

# Cross-linguistic Variation and Efficiency

---

JOHN A. HAWKINS

OXFORD  
UNIVERSITY PRESS

# Contents

Preface	xi
List of Figures and Tables	xv
List of Abbreviations	xvii
1 Language variation and the Performance–Grammar Correspondence Hypothesis	1
1.1 The Performance Grammar Correspondence Hypothesis	1
1.2 Examples of proposed performance–grammar correspondences	4
1.3 Predictions and consequences of the Performance–Grammar Correspondence Hypothesis	6
2 Three general efficiency principles	11
2.1 Efficiency principle 1: Minimize Domains	11
2.2 Efficiency principle 2: Minimize Forms	15
2.2.1 Greenberg’s markedness hierarchies	18
2.2.2 Wasow et al.’s relativizer omission data	20
2.2.3 Gaps and resumptive pronouns in relative clauses	22
2.3 Efficiency principle 3: Maximize Online Processing	28
2.3.1 Fillers First	30
2.3.2 Topics First	31
2.3.3 Other linear precedence asymmetries	33
2.4 The relationship between complexity and efficiency	34
2.5 Competing efficiencies in variation data	38
2.5.1 Extraposition: Good for some phrases, often bad for others	39
2.5.2 Competing head orderings for complex phrases	41
2.5.3 Complex inflections and functional categories benefit online processing	42
2.5.4 Interim conclusions	44
3 Some current issues in language processing and the performance–grammar relationship	46
3.1 Ease of processing in relation to efficiency	47
3.2 Production versus comprehension	50
3.3 Online versus acceptability versus corpus data	51
3.4 Locality versus antilocality effects	56
3.5 The relevance of grammatical data for psycholinguistic models	57
3.6 Efficiency in Chomsky’s Minimalist Program	62

---

3.6.1	Internal computations versus performance	63
3.6.2	Further issues	67
4	The conventionalization of processing efficiency	73
4.1	Grammaticalization and processing	73
4.2	The grammaticalization of definiteness marking	76
4.3	The grammaticalization of syntactic rules	78
4.4	The mechanisms of change	85
5	Word order patterns: Head ordering and (dis)harmony	90
5.1	Head ordering and adjacency in syntax	90
5.2	MiD effects in the performance of head-initial languages	93
5.3	MiD effects in head-final languages	96
5.4	Greenberg's word order correlations and other domain minimizations	98
5.5	Explaining grammatical exceptions and unpredicted patterns	101
5.6	Disharmonic word orders	102
5.7	The timing of phrasal constructions and attachments	104
5.8	Predictions for disharmonic word orders	106
5.8.1	Structure (5.4)	106
5.8.2	Structure (5.3)	109
5.8.3	Structure (5.2) (head finality)	111
5.8.4	Conclusions on word order disharmony	114
6	The typology of noun phrase structure	116
6.1	Cross-linguistic variation in NP syntax	117
6.2	Constructibility hypotheses	121
6.2.1	NP construction	122
6.2.2	Lexical differentiation for parts of speech	123
6.2.3	Head-initial and head-final asymmetries	124
6.3	Attachability hypotheses	126
6.3.1	Separation of NP sisters	127
6.3.2	Minimize NP attachment encoding	130
6.3.3	Lexical differentiation and word order	132
7	Ten differences between VO and OV languages	136
7.1	Mirror-image weight effects and head orderings	138
7.2	Predicate frame and argument differentiation in VO and OV languages	139
7.3	Relative clause ordering asymmetries in VO and OV languages	146
7.4	Related relative clause asymmetries	150
7.5	Complementizer ordering asymmetries in VO and OV languages	153
7.6	Fewer phrasal constructors and more affixes in OV languages	155

---

7.7 Complexity of accompanying arguments in OV vs VO languages	158
7.8 The ordering of obliques in OV vs VO languages	159
7.8.1 The patterns	161
7.8.2 Verb and direct object adjacency [Pattern II]	162
7.8.3 Object and X on same side of verb [Pattern III]	166
7.8.4 Direct object before oblique phrases [Pattern IV]	170
7.8.5 VO consistency vs OV variability [Pattern I]	171
7.9 Wh-fronting in VO and OV languages	172
7.10 Verb movement in VO and OV languages	176
8 Asymmetries between arguments of the verb	184
8.1 Illustrating the asymmetries	184
8.2 Hierarchies	187
8.3 Minimize Domains	190
8.4 Minimize Forms	192
8.5 Maximize Online Processing	196
9 Multiple factors in performance and grammars and their interaction	201
9.1 Pattern One: Degree of preference	202
9.2 Pattern Two: Cooperation	204
9.2.1 Performance	204
9.2.2 Grammars	207
9.3 Pattern Three: A Competition Hypothesis	210
9.3.1 Performance	211
9.3.2 Grammars	215
9.4 Summary	218
10 Conclusions	220
10.1 Support for the PGCH	221
10.2 The performance basis of grammatical conventions and cross-linguistic patterns	225
10.3 Some bigger issues	230
References	240
Index of Languages	259
Index of Authors	261
Index of Subjects	265