## Contents

Preface ................................................. 9

Chapter 1. Introduction ................................. 11

Chapter 2. Aims and Method of this Study ............. 17
  2.1. Introduction .................................. 17
  2.2. Aims of Philosophy of Science .................. 17
     2.2.1. The Distinction between Discovery and Justification 18
     2.2.2. Characterizing Science by its Values .......... 22
  2.3. Methodology in Philosophy of Science .......... 26
  2.4. Reflections on the Specific Method Used in this Study . 29

Chapter 3. Understanding Scientific Understanding ...... 33
  3.1. Introduction .................................. 33
  3.2. Scientific Understanding and Explanation ..... 35
  3.3. Basic Ideas of My Account of Scientific Understanding . 37
  3.4. Applying Theories to Phenomena .............. 41
     3.4.1. The Transition from the Syntactic to the Semantic
            View of Theories .......................... 41
     3.4.2. Representational Views of Models Based on
            Scientific Practice ........................ 43
     3.4.3. Giere’s Representational View of Models ...... 46
  3.5. Intelligibility as an Epistemic Condition for the Successful
       Application of Models .......................... 51
  3.6. Key Notions and Key Questions .................. 56

Chapter 4. The Virtue of Surplus Meaning: Neo-Behaviorism . . . 57
  4.1. Introduction .................................. 57
  4.2. The Meaning and Use of Theoretical Terms in
       Neo-Behaviorism ............................... 58
     4.2.1. Operational Definitions and the Meaning of
            Theoretical Terms ........................ 61
6.2. What kinds of skills are required for the successful application of a scientific model to a phenomenon? .... 167
6.3. Which kind of virtues can render a model intelligible to its users? .............................................. 168
6.4. On what kind of pragmatic and contextual factors does intelligibility depend? .............................. 168
6.5. Is the characterization of science advocated in this study useful for the explanatory and normative tasks of philosophy of science? .................................................. 170

References .................................................. 173
Index of Names ............................................ 183
List of Figures ............................................. 186

Dutch Summary (Samenvatting) .......................... 187