
From movement into action to manner of causation: Changes in argument mapping in the *into*-causative

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Abstract. Over the last 300 years, the *into*-causative (*he talked his father into giving him money*) increased in frequency and lexical diversity. Changes of this kind are often taken as evidence of functional expansion. From a Construction Grammar (CxG) perspective, this paper argues that what appears to be a loss of restrictions on the verbal slot results from changes in argument mapping links. As the construction provides the argument roles by mapping semantics (causer, causee, result) onto syntax (subject, object, oblique), stronger mapping links increasingly facilitated the use of verbs that are semantically and syntactically atypical for the expression of causation. Data from the *Corpus of Historical American English* confirm three predictions of this hypothesis with respect to shifts in (i) the semantic classes of matrix verbs, (ii) their general argument structure preferences, and (iii) voice-marking. The results provide evidence for a subtle semantic change from *movement into action* to *manner of causation*. The increase in frequency and productivity are hence explained as the consequence of the syntactic form becoming a more reliable cue for causative meaning. We discuss implications for models of language change against the background of current issues in Diachronic Construction Grammar (DCxG) pertaining to *constructionalization* vs. *constructional change*.

Keywords. *into*-causative, argument structure constructions, argument mapping, Diachronic Construction Grammar, constructionalization, constructional change, corpus linguistics, association plots

1 Introduction

When constructions increase in frequency, an intuitive explanation is that they have expanded in semantic and/or functional scope, particularly if the rise is accompanied by changes in the lexical material that can occur in it. For example, more attested verbs in an open slot may indicate that the construction imposes fewer constraints on that slot. With fewer restrictions and a wider range of possible verbs, a construction becomes available in more discourse-pragmatic contexts and subsequently increases in usage.

Functional extension is also a plausible explanation for the steep rise of the *into*-causative (*Mary talked John into signing the contract*). In this construction, a causer acts upon a causee such that the causee carries out the action in the *into*-complement. Several synchronic properties have motivated an analysis in Goldbergian Construction Grammar (CxG) (e.g., Rudanko 2011; Stefanowitsch 2014). Most generally, CxG attributes the causative meaning to the syntactic form [SUBJ V OBJ *into* V-*ing*], while the matrix verb specifies how the causation is brought about, even if the verb itself is not causative (i.e., by *talking*).

This article takes a Diachronic CxG (DCxG) perspective to account for the construction's recent developments. Following its emergence in the 17th century from a series of changes in the caused-motion construction (*He put the army into France*; *God put man into doubting*; cf. Flach 2020), the *into*-causative has remained formally and semantically stable, licensing the same types of verbs that characterize its contemporary use. On the other hand, it rose more than five-fold in frequency over the last 200 years and increased in lexical diversity (cf. Section 3; Davies and Kim 2019). These quantitative changes, which

suggest a non-trivial qualitative change, have led to proposals that the construction expanded functionally and became ‘more neutral’ or ‘indirect’ (Davies and Kim 2019; Rudanko 2005, 2006).

This paper attempts to account for the changes from a constructionist perspective: rather than undergoing functional expansion, the *into*-causative has become more idiosyncratic in its expression of causative meaning. The logic is as follows: Goldberg’s (1995) classic version of CxG assumes that an argument structure construction, e.g., [SUBJ V OBJ OBL], provides the argument roles and maps semantics onto syntax (causer–SUBJ, causee–OBJ, result–OBLIQUE). This mapping comes in the form of vertical links between argument roles (syntax) and participant roles (semantics). This implies that the strength of the links correlates with constructional idiosyncrasy: the stronger the links, the greater a construction’s ability to contribute to the meaning of an expression, and hence the greater the construction’s tolerance to license less compatible lexical material.

This article applies these assumptions to the diachronic context in order to account for the quantitative changes. The hypothesis is that the construction’s rise is a result of progressively stronger vertical links. As these become stronger, the *into*-causative is more likely to license verbs that are semantically or syntactically incompatible with constructional semantics. In other words, the syntactic form of the *into*-causative may have become a more reliable cue for causative meaning, increasingly independent of verb semantics and their subcategorization preferences. Crucially, this does not necessarily entail functional-pragmatic expansion of the construction.

These hypotheses will be explored using data from the *Corpus of Historical American English* (COHA). Three case studies track the distributional changes in the semantic classes of the matrix verbs (force, communication), their argument structure preferences (i.e., transitivity), and voice-marking (passive, active). The data show that material which is compatible with constructional semantics was initially overrepresented, while incompatible material gained ground only over time. As an abstract characterization of its semantic development, the *into*-causative subtly changed from profiling *movement into action* to specifying *manner of causation*.

The article aims to make two major contributions. First, it explores the possibility that changes in frequency and/or lexical variability are indicators of change in the strength of links. Second, it discusses the results within a larger Diachronic Construction Grammar (DCxG) context. As research in language change increasingly embraces constructionist ideas, this article seeks to contribute to the debate on the relationship between *constructionalization*, i.e., the creation of new constructions, and *constructional change(s)*, i.e., the change within constructions. To this end, Section 2 discusses the basic tenets of CxG and the historical background of the *into*-causative. Section 3 describes the data set, which is analyzed in three case studies in Section 4. Section 5 discusses the implications for models of language change.

2 Background

2.1 The *into*-causative in a Construction Grammar perspective

The *into*-causative encodes events where a cause(r) prompts a causee to perform the activity encoded in the *into*-complement:

- (1) a. A friend of mine bought a similar machine, maybe better than mine, for \$90. They *tricked me into buying* the machine for \$186 on credit. [COHA, NF, 1971]
- b. As I said, she's a convincer. A talker. She can *talk people into doing* almost anything she wants them to. [COHA, FIC, 1961]
- c. Microsoft appears to use a software industry trade association to cheat, *bullying foreign companies into buying* only Microsoft products. [COHA, MAG, 1998]
- d. Lawmakers wanted to *pressure schools into bringing* test scores of poor and minority children up to the level of their affluent white peers. [COHA, NEWS, 2006]
- e. Let us pray that his love and mercy will comfort the bereaved, heal the injured, and help and *guide leaders into taking* decisions that will avoid more suffering to humankind. [COHA, MAG, 2001]
- f. I will not *sphroxify gullible people into looking up* fictitious words in the dictionary. [COHA, NEWS, 1997]

The basic constructional meaning is 'X CAUSES Y TO DO Z', syntactically expressed in two clauses. The matrix clause encodes the cause event (*they tricked me*), while the complement clause encodes the result event (*I buy the machine*). The *into*-causative exhibits object-control: the object of the matrix clause—e.g., *me* in (a)—is the understood subject of the complement clause, because its referent (*me*) performs the action in the *-ing* clause (*buy the machine*). This separates the *into*-causative from subject-control patterns of the same syntagmatic form (*Mary put energy into completing the project*). These are not *into*-causatives under this definition, because the subject referent *Mary* completes the project, not the object referent *energy*.¹

A Construction Grammar (CxG) framework is particularly suited for the analysis. CxG assumes that constructions are form–meaning pairs, which contribute to the meaning of an expression. This accounts for properties that are unpredictable from either the form of the construction or the elements in its slots (Goldberg 1995: 4). Therefore, the causative meaning in (1) is attributed directly to the syntactic form [SUBJ V OBJ OBL_{into} V-*ing*]. Much of the previous literature on the *into*-causative makes explicit reference to CxG (e.g., Rudanko 2006, 2011; Stefanowitsch 2014), which is warranted for three reasons.

First, the causative meaning is independent of the verbs in the matrix clause. Most verbs, if not all, are neither causative nor typical three-participant verbs. For instance, *talk*, the most frequent verb, is unacceptable with animate objects outside the construction (**She talks people*). It is conventional only in intransitives (*She talks*), complex intransitives (*She talks to people*), or with inanimate themes (*She talks business*). Conversely, the construction does not license verbs that express its constructional meaning, most notably *cause* and *make* (Stefanowitsch 2014: 224). This is in contrast to the ditransitive, for example, where the typical verbs all express the notion of transfer (e.g., *give*, *tell*, *send*, or *offer*; Stefanowitsch and Gries 2003: 229).

Thus, causative meaning cannot be contributed by the verbs, unless we pose 'implausible verb senses' of causation (Goldberg 1995: 9). Rather, the verbs in the *into*-causative specify the *manner* of causation, in contrast to *make*- or *get*-causatives (Gilquin 2010; Stefanowitsch 2001). A more specific characterization of the *into*-causative would thus be 'X CAUSES Y TO DO Z *by means of* V'. Note also that the construction has a distinct resultative effect: *they pressured him into signing the deal* entails that the signing took place, while accomplishment is not necessarily implied in *they pressured him to sign the deal* (Rudanko 2011: 13–16, 2006: 316). In other words, the *into*-causative is inherently telic: while the

¹ Passives have subject-control (*He_i was talked into (him_i) signing the contract*), so it might be more suitable to speak of patient-control. The point is not important here: unlike other argument structure constructions, all passive *into*-causative uses have active paraphrases (and vice versa).

entailment of accomplishment largely depends on the verb in infinitival *to*-complements, it is part of the constructional meaning of the *into*-causative (Rudanko 2011: 13).

The construction's high type-token ratio have led many to ask if and how speaker creativity is limited (Davies 2012b; Davies and Kim 2019; Hunston and Francis 2000; Kim and Davies 2016; Rickman and Kaunisto 2018; Rudanko 2005, 2006; for analyses across varieties, cf. Brunner 2019 and Wulff et al. 2007). However, this is productivity within semantic *classes* (e.g., Gries and Stefanowitsch 2004; Stefanowitsch and Gries 2003; Stefanowitsch 2014): the majority of types and tokens are verbs of trickery or deception (*cheat, con, deceive, fool*), communication or persuasion (*cajole, coax, sweet-talk, wheedle*), fear or irritation (*bully, frighten, intimidate, scare*), and force (*brainwash, pressure, strong-arm, torture*). The remaining types are manner-unspecific verbs of low token frequencies in the *into*-causative (*drive, guide, lead, motivate, stimulate*).

Second, a CxG analysis accounts for these properties by assuming that the construction maps the participant roles causer, causee, and result (semantics) onto the argument roles subject, object, and oblique (syntax). Figure 1 shows a classic CxG representation, with the mapping links represented as arrows.

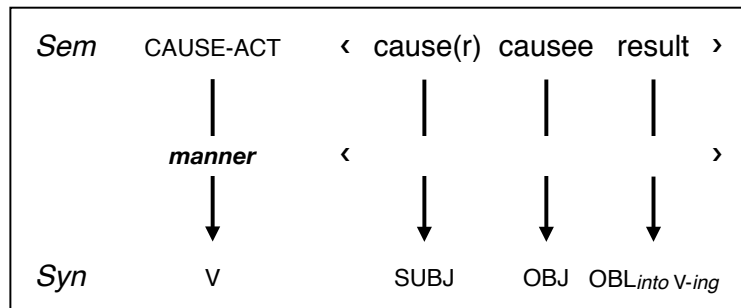


Figure 1: The *into*-causative in CxG (adapted from Stefanowitsch 2014: 220).

The vertical links between syntax and semantics explain why the construction licenses verbs that are neither causative nor typical three-argument verbs—this property is contributed by the schematic construction itself. Nevertheless, the construction has a tendency to attract verbs that have an *implied effect* for action: to *bully, pester, scare, or intimidate* suggests that causees are affected such that they feel compelled to act. Similar implied effects are absent from verbs of transformation and path-creation, such as *throw* (thrower, throwee, location thrown into). They are, as a class, not necessarily compatible with the meaning of causation; some attested verbs include the force verbs *push, drag, and kick*. Like most open-slot constructions, the *into*-causative is therefore not an ‘anything goes construction’ of unconstrained speaker creativity. Its lexical diversity is chiefly diversity within the main classes that are compatible with constructional semantics.

The third motivation for the CxG analysis is based on its close relationship with other argument structure constructions, most notably the caused-motion construction as in *he ushered her into the room* (Rudanko 2011; Figure 2). Both its form [SUBJ V OBJ OBL_{PP}] and its basic meaning ‘X CAUSES Y TO MOVE Z’ are very similar to the *into*-causative (‘X CAUSES Y TO DO Z’). The goal arguments in both constructions encode (metaphorical) movement along a path, which is verbal in the *into*-causative (*into* V-ing), but nominal in the caused-motion construction (*into* NP).

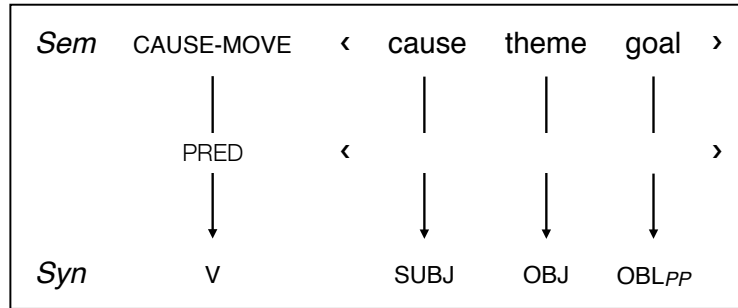


Figure 2: The caused-motion construction in CxG (based on Goldberg 1995: 78).

Yet, the *into*-causative is both more complex and more specific. First, the construction is bi-clausal, i.e., syntactically more complex. Second, the verbs in the *into*-causative are restricted to a few semantically specific classes. Third, following from object-control, the causee is always animate or construed as animate (cf. *schools* in 1d). Fourth, although trivial, it only features one directional preposition (*into*). Fifth, the goal is always metaphorical movement into a state of action ('DO Z') rather than more generally into a container ('MOVE Z'). As none of these properties are predictable from the caused-motion construction, postulating a separate construction is warranted on analytical grounds (Goldberg 1995: 4).

An additional semantic property that is relevant to the diachronic discussion has recently received some attention. On the one hand, the construction implies negativity, manipulation, and reluctance on the part of the causee (Hunston and Francis 2000; Gries and Stefanowitsch 2004; Rudanko 2011; Stefanowitsch and Gries 2003; Wierzbicka 1998; Wulff et al. 2007). On the other hand, the *into*-causative also occurs in neutral or even positive contexts with verbs such as *guide*, *lead*, *encourage*, or *motivate* (Kim and Davies 2016). The absence of negativity or reluctance has been argued to speak against its status as a construction in the CxG sense (Duffley 2018):

- (2) It would be nice to know about the athletes at other times of the year. It will also *guide kids into reading* other things they find in the newspaper. [COCA, 2000]

Duffley's position would be plausible if these properties were necessary conditions for a constructional status. Two arguments can be put forth in response. First, 'neutral' or 'positive' contexts expressed by *guide* or *lead* are rather infrequent. Furthermore, positive or neutral overtone is also characteristic of many *typical* verbs (e.g., *coax*, *flatter*, *talk*). In fact, many of the typical verbs are judged negative precisely because of their frequent use in the *into*-causative. So if *guide* and *lead* appear to be neutral uses, this does not necessarily mean that they are qualitatively different from *talk* or *flatter* outside the construction. Since there are no objective criteria to separate *flatter*, *coax*, and *talk* from *guide*, *lead*, and *motivate* by negativity, we largely refrain from referring to the subjective concept of polarity.

Second, building on the first, even if certain aspects are absent in some usage events—which is a matter of degree, if not definition—, this does not invalidate the generalization over the vast amount of data that *do* exhibit them. Rather, the question is whether negativity, manipulation, or causee reluctance are necessary conditions for constructional status in the first place. They are, in fact, near-inevitable *corollaries* of causation when X acts upon a human Y. It is for this reason that the *into*-causative has a statistical preference for verbs with direct cause-effect relationships with negative motivation on the part of the causer (*scare*, *deceive*, *pressure*) over more unspecific verbs in this respect (*guide*, *lead*, *motivate*).

This would not preclude an analysis of ‘neutral’ uses in a context of constructional polysemy (for MANIPULATION, TRIGGER, or PROMPT frames, cf. Stefanowitsch 2001, 2014; Gries and Stefanowitsch 2004). Crucially, constructional status does not depend on single verbs or infrequent usage events and lexis-syntax interaction is the central argument of CxG (Goldberg 1995: Ch. 2). If that means that children end up reading more through gentle guidance rather than brute force, *guide* instantiates the construction ‘X CAUSES Y TO DO Z by means of V’ rather straightforwardly—as do *lead*, *motivate*, or *encourage*.

This excursion was relevant for the diachrony of the *into*-causative, because unspecific, neutral, and positive verbs have been claimed to be on the increase. If true, this development could be indicative of semantic expansion and/or increased ‘indirect causation’ (Davies and Kim 2019; Rudanko 2006, 2011). However, since polarity and (in)direct causation depend on arbitrary definitions of how specific we take them to be, we focus on shifts in verb classes to approach change (cf. Section 4).

2.2 Diachrony

Since the earliest records in the late 17th century in (3), there has been no morpho-syntactic change. The *into*-causative plausibly emerged from a series of constructional changes in the caused-motion construction, cf. (4), which was subject to shifts towards higher proportions of animate causees and more abstract goal arguments in the 16th and 17th centuries (Flach 2020). The simultaneous rise of *-ing* complements led to ambiguity between nominal (*mourning*) and verbal (*truth-speaking*) readings. As the latter invited object-control interpretations, it was a relatively short step for speakers to extend the construction to sentential complements that define the *into*-causative today (3a, b):

- (3) a. he was honestly *trepanned* ... *into giving* sentence against himself. [EEBO, 1678]
 b. Besides, you *Hector’d me into saying* I lov’d both [EEBO, 1689]
- (4) a. He moved the army *into* France. [into NP]
 b. It turned mirth *into* mourning. [into -ing_N]
 c. They awed us *into* truth-speaking. [into -ing_{N|V}]

Due to a combination of low construction frequency and small corpora, the textual evidence is scarce in the 18th century. The few dozen clear examples in the century after the first attestations are parallel to contemporary use, with verbs of force (a), trickery (b), fear (c), or communication² (d), and miscellaneous verbs (e):

- (5) a. Yes, you villain, you have defiled my own bed, you have; and then you have charged me with *bullocking you into owning* the truth. [CLMET, 1749]
 b. The house was large and elegant, and *betrayed me into furnishing* it rather better than suited my present circumstances [CLMET, 1763]
 c. I wish I could *tease her into loving* me a little. [CLMET, 1781]

² An anonymous reviewer asks whether *flatter* should better be classified as a deception or trickery verb. The point is valid and illustrates the fuzzy boundaries. However, *flatter* evokes trickery here only because it appears in the *into*-causative; in isolation, it simply means ‘excessive praise using speech’ (cf. Section 2.1). Hence, *flatter* and similar speech-related verbs are classified as communication verbs. In addition, communication verbs are too rare in the 18th century to cite a clearer example from this class (e.g., *talk* is not attested until 1834).

- d. the civilities which were shewn her, *flattered her into believing* she had excited a partiality that a very little time would ripen into affection [CLMET, 1782]
- e. Some days after I revived the subject of the drama, and *led him into speaking* of his own plays. [COHA, 1824]

Communication verbs are conspicuously absent in clear object-control readings until the end of the 18th century (cf. Rudanko 2000: 72–73). As we will discuss in Section 4.1 in more detail, they gain significant ground only in the 20th century (see also Davies and Kim 2019: 40). Given their modern prevalence, this may seem surprising, but is in line with expectation, as we shall see below.

So what *has* changed, then? The previous studies that suggest semantic expansion and increased neutral uses (Davies and Kim 2019; Rudanko 2006) are based on the investigations of lexical innovation on a verb-type basis. By contrast, we will take a ‘bird’s-eye’ perspective on verb classes and focus on collective changes that account for the quantitative and qualitative changes in a constructionist framework.

2.3 Assumptions & hypotheses

This section brings together the synchronic CxG analysis (Section 2.1) and the diachronic origin (Section 2.2). The assumed developmental path allows predictions about what to expect in the data. This can test the claim that the *into*-causative develops into an more reliable cue for causative meaning: as the vertical links between semantics and syntax grow stronger, the construction becomes more tolerant towards incompatible material. In other words, as the construction takes over more functions in the division of labor between syntax and lexis, the constraints on verbs weaken. This makes syntactically and/or semantically incompatible verbs more likely to occur. Most generally, the construction changes from profiling movement into action to specifying manner of causation.

The pathway is illustrated in Figure 3. (A) represents the earliest stage, with a focus on movement into action, which reflects the origin in the caused-motion construction. (B) represents an *into*-causative that has inherited a result focus from the stage in (A). The focus on movement into action foregrounds the causee and backgrounds the cause(r), symbolized by the dashed line. (C) repeats the diagram for the contemporary *into*-causative (cf. Figure 1). The difference to (B) is indicated in bold font for *manner* and thicker lines for stronger links between semantics and syntax.

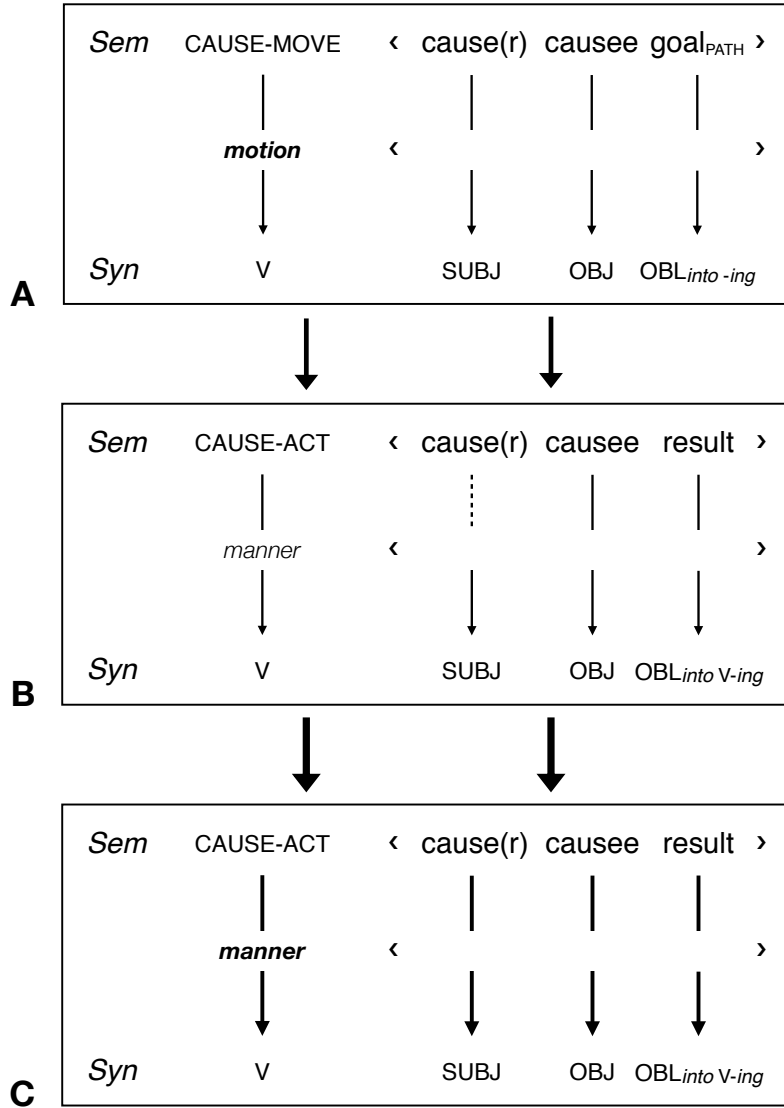


Figure 3: CxG representation of constructional change in the *into*-causative.

Two things should be borne in mind. First, the diagrams are abstractions rather than empirically motivated, and represent generalized landmarks of the developmental path. They are not tied to a particular period. While smaller steps could be posited on theoretical grounds, they can also neither be motivated empirically nor are they relevant for the discussion. Second, the assumed change from movement into action to manner of causation is relative and subtle, and shows only on aggregated data. Even the earliest examples in (3) specify the manner of causation, and, conversely, all modern examples retain a metaphorical movement into a state of action.

If the hypothesis of increasingly stronger argument mapping links is plausible, we expect shifts in the *into*-causative along the following three dimensions.

First, the construction should initially prefer compatible lexical material, i.e., verb classes that encode semantically transitive events, implying a direct cause–effect relationship between a causer and an animate causee. This is clearly the case for verbs of trickery (*deceive*, *fool*, *mislead*) and fear (*intimidate*, *shock*, *terrify*). Conversely, this is much less clearly the case for communication verbs (*argue*, *chitchat*, *scream*). Most communicative events are encoded in complex intransitives with prepositional obliques (*talk to/with sb.*) or with

inanimate themes (*argue a case*). This argument also holds for force verbs: although they express relationships between causer and causee, many prefer inanimate objects (*force a meeting, torture feelings*) or alternative patterns (*pressure/force somebody to do sth.*).

Second, the *into*-causative should initially prefer verbs that usually occur in transitive uses with animate objects, i.e., those verbs with structures and semantics similar to the *into*-causative, while intransitive verbs should gain ground only over time. This prediction is related to the previous one, but focuses on the verbs' argument structure profiles *outside* the *into*-causative.

Third, we will look at the development of voice-marking. By backgrounding the causer, the passive focuses on the causee and hence foregrounds the effect on the causee. Recall that the implication of successful causation is contributed by the construction (Rudanko 2011: Ch. 2). This may be, relatively speaking, a more recent development. If we assume change from *movement into action*, which highlights the effect on the causee (*he was forced into going*; cf. [B]), to *manner of causation*, which profiles *both* causer and causee (*she forced him into going*, cf. [C]), then actives should be relatively more likely in later periods. In other words, such a developmental pattern would indicate that the implication of accomplishment increasingly becomes part of constructional meaning.

From this perspective, rather than expanding functionally, the construction became more idiosyncratic: tighter links facilitate a greater variety of verbs, particularly those that are semantically or syntactically less compatible. In the absence of changes in form and meaning, the shifts are subtle and their empirical evidence is essentially indirect. We assume that constructional change shows as distributional shift (cf. Hilpert 2013: 16), not as a major restructuring of the constructional space.

3 Data

The analyses are based on a CQP conversion of the mid-2015 offline version of the *Corpus of Historical American English* (COHA, 385m words; Davies 2010). Additional examples were cited from *Early English Books Online* (EEBO; via CQPweb at Lancaster University), the *Corpus of Late Modern English Texts* (CLMET-3.1; De Smet et al. 2015), and the *Corpus of Contemporary American English* (COCA; Davies 2008). This section focuses on the extraction of the data for the *into*-causative; Section 4.2 below will describe two samples of verb uses outside the construction.³

To minimize the influence of tagging errors with rare matrix verbs, ad-hoc conversions, or ambiguous *-ing*, the search pattern was maximally inclusive within heuristic sentence boundaries. The query matched any verb, followed by an unspecified number of tokens for objects of any length, followed by the string *into*, optional adverbs, and a string ending in *-ing* (resulting in 14,653 hits).⁴

All data points that were not *into*-causatives by the definition in Section 2.1 were manually removed, especially those with subject control (*she put energy into solving the problem*). Systematically nominal result predicates were also excluded: for instance, *hiding* only occurs in a nominal context (*force sb. into hiding*), while *nursing*, *training*, or *managing* also occur as heads of verbal complements (*getting sb. into training for acts of folly*). In

³ All data is available on my website <https://sfla.ch/data>.

⁴ CQP query: [class="VERB"] []* "into"%c [class="ADV"]* ".+ing?"%c within s. This query also matched cases where the matrix verb is not tagged as a verb, but follows an earlier verb in the sentence and/or where the *-ing* string is tagged as an adjective or a noun.

addition, *being*-predicates were retained only if *be* was a copula (*coax her into being nice to him*), while the ‘existence’ sense was excluded (mostly *call/bring sb./sth. into being*).

The remaining 4,693 data points were annotated for CLASS of the matrix verb (communication, fear, force, trickery, misc), VOICE (active, passive, reflexive), and PERIOD (cf. below). The CLASS variable is based on previous studies, but some classes were combined, e.g. fear/irritation or deception/trickery (Hunston and Francis 2000; Gries and Stefanowitsch 2004; Wulff et al. 2007; Rudanko 2011). A full list of verbs by class is provided in the appendix.

Table 1 summarizes the data. Compared to a previous study based on the same corpus, the number of types ($N = 389$) is lower, while the number of tokens ($N = 4,693$) is higher: Davies and Kim (2019: 34–36) report 544 types and 3,874 tokens. The lower number of types in the current set results from a narrower definition of the *into*-causative as an object-control pattern, excluding verbs such as *bring*, *call*, or *throw*. The type divergence may also be due to the restriction of the COHA offline version, where 10 words every 200 tokens are blanked, which potentially penalizes the (hapax) type count. On the other hand, the higher recall for tokens despite the limits of the offline version results from a more inclusive query that imposes fewer restrictions on the verb, the length of the object, and the tag on the *-ing*-slot.

Table 1: Overview of *into*-causative token and types by period (COHA).

PERIOD	N/million verbs	Tokens	Unique types
P1: 1810s–1850s	15.44	113	46
P2: 1860s–1900s	69.24	763	136
P3: 1910s–1940s	109.33	1,214	200
P4: 1950s–2000s	140.94	2,603	283
COHA		4,693	389

The variable PERIOD represents larger temporal bins, which were determined by Variability-based Neighbor Clustering (VNC; Gries and Hilpert 2012). VNC clusters adjacent decades into larger bins in a bottom-up fashion, based on their similarity in relative frequency, which avoids arbitrary periodization. In the current analysis, larger bins are preferable because the *into*-causative is very infrequent in earlier COHA decades; larger bins hence safeguard against a disproportionate influence of fluctuation in the data and facilitate the detection of developmental patterns by sensible data aggregation.

One such development is illustrated in the left panel of Figure 4. The line suggests a uniform increase in frequency (per million verbs [pmv]). However, the lengths of the VNC bins indicate a slight s-curve development: P3 (1910s–1940s) is the shortest period with four decades, while P1 and P2 (1810s–1850s, 1860s–1900s) contain five and P4 (1950s–2000s) contains six decades. Hence, P3 hints at a slight acceleration of usage, before the increase levels off in the second half of the 20th century. The horizontal bars represent period means of per million verbs (pmv).

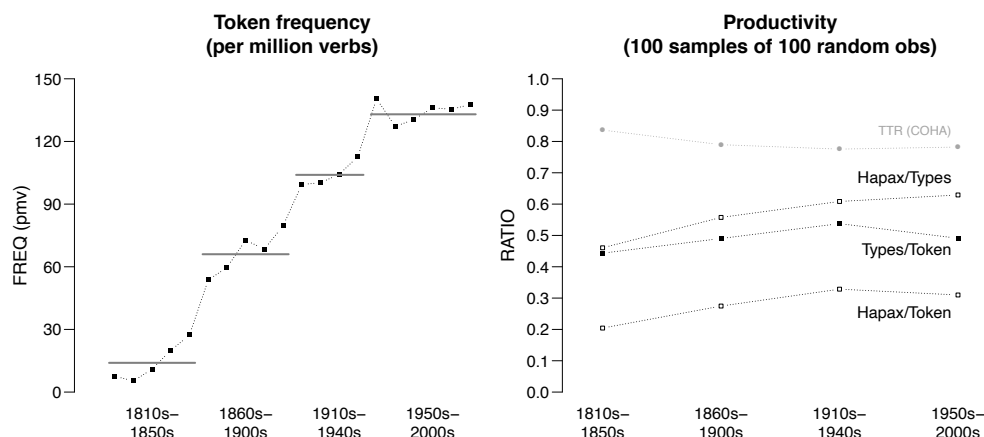


Figure 4: Frequency and lexical diversity in the *into*-causative (COHA). Left: frequency with VNC periods. Right: productivity, averaged values over 100 samples of 100 random *into*-causative tokens in each period; TTR(COHA) shows average corpus type-token ratio by the same method (all based on a sampler version of COHA of 16m tokens per decade).

Before we proceed with the analyses, we briefly discuss the increase in lexical diversity (right panel, Figure 4) and the problems associated with measuring productivity in a diachronic context. Proportions of types, tokens, and hapaxes depend on corpus size *and* construction frequency. As both increase (cf. Davies 2012), the ratios are based on a size-balanced sampler of COHA (16m tokens per decade from the 1840s). They were determined by averaging over 100 samples of 100 random verb tokens in each period, both for the construction and general main verbs in the corpus (cf. Perek 2018: 73 for a similar approach).

The pattern appears to support the claim that the construction became more lexically diverse. The divergent shape of the curve for the type-token-ratio in COHA (TTR) suggests that this may not be an artefact of corpus composition. However, it remains doubtful whether this is an appropriate strategy, even if corpus and construction sizes are held constant in sampling. After all, the samples are drawn from a corpus that is fed from increasingly more varied sources: as more authors contribute to the corpus and especially the construction, more diverse topics are included. This also increases the likelihood of finding a greater diversity of verbs in samples. Therefore, diversity measured this way cannot be distinguished from effects of constructional change, which adds to the known mathematical problems of differently-sized corpora (for discussions on productivity-related issues in a diachronic context, see e.g., Barðdal 2008; Hilpert 2018a; Perek 2018). Hence, the analysis in this study focuses on classes rather than on individual verb types.

4 Analysis

Building on the discussion in Section 2.3, this section investigates changes in mapping links from three angles: shifts in the verb classes in the *into*-causative (Section 4.1), shifts in the argument structure profiles of verbs outside the *into*-causative (Section 4.2), and shifts in voice-marking (Section 4.3).

4.1 Shifts in verb classes

4.1.1 Aim and data

This section analyses the distributional shifts in CLASS of 4,693 tokens. This is preferable over tracking frequencies changes of individual verbs, which may themselves become more or less frequent over time. We look at the interaction of CLASS and PERIOD, first by tokens, then by unique types.

4.1.2 Results

Table 2 shows the distribution of CLASS by PERIOD. Contingency tables are often assessed using a chi-square test, which confirms that the distribution shows a statistically significant interaction ($\chi^2 = 138.74$, $df = 12$, $p < .0001$, Cramér's $V = .1$).

Table 2: *Into*-causative by CLASS and PERIOD (tokens).

CLASS	PERIOD				SUM
	P ₁ 1810s–1850s	P ₂ 1860s–1900s	P ₃ 1910s–1940s	P ₄ 1950s–2000s	
trickery	54	274	388	719	1,435
fear	27	211	306	534	1,078
misc	7	68	91	134	300
force	8	107	225	588	928
communication	17	103	204	628	952
SUM	113	763	1214	2,603	4,693

However, since the χ^2 value is a measure for the entire table, it masks detailed patterns, especially the direction of an effect. Row- or column-wise percentages would be more informative, but are hard to read and can only be expressed either by row *or* by column. As an alternative, residual-based association plots are an intuitive way to interpret tabular data (Friendly 1992; Zeileis et al. 2007). Association plots are essentially visualized chi-square tests that show each cell's contributions to the overall χ^2 value. In contrast to line and bar plots of (relative) frequencies or tables with proportions, they show several pieces of information at a single glance.

Figure 5 is the plot for Table 2. The tile width mirrors frequency: more frequent classes have wider tiles and periods with more data points have wider columns. Most interesting for the detection of trends is the distribution of tile color, which indicates whether a CLASS-by-PERIOD combination is over- (blue) or underrepresented (red) relative to the overall distribution. Color depth shows association strength: it is darker for stronger (dis)preference. If there were no interaction between verb classes and time, most or all cells would be grey. While the primary asset of association plots is the identification of patterns, it helps to know that residuals greater than ± 2 indicate statistically significant cells at $p < .05$ (± 3 at $p < .01$, etc.). Finally, note that although the effect size for this table is very weak in statistical terms (Cramér's $V = .1$), this is expected for subtle changes that do not reshuffle a distribution.

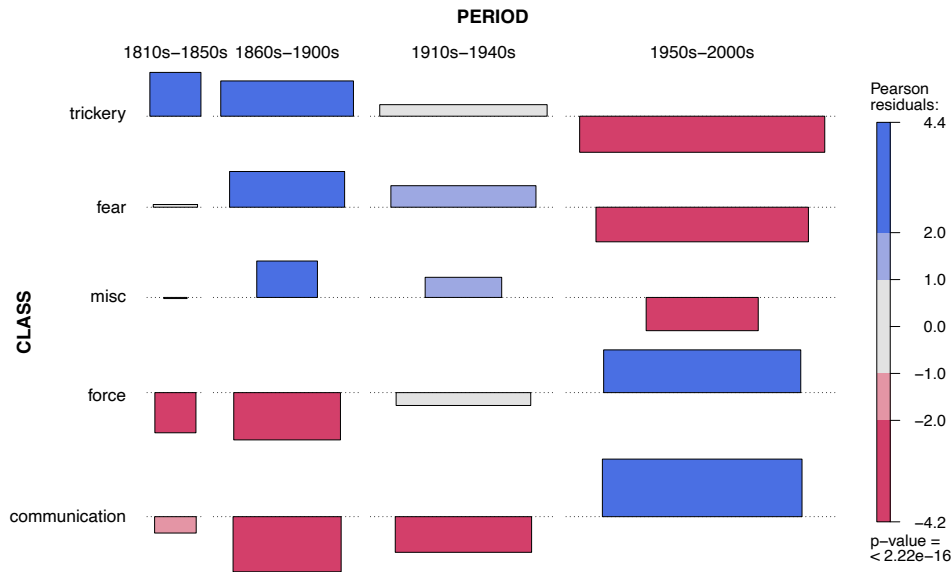


Figure 5: Residual-based association plot of CLASS by PERIOD (tokens).

Association plots are a simple, but very useful approach to patterns in diachronic (or ordered) data (Smirnova et al. 2019). They can indicate a trend horizontally from left to right and, depending on the order of rows, diagonally from top left to bottom right. For the *into*-causative, trickery, fear, and miscellaneous verbs are predominantly associated with earlier periods (cluster of blue tiles in the top left), while force and communication verbs are underrepresented (cluster of red tiles in the bottom left). This pattern is reversed in the later periods, especially when comparing P1/P2 to P4.

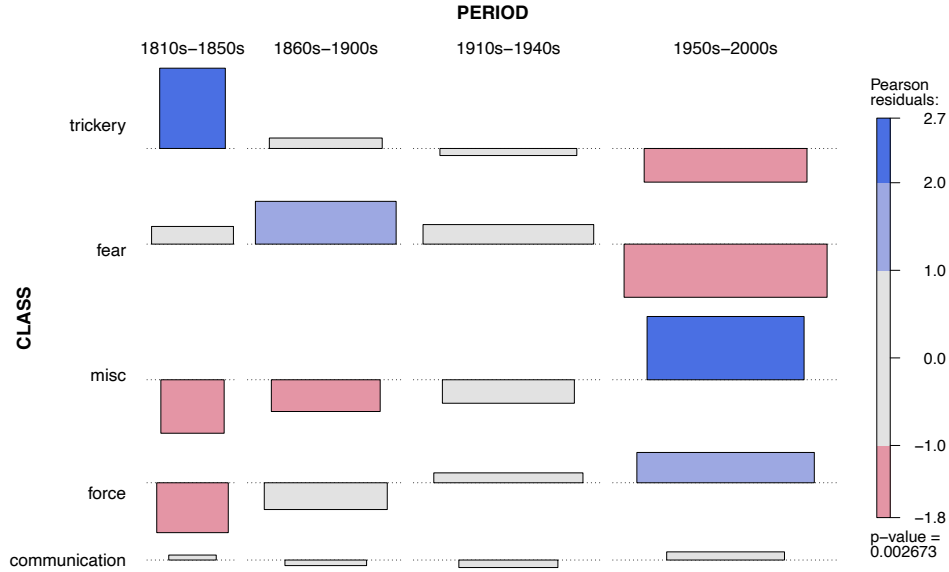
Two points should be noted with respect to the logic of association plots and how they should (not) be interpreted. First, distributions will necessarily show a cross-over somewhere in the table as the direction of association changes. The grey or lightly shaded tiles in P3 illustrate this effect. These cells must be assessed relative to whether they continue a trend. Crucially, the cross-over in P3 should not be interpreted in a way that attributes the major *linguistic* change to the 1910s-1940s. This is because the data for this (or any) period is not independent of the data in other periods (cf. Section 5). Second, the pattern does also not mean that trickery, fear, or miscellaneous verbs are on the decline. Quite to the contrary: they increase with an increasing construction, reflected in wider tiles in later periods.⁵ Thus, association plots focus on the *likelihood* of one class over another in a period relative to their occurrence across time. This means that individual cells are only meaningfully interpreted relative to all other cells. Put differently, association plots prioritize a trend ('interaction between variables') over individual variables (i.e., cells or tiles).

With one very notable exception, the same pattern emerges for types. Table 3 summarizes the distribution of unique types by period, visualized in Figure 6. While the table dimensions remain constant (5x4), there are fewer data points ($N = 665$), which explains lighter shades ($\chi^2 = 30.13$, $df = 12$, $p < .01$, Cramér's $V = .12$).

⁵ This also holds for the data from the COHA sampler and/or relative (pmv) frequency.

Table 3: *Into*-causative by CLASS and PERIOD (unique types).

CLASS	PERIOD				SUM
	P ₁ 1810s–1850s	P ₂ 1860s–1900s	P ₃ 1910s–1940s	P ₄ 1950s–2000s	
trickery	17	28	37	46	128
fear	16	50	65	68	199
misc	3	19	31	66	119
force	5	26	48	73	152
communication	5	13	19	30	67
SUM	46	136	200	283	665

Figure 6: *Into*-causative by CLASS and PERIOD (unique types).

The overall trend holds, except for communication verbs, which have no type-association with a period in this set (row of grey tiles). This is in part because they are the class with the fewest types ($\sim 10\%$), despite their large share in tokens ($> 20\%$).

The only marked and relevant difference over the token-based perspective is the pattern of the miscellaneous verbs. In technical terms, this is very much for the inverse reason as for the communication verbs: miscellaneous verbs make up roughly 18% of types (119/665; cf. Table 3), but contribute only 6% of tokens (300/4693; cf. Table 2). The majority of the miscellaneous verbs are hapaxes or low-frequency verbs, with the exception of *drive* and *lead*. However, in *linguistic* terms, their early overrepresentation by tokens (like trickery and fear verbs) and their later overrepresentation by types (like force and communication verbs) is not a fluke in the data, but indicative of a construction-internal change, as we discuss below.

4.1.3 Discussion

Recall that typical two-argument verbs with direct causer–causee relationships were expected to be initially overrepresented, because these are most compatible with the constructional semantics of the *into*-causative. Conversely, classes with a less clear collective behavior in semantic transitivity should initially be underrepresented. This is exactly what we find: the former is borne out by the positive association of trickery and fear verbs with

earlier periods, while the latter holds for force and, at least by tokens, for communication verbs, which are relatively more likely in later periods.

The pattern for force verbs appears unexpected. Intuitively, *force*, *coerce*, or *pressure* are typical verbs for expressing cause-effect relationships between causer and causee. We should thus expect them to pattern like trickery of fear verbs. However, a closer look at their historical behavior speaks against this expectation and in favor of a construction-internal change in line with the hypothesis.

On the one hand, there is the question of changing frequencies: some verbs enter the language and become more frequent, others become less frequent. In theory, this can affect the relative rise of this class in a construction, if the majority of force verbs are new (discourse or textual) developments. An example for a new verb is *pressure*, which is first attested in the construction in the 1940s and is one of the most frequent force verbs in the construction today. It is also a relative newcomer to English, which appears from the 1880s onwards, but reaches its modern-day frequency only by the 1960s. Other examples include *cudgel*, which has become less frequent, both in the construction and the corpus, and *torture*, which decreases in the corpus, but has remained constant in the construction. Such examples eliminate the (hypothetical) possibility that the force verbs in the *into*-causative are new verbs in the language.

On the other hand, the possibility of pre-empting constructional preferences is more interesting: synchronically, force verbs prefer alternative patterns, most notably *to*-infinitival complements (Rudanko 2006). However, in 19th century texts, *force* was neither predominantly used transitively with an animate object (*we force the people*), nor with a *to*-complement (*we force them to comply*). An analysis of 25 random *force* observations per decade shows that only 48% occur with an animate object in P1 (which rises to 80% in P4) and only 36% with a *to*-complement (which rises to 63% in P4). More typical uses in the 19th century were *force the door open* or *force a discussion*. By the same token, it was *feelings* and *minds* rather than *people* that were tortured, at least in 19th century writing. While these competing argument structures did not preclude uses of *force* or *torture* in the *into*-causative, they affected their *probability* to occur. In other words, there *are* pre-empting constructions, but in a slightly different form. We will discuss shifts in argument structure profiles of matrix verbs more systematically in the next section.

Finally, the diverging behavior of miscellaneous verbs by tokens and types deserves some discussion (cf. Section 4.1.2). Recall from Section 2 that claims about expansion towards neutral or positive uses hinges mostly on the development of verbs in this class (Davies and Kim 2019; Rudanko 2006). As Figure 5 shows, they are overrepresented in P1 and P2 by tokens. Also recall that the tokens in this class are contributed primarily by *lead* and *drive*, which are the only systematically licensed motion verbs.⁶ Given the skew, the association of this class with earlier periods by *tokens* is a remnant of the origin in the caused-motion construction. By contrast, miscellaneous verbs are overrepresented in later periods by *types* (Figure 6).

These patterns reflects two overlapping developments, which can both be linked to construction-internal changes. On the one hand, the shift away from profiling movement into a location means that the high-token contributors *lead* and *drive* have a *decreasing* likelihood to occur. Hence these verbs are increasingly underrepresented by *tokens*. On the other hand, the shift towards profiling the manner of causation means that the construction becomes more capable of licensing atypical intransitive verbs. Hence, miscellaneous verbs are progressively overrepresented by *types*. New types in P4 are mostly hapaxes with

⁶ Proportion of *lead/drive* tokens in the miscellaneous class (P1–P4): 85%, 67%, 51%, 26%.

intransitive or transitive-inanimate semantics (e.g., *brainstorm*, *catapult*, *direct*, *groom*, *initiate*, *rationalize*, *subsidize*, or *trigger*). In other words, these verbs feed on stronger mapping links over time.

This observation resolves two apparently conflicting earlier findings. Rudanko (2006) suggests that the construction has become more neutral, based on an increase in manner-neutral verb *types*. Davies and Kim (2019: 44) and Kim and Davies (2016: 80) reject this claim as they do not find a substantial increase in manner-neutral *tokens*.⁷ The association perspective above reconciles these positions: both approaches tap into the same phenomenon, they just look at two sides of the coin.

4.2 Shifts in verb argument structure

4.2.1 Aim and data

The discussion of *force* in the previous sub-section raises the question if shifts in argument structure preferences provide systematic evidence of constructional change. Weaker mapping links should show in an initial preference for verbs which are readily compatible with constructional syntax and semantics (i.e., transitive verbs with animate objects). As mapping links become stronger, the construction should increasingly license verbs that are less compatible (i.e., transitive verbs with inanimate objects; intransitive verbs).

Since it is not feasible to survey argument structure profiles for all 398 types in sufficient quantities for each verb in each decade, two samples were devised, one type-balanced and one unbalanced. If the results from both samples converge, they provide evidence that the results are not due to a particular sampling strategy.

For the type-balanced sample, all matrix verbs that occur in the *into-causative in a given period* were queried in COHA in that period. Then, 100 observations of each verb were randomly selected; if a verb occurs fewer than 100 times, all observations were included. From this list, 200 observations *per decade* were randomly selected (excluding *into-causatives*). Finally, from the list of 4,000 tokens for all 20 decades, 500 observations were sampled per period, for a total of 2,000 data points. This sampling method avoids a token overrepresentation of atypical verbs which are frequent in the corpus (*guide*, *work*) and avoids a token underrepresentation of typical verbs which are rare in the corpus (*betray*, *seduce*, *deceive*). However, *get* was excluded, where the mismatch between corpus and construction frequencies is greatest.

The second sample is unbalanced. Like the balanced sample, each matrix verb that occurs in a period was queried in that period. Then, 200 observations per period were randomly selected (excluding *into-causatives*), irrespective of how frequent the verb types are, for a total of 800 observations (*get* was again excluded).

All observations were coded for the ANIMACY of the direct object (animate, inanimate) or as intransitive if an NP object was absent. Animate objects include humans, animals, and collectives (*government*, *congress*). Complex intransitives with prepositional obliques (*talk to/of sb./sth.*, *scream at sb.*) or sentential complements (*she argues that S*, *he threatens to V*) were coded as intransitive. Coding for argument structure in this way is a simple but

⁷ The token frequency plot in Davies and Kim (2019: 44) *does* show an increase for manner-neutral verbs. However, since the construction increases, their interpretation is probably appropriately cautious. In any case, it illustrates the advantage of association plots over frequency graphs: while Davies and Kim (2019: 44) argue that manner-neutral verbs have always been present (rejecting Rudanko's claim of a recent development), the association view disentangles the effects of token- and type-based changes.

effective approximation and suitable to capture verb subcategorization preferences for the purpose of the present analysis.

4.2.2 Results

The overall patterns are identical for the type-balanced (Table 4, Figure 7) and the unbalanced samples (Table 5, Figure 8). This suggests a construction-internal effect: earlier periods are associated with transitives with animate objects, while inanimate objects and intransitive patterns are dispreferred. This pattern is reversed in later periods, which are associated more strongly with inanimate objects and intransitives.

Table 4: Object animacy of verb uses outside the *into*-causative (type-balanced sample)

PATIENT/ THEME	PERIOD				SUM
	P ₁ 1810S–1850S	P ₂ 1860S–1900S	P ₃ 1910S–1940S	P ₄ 1950S–2000S	
animate	383	301	281	251	1,216
inanimate	80	100	105	152	437
intransitive	37	99	114	97	347
Sum	500	500	500	500	2,000

$\chi^2 = 97.08$, $df = 6$, $p < .0001$, Cramér's $V = .16$

Table 5: Object animacy of verb uses outside the *into*-causative (unbalanced sample).

PATIENT/ THEME	PERIOD				SUM
	P ₁ 1810S–1850S	P ₂ 1860S–1900S	P ₃ 1910S–1940S	P ₄ 1950S–2000S	
animate	105	68	50	44	267
inanimate	31	49	53	58	191
intransitive	64	83	97	98	342
Sum	200	200	200	200	800

$\chi^2 = 51.44$, $df = 6$, $p < .0001$, Cramér's $V = .18$

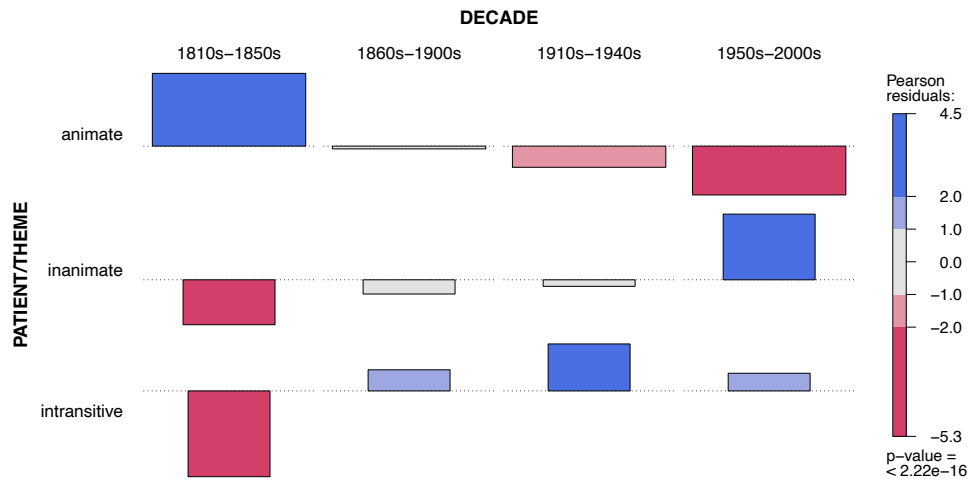


Figure 7: Object animacy in verb uses outside the *into*-causative (type-balanced sample).

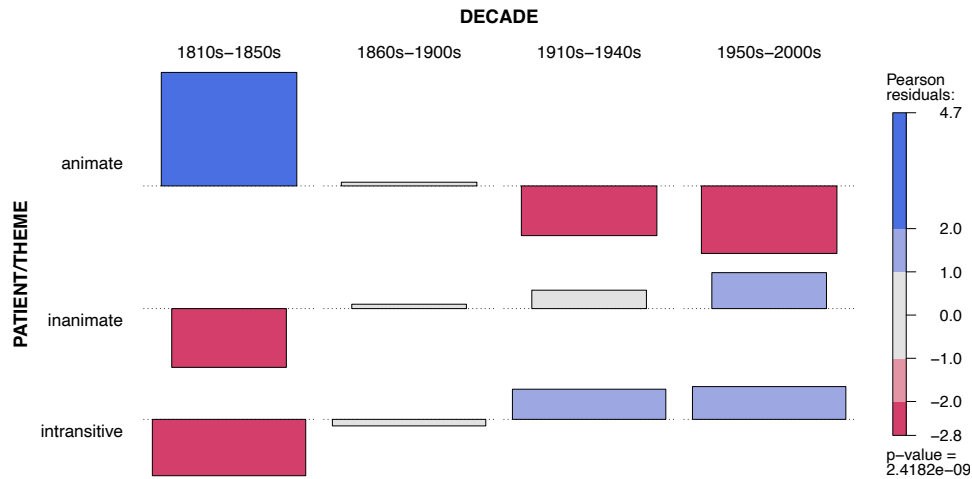


Figure 8: Object animacy in verb uses outside the *into*-causative (unbalanced sample).

4.2.3 Discussion

Although the patterns are based on data beyond the *into*-causative, they are insightful in the following way. In the earliest periods, the typical verb that occurs in the *into*-causative is used transitively with an animate object outside this construction. By contrast, verbs with inanimate objects and intransitive verbs are relatively more likely only in later periods. Again, this does not mean that transitive verbs decrease; but they occur with a lower probability relative to other verbs. In other words, incompatible lexical material ‘gains ground’ over time.

The patterns make sense assuming weaker initial mapping links. Transitive verbs with a statistical preference for animate objects are more compatible with causative events that involve an animate causee; they do not ‘require’ arguments supplied by the construction as much as intransitive verbs. Over time, stronger links increase the probability that the construction occurs with atypical (transitive–inanimate) or incompatible (intransitive) verbs. The fact that intransitives are associated with the construction earlier than transitives with inanimate objects (indicated by earlier blue tiles for intransitives) may have to do with the fact that intransitives include complex intransitives with obliques. This distinction was not separately coded, because the difference between oblique and adjunct is often unclear. But complex intransitives with an animate referent in the oblique (*talk to sb.*, *scream at sb.*) are arguably more compatible with the construction than transitives with inanimate objects (*argue a point*, *ridicule authority*).

The patterns converge with Rudanko’s (2005) detailed by-verb analyses, which found that many of the new manner-neutral verbs in the 20th century prefer verbal *to*-complements. Over time the *into*-causative increasingly licensed verbs independently of verb semantics or pre-empting argument structure profiles. The approach lends support to the methodological focus on verb classes, as it is less sensitive to the subjectivity of coding for polarity.

Note at this juncture that the ‘cross-over effect’ for argument structure (P2, 1860s–1900s; Figures 7 and 8) occurs earlier than for semantic classes (P3, 1910s–1940s; Figures 5 and 6). Although association plots show relative shifts, this could tentatively be interpreted such that the construction’s tolerance first extended to syntactically less compatible verbs within semantically compatible classes, before it extended to semantically incompatible classes.

4.3 Shifts in voice marking

4.3.1 Aim and data

This section looks at shifts in voice-marking: *into*-causatives are either active (*I deceive you into believing*), passive (*I was deceived into believing*), or reflexive (*I deceived myself into believing*). Recall that the passive foregrounds a causee and hence profiles the resulting effect, while the active profiles all participants. Also recall that the *into*-causative implies that the causation was successful. Therefore, the distributional patterns should show a relative shift from passive to active marking: actives should be relatively more likely in later periods as the implication of accomplishment becomes part of constructional meaning. This section investigates voice marking on all 4,693 *into*-causative tokens.

4.3.2 Results

Table 6 shows the distribution of VOICE by PERIOD, visualized in Figure 9. There is a significant interaction of voice-marking with time in line with the expectation: passives are overrepresented in the first two periods, while reflexives and actives characterize periods P3 and P4, respectively.

Table 6: VOICE by PERIOD in the *into*-causative.

VOICE	PERIOD				SUM
	P ₁ 1810s–1850s	P ₂ 1860s–1900s	P ₃ 1910s–1940s	P ₄ 1950s–2000s	
passive	56	332	363	582	1,333
reflexive	2	18	77	115	212
active	55	413	774	1,906	3,148
Sum	113	763	1,214	2,603	4,693

$\chi^2 = 173.77$, $df = 6$, $p < .0001$, Cramér's $V = .14$

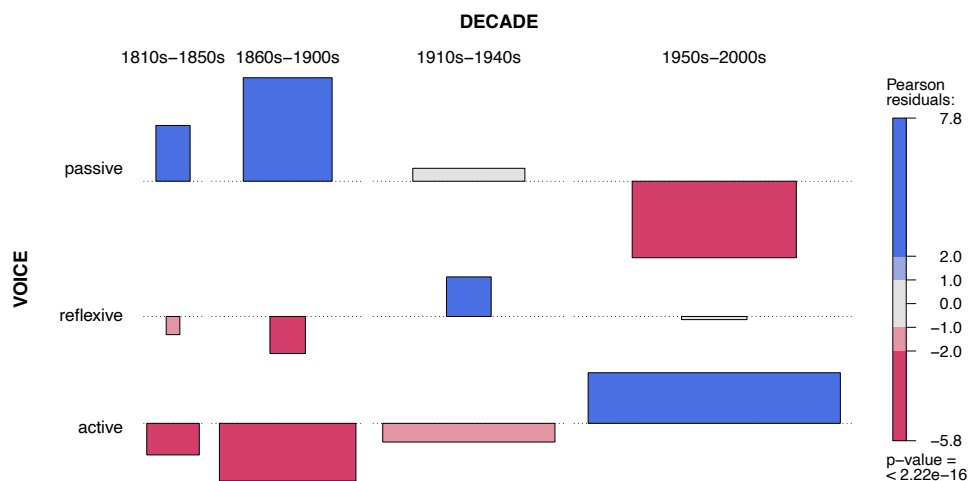


Figure 9: Residual-based association plot of VOICE by PERIOD.

One caveat here is the general decrease of passives in COHA. However, the developments do not proceed in parallel. Kendall's τ (Hilpert and Gries 2009)⁸ shows that the passive declines more uniformly in the corpus ($r_{\tau(20)} = -.89$) than in the *into*-causative ($r_{\tau(20)} = -.58$), reflecting an initially faster rate of decline in the construction. That voice-marking on the *into*-causative is a corpus-independent development is further supported by the increase of reflexives in the construction ($r_{\tau(20)} = .65$), despite their decrease in the corpus ($r_{\tau(20)} = -.81$).⁹ Reflexives, which have co-referential causer and causee, are semantically similar to actives. Hence, their intermediate developmental position between passives and actives adds weight to the assumption that this represents a meaningful construction-internal development.

4.3.3 Discussion

Similar to the analyses above, there is a systematic trend of stronger mapping links. Earlier periods have a higher probability of profiling causee and result. Again, the pattern does not imply that passives become less frequent over time: they increase with an increasing construction. What we observe is, again, a subtle relative shift within the construction.

A potential confound pertains to the interaction of voice, the passivizability of verbs, and their development in the construction. Since communication verbs are generally less likely in the passive (?*she was chitchatted*), their stronger association with the construction in later periods could be the main contributor to the increase of actives. However, three points suggest that the rise of communication verbs alone cannot account for this pattern.

First, force verbs, which are most strongly attracted to the passive, also increase over time. This potentially cancels out the effect of more frequent communication verbs. Second, with the exception of (some) communication verbs, the verbs' general attraction to the passive does not influence voice marking in the *into*-causative in a synchronic data set (cf. Flach 2018). Third, all verbs in the *into*-causative are passivizable (?*she was chitchatted*, but *she was chitchatted into V-ing*). In other words, the passive in the *into*-causative profiles the relationship between cause and causee independently of a verb's passivizability *outside* the construction.

While the evidence for constructional change here is indirect, the interaction between voice and time is plausibly interpretable under the assumption that the implication of successful causation becomes part of constructional meaning that makes active uses more likely (cf. Section 2; Rudanko 2011: 13–16).

5 General discussion

This final section serves two purposes: first, it puts the results into the context of previous research. Second, as this paper tried to account for the changes from a Diachronic Construction Grammar (DCxG) perspective, the insights will be used to address one of the central open issues in the emerging field of DCxG. As diachronic linguists increasingly

⁸ Kendall's τ ranges from -1 (perfect negative correlation) to 1 (perfect positive correlation). The coefficient can be interpreted as measuring the stability of decrease or increase, respectively, where values closer to 0 indicate a non-uniform development. Kendall's τ is measured across 20 COHA decades for reasons of sample size.

⁹ Approximating passives: *be [adv]* v.n.* Approximating reflexives: a main verb (tags vv.*) followed by a reflexive pronoun (tags ppx1, ppx2).

adopt constructionist ideas, the relationship between *constructionalization*, i.e., the creation of a new form–meaning pair, vs. *constructional change*, i.e., change(s) *within* a form–meaning pair, is currently undergoing conceptual and empirical refinement (Hilpert 2013, 2018b; Traugott and Trousdale 2013).

As regards the first point, this paper argued that the changes in the *into*-causative involved, most abstractly, a shift from profiling motion into action to specifying manner of causation. Applying the classic synchronic CxG idea of argument mapping between syntax and semantics (Goldberg 1995), we investigated the hypothesis that the construction’s ability to supply argument and participant roles grew over time. Stronger links between semantics (causer, causee, result) and syntax (subject, object, oblique) increased the likelihood that the construction tolerated semantically or syntactically incompatible verbs. Since stronger links correlate with greater constructional idiosyncrasy, the form itself became a more reliable cue for the expression of causative meaning. This facilitated the usefulness of the construction in more discourse-functional contexts, which then contributed to its increase in usage.

Three case studies put the predictions of these assumptions to the test, and the results provide evidence for a constructionist scenario. First, the construction initially preferred verb classes with direct cause–effect relationships between causer and causee and dispreferred classes which show less consistent behavior in this regard. Second, independent of semantic class, the *into*-causative initially preferred transitive verbs with animate objects (i.e., syntactically compatible verbs), and dispreferred intransitive verbs or verbs with inanimate objects. Third, the *into*-causative initially had a higher likelihood of occurring in the passive—which profiles causee and result—over the active, which profiles both causer and causee. This indicates that the implication of successful causation may have become a more salient part of constructional semantics. As a tentative hypothesis, the results in Sections 4.1 and 4.2 indicate that constructional tolerance first spread to syntactically atypical verbs that are semantically similar, before it spread to verbs that are both syntactically and semantically atypical, although this may require more fine-grained analyses.

The association-based view is a methodological alternative to type- or token-based investigation of changes in (mostly) low-frequency verbs. This approach is more multifactorial than normalized frequency curves and therefore less sensitive to shifts in the English lexicon; it is also more objective than interpreting proportion plots (e.g., stacked barplots). In addition, it safeguards against lexical variability in an unbalanced corpus that increases in size.

Previous studies suggested that the rise in frequency is due to functional expansion of the *into*-causative (Davies and Kim 2019; Rudanko 2006, 2011). These accounts are not necessarily incompatible with the present study, which makes no specific claims about expansion or the emergence of (potentially neutral) subsenses. However, the argument is that expansion, however defined, is a corollary of changes in argument mapping. As the construction becomes more idiosyncratic and tolerates a greater lexical variety, it licenses more verb types in more diverse contexts. This can create the impression of semantic and/or functional expansion, which may however be due to corpus composition or greater diversity in the publishing culture.¹⁰ In any case, it should be borne in mind that stronger links

¹⁰ An anonymous reviewer asks whether this is a chicken-and-egg question: could lexical diversity drive ‘usability’ in more discourse-pragmatic contexts? It is true that the processes are mutually reinforcing and overlapping and thus empirically difficult to disentangle. However, increased lexical diversity on a large scale logically presupposes constructional tolerance to license the larger diversity in a greater range of new contexts in the first place.

do not have to lead to increased usage (see Mair 2004 for this argument in grammaticalization).

Three processes were side-lined that are usually assumed to accompany grammatical change, i.e., changes in productivity, schematicity, and compositionality (Traugott and Trousdale 2013: 22). They do not apply to the *into*-causative in the way they are normally understood. First, productivity in the *into*-causative is productivity *within* classes—these classes do not (dis)appear. It is possible that an elevated lexical variability is to no small extent a function of English (or its published textual record) becoming more lexically diverse. Recall that comparing productivity over time is inherently problematic, especially if both construction frequency *and* corpus size increase: if we fish in a larger pond that is fed by more diverse sources, we will necessarily catch more different types of fish, especially if using a larger fishing net (representing an increasing construction). Hence, comparing productivity may only make sense for within-period comparisons between subsenses that serve as minimal ‘controls’ to counterbalance shifts in textual material (see Perek 2018 for an example of investigating productivity in the subsenses of the *way*-construction). Second, the construction has always been fully schematic, owing to its emergence from the lexically underspecified caused-motion construction. Third, therefore, its compositionality was low from the outset. Whether the shift from movement into action to manner of causation constitutes lower compositionality is a matter of definition.

On a similar note, it is for these reasons that the *into*-causative does not lend itself straightforwardly to an analysis as a grammaticalizing construction (Hopper and Traugott 2003). Unlike many other constructions, its emergence resulted from abrupt reanalysis, not a gradual development from erstwhile lexical contexts (cf. Section 2.2). Since the *into*-causative was grammatical from its first attestation—and its predecessors are instances of the caused-motion construction—its subsequent development could only fall under ‘secondary grammaticalization’. Yet, it is difficult to envisage what ‘becoming more grammatical’, ‘acquiring new grammatical functions’, or ‘being more grammaticalized’ means for the *into*-causative (for an overview and critical assessment of secondary grammaticalization, see Breban 2014).

How do the results now tie in with current questions in DCxG? With the popularity of constructionist approaches in synchronic linguistics also came an interest in applying these ideas to language change. As the diachronic constructionist perspective adds the change dimension, the notion of *constructionalization* (Traugott and Trousdale 2013), i.e., the creation of a new construction, gained considerable popularity. However, constructionalization has recently received critical evaluation (Börjars et al. 2015), particularly in contrast to *constructional changes* (Hilpert 2018b; Flach 2020). While I critically evaluate constructionalization with respect to the emergence of the *into*-causative until its first attestation (Flach 2020), the remainder of this discussion assesses constructionalization with regard to its endpoint.

In brief, constructionalization is defined as the creation of a new form–meaning pairing that has *both* a new form *and* a new meaning ($F_{\text{NEW}}-M_{\text{NEW}}$). It is hence to be distinguished from changes in *either* form *or* meaning, which are constructional changes that do not lead to a new construction (Traugott and Trousdale 2013: 22, 27). Since constructionalization is assumed to be gradual and accompanied by constructional changes, an inherent problem is that there is neither a cut-off between *pre*-constructionalization changes and constructionalization on the one hand, nor between constructionalization and *post*-constructional changes on the other. In other words, it is unclear which changes that lead to $F_{\text{NEW}}-M_{\text{NEW}}$ are pre-, con-, or post-constructionalization. Under this definition, the distinction between

constructionalization and constructional change is subject to the Sorites Paradox ('How many grains of sand are a heap?'; cf. Börjars et al. 2015; Hilpert 2015, 2018b; Flach 2020).

We can take the *into*-causative as an example to illustrate why the distinction is not helpful. *Until* the first attestation, all empirical records of [SUBJ V OBJ OBL] are fully accounted for as instances of the caused-motion construction and constructional changes therein (Flach 2020). It is therefore impossible to determine the beginning of the constructionalization of the *into*-causative. For example, even the rise of *-ing* gerunds was a contributing factor, which itself has a history that spans multiple centuries as far back as Old English (Fonteyn 2019). *After* the first attestation, the *into*-causative has not changed in *F* until today. Where then can we place the end of constructionalization? That is, which of the changes since the late 17th century accompany its constructionalization (con-constructionalization changes) and which do not (post-constructionalization changes)? One possibility is to assume that constructionalization requires conventionalization, i.e., spread through the speech community, in order to count as change rather than innovation (Traugott and Trousdale 2013: 2). However, this may be the mother of sand heaps (cf. Börjars et al. 2015: 364): measuring conventionalization varies linguistically with the specificity of the construction and empirically with the size of a corpus.¹¹

We should emphasize at this juncture that this is neither meant to deny the role of conventionalization in grammatical change, nor does it imply that conventionalization cannot be measured. There is a growing body of work that addresses these questions, in particular the relationship between the individual and the community and their role(s) in grammatical change (e.g., De Smet 2016; Fonteyn 2017; Petré and Van de Felde 2018). However, the argument is that conventionalization is best seen as a property of constructional change, alongside any type or combination of formal, semantic, social and/or discourse-pragmatic change(s) (Hilpert 2013: 16). To be sure, once we find textual evidence of a construction in corpora, it is a reasonable assumption that the construction was already conventional enough to be used in publishing or (private) correspondence, even if only in a very small (sub)section of the speech community. This view makes it easier to combine grammatical change with the idea of emergent grammar (Hopper 1987), as slight form and/or meaning changes occur in altered replication of conventional material (Croft 2000) through the speech community without necessarily leading to a new construction.

In other words, there appear to be two types of the Sorites Paradox, one that presents itself as an empirical problem (measuring conventionalization) and one that presents itself as an ontological one (defining constructionalization). It is the latter we evaluate critically here.¹²

Returning to the conceptual problem of constructionalization, it depends on one's definition of meaning whether the *into*-causative has changed in *M*. If its meaning is 'X CAUSES Y TO DO Z (*by means of* V)', then the *into*-causative has been a stable form–meaning pair for over 300 years (F_0 – M_0). We are unable to determine the end of constructionalization this way. If we assume *M* to be *manner of causation*, then its meaning is emergent, i.e., as a sequence of changes F_0 – $M_0 > F_0$ – $M_1 > F_0$ – $M_2 > F_0$ – M_3 etc. (Börjars et al. 2015; Hilpert 2018b). Do we assume that the steps M_0 , M_1 , M_2 , or M_3 are part of the constructionalization

¹¹ The more contextually specific or infrequent a construction and its predecessor are, especially at the initial stage, the more it depends on the corpus to cover its (potential) discourse-pragmatic environment in sufficient quantity. If it weren't for the 1-billion *Early English Books Online* collection, dating the construction's first attestation to the 17th century would not have been possible (cf. Flach 2020 for a detailed discussion).

¹² I thank an anonymous reviewer for cautioning against creating the impression that conventionalization is unjustifiably sidelined here.

of $F_{\text{NEW}}-M_{\text{NEW}}$? If yes, then constructionalization is potentially infinite. If no, this raises the question of the status of the intermediate steps, since every step M_N necessarily creates a new intermediate position between M_N and M_{N-1} and M_{N+1} .

This also cannot locate the end of constructionalization as $F_{\text{NEW}}-M_{\text{NEW}}$. The methodological approach illustrates this. If we restrict the data to nine decades in the 20th century (1910s–1990s), which simulates a smaller available corpus, we get the same pattern of change, just over a shorter time span (Figure 10). Conversely, we should find the same distribution over a longer time span, if we had sufficient textual records for the construction in the 18th century. Put differently, the change from motion to manner is relative, not tied to a specific period. Hence, it is empirically impossible to determine M_0 , M_1 , or M_2 , since the required steps could be infinitesimally small and their demarcation arbitrary. In a best case scenario and as a valid way out, it depends on what we define M_{NEW} to be.

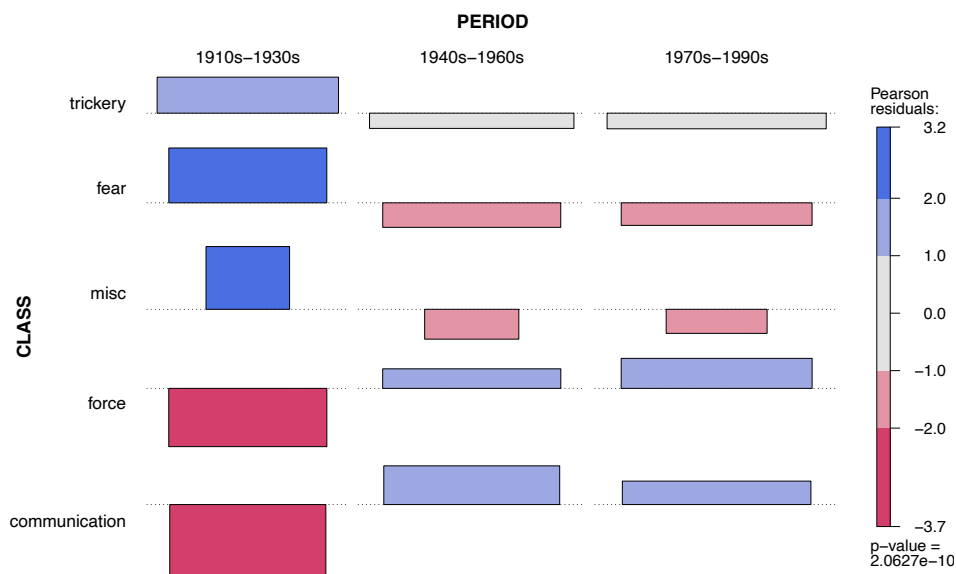


Figure 10: CLASS by TIME in the 20th century.

Since constructionalization so defined gives rise to more issues than are strictly necessary, a suggestion could be that its definition as $F_{\text{NEW}}-M_{\text{NEW}}$ is analytically helpful if it refers to first attestations, that is, as the endpoint of changes in other constructions (Börjars et al. 2015; Flach 2020), which may give ‘reanalysis’ a distinct DCxG flavor. In any case, first empirical records are based on, and relative to, the analyst’s subjective definition of $F-M$, which also defines $F_{\text{NEW}}-M_{\text{NEW}}$. Put differently, a definition of a construction is informed by our synchronic perspective and the construction’s subsequent development. For instance, $F_{\text{NEW}}-M_{\text{NEW}}$ for the *into*-causative was defined as the first attestation of an unambiguous object-control structure, because this is how the construction was defined synchronically (*he was honestly trepanned ... into giving sentence against himself*, 1678, cf. (3) above). This definition is of course influenced by hindsight knowledge that the construction *did* become part of the constructional inventory of a substantial part of the speech community. Had it not passed a critical mass, we would likely have classified isolated tokens as idiolectal uses of the caused-motion construction or non-consequential flukes in the data (printing or production errors, non-native representations, etc.) and would probably never have posited it as a separate construction. In a sense, constructionalization is a matter of perspective from where change is investigated.

Hence, given the problems with distinguishing between pre-, con-, and post-constructionalization, it might be preferable to capture all changes surrounding $F_{\text{NEW}}-M_{\text{NEW}}$ as constructional changes that ‘seize’ any or multiple aspect(s) of a construction and/or its forerunner(s), including form(s), collocational preferences, semantics, co(n)text, distributional behavior, or communal spread (Hilpert 2013: 16). In other words, while constructionalization pertains to what we define a node to be or the perspective we take, constructional change tends to refer to what is observable in the data.

Node definition and its identification in historical data might be more straightforward for the *into*-causative compared to many other phenomena (especially those that are functionally far more polysemous). What is claimed here is that changes in nodes, networks, and links may be modelled as constructional changes without recourse to a distinct process of ‘constructionalization’. Reducing constructionalization as a $F_{\text{NEW}}-M_{\text{NEW}}$ to the point when it is attested also avoids the unfortunate ambiguity of the term *constructionalization* which refers simultaneously to the *point* (new F–M) and the *processes* that necessarily surround or accompany its emergence (cf. Flach 2020). Ultimately, it may well be that a constructionalization view places more emphasis on the node, while the constructional change view puts more weight on connective or associative links. The latter remains relatively agnostic about the reality of nodes, instead viewing them as analytical helpful concepts. But it is for this reason that constructionalization is more vulnerable to terminological and empirical problems that tend to be avoided in a connective link view.

In this spirit, let us conclude with a reference to the growing body of constructionist approaches to vertical link changes within argument structure constructions (e.g., Coleman 2011; D’hoedt et al. 2019; Perek 2018), which complement the literature on changes between constructions, traditionally called ‘alternations’ (e.g., De Cuypere 2015; Wolk et al. 2013; Zehentner 2018). What we see is that many of these studies put greater emphasis on changes in links as dynamic re-configurations of the network of constructions (Torrent 2015). They shift the focus towards association-based conceptualizations of linguistic change that foreground the dynamicity of linguistic change. This perspective tends to be left behind in node-centered approaches (see Hilpert 2018b, Hilpert and Diessel 2016, and Schmid 2016 for discussion). This article attempted to contribute some further pointers how the shift away from node-centric definitions of change helps to shed new light on the dynamics of change.

Acknowledgements

The research was funded by the Swiss National Science Foundation (SNSF grant no. 100012L/169490/1). I thank two anonymous reviewers, Martin Hilpert, Elena Smirnova, and Anatol Stefanowitsch for their helpful comments, constructive feedback, and food for thought. The usual disclaimers apply.

Appendix

Classification of matrix verbs:

COMMUNICATION/PERSUASION. *argue, becoax, cajole, charm, cheer, chitchat, coax, convince, counsel, fast-talk, filibuster, flatter, hearten, heckle, impress, intrigue, invite, jive-talk, jolly, natter, overpersuade, persuade, please, romance, rouse, salestalk, scream, sign-talk, smooth-tongue, soft-soap, soothe, spur, stir, sweet-talk, talk, wheedle, woo.*

FEAR/IRRITATION. aggravate, alarm, anger, annoy, astonish, awe, badger, bewilder, bewitch, boss, bother, bribe, browbeat, bully, challenge, chill, chivvy, conjure, cow, cry, curse, damn, daunt, dazzle, degrade, devil, distress, dog, educate, egg, embarrass, enrage, exasperate, exhort, fret, frighten, frustrate, gall, goad, guilt, harass, harry, hector, horrify, hound, humiliate, influence, insult, intimidate, irk, irritate, jar, jeer, josh, laugh, lie, lull, manipulate, nag, needle, nerve, nettle, nudge, overwhelm, panic, pester, pique, preach, provoke, psych, quiz, railroad, reason, ridicule, sadden, scald, scare, school, scold, scowl, shame, shellshock, shock, snow, spoil, spook, stampede, stare, startle, starve, sting, storm, stun, stupefy, surprise, sway, tease, terrify, terrorize, threaten, urge, victimize, wear, weary, witch, worry.

FORCE/PRESSURE. abuse, batter, beat, blackjack, blackmail, blow, bludgeon, bomb, bounce, brainwash, bulldoze, captivate, chase, coerce, compel, corner, corral, corrupt, cross-ruff, crowd, crush, cudgel, discipline, dope, dose, draft, drag, dragoon, draw, drug, elbow, flog, force, hammer, haul, henpeck, herd, high-pressure, hook, horsewhip, hurry, hustle, impact, impel, incite, intoxicate, jog, jostle, kick, kick-start, lasso, lock, maneuver, massage, maul, muscle, paralyze, peck, pinprick, poke, press, pressure, prick, prod, propel, pull, push, rope, rush, sandbag, scourge, shake, shred, shunt, slash, slave-drive, smash, snooker, squeeze, steam-roll, steel, stiffen, strangle, strike, strong-arm, subdue, suck, sucker, suppress, sweep, thrash, thumbscrew, torment, torture, transfix, trap, trip, whip, whipsaw.

TRICKERY/DECEPTION. allure, attract, bait, bamboozle, befool, befuddle, beguile, bejuggle, betray, bluff, buffalo, cheat, con, confuse, cozen, deceive, decoy, delude, discombobulate, doctor, dupe, ensnare, entice, entrap, euchred, fake, fascinate, finagle, finess, flimflam, fool, fox, gammon, gull, hoax, hocus, hoodwink, hornswoggled, humbug, hypnotize, inveigle, jockey, juggle, kid, lure, mesmerize, misconstrue, misguide, mislead, mystify, outwit, rook, screw, seduce, self-deceive, shanghai, sidetrack, spoof, swindle, tempt, trick, wangle, will.

MISCELLANEOUS. act, address, anesthetize, anglicize, back, bestir, blind, boink, brainstorm, buy, calm, careful, carry, catalyze, catapult, co-opt, coach, comfort, condition, construe, contrive, convert, cue, dare, deny, direct, drive, ease, enchant, entertain, excite, fan, fashion, fashionate, fatigue, form, freeze, galvanize, get, goose, groom, guide, huckster, induce, initiate, interest, jade, jolt, kiss, lead, lecture, legislate, lick, midwived, missionary, mistake, mobilize, mold, motivate, nurture, pat, peckay, pervert, plow, precipitate, program, project, rasp, rassle, rationalize, re-educate, regiment, scene, socialize, soften, sophisticate, sphroxify, spirit, spoon, steer, stimulate, subsidize, swing, systematize, tick, tickle, tinker, train, transmute, trigger, vamp, vote, wheel, work.

References

- Barðdal, Jóhanna. 2008. *Productivity: Evidence from case and argument structure in Icelandic*. Amsterdam: John Benjamins.
- Barðdal, Jóhanna, Elena Smirnova, Lotte Sommerer & Spike Gildea (eds.). 2015. *Diachronic Construction Grammar*. Amsterdam: John Benjamins.
- Börjars, Kersti, Nigel Vincent & George Walkden. 2015. On constructing a theory of grammatical change. *Transactions of the Philological Society* 113(3). 363–382. doi:10.1111/1467-968X.12068.
- Breban, Tine. 2014. What is secondary grammaticalization? Trying to see the wood for the trees in a confusion of interpretations. *Folia Linguistica* 48(2). 469–502.
- Brunner, Thomas. 2019. *Into-causatives in World Englishes*. Paper presented at ICAME40, Université de Neuchâtel, June 2, 2019.
- Colleman, Timothy. 2011. Ditransitive verbs and the ditransitive construction: A diachronic perspective. *Zeitschrift für Anglistik und Amerikanistik* 59(4). 387–410.

- Croft, William. 2000. *Explaining language change: An evolutionary approach*. Harlow: Longman.
- Davies, Mark. 2008. The Corpus of Contemporary American English: 450 million words, 1990–present. (2015 Offline Version). corpora.byu.edu/coca.
- Davies, Mark. 2010. The Corpus of Historical American English: 400 million words, 1810–2009. <http://corpus.byu.edu/coha/>.
- Davies, Mark. 2012a. The 400 million word Corpus of Historical American English (1810–2009). In Irén Hegedűs & Alexandra Fodor (eds.), *English Historical Linguistics 2010: Selected Papers from the Sixteenth International Conference on English Historical Linguistics* (ICEHL 16), 231–262. Amsterdam: John Benjamins.
- Davies, Mark. 2012b. Some methodological issues related to corpus-based investigations of recent syntactic changes in English. In Terttu Nevalainen & Elizabeth Closs Traugott (eds.), *The Oxford handbook of the history of English*, 157–174. New York: Oxford University Press.
- Davies, Mark & Jong-Bok Kim. 2019. Historical shifts with the *into*-causative construction in American English. *Linguistics* 57(1). 29–58. doi:10.1515/ling-2018-0030.
- De Cuyper, Ludovic. 2015. A multivariate analysis of the Old English ACC+DAT double object alternation. *Corpus Linguistics and Linguistic Theory* 11(2). 225–254. doi:10.1515/cllt-2014-0011.
- De Smet, Hendrik, Susanne Flach, Jukka Tyrkkö & Hans-Jürgen Diller. 2015. *The Corpus of Late Modern English (CLMET), version 3.1: Improved tokenization and linguistic annotation*. KU Leuven, FU Berlin, U Tampere, RU Bochum.
- De Smet, Hendrik. 2016. How gradual change progresses: The interaction between convention and innovation. *Language Variation and Change* 28(1). 83–102. doi:10.1017/S0954394515000186.
- D’hoedt, Frauke, Hendrik De Smet & Hubert Cuyckens. 2019. Constructions waxing and waning: A brief history of the zero-secondary predicate construction. *Journal of English Linguistics* 47(1). 3–28. doi:10.1177/0075424218805524.
- Duffley, Patrick J. 2018. *Talk into vs convince to*: Talking as a cause leading to containment, convincing as a cause leading to a result. In Mark Kaunisto, Mikko Höglund & Paul Rickman (eds.), *Changing structures: Studies in constructions and complementation*, 15–30. Amsterdam: John Benjamins.
- Flach, Susanne. 2020. Constructionalization and the Sorites Paradox: The emergence of the *into*-causative. In Lotte Sommerer & Elena Smirnova (eds.), *Nodes and networks in Diachronic Construction Grammar*, 45–67. Amsterdam: John Benjamins.
- Flach, Susanne. 2018. “What’s that passive doing in my argument structure construction?” A note on constructional interaction, verb classes and related issues. Talk at the workshop *Verb Classes, Frames, and Constructions*, April 26–27, 2019, IDS Mannheim.
- Fonteyn, Lauren. 2017. The aggregate and the individual: Thoughts on what non-alternating authors reveal about linguistic alternations – a response to Petrè. *English Language and Linguistics* 21(2). 251–262. doi:10.1017/S1360674317000119.
- Fonteyn, Lauren. 2019. *Categoriality in language change: The case of the English gerund*. New York: Oxford University Press.
- Friendly, Michael. 1992. Graphical methods for categorical data. *SAS User Group International Conference Proceedings*, vol. 17, 190–200.
- Gilquin, Gaëtanelle. 2010. *Corpus, cognition and causative constructions*. Amsterdam: John Benjamins.
- Goldberg, Adele E. 1995. *Constructions: A Construction Grammar approach to argument structure*. Chicago: University of Chicago Press.
- Gries, Stefan Th. & Martin Hilpert. 2012. Variability-based neighbour clustering: A bottom-up approach to periodization in historical linguistics. In Terttu Nevalainen & Elizabeth Closs Traugott (eds.), *The Oxford handbook on the history of English*, 134–144. Oxford: Oxford University Press.
- Gries, Stefan Th. & Anatol Stefanowitsch. 2004. Covarying collexemes in the *into*-causative. In Michel Achard & Suzanne Kemmer (eds.), *Language, culture, and mind*, 225–236. Stanford, CA: CSLI.
- Hilpert, Martin. 2013. *Constructional change in English: Developments in allomorphy, word formation, and syntax*. Cambridge: Cambridge University Press.
- Hilpert, Martin. 2015. From *hand-carved* to *computer-based*: Noun-participle compounding and the upward strengthening hypothesis. *Cognitive Linguistics* 26(1). 113–147. doi:10.1515/cog-2014-0001.
- Hilpert, Martin. 2018a. Wie viele Konstruktionen stecken in einem Wortbildungsmuster? Eine Problematisierung des Produktivitätsbegriffs aus konstruktionsgrammatischer Sicht. In Stefan Engelberg,

- Henning Lobin, Kathrin Steyer & Sascha Wolfer (eds.), *Wortschätze: Dynamik, Muster, Komplexität*, 91–106. Berlin: De Gruyter.
- Hilpert, Martin. 2018b. Three open questions in Diachronic Construction Grammar. In Evie Coussé, Peter Andersson & Joel Olofsson (eds.), *Grammaticalization meets Construction Grammar*, 21–39. Amsterdam: John Benjamins.
- Hilpert, Martin & Holger Diessel. 2016. Entrenchment in Construction Grammar. In Hans-Joerg Schmid (ed.), *Entrenchment and the psychology of language learning: How we reorganize and adapt linguistic knowledge*, 57–74. Berlin: De Gruyter Mouton.
- Hilpert, Martin & Stefan Th. Gries. 2009. Assessing frequency changes in multistage diachronic corpora: Applications for historical corpus linguistics and the study of language acquisition. *Literary and Linguistic Computing* 24(4). 385–401. doi:[10.1093/lc/fqn012](https://doi.org/10.1093/lc/fqn012).
- Hopper, Paul. 1987. Emergent grammar. *Berkeley Linguistics Society* 13. 139–157.
- Hopper, Paul J. & Elizabeth Closs Traugott. 2003. *Grammaticalization*. 2nd ed. Cambridge: Cambridge University Press.
- Hunston, Susan & Gill Francis. 2000. *Pattern grammar: A corpus-driven approach to the lexical grammar of English*. Amsterdam: John Benjamins.
- Kim, Jong-Bok & Mark A. Davies. 2016. The *into*-causative construction in English: A construction-based perspective. *English Language and Linguistics* 20(1). 55–83. doi:[10.1017/S1360674315000271](https://doi.org/10.1017/S1360674315000271).
- Langacker, Ronald W. 1990. Subjectification. *Cognitive Linguistics* 1(1). 5–38. doi:[10.1515/cogl.1990.1.1.5](https://doi.org/10.1515/cogl.1990.1.1.5).
- Mair, Christian. 2004. Corpus linguistics and grammaticalisation theory: Statistics, frequencies, and beyond. In Hans Lindquist & Christian Mair (eds.), *Studies in Corpus Linguistics*, 121–150. Amsterdam: John Benjamins.
- Perek, Florent. 2018. Recent change in the productivity and schematicity of the *way*-construction: A distributional semantic analysis. *Corpus Linguistics and Linguistic Theory* 14(1). 65–97. doi:[10.1515/cllt-2016-0014](https://doi.org/10.1515/cllt-2016-0014).
- Petré, Peter & Freek Van de Velde. 2018. The real-time dynamics of the individual and the community in grammaticalization. *Language* 94(4). 867–901. doi:[10.1353/lan.2018.0056](https://doi.org/10.1353/lan.2018.0056).
- Rickman, Paul & Mark Kaunisto. 2018. Aspects of the use of the transitive *into* -ing pattern in New Zealand English. In Mark Kaunisto, Mikko Höglund & Paul Rickman (eds.), *Changing structures: Studies in constructions and complementation*, 71–87. Amsterdam: John Benjamins.
- Rudanko, Juhani. 2000. *Corpora and complementation: Tracing sentential complementation patterns of nouns, adjectives, and verbs over the last three centuries*. Lanham: University Press of America.
- Rudanko, Juhani. 2005. Lexico-grammatical innovation in current British and American English: A case study on the transitive *into* -ing pattern with evidence from the Bank of English Corpus. *Studia Neophilologica* 77(2). 171–187. doi:[10.1080/00393270500384791](https://doi.org/10.1080/00393270500384791).
- Rudanko, Juhani. 2006. Emergent alternation in complement selection: The spread of the transitive *into* -ing construction in British and American English. *Journal of English Linguistics* 34(4). 312–331. doi:[10.1177/0075424206293600](https://doi.org/10.1177/0075424206293600).
- Rudanko, Juhani. 2011. *Changes in complementation in British and American English: Corpus-based studies on non-finite complements in recent English*. Basingstoke: Palgrave Macmillan.
- Schmid, Hans-Jörg (ed.). 2016. A framework for understanding linguistic entrenchment and its psychological foundations. *Entrenchment and the psychology of language learning: How we reorganize and adapt linguistic knowledge*, 9–35. Berlin: De Gruyter Mouton.
- Smirnova, Elena, Robert Mailhammer & Susanne Flach. 2019. The role of atypical constellations in the grammaticalization of German and English passives. *Diachronica* 36(3).
- Stefanowitsch, Anatol. 2001. *Constructing causation: A construction grammar approach to analytic causatives*. PhD thesis, Rice University, Houston, TX. <http://hdl.handle.net/1911/18031>.
- Stefanowitsch, Anatol. 2006. Distinctive collexeme analysis and diachrony: A comment. *Corpus Linguistics and Linguistic Theory* 2(2). 257–262. doi:[10.1515/cllt.2006.013](https://doi.org/10.1515/cllt.2006.013).
- Stefanowitsch, Anatol. 2014. Collostructional analysis: A case study of the English *into*-causative. In Thomas Herbst, Hans-Jörg Schmid & Susen Faulhaber (eds.), *Constructions collocations patterns*, 217–238. Berlin: De Gruyter.
- Stefanowitsch, Anatol & Stefan Th. Gries. 2003. Collostructions: Investigating the interaction of words and constructions. *International Journal of Corpus Linguistics* 8(2). 209–243.

- Torrent, Tiago Timponi. 2015. The constructional convergence and the construction network reconfiguration hypotheses. In Jóhanna Barðdal, Elena Smirnova, Lotte Sommerer & Spike Gildea (eds.), *Diachronic Construction Grammar*, 173–211. Amsterdam: John Benjamins.
- Traugott, Elizabeth Closs & Graeme Trousdale. 2013. *Constructionalization and constructional changes*. Oxford: Oxford University Press.
- Wierzbicka, Anna. 1998. The semantics of English causative constructions in a universal-typological perspective. In Michael Tomasello (ed.), *The new psychology of language: Cognitive and functional approaches to language structure*, vol. 1, 113–153. Mahwah, N.J.: L. Erlbaum.
- Wolk, Christoph, Joan Bresnan, Anette Rosenbach & Benedikt Szmrecsanyi. 2013. Dative and genitive variability in Late Modern English: Exploring cross-constructional variation and change. *Diachronica* 30(3). 382–419. doi:10.1075/dia.30.3.04wol.
- Wulff, Stefanie, Anatol Stefanowitsch & Stefan Th. Gries. 2007. Brutal Brits and persuasive Americans: Variety-specific meaning construction in the *into-causative*. In Günter Radden, Klaus-Michael Köpcke, Thomas Berg & Peter Siemund (eds.), *Aspects of meaning construction in lexicon and grammar*, 265–281. Amsterdam: John Benjamins.
- Zehentner, Eva. 2018. Ditransitives in Middle English: On semantic specialisation and the rise of the dative alternation. *English Language and Linguistics* 22(1). 149–175. doi:10.1017/S1360674316000447.
- Zeileis, Achim, David Meyer & Kurt Hornik. 2007. Residual-based shadings for visualizing (conditional) independence. *Journal of Computational and Graphical Statistics* 16(3). 507–525. doi:10.1198/106186007X237856.