



Universiteit  
Leiden  
The Netherlands

## **Cultural evolutionary modeling of patterns in language change : exercises in evolutionary linguistics**

Landsbergen, F.

### **Citation**

Landsbergen, F. (2009, September 8). *Cultural evolutionary modeling of patterns in language change : exercises in evolutionary linguistics*. LOT dissertation series. Retrieved from <https://hdl.handle.net/1887/13971>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/13971>

**Note:** To cite this publication please use the final published version (if applicable).

# Contents

<b>ACKNOWLEDGEMENTS</b>	9
<b>1 INTRODUCTION</b>	11
1.1 Language and evolutionary theory	11
1.2 Recent evolutionary approaches in linguistics	11
1.3 A framework of evolutionary linguistics	13
1.4 Advantages of an evolutionary approach to language	16
1.5 This thesis	17
<b>2 A CULTURAL EVOLUTIONARY MODEL OF PATTERNS IN SEMANTIC CHANGE</b>	21
2.1 Introduction	21
2.2 Possible causes for asymmetries in semantic change	22
2.3 The model	24
<i>Theoretical background</i>	24
<i>Properties of the model</i>	24
2.4 Results	30
<i>General behavior of the model</i>	30
<i>Factors affecting the rate of semantic change</i>	34
<i>Factors causing unidirectional semantic change</i>	39
2.5 Discussion and conclusions	43
<b>3 THE COMPETITIVE EXCLUSION PRINCIPLE IN LANGUAGE: A CASE STUDY OF AN-COMBINATIONS</b>	47
3.1 Introduction	47
3.2 AN-combinations in Dutch, German and English	49
<i>Characteristics of lexicalized AN-phrases</i>	50
<i>Semantic subtypes among AN-combinations</i>	53
<i>Differences in productivity across German, Dutch and English</i>	54
<i>Selection pressures at work across compounds and phrases</i>	57

3.3	The model	59
	<i>Initialization and basic set-up of the model</i>	59
	<i>The three main parameters of the model</i>	60
	<i>Enabling semantic subtypes</i>	62
3.4	Results	63
	<i>The basic model</i>	63
	<i>The addition of meaning</i>	66
3.5	Discussion and conclusions	72
<b>4</b>	<b>THE SYNTACTIC AND SEMANTIC DEVELOPMENT OF THE DUTCH VERB <i>KRIJGEN</i></b>	<b>75</b>
4.1	Introduction	75
4.2	Current and past use of <i>krijgen</i>	76
	<i>The semi-passive and resultative constructions</i>	78
	<i>Linking the present variation to the past</i>	83
4.3	Exploring <i>krijgen</i> 's history: a corpus study	84
	<i>Data collection</i>	84
	<i>Decline of the intransitive</i>	85
	<i>Decline of <i>gecrigen</i></i>	87
	<i>Decline of the agentive subject</i>	88
	<i>Development of the complement construction</i>	100
	<i>Development of the non-agentive complement use</i>	103
	<i>Increase in the frequency of use</i>	106
4.4	Discussion and conclusions	107
<b>5</b>	<b>SIMULATING THE SEMANTIC CHANGE OF <i>KRIJGEN</i> WITH AN EXEMPLAR MODEL OF LANGUAGE</b>	<b>111</b>
5.1	Introduction	111
5.2	Exemplar models and usage-based approaches to language	112
5.3	Basic structure of the model	114
5.4	Mathematical details of the model	117
	<i>Representation of knowledge of exemplars and abstract categories</i>	118
	<i>Production of an utterance in communication</i>	119
	<i>Perception and reconstruction of an utterance in communication</i>	120
	<i>Additional updates of the agent's knowledge after communication</i>	122
	<i>Initialization of the simulation</i>	123
	<i>Measurements</i>	124

<i>Investigated parameters</i>	125
5.5 Results	125
<i>The basic model</i>	125
<i>Different values of parameter <math>\alpha</math></i>	130
<i>Allowing the frequency of use to vary</i>	132
<i>Using a skewed distribution in the frequency of use</i>	134
<i>Allowing the model to run for 500,000 iterations</i>	140
<i>Using a population of <math>N = 50</math></i>	144
5.6 Discussion and conclusions	146
<b>6 RECONSTRUCTING THE DIACHRONY OF KRIJGEN WITH SYNCHRONIC DATA USING PHYLOGENETIC INFERENCING TECHNIQUES</b>	151
6.1 Introduction	151
6.2 Phylogenetic inferencing methods	153
<i>Distance-based methods</i>	154
<i>Character-based methods</i>	156
<i>Phylogenetic methods in linguistics</i>	159
<i>Phylogenetic methods in this study</i>	160
6.3 Defining taxa and characters for <i>krijgen</i>	161
<i>The problem of defining taxa and characters for a single linguistic item</i>	161
<i>Taxa and characters for <i>krijgen</i></i>	162
6.4 Results	167
<i>A short overview of the development of <i>krijgen</i></i>	167
<i>NeighborNet</i>	168
<i>Neighbor-joining</i>	169
<i>Bayesian analysis</i>	172
6.5 Discussion	174
<b>7 CONCLUSIONS</b>	177
<i>An overview of the chapters and their conclusions</i>	178
<i>General conclusions and recommendations for further research</i>	181
<b>REFERENCES</b>	185

<b>SAMENVATTING IN HET NEDERLANDS</b>	197
<i>Cultureel-evolutionaire modellen van patronen in taalverandering</i>	197
<i>Hoofdstuk 2: een cultureel-evolutionair computermodel van patronen in betekenisverandering</i>	201
<i>Hoofdstuk 3: het principe van wederzijdse uitsluiting in taal: een onderzoek naar AN-combinaties</i>	203
<i>Hoofdstuk 4: de syntactische en semantische ontwikkeling van het werkwoord krijgen</i>	206
<i>Hoofdstuk 5: een simulatie van de betekenisverandering van krijgen met een exemplar-model</i>	209
<i>Hoofdstuk 6: een reconstructie van de ontwikkeling van krijgen met synchrone data en phylogenetische reconstructietechnieken</i>	211
<b>CURRICULUM VITAE</b>	215