

A SYNTACTICO - SEMANTIC STUDY OF CAUSATIVE CONSTRUCTIONS IN SCIENTIFIC AND NON - SCIENTIFIC TEXTS

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ABSTRACT

In English, there are two types of construction to express causativity: the first is 'lexical causative' in which a verb conveys the notion of 'cause' and 'result', and the second is 'periphrastic causative' in which a verb conveys only the notion of 'cause'. The second type is of special interest to researchers because they directly encode different causal concepts. Two articles of two different disciplines, 'scientific vs. non-scientific' are taken under the investigation to be data of the study. The aim of the study is to investigate syntactic and semantic features of causative constructions, and to discover similarities and differences between scientific articles and non-scientific articles in the employment of causativity. The researcher adopts Song's (1996) syntactic model and Dixon's (2000) semantic model for the analysis. The study shows some general conclusions such as: the class of English causative verbs is open-ended. In addition, the frequency of appearance of causativity is more frequently employed in non-scientific text than those occur in scientific text. A number of pedagogical recommendations and suggestions for further studies are put forward.

Key Words: Causativity, causative verbs, causative constructions.

1. INTRODUCTION

The notion of causativity indicates the relation between two (or more) successive events where the second event; a caused event is grasped as the consequence of the first event; a causing event. This means that the caused event will not happen if the causing event does not happen. Many studies have presumed that there is a vigorous relationship between our conceptual system and linguistic system of causativity, assuming that the concept of 'cause' as it is reflected in the task of causal reasoning is the same concept as that encoded in causal language. Talmy (1985) views causativity as denoting whether some event is conceived either as occurring by itself or resulting from another event, where this latter event is either initiated by an agent or not, and such an agent is either volitional or not, or involved in the activity or not and so on. According to cross-linguistic research on the syntactic as well as semantic aspects, the way in which people use causative verbs, in particular, periphrastic causative verbs 'e.g. force', is consistent with the

notions of 'cause, enable, and prevent' identified in these aspects. In discussing the nature of periphrastic causative constructions as well as the lexical ones, two dimensions are important: their form and their function. In almost all the cases, the tendency has been to focus on the similarities and dissimilarities of causativity in syntactic and semantic behaviors found within the data for the analysis.

Texts of two scientific and non-scientific articles of almost the same lengths will be randomly selected for the analysis. So, the researcher would try to know and attempt to examine the impact of using syntactic and semantic features through the analysis on such texts. This is because these texts may contain many classes of verbs in which writers can employ different means to express the way how the structures of the two types (lexical and periphrastic) are formed to show causativity. When the articles are analyzed syntactically and semantically, it might be significant for those who are interested in linguistics, literature, stylistics. Accordingly, the study attempts to give plausible answers to some problems such as:

1. Which semantic class do causative verbs belong to? Do linguists and grammarians ascribe causative verbs to the class of state verbs or action verbs?
2. Are causative constructions frequently employed in scientific articles more than those employed in non-scientific articles or vice versa? why?

The current study aims at achieving the following:

1. Discovering syntactic and semantic features of causative constructions and how these features can affect -and be affected- and distinguish between causative and non-causative constructions.
2. Finding out similarities and/or dissimilarities between scientific articles and non-scientific articles in the use of causativity. The study puts forward the three hypotheses mentioned hereunder:

1. English causative verbs do not belong to a specific semantic class of verbs whether action verbs class or state verbs one.
2. The frequency of presence of causative verbs and constructions relies on the type and style of text, and that non-scientific language uses causativity more frequently than scientific language does.

2. LITERATURE REVIEW

The term causativity, in general, denotes the notion of the relationship between two (or more) consecutive events where the second event, referred to as **a caused event**, is grasped as the potential consequence of the first one which is referred to **as a causing event** (Yueru Ni, 2012). Wolff & song (2003, p.1) imply that "if the causing event, within a causative construction, does

not happen, the caused event will not happen either". Any single language has a number of methods and devices of how causativity can be shown up, such as verbs (e.g. cause), prepositions (e.g. in order to), or conjunctions (e.g. because) and so on. In everyday life, it is necessary to have knowledge of causal relations. This refers to what human beings learn when they deduce causative relations and what human beings mean when they utilize causative language (Wolff, 2007). For instance, it is ordinary to say a sentence like 'boiling water causes steam' while 'drinking water causes steam' seems, to some extent, odd. According to Halliday (1994), causativity is the issue whether the process is being happened by a causer or another entity such as causee. There is an explicit distinction between a self-stimulated event and an event stimulated by another participant or power. Talmy (1985, p.130) argues that a causative structure includes a relationship between "a precipitating event (Ep) and a resulting event (Er)".

Comparable perspective is held by Frawley who posits that a causal relation demonstrates determination between two events, with a preceding event giving rise to a following event (1992). Frawley (ibid, p.159) points out, a causal event is to be construed by "the logic of antecedence and consequence". It is represented as an 'if / then' relation:

(2.1) Ahmed forced Samir to do the homework.

This means that if Ahmed forced Samir, then Samir did the homework. Such relation, furthermore, is appropriate for the ergative causative structures as well:

(2.2) If the headmaster marched the pupils, then the pupils marched.

Various ways can be utilized to express causativity. Hladký and Růžička (2001, p.36) hold that a syntactic construction may be used to denote causativity as in e.g. "help a person do something" by lexical instrument e.g. "pairs made up of a transitive and an intransitive verb like fall / fell" or via a shift from intransitive to transitive form of the same verb:

(2.3) a. The bird fell.

b. The hunter fell the bird.

The realization of causativity in (2.3) is that 'the hunter caused the bird to be fallen'.

Dowty (1979), in turn, states that, there is actually a systematic-syntactic relation between the three sentences below:

(2.4) a. The crisis was deep.

b. The crisis deepened.

c. This project deepened the crisis.

He comments, the first sentence is a statement declarative sentence asserting or giving an opinion, fact or idea, the second sentence expresses what is called inchoative 'become' construction, whilst the third one is causative since 'this project' is behind the cause of making 'the crisis' be 'deepened'.

3. METHODOLOGY

A thorough presentation of two suggested models is required for the sake of interpreting to the reader that how causative constructions existing in scientific and non-scientific texts are to be analyzed. The models according to which the analysis are going to be conducted are adopted models; they complement each other. The syntactic model is proposed by Song (1996) while the semantic one is proposed by Dixon (2000). These models are chosen to be in a way that can reveal the primary syntactico-semantic features of examined articles.

3.1 Song's Model (1996)

A common view of causativity can be clearly seen in Song (1996) in which a functionally based-typology is developed and that is originally based on a sample of more than 400 languages.

Song assumes that causative constructions should be composed of three distinct types: the **COMPACT**, **AND**, and **PURP** types.

1. The **COMPACT** type: It is the first type of causative construction according to Song that can be schematically represented as:

S1 (... [S-cause] + [V-cause] ...)

Song claims that the term **COMPACT** is mnemonic in that it captures the contiguity or the compactness of [V-cause] and [V-effect]. At least in the prototypical case, no other elements can intervene between these two terms.

This type encompasses the traditional lexical causatives, as simply instantiated in (3.1), an example of change of location, and (3.2), an instance of change of state.

(3.1) John closed the door.

(3.2) The officer killed the fugitive.

As (3.1) indicates the change of location of the door from being open into being closed, (3.2) denotes the change of the state of the fugitive from being alive into being killed.

2. The **AND** type: It is the second type of causative construction examined by Song and which can be modelled on the following schema:

S1 (... [V-cause] ...) + (AND) + S2 (... [V-effect] ...)

In contrast to that of the COMPACT type, this schema indicates that in AND type there are two clauses involved, one containing [V-cause] and the second containing [V-effect], that's to say, made up of two contiguous sentences. These clauses are either linked with a conjunction or the two clauses are juxtaposed. In other words, the clause boundary is made either implicit or explicit. Being explicit is by means of an element coordinating the two clauses, that's why it is schematized here as AND. Unlike the COMPACT type, the order of the two clauses is fixed, or even cannot be reversed and this is the most striking feature about this schema. [S-cause] must precede [S-effect], but not vice versa.

3.2 Dixon's Model (2000)

Dixon's model seems rather comprehensive and more applicable in the analysis of any causative text semantically. Dixon divides these semantic differences into nine parameters, involving the verb itself, the causee, and the causer:

(a) Relating to the verb

1.State/action: Does a causative mechanism apply only to a verb describing a **state**, or also to a verb describing an **action**?

2.Transitivity: Does it apply only to **transitive** verbs, or to both **intransitive** and simple **transitive** verbs, or to all types of verbs – intransitive, simple transitive and also **ditransitive**?

(b) Relating to the causee

3. Control: Is the causee lacking control of the activity (e.g. if inanimate, or a young child) or normally having control?

4. Volition: Does the causee do it willingly 'let' or unwillingly 'make'?

5. Affectedness: Is the causee only partially affected by the activity, or completely affected?

(c) Relating to causer

6. Directness: Does the causer act directly or indirectly?

7. Intention: Does the causer fulfill the result accidentally or intentionally?

8. Naturalness: Does it happen fairly naturally (the causer just initiating a natural process) or is the result achieved only with effort (perhaps, with violence)?

9. Involvement: Is the causer also involved in the activity (in addition to the causee) or not involved?

Purposes of such comparative analysis are to find out and identify all types of causativity in both scientific and non-scientific texts, and compare their rate within both types of texts.

In the analysis of each article, there will be two separate tables for each article; one of which concerning syntax and the other concerning semantics of causativity. As to the tables set for the syntactic analysis, 'main category', 'subtype', 'frequency', and 'percentage' are to be displayed. Under economical purposes, the types of causatives are replaced by abbreviation inside table; **COM**, **AND**, and **PUR** represent **compact**, **AND**, and **purpose** respectively.

On the other hand, applying the nine semantic parameters of Dixon's model, the tables for the semantic analysis will display 'relation', 'parameter', 'frequency', and 'percentage'.

Under each table there will be reflection and of what is tabulated and then some examples of causative constructions are selected for the purpose of explaining to the reader about how each causative construction is analyzed whether syntactically or semantically.

4. DATA ANALYSIS

4.1 The scientific text which is represented by MedicineArticle is entitled "**Induced pluripotent stem cells: Problems and advantages when applying them in regenerative medicine**":

- Syntactic Analysis :

Main type	Subtype	Frequency	Percentage
COM	change of state	40	66.67 %
	change of location	2	3.33 %
AND	Juxtaposed	8	13.33 %
	linked with a conjunction	6	10 %
PUR		4	6.67 %
Total		60	100%

Table (4-1) Distribution and percentage of syntactic types of causativity in Medicine article

From table (4-1) it can be noticed that, the overall number of all the causativity found within the Medicine text comprises 60 cases. **Change of state**, the subtype of **COMPACT** type of causativity has been identified 40 cases representing 66.67% in total percentage. So, it is the highest rate among the other types.

On the other hand, only 2 cases of **change of location**; the second subtype of **COMPACT** occur within the whole text of Medicine article and have been counted 3.33% in total percentage. Thus, it achieves the lowest rate. However, 8 cases of **juxtaposed**; the subtype of **AND** rate 13.33 % in total percentages which are used by the writer of this article. The second subtype of **AND**, **linked with a conjunction**, accomplished 6 cases representing 10 % in total percentage. Finally, only 4 cases of **PUR** type record 6.67 % in the total percentage of the entire text of Medicine article.

Hereunder are three selected examples that represent some syntactic types of causativity used in text of Medicine article:

1. *Valproic acid increases the reprogramming efficiency of murine.*

The noun phrase **valproic acid** refers to the subject of sentence. It is the causer which acts as a causing event or S-cause of the causative construction. The verb **increases** is a transitive verb that indicates V-cause. **The reprogramming efficiency of murine** indicates the caused event, thus acts as S-effect.

This construction, accordingly, is a **COMPACT** - type causative because it is a single clause. It belongs to the **change-of-state** subtype since there is the causer who caused a change in the event to be brought about from a state to another.

2. *They make a viral-origin pathogen transfer from animals to humans impossible.*

This causative construction consists of two clauses within which there is no conjunction to link them together. Thus, it belongs to **juxtaposed** the subtype of **AND** type.

The higher sentence clause level, which is S_1 , is represented by the clause **they make a viral-origin pathogen**. It denotes the causing event. Meanwhile, the lower clause level, which is S_1 , is represented by the clause **transfer from animals to humans impossible**. It denotes the caused event. In the causing event, the S-cause is the pronoun **they**, **makes** is the V-cause, the noun phrase **a viral-origin pathogen** is the S-effect, and **transfer** is the V-effect of the causative construction. Furthermore, **They** is the causer while **a viral-origin pathogen** is the causee of the construction.

3. *Several research groups have introduced for delivering pluripotency genes into the recipient cell.*

It is a PUR-type causative construction although made up of two clauses.

The higher sentence clause level; the S_1 is represented by the clause **several research groups have introduced**. It denotes the causing event that consists of two actual elements. The first is the noun phrase **several research groups** that refers to the subject taking the role of the S-cause, whereas the second is the verb phrase **have introduced** takes the role of the V-cause.

On the other hand, the lower clause level; the S_2 is represented by **for delivering pluripotency genes into the recipient cell**. It is the caused event that consists of two elements; **for delivering** takes the role of the V-effect, and **pluripotency genes** the S-effect of the construction. The rest of the elements are optional.

To conclude the discussion concerning the Medicine article, the writer uses all syntactic types of causativity as shown in table (4-1). Through the analysis of this second article, it can be noticed

that there is a huge gap in using the types of causativity. In other words, one can see that the writer uses 40 cases of **change of situation** the subtype of **COMPACT**, whereas all the other four types are used in only 20 cases. Accordingly, it can be inferred that in Medicine text there are simple causative constructions used much more than compound ones.

- Semantic Analysis:-

Relation	Parameter		Frequency	Percentage
Relating to verb	State/action	state	15	25 %
		action	45	75 %
	Transitivity	intransitive	5	18.33 %
		transitive	55	91.67 %
		ditransitive	4	6.67 %
Related to causee	Control	having control	8	13.33 %
		lacking control	8	13.33 %
	Volition	willingly	8	13.33 %
		unwillingly	8	13.33 %
	Affectedness	partially affected	8	13.33 %
		completely affected	8	13.33 %
No causee found in the event			44	73.34 %
Relating to causer	Directness	directly	45	75 %
		indirectly	15	25 %
	Intention	intentionally	53	88.33 %
		accidentally	7	11.67 %
	Naturalness	fairly naturally	23	38.33 %
		with effort	37	61.67 %
	Involvement	involved	41	68.33 %
		not involved	19	31.67 %
Total			60	

Table(4-2)Distribution and percentage of the semantic parameters in Medicine article

Table (4-2) shows that causative **action** verbs are found in 45 cases from 60 cases used in the entire article presenting 75 % whilst causative **state** verbs are used only in 15 cases presenting 25% in total percentage. Concerning **transitivity** parameter, most of the causative verbs used in this article are **transitive**. As for the parameter of **control**, the cases in which the causee **lacks control** and **has control** employed by the writer are 16 cases, 8 times for each subparameter. Similarly, the writer employs the same numbers of causative constructions concerning the parameters of **volition** and **affectedness** whether the causee is partially affected and does the activity willingly or not as shown above. On the other hand, the cases where the causee is not involved in the event are 44 times recording 73.34% of the entire number of causatives which are

60 cases. The parameter of **directness**, 45 cases are utilized where the causer acts **directly** presenting 75%, whilst only 15 cases are utilized by the writer where the causer acts **indirectly** presenting 25%. As for the parameter of **intention**, 53 times occur in this article by the writer where the causer **intentionally** does the activity whereas just 7 times are employed where the causer **accidentally** does the activity. Concerning the parameter of **naturalness**, the causative constructions in which the activity happens **fairly naturally** occur 23 times whereas 37 times occur in this article where the activity happens **with effort** made by the causer. Finally, the writer employs 41 causative constructions in which the causer is **involved** in the activity whilst just 19 cases are utilized where the causer is **not involved** in the activity.

Below are two sentences taken from Medicine article to be instantiated for the sake of showing how the researcher analyzes causative constructions semantically according to Dixon's model:

1. BIX-01294 inhibiting histone methyltransferase G9a allows murine fibroblast reprogramming using two factors.

- Related to verb [allow]

Action/state → often seen to act as a state verb

Transitivity → transitive

- Related to causee [murine fibroblast reprogramming]

Control → the causee possesses control given by the causer through the existence of the verb **allow** which semantically denotes admitting an event as legal or acceptable

Volition → the causee performs the activity willingly since it has control or power used for achieving the task

Affectedness → the causee here is completely affected by the causer.

- Related to causer [BIX-01294 inhibiting histone methyltransferase G9a]

Directness → the causer acts indirectly because the causee is the one that has power to bring about what is targeted in the event.

Intention → the causer accomplishes the result of the activity intentionally by inducing the causee to do it directly.

Naturalness → the event happens fairly naturally and there is no any effort made by the causer in the activity

Involvement → the actual performance is obviously done by the causee therefore the causer is not involved in the event.

2. *To do this, lox P-site was introduced into the lentiviral 3'LTR-regions....*

- Related to verb [do]

Action/state → action

Transitivity → transitive

- Related to causee [lox P-site]

Control → here the causee actually lacks control because it is **introduced** involuntarily in the event

Volition → since it is **introduced** involuntarily, the causee does the activity unwillingly

Affectedness → because of lacking control, the causee is completely affected by the causer to bring about the task of the event.

- Related to causer [one]

Directness → the sentence is in the passive voice so the causer actually is not mentioned literally therefore the causer acts indirectly in the event.

Intention → The causer that is represented by implicit power does the activity intentionally since this imposes the causee to perform it directly.

Naturalness → the causer is required to make effort so as to stimulate the causee and put it in certain direction for achieving the task in the activity

Involvement → the causer is not involved in the actual activity, it is regarded as initiator and does not participate in achieving the task directly.

4.2The non-scientific text which is represented by Philosophy Article is entitled "**Reasons to act and believe: Naturalism and rational justification in Hume's philosophical project**":

- **Syntactic Analysis :-**

Main type	Subtype	Frequency	Percentage
COM	change of state	47	50 %
	change of location		
AND	Juxtaposed	22	23.40 %
	linked with a conjunction	13	13.83 %
PUR		12	12.77 %
Total		94	100%

Table (4-3) Distribution and percentage of causativity in Philosophy article

The table (4-3) shows the relative frequency and percentage of each type and subtype of causativity analysis as it occurred in the Philosophy article used by the writer.

Again, through the analysis of the second non-scientific article, one can see that, except that of (**COM: change of location**), the writer uses all the types of causativity.

From the table above, a reader can notice that the total number of the causatives found within the Philosophical article reaches to 94 cases.

Change of state; the subtype of **COMPACT** type of causativity has been identified 47 cases which represent exactly 50 % in total percentage. So, it again records the highest rate among the other types.

On the other hand, 22 cases of **juxtaposed**; the subtype of **AND** record 23.40 % in total percentages which are used by the writer of this article. However, 13 cases of **linked with a conjunction**; a subtype of **AND** occur within the entire text of Philosophy article and that have been counted 13.83% in total percentage. Finally, only 12 cases of **PUR** type represent 12.77% in the total percentage of the whole text of Philosophy article used by the writer. Therefore, it records the lowest rate.

Hereunder are three selected examples that represent the types of causativity used in text of Philosophy article:

1. Hume denies the existence of reasons.

Since it is a simple causative construction in which there is no any indication to a process of change in location, it belongs to the **COMPACT** type, in particular, **change of state**. **Hume** is a proper name referring to the subject of sentence, thus, it is the causer of the construction acting as the S-cause. **Denies** is a transitive verb taking the function of the V-cause. The noun phrase **the existence of reasons** takes the function of the S-effect.

2. In order to settle these questions, it is necessary to examine some of the many quite different things.

This causative construction belongs to **linked with a conjunction**; the subtype of **AND** type, since within which two separate clauses are linked with the initial conjunction **in order to**. The first clause which follows this conjunction is the subordinate clause. It indicates the S₂ denoting the caused event and that contains the V-effect represented by **settle**, and the S-effect represented by **these questions**.

On the other hand, the second clause is the main clause. It indicates the S₁ that denotes the caused event. It contains the verb **to examine** which represents the V-effect and the noun phrase **some of the many quite different things** represents the S-effect.

3. He uses the separate term 'responsible' to describe persons, beliefs, or actions.

The first event is done just for the sake of the second event to be brought about. It, thus, belongs to the **PUR** type. Two clauses are involved within this causative construction; the first is the causing event and the second is the caused event. The first clause includes the pronoun **he** which acts as the S-cause, thus it is the causer, the verb **uses** which acts as the V-cause, and **the separate term 'responsible'** is the causee of the construction.

Meanwhile, in the second clause one can find the V-effect represented by the verb **describe**, and **persons, beliefs, or actions** which represents the S-effect since the latter includes the elements in this construction onto which the effect is located.

- Semantic Analysis:-

Relation	Parameter		Frequency	Percentage
Relating to verb	State/action	state	45	47.87 %
		action	49	52.13 %
	Transitivity	intransitive	2	2.13 %
		transitive	92	97.87 %
		ditransitive	6	6.38 %
Related to causee	Control	having control	18	19.15 %
		lacking control	14	14.89 %
	Volition	Willingly	18	19.15 %
		unwillingly	14	14.89 %
	Affectedness	partially affected	18	19.15 %
		completely affected	14	14.89 %
No causee found in the event			62	65.96 %
Relating to causer	Directness	directly	50	53.19 %
		indirectly	44	46.81 %
	Intention	intentionally	82	87.23 %
		accidentally	12	12.77 %
	Naturalness	fairly naturally	27	28.72 %
		with effort	67	71.28 %
	Involvement	involved	54	57.45 %
		not involved	40	42.55 %
Total			94	

Table(4-4) Distribution and percentage of the semantic parameters in Philosophy article

Through examining the text of philosophy semantically, it must be observed within the scope of related to verb that **state** verbs used in this article by the writer occur in 45 cases from 94 cases used in the article presenting 47.87% whereas 49 cases occur when the verbs act as **action** verbs

presenting 52.13% in total percentage. Furthermore, except 2, all causative verbs employed in this article are **transitive** recording 92 verbs, and those 2 verbs act as **intransitive** and only 6 verbs can act as **ditransitive**. As for related to causee, when noticing the parameter of **control**, it would be found that the number of times where the causee **lacks control** is found in 18 cases representing 19.15% and the times where the causee **has control** are 12 cases representing 14.89% in total percentage. As shown in the table above, the writer uses the exact numbers that occur with the parameters of **volition** and **affectedness** whether the causee is **partially affected** and does the activity **willingly** or not. Within the same context, the cases where the causee is not involved in the event are 62 times of 94 recording 65.96 % in total percentage. Within the scope of related to causer, particularly the parameter of **directness**, 50 cases are utilized in the article in which the causer acts **directly** in the event whereas 44 cases are utilized in which the causer acts **indirectly**. Concerning the parameter of **intention**, 82 cases have been accounted in this article where the causer does the activity **intentionally** representing 87.23 % whereas only 12 cases have been accounted where the causer does the activity **accidentally** representing 12.77%. Within the **naturalness** parameter it can be observed that the causative constructions in which the activity occur **fairly naturally** are used in 27 cases recording 28.72% whereas 67 cases are used where the activity happens **with effort** made by the causer during the activity recording 71.28%. Finally, as to the **involvement** parameter, the causative constructions employed by the writer in which the causer is **involved** in the event occur in 54 cases presenting 57.45% whereas 40 cases occur in the article in which the causer is **not involved** presenting 42.55 % in total percentage.

Again, here are two selected examples representing all semantic parameters used in the text of Philosophy article:

1. Some long-term desires lead us to disapprove the force of other desires as contrary to self-interest.

- Related to verb [lead]

Action/state → action

Transitivity → transitive

- Related to causee [us]

Control → here the causee has control because (us) themselves are responsible for achieving the event directly

Volition → since having control the causee willingly does the activity

Affectedness → based on the above, the causer affects the causee partially

- Related to causer [Some long-term desires]

Directness → the causer acts indirectly because the causee is the one that has power to carry out the task of the event

Intention → here the causer accomplishes the result of the event intentionally and this is done by stimulating the causee to do it directly

Naturalness → the event happens fairly naturally and the causer does not make effort in achieving the task

Involvement → since acting indirectly the causer is not involved because *Some long-term desires* as a cause is considered as initiator of the activity.

2. Hume also employs a narrower sense of imagination

- Related to verb (employs)

Action/state → action

Transitivity → transitive

- Related to causee

No causee is involved in the event

- Related to causer [Hume]

Directness → the causer acts directly since *Hume* himself achieves the activity directly

Intention → since the causer acts directly the activity is actually achieved intentionally but not accidentally

Naturalness → the causer brings about the activity with effort

Involvement → the causer here must be involved since the task is not achieved without a causer to perform it.

5. CONCLUSIONS

Throughout the present study the following conclusions are arrived at:

1. The class of English causative verbs is open-ended. In other words, they are not restricted to any semantic class. Causative verbs can be found within action verb class as well as state verb one.

2. The frequency of appearance of causativity is more frequently employed in 2non-scientific text than those occur in scientific text.

3. Semantic roles are associated with the type of verb; therefore the subject of causative construction can be represented by instrument not only by agent.
4. Selectional restrictions can play a significant role in determining and existing any causative construction. In other words, the selectional restrictions on the object in the transitive structure and the subject in the intransitive one do not concur with any verb.
5. Remarkable differences between scientific and non-scientific texts; for instance, writers of scientific language employ passive voice sentences much more than those found in non-scientific which characterized by using active ones and this leads to the fact that scientific language is considered to be free from alternative, and much less artistic than non-scientific language. That's to say, language of science is characterized by impersonal style, accordingly causative constructions are less frequent used in scientific than non-scientific text.

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