

Table of Contents

Foreword	V
Preface	IX
Acknowledgment	XI
Table of Contents	XIII
Figures	XVII
Tables	XXI
Nomenclature	XXIII
1 Chapter One: Introduction	1
2 Chapter Two: Theoretical Basis	5
2.1 Review of Relevant Literature	5
2.1.1 The van Hiele Model	6
2.1.2 Research Guided by the van Hiele Model	9
2.2 Theoretical Framework	28
2.2.1 Learning as Communicating	28
2.2.2 Sfard's Discursive Framework	31
2.2.3 The Levels of Geometric Discourse	34
3 Chapter Three: Methodology	41
3.1 Participants	41
3.2 The van Hiele Geometry Test	42
3.3 Interview Tasks	43
3.3.1 Task One: Sorting Geometric Figures	44
3.3.2 Task Two: Investigating Properties of Parallelograms	45
3.4 Data Collection	47

- 3.5 Data Analysis48
- 4 Chapter Four: Results51**
 - 4.1 Results from the van Hiele Geometry Test51
 - 4.2 Changes in Geometric Discourse54
 - 4.2.1 Case One: Changes in Molly's Geometric Discourse56
 - 4.2.2 Case Two: Changes in Ivy's Geometric Discourse79
 - 4.2.3 Case Three: Changes in Kevin's Geometric Discourse103
 - 4.2.4 Case Four: Changes in Sam's Geometric Discourse129
 - 4.2.5 Case Five: Changes in Judi's Geometric Discourse150
 - 4.3 The van Hiele Levels as Geometric Discourse176
- 5 Chapter Five: Discussions183**
 - 5.1 Summary of the Results.....183
 - 5.1.1 Changes in van Hiele Levels.....184
 - 5.1.2 Changes in Geometric Discourse185
 - 5.2 What Can We Generalize and Why?.....188
 - 5.2.1 The Levels of Geometric Discourse189
 - 5.2.2 Differences in Discourse within a van Hiele Level192
 - 5.2.3 Differences in Discourse among Two Consecutive van Hiele Levels.....195
 - 5.2.4 Characteristics Should Be Considered at the van Hiele Levels.....196
 - 5.3 What Can Be Asked and Why?198
 - 5.3.1 What Do We Learn from Student Thinking?199
 - 5.3.2 Classroom Discourse Practice and Student Learning202

5.4 Closing	204
Appendices	207
Appendix A: A Translation of van Hiele Levels of Geometric Discourse	207
Appendix B: Interview Tasks	217
Appendix C: Interview Protocols	219
About the Author	225
References	227