In the Belgian variety, most of the distinctive verbs within the large class of Change of State refer to a ‘calibratable’ change of state (Levin 1993: 247–248), i.e. change along a scale, which involves a measurable entity (cf. the Quantitative Concepts among the Belgian distinctive Causees in 4.2). The examples of such verbs are *dalen* ‘go down’ and *stijgen* ‘rise’.

#### 4.4 Summary

To summarize, the data from the three slots that we have presented demonstrates that the Netherlandic *doen*-CC specializes in the causation patterns that involve a stimulus (an event, another human being, a source of information, a perception phenomenon like sound, etc.) that causes the Cognizer/Experiencer to think, feel, believe, perceive, etc. The result of this impact (the caused event) may be either an invisible, purely mental state, or a perceivable physiological or communicative reaction. The Belgian *doen*-CC, by contrast, denotes non-mental causation, especially change along a scale. Our analyses also reveal that the caused event is the conceptual element that accounts for the largest divergence between the varieties.

### 5. Control of the results in a thematically balanced corpus

As we mentioned in 4.1, there is some risk of a corpus bias that could have affected our analyses. The question now is whether the predominance of mental predicates among the Netherlandic collexemes and non-mental ones in the Belgian slot fillers is due to the thematic corpus bias of the Belgian data towards economy-related topics. Unfortunately, the subcorpora were too large to identify the subject domain of every article. Therefore, our decision was to create a smaller corpus, which would be balanced in terms of the topics discussed by the journalists. To do so, we used a small part of the corpora from 2001 to 2002, which was provided with thematic keywords by the corpus compilers, and built two subcorpora on the basis of those keywords. The selected articles belonged to the subject domains of politics, economy, music and football. Each thematic part of the subcorpora totalled approximately 1 mln. tokens.

The next step was to extract all Effected Predicate slot fillers of the *doen*-CC and carry out another distinctive collexeme analysis. Table 9 presents all distinctive collexemes in the two varieties (the lists are much shorter because of data sparseness, but the strongest collexemes have survived the test).

**Table 9.** The distinctive Effected Predicates in the thematically balanced corpus

The Netherlands		Belgium	
Collexeme	$-\log(p)$	Collexeme	$-\log(p)$
<i>denken</i> 'think'	13.53	<i>keren</i> 'turn'	6.25
<i>spreken</i> 'speak'	9.90	<i>rijzen</i> 'appear'	4.67
<i>vóórkomen</i> 'seem'	5.17	<i>terugkeren</i> 'turn back'	3.74
<i>besluiten</i> 'decide'	4.83	<i>terugdenken</i> 'think back to'	3.50
<i>verlangen</i> 'want'	3.84	<i>opmerken</i> 'observe'	3.16
<i>vergeten</i> 'forget'	3.48	<i>ontstaan</i> 'come into being'	3.16
<i>uitgaan</i> 'go out'	3.46		

Again, the Netherlandic data yields the Cognizer/Experiencer-related verbs, whereas the Belgian picture is more varied. Interestingly, two out of six verbs in the Belgian list involve a Cognizer (*terugdenken* "think back to", *opmerken* "observe, notice"). This shows that the tendency of the Belgian *doen*-CC to denote non-mental causation (most prominently, change along a scale), which we observed in Section 4.3, is unstable and prone to a corpus bias. This also means that the

meaning construction in the two varieties is asymmetric, the Netherlandic *doen*-CC being more restricted both quantitatively and qualitatively.<sup>2</sup>

## 6. Conclusions

The distinctive collexeme analyses presented in this article showed that the Netherlandic *doen*-CC, being a less frequent one, also has a narrower meaning. It specializes in causation with mental caused events. This tendency holds both in the initial and the control corpus. As for its Belgian counterpart, the results of the two tests do not converge: in the first corpus we observed the predominance of non-mental causation and especially quantitative change along the scale, typical of economy-related texts, whereas in the thematically balanced one this tendency could not be traced.

The present study leaves a few questions for the future. First of all, we would like to estimate the impact of cultural and linguistic regional markers on the analysis. It would also be interesting to study the degree of attraction/repulsion of the three slot fillers taken together. Another important issue to address in the future is the impact of semantically related constructions (most importantly, the causative construction with *laten*) on the regional distribution of *doen*-CC. Taking these constructions into consideration would enable us to make generalizations about the salient scenarios of causation in both cultures.

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2. Our current research shows that idiomatic fixation of the Effected Predicates in the *doen*-CC is on average stronger in the Netherlands than in Flanders. From this it follows that the Netherlandic *doen*-CC is less productive, which ties in with the results of the present study.

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