COVARYING COLLEXEME ANALYSIS AS A TYPE OF COLLOSTRUCTIONAL ANALYSIS

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Abstract: This article introduces the concept of Covarying Collexeme Analysis (CCA), a novel approach for examining the relationships between linguistic forms and their contextual usages. CCA enhances traditional collexeme analysis by considering contextual variability, allowing for the identification of co-occurrence patterns between specific lexical items and their grammatical constructions. Through empirical studies, we illustrate how CCA can reveal underlying semantic and syntactic trends that enhance our understanding of language use. By applying this method to various corpora, we emphasize its effectiveness in identifying both common collocations and the subtle interactions that influence meaning in discourse. Our findings indicate that CCA provides a valuable framework for linguists to explore the dynamic relationship between language form and function, ultimately enriching our understanding of linguistic structures and their cognitive foundations.

Keywords: Covarying Collexeme Analysis, collostruction, construction, Fisher Test, repelled collexemes, attracted collexemes.

Covarying Collexeme Analysis

Recently, A. Goldberg's theoretical constructions, which emphasize the dependencies among the components of a structure and their connection to the overall meaning, have gained strong support from statistical methods that allow for mathematical evaluation of these dependencies. The use of statistics among proponents of construction grammar is rapidly increasing, exemplified by "collostructional analysis," a research field developed by Steph Chris and Anatoly Stefanovich [3], [4].

Collostructional analysis is theoretically grounded in the Grammar of Constructions and involves three primary research methods that bridge linguistics and statistics. One such method, covarying collexeme analysis, measures how frequently a token in one slot cooccurs with specific tokens in other slots. The potential of this method will be explored using specific examples.

This intriguing example of collostructional techniques involves lexemes and constructions where semantic constraints simultaneously impact multiple slots. We

will examine the causative construction with "into" in English, as described by Gries and Stefanovitch [3] and Stefanovitch and Gries [4].

A. Wierzbicka noted that this construction is applicable only in scenarios where the object of causation resists taking action, and the causer overcomes this resistance, often through pressure or deceit [11]. This insight predicts which verbs will fill the construction's slots. The first slot should be occupied by verbs indicating pressure or deception, while the second slot should feature verbs associated with actions that are unpleasant or undesirable from the perspective of the performer.

Indeed, the verbs that fit the first slot include those related to trickery (e.g., trick, fool, mislead) and pressure (e.g., coerce, force, bully). In contrast, the second slot includes verbs that clearly denote unpleasant actions (e.g., misbehave, misrecognize, betray), as well as some that do not imply unpleasantness, such as think, believe, reveal, prove, buy, and purchase.

To understand why certain verbs frequently appear in the second slot of this causative construction, we need to examine the frames they describe. It suggests that it's not necessarily the verbs themselves that imply something undesirable, but rather the overall situation they depict. This indicates that the two slots in the construction are interconnected, and their combinations are not merely random pairings of verbs from the two lists.

To statistically identify the relationship between the verbs in these lists, we need to measure the mutual attraction of tokens to the two slots, referred to as the covarying collexemes by A. Stefanovich and S. Gries. This involves calculating the probability of verb 1 occurring in the first slot and verb 2 in the second slot.

If these events were independent, the probability of both verbs appearing together would be the product of their individual probabilities. By comparing this expected probability with the actual occurrence of verb 1-verb 2 pairs in the construction, we can determine whether the pair is attracted to the construction (if the actual probability is higher than expected) or repelled (if it is lower). The results of this analysis are shown in Table 1.

Table 1. The most significant collexeme combinations in the causative construction with into

Attracted covarying-collexeme pairs in the into-causative		**Repelled covarying-collexeme pairs in the into-causative**	
fool into thinking	30.06	force into thinking	2.554
mislead into thinking	12.755	coerce into thinking	1.421
mislead into believing	8.355	trick into making	0.945

deceive into thinking	5.651	push into thinking	0.794
trick into parting	5.248	trick into accepting	0.717
encourage into framing	4.652	bully into believing	0.716
dragoon into serving	4.652	talk into believing	0.671
aggravate into producing	4.28	trick into thinking	0.634
panick into seizing	4.078	lead into believing	0.561
seduce into misbehaving	3.966	talk into making	0.536
deluded into believing	3.952	force into giving	0.497
torture into revealing	3.75	tempt into thinking	0.42

The table displays the attraction or repulsion between pairs of tokens concerning the structure, measured using the exact Fisher criterion. For instance, the value of 30.06, representing the attraction of the phrase "fool into thinking," indicates a very small number (E-30), signifying a statistically significant attraction to the structure. Notably, in the list of repulsive phrases, only the first two exhibit statistically significant repulsion.

The results of the collostructional analysis highlight several important frames for this construction. The first four examples demonstrate the connection between trick-related verbs in the first slot and knowledge or belief verbs in the second slot. Interestingly, another category of verbs—pressure verbs—does not fit into this frame, as shown by the repulsion of pairs like "force into thinking," "coerce into thinking," and "bully into believing."

These relationships reflect cultural beliefs about how individuals influence others' thoughts: such influence is more commonly associated with tricks rather than violence.

Another noteworthy frame within this construction is represented by the pair "torture into revealing," which illustrates that physical pressure verbs dominate in the first slot. In this case, physical coercion is employed to extract information that a person wishes to conceal. Consequently, verbs related to the communication of information, such as "admit," "confess," and "prove," frequently appear in this frame.

The study of the covarying collexemes—how words in different slots of a construction interact—reveals that multiple culturally significant frames can exist within a single construction, illustrating situations where one person compels another to take action. Collostructional analysis effectively highlights these mutual preferences, aiding in the identification of important frames for the construction.

The examples presented demonstrate the methods and potential of collostructional analysis, showcasing its benefits for addressing a range of linguistic issues, including understanding the conditions of attraction, repulsion, and the distribution of linguistic units within various constructions.

Another key advantage of this method is its independence from initial theoretical assumptions. The effectiveness of collostructional analysis relies solely on corpus data and statistical information, without being influenced by pre-existing hypotheses. As a result, this method can serve as a powerful tool for linguists to independently verify their assumptions about the structures being studied, while also subtly integrating the principles of Construction Grammar into other linguistic theories.

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