

Causative constructions in process: How do they come into existence in learner writing?

Abstract

This article examines the processes through which English causative constructions with *MAKE* are produced by French-speaking learners. It relies on data from the Process Corpus of English in Education (PROCEED), in which every text is accompanied by a keylog file and a screencast video. These data make it possible to observe the process paths of constructions as they unfold, from their appearance in the text to their evolution (and possible disappearance) through revision. The analysis shows that almost 20% of the causative constructions do not make it to the final version of the text, either because the idea of causation disappears altogether or because it is expressed in a different way. Among the causative constructions that are kept in the finished text, most still undergo some changes, which range from the simple correction of a typo to the transformation of the complement type (e.g. a verbal complement becoming an adjectival complement). Some of these changes are the result of dictionary consultation, also visible in the process data. In addition, the keylog files reveal the presence of pauses during writing, whose investigation can improve our understanding of the mental processing of causative constructions. It thus turns out that in almost 40% of the cases, the causative constructions are immediately preceded and followed by a pause, which could indicate that they are stored holistically in learners' minds. Besides providing insights into the processes through which causative constructions come into existence in learner writing, this study also illustrates how writing process data can bring us closer to what the reality of writing looks like for language learners.

Keywords: writing processes, keylogging, screencasting, causative constructions, learner corpus

1 Introduction

While we are starting to have a fairly good understanding of how constructions behave in writing, including learner writing, our knowledge of how these constructions come into existence is still very limited. The main reason for this is that the data that are used to study constructions in writing tend to only represent the finished products, that is, the texts in their final version. The processes through which those texts come to be written are usually invisible to the researcher. Yet, technologies like keylogging and screencasting, when integrated into the data collection, can make such processes visible and hence analyzable.

This article explores writing process data, in the form of keylog files supplemented by screencast videos, in an attempt to analyze the process paths of English causative constructions with *MAKE* in learner writing, that is, how the constructions take shape and evolve during the composition process. After summarizing the main characteristics of causative constructions as reported in the (product-based) literature (Section 2), the methodology used to extract causative constructions with *MAKE* from the Process Corpus of English in Education (PROCEED) is described (Section 3). The following aspects of causative constructions with *MAKE* are then investigated: their frequency (according to complement

type and in the written product data vs. the writing process data; Section 4), the changes that they undergo during writing (Section 5) and the placement of pauses around and inside the constructions (Section 6). The article ends with some concluding remarks (Section 7).

2 English causative constructions

Causation can be expressed in different ways in English, including causal adjuncts (e.g. *because of the heat*) or subclauses (e.g. *because it is too hot*), synthetic causative verbs (e.g. *kill*) and periphrastic (or analytic) causative constructions (e.g. *cause somebody to die*). Periphrastic causative constructions are made up of a verb (such as *CAUSE*, *MAKE* or *GET*), followed by an object and a complement. With the verb *MAKE*, which is the focus of this article, the complement can be adjectival (1), verbal (with a bare infinitive (2), a past participle (3) or, in the passive, a *to*-infinitive (4)), nominal (5) or prepositional (6). These structures are exemplified below with sentences taken from the British National Corpus.

- (1) The idea of going back still **made** me nervous, though. [adjectival complement]
- (2) In the case of global pollution, no world government exists to **make** polluters pay. [bare infinitive complement]
- (3) Shoals of bustling, professional lobbyists will be in Blackpool to **make** their voices heard. [past participle complement]
- (4) They must be **made to realise** that driving skills alone will not prevent accidents, says the AA report. [*to*-infinitive complement]
- (5) The Casio TV 470 has a retail value of £99.99, which **makes** it a great prize for our readers. [nominal complement]
- (6) Keller's Zurich upbringing **made** him into a skier and sculler, and he raced for the Grasshopper club. [prepositional complement]

All types of complements will be taken into account in the present study and considered as instances of periphrastic causative constructions, although it is acknowledged that some may also be categorized as instances of different constructions (e.g. the adjectival construction as an instance of the resultative construction, cf. Goldberg 1995: 87).

English periphrastic causative constructions have been the subject of many corpus studies, including some describing their use by learners of English as compared to native speakers. Several of these studies highlight differences in the frequency with which learners use periphrastic causative constructions, although the results vary according to the learners' mother tongue, the reference corpus chosen and the type of construction considered. Altenberg and Granger (2001), for example, show that Swedish learners tend to overuse adjectival and verbal causative constructions with *MAKE*, whereas French-speaking learners underuse adjectival, verbal and nominal causative constructions with *MAKE* in comparison with native novice writers. In Gilquin (2010), on the other hand, a comparison with native

expert writers points to an overuse of the verbal causative construction with *MAKE* by learners of English (including French-speaking learners).

Other distinctive features of periphrastic causative constructions in learner English are highlighted in the literature, including the use of non-standard structures. Laporte (2012) reports on the use of *to*-infinitives with active *MAKE*, while Gilquin (2016) shows that learners produce as many as eight variants of the [X *MAKE* Y V_{inf}] structure, e.g. [X *MAKE* V_{to-inf}] (a structure with no object and a *to*-infinitive complement), [X *MAKE* V_{inf} Y] (a structure with an object following, rather than preceding, the infinitive complement) and [X *MAKE* Y V_{prp}] (a structure with an object followed by a present participle).

Phraseological analyses have also revealed that learners do not necessarily display the same preferences as native speakers in terms of the lexical items used as complements in periphrastic causative constructions. Altenberg and Granger (2001) underline the underuse of relational verbs (e.g. *seem*, *appear*) in the *MAKE* causative constructions produced by Swedish and French-speaking learners. In Gilquin (2012), a collostructional analysis carried out for [X *MAKE* Y V_{inf}] among learners from different mother tongue backgrounds provides an overview of the verbs more distinctive of native expert writing (e.g. *seem*, *appear*, *refer*, *work*) and those more distinctive of learner writing (e.g. *be*, *become*, *believe*).

A final aspect which tends to distinguish learners' causative constructions from those produced by native speakers is related to what Altenberg and Granger (2001) call 'decompositional strategy'. They argue that learners tend to decompose the causative meaning through the use of a periphrastic causative construction in contexts where a synthetic causative verb would sound more natural. They give examples such as *make the family live* (instead of *support the family*) and *differences are made to vanish* (instead of *differences are eliminated*).

The learner corpora that have been used for the study of causative constructions in learner English have made it possible to gain many interesting insights into how learners of English actually use such constructions. However, because these corpora are made up of finished texts, they do not provide information about how learners go about constructing causative constructions. In the present study, by contrast, keylog files and screencast videos are used to examine the processes through which causative constructions are produced. As we will see below, this opens the door to new types of analyses, such as the study of how causative constructions are edited or whether they are interrupted by pauses.

3 Data and methodology

The data used to examine the production of causative constructions come from the Process Corpus of English in Education (PROCEED; Gilquin 2022), a corpus which includes, in addition to the finished texts, keylog files and screencast videos. The keylog files, recorded by means of Inputlog (Leijten and Van Waes 2013), show all the keys struck on the keyboard during the text production. The screencast videos, recorded by means of OBS Studio (Bailey and OBS Studio contributors 2012), reproduce everything that was visible on the screen during the text production. The corpus also includes rich metadata for each writer.

The PROCEED data have been collected among university students who are upper-intermediate to advanced learners of English. They involve argumentative essay writing on the basis of a set topic. The texts are between 300 and 400 words long and are written with a time limit of 40 to 50 minutes.

The sample used here represents the data collected among three cohorts of students, with each student producing one or two texts in English – one at the beginning of the academic year and, for some students, another one at the end of the academic year. All texts in the sample were produced by learners of English who identified French as their (only) native language. The sample is made up of 263 texts (for a total of 94,229 words), together with their corresponding keylog files and screencast videos.

MAKE causative constructions were searched for in both the finished texts and the writing process data. The extraction of the constructions from the finished texts was based on a simple search for the inflected forms of *MAKE* (*make*, *makes*, *making* and *made*) by means of the concordancer AntConc (Anthony 2022). All the concordance lines were then examined to determine whether *MAKE* was used as part of a causative construction or not, and if so, what type of causative construction (adjectival, verbal, nominal or prepositional). In total, 158 instances of causative constructions with *MAKE* were extracted from the finished texts of the PROCEED sample.

For the writing process data, the extraction was based on the output of a linear analysis in Inputlog. A linear analysis is a chronological representation of all the keyboard-related steps involved in writing a text. Example (7) shows the linear analysis for the sentence *Facing a problem could make people aware of what they already have*. The figures between curly brackets correspond to pauses (expressed in milliseconds), when the writer is not actually typing anything. The threshold for pauses has been set to 2000 milliseconds, which means that shorter pauses are not visible in the linear analysis. In addition to the initial and final pauses, a pause of 2672 milliseconds can be found between *aware* and *of*, and a pause of 2224 milliseconds between *they* and *already*. The indications between square brackets describe actions such as deletion [BACK] or capitalisation [CAPS LOCK]. It appears that caps lock was turned on and then off to type a capital *f* at the beginning of the sentence. It also appears that the writer typed a *w* letter before deleting it and typing *could*.¹

(7) [CAPS LOCK]{3904}F[CAPS LOCK]acing·a·problem·w[BACK]could·**make**·people·aware{2672}·of·what·they·{2224}already·have{4536}

All the occurrences of *mak** and *mad** were extracted from the output of the linear analyses of each keylog file by means of AntConc. This made it possible to retrieve all the inflected

¹ In the examples given throughout this article, the output of the linear analysis is provided when it is necessary to show all the steps involved in the writing process. Otherwise, the examples are presented orthographically, possibly with different versions of the text ordered chronologically and identified by means of letters (*a* for the earlier version, *b* for the later version). Some of these versions may be incomplete in case they have been interrupted and replaced by something else. All the examples are presented in their original form, including any errors that learners may have made.

forms of *MAKE*, but also some misspelled forms, such as *makesz* in (8), which is immediately corrected by the writer (as appears from the delete keys and the insertion of *s*), but whose trace remains visible in the linear analysis.

- (8) Speaking·severa·[BACK]I·languages·help·to·destroy·the·language·barrier{3496},·it
·**makesz**·[BACK][BACK][BACK]s·the·travelling·a·lot·easier[LSHIFT].

In order to retrieve further misspelled instances of *MAKE*, use was made of VariAnt (Anthony 2017), a program that looks for possible variants of a target word in a corpus, based on formal similarity. Next to bona fide words such as *have*, *more* or *same*, VariAnt identified variants potentially corresponding to (parts of) misspelled forms of *MAKE* found in the writing process data, e.g. *mae*, *mai* or *mk*. These elements were searched for by means of AntConc and examined in context to identify any actual forms of *MAKE*, e.g. (9), where ‘mae[BACK]ke’ corresponds to *make* (with the deletion of *e*).

- (9) {7024}politicians·should·clearly·do·something·in·order·to·**mae**[BACK]**ke**·things·m
ove[RSHIFT].

All instances of *MAKE* retrieved from the writing process data were inspected to determine whether they were used as part of a causative construction. They were considered instances of a causative construction if there was enough material in the linear analysis to clearly justify this. In (10), for example, it is quite likely that the writer started producing a causative construction (*things which make women*), which was then replaced by a ditransitive construction (*things which gave women more rights than before*). However, since the construction is incomplete, it was not counted as a causative construction.

- (10) [CAPS LOCK]T[CAPS
LOCK]hey·have·{8112}done·some[BACK][BACK][BACK][BACK]{2644}[Movement]i
ncredible·things·which·**make**·women·{5520}[BACK][BACK][BACK][BACK][BACK][B
ACK][BACK][BACK][BACK][BACK][BACK][BACK]·gave·women·more·rights·than·bef
ore

In total, 191 instances of causative constructions with *MAKE* were extracted from the keylog files of the PROCEED sample. Each instance was coded for a number of features, including the type of causative construction (adjectival, verbal, nominal or prepositional), the pause placement pattern (whether it was interrupted by a pause, immediately preceded/followed by a pause, etc.) and whether it was kept in the finished text or not. The coding was mainly based on the keylog files (linear analysis), but the screencast videos were used in some cases to facilitate the interpretation of the keylog files.

4 Types of causative constructions

Table 1 shows the distribution of the different types of causative constructions in the finished texts of the PROCEED sample. The most frequent type, with 56.3%, is the adjectival causative construction, followed by the verbal causative construction, with 36.7%, then the

nominal causative construction, with 6.3%, and finally the prepositional causative construction, with 0.6%.

Table 1. Distribution of *MAKE* causative construction types in the finished texts

	N	%
Adjectival causative constructions	89	56.3%
Verbal causative constructions	58	36.7%
Nominal causative constructions	10	6.3%
Prepositional causative constructions	1	0.6%
All causative constructions	158	100%

As appears from Table 2, the ranking in the PROCEED sample is the same as in British English student writing, based on Laporte's (2012) findings for samples of the British component of the International Corpus of English (ICE-GB) and the British component of the Louvain Corpus of Native English Essays (LOCNESS-UK). The proportions, however, differ, in that verbal causative constructions are proportionally more frequent in the PROCEED sample than in the ICE-GB and LOCNESS-UK samples (36.7% vs. 27.6%), whereas it is the opposite for the other construction types (56.3% vs. 62.1% for adjectival constructions, 6.3% vs. 9% for nominal constructions and 0.6% vs. 1.4% for prepositional constructions).

Table 2. Comparison of the distribution of *MAKE* causative construction types in learner English (based on the PROCEED sample), British English (based on Laporte 2012) and American English (based on Altenberg and Granger 2001)

	% in learner English	% in British English	% in American English
Adjectival causative constructions	56.3%	62.1%	55.1%
Verbal causative constructions	36.7%	27.6%	33.9%
Nominal causative constructions	6.3%	9.0%	11.0%
Prepositional causative constructions	0.6%	1.4%	N.A.
All causative constructions	100%	100%	100%

Interestingly, the distribution of *MAKE* causative constructions in the PROCEED sample turns out to be slightly more similar to the distribution in American English, based on Altenberg and Granger's (2001: 181) findings for adjectival, verbal and nominal causative constructions (prepositional causative constructions are not included in their study) in the American component of the Louvain Corpus of Native English Essays (LOCNESS-US). As shown in Table 2, adjectival causative constructions occur with a proportion of 55.1% in LOCNESS-US (to be compared with 56.7% in PROCEED),² verbal causative constructions with a proportion of

² The proportions given for PROCEED are those obtained if prepositional causative constructions are disregarded.

33.9% (to be compared with 36.9% in PROCEED) and nominal causative constructions with a proportion of 11% (to be compared with 6.4% in PROCEED).

What is common to the two comparisons (with British and American English) is the higher proportion of verbal causative constructions and the lower proportion of nominal causative constructions in PROCEED. The higher proportion of verbal causative constructions could be explained by the existence of a French causative construction with the direct counterpart of *MAKE*, namely *FAIRE*, and by the fact that *FAIRE* verbal causative constructions are more frequent than *MAKE* verbal causative constructions (see Gilquin 2001). The French-speaking learners might transfer the frequency of the French causative construction when producing the English causative construction. The lower proportion of nominal causative constructions in PROCEED could be due to the fact that French does not have an equivalent causative construction with an object and an object complement (the French equivalent involves a prepositional phrase, e.g. *faire de lui le président*, lit. 'make of him the president'), which presumably makes the English construction quite complex for French-speaking learners.

The keylog files available in the PROCEED sample give access to writing processes. Table 3 shows the distribution of the different types of causative constructions in the writing process data. The ranking is the same as in the finished texts (Table 1): adjectival causative constructions come first, with 57%, followed by verbal causative constructions, with 36.8%, then nominal causative constructions, with 5.7%, and finally prepositional causative constructions, with 0.5%.

Table 3. Distribution of *MAKE* causative construction types in the writing process data

	N	%
Adjectival causative constructions	110	57.0%
Verbal causative constructions	71	36.8%
Nominal causative constructions	11	5.7%
Prepositional causative constructions	1	0.5%
All causative constructions	193	100%

It will be noticed that the total in Table 3 (193) does not equal the number of causative constructions extracted from the writing process data (191). This is because, in two cases, the constructions evolved during the writing process in such a way that they became another type of causative construction. In (11), the construction started as a verbal causative construction (a), but ended as an adjectival causative construction (b), whereas in (12), it started as a nominal causative construction (a) and ended as a verbal causative construction (b).

- (11) a) However, it can stimulates our imagination by **making** people want to discover more and more.
b) However, it can stimulates our imagination by **making** people eager to discover more.
- (12) a) These three daily life features have not stopped men's imagination or dreams but have rather enable them to **make** them reality.

b) These three daily features have not stopped men's imagination but have rather enable them to **make** their dreams come true.

Besides transformations such as these, revisions also lead to the disappearance of some causative constructions. The comparison of the frequency of causative constructions in the process and product data (see Table 4) reveals that, on average, some 18% of the causative constructions are lost during the writing process, while the remaining 82% are kept in the finished texts. Adjectival and verbal causative constructions are close to this average, with 19.1% and 18.3% of loss, respectively. Some 9% of nominal causative constructions disappear during the writing process and 0% of prepositional causative constructions, but these percentages correspond to few occurrences (-1 out of 11 for the former and -0 out of 1 for the latter).

Table 4. Comparison of the frequency of *MAKE* causative construction types in the process and product data

	Process	Product	Difference
Adjectival causative constructions	110	89	-21 (19.1%)
Verbal causative constructions	71	58	-13 (18.3%)
Nominal causative constructions	11	10	-1 (9.1%)
Prepositional causative constructions	1	1	-0 (0%)
All causative constructions	193	158	-35 (18.1%)

5 Changes in causative constructions

As noted above, 18% of the causative constructions produced in the PROCEED sample do not make it to the finished text. In some cases, this is because the sentence as a whole and the idea it expresses are deleted during the writing process. In other cases, the idea is kept and the expression of causation, too, but the *MAKE* causative construction disappears. It can, for example, be replaced by a prepositional phrase expressing the cause (13) or by a synthetic causative verb (14).

- (13) a) These unequal chances and opportunities **make** it impossi[ble]
b) Because of these unequal chances and opportunities, it would be inonceivable and unreasonable to assess someone's identity and worth by solely looking at their abilities.
- (14) a) Education **makes** us able to
b) Education provides us a better probability to change the world by showing us different ways of living.

Sometimes, the alternative makes it possible to express a more specific kind of causation than is allowed by the rather general *MAKE* verb. In (15), for instance, the *MAKE* causative construction is replaced by an *into* causative construction with the verb *manipulate*.

- (15) a) For instance, Hitler was able to **make** people believe improbable things
b) For instance, Adolf Hitler was able to manipulate people into believing improbable things that lead to the Holocaust and the Second World War.

Even when *MAKE* causative constructions are kept in the final product, they may undergo some changes during the writing process. This is the case for a majority of the causative constructions found in the keylog files. Many of these changes simply concern typos, as illustrated in (16), which shows corrections centred around the words *might*, *think* and *fate*.

- (16) which·{2288}c[BACK]migh·[BACK]t·**make**·thing·[BACK][BACK]k·of·a·kind·of·t[BACK]
]fate[RSHIFT].

The writer may also change some of the words in the construction, including the complement, e.g. *make us realize* > *make us believe*, *makes us lazy* > *makes us idle* and *make us a good person* > *make us a good friend or a nice employer*. In (17), the verbal complement of the causative construction changes twice, from *ask* to *wonder* and from *wonder* to *question*.

- (17) a) This issue ... **makes** us ask questions
b) This issue ... **makes** us wonder
c) This issue ... **makes** us question our society.

Some changes follow paths which are the reverse of those described above, as illustrated by (18), where a prepositional phrase expressing a cause is turned into the subject of a *MAKE* causative construction.

- (18) a) Thanks to the 3D technology, he has been able to imagine an entire new world with blue people
b) the 3D technology has **made** possible to achieve Cameron's imaginings.

Revisions may also involve the correction of errors in the causative constructions. Thus, in (19), the verbal complement *evolves* is corrected to the infinitive form *evolve*. In (20), the initial construction lacks a causee (*make ∅ apply the law*), a structure which is not possible in English, but which is acceptable in the equivalent French construction when the causee is generic. About a minute later, however, the learner inserts the causee *people* (*make people apply the law*), hence turning the structure into an acceptable causative construction in English.

- (19) a) in order to better **make** it evolves
b) in order to better **make** it evolve
- (20) a) Prison is an institution that has existed since a long time in order to **make** apply the law and organize the society.

b) Prison is an institution that has existed since a long time in order to **make** people apply the law and that organizes the society.

Not all errors are necessarily corrected, though, even if the student clearly spends time revising their text. The causative constructions in (21) and (22) are examples where an incorrect verbal complement (*to*-infinitive and present participle, respectively) are kept in the final version of the texts.

- (21) Equality between men is a topic that had **made** a lot of ink to flow, and it is still part of important debates in today's society.
- (22) The logic behind this kind of punishment is not to punish but to **make** criminals thinking about their acts

The role of dictionaries and other online reference tools in the production of causative constructions should also be underlined. In (23), for instance, the reflexive past participle construction with *MAKE*, a relatively rare kind of causative construction in English, is only produced after the student has looked up the French equivalent (*se faire entendre*) in a bilingual dictionary. For a similar construction in another text, the bilingual dictionary helps with the revision rather than the production. After producing *make yourself be understood* (24.a), the student looks up the French equivalent (*se faire comprendre*) and deletes the redundant *be* (24.b).

- (23) Women need that movement to **make** themselves heard.
- (24) a) to understand people and **make** yourself be understood
b) to understand people and **make** yourself understood.

Thesauri are also used regularly to change some words in the causative constructions. This is the case, among others, with the transformation from *makes us lazy* to *makes us idle* that was mentioned earlier.

6 Pause placement patterns

Research on speech has suggested that pauses might be “indirect indicators of prefabricated language and holistic storage” (Dahlmann and Adolphs 2007: 50), in the sense that formulaic sequences are unlikely to be interrupted by pauses. Transposed to writing, it can similarly be argued that pauses provide information about what sequences could be stored holistically in the mind. This assumption can be operationalized through the concept of burst of writing, and more precisely P-burst. A P-burst is a segment of text written between two pauses (Chenoweth and Hayes 2001), and as pointed out by Cislariu and Olive (2017), the spontaneity of their production could indicate a certain degree of automatization (see also Gilquin, forthcoming).

Adapting a methodology proposed by Dahlmann and Adolphs (2007) for speech, the pause placement patterns for causative constructions with *MAKE* were identified on the basis of

the output of the linear analysis in Inputlog, with a minimum threshold of 2000 milliseconds for pauses. Patterns were distinguished on the basis of whether the construction (X) was immediately preceded and/or followed by a pause (P) or not (_) and whether it was interrupted by one or several pauses.

The construction was defined as minimally including the verb *MAKE*, the object and the complement. Thus, (25) was coded as a construction surrounded by pauses (XPX), with the verb (*does not make*) being immediately preceded by a pause {2600} and the complement (*good people*) being immediately followed by another pause {2712}. However, constructions at a higher level were accepted too. (26), for example, was also coded as a XPX pattern, since the whole subclause, including the subordinating conjunction and the subject of the causative construction, was surrounded by pauses.

(25) having·strong·abilities·{2600}does·not·**make**·us·good·people{2712}

(26) {3564}·because·it·does·np[BACK]ot·**make**·them·less·humans·than·other·people[RSHIFT]·{7680}

Even though we acknowledge the possibility that they are embedded within larger constructions, not all causative constructions in the PROCEED sample are surrounded by pauses. Some are preceded but not followed by a pause (PX_), e.g. (27), while for others it is the opposite (_XP), e.g. (28).

(27) Most·of·the·time,·dealing·with·problems·{2704}would·**make**·the·person·stronger [RSHIFT]·[RSHIFT]As{3568}·the·person·{7472}

(28) When·some[BACK][BACK][BACK][BACK]oone[BACK][BACK][BACK]ne·a[BACK]has·{2744}a·project,·an·idea·in·mind·and·wn[BACK]ant·to·**make**·it·real,·[BACK][BACK]·[BACK]·{4384}

Causative constructions can also be interrupted by one or several pauses (XPX). In (29), the production of the verb *make* is followed by a long pause, before the student writes the rest of the construction. In (30), pauses are found both between words (us{3120}·ha...) and within words (ab{2144}sence, ha{5384}ppy).

(29) to·{6152}**make**·{16328}everything·better·than·it·is[LSHIFT]·{8160}

(30) the·ab{2144}sence·of·issues·will·**make**·us{3120}·ha{5384}ppy

In a small number of cases, the causative construction results from the insertion of an element which transforms another construction into a causative one, which makes it impossible to determine a pause placement pattern for the causative construction. The example in (31) shows how the construction *are widely available* was turned into the causative construction *are made widely available* through the simple insertion of *made*.

(31) a) For example some video games help children with puzzle solving problems and are widely available.

b) For example some video games help children with puzzle solving problems and are **made** widely available.

Causative constructions surrounded by pauses (PXP) are those that correspond to P-bursts and hence are good candidates for holistic storage. As appears from Table 5, they represent 38.2% of all causative constructions. While this does not constitute a majority, this is the most frequent pause placement pattern in the data. These results suggest that the *MAKE* causative construction may be stored holistically in some learners' minds and thus provide further evidence that foreign language learners have constructions (see Gries and Wulff 2005). This is partly reinforced by the PX_ and _XP patterns (18.3% and 12%, respectively), where either the beginning or the end of the construction is demarcated by means of a pause, which may also point to some special status in the mind.

Table 5. Pause placement patterns for *MAKE* causative constructions (X = construction, P = pause, _ = anything else)

	N	%
PXP	73	38.2%
XPX	44	23.0%
PX_	35	18.3%
_XP	23	12.0%
X	13	6.8%
Insert	3	1.6%
Total	191	100%

Although the _X_ and, especially, XPX patterns (6.8% and 23%, respectively) provide possible evidence against the holistic storage of causative constructions, it should be emphasized that these patterns are less frequent than the PXP pattern. In addition, a pause in the middle of a construction may have different origins, including lexical retrieval, particularly challenging for learners. In fact, some pauses within causative constructions are followed by dictionary consultation, which points to difficulties in retrieving the right word(s). This can be illustrated by (32), where the long pause after *makes it more* is followed by the use of a bilingual dictionary to search for the English equivalent of French *efficace*. Once the word *effective* has been found, the learner is immediately able to finish the construction, which is demarcated by a final pause.

(32) **makes**·it·more·{35510}[Movement][LEFT
Click][Movement][Movement]efficace[RETURN][Movement][LEFT
Click][Movement][Movement]effective·{2960}

7 Conclusion

This exploratory study of the process paths of causative constructions with *MAKE* has provided some insights into how they come into existence in learner writing. It has shown that, very often, causative constructions undergo some changes (e.g. correction of a typo or change in the type of complement) or disappear altogether during the writing process. Sometimes, changes occur as a consequence of dictionary consultation. The study has also

highlighted the possible holistic storage of causative constructions in learners' minds, as indicated by the high proportion of constructions corresponding to bursts of writing.

This article has only uncovered some aspects of the processes involved in learners' production of causative constructions. It has also relied on a relatively small set of data and its findings should therefore be interpreted with caution. Nevertheless, it has hopefully established the relevance of process-based approaches to constructions in learner writing, to be combined with the more traditional product-based approaches. Taking this less trodden path may cast a new light on well-known constructions and bring us closer to what the reality of writing looks like for language learners.

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