Toward a pattern-based analysis of English resultatives:

Presenting a new type of usage-based approach to grammatical constructions

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1. Introduction

To date, a large number of studies have been devoted to exploring a famous grammatical component, known as the *resultative construction* such as (1).

(1) He hammered the metal flat.

However, strangely enough, there are only small number of studies of the construction conducted from a *usage-based* point of view (e.g., Langacker 1987, 2000; Kemmer & Barlow 2000).[1]

Consequently, it can be pointed out that there remains much room to investigate the resultative construction in a usage-based fashion. This paper presents a new kind of analysis, called *pattern-based analysis*, in order to open a possible new approach to the construction. Under the analysis, it is assumed that constructions are attributed to various conventionalized patterns which are considered to be derived from vast number of concrete exemplars. Patterns are defined by the model named *Pattern Lattice Model* (PLM: Kuroda & Hasebe 2009; Kuroda 2009).

Based on the model, this paper presents a quantitative research using the data from the database of the construction assembled by Boas (2003). The results of the research suggest that the resultative construction can be analyzed as the collection of several conventional patterns such as "__ door open," "shoot __ dead" and "tear __ apart," agreeing with the conclusion by Boas (2003) in a more radical way.

2. Background: The Pattern Lattice Model (PLM)

The PLM of language is proposed by Kuroda (Kuroda & Hasebe 2009; Kuroda 2009). It assumes that we human memorize all the expressions we have heard/read and linguistic memory is filled with concrete exemplars with numerous indices. The indices are identified with patterns, which are defined as products of the operation in which a certain expression *e*, such as (1), is segmented arbitrarily and one or more segments are replaced by slots. If (1) is segmented into [He, hammered, the metal, flat], the patterns produced are the followings ("_" denotes a slot):

(2) "_ hammered the metal flat", "He hammered the metal _", "He hammered _ flat", "He _ the metal flat", "_ hammered the metal _", "_ hammered _ flat", "_ _ the metal flat", "He hammered _ _", "He _ the metal _", "He _ _ flat", "_ hammered _ _", "_ _ the metal _", "_ _ _ flat", "He _ _ _", "_ _ _ _."

The patterns construct a hierarchical network forming a lattice structure, called a *pattern lattice*.

3. Research

The research was conducted in the following way:

(i) More than 5,000 examples of the resultative construction obtained from the database provided by Boas (2003) (downloadable at http://csli-publications.stanford.edu/hand/1575864088appendix.pdf) are manually coded in the way in which each example is annotated with the head NP of the subject and the object, the verb, and the resultative predicate;

[1] We can find Boas (2003) as a notable exception.

(ii) From the coded data, the VP of each resultative sentence (i.e., *VOR* where *V*, *O* and *R* denote the verb, the head NP of the object, and resultative predicate, respectively) is extracted and the number of different VPs is tallied;

(iii) Based on the collected VPs, the total number of which is 3,376, a pattern lattice is produced using *rubyplb* (Kuroda & Hasebe 2009, http://www.kotonoba.net/rubyfca/);

(iv) A statistic quantity *z-score* is computed for each of the patterns, in order to know which pattern is conventional and productive; the *z-score* is computed by the *rubyplb*.

4. Results and Discussion

As a result, 8,043 patterns are extracted from the 3,376 resultative VPs. Interestingly enough, the pattern whose z-score is highest is "shoot __ dead" (z = 43.6), which is highly lexically specific or *super-lexical*. The subsequent patterns whose z-score exceed 10 are listed in table 1. All the patterns but for "__ __ off" and "__ __ to death" in the table 1 are super-lexical and, more interestingly, the positions of the slots vary from pattern to pattern. This suggests that the productivity or generative power of resultative construction cannot be reduced to the verbal semantics or abstract syntactic/constructional patterns; alternatively, the semi-productivity of the construction can be assumed to arise from the analogical application of the conventionalized patterns.

table. 1

rank	pattern	freq	z-score
1	shoot _ dead	389	43.6
2	_ _off	2842	30.42
3	_ door open	216	24.08
4	tear _ apart	167	18.55
5	make _ sick	128	14.15
6	push _ open	118	13.03
7	_ _ to_death	1180	12.53
8	beat _ off	108	11.9
9	stab _ to_death	107	11.78
10	drive _ mad	106	11.67
11	make me _	106	11.67
12	_ head off	104	11.45
13	throw _ open	103	11.33
14	push door _	100	10.99

5. Conclusion

This paper presents a pattern-based analysis of the English resultative construction using quantitative data, whose results suggest the conventional nature of the construction. This kind of highly bottom-up approach has never been conducted and therefore the results can be thought to say something not trivial.

References

Boas, H. 2003. *A constructional approach to resultatives*. Stanford: CSLI publications.

Kemmer, S., & Barlow, M. 2000. Introduction: A usage-based conception of language. In Barlow, M., &. Kemmer, S. (eds.) Usage-based models of language (pp. vii-xxii). Stanford: CSLI Publications.

Kuroda, K. 2009. Pattern lattice as a model of linguistic knowledge and performance. *Proceedings of The 23rd Pacific Asia Conference on Language, Information and Computation*.

Kuroda, K. and Hasebe, Y. 2009. Modeling (Human) Knowledge and Processing of Natural Language Using Pattern Lattice. *15th Annual Meeting of Japanese Society of Natural Language Processing*, 670−673.

Langacker, R. 1987. *Foundations of cognitive grammar Vol. 1: Theoretical prerequisites*. Stanford: Stanford University Press.

——. 2000. A dynamic usage-based model. In Barlow, M., &. Kemmer, S. (eds.) (pp. 1- 63).