

A Cognitive Semantic Study of Causal Interaction of Acts in Narrative

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Abstract—Causality is one of the main prominent schematic components in language and cognition. In cognitive semantics, causality has received especial interest because of its significance as a basic element in our cognition. Langacker's (1990 and 1991) causal chain and Talmy's (2000) force dynamics are the most important models of causal structure in language and cognition. Talmy considers force dynamics as one of the schematic systems that structure events. His model is directed to the causal relation between clause components; while the current study investigates the causal relation out of the clause boundaries. It studies how a scene affects another one. The interaction between acts in terms of causality is part of the narrative structuring system in which causality is only one schematic component among others. The current study involves a new treatment of causality in narrative within the framework of cognitive semantics. It aims to answer the following three questions: first, how is causality formulated in narrative? Second, what are the causality forms in narrative? What is the role of causality in narrative? In order to answer these questions, the researcher builds a model on the basis of Talmy's force dynamics. It formulates the way in which related acts interact in terms of causality. The acts are selected and modified by the processes of extraction and conversion which pull out the schematic features of scenes. The model is applied to three events selected randomly from J.K. Rowling's Harry Potter novel.

Index Terms—causality, narrative, interaction, extraction

I. INTRODUCTION

Causality is one of the main prominent schematic components in language and cognition. In cognitive semantics, causality has received especial interest because of its significance as a basic element in our cognition. Langacker's (1990, 1991) causal chain and Talmy's (2000) force dynamics are the most important models of causal structure in language and cognition. Talmy considers force dynamics as one of the schematic systems that structure events. His model is directed to the causal relation between clause components; while the current study investigates the causal relation out of the clause boundaries. It studies how a scene affects another one. The interaction between acts in terms of causality is part of the narrative structuring system in which causality is only one schematic component among others.

The current study involves a new treatment of causality in narrative within the framework of cognitive semantics. It aims to answer the following three questions: first, how is causality formulated in narrative? Second, what are the causality forms in narrative? What is the role of causality in narrative? In order to answer these questions, the researcher builds a model on the basis of Talmy's force dynamics. It formulates the way in which related acts interact in terms of causality. The acts are selected and modified by the processes of extraction and conversion which pull out the schematic features of scenes. The model is applied to three events selected randomly from J.K. Rowling's Harry Potter novel.

II. CAUSAL INTERACTION OF ACTS AS A MODEL OF ANALYSIS

Causality is one of the most fundamental schematic components in the narrative structuring system because it connects, ascribes and sequences scenes and events at different levels. There are different treatments of causality within and out cognitive linguistics. In cognitive semantics, Talmy (2000) has generalized the notion of causation in his framework of force dynamics. He suggests that the processes of causation are conceptualized as having different types of forces which act in different ways upon the event participants. Talmy has examined many different patterns of force dynamics, some of them are illustrated in the following examples:

- (1) a. I kicked the ball.
- b. I held the ball.
- c. I dropped the ball.

Example (1a) illustrates the canonical type of causation: the causer (antagonist) forces the causee (agonist – the ball) to move. In the example (1b), there is an extension to the notion of causation to sustain a rest state: the antagonist has resistance against the moving tendency of the agonist. In the example (1c), the antagonist enables or allows the agonist to succeed its tendency towards movement (Croft & Cruse, 2004, p. 65).

Mulder (2007, p. 295) clarifies the steady-state force-dynamic pattern in the following situations:

a. A stronger Antagonist forces the Agonist to move while it has internal tendency toward rest. As in *The ball kept rolling because of the wind blowing on it*.

b. The Agonist's tendency toward rest is stronger than the force opposing it. The Agonist has strong inherent tendency toward rest that overcomes the opposing force. As in *The shed kept standing despite the gale wind blowing against it*.

c. The Agonist has strong tendency toward motion that cannot be stopped by the Antagonist; as in *The ball kept rolling despite the stiff grass*.

d. The Agonist has weak tendency toward motion that is blocked by the Antagonist's strong force. As in *The log kept lying on the incline because of the ridge there*.

It seems that this theory is designed to work at a lower level of language structure, level of clause. However, this theory does not work with the same efficiency at the upper levels, text or event level. It shows us how the entities within a clause interact, but not how this interaction leads to another interaction in other clauses or sentences. So, the current study suggests a new treatment of causality to deal with the upper level of event structure. This new model of causality is called **Causal Interaction of Acts**.

In Talmy's model, the interaction is between entities within a clause or a sentence. The current model posits an interaction between acts that involve interaction between entities. This means that there are two levels of interaction the lower level (between entities) and the upper level (between acts). According to this model, an event is viewed as a series of interacted acts. Every act consists of a verb (process) and one, two or a group of arguments. In the transitive processes, the act consists of an agent (A) with its process and a patient (P) with its process. In other words, the act structure consists of two states, one state encodes the agent's state (S1) and the second encodes the patient's state (S2). In the case of intransitive process, there is only one state (S0), the agent's state. Croft (2017) refers to these aspectual states in his model of event structure. The two situations, transitive and intransitive, are illustrated in Figure 1.

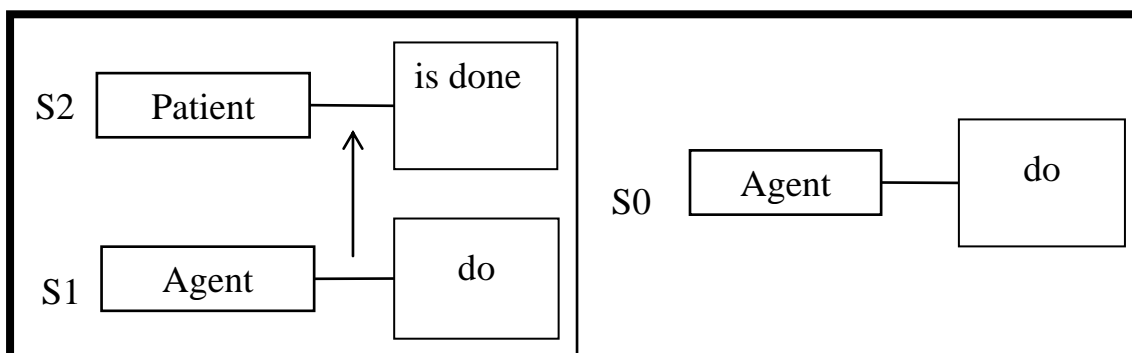


Figure 1: Diagrammatical Analysis of Act Structure

The interacted acts divide into the following types:

1. Logical Act (LogAct): this type of act is not found explicitly in the text, but it is part of the human logic or subjects to it. For example, in the sentence *the horse sings a wonderful song* there is an interaction between this act in which *horses sing* and a logical act in which *horses cannot sing*.
2. Typical Act (TypAct): it is derived from our daily interaction with world around. For example, how boys go to school, how one eats in a restaurant, what happens when a person goes to dentist, etc. Such acts are formulated in terms of script (see Koppel & Berntsen, 2014).
3. Inferred Act (InfAct): these acts can be named contextual acts because they are not expressed explicitly by language, but they derived from context relying on the contextual clues. Although inferred acts are not expressed explicitly, they can be manifested later. The inferred acts, which are expressed explicitly by language in a later time, are called **actualized acts**. Inferred acts exist in mysterious events when something needs to be discovered.
4. Perceived Acts (PerAct): such acts represent the most common acts used in our language. A perceived act is the act that is expressed explicitly by language. These acts divide into two types, **real** and **fantastical acts**. Real acts subject to the real life laws, while fantastical events violate these laws. Sometimes a speaker expresses an act indirectly and with different details. The speaker's expressions can be reformed to show the speaker **intended act**.

These different acts interact with each other on the basis of different notions or forms of causality. Causality in this context consists of three parts: causer, cause, result. Causer refers to the act that makes the cause act performed. Causer and causee can be represented in different forms as follow:

1. Motivator and Motivatee: these terms refer to the situation in an act motivates another act to be performed. The sentence in (2) consists of two interacted acts: the act of traveling and the act of *seeing* that are performed by the same participant, *Tom*. The act of *seeing* motivates the act of *travel* to be performed.

- (2) *He traveled to London to see his family.*
- Inhibitor and Inhibitee: this situation of causality is opposite to the previous one. In this situation, one act causes another act to stop or to prevent it from undertaking. The sentence in (3) involves two interacted perceived acts. The first act of *the weather* inhibited the second act of *travel*.
(3) *The weather was so bad, so he couldn't travel to London.*
 - Facilitator and Facilitatee: the situation of facilitation is close to the situation of motivation in which the two lead to performing an act. In this situation, one of the interacted acts facilitates the second act to undertake. The sentence in (4) involves interaction between two perceived acts. The act of *switching on* facilitates the act of *seeing* to be performed.
(4) *He could see the armed man when he switched on the light.*
 - Resistor and Resistee: this situation is close to the situation of inhibition in which the two lead to stop or prevent performance of an act. In (5), the sentence includes interaction over the concept of resistance between two acts. The act of *the weather being bad* was supposed to stop the act of *travel* but this act resisted and proceeded.
(5) *He traveled to London although the weather was so bad.*
 - Maker and Makee: this situation encompasses the mechanical affection between two interacted acts. In other words, the effect of the maker on the makee is presupposed and identified. There are two interacted acts in (6) in which the scene starts with the act of *explosion* which leads to the act of *demolish* as a presupposed and mechanical result.
(6) *The house demolished when the bomb exploded.*

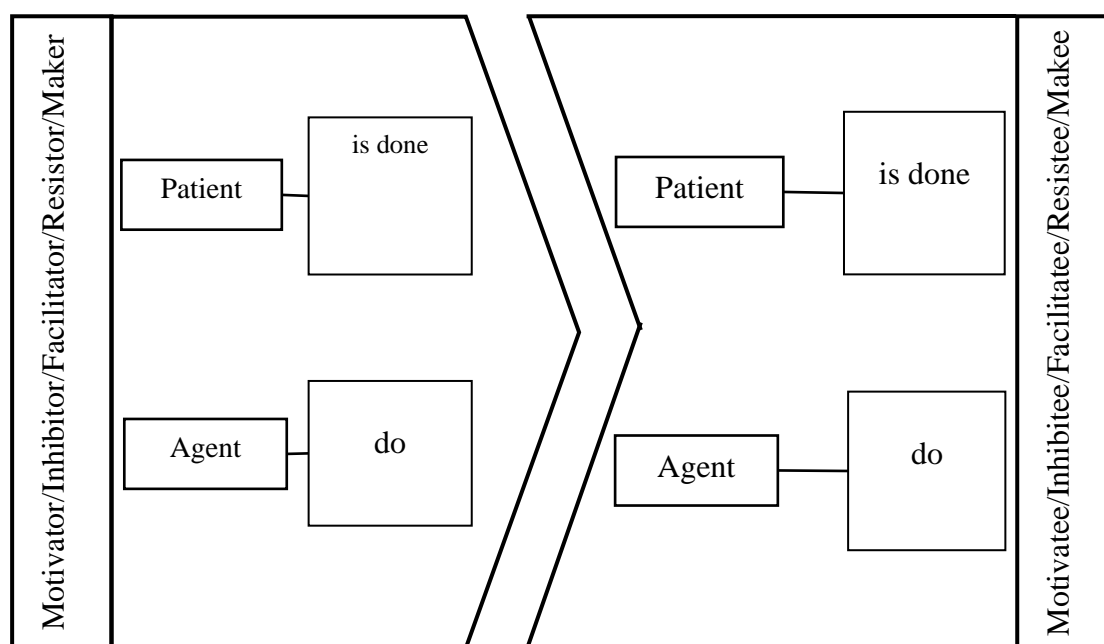


Figure 2: Diagrammatical analysis of Acts Interaction

Extraction and Conversion Process

One of the main scientific principles in language processing is the principle of economy. A narrative may include a huge and diverse amount of details that cover the main story of that narrative. All of these details are processed within the short term memory, but only the basic concepts or scenes pass to the long term memory. The principle of economy and the huge and diverse amount of details that our memory does not keep represent the necessity of the existence of the extraction process; it involves deleting some linguistic and nonlinguistic redundant elements. This process is directed mainly to the interaction of acts within scenes. Every scene involves interaction between one or more acts which are selected through the process of extraction. The scene in (30) involves interaction between two acts: the act of *selling* and the act of *paying off*.

(30) The man sold his car to pay off his debt.

The second process, conversion, is directed for converting some fluid linguistic elements, for example metaphorical, into more stable elements, literal. Sometimes, a speaker uses many words or expressions to describe something can be explained with one word (or little words) that represent the category to which the expressions belong. The process of conversion uses the category instead of the words which belong to it. In (31), the expression *turning the issue all over in his mind* can be converted to the general concept to which this expression belongs, as it is illustrated in Figure 3. The

bold circle represents the general category to which the expression in question belongs. This category or the converted meaning is called the intended action.

(31) He was turning the issue all over in his mind.

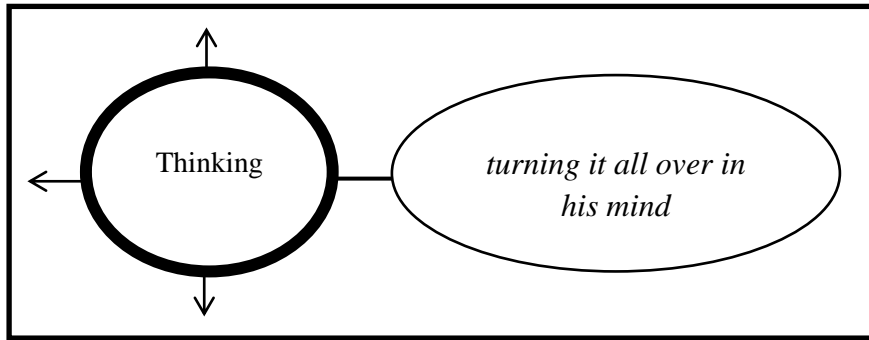


Figure 3: The Conversion Process

The question here is to what extent the two processes can be applied to compress scenes or expressions. The main criterion in this context is the accuracy of message. An expression subjects to the three processes to the extent that the expression meaning is not affected. Language mainly designed to convey messages, so the three processes do not affect the conveyed meaning in any way. In other words, the message will be conveyed as it is.

III. CAUSAL INTERACTION IN SELECTED EVENTS

A. Causal Interaction of Event-A

The present event consists of seven scenes that reflect the different aspects of the events. The framing process ascribes the boundaries of the event on the bases of the five schematic components. These scenes (S) are analyzed in the following sections:

S1. *He was in a very good mood until lunch-time, when he thought he'd stretch his legs and walk across the road to buy himself a bun from the baker's opposite.*

[Motivator: PerAct [(A: He – Pr: think) (P: (A: He – Pr: stretch/walk) (P: his legs – Pr: are stretched)) – Pr: is thought]] [Motivee: PerAct [(A: He – Pr: bay) (P: a bun – Pr: is bought)]]

According to the formula of the scene above, the scene involves interaction between two PerActs. The first act works as a motivator and it consists of the state of the agent (*Mr. Dursley*) who *thinks* the state of the patient (the clause *he'd stretch his legs and walk*). The second act functions as motivee and it encompasses the state of the doer (*Mr. Dursley*) who *bay* and the state of the patient (*a bun*) which *is bought*.

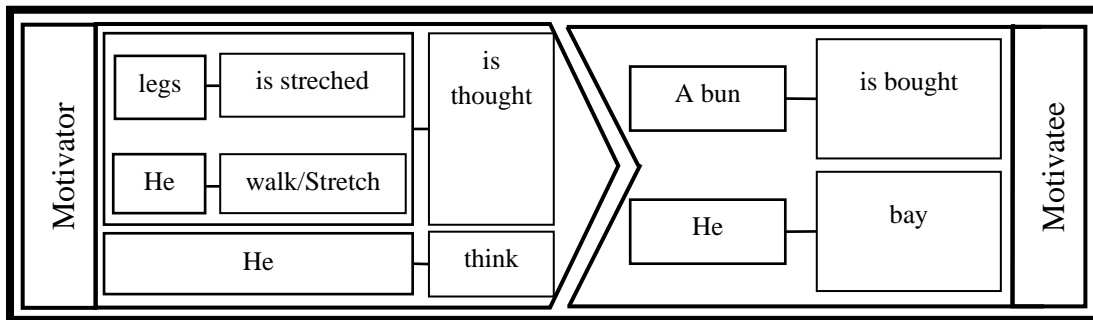


Figure 4: Diagrammatical analysis of S1 in event-A

S2. *He'd forgotten all about the people in cloaks until he passed a group of them next to the baker's.*

(1) [Facilitator: InfAct [(A: He – Pr: walk)]] [Facilitatee: PerAct [(A: He – Pr; pass) (P: a group of the people in cloaks – Pr: is passed)]]

(2) [Motivator: PerAct [(A: He – Pr; pass) (P: a group of the people in cloaks – Pr: is passed)]] [Motivee: PerAct [(A: He – Pr: remember) (P: people in cloak – are remembered)]]

The scene involves an interaction between two extracted acts in two places. The first interaction involves two extracted acts. The first act is inferred from the context relying on the previous scene when the agent (*Mr. Dursley*) thinks that he should walk. This scene consists of only one state in which the agent (*Mr. Dursley*) performs the action of *walk*. This act functions as a facilitator to the second which includes, as in the formula above, the state of the agent (*Mr. Dursley*) with the process *pass* and the state of the patient (*a group of the people in cloaks*) who *are passed*. This act returns to be a motivator in the second place of interaction with another act. The motivee PerAct involves *Mr. Dursley*

as an agent who performs the process *remember* and the patient (*people in cloaks*) with the passive process *are remembered*.

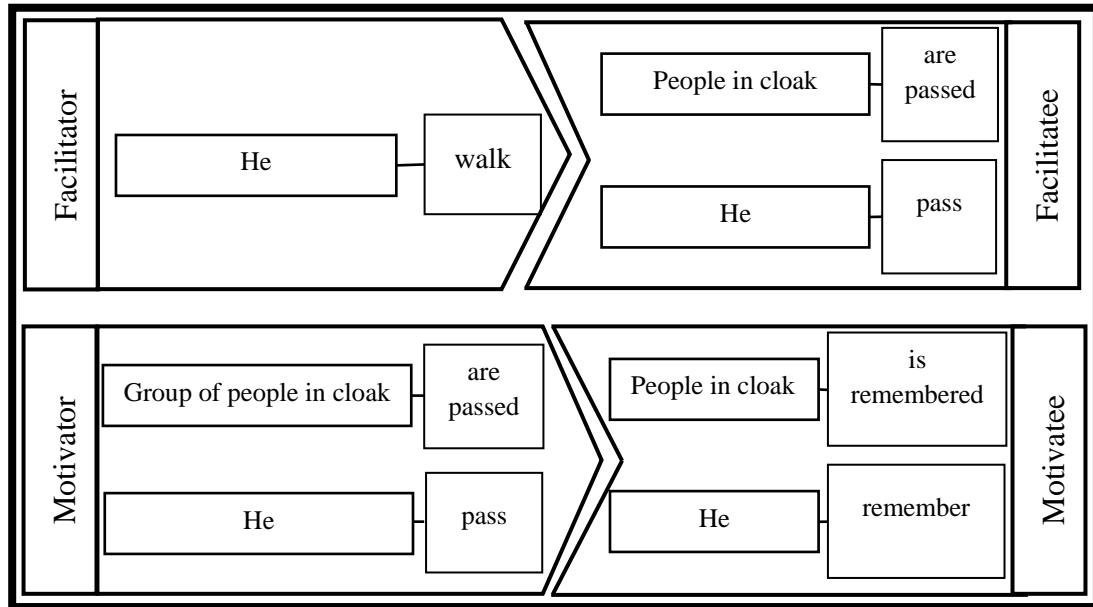


Figure 5: Diagrammatical analysis of S2 in event-A

S4. *This lot were whispering excitedly, too, he caught a few words of what they were saying.*
'The Potters, that's right, that's what I heard –'
'– yes, their son, Harry –'

A-Dom: Mr. Dursley [Facilitator: PerAct [(A: He – Pr: pass) (P: a group of the people in cloaks – Pr: is passed)]]
 [Facilitatee: PerAct [(A: He – Pr: hear) (P: (A: People – Pr: say) (P: The Potters – is said)) – Pr: is heard]]

The process of extraction derives two acts that interact in terms of facilitation. The first act is derived from the previous scenes and it functions in this scene as a facilitator. The facilitated act consists of two states: the state of agent in which *Mr. Dursley hears* and the state of patient in which the clause *people say The Potter is heard*. The two acts involve the process of **conversion** in the expression *caught a few words* has been converted to the verb *hear*. There are some words and expressions that have not been integrated because their meaning is conveyed by the extracted acts. These words and expressions are like *whispering, that's right, and that's what I heard*.

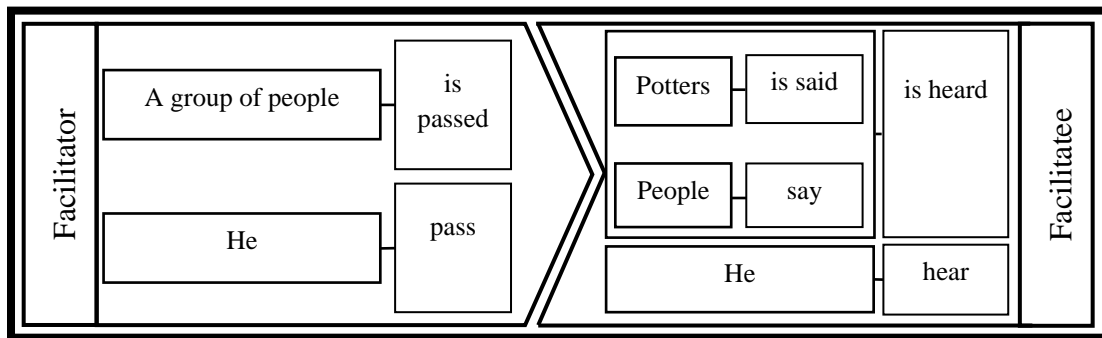


Figure 6: Diagrammatical analysis of S4 in event-A

S5. *Mr Dursley stopped dead.*

[Motivator: PerAct [(A: He – Pr: hear) (P: (A: People – Pr: say) (P: The Potters – is said)]]] [Motivatee: PerAct [(A: He – Pr: stop dead)]]

This scene is a simple one because it is extracted in nature. It involves two PerActs; the first motivates the second. The first act is derived from the former scene where it functions as a facilitatee in the former scene. The second scene involves only one state in which the agent (*Mr. Dursley*) and the process *stop*.

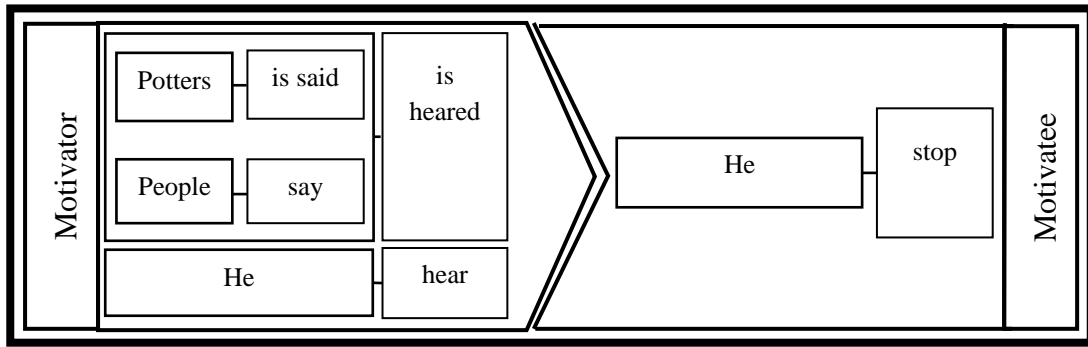


Figure 7: Diagrammatical analysis of S5 in event-A

S6. *He hurried up to his office, seized his telephone and had almost finished dialing his home number when he changed his mind.*

- (1) [Motivator: PerAct [(A: He – Pr: hear) (P: (A: People – Pr: say) (P: The Potters – is said))] [Motivatee: PerAct [(A: He – Pr: phone)]]
- (2) [Motivator: PerAct [(A: He – Pr: phone)]] [Motivatee: PerAct [(A: He – Pr: go (to his office))]]
- (3) [Inhibitor: PerAct [(A: an idea – Pr: appear)]] [Inhibitee: PerAct [(A: He – Pr: phone)]]

The scene involves three places of interaction as they are shown in the above formulas. The first interaction is between two PerActs: the first is derived from the former and it works as a motivator to the second act. The latter consists of only one state in which the agent (*Mr. Dursley*) performs the action of *phoning*. This act turns to be motivator in the second place. It motivates the PerAct in which the agent (*Mr. Dursley*) performs the action of *going*. The act of *phoning* turns to participate in the third interaction; it is inhibited by the PerAct in which the agent (*an idea*) appears.

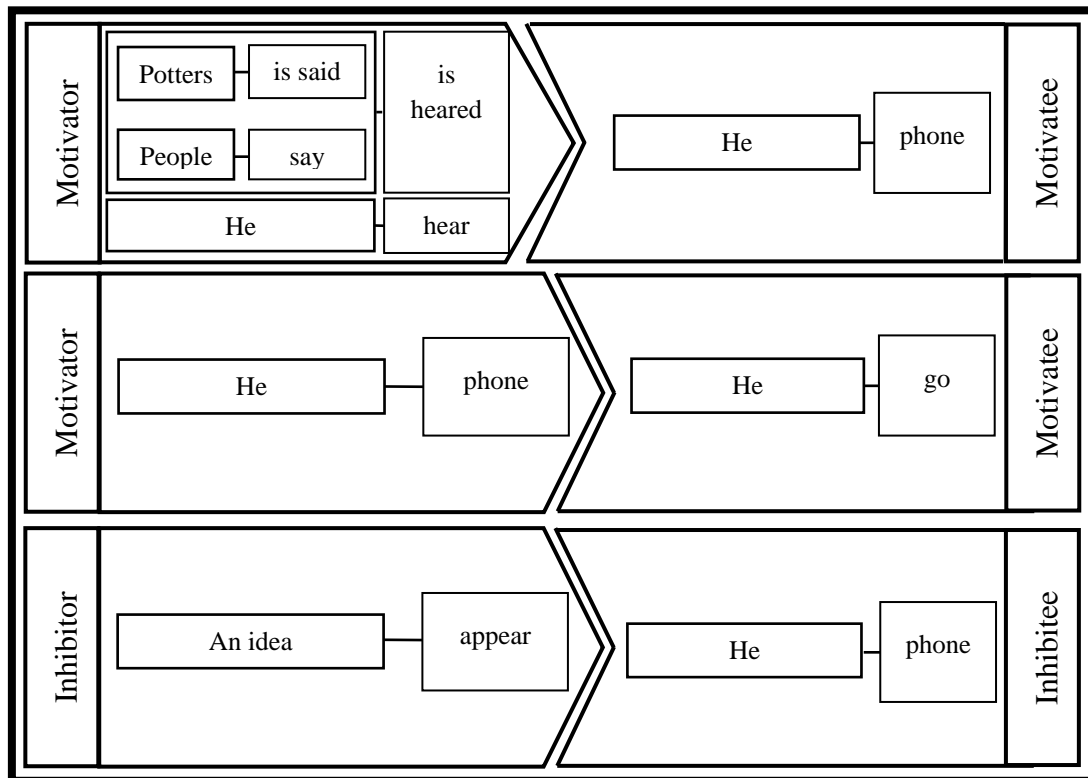


Figure 8: Diagrammatical analysis of S6 in event-A

S7. *He was sure there were lots of people called Potter who had a son called Harry.*

- [Inhibitor: PerAct [(A: many people – Pr: have) (P: the name of Potter and son called Harry – Pr: is had)]] [Inhibitee: PerAct [(A: He – Pr: phone)]]

The scene involves an interaction between two PerActs in terms of inhibition. The first act represents the idea that Mr. Dursley has in the previous scene. It consists of two states, the state of the agent (*many people*) with the process *have*

and the state of the patient (*the name of Potter and son called Harry*) with the passive form of the verb *have* (*is had*). The inhibittee is the act of *phoning* which is derived from the prior scenes.

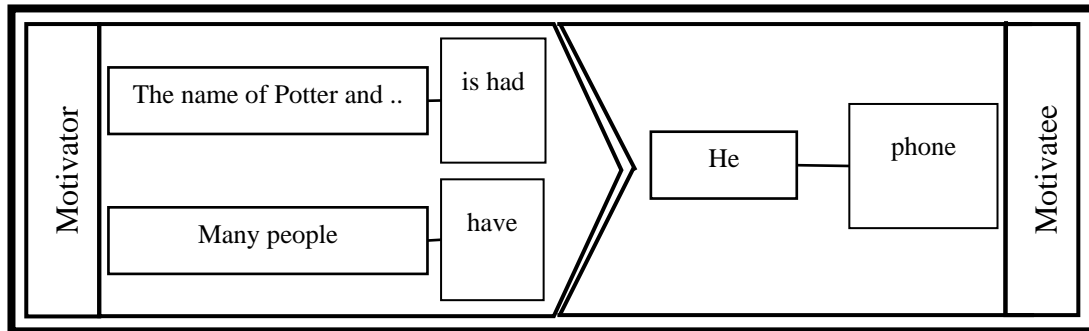


Figure 9: Diagrammatical analysis of S7 in event-A

B. Causal Interaction of Event-B

The present event consists of three scenes that are listed in the following sections:

S1. *He flicked a silver cigarette lighter open, held it up in the air and clicked it.*

[Motivator: InfAct [(A: something – Pr: do) (P: something – Pr: is done)]] [Motivatee: PerAct [(A: He – Pr: open/held up/click) (P: it – Pr: is opened/hold up/clicked)]]

The formula above indicates that the scene has two extracted acts. The first one is inferred from the context and it functions as a motivator. It consists of a general agent (*something*), and unidentified action and patient. This act needs to be identified in a later act. This act interacts with three related PerActs that are integrated in one act for short. The three actions *open*, *held up* and *click* are performed by *Dumbledore* (agent) on the agent (Put-Outer).

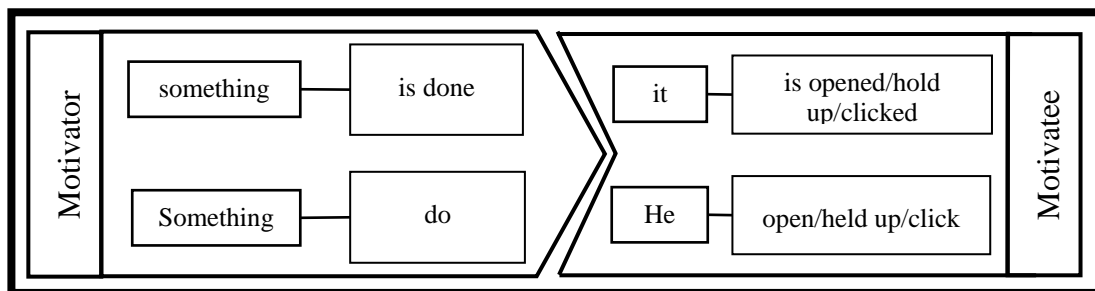


Figure 10: Diagrammatical analysis of S1 in event-B

S2. *Twelve times he clicked the Put-Outer, until the only lights left in the whole street were two tiny pinpricks in the distance, which were the eyes of the cat watching him.*

(1) [Maker: PerAct [(A: He – Pr: click) (P: the Put-Outer – is clicked)]] [Makee: PerAct [(A: All lights – Pr: are went out)]]

(2) [Maker: PerAct [(A: darkness – Pr: exist)]] [Makee: PerAct (A: the cat's eyes – Pr: flash)]]

The scenes involve two places of interaction in terms of making. The first place of interaction includes two PerActs; the first is derived from the former scene and is used as a maker. The second act consists of the agent (*all lights*) which performs the action of *going out*. The second place of interaction involves two extracted PerActs. The first act (maker) includes the agent (*darkness*) with the process of *exist* which is extracted because it is part of the conceptual meaning of the act. The second act includes the agent (the cat's eyes) which performs the action of *flashing*. The spatial component is represented explicitly and illustrated in Figure 11. The cat (the left black circle) is located on the wall (the upper bold line). It directs its sight (the arrow) toward the man (the right black circle) who is located on the street (the below bold line). Concerning causality, the act of *clicking* in the current scene is derived from the previous scene. The other schematic components extend fully into the current scene.

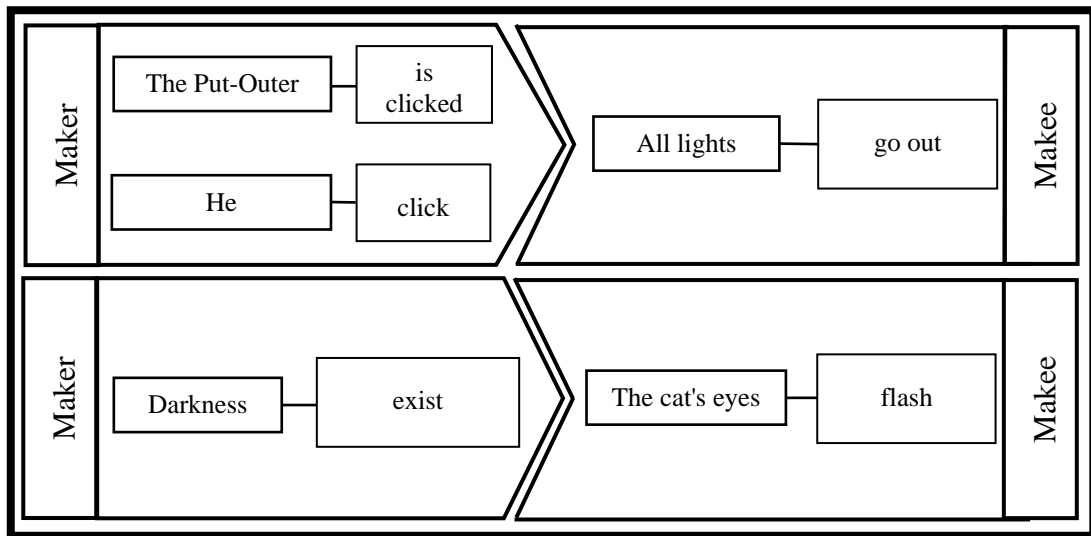


Figure 11: Diagrammatical analysis of S2 in event-B

S3: *If anyone looked out of their window now, they wouldn't be able to see anything that was happening down on the pavement.*

[Inhibitor: PerAct [(A: darkness – Pr: exist)]] [Inhibitee: PerAct [(A: people – Pr: see) (P: what happens – Pr: is seen)]]

The scene encompasses two extracted acts that interact in terms of inhibition. The first act is derived from the previous scene in which *darkness exists*. It functions as an inhibitor to another act which consists of the action *see* with two arguments, *people* as an agent and *what happen* as a patient. Causality has a full extension to this scene; the first act is derived from the preceding scene and the second act represents actualization of the inferred act in the first scene within the present event.

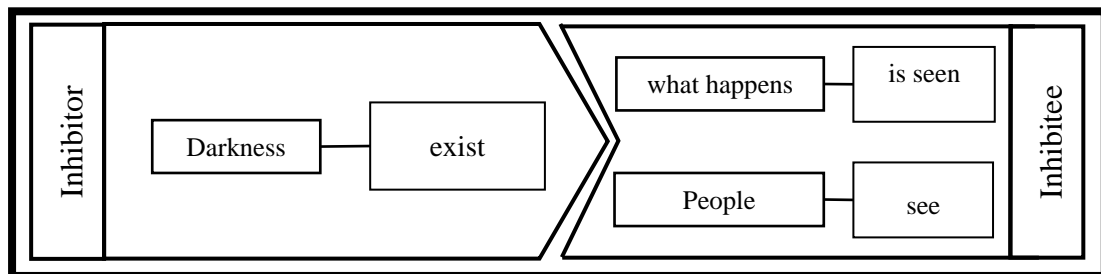


Figure 12: Diagrammatical analysis of S3 in event-B

C. Causal Interaction of Event-C

It consists of three scenes represented in the following sections:

S1. *...the cat on the wall outside was showing no sign of sleepiness.*

[Inhibitor: InfAct [(A: the cat – Pr: wait) (A: something – Pr: is waited)]] [Inhibitee: PerAct [(A: the cat – Pr: show) (P: sign of sleepiness – Pr: is shown)]]

This scene is classified as an initiating scene which contains two acts that are derived by the process of extracting. The first act is an inferred act that is extracted by means of the contextual clues. This act consists of the process of waiting and the two arguments, the cat as an *agent* and *something* as a patient. This act will be actualized in the next scenes or events. It represents the inhibitor for the second act that involves the process of *showing*, *the cat* as an agent and the sign if sleep as a patient.

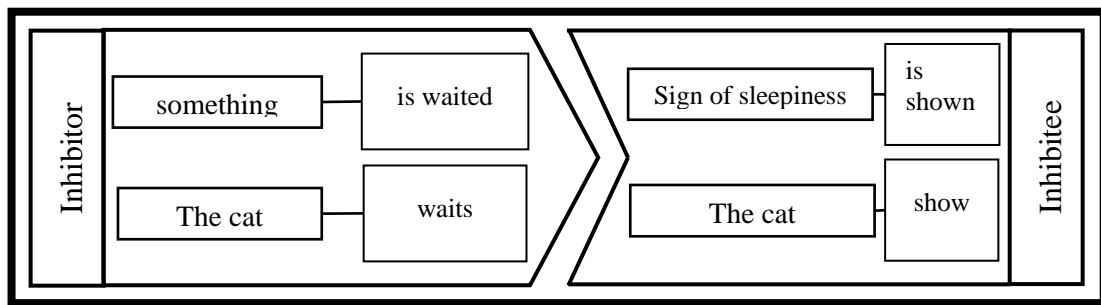


Figure 13: Diagrammatical analysis of S1 in event-C

S2. *It was sitting as still as a statue, its eyes fixed unblinkingly on the far corner of Privet Drive.*

(1) [Motivator: InfAct [(A: the cat – Pr: waits) (P: something – Pr: is waited)]] [Motivatee: PerAct [(A: the cat – Pr: sitting)]]

(2) [Motivator: InfAct [(A: the cat – Pr: waits) (P: something – Pr: is waited)]] [Motivatee: PerAct [(A: the cat's eyes – Pr: fix)]]

The scene, which is reflected in the sentence above, involves three interacted acts that are identified by the process of extracting. These acts take place within one domain, *the cat*. The first one is the inferred act of *waiting* which is represented in the previous scene. This act interacts with the other two acts, the PerActs of *sitting* and *fixing*. These two acts have the cat as an agent. The InfAct of *waiting* is the basic act in this scene while the other two PerActs are supporting ones. This scene relates to the former scene through the extension of all schematic components. The causal chain extends to this scene through the InfAct of *waiting* that is extracted relying on the contextual clues in the two scenes. This scene is illustrated in Figure 14.

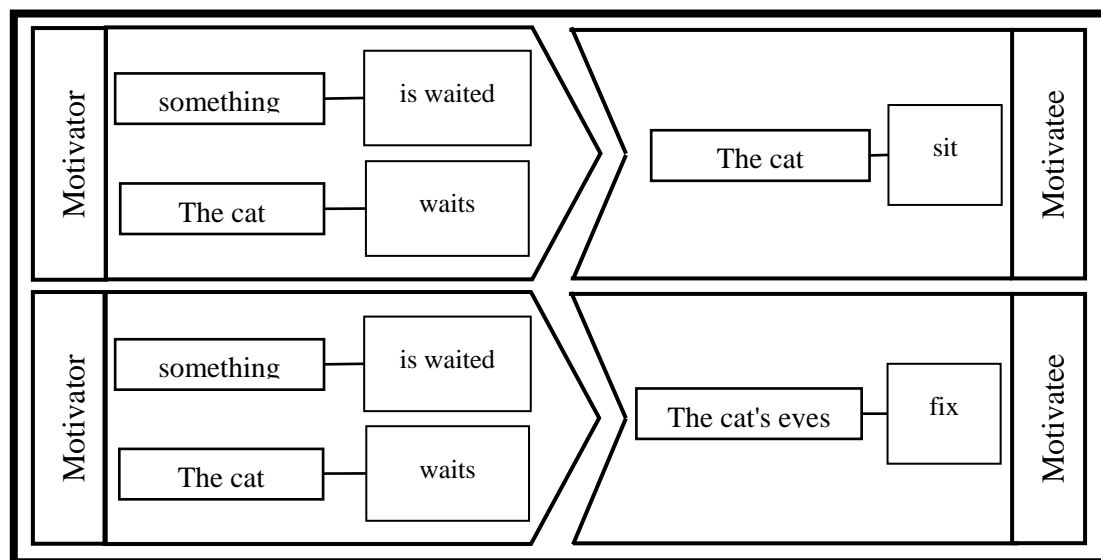


Figure 14: Diagrammatical analysis of S2 in event-C

S3. *It didn't so much as quiver when a car door slammed in the next street, nor when two owls swooped overhead.*

(1) [Resistor: PerAct [(A: the cat – Pr: not quiver)]] [Lo: street corner] [Resistee: PerAct [(A: someone – Pr: slim) (P: the door – Pr: is slimmed)]]

(2) [Resistor: PerAct [(A: the cat – Pr: not quiver)]] [Resistee: PerAct [(A: two owls – Pr: swooped)]]

The process of extracting indicates that the scene above involves interaction between three acts and the interaction is based on the concept of resistance. It also includes three domain of participation, they are: the *cat*, the *man* and the *two owls*. The first act is the PerAct of *not quiver* that includes the *cat* as an agent. This act resists the other two acts: the PerAct of *slimming* that the *man*, as an agent, performs and the PerActs of *swooping* which has the two *owls* as agents. The latter PerActs are classified as resistees. The extension of causality from the previous scene is represented by the relationship between the act of *quivering* in the current scene and the inferred act of *waiting* in the prior scenes. The act of *waiting* motivates the cat to resists the act of *quivering*.

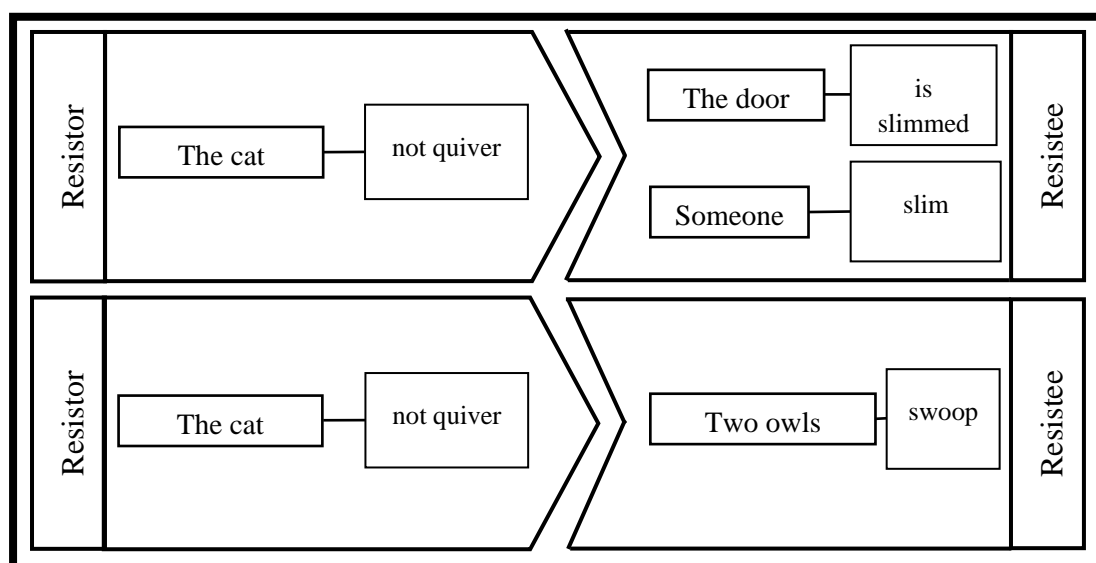


Figure 15: Diagrammatical analysis of S3 in event-C

IV. CONCLUSIONS

The events analysis above shows how the acts in scenes interact in terms of causality. The analysis can answer the questions raised in the introduction in the following points:

1. Causality is found in narrative in the form of interaction between acts that are performed by one participant or more than one. This interaction takes place within one scene or more.
2. Causality is not only one form; it has a number of forms that encode different causal relations between acts. It can be formed in terms of motivation, inhibition, making, facilitation, and resistance.
3. Causality is a fundamental component of narrative; it has two roles: first, the interaction between the acts represents the core component of scenes/event structure.

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