Contents

Abstract III

Acknowledgements V

Preface VII

4 Introduction 1

5 Preliminaries 5

6 Definitions 11
6.1 Grammars for Sequential Regulated Rewriting 11
6.1.1 Matrix Grammars 11
6.1.2 Conditional Grammars 14
6.2 Grammars for Parallel Regulated Rewriting 18
6.2.1 Scattered Context Grammars 18
6.2.2 E0L and ET0L Grammars 19
6.2.3 Grammar Systems 20
6.3 Grammars 21

7 Sequential Grammars 27
7.1 Introduction 27
7.2 Matrix Simple-Semi-Conditional Grammars 28
7.2.1 Definitions 28
7.2.2 Matrix Simple-Semi-Conditional Grammars of Degree 3 29
7.2.3 Matrix Simple-Semi-Conditional Grammars of Degree 2 32
7.3 Simple-Semi-Conditional Matrix Grammars 36
7.3.1 Definitions 36
7.3.2 Simple-Semi-Conditional Matrix Grammars of Degree 3 37
7.4 Summary 40

8 Semi-Parallel Grammars 41
8.1 Scattered Context 41
8.2 Scattered Context Grammars and Their Reduction 41
8.3 Semi-parallel Uniform Rewriting 54

9 Parallel Grammars 61
9.1 Context-Conditional ET0L Grammars 61
9.2 Forbidding ET0L Grammars 68
9.3 Simple Semi-conditional ET0L Grammars 88

10 Derivation Similarity of Grammars 103
10.1 Derivation Simulation 103
10.2 Grammatical Simulation 108
10.3 Simulation of Scattered Context Grammars 109
10.4 Derivation simulation of Scattered Context Grammars 113
10.5 Simulation of Phrase-Structured Grammars 115
10.6 Derivation simulation of Phrase-Structured Grammars 120

11 Conclusion 123
11.1 Bibliography 123
11.2 Applications 124
11.3 Theoretical Investigation 126

References 129

Index 137