

An Examination of the Effectiveness of FrameNet in Annotating Causative Constructions*

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1. Introduction

This paper uses the Haruki Murakami novel *Supūtoniku No Koibito* and its English translation by Philip Gabriel as a case study to examine the effectiveness of existing FrameNet frames in annotating causative constructions. In the framework of frame semantics, words are understood to evoke frames which represent a “schematic understanding of types of events, situations, individuals, and things, including the participants, props, parts, and their relations to each other and to the larger situation” (Hasegawa et al. 2014:171). The Berkeley FrameNet project is based on these principals and forms a database of semantic frames and annotated sentences. While attempting to use frames listed in this database to compare the use of causatives in the two literary works stated above, I encountered difficulties in annotating causative sentences which involve an element control over their actions on the part of the party being caused to do something. Thus, the aim of this paper is to examine the current solutions within FrameNet for dealing with causative constructions, and to give suggestions for further improvement.

Regarding the structure of this paper, I will first briefly discuss two important types of causative construction, before going on give my analysis of three key examples from the novels. Finally I will discuss my findings and highlight gaps in FrameNet which should be addressed to better capture different kinds of causality. In particular, I will discuss how causative constructions which involve intentionality of the part of the causee are difficult to annotate with the current set of frames in FrameNet.

2. Causative constructions

Causative constructions are necessarily related to cause-and-effect relationships. A cause causes an effect such as a change in state or position in something else. It is not possible to give a comprehensive look at all causative constructions here. Rather, I will introduce two different broad types of causative construction which are relevant to this study and to my suggestions for FrameNet. First, perhaps the most basic type of causative construction seen in (1) has been called “direct manipulation” (Nishimura 1998:124) and tends to use lexical causatives.

(1) He opened the door.

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In the example above, we have an agent (*he*) who does some action (unstated, presumably ‘pushing’, etc.) to the patient (*door*), causing it to open. Nishimura (1998:124) describes the properties of this direct manipulation construction as follows.

- A. The agent aims to bring about a change (for example in position or state) in the patient.
- B. In order to complete the aim (A), the agent performs a physical action on the patient.
- C. The agent is in control of that physical action (B).
- D. The action (B) confers energy from the agent to the patient, bringing about the change in the patient which the agent aimed for (A).
- E. The responsibility for the action (B) and the change (D) brought about because of it lie with the agent.

Compare this to another common kind of causative construction below.

- (2) They made him jump up and down.
- (3) Let me speak.

These sentences can be described in terms of a cause-and-effect relationship in a similar way to (1). We have an agent (*They*, unstated *you*) which performs an action which brings about an effect (*him* jumps up and down, *me* speaks). The action of the agent in this case is likely not a physical action such as pushing the door in (1), but rather a speech-act such as giving an order in (2) or giving permission in (3).

The key difference between (1) and (2)/(3) is the nature of the cause-and-effect relationship. As Nishimura (1998:133) explains, this relationship is looser in (2) and (3) than in (1) in the following way. In direct manipulation cases such as (1) the only change effected is through the action of the causer. In ‘indirect’ cases such as (2) and (3), the effect (jumping up and down, speaking) is an action under the control of the person (*him*, *me*) being acted upon by the causer. In other words, rather than directly bringing about a change, in (2) and (3) the causer acts indirectly through the causee to bring about his or her desired effect.

Nishimura and Noya (2013:112) discuss how this type of indirect causality is common to periphrastic causatives in both Japanese and English, with Japanese using the morpheme *-aseru* in this construction. Lakoff (1987:55) agrees, stating that in “many languages of the world” it is the case that “the more direct the causation, the closer the morphemes expressing the cause and the result.”

In my analysis of causatives in the Japanese fictional novel and its English counterpart that follows, these notions of directness of causality, and intentionality and control on the part of the causee will be key themes.

3. Analysis

My study makes use of the first chapter of Haruki Murakami’s *Supūtoniku No Koibito* and its English translation by Philip Gabriel, *Sputnik Sweetheart*. The study involved looking for causative constructions (in both versions of the novel) and comparing them with the equivalent sentence in the other language version. Illustrative examples of different kinds of causative construction were then annotated using frames listed on Berkeley FrameNet, with reference also being made the Japanese FrameNet project for the Japanese sentences.

3.1. Example 1

(4) It made her think of Laika, the dog.

(Murakami 2002:8)

	Causation	Cogitation
It	ACTOR	
made	LU	
her	AFFECTED	COGNIZER
think	(EVENT	LU
of		
Laika,		(TOPIC
the		
dog.))

Table 1: Breakdown of key frames in (4)

(5) Sore-wa kanojo-ni raika-ken-o omoيدا-sase-ta
 That-TOP 3SG.F-DAT Laika-dog-ACC remember-CAUS-PST
 ‘That made her remember the Laika dog.’

(Murakami 2001:14)

	Causation	Memory
Sore-wa	ACTOR	
kanojo-ni	AFFECTED	COGNIZER
inu-o	(EVENT	CONTENT
omoida-		LU
sase-	LU	
ta)	

Table 2: Breakdown of key frames in (5)

My annotation splits the sentence into lexemes (or relevant morphemes) down the left-most column of the table and gives the frames evoked along top row. How the words in the sentence relate to the frames, either as the frame elements (FEs) or as the evoking lexical unit (LU) are given in the intersections. Advantages of this approach over the style of annotation seen in other papers using FrameNet include the possibility of annotating for multiple frames at the same time, and how easy it is to see how the same lexeme takes on different roles in the different frames evoked.

This is clear in the two examples above. In the English the word *make*, and in the Japanese the causative auxiliary verb *saseru*, evoke the Causation frame. Next, *think* and *omoidasu* ‘remember’ evoke the Cogitation and Memory frames respectively. We can see how the AFFECTED parties in the Causation frames become the COGNIZERS of the Cogitation and Memory frames.

Looking at intentionality in the causative constructions here, while a causee is making an action (thinking, remember), we cannot say that they intended to make this action in the same way that the causee chose to jump up and down in (2). Rather, thinking of something or remembering something in these sentences is a natural, involuntary response to the causing stimuli.

The Causation frame will form an important part of our analysis and thus is worth looking at it in some detail. The FrameNet definition is given below.

A CAUSE causes an EFFECT. Alternatively, an ACTOR, a participant of a (implicit) CAUSE, may stand in for the CAUSE. The entity AFFECTED by the Causation may stand in for the overall EFFECT situation or event.

This is a rather abstract frame which is focused on cause-and-effect relationships in general, including and going beyond the scope of causative constructions. This is obvious looking at the LUs listed which include words such as *responsible*, *reason*, *due to* and *because* as well as *bring about*, *lead to* and *give rise*, and the example sentences listed such as (6).

- (6) The strange mutations of the rumor mill in the end LED to it being said that he was actually a woman.

The AFFECTED element is listed as a core FE of this frame but more often than not is not present in the annotated examples.

3.2. Example 2

(7) His nose, [...] making his female patients blush.

(Murakami 2002:10)

	Causation
His	(ACTOR
nose,)
making	LU
his	(AFFECTED
female	
patients)
blush	EVENT

Table 3: Breakdown of key frames in (7)

(8) Sore-o me.ni.suru to hotondo subete-no
 That-ACC see COND almost all-GEN
 josei kanja-wa kao-o akarame
 female patient-TOP face-ACC cause.to.turn.red
 ‘Almost all the female patients who saw that blushed.’

(Murakami 2001:17)

	Conditional _occurrence	Proportional_quantity	Quantified_mass	Cause_change	Color
Sore-o	(PROFILED_ POSSIBILITY				
me.ni.suru)				
to	LU				
hotondo	(CONSEQUENCE	DENOTED_QUANTITY / LU			
subete-no		REFERENCE_QUANTITY	QUANTITY / LU		
josei		(INDIVIDUALS	(INDIVIDUALS	(AGENT	
kanja)))	
kao				ATTRIBUTE	ENTITY
akarame)			FINAL_VALUE / LU	COLOR / LU

Table 4: Breakdown of key frames in (8)

The examples here have been shortened to the relevant parts for clarity. The full sentences can be found in the footnotes.¹

The English is a causative sentence with an inanimate subject which causes an EVENT (blushing) in the AFFECTED element (his female patients). The Japanese sentence is more complicated, following a pattern seen in Hasegawa et al. (2014:191) by shunning the inanimate subject in favour of a conditional clause and an animate subject. The conditional is annotated with the Conditional_occurrence frame which profiles a possibility and its consequence if it occurs. The evoking LU here is taken to be *to*. The Japanese verb used, *akarameru*, is a lexical causative meaning to make something (normally one’s face or cheeks) turn red. This is captured by the Cause_change frame which is described on FrameNet as follows:

An AGENT or CAUSE causes an ENTITY to change, either in its category membership or in terms of the value of an ATTRIBUTE. In the former case, an INITIAL_CATEGORY and a FINAL_CATEGORY may be expressed, in the latter case an INITIAL_VALUE and a FINAL_VALUE can be specified.

3.3. Example 3

(9) Start her talking and she’d go on nonstop.

(Murakami 2002:4)

	Cause_to_start (CAUSE = omitted)	Conditional_occurrence (evoked by construction)
Start	LU	(PROFILED_POSSIBILITY
her	(EFFECT	
talking))
and		
she'd		(CONSEQUENCE
go		
on		
nonstop)

Table 5: Breakdown of key frames in (9)

¹ His beautiful, manly nose swelled up suggestively from under his mask, making his female patients blush. In an instant - regardless of whether their dental plan covered the costs - they fell in love.
 美しい鼻はりりしく、またセクシュアルにマスクを盛り上げていたし、それを目にするほとんどの女性患者顔を赤らめ、あっというまもなく——医療保険がきかなかったにもかかわらず——恋に落ちた。

- (10) Ittan shaberi-dasu to kiri naku shabet-tei-ta
 Once speak-start.doing COND end without speak-CONT-PST
 ‘If she started to speak once, she would continue without stopping.’

(Murakami, 2001, p.8)

	Event_instance	Activity_start (AGENT = omitted)	Conditional_occurrence
Ittan	INSTANCE / LU		(PROFILED_POSSIBILITY
shaberi-	(EVENT	ACTIVITY	
dasu)	LU)
to			LU
kiri			(CONSEQUENCE
naku			
shabet-tei-ta)

Table 6: Breakdown of key frames in (10)

(9) and (10) are an example of the English translation introducing a causative which was not present in the original Japanese. The Japanese construes the event as a simple conditional: ‘If she starts talking, she goes on nonstop.’ The English introduces another agent into the scene: perhaps the impersonal *you*. The actual word is omitted in the conditional construction but the introduction of another agent is clear. The sentence could be rephrased to start, ‘If you start her talking, ...’

The Japanese sentence, with its single agent who starts talking of her own accord, fits easily into the Activity_start frame, in which, to quote FrameNet, “An AGENT initiates the beginning of an ongoing ACTIVITY in which he will be continuously involved.” The LU here is the auxiliary verb *dasu* ‘to start to do V’ attached to *shaberu* ‘to speak’. The AGENT element is omitted: the reader is aware who the subject of the sentence is without being told.

The English sentence is considerable harder to annotate. *Start her talking* is an example of the indirect causal relationship discussed in section 2. An agent is causing her to speak, presumably by bringing up a topic she would want to talk about, but the action of speaking is entirely under her control and relies on her intention.

My annotation above uses the Cause_to_start frame. This frame has a causative frame relation with Process_start, the frame from which Activity_start inherits. The description of Cause_to_start from FrameNet is as follows: “A CAUSE, animate or inanimate, causes a process, the EFFECT, to begin.”

The major downside of using this frame is that it fails to capture both of the agents, and thus also fails to capture the indirect nature of the causal relationship. Using this frame, an

annotator can show that an agent causes the effect of ‘her talking’, but one cannot show that the agent causes ‘her’ to ‘start talking’ of her own intention.

One solution may be to use the Causation frame alongside the Activity_start frame, showing that the AFFECTED element of the Causation frame is the AGENT in Activity_start, in a combination similar to Hasegawa et al. (2014:187)’s Causation+Trust. I believe, however, that there is a compelling argument for the Causation frame being inadequate in this instance. This will be discussed in detail in the next section.

4. Discussion

FrameNet contains a variety of frames for dealing with causation. On an abstract level, we have the Causation_scenario frame and the Causation which inherits from it. On a more concrete level, we have the Cause_to_X and Cause_X series of frames. Examples include Cause_to_start (causative of Process_start), Cause_to_burn, Cause_motion (causative of Motion) and Cause_harm. One characteristic of these frames is that they are only equipped to deal with the actions of one agent. Cause_motion for example deals mainly with LUs such as *push*, *throw*, *shove*. Indirect causation of motion (something like ‘The teacher made him leave’) is not covered.

The Causation frame, with its AFFECTED FE, is uniquely equipped within FrameNet to deal these kinds of causatives which involve intention on the part of the causee. This frame is, however, extremely abstract and broad in scope and a look at the annotated sentences brings up few sentences of this type.

One is left wanting a frame which specifically captures the indirect causal relationship where the causer acts indirectly through the causee, achieving his or her intended effect via the causee’s intentional action. This hypothetical frame would use FE’s such as AGENT, AFFECTED and EFFECT from the Causation frame via the ‘use’ frame relation. LUs would include verbs such as *make* and *force*, as well as lexical causatives which appear in this type of construction (such as *start* in (9)).

5. Conclusion

In conclusion, this paper has qualitatively examined the effectiveness of FrameNet in annotating causative constructions through a case study using a Japanese and an English novel. I have broadly split causative constructions into two different types: those which involve no intention on the part of the causee, and those which do. The former type are easy to annotate using FrameNet’s existing frames, either through the Cause_to_X and Cause_X frames, or with a combination of the Causation frame and another frame.

The main point I seek to make is that the latter type, causative constructions in which the causee makes an intentional action, are in need of a frame which specifically captures their indirect causal relationship. At present, this relationship can be captured by the Causation frame, but I argue that this frame is too broad and abstract. This type of indirect relationship

is schematic and has lexical units which evoke it. A new frame which is more specific than the Causation frame and which uses core FEs from it would allow for more effective annotation of causative constructions using FrameNet.

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