

Cambridge University Press

978-0-521-86737-5 - Thinking as Communicating: Human Development, the Growth of Discourses, and Mathematizing

Anna Sfard

Table of Contents

[More information](#)

## Contents

<i>Series Foreword</i>	<i>page xi</i>
<i>Introduction</i>	xiii
<i>Acknowledgments</i>	xxi
 <b>Part I. Discourse on Thinking</b>	
1. Puzzling about (Mathematical) Thinking	3
1. The Quandary of <i>Number</i>	4
2. The Quandary of <i>Abstraction</i> (and <i>Transfer</i> )	9
3. The Quandary of <i>Misconceptions</i>	16
4. The Quandary of <i>Learning Disability</i>	22
5. The Quandary of <i>Understanding</i>	27
6. Puzzling about Thinking – in a Nutshell	32
2. Objectification	34
1. What Is Research and What Makes It Ineffective?	35
2. Metaphors as Generators of New Discourses	39
3. The Metaphor of Object	42
4. The Gains of Objectification	51
5. The Traps of Objectification – the Case of the Discourse on Thinking	56
6. Objectification – in a Nutshell	63
3. Commognition: Thinking as Communicating	65
1. Monological and Dialogical Discourses on Thinking	65
2. Disobjectification of Discourses on Thinking – Brief History	68
3. We Are Almost There: Participationism	76
4. Finally: Thinking as Communicating	80
5. Thinking as Communicating – in a Nutshell	91
	vii

Cambridge University Press

978-0-521-86737-5 - Thinking as Communicating: Human Development, the Growth of Discourses, and Mathematizing

Anna Sfard

Table of Contents

[More information](#)

viii	<i>Contents</i>
4. Thinking in Language	94
1. The Dilemma of Relation between Thinking and Speaking	95
2. Commognizing in Language	101
3. What Are the Properties of Commognition That Recursivity Makes Possible?	109
4. Human Development as the Development of Discourses	115
5. Thinking in Language – in a Nutshell	123
 <b>Part II. Mathematics as Discourse</b>	
5. Mathematics as a Form of Communication	127
1. What Makes Mathematical Discourse Distinct	129
2. Challenges to Mathematical Communication	135
3. Visual Mediation in Mathematical Communication	146
4. Visual Realizations of Mathematical Signifiers	154
5. Mathematics as a Form of Communication – in a Nutshell	160
6. Objects of Mathematical Discourse: What Mathematizing Is All About	163
1. Mathematical Objects	164
2. Historical Development of Mathematical Objects	174
3. Individualization of Mathematical Objects	177
4. Challenges of Object Construction	182
5. Objects of Mathematical Discourse – in a Nutshell	192
7. Routines: How We Mathematize	195
1. Meaningfulness from Repetition	195
2. Rules of Discourse	200
3. Routines	208
4. Routines and Creativity	216
5. Routines – in a Nutshell	220
8. Explorations, Deeds, and Rituals: What We Mathematize For	222
1. Explorations	223
2. Deeds	236
3. Rituals	241
4. Development of Routines	245
5. Explorations, Deeds, and Rituals: What We Mathematize For – in a Nutshell	259
9. Looking Back and Ahead: Solving Old Quandaries and Facing New Ones	261
1. Looking Back: What Has Been Done	262

Cambridge University Press

978-0-521-86737-5 - Thinking as Communicating: Human Development, the Growth of Discourses, and Mathematizing

Anna Sfard

Table of Contents

[More information](#)

---

<i>Contents</i>	ix
2. What Happened to the Old Quandaries	263
3. What Happened to Research on Thinking and Human Development	275
4. Some Implications for the Practice of Teaching and Learning	280
5. Looking Ahead: Facing New Questions (and New Quandaries?)	289
6. Looking Back and Ahead – in a Nutshell	292
<i>Glossary of Commognition</i>	295
<i>References</i>	303
<i>Name Index</i>	319
<i>Subject Index</i>	322