Constructions
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Multiple sources of constructional contamination in different language varieties: further pieces to the contamination puzzle

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Abstract

Two formally similar constructions can affect each other's realization through a process called constructional contamination. Pijpops & Van de Velde (2016) have shown that language users may store (frequent) instances of one construction as an exemplar chunk and later recycle them in a different but formally similar construction. Contamination effects have since been described for several other constructions, but Delaby & Colleman (in press) have shown that at least for one pair of Dutch constructions, the process of constructional contamination can have different outcomes in different varieties of the language, i.e. in Belgian vs. Netherlandic Dutch. In addition, it has been argued that the storing and recycling of chunks might not fully explain constructional contamination in all cases (Pijpops et al. 2018; Delaby & Colleman in press).

In this paper, we further explore the mechanism(s) behind constructional contamination as well as the nature and extent of national variation in contamination outcomes, by focussing on the Dutch receptive construction. We show that different slots of this construction are contaminated by multiple constructions at the same time. However, these contamination effects are not identical across both varieties of Dutch. In Netherlandic Dutch, a higher degree of formal similarity is needed to trigger constructional contamination, which we hypothesize to be linked to the delayed standardization of Belgian Dutch compared to Netherlandic Dutch (Grondelaers et al. 2008). Our case studies also provide additional evidence for a direct role of horizontal links in constructional contamination.

1 Introduction

Pijpops & Van de Velde (2016) demonstrate that two formally similar constructions can influence each other's realization through a process they call constructional contamination. They illustrate this with the Dutch partitive genitive, which consists of an indefinite pronoun or quantifier expression followed by an adjective. This adjective can appear with a genitival *-s* ending in this construction (1), but this suffix is often not realized (2).

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(1) *iets* *verkeerd-s*
something wrong
'something wrong'

(2) *in* *begin* *van* *de* *week* ***iets*** ***verkeerd***
[in beginning of the week]$_{PP}$ [something wrong]$_{NP}$
gegeten
eaten
'I ate **something wrong** at the start of the week.'
(Pijpops & Van de Velde 2016: 544)

Pijpops & Van de Velde (2016) have shown that the use of the *-s* suffix is partially determined by the frequency in which an adjective occurs in other constructions that are coincidentally formally similar to the partitive genitive. For example, in the construction in (3), the pronoun *iets* 'something' and the adverb *verkeerd* 'wrong' belong to different constituents, but they happen to occur adjacently and, consequently, this string resembles a partitive genitive construction. Importantly, in the construction with an adverb in (3), only the bare form of the adverb is possible. On the basis of corpus data, Pijpops & Van de Velde (2016) show that adjectives that occur more frequently in such a formally similar construction are also more likely to appear without a suffix in the partitive genitive, compared to adjectives that do not frequently occur in the construction in (3). Thus, the construction with an adverb can be said to "contaminate" the partitive genitive.

(3) *dat* ***iets*** ***verkeerd*** *geïnterpreteerd* *wordt?*
that [something]$_{NP}$ [wrongly]$_{AdvP}$ interpreted gets
'…that **something** gets **wrongly** interpreted?'
(Pijpops & Van de Velde 2016: 544)

These contamination effects are explained by Pijpops & Van de Velde (2016) as a result of shallow parsing and exemplar chunking. Language users do not always perform a full parse of the syntactic structure when processing a sentence – often, they rely on a pseudo-parse (Dąbrowska 2012; Ferreira & Patson 2007). Consequently, when a language user processes a construction with an adverb, as in (3), they may process and store *iets verkeerd* 'something wrong' as a single chunk, despite the fact that these two words do not actually form a syntactic unit in (3). The combination of *iets* 'something' and *verkeerd* 'wrong' frequently occurs in the construction with an adverb, making that chunk strongly entrenched for Dutch language users. When speakers want to form a partitive genitive with the words *iets* and *verkeerd*, they may use the chunk stored in their memory, recycling it in the partitive genitive. This reduces cognitive processing costs. Since the chunk created from instances of the construction with an adverb does not have

a suffix in the adjective, there will also be a bias in the partitive genitive for the adjective in question to appear without a suffix. Pijpops & Van de Velde (2016) indeed find that the more frequently an adjective occurs in the contaminating construction with an adverb, the greater the likelihood that it appears without an *-s* ending in the partitive genitive. Such contamination effects have since been observed for several other pairs of constructions, both in Dutch and in English (see, e.g., Pijpops et al. 2018; Van de Velde & Pijpops 2018; Hilpert & Flach 2022; Bouso 2022a, 2022b).

In the process of constructional contamination, a crucial role is played by formal similarity links between constructions. Recent work in construction grammar has described such similarity links – whether rooted in formal or semantic similarity – as "horizontal links" (e.g., Van de Velde 2014; Diessel 2015; Perek 2015). Pijpops & Van de Velde (2016: 546-551) consider these horizontal links to be, at the very least, *facilitators* of constructional contamination: the process of exemplar chunking and recycling just described can take place because there is a coincidental formal similarity between two constructions. Delaby & Colleman (in press) argue that, for some constructions, the mental activation of a horizontal link is likely to be directly responsible for contamination effects. They discuss contamination effects between two Dutch constructions that both combine *krijgen* 'to get' with a past participle. In the receptive *krijgen*-construction in (4), in which the subject of the sentence is the recipient of a transfer, *krijgen* and the past participle can freely occur in both possible orders in a verb cluster. This word order is relatively less flexible in the resultative *krijgen*-construction in (5), which expresses that the subject succeeds in performing the action mentioned by the past participle. While both orders occur in this pattern as well in real language data, the resultative construction is strongly statistically skewed towards the participle-first order, the *krijgen*-first order appearing in about 1 to 2 % of the cases only. Delaby & Colleman demonstrate that the resultative construction contaminates the receptive construction. However, they show that the frequency of the past participle in contexts that might lead to the storage of an unanalyzed chunk (as in (5), where the participle *betaald* 'paid' and *krijgen* occur adjacently) is a less good predictor of contamination effects than the frequency of the verb in all occurrences of the contaminating construction, i.e., including those occurrences where there is no formal similarity with the target construction (as in (6), where the past participle *betaald* 'paid' and *krijgen* do not occur adjacently and can thus not be stored as an unanalyzed chunk). This suggests that the activation of a horizontal link may be directly responsible for constructional contamination. In addition, Delaby & Colleman show that these effects differ between the two national varieties of European Dutch, viz. Belgian Dutch and Netherlandic Dutch.

(4) *Wat zeker is, is dat Mills in 2000 615.000*
what certain is is that Mills in 2000 615,000
dollar ***betaald*** ***kreeg.***
dollar paid got
'What is certain, is that Mills was paid 615,000 dollar in 2000.'
(SoNaR, newspapers, dataset Delaby & Colleman in press)

(5) *(…)* *het* *stadsbestuur* *trok* *er* *de* *stekker* *uit*
the city.council pulled there the plug out
omdat *het* *de* *artiesten* *niet* *meer* ***betaald***
because it the artists not anymore paid
kreeg.
got
'(…) the city council pulled the plug because it was no longer able to pay the artists'
(SoNaR, newspapers, dataset Delaby & Colleman in press)

(6) *Het* *stadsbestuur* *kreeg* *de* *artiesten* *niet* *meer*
the city.council got the artists not anymore
betaald.
paid
'The city council was no longer able to pay the artists.'

In the present investigation, we broaden the scope to include three additional constructions which potentially contaminate two different slots of the receptive *krijgen*-construction (viz. contamination by copular clusters with *worden* 'to become' and *zijn* 'to be', by infinitival clusters with *krijgen*, and by the passive construction, see Sections 3.3, 3.4 and 4, respectively, for further elaboration). Our goal is threefold. First, we demonstrate that a construction can be contaminated by *different* source constructions at the same time. Second, we provide further evidence for a direct role of horizontal links in causing constructional contamination, in addition to the chunking-mechanism proposed by Pijpops & Van de Velde (2016). Third, we show that the national variation found by Delaby & Colleman (in press) is found for different construction pairs and thus not restricted to the receptive and resultative construction.

The article is structured as follows. In the next section, we briefly elaborate on the receptive *krijgen*-construction in Dutch. The case studies are discussed in Section 3, which deals with word order variation in receptive verbal clusters, and Section 4, which deals with variation in the preposition used to express the agent of the transfer in the receptive construction. Section 5 is a further discussion section and the conclusions follow in Section 6.

2 The receptive *krijgen*-construction in Dutch

The receptive *krijgen*-construction, illustrated in (7), has the form [Subj *krijgen* Obj (*van/door* NP) $V_{\text{past participle}}$] and expresses that the subject is the recipient of a transfer. The construction presents the transfer from the perspective of the recipient, making it a perspectival alternative to the double object construction (8) and the prepositional object construction (9) – both of which present the transfer from the perspective of the source – and the regular passive construction (10), which presents the transfer from the perspective of the theme.

(7) *Ik kreeg de boeken overhandigd (van / door de hoogleraar).*
I got the books handed from / by the professor
'I was handed the books (by the professor).'
(Colleman 2015: 214)

(8) *De hoogleraar overhandigde mij de boeken.*
the professor handed me the books
'The professor handed me the books.'
(Colleman 2015: 214)

(9) *De hoogleraar overhandigde de boeken aan mij.*
the professor handed the books to me
'The professor handed the books to me.'

(10) *De boeken werden (aan) mij overhandigd (door de hoogleraar).*
the books were (to) me handed by the professor
'The books were handed (to) me (by the professor).'
(Colleman 2015: 214)

The receptive *krijgen*-construction emerged around 1900 (Van Leeuwen 2006; Landsbergen 2009). Colleman (2015) discusses how the construction likely originated from two source constructions, and can thus be considered a multiple source construction (Van de Velde et al. 2013). The first source construction is the resultative *krijgen*-construction (11), which combines the same form as the receptive construction with an agentive-resultative meaning. The second source construction combines the verb *krijgen* as a main verb with a co-predicative participle, as illustrated in (12).

(11) *Zal je al die broncode trouwens wel op één*
wil you all that source.code by.the.way PRT on one
zondag gelezen krijgen?
Sunday read get
'Will you be able to read all that source code in one Sunday?'
(SoNaR, discussion lists, dataset Delaby & Colleman in press)

(12) *Ik kreeg het boek beschadigd.*
I got the book damaged
'I received the book in a damaged condition.'
(Colleman 2015: 218)

3 Case study I: word order in verbal clusters with receptive *krijgen*

3.1 The red and green order in Dutch

In Dutch, if an auxiliary and a past participle form a two-part verb cluster, both the word order with the auxiliary first and the word order with the past participle first are possible. In the Dutch grammatical tradition, the former order is called the "red order" (13) while the latter one is called the "green order" (14).[1] The alternation between both orders has been studied extensively for the established (perfective and passive) auxiliary verbs *hebben* 'to have', *zijn* 'to be' and *worden* 'to become'. The variation is largely driven by factors which are related to the complexity of the clause: it is assumed that language users fall back on the "default order" when they produce a sentence with a higher complexity as a compensatory strategy for the increased processing costs, although there is no agreement on which order is the default order (De Sutter 2007; Bloem et al. 2014, 2017). In addition, language-external factors have also been shown to influence the choice between the red and green order: the red order is used relatively more often in Netherlandic Dutch compared to Belgian Dutch and relatively more often in formal registers compared to informal registers (De Sutter et al. 2005).

(13) *dat hij een boek* ***heeft gekocht.***
that he a book has bought
'that he bought a book'

[1] These labels are based on the colors that Pauwels (1953) used to show the geographical distribution of both orders on dialect maps.

(14) *dat hij een boek* ***gekocht*** ***heeft.***
that he a book bought has
'that he bought a book'

Note that the variation between the red and green order is only possible for verbal clusters. If a copular verb is combined with an adjectivally used past participle, only the green order is straightforwardly possible, as illustrated in (15) (Haeseryn et al. 1997: 2.4.6, 18.5.7.3.ii; De Sutter 2007). Both of the source constructions of the receptive *krijgen*-construction appear (almost) exclusively in the green order and are therefore considered to be adjectival constructions. It is thus not surprising that the green order used to be dominant in the receptive *krijgen*-construction as well, in the first decades after its emergence (Colleman & Rens 2016). However, Delaby & Colleman (2023) have shown that the receptive *krijgen*-construction has fully adopted the red order in the course of the 20th century and now uses the red order to more or less the same extent as the longer-established auxiliary verbs *hebben* etc. (viz. 56.34% red orders in Netherlandic Dutch newspaper material from the period 1999-2005) – see (16) for an example of a red receptive cluster. Additionally, they demonstrate that the variation between both orders is driven by the same complexity-related factors determining the variation in clusters with *hebben* etc.

(15) *{Ik heb je toch gezegd}*
dat mijn moeder al jaren ***overleden*** ***is / * is***
that my mother already years dead is / is
overleden
dead
'{I told you} that my mother has been dead for years.'
(Haeseryn et al. 1997: 2.4.6)

(16) (…) *{dat mensen zich eraan storen}*
dat ze constant rook in hun gezicht
that they constantly smoke in their face
krijgen ***geblazen***
get blown
'(…) {that people are bothered} that they constantly are blown smoke in their face'
(SoNaR, discussion lists, dataset Delaby & Colleman in press)

In the remainder of this section, we will show that not only complexity-related variables determine the choice between the red and green order, but also the horizontal links that the receptive *krijgen*-construction maintains with formally

similar constructions. In Section 3.2, we summarize the results of Delaby & Colleman (in press), who found contamination effects by the resultative *krijgen*-construction. In Section 3.3 and Section 3.4, we discuss two new, additional cases of contamination targeting receptive *krijgen*-clusters.

3.2 Contamination by the resultative *krijgen*-construction

Delaby & Colleman (in press) investigated whether the order in receptive *krijgen*-clusters is contaminated by resultative *krijgen*-clusters. As noted in Section 3.1, resultative *krijgen*-clusters appear almost exclusively in the green order, which is why the resultative construction is usually considered to be adjectival in nature. Resultative clusters thus have the potential to promote the green order in receptive clusters: green resultative *krijgen*-clusters such as *betaald kreeg* 'paid got' in (5) (repeated below as (17)) can be stored as unanalyzed chunks and can later be recycled for a receptive *krijgen*-cluster with the same verb, as in (4) (repeated below as (18)).

(17) *(…) het stadsbestuur trok er de stekker uit*
the city.council pulled there the plug out
omdat het de artiesten niet meer ***betaald***
because it the artists not anymore paid
kreeg.
got
'(…) the city council pulled the plug because it was no longer able to pay the artists'
(SoNaR, newspapers, dataset Delaby & Colleman in press)

(18) *Wat zeker is, is dat Mills in 2000 615.000*
what certain is is that Mills in 2000 615,000
dollar ***betaald*** ***kreeg***.
dollar paid got
'What is certain, is that Mills was paid 615,000 dollar in 2000.'
(SoNaR, newspapers, dataset Delaby & Colleman in press)

Delaby & Colleman (in press) collected a large sample of receptive two-part *krijgen*-clusters from the SoNaR-corpus (Oostdijk et al. 2013), which contains 500 million words of present-day written Dutch. These instances were extracted from the corpus using the XPath query in (19). After removing resultative hits, ambiguous hits and clusters with *krijgen* as a past participle, in which only the green order is possible (Haeseryn et al. 1997: 18.5.7.3.ii), this resulted in 6,912 hits. 62.40% of the clusters appear in the green order. Table 1 shows the distribution of these hits between the red and green order for Belgian Dutch and Netherlandic Dutch.

(19) //node[@cat and node[@rel = "hd" and @pt = "ww" and @lemma = "krijgen"] and node[@cat = "ppart" and node[@rel = "hd" and @pt = "ww" and @wvorm = "vd" and @positie = "vrij" and @buiging = "zonder"]]]

Variety	Number of hits		
	Red order	Green order	Total
Belgian Dutch	1531 (31.89%)	3270 (68.11%)	4801 (100%)
Netherlandic Dutch	1068 (50.59%)	1043 (49.41%)	2111 (100%)
Total	2599 (37.60%)	4313 (62.40%)	6912 (100%)

Table 1: Number of hits with receptive two-part clusters

All hits were annotated for (i) the language-internal variables listed in Table 2, which are mostly related to complexity according to De Sutter (2007) and Bloem et al. (2014, 2017) and which serve here as control variables, (ii) the formality of the text genre (using a crude dichotomic distinction between relatively formal and more informal genres), and, (iii) different measurements of constructional contamination. Delaby & Colleman (in press) calculated for each verb, based on the data collected from the SoNaR-corpus with the query in (19), how often it appears in a resultative two-part verb cluster, how often it appears in ambiguous two-part clusters in the green order, how often it appears in the resultative construction overall (regardless of whether it appears in a two-part verb cluster), and how distinctive it is for the resultative construction compared to the receptive construction. The first three variables were calculated by counting the frequencies of a particular past participle in the contexts just mentioned, divided by the total number of occurrences of that past participle and then applying an angular transformation to this ratio.[2] The last variable was calculated with a distinctive collexeme analysis (Gries & Stefanowitsch 2004), using Gries' (2014) R-script for collostructional analysis. The latter two variables thus measure how strongly connected a verb is to the contaminating construction (either in isolation or compared to its connection with the target construction), while the former two variables measure how often a verb is used in the contaminating construction in contexts that could be stored as chunks available for recycling into the target construction.[3]

[2] Pijpops & Van de Velde (2016: 563) propose to divide the frequency of a lexeme in a contaminating construction by the total number of occurences of that lexeme to account for the fact that highly frequent lexemes will neccesarily occur more often in contaminating constructions. The angular transformation is applied to spread out values that are very close to 0 (i.e. lexemes that (almost) never appear in the contaminating construction) or 1 (i.e. lexemes that almost exclusively appear in the contaminating construction).

[3] The frequency of a verb in green clusters that are *ambiguous* between a receptive and resultative reading was included as a variable because Pijpops & Van de Velde (2016) found that the recycling of unanalyzed chunks in a target construction appears to be facilitated when the chunk originally occurred in an ambiguous context.

Variable	Levels
MORPHOLOGICAL STRUCTURE OF THE MAIN VERB	separable, non-separable
LENGTH OF THE MIDFIELD	{numerical variable: number of words in the midfield}
INFORMATIVITY OF THE LAST PREVERBAL WORD	low, intermediate, high
PRIMING OF THE RED ORDER	{numerical variable: number of preceding red clusters in the document of the hit}
PRIMING OF THE GREEN ORDER	{numerical variable: number of preceding green clusters in the document of the hit}
INHERENCE OF THE LAST PREVERBAL WORD	inherent, not inherent
GRAMMATICAL RELATION OF CONSTITUENT IN EXTRAPOSITION TO HEAD	no extraposition, complement of the last preverbal word, complement of the verb, adjunct
FINITENESS OF THE GRAMMATICAL HEAD *KRIJGEN*	finite, infinitive, *te*-infinitive
FORMALITY	formal, informal

Table 2: Overview of control variables

Delaby & Colleman (in press) built logistic regression models with the word order of the cluster as the dependent variable and the red order as the success level.[4] Table 3 lists the significant effects of the contamination variables found for the models for Belgian Dutch and Netherlandic Dutch.[5] A positive coefficient indicates a greater likelihood of the success level (i.c., the red order) and vice versa. For both varieties, variables that take into account the frequency of a verb in all instances of the resultative construction were better predictors of contamination effects, as opposed to variables that only measure the frequency of a verb in resultative two-part verb clusters. In Belgian Dutch, verbs that are frequently used in the resultative *krijgen*-construction, are more likely to be used in the green order in the receptive construction. For Netherlandic Dutch, contamination effects seemed to have a more limited range, both with regard to which verbs contaminate and with regard to which verbs are affected by contamination. It was found that only verbs that are highly distinctive for the resultative construction compared to the receptive construction are influenced by contamination (as opposed to all verbs that are frequently used in the resultative construction in Belgian Dutch) and that this contamination only affected non-separable verbs in receptive clusters (as opposed to all verbs in Belgian Dutch). In addition, we observed that, in Netherlandic Dutch, the contamination had the opposite effect of what would be expected on the basis of the general contamination mechanism as introduced in Pijpops & Van de Velde

[4] All data presented in Section 3 and Section 4 were analyzed using R (R Core Team 2025) and the R-package *multcomp* (Hothorn et al. 2008).

[5] The coefficients and p-values in Table 3 differ slightly, although not in any meaningful way, from those reported in Delaby & Colleman (in press), as we ran a new model which also includes the variables discussed in Section 3.3 and Section 3.4.

(2016): it was found that verbs that are distinct for the resultative construction, are more likely to be used in the *red* order with receptive *krijgen*. We will return to these differences in Section 5.

Variety	Variable	Coefficient (log odds ratio)	P-value
Belgian Dutch	Frequency of V in the resultative *krijgen*-construction	-5.5635	0.0459 *
Netherlandic Dutch	Frequency of V in the resultative *krijgen*-construction (collostructional attraction)	0.1372	< 0.001 ***

Table 3: Results of the logistic regression analyses evaluating contamination effects by the resultative *krijgen*-construction

3.3 Contamination by copular constructions

The red order is in principle only possible with verbal clusters. When a verb is combined with an adjectivally used past participle, as in the resultative *krijgen*-construction (Section 3.2), only the green order is possible, allegedly (Haeseryn et al. 1997: 2.4.6, 18.5.7.3.ii; De Sutter 2007; in practice, as we have already observed above, this is a statistical rather than a categorical constraint). This is also the case for the copular verbs *worden* 'to become' and *zijn* 'to be', as illustrated in (20)-(21). Pijpops et al. (2018) demonstrated that such green adjectival clusters have a contamination effect on verbal clusters: past participles frequently used in copular constructions with *worden* and *zijn* were found to have a higher likelihood of appearing in the green order in verbal clusters where *worden* and *zijn* are used as passive or perfective auxiliaries, as in (22)-(23).

(20) *dat* *ik al heel de dag* ***vermoeid*** ***ben***
that I already entire the day tired am
'…that I have been feeling tired throughout the entire day.'
(Pijpops et al. 2018: 285)

(21) *dat* *de situatie steeds meer* ***verziekt*** ***wordt.***
that the situation increasingly more ugly becomes
'…that the situation is increasingly becoming more ugly.'
(Pijpops et al. 2018: 285)

(22) *dat* *ik door haar* ***vermoeid*** ***ben.***
that I by her tired am
'…that she has been tiring me out.'
(Pijpops et al. 2018: 285)

(23) *dat* *de situatie door hem* ***verziekt*** ***wordt.***
that the situation by him sickened is
'…that the situation is being screwed up by him.'
(Pijpops et al. 2018: 285)

Pijpops et al. (2018) have shown that this contamination effect even extends, albeit to a lesser degree, to verbal clusters with a different auxiliary. That is, clusters with the perfective auxiliary *hebben* 'to have', such as in (24), also appear to be influenced by the frequency of the main verb in the copular constructions with *worden* and *zijn*, even though there is no exact formal similarity between clusters with *worden* or *zijn* (e.g. *vermoeid ben* 'tired am') on the one hand and clusters with *hebben* (e.g. *vermoeid heb* 'tired have') on the other hand. They explain this as second-degree contamination: instances which do not exhibit formal identity to the contaminating construction can still be affected by contamination if they exhibit some degree of similarity to the instances that were originally affected by the contaminating construction. *Hebben*-clusters are thus assumed to be affected by verbal clusters with *worden* and *zijn* in the green order, which were originally contaminated by copular clusters with *worden* and *zijn*.

(24) *dat* *ik jouw moeder* ***gezien*** ***heb.***
that I your mother seen have
'…that I have seen your mother.'
(Pijpops et al. 2018: 284)

To test whether the copular constructions with *worden* and *zijn* also influence word order in receptive *krijgen*-clusters, we calculated the "adjectiveness" of each past participle in the dataset described in Section 3.2. For this, we followed the operationalization of Pijpops et al. (2018: 287): for each past participle, we calculated how often it was tagged as an adjective in the SoNaR-corpus, divided by the total number of occurrences of that past participle. An angular transformation was applied to this variable. These calculations were performed separately for the Belgian and Netherlandic data.

We added this variable to the two logistic regression models discussed in Section 3.2. The effects of the adjectiveness of the past participle are presented in Table 4, with the red order as the success level.[6] For Belgian Dutch, we find a significant correlation between this variable and the word order in a receptive *krijgen*-cluster: the more often a verb is used in copular constructions with *zijn*

[6] The coefficients and significance levels of the control variables and the variable operationalizing contamination by the resultative *krijgen*-construction are not impacted in any meaningful way.

and *worden*, the greater the likelihood that the green order is used in the receptive *krijgen*-construction. In the model for Netherlandic Dutch, we observe the same trend, but it does not reach significance (p = 0.0583). To verify whether the lack of significance could be due to the smaller size of the Netherlandic Dutch dataset (n = 2,111 vs. n = 4,801 for Belgian Dutch), we performed a bootstrap analysis for the Belgian Dutch dataset with 1,000 bootstrap runs and sampling with replacement. For each run, the dataset was limited to 2,111 attestations (i.e., the size of the Netherlandic Dutch dataset). The adjectiveness variable retained its effect, suggesting that the lack of a significant effect in Netherlandic Dutch is not simply due to dataset size. Thus, in Belgian Dutch (but not in Netherlandic Dutch), we find the same contamination effects for the receptive *krijgen*-construction caused by copular constructions with *worden* and *zijn* as those identified by Pijpops et al. (2018) for clusters with the established auxiliary *hebben* 'to have'.

Variety	Variable	Coefficient (log odds ratio)	P-value
Belgian Dutch	Adjectiveness of past participle	-4.1660	0.0153 *
Netherlandic Dutch	Adjectiveness of past participle	-4.3515	0.0583

Table 4: Results of the logistic regression analyses evaluating contamination effects by copular constructions

3.4 Contamination by infinitival clusters

Clusters with an auxiliary verb and a past participle show variation between the red and green order, but various studies have already pointed out that this variation is much more limited when the auxiliary verb appears as an infinitive (25) or as a *te*-infinitive (26). Such infinitival clusters have, for centuries, shown a strong preference for the green order (cf. Coussé 2008; Bloem et al. 2014, 2017; Delaby & Colleman 2023, 2024). For example, Delaby & Colleman (2025) report that 55.71% of all finite receptive *krijgen*-clusters appear in the green order, whereas this figure increases to 96.03% and 99.41% for receptive *krijgen*-clusters with *krijgen* as an infinitive or *te*-infinitive, respectively.

(25) *Zelfs paarden moeten nu een chip* ***ingeplant*** ***krijgen***
even horses must now a chip implanted get
{al loopt ook dat systeem vertraging op}.
'Even horses must now be implanted with a chip {although that system is also experiencing delays}.'
(SoNaR, periodicals and magazines, dataset Delaby & Colleman in press)

(26) (…) *maar* *het* *is* *wel* *leuk* *om* *is* *u* *toekomst*
but it is PRT fun to once your future
voorspeld ***te*** ***krijgen***
predicted to get
'(…) but it is fun to have your future predicted'
(SoNaR, discussion lists, dataset Delaby & Colleman in press)

The receptive *krijgen*-construction thus has finite clusters that show real variation between the red and green order, and infinitival clusters that almost exclusively occur in the green order. These infinitival clusters could potentially have a contaminating influence on the finite clusters, as some of these finite clusters exhibit exact formal similarity with the infinitival clusters. In Dutch, the infinitive form of a verb is formally identical to the indicative present plural. As a result, an infinitival cluster like *geschonken krijgen* 'gifted get' in (27) could be stored as an unanalyzed chunk in the green order, which could later be recycled to form a receptive cluster with *krijgen* in the indicative present plural, as in (28).

(27) *Ranja* *drinken* *ze* *maar* *thuis* *en* *alcohol*
lemonade drink they only at.home and alcohol
mogen *ze* *niet* ***geschonken*** ***krijgen.***
can they not served get
'They only drink lemonade at home and they are not allowed to be served alcohol.'
(SoNaR, discussion lists, dataset Delaby & Colleman in press)

(28) *«Als* *we* *zo'n* *beeld* ***geschonken*** ***krijgen,*** *gaan* *we*
if we such statue gifted get go we
zeker *niet* *weigeren»* *(…).*
certainly not refuse
'"If we are given such a statue, we will certainly not refuse" (…)'
(SoNaR, newspapers, dataset Delaby & Colleman in press)

In the logistic regression models presented in Section 3.2, a variable FINITENESS OF *KRIJGEN* was already included to account for the fact that (*te*-)infinitives almost exclusively occur in the green order. This variable distinguished between finite forms of *krijgen*, infinitives and *te*-infinitives. To test whether these infinitival clusters indeed contaminate clusters with *krijgen* in the indicative present plural, we re-operationalized this variable and made a distinction between finite clusters with *krijgen* in the indicative present plural and other finite forms of *krijgen*. If our hypothesis is correct, we expect that clusters with a (*te*-)infinitive are most strongly correlated with the green order, clusters with finite forms of *krijgen*,

except for the indicative present plural, are least correlated, and clusters with *krijgen* in the indicative present plural are somewhere in between. We ran the logistic regression models again, including the ADJECTIVENESS variable discussed in Section 3.3, with this re-operationalized variable FINITENESS OF *KRIJGEN*. The results for both models are presented in Table 5.[7] We find that, both in Belgian Dutch and in Netherlandic Dutch, clusters with *krijgen* in the indicative present plural have a significantly higher chance of the green order compared to clusters with other finite forms of *krijgen*. A post-hoc Tukey Multiple Comparison test indicates that the differences between the indicative present plural and the (*te*-)infinitive are significant as well ($p < 0.001$ for both comparisons and in both regression models): clusters with *krijgen* in the indicative present plural are more likely to appear in the green order than clusters with other finite forms of *krijgen*, but this chance is smaller than for (*te*-)infinitive clusters. The results thus align with our hypothesis: it appears that, in both varieties of Dutch, infinitival clusters exert a constructional contamination effect on clusters with *krijgen* in the indicative present plural.[8]

Variety	Variable	Level	Coefficient (log odds ratio)	P-value
Belgian Dutch	Finiteness of *krijgen*	All finite forms except for the indicative present plural	Reference level	Reference level
		Indicative present plural	-0.7986	< 0.001 ***
		Infinitive	-3.1088	< 0.001 ***
		Te-infinitive	-5.0886	< 0.001 ***
Netherlandic Dutch	Finiteness of *krijgen*	All finite forms except for the indicative present plural	Reference level	Reference level
		Indicative present plural	-0.3564	0.004 **
		Infinitive	-3.3885	< 0.001 ***
		Te-infinitive	-5.3001	< 0.001 ***

Table 5: Results of the logistic regression analyses evaluating contamination effects by infinitive clusters

4 Case study II: preposition heading the agent prepositional phrase

As noted in Section 2, the receptive *krijgen*-construction can include a prepositional phrase that encodes the source and agent of the transfer. According

[7] The coefficients and significance levels of the control variables and the variables operationalizing contamination by the resultative *krijgen*-construction and the copular constructions are not impacted in any meaningful way.

[8] See Delaby & Colleman (2025) for a similar contamination effect with the resultative *krijgen*-construction.

to Dutch grammars (e.g. De Schutter & Van Hauwermeiren 1983: 126; Haeseryn et al. 1997: 22.4.2.1; Vandeweghe 2013: 75-76), this agent PP appears with the preposition *van* 'of' (29), just as is the case when *krijgen* is used as a main verb (30). However, other authors have pointed out that the preposition *door* 'by' can also be used to name the agent (31) (Hoekstra 1984: 71; Landsbergen 2009: 79; Broekhuis et al. 2015: 454), which is also the preposition used to express the agent in the regular passive construction (32). According to Landsbergen (2009: 79), this is indicative of the receptive construction being a mixture between transitive constructions with *krijgen* as a main verb and the passive.

(29) *Hij kreeg een eredoctoraat aangeboden* ***van de Universiteit van Bologna.***
he got a honorary.doctorate offered from the university of Bologna
'He was offered an honorary doctorate from the University of Bologna.'
(Vandeweghe 2013: 75)

(30) *Hij kreeg een eredoctoraat* ***van de Universiteit van Bologna.***
he got a honorary.doctorate from the university from Bologna
'He received an honorary doctorate from the University of Bologna.'

(31) *Zij krijgt het boek* ***door de burgemeester*** *aangeboden.*
she gets the book by the mayor presented
'She is presented the book by the mayor.'
(Broekhuis et al. 2015: 454)

(32) *Een eredoctoraat wordt hem aangeboden* ***door de Universiteit van Bologna.***
an honorary.doctorate is him offered by the university of Bologna
'An honorary doctorate is offered to him by the University of Bologna.'

Little is known about the alternation between *van* and *door*. Broekhuis et al. (2015: 454) suggest that there is a preference for *van* when the meaning of the

main verb *krijgen* 'to receive' is still strongly present in the auxiliary *krijgen* of the receptive construction. From a generative perspective, Hoekstra (1984: 71) explains the alternation by stating that a *van*-PP is an argument of *krijgen*, while a *door*-PP would be an argument in a small clause with the past participle.

To get a general picture of the use of both prepositions, we tracked and annotated all instances with an agent PP in the datasets from Delaby & Colleman (2023, in press). The data from Delaby & Colleman (2023) consist of attestations from the Delpher corpus, which contains Netherlandic Dutch newspaper material from three different periods in the 20th century; the dataset from Delaby & Colleman (in press) was already presented in Section 3. Table 6 shows the distribution of *van* and *door* in the four diachronic periods and in both varieties of Dutch. We find that in Netherlandic Dutch, the proportion of *door*-PPs increased from 20% in 1927-1929 to 38.6% in 1994-2011. The calculation of a gamma coefficient shows that there has been a mild, but significant increase in the proportion of *door*-PPs across the four periods (gamma = 0.1882, 95%-CI: [0.0320; 0.3444]). The proportion of *door*-PPs is slightly lower in Belgian Dutch (32.5%): a chi-squared test shows that this difference is significant ($\chi^2 = 5.04$, df = 1, p = 0.0248). These figures demonstrate that the receptive construction, shortly after its emergence around 1900, mostly used agent PPs with *van*, but that the preposition *door* has emerged over the course of the 20th century as an alternative for *van*. This process seems to have been slower in Belgian Dutch, which is not unexpected given the generally more grammatically conservative nature of this variety compared to Netherlandic Dutch.

Period	**Belgian Dutch**			**Netherlandic Dutch**		
	Agent PP with *van*	**Agent PP with *door***	**Total**	**Agent PP with *van***	**Agent PP with *door***	**Total**
1927-1929	[no data]			36 (80.0%)	9 (20.0%)	45 (100%)
1952-1954				49 (63.6%)	28 (36.4%)	77 (100%)
1977-1979				54 (72.0%)	21 (28.0%)	75 (100%)
1994-2011	657 (67.5%)	317 (32.5%)	974 (100%)	297 (61.4%)	187 (38.6%)	484 (100%)

Table 6: Contamination effects found for the receptive construction in Belgian Dutch and Netherlandic Dutch

That the agent PP in the passive construction only occurs with the preposition *door* provides an ideal ground for constructional contamination of the agent PP in the receptive construction. To test this, we will analyze the dataset with agentive PPs from Delaby & Colleman (in press; i.e., the data from the 1994-2011 period in Table 6). For each of the 170 verbs in the dataset, we calculated how often they occur (i) in passive constructions in general and (ii) in passive constructions with an agent *door*-PP (as in (32)) in the newspapers component of the SoNaR-corpus, using the XPath queries which are illustrated for the verb *aanbieden* 'to offer' in (33) and (34), respectively. This resulted in 124,720 passive constructions for the first search, and 15,627 passive constructions with an agent PP for the second search. For each verb, we calculated how many times

it appeared in a passive construction (with an agent PP) and divided this by the frequency of its past participle form in the newspapers component of the SoNaR-corpus. An angular transformation was applied to this variable. These calculations were made separately for the Belgian and Netherlandic data.

(33) //node[@cat and node[@rel = "hd" and @pt = "ww" and @lemma = "worden"] and node[@rel = "vc" and @cat = "ppart" and node[@rel = "hd" and @pt = "ww" and @wvorm = "vd" and @positie = "vrij" and @buiging = "zonder" and @word = ("aangeboden")]]]

(34) //node[@cat and node[@rel = "hd" and @pt = "ww" and @lemma = "worden"] and node[@rel = "vc" and @cat = "ppart" and node[@rel = "hd" and @pt = "ww" and @wvorm = "vd" and @positie = "vrij" and @buiging = "zonder" and @word = ("aangeboden")] and node[@rel = "mod" and @cat = "pp" and node[@rel = "hd" and @pt = "vz" and lower-case(@word) = "door" and lower-case(@lemma) = "door"]]]]

We performed logistic regressions for both potential contamination variables (frequency of a verb in all passive constructions vs. in only those with a *door*-PP) and for both varieties of Dutch, with the preposition *door* as the success level. The results are presented in Table 7. A positive coefficient indicates a greater likelihood of the preposition *door*. In Belgian Dutch, both contamination predictors are significantly correlated with a higher chance for the preposition *door* in an agent PP with receptive *krijgen*. The effect size is somewhat more pronounced with the variable that only takes into account the occurrences of a verb in passive constructions with an agent PP. However, in the models for Netherlandic Dutch, no contamination effects are found. To check if the lack of significance might be caused by the smaller size of the Netherlandic Dutch dataset (n = 484 vs. n = 974 for Belgian Dutch), we conducted a bootstrap analysis for the Belgian Dutch dataset with 1,000 bootstrap runs and sampling with replacement. For each run, the dataset was limited to 484 attestations (i.e., the size of the Netherlandic Dutch dataset). Both contamination variables retained their effect, indicating that the lack of a significant effect in Netherlandic Dutch is not simply due to the size of the dataset. It thus seems that the passive construction contaminates the prepositional encoding of the agent in the receptive *krijgen*-construction, but only in Belgian Dutch.

Variety	Variable	Coefficient (log odds ratio)	P-value
Belgian Dutch	Frequency of V in the passive construction	1.0461	< 0.001 ***
Belgian Dutch	Frequency of V in passive constructions with an agent PP	1.4821	< 0.001 ***
Netherlandic Dutch	Frequency of V in the passive construction	0.3215	0.404
Netherlandic Dutch	Frequency of V in passive constructions with an agent PP	-0.1430	0.786

Table 7: Results of the logistic regression analyses evaluating the effect of constructional contamination on the choice between a *van*-PP or a *door*-PP

5 Discussion

5.1 Multiple sources of contamination

Our results show that different slots of the receptive *krijgen*-construction are contaminated by different constructions. Table 8 and Figure 1 summarize all the effects that were found. We observed that the word order in verbal clusters is contaminated by three different constructions simultaneously. This is, as far as we know, the first case study in which the separate effects of multiple contaminating constructions on different formal alternations within a target construction have been demonstrated, thus further testifying to the ubiquity of the phenomenon: all other case studies focused on the relationship between a single target construction and a single contaminating construction. The only exception is Pijpops & Van de Velde (2016), who identified multiple potentially contaminating constructions for the variation in the Dutch partitive genitive (cf. Section 1), but did not separately test the effect of these different sources of contamination.[9, 10]

[9] Other constructions contaminating the Dutch partitive genitive include the predicative construction (e.g. *Is er iets verkeerd?* 'Is there something wrong?') and color noun constructions (e.g. *veel wit* 'a lot of the color white').

[10] Another investigation worth mentioning in this respect is Bouso (2022a, 2022b), who deals with a quite different kind of horizontal influence, viz. the carrying over of lexical collocations from one construction to the other, but who does identify *several* source constructions as (potentially) impacting a single target construction (viz. the English reaction object construction, as in *She smiled appreciation*) in this way. Thus, this is another instance where the way in which a construction is used (in her case, the new lexical collocations it forms) is influenced by multiple horizontally related constructions.

Target	Contaminating construction	Effect in Belgian Dutch	Effect in Netherlandic Dutch
word order in verbal clusters	resultative construction	promotes green order	promotes red order
	copular constructions with *worden* and *zijn*	promotes green order	[no effect]
	receptive construction: infinitival clusters	promotes green order	promotes green order
preposition heading the agent PP	passive construction	promotes preposition *door*	[no effect]

Table 8: Contamination effects found for the receptive construction in Belgian Dutch and Netherlandic Dutch

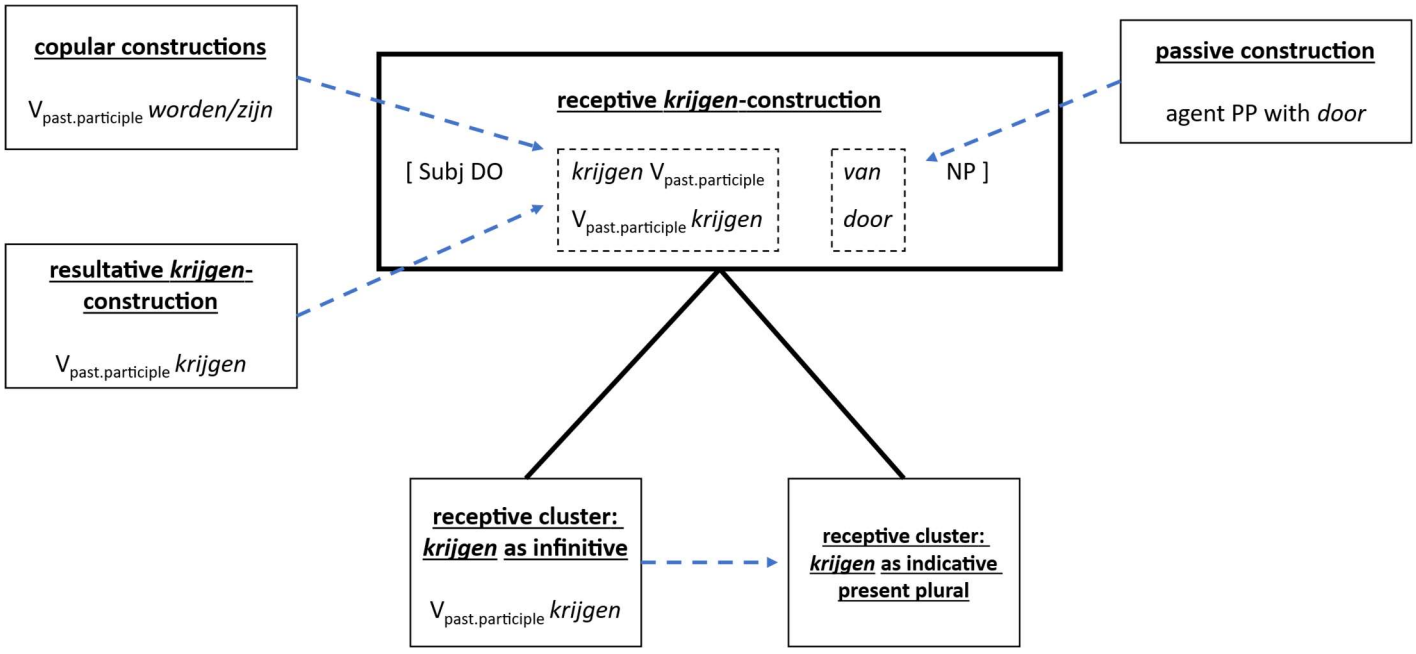

Figure 1: Contamination effects found for the receptive construction in Belgian Dutch and Netherlandic Dutch

Pijpops & Van de Velde (2016: 576) argue that constructional contamination demonstrates that "language as a whole is emergent, and that the constructions it is composed of have a temporary, transient or ephemeral status". In work in diachronic construction grammar, it has already been established that some constructions have emerged from several different source constructions and can thus be considered so-called "multiple source constructions" (Van de Velde et al. 2013). Through the contamination of the receptive *krijgen*-construction, we have demonstrated that constructions may also be synchronically influenced by different constructions at the same time and therefore have *multiple potential*

sources of contamination. Pijpops & Van de Velde (2016: footnote 5) suggest that multiple source constructions might result from synchronous constructional contamination. Our case study shows that this sequence can also work in the opposite direction: the receptive *krijgen*-construction emerged around 1900 from multiple source constructions and is currently being contaminated by at least one of those source constructions, viz. the resultative *krijgen*-construction. An additional parallel between multiple source constructions and constructional contamination is that both phenomena can occur at both the macro- and micro-level. Multiple source constructions can emerge at the macro-level from clearly distinct lineages or at the micro-level from different uses of the same item (Van de Velde et al. 2013: 1-2). Constructional contamination can occur at the macro-level through a construction other than the target construction, as is the case with contamination by the resultative *krijgen*-construction, the copular constructions and the passive construction. It can occur at the micro-level when one cluster of usages of a construction influences another one, as is the case with the receptive infinitive clusters contaminating receptive clusters with *krijgen* in the indicative present plural.

An anonymous reviewer raised the question why we refer to the relation between the receptive *krijgen*-construction and its contaminating constructions in Figure 1 as a "multiple source construction" rather than as a case of "multiple inheritance", as the former is normally used to describe the historical/diachronic relation between constructions while the latter describes a synchronic relation. Indeed, we slightly reinterpret the label of *multiple source constructions* to apply it to the synchronic constructional network. However, the concept of *multiple inheritance* would also have to be extended somewhat in order to capture the contamination in Figure 1: multiple inheritance normally refers to the fact that a particular construct typically is an instantiation of several constructions and thus inherits features from multiple constructions at the same time (e.g., Goldberg 1995: 97-98; Trousdale 2013; Torrent 2015; Hilpert 2019: 63-65; Sommerer 2020; Sommerer & Van de Velde 2025: 228-229). For example, the utterance *I didn't sleep* is an instantiation of both the intransitive verb construction and the negative construction (Croft 2001: 26). In other words, multiple inheritance describes how a construct has several *vertically* linked mother constructions, while the contaminating constructions in Figure 1 are *horizontally* linked to the receptive *krijgen*-construction. The fact that existing CxG terminology needs to be (at least slightly) adapted to describe the multiple contaminating constructions in Figure 1 (e.g. by applying the label *multiple source constructions* to synchronic data or by extending the concept of *multiple inheritance* to horizontal relations), is reflective of the fact that horizontal links have only recently received more attention in construction grammar. We have opted for the label *multiple source constructions* here because we wanted to emphasize that the relation between a construction and its source constructions is not necessarily only historical in nature, but can persist after a construction has emerged from its source constructions, for instance in the form of constructional contamination.

5.2 The role of horizontal links in constructional contamination

We note two points where the different contaminating constructions do not appear to influence the target construction in identical ways and which we will discuss in this and the following subsection. First, we observe that the mechanism proposed by Pijpops & Van de Velde (2016) for constructional

contamination does not seem equally applicable to all of the contamination cases documented above. According to Pijpops & Van de Velde, strings produced in the contaminating construction are stored as unanalyzed chunks, which can later be recycled in the target construction. This explanation seems plausible for several of the case studies from earlier research (Pijpops & Van de Velde 2016; Pijpops et al. 2018; Hilpert & Flach 2022) as well as for the contamination by the resultative *krijgen*-construction and by the receptive infinitive clusters we found in the present study: chunks in the green order with the structure [past participle + *krijgen*] may be strongly entrenched due to their frequent occurrence and later reused in the receptive construction.

However, for contamination by the resultative construction, Delaby & Colleman (in press) found that a variable operationalizing how often a verb appears in a green resultative cluster models contamination effects less well than a variable operationalizing how often a verb occurs in the resultative construction overall, i.e., not only in contexts where there is formal similarity with the target construction (i.c., a green cluster) and where a stored chunk could thus have been re-used. Moreover, Delaby & Colleman identified a reverse effect for contamination by the resultative construction in Netherlandic Dutch: for verbs frequently used in the resultative construction, the green order, which is typical of that construction, is *avoided* in the receptive construction. This suggests that contamination in this case likely does not occur through chunking related processes, as choosing the variant for which no chunk is formed undermines the advantage of recycling ready-made chunks, viz. processing efficiency (Delaby & Colleman in press: Section 5.3.2). If we turn to contamination by the copular constructions with *worden* and *zijn*, we observe that no strings are formed that could be stored as chunks and later recycled in the receptive *krijgen*-construction. Chunks such as *bezorgd worden* 'becoming delivered' or *bezorgd zijn* 'being delivered' do not show an exact formal resemblance to *bezorgd krijgen* 'getting delivered' – they only share the more abstract pattern [$V_{past.participle}$ + V_{finite}].

Likewise, the contamination of the preposition heading the agent PP by the passive construction seems unlikely to involve the recycling of unanalyzed chunks. There is considerable variation in the complement of the preposition *door*, as illustrated in (35)-(37) with passive sentences containing the verb *betalen* 'to pay' from the dataset presented in Section 4. Chunks such as *betaald door de dader* 'paid by the perpetrator', *betaald door de vzw Liebaert Projects* 'paid by the non-profit Liebaert Projects', or *betaald door de gemeente* 'paid by the municipality' can be stored, but the likelihood that someone producing an agent PP in the receptive *krijgen*-construction would do so with exactly the same agent is minimal. In other words, such a chunk would have only a small chance of being recycled. Is it then possible that language users store chunks such as *betaald door* 'paid by' (i.e., without the complement of *door*)? While *betaald* and *door* belong to different constituents, the chunks involved in constructional contamination are assumed to be stored in an unanalyzed format and may potentially be formed across constituent borders (Pijpops & Van de Velde 2016). In the dataset of passive sentences, we observe that in 7,010 out of 15,627 attestations (= 44.86%) the past participle and *door* occur adjacently to each other, so such chunks could theoretically be stored and recycled in the receptive construction. However, if we run the logistic regression analysis again and now only include the receptive sentences in which the participle and the preposition of the agent PP do *not* occur adjacently as in (38) (n = 660 for Belgian Dutch), there still is a significant effect of the frequency of a verb in the passive

construction in Belgian Dutch (log odds ratio = 0.8105, p = 0.014). As we still find a contamination effect in a dataset with instances in which no chunk such as *betaald door* could have been recycled, it seems like chunking can not (fully) explain the contamination effect.

(35) *In de grote meerderheid van deze gevallen wordt de*
in the vast majority of these cases is the
minnelijke schikking ***door de dader*** *ook effectief*
amicable settelment by the perpetrator too actually
betaald.
paid
'In the vast majority of these cases, the amicable settlement is actually paid by the perpetrator.'

(36) *Alles wordt* ***door de vzw Liebaert Projects***
everything is by the non-profit Liebaert Projects
met eigen middelen betaald.
with own resources paid
'Everything is paid by the non-profit organisation Liebaert Projects with its own resources.'

(37) *Er zijn niet alleen de kosten van het vervoer*
there are not only the costs of the transport
zelf, ook de begeleidsters moeten ***door de***
itself also the escorts must by the
gemeente *worden betaald.*
municipality be paid
'There are not only the costs of the transport itself, the escorts also have to be paid by the municipality.'

(38) *{Er zijn goed gedocumenteerde gevallen van mensen}*
die ***door*** *hun* *therapeut* *zeer* *gedetailleerde*
who by their therapist very detailled
herinneringen *kregen* ***aangepraat*** *(…)*
memories got talk.into
'{There are well-documented cases of people} who are talked into very detailed memories by their therapists (…)'

Delaby & Colleman (in press: Section 5.1) suggest that for some cases of contamination, the recycling of chunks might play a less crucial role and that the activation of a horizontal link is what causes the contamination: when a language user produces a receptive *krijgen*-cluster with a verb that is frequent in the resultative construction, this may activate the horizontal link between both constructions more strongly and hence make it more likely that the language user chooses the word order which is typical for the resultative construction.[11] An explanation based on horizontal links seems more plausible than one based on chunking-related processes in at least two cases. First, as suggested by Delaby & Colleman (in press: Section 5.1), in instances where the contaminating construction does produce chunks that could theoretically be recycled in the target construction, but where such potentially contaminating cases occur too infrequently in contexts that are ambiguous between the two constructions. As we briefly mentioned in Section 3.2, Pijpops & Van de Velde (2016) demonstrate that unanalyzed chunks that originally appeared in ambiguous contexts might be more easily recycled in a target construction. For both *krijgen*-constructions, the number of ambiguous clusters seems rather limited (Delaby & Colleman in press: Section 5.1). Second, there are pairs of constructions where the formal similarity exists only at a more abstract level, meaning that no lexically filled chunks are available for recycling in the target construction, as discussed earlier for the copular constructions with *worden* and *zijn*, as well as for the passive construction. The case studies discussed in the present contribution therefore provide additional evidence for the possibility of a more direct role of horizontal links in constructional contamination.

Note that we do not wish to claim that the process of storing and recycling chunks as described by Pijpops & Van de Velde (2016) is *not* what causes constructional contamination. We believe that both chunking-related mechanisms and the activation of horizontal links can play a role in contamination, with some cases susceptible to both mechanisms at the same time and others only to one of them. For example, in the regression analysis for the dataset with receptive instances where the past participle and the preposition of the agent PP do not occur adjacently (Section 4), we found a slightly lower effect

[11] Note that Pijpops et al. (2018) already acknowledged that constructional contamination can happen even in cases where there is no exact formal similarity between contaminating and target construction, by introducing the concept of second-degree contamination (cf. Section 3.3). Our proposal differs in that we assume that contamination can be caused directly by horizontal links, while the concept of second-degree contamination is dependent on first-degree contamination (Pijpops et al. 2018: 275) and thus assumes that chunking-based contamination needs to occur *before* its effect can extend to contexts which are only similar on a more schematic level.

size (log odds ratio = 0.8105 vs. 1.0461 in the full dataset) and a higher p-value ($p = 0.014$ vs. $p < 0.001$ in the full dataset) compared to the regression analysis for the full dataset. That could be an artifact due to the smaller dataset size, but it is also possible that we found a larger effect in the full dataset because chunking-related processes contribute to the contamination effects in that dataset, but not in the limited dataset. To test whether this is merely due to the smaller dataset size, we reconducted the regression analysis for the full Belgian Dutch dataset, now including a variable that encodes whether the past participle and the preposition of the agent PP occur adjacently, as well as its interaction with the contamination variable. The results in Table 9 show that the likelihood of an agent *door*-PP is indeed significantly lower if the participle and the agent PP do not occur adjacently (log odds ratio = -0.7523). This supports the hypothesis that contamination effects can be triggered by both horizontal links and the recycling of exemplar chunks.

Variable	**Values**	**Coefficient (log odds ratio)**	**P-value**
Frequency of V in the passive construction	{numerical variable}	1.5987	< 0.001 ***
Past participle and the preposition of the agent PP occur adjacently	yes	Reference level	
	no	-0.7523	0.044 *
Frequency of V in the passive construction X Past participle and the preposition of the agent PP occur adjacently	{numerical variable} X no	-0.7881	0.159

Table 9: Results of the logistic regression analysis evaluating the effect of constructional contamination on the choice between a *van*-PP or a *door*-PP, including a variable that encodes whether the past participle and the agent PP occur adjacently

5.3 Constructional contamination and national variation

The case studies discussed in this article further demonstrate that the effects of constructional contamination can differ between the two national varieties of European Dutch. Unlike in Belgian Dutch, no contamination effects from the passive construction or the copular constructions are found in Netherlandic Dutch.[12] Notably, these are the two cases where there is no exact formal similarity between the contaminating construction and the target construction, as discussed earlier. We do find contamination effects in Netherlandic Dutch from the resultative *krijgen*-construction and the receptive infinitive clusters, i.e. in cases where there *is* exact formal similarity between contaminating and target construction chunks.

[12] It is not necessarily the case that these constructions do not cause constructional contamination at all in Netherlandic Dutch. It is also possible that the contaminating effects of these constructions are simply smaller than in Belgian Dutch and therefore not detected in the regression analyses – cf. the effect of the copular constructions in Netherlandic Dutch, which is only slightly above the significance threshold ($p = 0.0583$).

This could potentially be linked to the differences in grammatical organization between Belgian Dutch and Netherlandic Dutch. For Netherlandic Dutch, it is assumed that a normal and spontaneous standardization process occurred. However, the standardization process of Belgian Dutch is often described as delayed or unfinished (Geeraerts & Van de Velde 2013), partly due to the prominent role that French historically played in Flanders. This is also linked to the grammatically more conservative nature of Belgian Dutch, which is often slower to adopt grammatical changes, as reflected by the lower frequencies of the red order (Section 3.2) and of *door*-PPs (Section 4) in Belgian Dutch. According to Grondelaers et al. (2008), this delayed standardization has led to the grammar of Belgian Dutch being more "rule-based", whereas the grammar of Netherlandic Dutch is more "exemplar-based". The underlying idea is that many grammatical alternations in Netherlandic Dutch were originally determined by cognitive-functional factors. These factors caused certain lexemes to occur more frequently in one variant than the other, though, the progress of standardization eventually leading to these preferences being lexicalized and stored as exemplars. Over time, these lexical preferences became increasingly stronger and started playing a greater role than the cognitive-functional factors that initially drove the alternation. Belgian Dutch lags behind in this process due to its delayed standardization, which is why cognitive-functional factors still play a larger role in this variety compared to Netherlandic Dutch. In line with this hypothesis, various case studies have found that grammatical variation is more easily modeled in Netherlandic Dutch and that cognitive-functional factors have greater explanatory value in Belgian Dutch (e.g., Grondelaers et al. 2008; Speelman & Geeraerts 2009; Pijpops 2019, 2021; De Troij 2023; Delaby & Colleman 2024).

Such case studies have focused on the "construction-internal" mechanisms regulating the alternation, but the different grammatical organization of Belgian Dutch and Netherlandic Dutch may also influence constructional contamination. First, due to the exemplar-based nature of Netherlandic Dutch, language users might be more prone to recycle unanalyzed chunks with exact formal similarity between both constructions and less prone to make analogical extensions based on more schematic similarities. Second, we expect that the links between the potentially contaminating construction and the target construction are organized differently in both varieties of Dutch. If we translate the theory of Grondelaers et al. (2008) into a construction grammar framework, it would seem to imply that lower-level, lexically filled constructions are more strongly entrenched and play a more prominent role in the grammatical network in Netherlandic Dutch, while higher-level, schematic constructions are more strongly entrenched in Belgian Dutch, as these "mother" constructions are often assumed to store rule-based generalizations that are inherited by "daughter" constructions.[13] If both varieties of Dutch indeed differ with regard to which type of constructions (lower-level and lexically filled vs. higher-level and schematic) are most strongly entrenched, this would entail that the strongest horizontal links will also form at different levels. That is, in Netherlandic Dutch, we expect the strongest horizontal links between lower-level, lexically filled constructions, while in Belgian Dutch, the horizontal links between the most schematic constructions

[13] Note that some usage-based construction grammar theories assume that information is not per se inherited by daughter constructions from mother constructions, but rather redundantly stored in all nodes in the network (Smirnova & Sommerer 2020: 22).

will be relatively stronger. This would, again, constrain constructional contamination to constructions with higher degrees of formal similarity in Netherlandic Dutch. In Belgian Dutch, on the other hand, strongly entrenched horizontal links can be activated based on schematic formal similarities.

In Colleman & Noël (2025), it is pointed out that, while there is a growing body of construction grammatical research on differences between lects in the formal and semantic properties of individual grammatical constructions (i.e., of network nodes), far less attention has been devoted to lectal differences in the kinds of links structuring the grammatical network and their effects. In illustrating partially different contamination effects between constructions in Belgian vs. Netherlandic Dutch and relating these to hypothesized differences in the relative strength of links at different levels of schematicity, the present investigation offers a glimpse of what such subtler differences in constructional network organisation could consist in.

Finally, we return to the unexpected direction of the contamination effect in receptive *krijgen*-clusters by the resultative construction (Section 3.2). In Delaby & Colleman (in press), we suggested that the horizontal link between the two *krijgen*-constructions has become weaker in Netherlandic Dutch because receptive *krijgen* is evolving into a full-fledged auxiliary verb (Delaby & Colleman 2023), unlike resultative *krijgen*, and that Belgian Dutch lags behind in this process. Grondelaers et al. (2008) suggest that, as a result of the process described above, there is also greater functional specialization between alternating constructions in Netherlandic Dutch: in the case of word order in participle clusters, this could mean that Netherlandic Dutch (and later Belgian Dutch) is evolving towards a state where the red order is used exclusively for verbal clusters and the green order for adjectival clusters (Delaby & Colleman 2024: 63). The fact that speakers of Netherlandic Dutch increasingly perceive both constructions as distinct could lead to a disambiguating reflex when forming a receptive *krijgen*-cluster with a verb that is also frequently used in the resultative *krijgen*-construction. Diessel (2023: 59-60) argues that horizontal links can be situated on a continuum between two related concepts of gestalt perception, viz. similarity and contrast. These concepts entail each other: two constructions can only be perceived as similar, if they are distinct constructions and thus also exhibit contrast. Conversely, contrast between two constructions is notable because the constructions are otherwise similar. Perhaps ambiguity avoidance becomes more important when the degree of contrast outweighs the degree of similarity. Specifically, the high degree of string resemblance (similarity) between receptive and resultative clusters triggers the activation of a horizontal link, but in Netherlandic Dutch, this link is relatively more strongly determined by the contrast between the two constructions (due to the stronger degree of auxiliarization of receptive *krijgen* in Netherlandic Dutch compared to Belgian Dutch), which may encourage speakers to choose the word order that is unusual in the resultative construction when forming a receptive cluster.

6 Conclusion

In this article, we have shown that the receptive *krijgen*-construction is contaminated by multiple constructions, impacting at least two different slots of the construction, but that these contamination effects are subject to national variation. Our results suggested that a higher degree of formal similarity is needed to trigger constructional contamination in Netherlandic Dutch, while in

Belgian Dutch, contamination also takes place when the formal similarity is only present at a more schematic level. We hypothesize that this can be explained as a consequence of the different grammatical organization of Belgian Dutch and Netherlandic Dutch. The former experienced a delayed standardization, while this is not the case for Netherlandic Dutch, which evolved to a more exemplar-based grammar compared to Belgian Dutch (Grondelaers et al. 2008). We have argued that this does not only affect how alternations *within constructions* are organized, but also which horizontal links these constructions form with other constructions in the network. More specifically, we expect stronger horizontal links between lower-level, lexically filled constructions in Netherlandic Dutch, as opposed to Belgian Dutch, where we expect the strongest horizontal links to hold between higher-level, schematic constructions. Finally, we have shown that in two of the four described cases of contamination, it seems unlikely that the contaminating effect is (solely) due to the storage of exemplar chunks that can be recycled in the target construction. This is additional evidence for a more direct role for the activation of horizontal links in constructional contamination.

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Conflict of interest statement

The authors declare none.

Data availability statement

The dataset generated and analysed during the current study is available in the Zenodo repository: https://doi.org/10.5281/zenodo.16738802.

License

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