THE COMPLEXITY OF CAUSAL CONSTRUCTIONS IN TEXT

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With the help of the theory of systems, well known in the natural sciences, the complicated phenomenon of causality can be seen in all its complexity. While the syntactic complexity can be analized by different degrees of subordination, in the semantic aspect causality is complex as regards its interrelations with conditionality, finality, consecutivity, concessivity and other relations. The so called causal complexes in the text throw a completely new light on the problem. Their application provides an onomasiological method of text analysis including any linguistic form expressing causality. The interesting results will be proved with examples of the spanish language.

In traditional grammar, causality is mostly seen as an indication of the cause, one of the two parts of a simple relation between cause and effect. Although it is one of the possible cases, which in many languages is expressed by a subordinated clause with a conjunction, this does not fully describe the phenomenon of causality, which is much more complicated.

In colloquial speech, events such as the following are often expressed:

(1) I lost the key, because there was a hole in my pocket.

This is a typical example of a simple, unidirectional causal expression that includes only one cause, the hole in the pocket, and one effect, the fact that someone lost a key. Often it is not necessary to ask for more than one cause. In this example the fact, that without the gravitation of the earth the key could not have fallen down at all, is not of interest. Neither are things such as the weight and the material of the key, the condition of the material from which the pocket is made, that has led to the hole, or the psyche of the man who has lost the key which is responsible for the lack of care he took of his clothes. But on the other hand all these causes or conditions are present. Without them the action would not happen.
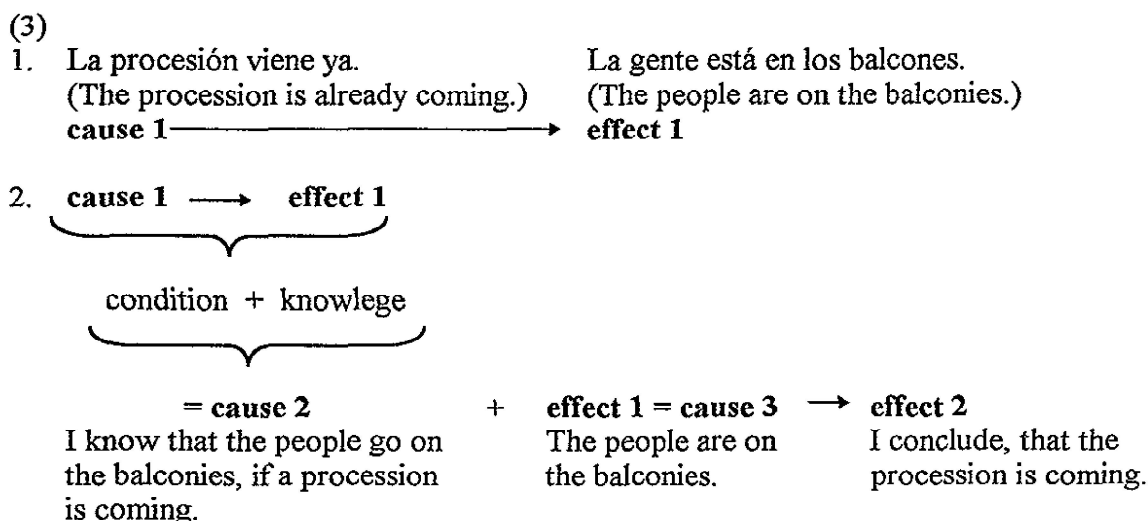
It is not always necessary, possible or desirable for us to know these nets of relations. The colloquial concept of causality in some situations is sufficient. In such a concept it is emphasized only one relation between cause and effect. Normally it is the relation that is unusual or that shows a sudden change of situation, like the hole in the pocket. Other facts like the law of gravity are not mentioned, because they are so natural and self-evident that it is not necessary to speak about them. There are however other situations in which it is very necessary to demonstrate a larger part of the extensive net of causality and this happens not only in scientific and complicated texts, but also in texts of common every day speech. The

following examples from the Spanish language show one of the problems that occur in expressing facts of our complex world linguistically in a simple way:

(2) 1. La gente está en los balcones, porque la procesión viene ya.
   (The people are on the balconies, because the procession is already coming.)
 2. La procesión viene ya, porque la gente está en los balcones.
   (The procession is already coming, because the people are on the balconies.)[1]

In the first sentence a real cause is expressed. The reason why the people are standing on their balconies is the fact that the procession is coming. Maybe they already hear some noises. In the second sentence there is something wrong with the causal reference. The fact that the people are standing on their balconies can never be the cause of the fact that the procession ist coming. In traditional grammar 1. is called *real cause* and 2. *logical cause*. The question arises what a sentence like 2. really means. This cannot be explained by a simple linear concept of causality, that contains only one cause and one effect.

Only a complex view of causality can promise a solution. Fertile stimulation in this regard is provided by the modern theory of systems or theory of chaos, well known in the natural sciences, and now being applied in social sciences. This theory tells us that causality as a phenomenon of our complex world is a system of interrelations and can be considered a network as proposed by Wuketits (1981). We can therefore analize the two sentences in the following way:

(3)
1. La procesión viene ya.   La gente está en los balcones.
   (The procession is already coming.)   (The people are on the balconies.)
   cause 1————————————→ **effect 1**

2.   **cause 1** ——→ **effect 1**

           condition + knowlege

         = cause 2   +   **effect 1 = cause 3** ——→ **effect 2**
   I know that the people go on   The people are on   I conclude, that the
   the balconies, if a procession   the balconies.   procession is coming.
   is coming.

The speaker observes that the people are on their balconies and concludes that a procession is coming. It is obvious that sentence 2. is much more complex than sentence 1. One of the main ideas in the present paper is the argument that complex causal relations like the conclusion in this example consist of various combined cause-effect-relations, as I have shown in my work *The Development of the Expression of Causality in the Spanish Language* (Störl-Stroyny 1996). I understand causality in the following sense:

„Causality is a concept of relation, that exists, if there is at least one x and one y and between x and y there is at least one relation in the way that the effect y is created and determined by the cause x." (Störl-Stroyny 1996, S. 241)

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[1] The spanish examples are from Bartol Hernández (1988), p.17

This definition is quite general and leaves space to include several relations into the concept of causality, which traditionally are not considered causal, for instance conditionality, finality, consecutivity, instrumentality, concessivity, causativity and other relations. In the above mentioned work I have shown that the more complex relations always consist of a variety of combined simple cause-effect-relations.

Having considered the complexity of causal relations, we now have to ask how this complex network of causality is expressed in the text. In the following passages I will demonstrate that the principle of complexity of Clark and Clark works as regards formal, especially syntactic expression, not however in terms of semantics:

„Complexity in thought tends to be reflected in complexity of expression." (Clark and Clark 1978, p. 230)

The investigation of complexity is not so easy as it seems at first. If only the quantity of linguistic forms is considered to be a test of complexity it is not possible to achieve an adequate result. There was a variety of forms for instance in the Spanish language of the Middle Ages, but it is unlikely that there is a higher complexity in these texts. That is why it is necessary to differenciate between types of complexity. Obviously there is an explicit complexity characterized by an abundance of forms, and an implicit complexity characterized by semantic abundance.

An effective method that I used for the analysis of causality in Spanish texts from the Middle Ages to the present day are the *causal complexes*. A causal complex consists of two or more *causal parts*. The term causal part is used to summarize the forms containing causality, because it is not possible to mention the whole form, especially when they are very long. The most simple causal complex is a relation between two causal parts, one cause and one effect:

(4) „Da qui quito Castiella, pues que el rey he en yra... (Menéndez Pidal 1961, p. 15) (I am leaving this place, because the king is angry.) W I Pr (U) I Pr

(5) „Asconden se de myo Çid, ca nol osan dezir nada." (Menéndez Pidal 1961, p. 10) (They hide out from my Çid, because they do not dare tell him anything.) W I Pr (U) I Pr

These two examples from the Old Spanish text *Cantar de myo Çid* show a typical relation between an effect expressed at the beginning of the sentence: *Da qui quito Castiella* and *Asconden se de myo Çid*, summarized by the symbol W = effect, and a cause: *pues que el rey he en yra...* and *ca nol osan dezir nada*, symbolized by U = cause. The brackets mean that the cause is expressed by a subordinate clause. U is underlined to demonstrate that it is introduced by a connective, in this case a conjunction: *pues que* and *ca*. I Pr means that the causal part contains a present indicative tense. So the causal complex is sufficiently characterized by the symbol W I Pr (U) I Pr and can be easily used for analysis of the text. But a causal complex does not necessarily refer to a sentence. As it is possible that a complex is a part of a sentence as for instance in *Por la lluvia no voy (For the rain I do not leave)*, where the connective is a preposition and the first causal part is a nominal construction, it is also possible realized over several sentences, as in the following dialogue that contains three causal parts:

(6) „J. D. ¿Quiere decir que se trasladó a Barcelona?
M. Si.
J. D. ¿Porque?
M. No encontraba trabajo en Valladolid." (Mendoza 1975, p. 539)
U ? W I PS U I Imp

Explanation: ?   = Question
                I PS   = Simple Perfect Indicative
                I Imp   = Imperfect Indicative

The first causal part is the fact that the man moved to Barcelona. The second is the question why he did so and the third, the answer that he did not find work in Valladolid, is the cause. This example does not have any subordination, just as little as in the following causal complex that shows a very comprehensive cause, consisting of a lot of sentences which explain the situation of the speaker and all are the reason why he wants to take drastic measures, expressed in the little sentence at the end: *Por eso es preciso cortar por lo sano*. Instead of mentioning all these causes, the causal part is abbreviated to U Kompl., that means complex cause.

(7) FERNANDO. - No es eso, Urbano. !Es que le tengo miedo al tiempo! Es lo que más me hace sufrir. Ver como pasan los días, y los años..., sin que nada cambie. Ayer mismo éramos tú y yo dos críos que veníamos a fumar aquí, a escondidas, los primeros pitillos... !Ya hace ya diez años! Hemos crecido sin darnos cuenta, subiendo y bajando la escalera, rodeados siempre de los padres, que no nos entienden; de vecinos que murmuran de nosotros y de quienes murmuramos... Buscando mil recursos y soportando humillaciones para poder pagar la casa, la luz... y las patatas. Y mañana, o dentro de diez años que pueden pasar como un día, como han pasado estos últimos..., !sería terrible seguir así! Subiendo y bajando la escalera, una escalera que no conduce a ningún sitio; haciendo trampas en el contador, aborreciendo el trabajo..., perdiendo día tras día... **Por eso es preciso cortar por lo sano.**" (Buero Vallejo 1987, p. 45-46) U Kompl. W I Pr

Not every causal complex contains a connective, such as a conjunction or a preposition. Causality can also be lexicalized as in the following example with the verb *causar* (*cause*), symbolizd by N = lexical category.

(8) „... el carácter de la joven, que había heredado no poco de su propia firmeza, le causaba alguna inquietud." (Gil y Carrasco 1967, S. 41) U N W I Imp

Alternatively, the causal part can be coordinated only in semantics, but without a marker as in *It is raining. I do not leave home*, where the causal connection is sufficiently clear and does not need to be marked.
Until now the examples contain relatively simple causal complexes, but these can also be very large, as is seen in the following examples. Naturally extensive causal complexes are a sign of a great explicit complexity and they are typical of the Old Spanish period:

(9) „Et **porque** estas dos figuras[2] dieron semeíanza de animales de un linage, et ambas fembras, esto no fué sinon por demostracion grande de las uertudes que Dios puso en estas figuras sobredicha, et de los fechos que fazen assí cuemo fallaron los philósophos que prouaron todas las cosas, et por esto possieron esta figura en semeíanza de *ossa fembra*, et **cuemo que** andaua buscando que comiesse, ca en algunos logares la figuraron ell rostro baxo por tierra cuemo qui llera aquello que comer, et en otros logares la cabeça un poco mas alta, et la boca abierta, et en otra **cuemo que** estaua sobre todos los quatro pies infiesta, et queda, et tenia la lengua sacada, et lambra la mano delantrera. Et esto fizieron **porque** cada una de estas maneras a su significança, et su uertud, et su obra." (Alfonso X. 1863, p. 19-20)
(U) I PS W I PS W I PS U I Imp (U) I PS (U) ° (U) ° U I Imp (U) I Pr[3]

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[2] It refers to the two figures *ossa mayor* and *ossa menor*.
[3] „ °" = a form that is not identifiable as nominal or verbal.

This complex, taken from an astronomical text of Alfonso el Sabio, has nine causal parts and contains theories on the constellation of the *Great Bear*. It is of average size. The same text contains complexes with many more parts; the largest has as many as 76 causal parts. With its structure, in part coordinated, in part lightly subordinated, it is typical of 13th century texts. However, it also contains causal complexes with a stronger hypotactic character such as the following:

(10) "Et sin esto ay otras cosas muchas **porque** es ell arco muy buena arma. primeramientre **que** se arma ayna. et despues **que** es armado non se desarma tirando. assí cuemo la ballesta. mas siempre finca armado. **ca por** tirar que faga nol pierde. lo que non faz la ballesta. **que quan** a tirado conuiene que otra uez la armen con yngenio. Et **por ende** all arquero antes tirará tres saetas o quatro que el de la ballesta una. Et **por esta guisa** son mas dannosos." (Alfonso X. 1863, p. 44)
W I Pr (U) I Pr ((U)) I Pr ((U)) I Pr ((U)) I Pr (((U))) I Pr ((((B)))) N (((F))) I Pr = (((W)))
((((U))))° (((((B))))) I Pr (((((F))))) I Pr = ((((U)))) W I Pr W I Pr[4]

This complex contains the deepest subordinations of the whole text. The deeper the subordinations, the higher the number of brackets. On the contrary the following causal complex is nearly without subordinations:

(11) "... Et **por estas connoscencias** que los hombres ouieron con estos nobles spíritos. sopieron mucho de las poridades de Dios. et de la so nobleza. et de so poder. et otrossí del ordenamiento de la so corte. Et **por esto** dixeron. et fizieron muchas cosas marauillosas assi cuemo prophetizar lo que auia á ser de uien. ó de mal en el mundo. et non tan solamientre á los querpos de los omes mientre eran uiuos. mas á las almas en ell otro mundo despues que salien de ellos. et resuscitaban los muertos. et sanauan los enfermos. et las cosas que entendian que eran buenas endereçábanlas. et las que malsa tollíanlas sin alongamiento. et sin tardança. et fazian cosas que **por otra natura** non podrian ser fechas sinon por spiritoal...." (Alfonso X. 1863, p. 17) U N W I PS W I PS W I PS W I Imp W I Imp W I Imp W I Imp W I Imp Mi N Zw I Imp = F B° Mi N[5]

In addition to the size of the causal complexes and the number of the causal parts, *subordination* is an important factor for investigating complexity. While the the quantity of the linguistic forms indicates an explicit complexity, subordination is a criterion of both explicit and implicit complexity. While two coordinated sentences such as (12) 1. and 2. are less complex, by subordination (12) 3. begins the integration of one sentence into the other and that is why it also has a character of implicit complexity, although the explicit complexity is still to be observed, since the two parts are clearly visible. In the example (12) 4. one sentence is totally integrated into the other, becoming one sentence.

(12)   1. Llueve. No voy de la casa. (It is raining. I do not leave home.)
            2. Llueve. **Por esto** no voy de la casa. (It is raining. **That is why** I do not leave home.)
            3. No voy de la casa, **porque** llueve. (I do not leave home, **because** it is raining.)
            4. **Por** la lluvia no voy de la casa. (**For** the rain I do not leave home.)

Comparing all these sentences, it is clear that all have nearly the same content. Although 4. is shorter than 1. it is no less complex. The model of these four sentences represents the

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[4] B = condition; F = consequence
[5] Mi = menas; Zw = purpose

development of causal structures from the Middle Ages until nowadays: from explicit to implicit complexity. That is also one of the conclusions of my work *The Development of the Expression of Causality in the Spanish Language* (Störl-Stroyny 1996).

Within the process from explicit to implicit complexity the connectives play an important role too. At stage 1. there is no connective. The asyndetic parataxis is a typical phenomenon of older periods in the development of Spanish language. Conjunctions are a particular feature of increasing subordination. The first step are the coordinating conjunctions as illustrated in 2. One sentence begins to have a stronger relation to the other. Later there are the subordinating conjunctions such as in 3. In the Old Spanish period arose a variety of conjunctions that did not exist in Latin. It is the beginning of a stronger incorporation from one sentence into the other. Later the conjunctions specialized to a few selected ones. Step 4. is characteristic of modern Spanish. There are a lot of prepositions and nominal expressions. As regards causality the next stages, the development from a word to a morpheme or the loss of the whole expression has not yet taken place. This development can be described as a grammaticalization process that includes an evolution from explicit to implicit complexity.
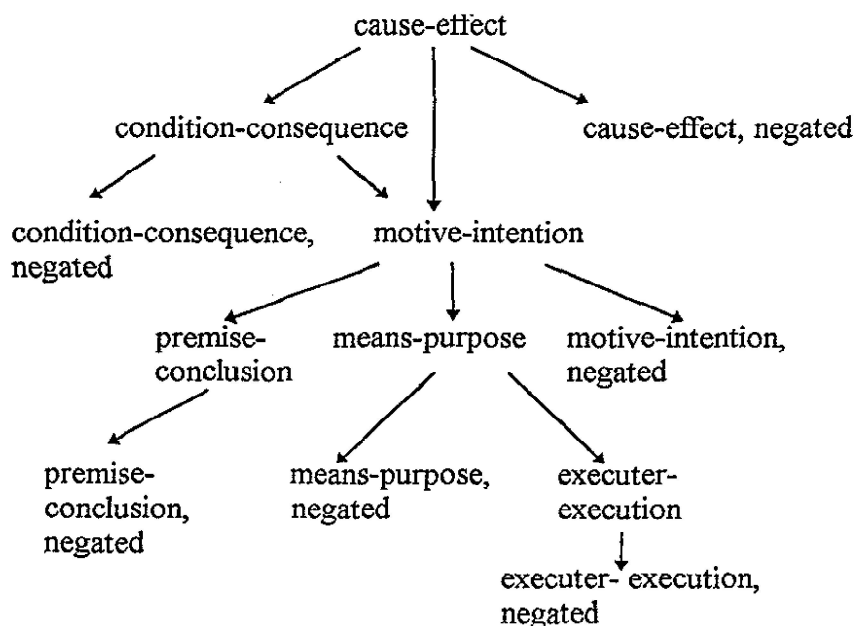
Purely implicit is the kind of complexity that causal significations contain. In contrast to the explicit complexity, in this implicit type complexity of thought is not reflected by complexity of expression as is claimed in the quote by Clark and Clark. Only the form shows no sign of complexity, as is shown in the example 3, where it can be observed that a relation of premise and conclusion is much more complex than one of cause and effect and contains several cause-effect-relations. There are a lot of other examples of implicit complexity, for instance the negative relations such as:

(13) Aunque cayó un rayo, la madera no se encendió. (Although a lightning struck, the wood did not caught fire.)

Although it is only a main clause and a subordinate clause with a conjunction, the relation consists of a variety of contradictory cause-effect-relations, as it is shown in the following diagram:
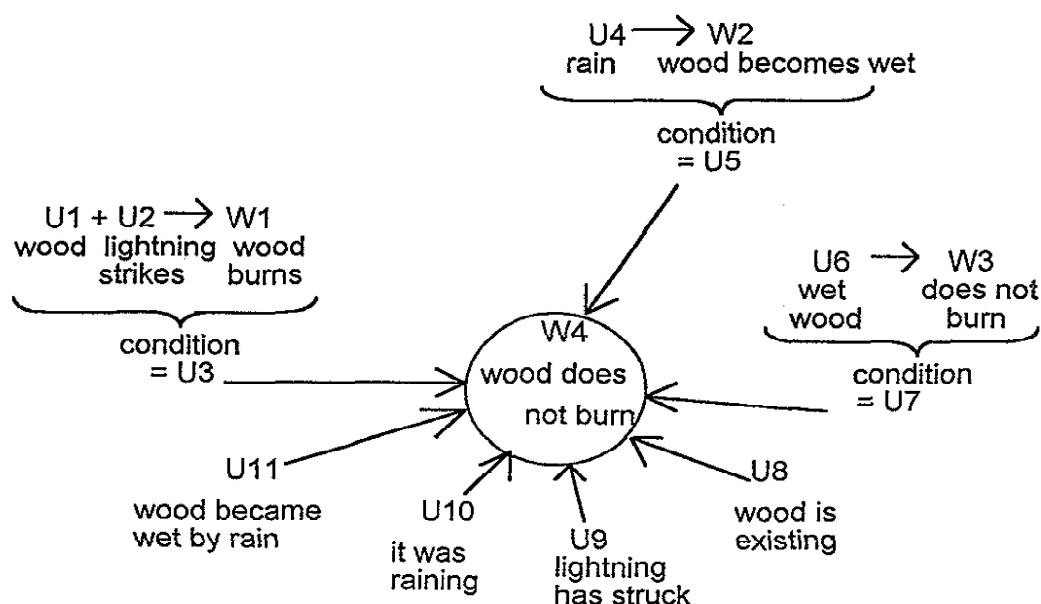
To summarize the semantic relations of causality I will give a survey, in which the less complex and at the same time more original relations are on top. Those nearer the bottom are gradually more complex and the result of later thought processes.

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                              cause-effect
                 ╱               │              ╲
   condition-consequence        │        cause-effect, negated
          ╱          ╲          │
condition-consequence,   motive-intention
negated              ╱        │        ╲
            premise-    means-purpose   motive-intention,
            conclusion        ╱    ╲    negated
          ╱                  ╱      ╲
premise-            means-purpose,   executer-
conclusion,        negated          execution
negated                                 │
                          executer- execution,
                          negated
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In conclusion, I whish to point out that a complex view of the problem of causality is able to supply interesting new results. The use of causal complexes in particular made it possible to analyze a lot of text in an onomasiologic way, since these complexes contain information about syntax and semantics and include all causal forms without any restraint. It was therefore possible to make statements about the development of causal forms as well as about the complexity of the different constructions.

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