

# Contents

|  |    |
|--|----|
| <b>Attitudes, Beliefs, Motivation, and Identity<br/>in Mathematics Education</b> . . . . . | 1  |
| 1 Introduction (Markku S. Hannula) . . . . .   | 1  |
| 2 Surveys of the State of the Art . . . . .  | 2  |
| 2.1 Attitude (Pietro Di Martino) . . . . .   | 2  |
| 2.2 Student Self-efficacy Beliefs (Marilena Pantziara) . . . . .                           | 7  |
| 2.3 Teacher Beliefs (Qiaoping Zhang and Francesca Morselli) . . . . .                      | 11 |
| 2.4 Identity (Einat Heyd-Metzuyanim, Sonja Lutovac,<br>and Raimo Kaasila) . . . . .        | 14 |
| 2.5 Motivation (James A. Middleton, Amanda Jansen,<br>and Gerald A. Goldin) . . . . .      | 17 |
| 3 Summary and Looking Ahead . . . . .  | 23 |
| References . . . . .   | 27 |
| Further Reading on Mathematics Related Affect . . . . .                                    | 35 |

# Abstract

Research on mathematics-related affect is varied in theories and concepts. In this survey we record the state of the art in this research through short sections from leading experts in different areas. We describe the historical development of the concept of attitude and different ways it is defined. Research on student self-efficacy beliefs in mathematics is summarized. There is reflection on the dialectic relationship between teacher beliefs and practice as well as on how their beliefs change. One section records the emerging research on student and teacher mathematical identities over the last two decades. Finally, mathematical motivation is explored from the perspectives of engagement structures, social behaviors, and the relationship between individual factors and social norms.

**Keywords** Attitude • Self-efficacy • Beliefs • Identity • Motivation