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Where does lexical diversity come from? Horizontal interaction in the network of the Late Modern English Reaction Object Construction

This paper provides further insight into the Reaction Object Construction (*she nodded intelligence*) as a case of constructional contamination, a phenomenon that describes the relation between two or more constructions such that usage frequencies of one construction influence the patterns of variation in another one (Pijpops and Van de Velde 2016). Earlier research has shown that the frequencies of structures of the type *she gave a nod of intelligence* explain part of the lexical diversity that is found in the object slot of the nineteenth-century British ROC. These findings are now contrasted with American data to explore whether the phenomenon has gone beyond British English and, if so, examine how it is manifested in diachrony. The results show clear similarities with the British data, confirming that horizontal interaction in the network of the Late Modern English ROC played a role in the diverse configuration of this construction.

Keywords: ROC; lexical diversity; constructional contamination; horizontal interaction; American and British English; Late Modern English; Diachronic Construction Grammar

1 Introduction

Modern examples of the so-called English Reaction Object Construction (ROC) are included in (1) below.[1]

(1) a. Pauline **smiled** her thanks.[2]

b. Tristram **nodded** assent.[3]

[1] Levin, *Verb Classes*, 98.

[2] Ibid.

[3] Bouso, 'Disentangling'.

c. She **mumbled** her adoration.[4]

d. The door **jingled** a welcome.[5]

As shown in (1) a-d, the ROC consists of an intransitive verb of manner of action (*smile, nod, mumble, jingle*)[6] followed by an object that expresses a reaction or an attitude of some kind (*thanks, assent, adoration, welcome*). The result of this verb-noun (V-N) combination is a transitivising, valency-increasing construction whose overall meaning is "to express, communicate, signal a reaction or an emotion by V-*ing*", as in "Pauline expressed her thanks by smiling", "She communicated her adoration by mumbling, and "The door signalled a welcome by jingling" in (1a), (1c) and (1d), respectively.[7]

In earlier research, it has been shown that the history of the ROC is strikingly similar to that of other transitivising constructions and, most particularly, to that of the well-known *way*-construction, as in *She giggled her way up the stairs*.[8] Both constructions find their origins around the Early Modern English (EModE) period, which is when they undergo "constructionalisation",[9] and both become grammatically stable in British English by the early nineteenth century. In the case of the ROC, the frequent attestation in British sentimental novels of highly idiosyncratic and emotional examples

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[4] Levin, *Verb Classes*, 98.

[5] Martínez Vázquez, 'Reaction Object Constructions'.

[6] Zwicky, 'Manner of Speaking'; and Mufwene, 'Manner-of-Speaking Verbs'.

[7] Bouso, *Argument Structure*.

[8] Ibid; Goldberg, *Construction Grammar*; Israel, '*Way* Constructions'; Fanego '*Way* construction'; Perek, '*Way*-Construction'; and Idem, 'Constructional Change'; among many others.

[9] Traugott and Trousdale, *Constructionalisation*.

like the one included here in (2) suggests a link between its nineteenth-century consolidation and this particular novel sub-type, that is, the British sentimental novel, which precisely flourishes in the middle of the eighteenth century.[10]

(2) The Moor, hereat, **smiled** celestial Sweetness, and Joy beamed from his Eyes and throughout his dimpling Aspect.

(CLMET3.0 1765-70, Henry Brooke; *The Fool of Quality*)

This potential link was tested on the basis of *The British Sentimental Novel Corpus* (BSNC) and the American section of De Smet's *Corpus of English Novels* (CEN), the first of which contains more than 21 million words written by eleven canonical British authors.[11] The results obtained there confirm this tight connection between the ROC and this particular novel sub-type: the ROC is much more frequent and, quite crucially, much more diverse in terms of Reaction Object (RO) types or hapaxes (one-token occurrences) in the middle of the nineteenth century rather than, for instance, in the first two decades of the twentieth-century American novel. On another level, in Bouso and Ruano San Segundo,[12] it is also shown that the Direct Discourse Construction (DDC) as in (3), cannot be treated as the *single source construction* of the ROC, among other reasons because the DDC and the ROC show a very low degree of collocational overlap, with only a few perfect matches being attested in the data; see, for instance, (4b), where the RO *his delight* stands for the projected discourse represented in the DDC in (4a).

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[10] Carter and McRae, *English Literature*, 78; and Rowland, 'Sentimental Fiction'.

[11] Bouso and Ruano San Segundo, 'Turn of the Screw'; Idem, 'ROC-DDC alternation'; Ruano San Segundo and Bouso, *British Sentimental Novel Corpus*; and De Smet, 'English Novels'.

[12] 'Turn of the Screw'; and Idem, 'ROC-DDC alternation'.

(3) The My father **nodded**: "I approve."

(BSNC 1870-1, Meredith; *The Adventures of Harry Richmond*)

(4) a. "Oh!" **smiled** Carker, with humility….

(BSNC 1846-8, Dickens; *Dombey and Son*)

b. The landlord **smiled** his delight.

(BSNC 1836-7, Dickens; *The Pickwick Papers*)

More recently, Bouso explores *other potential sources* of the ROC, namely the syntactic patterns exemplified in (5), referred to there as the Complex VP with PP construction (VPPP), the Complex NP with PP construction (NPPP), and the Complex NP with Participle construction (NPP), respectively.[13]

(5) a. Mrs. Loveday **nodded** with satisfaction.

(BSNC 1880, Hardy; *The Trumpet Major*)

b. Christie gave a sagacious **nod** of intelligence ….

(BSNC 1820, W. Scott; *The Monastery*)

c. [H]e looked with **smiling** interest ….

(BSNC 1836-7, Dickens; *Pickwick Papers*)

The hypothesis that is put forward is that these patterns could have played some role on the diverse configuration of the object slot of the nineteenth-century British ROC. The mechanism of change at work would have been the one known as "constructional contamination",[14] a phenomenon that describes the relation between two *or more*

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[13] 'Contamination'.

[14] Pijpops and Van de Velde, 'Constructional Contamination'; and Pijpops, De Smet and Van de Velde, 'Four Case Studies'.

constructions that potentially alternate and where the usage frequencies of one construction influence the patterns of variation in another one.[15]

This hypothesis is confirmed by showing that the syntactic patterns exemplified in (5) show a considerably high degree of collocational overlap with the ROC, and that some of the collocates of the ROC, like, for instance, the verb-noun combinations in (6) (*nod satisfaction*, etc.), are clearly much more frequent and much more strongly associated to these other patterns than to the ROC itself.[16]

(6) a. The old lady **nodded** [her] satisfaction ….

(BSNC 1836-7, Dickens; *Pickwick Papers*)

b. Jobling **nods** intelligence ….

(BSNC 1852-3, Dickens; *Bleak House*)

c. Better declare at once 'Paul Carl Emanuel —je te déteste, mon garçon!'— than **smile** an interest, look an affection, and be false and cold at heart.

(BSNC 1853, Brontë; *Vilette*)

The present paper provides further insight into the ROC as a new case of constructional contamination in English syntax. The data analysed in Bouso is only based on nineteenth-century British English novels,[17] and we know from previous research that the ROC was also relatively frequent in American novels and other American text types of the nineteenth and twentieth centuries.[18] Thus, to explore the strength and scope of the

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[15] Hilpert and Flach, 'Constructional Contamination'.

[16] Bouso, 'Contamination'.

[17] Ibid. For ease of exposition, I also report on these findings in Section 6.

[18] Bouso and Ruano San Segundo, 'Turn of the Screw'; and Bouso, *Argument Structure*.

effect of constructional contamination, it would also be necessary to go beyond British English, and more specifically, beyond British sentimental novels, to see whether the phenomenon is not just simply the result of a genre effect. Another important and crucial aspect that is missing from Bouso's study is to show which specific collocates (verb-noun combinations) found in the ROC are attested earlier in other patterns and are also significantly associated with them, i.e. the ones in (5): the Complex VP with PP, the Complex NP with PP construction, and the Complex NP with Participle constructions.[19]

In this light, the aim of the present paper is twofold: on the one hand, to test whether the results obtained for British English also apply to American English and, on the other, to examine how the effect of constructional contamination is manifested in the diachrony of the ROC. More specifically, the research questions that will be addressed in this paper are the following:

RQ1: Are the potentially contaminating constructions identified in British English also attested in American English? If so,

RQ2: How do they interact with the ROC? Is there any evidence, in the form of shared collocations, for constructional contamination effects in the data? That being the case,
RQ3: a) How is the effect of constructional contamination manifested in the diachrony of the ROC? b) More specifically, is it possible to identify some of the historical source(s) of the lexical diversity attested in the object slot of the Modern ROC?

Despite being a lower-frequency phenomenon in American English than in British English, it is assumed that the American ROC will also show some degree of collocational

[19] 'Contamination'.

overlap with the potentially contaminating constructions previously identified and that, looking at the phenomenon from a diachronic perspective can also bring interesting insights into the extent to which these superficially similar patterns explain the lexical diversity attested in the ROC.

2 Theoretical framework: (Diachronic) Construction Grammar

The framework that will be adopted is that of (Diachronic) Construction Grammar, as developed by Lakoff, Goldberg, Traugott and Trousdale, and Hilpert, among many others.[20] Construction Grammar is defined as a theory of linguistic knowledge that claims that the totality of our knowledge of a language consists of a large network of constructions "*and nothing else in addition*".[21]

From this definition one can easily infer some of the main tenets that guide this approach to linguistic knowledge. One of these is that our knowledge of a language consists of constructions, or mentally stored form-meaning pairings at varying levels of complexity and abstraction, from morphemes (*-s*), words (*cat*) and idioms (*going great guns*) to larger phrasal units (Subj V Obj_1 Obj_2). A second one, and closely related to the tenet just mentioned, is the principle that claims that speakers make generalisations on the basis of the surface structure of the utterances they hear. This means that patterns of the type in (7) are treated as part of a more general construction known as Caused Motion Construction, even if the verb *cough* does not convey itself a motion meaning. By

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[20] *Lakoff, Women, Fire, and Dangerous Things*; Goldberg, *Construction Grammar*; Idem, Constructions at Work; Idem, *Explain Me This*; Traugott and Trousdale, *Constructionalisation*; Hilpert, *Constructional Change*; and Idem, *Construction Grammar*.

[21] Hilpert, *Construction Grammar*, 2 (emphasis in the original).

contrast, structures like the one in (8), although traditionally analysed as a prototypical example of alternation, are not taken, in principle, as a manifestation of the same phenomenon within this framework.[22]

(7) I actually had a moth go up my nose once. I **coughed** it out of my mouth.

(8) a. Mina **sent** *Mel* a book.

b. Mina **sent** a book *to Mel*.[23]

One last tenet that can be inferred from the definition and that should be explicitly mentioned here for the purposes of this article is that constructions are claimed to be organised in a network, with many different links between and among these constructions. These links can be of various types: (i) instance links, where one construction is a special case of another more general one, (ii) polysemy links, which link constructions with related meanings, (iii) metaphorical links that connect the basic sense of a construction with its extended sense and, finally, (iv) subpart links.[24]

As will be shown in Section 4, this last type of link is of particular relevance for the phenomenon of constructional contamination, mostly because it relates constructions "that show either formal or semantic overlap, but which do not allow the classification of one construction as an instance of the other". Contrary to the other types of relations just mentioned, subpart links are treated in the literature as horizontal links that "connect constructions that occupy the same level of abstraction". Subpart links therefore relate to

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[22] But see Perek, 'Alternation-Based Generalizations'; Pijpops, 'Six Answers'; and Cappelle et al., 'Interview'; among others.

[23] Goldberg, 'Constructionist Approaches', 20; and Diessel, *Grammar Network*.

[24] Goldberg, *Construction Grammar*, 78.

the phenomenon of multiple inheritance "which describes the way that one construction may instantiate several successively more constructions at the same time".[25] Hybrid structures of this kind are rampant in language, and they have been shown to be normally fed by more than one source, that is, from a historical perspective they qualify as "multiple source constructions".[26] For instance, the modern *way*-construction, defined by Goldberg as a "conventionalized amalgam of two constructions" has its origins in: (i) an intransitive motion construction (involving verbs with *way* functioning as an adverbial), and (ii) a creation construction (consisting of *way* as the object of a transitive verb denoting creation or acquisition of a path).[27] Importantly, the idea that subpart links relate to multiple source constructions has also been noticed by the coiners of the concept of constructional contamination,

> [F]eatures may travel horizontally from one construction to the next, on the basis of superficial formal and semantic resemblance (…), forming *the basis of multiple source constructions in diachrony* (...).[28]

3 Characteristic features of the Reaction Object Construction

Modern examples of the ROC were given in the introduction. They exemplify the three main categories of ROs identified by Martínez Vázquez in her various articles on the topic. These are: (i) delocutives, which derive from locutions or "independent utterances

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[25] Hilpert, *Construction Grammar*, 62-3.

[26] De Smet, Van de Velde and Ghesquière, 'Multiple Source Constructions'.

[27] Goldberg, *Construction Grammar*, 128; Traugott and Trousdale, *Constructionalisation*, 89; and De Smet, Hendrik, Ghesquière, and Van de Velde, 'Multiple Source Constructions'.

[28] Pijpops and Van de Velde, 'Constructional Contamination', 576 (emphasis mine).

associated with specific conventional situations" such as *thanks* or *welcome* (1a, d), (ii) deverbal illocutionary nouns, which derive from speech act verbs like *assent* (1b), and, finally, (iii) attitudinal or predicative expressive nouns such as *adoration* (1c).[29]

As argued elsewhere,[30] the examples in (1) also serve to qualify the ROC as a form-meaning pairing in the traditional Goldbergian sense:

> C is a CONSTRUCTION iff$_{def}$ C is a form-meaning pairing <F_i, S_i,> such that some aspect of F_i or some aspect of S_i is not strictly predictable from C's component parts or from other previously established constructions.[31]

Modern ROCs have unusual syntax, and they also lack compositionality as the verbs involved in the construction are originally intransitive manner of action verbs that do not have a communicative or expressive meaning as their core sense. As for the function of the ROC, it has been argued that the ROC can be treated as "one more option to project someone else's verbal or mental discourse".[32] To support this idea, the authors rely on Leech and Short's model of discourse presentation constructions which distinguishes five different categories, depending on the degree of interference of the narrator. These five categories are included in Table 1.

[Table 1]

Within this model, the ROC fits best into the category named as Narrative Report of Speech / Thought Acts. This is so as the narrator in the ROC does not provide the

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[29] Martínez Vázquez, 'Reaction Object Constructions', 153; Idem, 'English and Spanish'; and Idem, 'Nominalised Expressive Acts'; among others.

[30] Bouso, 'The Growth'; and Idem, *Argument Structure*; among others.

[31] Goldberg, *Construction Grammar*, 4.

[32] Bouso and Ruano San Segundo, 'Turn of the Screw', 212.

verbatim words or thoughts of a character, as happens in cases of DS/T and FDS/T, nor includes a reference to a reported clause, as in typical examples of IS/T and FIS/T. Instead, in the ROC there is a minimal account of the discourse that is reported. As argued by Bouso and Ruano San Segundo the main difference between a ROC (see example 9) and a prototypical NRS/TA (see example 10) is that the ROC always conveys the illocutionary force of the speaker's utterance through a RO, which makes the ROC closer to the original act of communication that is being reported.[33]

(9) He **shouted** his excitement to come back. (my own example)

(10) He looked straight at her and **told** her about his imminent return. She was pleased.[34]

4 The phenomenon of constructional contamination

As mentioned in Section 2, horizontal links connect constructions that "show partial similarities in their respective forms and meanings".[35] Pijpops and Van de Velde were the first to claim and show that links of this kind may influence speakers' preferences in contexts where "they have a choice between two constructional variants".[36] They refer to this type of horizontal interaction as constructional contamination and they define it as follows,

> Constructional contamination is the effect whereby a subset of instances of a target construction is (stochastically) affected in its realization by a contaminating construction,

[33] 'Turn of the Screw', 212-3.

[34] Semino and Short, *Corpus Stylistics*, 10.

[35] Hilpert, *Construction Grammar*, 63.

[36] Pijpops and Van de Velde 'Constructional Contamination'; and Hilpert, *Construction Grammar*, 65.

> because of a coincidental resemblance between the *superficial* strings of instances of the target construction and a number of instances of the contaminating construction.[37]

The authors demonstrate the effect with a number of case studies from Dutch morphology and syntax.[38] For instance, in their 2016 paper, Pijpops and Van de Velde show that the variation that the Dutch partitive construction exhibits, as for the presence or absence of the inflectional suffix (*-s* in, for instance, *verkeerd(s)* in 12), is due to the frequent exposure of a fixed construction that is superficially similar to the Dutch partitive (see 11). In other words, the high frequency of strings such as *its verkeerd* in (11) yields a bias towards the bare variant of the Dutch partitive construction (see 12).

(11) Contaminating construction: construction with adverb

dat	*iets*	*verkeerd*	geïnterpreteerd	wordt?
that	[something]$_{NP}$	[wrongly]$_{AdvP}$	interpreted	gets

'...that something gets wrongly interpreted?'

(12) Target construction: partitive genitive

in	begin	van	de	week	*iets*	*verkeerd(s)*	gegeten
[in	beginning of	the	week]$_{PP}$		[something wrong]$_{NP}$		eaten

'I ate something wrong at the start of the week.'

Hilpert and Flach provide a similar case of constructional contamination for English syntax.[39] They show that the placement of the adverb in the English passive is

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[37] Pijpops and Van de Velde, 'Constructional Contamination', 543-4 (emphasis mine).

[38] Pijpops and Van de Velde, 'Constructional Contamination'; and Pijpops, De Smet and Van de Velde, 'Four Case Studies'.

[39] Hilpert and Flach, 'Constructional Contamination'.

influenced by the relatively high frequency of a fixed sequence of an adverb and a participle functioning as a complex modifier of a noun. For instance, for the examples in (13), the complex noun phrase *sexually transmitted disease* yields a bias towards the form of the passive represented in (13a) where the adverb is placed right before the participle.

(13) a. The disease was *sexually* transmitted.

b. The disease was transmitted *sexually*.

Finally, in line with the ideas presented in their first study of the phenomenon, Pijpops, De Smet and Van de Velde also argue in their 2018 paper that, for constructional contamination to take place, two conditions need to be met. First, there must be a target construction displaying some form of formal alternation (e.g. the placement of the adverb in the English passive), and second, there must be a variant, or a set of variants, that are related to the target construction formally and semantically (for the English passive represented in 13, the variant is the complex noun phrase *sexually transmitted disease*).[40]

In the present study we also have a target construction displaying some formal alternation, i.e. the ROC exhibits a lot of variation in the object slot (see examples in 6),[41] and secondly, we also have a set of variants, potentially contaminating structures, that are related to the ROC formally and semantically; in the examples given in (5), for instance, the first element in the sequence semantically corresponds to the verb in the ROC whereas the second element corresponds to the RO proper. Quite importantly, the ROC and these superficially similar patterns are also interchangeable in most contexts, that is, they

[40] Pijpops, De Smet and Van de Velde, 'Four Case Studies'.

[41] Bouso, 'Contamination', 17.

qualify as alternations.[42] Following Sven Jacobson,[43] this interchangeability is possible because, apart from the formal and semantic similarities just mentioned, the different formal versions of the ROC are also comparable at the functional level. To be more specific, the syntactic patterns exemplified in (5), like the ROC itself, are part of Leech and Short's paradigm of discourse presentation constructions that has been outlined earlier in Table 1, and, quite crucially, they also belong to the same category as the ROC, that of NRT/SA.

Last, it should be noted here that the distinction between the mechanism of change known as "analogisation" and the phenomenon of constructional contamination is not always clear-cut in the literature (see Bouso for some discussion).[44] Following Hilpert, these two notions should be kept apart.[45] The former involves the creation of new constructs. In the words of Traugott and Trousdale, this "is a process of change bringing about matches of meaning and form *that did not exist before*".[46] Constructional contamination, by contrast, is essentially defined in the literature as a frequency effect that yields "lexical biases".[47] In this regard, Bouso adds that "analogisation should not be

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[42] Though not explicitly mentioned in Pijpops and Van de Velde's 2016 definition, a third condition for constructional contamination is that the target construction and its different formal realisations is that they should be interchangeable (see also Hilpert and Flach, 'Constructional Contamination').

[43] Jacobson, 'Syntactic Variation', 23-4; see also Pijpops, 'Six Answers'.

[44] 'Contamination', 21-2.

[45] Hilpert, 'Variable Adverb Placement'.

[46] Traugott and Trousdale, *Constructionalisation*, 38 (emphasis mine).

[47] Pijpops, De Smet and Van de Velde, 'Five Case Studies'; and Pjpops and Van de Velde, 'Constructional Contamination', 546-50.

treated as a *sine qua non* condition for constructional contamination as not all instances of contamination necessarily involve the attestation of *new* instances".[48] Building on this idea, the research questions in the present study approach the phenomenon of constructional contamination from a synchronic and a diachronic perspective, assuming that if constructional contamination has gone beyond the British sentimental novel (RQ2), synchronically, frequency effects should emerge in the American data as well, and diachronically, these frequency effects would be manifested in the emergence of new (novel) verb-noun combinations in the ROC, that is, they would result in analogisation (RQ3).

5 Data and methodology

This article builds on instances of the ROC from earlier work based on the *British Sentimental Novel Corpus* (1798-1880; more than 21 million words; 468 ROCs) and the American section of the *Corpus of English Novels* (1881-1922; around eight million words; 197 ROCs).[49] For the present study, additional data was retrieved from CEN in order to address RQ1, that is, to find out whether potentially contaminating constructions of the type exemplified in (5) are also attested in Late Modern American English (LMod AE).

For comparative purposes, as in previous work based on British English, the software used was *WordSmith 6.0* (e.g. search string the verb *mutter*: *mutter/mutters/muttered /mutter'd/muttering*)[50] and the focus was on the seven most

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[48] 'Contamination', 22 (emphasis in the original).

[49] Bouso, 'Contamination'.

[50] Scott, 'WordSmith'

prototypical verbs of the ROC identified by Bouso via simple collexeme analysis, i.e. the verbs *mutter*, *murmur*, *smile*, *nod*, *whisper*, *shout*, and *wave*.[51] The approach adopted was a bottom-up one, and the data retrieved was manually analysed: for the identification of the potentially contaminating constructions, the second element in the sequence of the tokens gathered, a total of 10,820 tokens (see Table 2, Section 6.2), was classified into one of the three RO types that were mentioned earlier, i.e. delocutives, deverbal illocutionary nouns, and predicative expressive nouns.

Finally, additional data was extracted from the largest diachronic corpus of American English available nowadays (i.e. the online version of the *Corpus of Historical American English*, COHA; 1810s-2000s; 400 million words).[52] The aim of this second corpus-based study was to provide an answer to RQ3, hence it was necessary to come up with a large dataset spreading over several decades of the nineteenth and twentieth centuries. The searches conducted (e.g. search string used: *murmur* acquiescence**) involved 42 verb-noun combinations (from my BSNC and CEN database) common to both: the ROC, and the most fitting candidate for constructional contamination.

Regarding the methodology, the first step taken was to calculate the overall token and type frequencies of the constructions under investigation (RQ1). With the resulting data, the degree of collocational overlap between the ROC and its potentially contaminating constructions was measured (RQ2). Then, after identifying by means of distinctive collexeme analysis the prototypical verb-noun combinations of each

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[51] 'Disentangling'; Gries, 'Coll.analysis 3.5.'; and Stefanowitsch and Gries, 'Collostructions'.

[52] Davies, 'COHA'.

construction,[53] I looked for time-frequency correlations between the ROC and each of the potentially contaminating constructions separately (RQ3a).

To investigate adequately how the phenomenon of constructional contamination is manifested in diachrony (RQ3a/b), the same procedure was repeated but with the new data retrieved from COHA. Moreover, for this new second dataset, several co-varying collexeme analyses were performed on the ROC to find out first whether the American ROC indeed expanded in collocations over the course of the nineteenth and twentieth centuries.[54] Then, Variability-based Neighbor Clustering (VNC) was applied; the aim here was to perform distinctive collexeme analysis with a view of obtaining, for the most relevant stages identified in the VNC, the prototypical verb-noun combinations of the ROC, and of its stronger competitor.[55] The key aspect was to keep track of the changes in collocations of the ROC, and to identify the origins of those changes.

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[53] Gries and Stefanowitsch, 'Extending Collostructional Analysis'; and Hilpert, 'Distinctive Collexeme Analysis'.

[54] Stefanowitsch and Gries, 'Covarying collexemes'. Note that in Bouso, COHA is also used but the focus there is only on the development of a set of a sub-type of ROC involving delocutives. *Argument Structure*, Chapter 7.

[55] The VNC analysis was performed using the script published on the companion website to Gries and Hilpert, 'Variability-Based Neighbor Clustering', https://global.oup.com/us/companion.websites/fdscontent/uscompanion/us/static/companion.websites/nevalainen/Gries-Hilpert_web_final/vnc.individual.html (accessed August 13, 2022).

6 Empirical findings

6.1 Degree of collocational overlap

Table 2 includes the overall token and type frequencies (different verb-noun combination) attested for the ROC and the three potentially contaminating constructions under analysis. The results from CEN do not differ to a great extent from those from the BSNC (see Table 3): once again the most frequent patterns correspond to the ROC and the Complex NP with PP construction, though in the reversed other, with the Complex NP with PP construction being a bit more frequent than the ROC in LMod AE.

[Table 2]

[Table 3]

As with the data retrieved from the BSNC, the results from CEN also offer some encouragement to the hypothesis that more than one structure could have influenced the patterns of variation in the American ROC (RQ1): 33 % of the collocates (verb-noun combinations) of the ROC in the BSNC and the CEN data have been attested in the potentially contaminating patterns analysed. To be more specific, in the BSNC, the Complex NP with PP construction accounts for 18% of the 238 ROC verb-noun combinations, the Complex NP with Participle construction for 12 % of this dataset, and finally, the Complex VP with PP construction for 10 %. As for the CEN data, the Complex NP with PP construction shares 20 % of the 100 ROC verb-noun combinations, and the Complex VP with PP construction and the Complex NP with Participle share 10 % and 8 % of the data, respectively.

Figures 1 and 2 zoom in on this, and Tables 4a-c and 5a-c reveal for each variety which of these combinations are most significantly attracted to which construction (Coll.

Strength: < 1.3; p = < 0.05, or greater).

[Figure 1]

[Figure 2]

[Table 4a, 4b, and 4c]

[Table 5a, 5b and 5c]

As noted in Bouso, the idiosyncratic (one-off) Late Modern British ROC patterns *nod satisfaction*, *nod intelligence*, and *smile an interest* exemplified in 5a-c (Section 1) are characteristic of the potentially contaminating constructions under analysis (see shaded V-N combinations in Figure 1). Similarly, in our LMod AE data combinations such as *shout welcome* (see 14a and 15a) and *mutter oath* (see 14b and 15b) are not only more frequent (see shaded V-N combinations in Figure 2) but are also more distinctive of the Complex NP with PP construction and the Complex NP with Participle (Coll. Strength: < 1.3; p = < 0.05, in both) than of the ROC itself.

(14) a. The clear tones rang like a trumpet along the mountain-side in a glad **shout** of welcome.

(CEN 1882, Francis Marion Crawford; *Mr. Isaacs*)

b. The monocle and the stare stopped the bon soir and the friendly warning on Rouge Gosselin's tongue, and the pilot passed on with a **muttered** oath.

(CEN 1901, Gilbert Parker; *The Right of Way*)

(15) a. A shadow fell upon his face, but with a quick resolve, he **shouted** a loud welcome to them.

(CEN 1921, Ralph Connor; *To Him That Hath*)

b. Tommaso also understood, for his face was white and he **muttered** terrible oaths as he pressed on.

(CEN 1906, Lyman Frank Baum; *Aunt Jane's Nieces Abroad*)

Finally, of the common collocates between the ROC and its competitors in CEN (see Figure 2), only a couple are *significantly* attracted to the ROC, namely the highly entrenched verb-noun combinations *nod assent* and *nod approval* (Coll. Strength: < 3; *p* = < 0.001, for both; see Tables 5a-c).

It should be noted here that multiple distinctive collexeme analysis (the alternative to simple distinctive collexeme analysis to compare the distinctive collexemes of *more than* two constructions) reveals exactly the same results as for the proportion of distinctive collexemes of each construction, and their most significantly attracted collexemes in CEN. *Shout welcome* and *mutter oath* are the most strongly attracted collocates to the Complex NP with PP construction and the Complex NP with Participle construction, respectively (Coll. Strength: < 3; *p* = > 0.001, for both). Also, the verb-noun combinations *nod assent,* and *nod approval* are the only and most strongly attracted collexemes of the ROC (Coll. Strength: < 3; *p* = > 0.001, for both). The small differences in the results lie in those collexemes that show attraction to one construction but not at a significant level. This is the case for instance of *smile encouragement* (last verb-noun combination in Table 5a), which shows *attraction to the ROC* in distinctive collexeme analysis but *attraction to the Complex NP with PP construction* in multiple distinctive collexeme analysis (in both cases Coll. Strength: > 1.3; 0.15 and 0.25, respectively). As we shall see later, these results represent a transitional stage in the history of the pattern: in Table 10b (Section 6.3) we observe that in the data from COHA between 1900s–2010s (Period 2) this collocation will eventually become more distinctive of the ROC (Coll. Strength: > 2; *p* = > 0.01).

6.2 Time-frequency correlations

As with the data from the BSNC,[56] in CEN we observe strong, positive correlations for each pairing (between the ROC and each of the potentially contaminating constructions), and a strong, positive, and statistically significant correlation between the Complex NP with PP and the ROC (rho = 1.00, S = 0.00, $p = 0.042$). Apart from being the most frequent pattern in CEN, the Complex NP with PP construction also turns out to be the most frequent one of the four constructions analysed at the start of the period. The difference with the BSNC data is that the ROC is no longer preferred over the Complex NP with PP construction at any particular point in time. These results support the idea that the ROC is an intrinsic feature of the British sentimental novel and that its golden period is indeed to be found right in the middle of the nineteenth century, as already noted in previous investigations.[57]

[Figure 3]

All in all, the CEN dataset concurs with the idea that the Complex NP with PP construction is "the most fitting candidate for constructional contamination": it is the most frequent construction at all time periods (Figure 3), the construction that shows the largest number of distinctive collexemes (see Tables 5a-c), and the one with the greatest degree of collocational overlap with the ROC (Figure 3).[58]

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[56] Bouso, 'Contamination', 29.

[57] Bouso, *Argument Structure*; among others.

[58] Bouso, 'Contamination', 32. An anonymous reviewer asks whether having the largest amount of distinctive collexemes is simply a consequence of being the most frequent construction. This does not necessarily have to be that way; that is, frequency does not have to correlate with productivity. It may be the case that a particular construction shows a large number of entrenched

To test this idea further, all verb-noun combinations attested in the three potentially contaminating constructions in the BSNC (for illustrative purposes, these are included in Tables 6-8) were searched for in COHA, COCA, and on the Web Corpus in quest of ROC counterparts.[59] Even though not all show ROC counterparts in the BSNC and CEN, now more than 75 % of these combinations are found at some point in the Modern ROC, and as before, the Complex NP with PP construction is the one that shows the greatest degree of collocational overlap (82 %). This leads us to the last point in our analysis, where I analyse the diachronic impact of the Complex NP with PP construction on the shaping of the Modern ROC.

[Table 6]

[Table 7]

[Table 8]

6.3 The effect of the Complex NP with PP construction on the ROC in COHA

The potential diachronic effects of the Complex NP with PP construction on the lexical variation of the ROC were tested in a more systemic way using COHA and 42 verb-noun

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lexicalized units and a small number of distinctive collexemes. This idea is embodied in De Smet's 2020 study on the negative effect of token frequency on the productivity of constructions, and previously, in Barðdal's 2008 monograph where she confirms her hypothesis that "the lower the type frequency of a construction, the higher degree of semantic coherence is needed for a construction to be extendable". 'What Predicts Productivity?'; and *Productivity*, 34.

[59] Davies, 'COCA'. As shown in Tables 2 and 3 (Section 1), the number of verb-noun combinations in the BSNC exceeds the number of verb-noun combinations attested in CEN. Since these are largely overlapping with those attested in the latter, for the sake of coherence and to cast the net wider, all BSNC overlapping collocations were selected.

combinations common to both constructions (see collocates in boldtype in Table 6). The aim was to document, first, that the American ROC, like its British counterpart,[60] extended in collocations (verb-noun combinations) between Late Modern English (LModE) and later stages and, second, that some of these additional elements were attested earlier in (and were significantly associated with) its competing, alternative construction, the Complex NP with PP construction.

Table 9 displays the results obtained in the form of types, and token frequencies, and Figure 4 shows the diachronic distribution of their token frequencies. As before, there is a considerable degree of collocational overlap, and this is also manifested diachronically in their parallel development.

[Table 9]

[Figure 4]

The ROC increased in frequency over the course of the LModE period, reaching a peak as in previous data from CEN (see Figure 3, Section 6.2) in the transition between the nineteenth to the twentieth century. In addition to this, the Complex NP with PP construction was also considerably more frequent in earlier stages. What is not yet clear from Figure 4 is whether the American ROC expanded in collocations, and if that is so, whether these later (potentially novel) collocates of the ROC were attested earlier in and were also more significantly associated with the Complex NP with PP construction (RQ3).

To test this idea, I identified via co-varying collexeme analysis the most distinctive verb-noun combinations of the ROC over four fifty-year periods, i.e. Period 1

[60] Bouso, 'The Shaping'; Idem, *Argument Structure*; and Bouso and Ruano San Segundo, 'Turn of the Screw', 220.

(1820s – 1860s), Period 2 (1870s – 1910s), Period 3 (1920s – 1960s), and Period 4 (1970s – 2010s). Then, I plotted in a network the most statistically significant verb-noun combinations of the ROC for each stage (Coll. Strength: < 1.3; p = > 0.005; or higher). Figure 5 reveals that the ROC indeed extends in collocations, especially in Period 2 and Period 3, where the array of semantic frames (verb-noun combinations) significantly attracted to the construction becomes particularly diverse.

[Figure 5]

To be more specific, in Figure 5 we observe that the patterns *shout applause* and *murmur admiration* emerge in Period 2 and Period 3 as part of the set of distinctive patterns of the ROC (Coll. Strength: < 3; p = > 0.001 for both). Also, the verb *smile*, in its origins only occurring with highly redundant objects, e.g. the delocutives *adieu*, *greeting*, and *welcome*, is now attested in Period 2 with emotional abstract nouns such as *encouragement* (Coll. Strength: < 2; p = > 0.01) and *sympathy* (Coll. Strength: < 3; p = > 0.001). Finally, as before (see Tables 4a-c and Tables 5a-c), the verb-noun combinations *nod approval* and *nod assent* persist over time as the most prototypical of the construction (Coll. Strength: < 3, p = < 0.001, in all periods).

After confirming that the ROC expanded in collocations in LMod AE, the next step was to run a distinctive collexeme analysis with its main competitor. For the identification of the most relevant periods in their development, VNC was applied. This was done in such a way for practical purposes, as noted in Hilpert, "comparing 20 sets [a set per sub-period] of collocates that exhibit a fair amount of semantic overlap would be an unwieldy exercise".[61] VNC is a solution to this problem as it reveals the most informative way of dividing the dataset into clusters. The resulting dendrogram with the

[61] Hilpert, 'Diachronic Collostructional Analysis', 236.

overlaid frequency development of the Complex NP with PP construction and its corresponding 'Scree' plot are shown in Figure 6.

[Figure 6]

The dendrogram and the 'Scree' plot suggest that if we draw a horizontal line at $y = 6$,[62] the data can be best divided into two clusters: one cluster covering the 1820s to the 1890s, and a second covering the period 1900s to the 2010s. With this periodisation, I performed a distinctive collexeme analysis on the verb-noun combinations common to the Complex NP with PP construction and the ROC for each of the two periods separately. The results are included in Tables 10a and 10b.

[Table 10a]

[Table 10b]

A look at these tables reveals that *nod assent* and *nod approval* emerge, once again, as the most prototypical verb-noun combinations of the ROC. The analysis also confirms that the lion's share of the common verb-noun combinations to these constructions feel more at home in the Complex NP with PP construction. Quite crucially, the output of the method also lends support to the diachronic effects of constructional contamination, with some of the novel (later) instances of the ROC attested earlier in and being more strongly associated to the Complex NP with PP construction.

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[62] Note here that "[a]n analyst could, in principle, draw a horizontal line ... at any height and take the crossing vertical lines as indicating historical periods […]. The favored solution is a compromise between capturing as much dissimilarity between periods as possible and positing as few clusters as necessary" (Gries and Hilpert, 'Variability-Based Neighbor Clustering', 139-40). In this case, I have drawn the line $y = 6$ because all frequency points up until 1900 are higher than all frequency points from 1910 onwards.

For instance, the novel collocates of the ROC referred to in Figure 6, i.e. *shout applause*, *murmur admiration*, and *smile encouragement*, are more distinctive of the Complex NP with PP construction already in Period 1 (1820s to the 1890s). The first two (i.e. *shout applause* and *murmur admiration*) are in fact highly entrenched in the Complex NP with PP construction in Period 1 (Coll. Strength: < 3; p = > 0.001, for both; see Table 10a) and they continue to be part of the set of highly distinctive collexemes of the Complex NP with PP construction in Period 2 (see Table 10b; Coll. Strength: < 1.3; p = > 0.005). Importantly, as evinced in examples (16) and (17), these were also attested much earlier in the Complex NP with PP construction than in the ROC.

(16) a. Then motioning the crowd away with a high and haughty sweep of his arm, he advanced in front of the nation with the air of a king, and spoke in a voice louder than the **murmur** of admiration that ran through the multitude.

(COHA **1826**, FIC, J. F. Cooper; *The Last of the Mohicans*)

b. [T]he diminutive speaker, after exhausting his lungs, storming against the audacity of the lazy and haughty dons -- and to the very top of his voice, calling on each honest man present and absent, to oppose every attempt of governmental proceeding; and concluding with a flowery and glowing description of his own patriotism, and "that he was no friend of tyrants, even before he was born," sat down exhausted and panting for breath, amid repeated **shouts** of applause from his audience, very few of whom had heard a word.

(COHA **1827**, FIC, S. B. Helbert Judah; *The Buccaneers*)

(17) a. We rested an hour or more by the road. Mounted officers galloping along down the lines kept up the excitement. … We moved half a mile farther, and presently a broad pathway of reflected moonlight shone up at us from the Potomac. No orders, at this, came from the Colonel, "Attention, battalion! Be sentimental!"

Perhaps privates have no right to perceive the beautiful. But the sections in my neighborhood **murmured** admiration. The utter serenity of the night was most impressive.

(COHA **1863**, FIC, T. Winthrop; *Life in the Open Air, and Other Papers*)

b. Becoming cheered with his own singing, the bird began to mimic the hoarse crowing with which Daddy Longlegs wakened him in the morning. This set the barn-yard in a roar, and the peacock **shouted** his applause in a loud "ne-onk!" Alas! for him, the mocking-bird mimicked his hideous cry, then quacked like the duck, and even Miss Guinea-fowl found that he could "pot-rack" better than she could.

(COHA **1884**, FIC, E. Eggleston; *Queer Stories for Boys and Girls*)

As for the novel ROC verb-noun combination *smile encouragement*, despite being a distinctive collocate of the Complex NP with PP construction in Period 1 (see Table 10a, and also comments included in Section 6.1), it pops in Period 2 (Table 10b) as being more significantly attracted to the ROC (Coll. Strength: < 2; p = > 0.001). Also, as with *shout applause* and *murmur admiration*, the pattern *smile encouragement* is attested first with the Complex NP with PP construction: the examples in (18) and (19) are the earliest attestations for both constructions in COHA.

(18) He will feel that he is his own destroyer, that every attribute in God had provided for his welfare, that not a single perfection had given one **smile** of encouragement to his sin and rebellion, and that no divine attribute had thrown or left in the way any obstacle to his reconciliation.

(COHA **1837**, NF/ACAD, Thomas W. Jenkyn, *On the extent of the Atonement in its relation to God and the universe*)

(19) O, will not the ghosts of our grandmothers come out from among the wraiths of spinning-wheels and home-made linen, and **smile** their encouragement upon the marshalled ranks of their grand-daughters, the brave defenders of Women's rights?

(COHA **1854**, FIC, Louise Chandler Moulton, *This, That and the Other*)

7. Concluding remarks

The research questions put forward in this article address the strength and scope of the effect of constructional contamination (RQ1 & RQ2), and whether it is possible to trace some of the historical source(s) of the lexical variation attested in the object slot of the Modern ROC (RQ3). From the new data retrieved from De Smet's *Corpus of English Novels*, it seems clear that the potentially contaminating constructions identified in British English novels are also present in the American variety (RQ1). The main difference lies in their frequency and the degree of lexical variation attested in these constructions: the different formal versions of the ROC are less frequent and, also, much less diverse in terms of RO types and hapaxes in the American variety. Still, the results from CEN also hint at an interaction between the patterns analysed and the ROC: they develop in parallel and show some degree of collocational overlap, with some of the collocations attested being more frequent and much more strongly associated to the ROC alternatives than to the ROC itself.

Regarding the third research question concerning the origins of the lexical variation of the ROC, the picture that emerges from COHA is that the ROC no doubt extended in collocations over the course of the nineteenth century and that, quite crucially, some of these new verb-noun combinations attested in the ROC were attested earlier in and were also more strongly associated to one of its main competitors, namely the Complex NP with PP construction. These results concur with those presented in

Bouso for British English where this construction was claimed to be the most fitting candidate for constructional contamination.[63]

All in all, the findings reveal that horizontal interaction, via constructional contamination in the network of the LModE ROC, must have played some role in the diversity of the object slot of the Modern ROC. Synchronically, constructional contamination is manifested in the ROC in the form of lexical biases towards one particular variant (Figures 1 and 2), and diachronically, the effect results in analogisation (Figure 6), that is, in the attestation of novel and highly idiosyncratic verb-noun collocations in the construction. The results presented here therefore add up to those presented in recent investigations in the area,[64] and which highlight the importance of associative (horizontal) links in the network configuration.

Acknowledgements

References

Barðdal, Jóhanna. *Productivity: Evidence from Case and Argument Structure in Icelandic*. Amsterdam: John Benjamins, 2008.

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[63] 'Contamination'.

[64] Van de Velde, 'Degeneracy'; Torrent, 'Inheritance and Change'; Traugott, 'Language Change with Constructional Networks'; and Sommerer and Smirnova, *Nodes and Networks*, among many others.

Bouso, Tamara. '*Muttering Contempt* and *Smiling Appreciation*: Disentangling the History of the Reaction Object Construction in English'. *English Studies* 98, no. 2 (2017), doi.org/10.1080/0013838X.2016.1210358

Bouso, Tamara. 'The Growth of the Transitivising Reaction Object Construction'. *Constructions and Frames* 12, no. 2 (2020a), https://doi.org/10.1075/cf.00041.bou

Bouso, Tamara. 'The Shaping of the Late Modern English Reaction Object Construction'. In *Thresholds and Ways Forward in English Studies*, ed. by Lourdes López Ropero, Sara Prieto García-Cañedo, and José Antonio Sánchez Fajardo, 179-91. Alicante: Publicaciones de la Universidad de Alicante, 2020b.

Bouso, Tamara. *Changes in Argument Structure. The Transitivizing Reaction Object Construction*. Bern: Peter Lang, 2021.

Bouso, Tamara. 'The English Reaction Object Construction: A Case of Syntactic Constructional Contamination'. *Miscelánea: A Journal of English and American Studies* 65 (2022), https://doi.org/10.26754/ojs_misc/mj.20226826

Bouso, Tamara, and Pablo Ruano San Segundo. 'Another Turn of the Screw on the History of the Reaction Object Construction'. *Functions of Language* 28, no. 2 (2021a), https://doi.org/10.1075/fol.20026.bou

Bouso, Tamara, and Pablo Ruano San Segundo. '*The British Sentimental Novel Corpus* (BSNC) and the ROC-DDC alternation at the level of the individual'. *Nordic Journal of English Studies* 20, no. 1 (2021b), https://doi.org/10.35360/njes.659

Carter, Ronald, and John McRae. *The Penguin Guide to English Literature: Britain and Ireland*. London: Penguin Books, 1996.

Cappelle, Bert, Pâmela Fagundes Travassos, Nahendi Almeida Mota, Letícia Freitas Nunes, Gabriel Lucas Martins, and Marcia dos Santos Machado Vieira.

‘Constructional Variation: Unveiling Aspects of Linguistic Knowledge. Interview with Bert Cappelle’. *Revista da Anpoll* 52 (2021): 258-306.

Davies, Mark. ‘Corpus of Contemporary American English (COCA)’, 2008. Accessed August 13, 2022. http://corpus.byu.edu/coca/

Davies, Mark. ‘Corpus of Historical American English (COHA)’, 2010. Accessed August 13, 2022. https://www.english-corpora.org/coha/

De Smet, Hendrik. ‘Corpus of English Novels (CEN)’, 2008. Accessed August 13, 2022. https://perswww.kuleuven.be/~u0044428/

De Smet, Hendrik, Lobke Ghesquière, and Freek Van de Velde (eds.). ‘Multiple Source Constructions in Language Change’. *Special Issue of Studies in Language* 37, no. 3 (2013), https://doi.org/10.1075/bct.79

De Smet, Hendrik. ‘What Predicts Productivity? Theory Meets Individuals’. *Cognitive Linguistics* 31, no. 2 (2020), https://doi.org/10.1515/cog-2019-0026

Diessel, Holger. *The Grammar Network: How Linguistic Structure Is Shaped by Language Use*. Cambridge: Cambridge University Press, 2019.

Fanego, Teresa. ‘A Construction of Independent Means: The History of the Way Construction Revisited’. *English Language and Linguistics* 23, no. 3 (2018), https://doi.org/10.1017/S1360674318000059

Goldberg, Adele. E. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago, IL: The University of Chicago Press, 1995.

Goldberg, Adele E. *Constructions at Work: The Nature of Generalization in Language*. Oxford: Oxford University Press, 2006.

Goldberg, Adele E. ‘Constructionist Approaches’. In *The Oxford Handbook of Construction Grammar*, ed. Thomas Hoffmann and Graeme Trousdale, 15-31. Oxford: Oxford University Press, 2013.

Goldberg, Adele E. *Explain Me This: Creativity, Competition, and the Partial Productivity of Constructions*. Princeton, NJ: Princeton University Press, 2019.

Gries, Stefan Th. 2014. 'Coll.analysis 3.5. A Script for R to Compute Perform Collostructional Analyses'. Accessed August 13, 2022. http://www.stgries.info/teaching/groningen/index.html

Gries, Stefan Th., and Anatol Stefanowitsch. 'Extending Collostructional Analysis: A Corpus-Based Perspective on Alternations'. *International Journal of Corpus Linguistics* 9, no. 1 (2004), https://doi.org/10.1075/ijcl.9.1.06gri

Gries, Stefan Th., and Martin Hilpert. 'Variability-Based Neighbor Clustering: A Bottom-Up Approach to Periodization in Historical Linguistics'. In *The Oxford Handbook of the History of English*, ed. Terttu Nevalainen and Elizabeth Closs Traugott, 134-44. Oxford: Oxford University Press, 2012.

Hilpert, Martin. 'Distinctive Collexeme Analysis and Diachrony'. *Corpus Linguistics and Linguistic Theory* 2, no. 2 (2006), https://doi.org/10.1515/CLLT.2006.012

Hilpert, Martin. 'Diachronic Collostructional Analysis Meets the Noun Phrase. Studying *Many a Noun* in *COHA*'. In *The Oxford Handbook of the History of English*, ed. Terttu Nevalainen and Elizabeth Closs Traugott, 233-44. Oxford: Oxford University Press, 2012.

Hilpert, Martin. *Constructional Change in English: Developments in Allomorphy, Word Formation, and Syntax*. Cambridge: Cambridge University Press, 2013.

Hilpert, Martin. 'Collostructional Analysis: Measuring Associations between Constructions and Lexical Elements'. In *Corpus Methods for Semantics: Quantitative Studies in Polysemy and Synonymy*, ed. Dylan Glynn and Justyna A. Robinson, 391-404. Amsterdam: John Benjamins, 2014.

Hilpert, Martin. ‘Three Open Questions in Diachronic Construction Grammar’. In *Grammaticalization Meets Construction Grammar*, ed. Evie Coussé and Joel Olofsson, 21-39. Amstedam: John Benjamins, 2018.

Hilpert, Martin. *Construction Grammar and Its Application to English*. 2nd ed. Edinburgh: Edinburgh University Press, 2019.

Hilpert, Martin. ‘Variable Adverb Placement in the English Passive: *It Has to Be Analyzed Carefully / Carefully Analysed*’. Keynote address, VI Setmana del Postgrau, Palma de Mallorca (online), Universitat de les Illes Balears, Spain, April 23, 2021.

Hilpert, Martin, and Susanne Flach. 2022. ‘A Case of Constructional Contamination in English: Modified Noun Phrases Influence Adverb Placement in the Passive’. In *Contrast and Analogy in Language: Perspectives from Cognitive Linguistics*, ed. Marcin Grygiel, 1-24. Amsterdam: John Benjamins, 2022.

Israel, Michael. ‘The *Way* Constructions Grow’. In *Conceptual Structure, Discourse and Language*, ed. Adele E. Goldberg, 217-30. Stanford: CSLI Publications, 1996.

Jacobson, Sven. 1980. ‘Issues in the Study of Syntactic Variation’. In *Papers from the Scandinavian Symposium on Syntactic Variation*, ed. Sven Jacobson, 23-36. Sweden: Almqvist & Wiksell, 1980.

Lakoff, George. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Chicago: University of Chicago Press, 1987.

Leech, Geoffrey, and Mick Short. *Style in Fiction*. 1st ed. London: Longman, 1981.

Leech, Geoffrey, and Mick Short. *Style in Fiction: A Linguistic Introduction to English Fictional Prose*. 2nd ed. London: Routledge, 2007.

Levin, Beth. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press, 1993.

Martínez Vázquez, Montserrat. ‘Reaction Object Constructions in English: A Corpus-Based Study’. In *Language Windowing Through Corpora*, ed. Isabel Moskowich, Begoña Crespo-García and Inés Lareo, 551-6. A Coruña: SP da Universidade de A Coruña, 2010.

Martínez Vázquez, Montserrat. ‘Reaction Object Constructions in English and Spanish’. *ES. Revista de Filología Inglesa* 3, no. 35 (2014): 193-217.

Martínez Vázquez, Montserrat. ‘Nominalised Expressive Acts in English’. *Verbum* 37, no. 1 (2015): 147-70.

Mufwene, Salikoko S. ‘English Manner-of-Speaking Verbs Revisited’. In *CLS 14*, ed. Donka Farkas, Wesley M. Jacobsen and Karol W. Todrys, 278-88. Chicago: CLS Publications, 1978.

Perek, Florent. ‘Alternation-Based Generalizations Are Stored in the Mental Grammar: Evidence from a Sorting Task Experiment’. *Cognitive Linguistics* 23, no. 3 (2012), doi.org/10.1515/cog-2012-0018.

Perek, Florent. ‘Recent Change in the Productivity and Schematicity of the *Way*-Construction: A Distributional Semantic Analysis’. *Corpus Linguistics and Linguistic Theory* 14, no. 1 (2018), https://doi.org/10.1515/cllt-2016-0014

Perek, Florent. ‘Productivity and Schematicity in Constructional Change’. In *Nodes and Networks in Diachronic Construction Grammar*, ed. Lotte Sommerer and Elena Smirnova, 142-166. Amsterdam: John Benjamins, 2020.

Pijpops, Dirk, Isabeau De Smet, and Freek Van de Velde. ‘Constructional Contamination in Morphology and Syntax: Four Case Studies’. *Constructions and Frames* 10, no. 2 (2018), https://doi.org/10.1075/cf.00021.pij

Pijpops, Dirk and Freek Van de Velde. ‘Constructional Contamination: How Does It Work and How Do We Measure It?’. *Folia Linguistica* 50, no. 2 (2016), doi.org/10.1515/flin-2016-0020.

Pijpops, Dirk, Isabeau De Smet, and Freek Van de Velde. ‘Attraction through Formal Resemblance. Five Case Studies on Constructional Contamination’. Paper presented at the 5th Usage-based Linguistic Conference, Tel Aviv (online), Israel, July 5-7, 2021.

Pijpops, Dirk. ‘What Is an Alternation? Six Answers’. *Belgian Journal of Linguistics* 34 (2020), doi.org/10.1075/bjl.00053.pij

Rowland, Ann. ‘Sentimental Fiction’. In *The Cambridge Companion to Fiction in the Romantic Period*, ed. Richard Maxwell and Katie Trumpener. 191-206. Cambridge: Cambridge University Press, 2008.

Ruano San Segundo, Pablo, and Tamara Bouso, compilers. *British Sentimental Novel Corpus* (BSNC). Cáceres: Departamento de Filología Inglesa, Universidad de Extremadura, 2019.

Semino, Elena, and Mick Short. *Corpus Stylistics. Speech, Thought and Writing Presentation in a Corpus of English Writing*. London: Routledge, 2004.

Scott, Mike. ‘WordSmith Tools Version 6’, 2020. Accessed August 13, 2022. https://lexically.net/wordsmith/version6/

Sommerer, Lotte, and Elena Smirnova, eds. *Nodes and Networks in Diachronic Construction Grammar*. Amsterdam: John Benjamins, 2020.

Stefanowitsch, Anatol, and Stefan Th. Gries. ‘Collostructions: Investigating the interaction of words and constructions’. *International Journal of Corpus Linguistics* 8 no. 2 (2003): 209-43.

Stefanowitsch, Anatol, and Stefan Th. Gries. ‘Covarying collexemes’. *Corpus Linguistics and Linguistic Theory* 1 no. 1 (2005), https://doi.org/10.1075/ijcl.8.2.03ste

Torrent, Tiago Timponi. ‘On the Relation between Inheritance and Change: The Constructional Convergence and the Construction Network Reconfiguration Hypotheses’. In *Diachronic Construction Grammar*, ed. Jóhanna Barðdal, Elena Smirnova, Lotte Sommerer and Spike Gildea, 173-212. Amsterdam: John Benjamins, 2015.

Traugott, Elizabeth Closs. ‘Modelling Language Change with Constructional Networks”. In *Beyond Grammaticalization and Discourse Makers*, ed. Pons Bordería, Salvador and Óscar Loureda Lamas, 17-50. Leiden: E. J. Brill, 2018.

Traugott, Elizabeth Closs, and Graeme Trousdale. *Constructionalisation and Constructional Changes*. Oxford: Oxford University Press, 2013.

Van de Velde, Freek. ‘Degeneracy: The maintenance of constructional networks’. In *Extending the Scope of Construction Grammar*, ed. Ronny Boogaart, Timothy Colleman and Gijsbert Rutten, 141-80. Berlin: De Gruyter, 2014.

Zwicky, Arnold M. ‘In a Manner of Speaking’. *Linguistic Inquiry* 2 no. 2 (1971): 223-33.

Table 1. Leech and Short's model of discourse presentation[65]

NRS/TA	**IS/T**	**FIS/T**	**DS/T**	**FDS/T**
Narrative Report of Speech / Thought Acts	Indirect Speech / Thought	Free Indirect Speech / Thought	Direct Speech / Thought	Free Direct Speech / Thought

[65] *Style in Fiction*, 255-81; and Idem, *Fictional Prose*.

Table 2. Tokens and type frequencies of the constructions under analysis in CEN

	Tokens analysed: 10,820	**Verb Types** [First element in the contaminating construction and in the ROC]	**Emotional Noun Types** [Second element in the contaminating construction and in the ROC]	**Different (verb-noun) combinations**
ROC (e.g. *nod satisfaction, wave farewell, nod intelligence, shout welcome, smile an interest, mutter oath*)	197	7	68	100
Complex VP with PP (VPPP) (e.g. *nod with satisfaction, wave in farewell*)	75	6	42	53
Complex NP with PP (NPPP) (e.g. *nod of intelligence, shout of welcome*)	239	7	98	123
Complex NP with Participle (NPP) (e.g. *smiling interest, muttered oath*)	44	4	37	38

Table 3. Tokens and type frequencies of the constructions under analysis in the BSNC (adapted from Bouso)[66]

	Tokens analysed: 18,772	**Verb Types** [First element in the contaminating construction and in the ROC]	**Emotional Noun Types** [Second element in the contaminating construction and in the ROC]	**Different (verb-noun) combinations**
ROC (e.g. *nod satisfaction, nod intelligence, smile an interest*)	468	7	150	238
Complex VP with PP (e.g. *nod with satisfaction*)	199	7	110	132
Complex NP with PP (e.g. *nod of intelligence*)	450	6	184	233
Complex NP with Participle (e.g. *smiling interest*)	115	6	78	90

[66] 'Contamination', 25.

Table 4a: Distinctive collexemes of the Complex NP with Participle and the ROC (shaded) in the BSNC[67]

Combination	obs.freq NPP	obs.freq. ROC	exp.freq. NPP	exp.freq. ROC	coll.strength
mutter oath	6	5	2.16	8.83	1.99 (NPP)
smile interest	3	1	0.78	3.21	1.58 (NPP)
whisper request	3	1	0.78	3.21	1.58 (NPP)
nod assent	1	55	11.0	44.9	4.42 (ROC)

*** Only statistically significant collexemes included

[67] Tables 4a-c have been adapted from Bouso, 'Contamination', 28-9.

Table 4b: Distinctive collexemes of the Complex VP with PP and the ROC (shaded) in the BSNC

Combination	obs.freq. VPPP	obs.freq. ROC	exp.freq. VPPP	exp.freq. ROC	coll.strength
nod satisfaction	7	1	2.38	5.61	2.93 (VPPP)
nod affirmative	9	3	3.58	8.41	2.83 (VPPP)
smile reply	5	1	1.79	4.20	1.98 (VPPP)
nod assent	4	55	17.6	41.3	5.13 (ROC)

*** Only statistically significant collexemes included

Table 4c: Distinctive collexemes of the Complex NP with PP and the ROC (shaded) in the BSNC

Combination	obs.freq. NPPP	obs.freq. ROC	exp.freq. NPPP	exp.freq. ROC	coll.strength
murmur applause	11	1	5.88	6.11	2.60 (NPPP)
nod intelligence	11	1	5.88	6.11	2.60 (NPPP)
nod recognition	11	2	6.37	6.62	2.04 (NPPP)
shout applause	10	2	5.88	6.11	1.80 (NPPP)
murmur approbation	8	1	4.41	4.58	1.78 (NPPP)
smile recognition	9	2	5.39	5.60	1.56 (NPPP)
nod assent	6	55	29.9	31.0	10.7 (ROC)

*** Only statistically significant collexemes included

Table 5a. Distinctive collexemes of the Complex NP with PP and the ROC (shaded) in CEN (statistically significant collexemes in boldtype)

Combination	**obs.freq. NPPP**	**obs.freq. ROC**	**exp.freq. NPPP**	**exp.freq. ROC**	**coll.strength**
shout welcome	9	1	5.48	4.51	1.66 (NPPP)
smile welcome	10	2	6.57	5.42	1.40 (NPPP)
murmur approval	6	1	3.83	3.16	1.00 (NPPP)
shout joy	7	2	4.93	4.06	0.84 (NPPP)
shout approval	10	4	7.67	6.32	0.79 (NPPP)
murmur admiration	4	1	2.74	2.25	0.59 (NPPP)
smile recognition	3	1	2.19	1.80	0.41 (NPPP)
murmur delight	2	1	1.64	1.35	0.24 (NPPP)
murmur discontent	2	1	1.64	1.35	0.24 (NPPP)
murmur protest	2	1	1.64	1.35	0.24 (NPPP)
shout applause	2	1	1.64	1.35	0.24 (NPPP)
smile joy	2	1	1.64	1.35	0.24 (NPPP)
shout warning	3	2	2.74	2.25	0.22 (NPPP)
nod assent	2	44	25.21	20.78	13.86 (ROC)
nod approval	1	15	8.77	7.22	4.32 (ROC)
shout greeting	2	2	2.19	1.80	0.21 (ROC)
smile greeting	2	2	2.19	1.80	0.21 (ROC)
nod affirmation	1	1	1.09	0.90	0.15 (ROC)
nod farewell	1	1	1.09	0.90	0.15 (ROC)
smile encouragement	1	1	1.09	0.90	0.15 (ROC)

*** In boldtype, statistically significant collexemes

Table 5b: Distinctive collexemes of the Complex NP with Participle and the ROC in CEN

Combination	**obs.freq NPP**	**obs.freq. ROC**	**exp.freq. NPP**	**exp.freq. ROC**	**coll.strength**
mutter oath	4	2	1.09	4.90	1.95 (NPP)
murmur excuse	1	1	0.36	1.63	0.47 (NPP)
mutter charm	1	1	0.36	1.63	0.47 (NPP)
smile farewell	1	1	0.36	1.63	0.47 (NPP)
whisper oath	1	1	0.36	1.63	0.47 (NPP)
whisper order	1	1	0.36	1.63	0.47 (NPP)
whisper warning	1	1	0.36	1.63	0.47 (NPP)
smile welcome	1	1	0.54	2.45	0.34 (NPP)

*** In boldtype, statistically significant collexemes

Table 5c: Distinctive collexemes of the Complex VP with PP and the ROC (shaded) in CEN

Combination	**obs.freq NPP**	**obs.freq. ROC**	**exp.freq. NPP**	**exp.freq. ROC**	**coll.strength**
nod approval	2	15	4.68	12.31	0.97 (ROC)
nod acquiescence	2	6	2.20	5.79	0.21 (ROC)
wave welcome	1	3	1.10	2.89	0.15 (ROC)
wave farewell	7	9	4.41	11.58	0.93 (VPPP)
smile joy	2	1	0.82	2.17	0.73 (VPPP)
shout joy	2	2	1.10	2.89	0.51 (VPPP)
nod satisfaction	1	1	0.55	1.44	0.32 (VPPP)
wave courtesy	1	1	0.55	1.44	0.32 (VPPP)
smile greeting	1	2	0.82	2.17	0.20 (VPPP)
smile welcome	1	2	0.82	2.17	0.20 (VPPP)

Table 6. Complex NP with PP combinations attested in the ROC. Based on the BSNC (in boldtype), COCA, COHA, and the Web Corpus (adapted from Bouso) [68]

Verbs-noun combinations	**Emotional nouns (192 Complex NP with PP strings attested in the ROC) 192 / 233 (82 %)**
Murmur **(46)**	**acquiescence**, **admiration**, agreement, **answer**, **applause**, **approbation, approval**, **assent**, astonishment, benediction, commiseration, compassion, **complaint**, confession, confidence, curiosity, denial, derision, despair, disapprobation, dissatisfaction, distrust, expectation, farewell, gratification, horror, Hush!, impatience, indignation, **inquiry**, interest, **love**, pain, pity, plaudit, pleasure, question, remonstrance, response, satisfaction, shame, sorrow, support, surprise, **sympathy**, weakness
Nod **(15)**	acknowledgement, **acquiescence**, **affirmative**, **approbation**, **approval**, **assent**, dismissal, farewell, friendship, greeting, **intelligence**, invitation, **recognition**, resignation, **understanding**
Shout **(39)**	**acclamation**, admiration, affliction, **applause**, astonishment, attachment, **bravo**, congratulation, contempt, **defiance**, delight, derision, disappointment, enthusiasm, excitement, execration, exultation, gratulation, grief, ha, ha, huzzah, jollity, joy, jubilation, jubilee, merriment, **no**, patriotism, rage, recognition, reprobation, scorn, supplication, surprise, thanksgiving, triumph, vengeance, **victory**, **welcome**
Smile **(72)**	**adieu**, admiration, affection, amusement, **applause**, apprehension, **approbation**, astonishment, beauty, bitterness, complacency, complaisance, composure, condescension, confidence, consolation, contempt, content, contentment, courtesy, cunning, **delight**, denial, derision, disdain, **encouragement**, enjoyment, excuse, feeling, forgiveness, glee, goodwill, gratification, **gratitude**, **greeting**, hope, hospitality, incredulity, indulgence, innocence, **intelligence**, invitation, irony, joy, kindness, **meaning**, **patronage**, pity, pleasantry pleasure, politeness, protection, protestation, **recognition**, relief, rest, sarcasm, satire, satisfaction, scorn, serenity, simplicity, submission, superiority, sweetness, **sympathy**, **tenderness**, timidity, toleration, triumph, understanding, **welcome**
Wave **(1)**	triumph
Whisper **(19)**	alarm, anguish, applause, astonishment, beauty, caring, condemnation, encouragement, goodwill, Hush!, indication, **inquiry**, mystery, **passion**, **reply**, sorrow, terror, truth, uneasiness

[68] 'Contamination', 30.

Table 7. Complex VP with PP combinations attested in the ROC. Based on the BSNC (in boldtype), COCA, COHA, and the Web Corpus

Verbs-noun combinations	**Emotional nouns (97 Complex VP with PP strings attested in the ROC) 97 / 132 (73 %)**
Murmur **(5)**	**admiration**, gladness, **happiness**, **praise**, **reply**
Mutter **(4)**	**answer**, discontent, **prayer**, surprise
Nod **(16)**	acknowledgement, **affirmative**, agreement, answer, **approbation**, **assent**, condescension, **confirmation**, familiarity, indifference, **intelligence**, knowledge, reply, **satisfaction**, triumph, **yes**
Shout **(9)**	derision, excitement, glee, impatience, love, **oath**, response, triumph, woe
Smile **(39)**	**acquiescence**, admiration, affection, answer, apology, **approval**, **assent**, benevolence, bewilderment, bitterness, brightness, composure, confidence, contempt, **delight**, derision, disdain, elegance, enjoyment, fascination, frankness, friendliness, good nature, grace, gratification, hope, joy, kindness, **meaning**, merriment, modesty, pleasure, **reply**, response, scorn, superiority, sweetness, **tenderness**
Wave **(14)**	answer, assent, defiance, delight, deprecation, dignity, dismissal, **farewell**, impatience, **negative**, rejection, response, thanks, triumph
Whisper **(10)**	acceptance, awe, **courage**, curiosity, fear, pardon, **reply**, softness, solicitude, sorrow

Table 8. Complex NP with Participle combinations attested in the ROC. Based on the BSNC (in boldtype), COCA, COHA, and the Web Corpus.

Verbs-noun combinations	**Emotional nouns (69 Complex VP with PP strings attested in the ROC) 69 / 90 (77 %)**
Murmur **(4)**	**applause**, **approbation**, **blessing**, **exclamation**
Mutter **(15)**	**acknowledgment**, **answer**, **assent**, assurance, **charm**, comment, **curse**, **exclamation**, **imprecation**, incoherence, indignation, **invocation**, **oath**, **prayer**, **remark**
Nod **(4)**	**affirmative**, **approbation**, **assent**, proposal
Shout **(1)**	**invitation**
Smile **(26)**	acknowledgment, admiration, amusement, **approval**, beauty, compliment, condescension, confidence, courtesy, deprecation, disbelief, disdain, **encouragemen**t, goodwill, humility, hypocrisy, indulgence, **interest**, negative, **peace**, politeness, remark, salute, satisfaction, sweetness, wonder
Whisper **(19)**	admiration, **assurance**, awe, challenge, confidence, counsel, encouragement, **exclamation**, excuse, gallantry, horror, justification, no, **remark**, remonstrance, **request**, suggestion, **suspicion**, **threat**

Table 9. Tokens and type frequencies of the constructions under analysis in COHA

	Tokens analysed: 3,171	**Different (verb-noun) combinations analysed**	**Common (verb-noun) combinations to both constructions**
ROC (e.g. *nod satisfaction, nod intelligence, smile an interest*)	882	42	33
Complex NP with PP (e.g. *nod of intelligence*)	935	42	33

Table 10a. Distinctive collexemes of the Complex NP with PP and the ROC (shaded) in COHA (Period 1: 1820s – 1890s)

Combination	obs.freq. NPPP	obs.freq. ROC	exp.freq. NPPP	exp.freq. ROC	coll.strength
shout applause	61	2	38.44	24.55	11.29 (NPPP)
murmur admiration	29	1	18.30	11.69	5.27 (NPPP)
shout victory	58	12	42.71	27.28	4.50 (NPPP)
murmur approbation	18	1	11.59	7.40	3.00 (NPPP)
smile recognition	23	3	15.86	10.13	2.72 (NPPP)
nod recognition	23	4	16.47	10.52	2.26 (NPPP)
murmur approval	13	1	8.54	5.45	2.02 (NPPP)
smile gratitude	13	1	8.54	5.45	2.02 (NPPP)
shout welcome	27	7	20.74	13.25	1.78 (NPPP)
smile approbation	20	6	15.86	10.13	1.18 (NPPP)
smile welcome	43	23	40.27	25.72	0.55 (NPPP)
smile encouragement	10	4	8.54	5.45	0.51 (NPPP)
murmur love	5	2	4.27	2.72	0.35 (NPPP)
murmur complaint	3	1	2.44	1.55	0.30 (NPPP)
whisper reply	3	1	2.44	1.55	0.30 (NPPP)
shout defiance	15	9	14.64	9.35	0.27 (NPPP)
smile sympathy	5	3	4.88	3.11	0.20 (NPPP)
nod intelligence	2	1	1.83	1.16	0.17 (NPPP)
nod assent	16	132	90.31	57.68	45.91 (ROC)
nod approval	11	21	19.52	12.47	2.78 (ROC)
nod approbation	4	9	7.93	5.06	1.58 (ROC)
nod acquiescence	6	9	9.15	5.84	1.10 (ROC)
smile adieu	2	4	3.66	2.33	0.78 (ROC)
shout bravo	1	2	1.83	1.16	0.47 (ROC)
murmur assent	11	9	12.20	7.79	0.43 (ROC)
smile greeting	6	5	6.71	4.28	0.35 (ROC)
murmur answer	1	1	1.22	0.77	0.20 (ROC)

*** In boldtype, statistically significant collexemes.

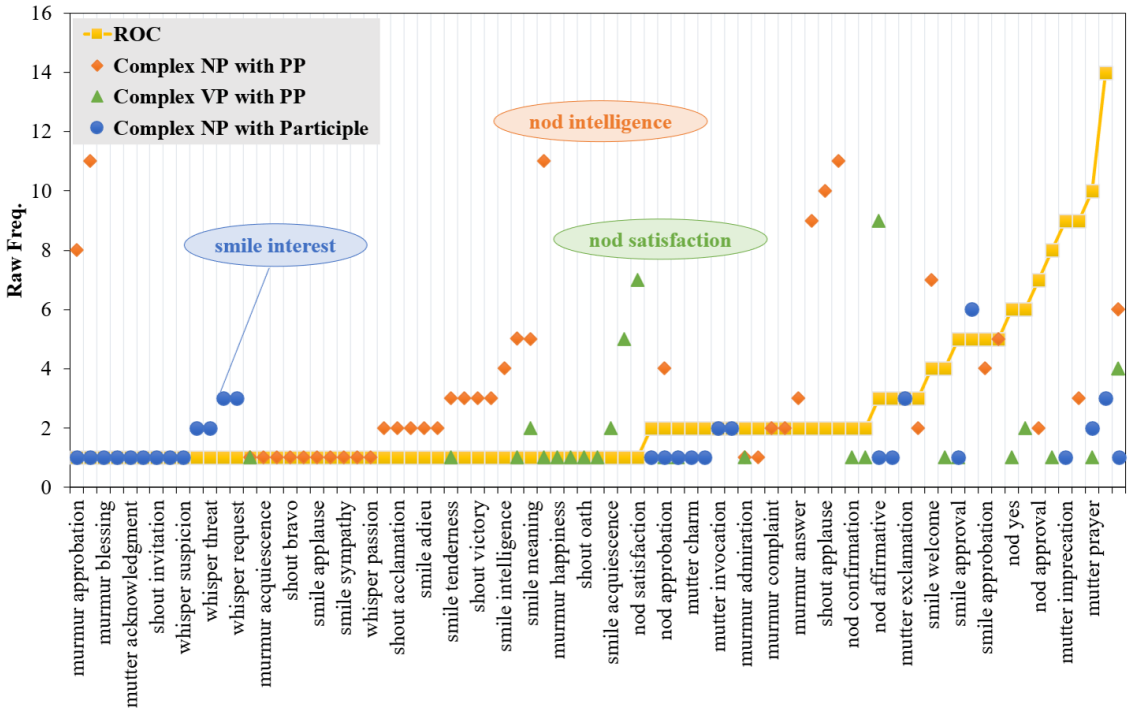
Table 10b. Distinctive collexemes of the Complex NP with PP and the ROC (shaded) in COHA (Period 2: 1900s – 2010s)

Combination	**obs.freq. NPPP**	**obs.freq. ROC**	**exp.freq. NPPP**	**exp.freq. ROC**	**coll.strength**
smile welcome	74	24	42.38	55.61	10.97 (NPPP)
smile recognition	38	6	19.02	24.97	8.71 (NPPP)
murmur approval	39	10	21.19	27.80	6.92 (NPPP)
nod recognition	32	10	18.16	23.83	4.99 (NPPP)
murmur applause	14	1	6.48	8.51	4.18 (NPPP)
smile gratitude	17	5	9.51	12.48	2.94 (NPPP)
murmur assent	34	21	23.78	31.21	2.46 (NPPP)
murmur admiration	13	5	7.78	10.21	1.92 (NPPP)
shout welcome	24	15	16.86	22.13	1.82 (NPPP)
shout applause	14	7	9.08	11.91	1.60 (NPPP)
murmur sympathy	5	1	2.59	3.40	1.24 (NPPP)
shout victory	7	3	4.32	5.67	1.08 (NPPP)
murmur love	4	1	2.16	2.83	0.94 (NPPP)
murmur acquiescence	3	1	1.72	2.27	0.66 (NPPP)
smile greeting	29	33	26.81	35.18	0.48 (NPPP)
murmur approbation	2	1	1.29	1.70	0.39 (NPPP)
smile approbation	2	2	1.72	2.27	0.23 (NPPP)
nod approbation	1	1	0.86	1.13	0.16 (NPPP)
nod assent	21	142	70.49	92.50	18.69 (ROC)
nod approval	58	197	110.27	144.72	14.17 (ROC)
nod understanding	5	42	20.32	26.67	6.09 (ROC)
smile encouragement	2	15	7.35	9.64	2.23 (ROC)
nod acquiescence	4	17	9.08	11.91	1.74 (ROC)
murmur answer	2	10	5.18	6.81	1.27 (ROC)
shout defiance	9	21	12.97	17.02	1.01 (ROC)
whisper passion	1	3	1.72	2.27	0.37 (ROC)
shout bravo	7	11	7.78	10.21	0.34 (ROC)

*** In boldtype, statistically significant collexemes.

Figure 1 Caption. Sources of the ROC verb-noun combinations alongside the Zipfian distribution of the ROC in the BSNC (adapted from Bouso)[69]

Figure 1 Alt Text. The graph shows the Zipfian distribution of the ROC in the BSNC data and the extent to which the verb-noun strings attested in the ROC (horizontal axis) qualify, on the one hand, as novelties or hapaxes in the ROC and, on the other, as more regular patterns in each of the potentially contaminating constructions analysed (vertical axis). For space reasons, not every point in the graph has a label on the horizontal axis. The graph also highlights one distinctive verb-noun combination for each of the potentially contaminating constructions (*nod intelligence*, *smile interest*, and *nod satisfaction*)



[69] 'Contamination', 27. The string *nod assent* for the ROC, which amounts to up to 55 tokens in the BSNC and 44 in CEN, has been excluded from the graphs for the sake of clarity (last column in both graphs; see Figure 2).

Figure 2 Caption. Sources of the ROC verb-noun combinations alongside the Zipfian distribution of the ROC in CEN

Figure 2 Alt Text. The graph shows the Zipfian distribution of the ROC in the CEN data and the extent to which the verb-noun strings attested in the ROC (horizontal axis) qualify as novelties or hapaxes in the ROC and as more regular patterns in each of the potentially contaminating constructions analysed (vertical axis). The graph highlights three distinctive verb-noun combinations for two of the three potentially contaminating constructions of the ROC (*smile / shout welcome*, and *mutter oath*)

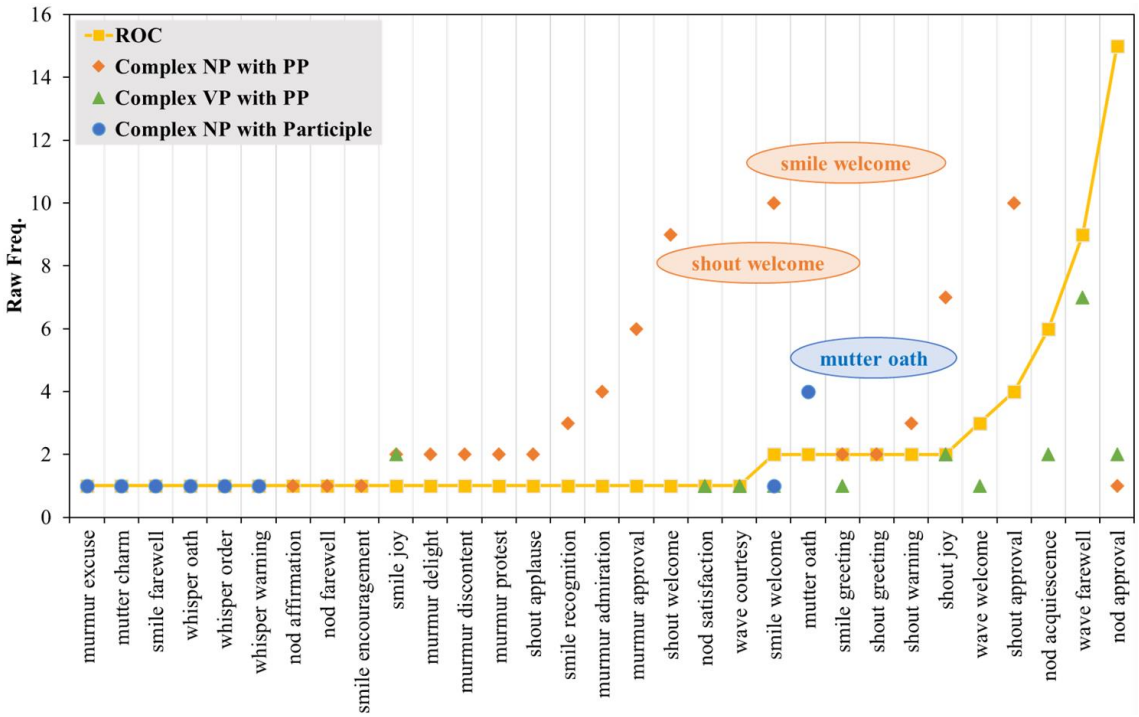
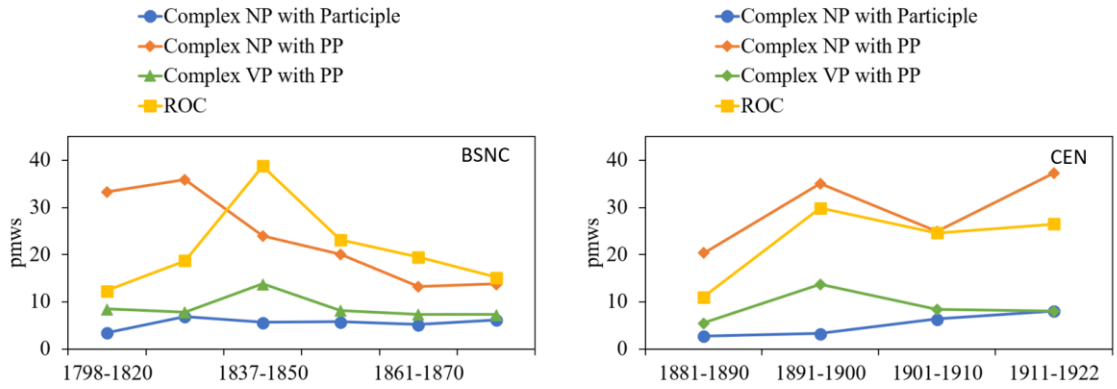


Figure 3 Caption. Diachrony of the potentially contaminating constructions and the ROC in BSNC (1798-1880)[70] and CEN (1881-1922)

Figure 3 Alt Text. In the two graphs, the diachrony of the potentially contaminating constructions and the nineteenth-century ROC in the BSNC and in CEN, respectively. On the vertical axis, normalised frequencies per million words; on the horizontal axis, time sub-periods of each corpus



[70] Adapted from Bouso. 'Contamination', 27.

Figure 4 Caption. Diachrony of the Complex NP with PP construction and the ROC in COHA (1820s-2010s)

Figure 4 Alt Text. The graph shows the historical development of the Complex NP with PP construction and the ROC over the course of the nineteenth and twentieth centuries in American English. On the vertical axis, normalised frequencies per million words; on the horizontal axis, time sub-periods

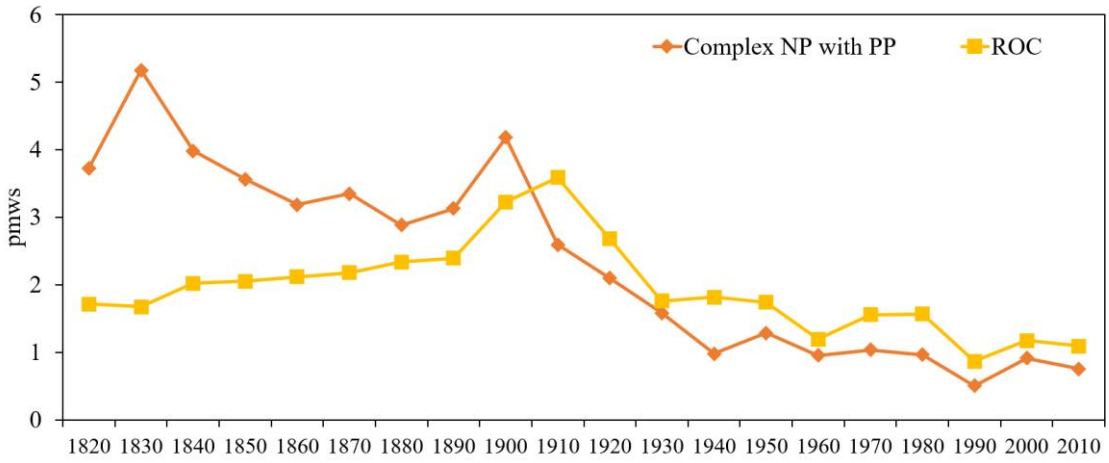
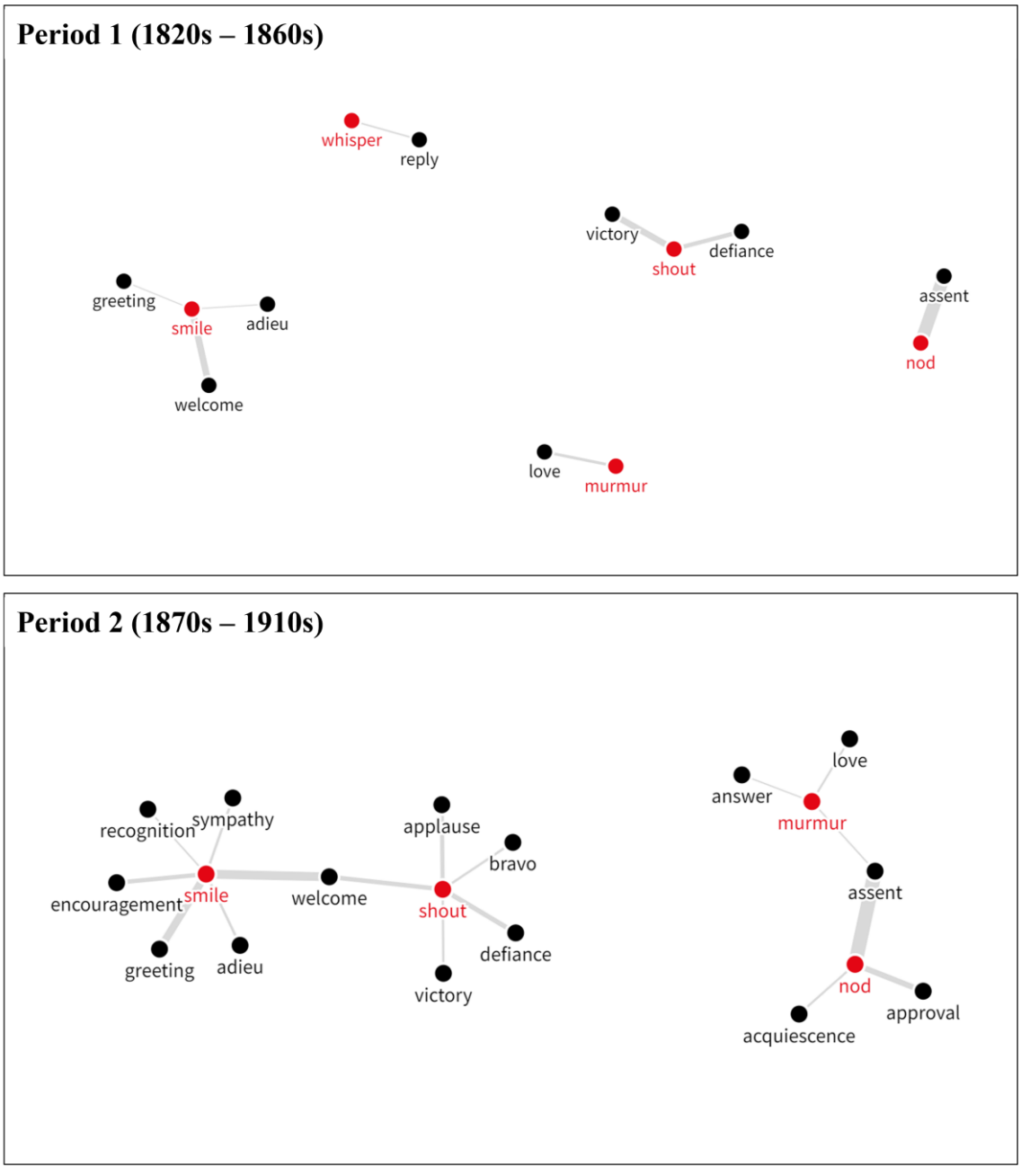
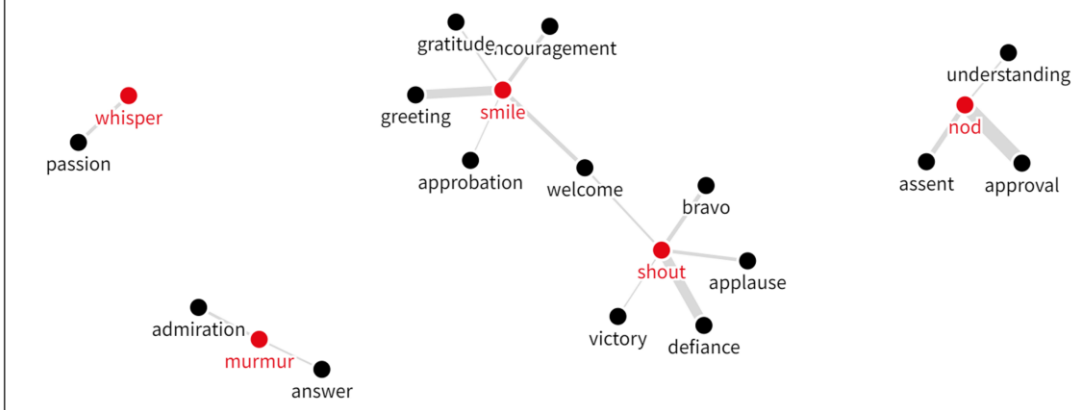


Figure 5 Caption. Diachrony of the most distinctive co-varying collexemes of the ROC
Figure 5 Alt Text. The graph represents the diachronic distribution of the most distinctive collexemes of the ROC over four fifty-year sub-periods, from the 1820s to the 2010s. The thicker the lines, the stronger the association.



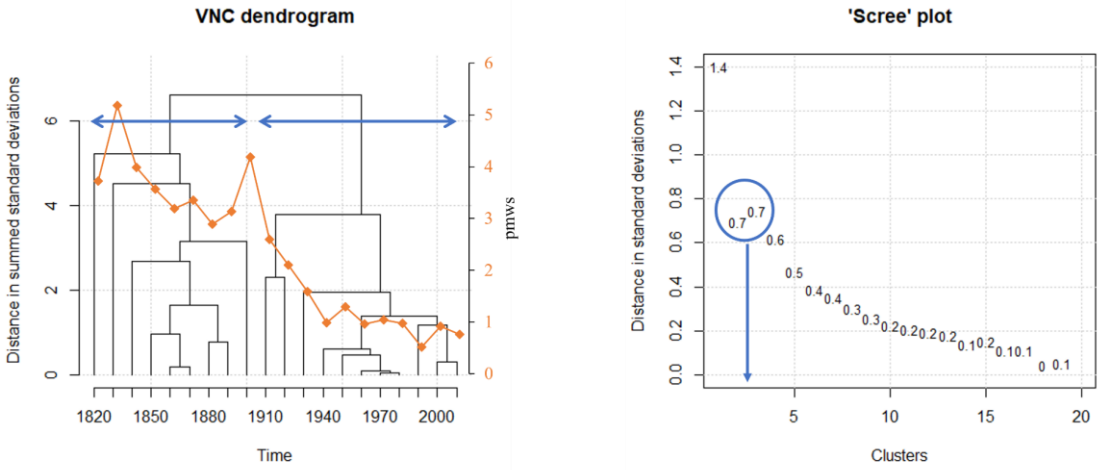
Period 3 (1920s – 1960s)



Period 4 (1970s – 2010s)

Figure 6 Caption. VNC output for the Complex NP with PP construction: dendrogram with overlaid frequency development, and 'Scree' plot

Figure 6 Alt Text. The figure shows a Variability-Based Neighbour clustering dendrogram with the overlaid frequency development of the Complex NP with PP construction. It also indicates with a horizontal line at $y = 6$ that the Complex NP with PP construction data can be best divided into two clusters. On the vertical axis, normalised frequencies per million words; on the horizontal axis, sub-periods of the corpus. The 'Scree' plot on the right shows how much dissimilarity is covered with the two-cluster solution



Word count: 11,579 words