CONTENTS

Series Editor's Introduction xi

Acknowledgments xiii

About the Author xv

1. Introduction 1
What This Book Covers 2
What This Book Does Not Cover 2
The Path Ahead 2
What Are Longitudinal Network Data? 3
Modeling Capabilities 6
Why Not Standard Regression? 8
Theoretical Issues 10
Summary 13
Accompanying Website 13

2. Temporal Exponential Random Graph Models 14
What Are Network Panel Data? 14
The Cross-Sectional ERGM 16
Temporal Exponential Random Graph Models (TERGM) 18
The Intuition 19
Assumptions 20
Model Specification 20
Example 2.1. A TERGM Analysis of Friendship Formation Among Dutch College Students 24
Other Modeling Considerations 39
Conclusion 42

3. Stochastic Actor-Oriented Models 43
The Stochastic Actor-Oriented Model (SAOM) 43
The Intuition 45
Assumptions 46
Model Specification 47
Example 3.1. An Actor-Oriented Analysis of Friendship Formation Among Dutch College Students 49
Other Modeling Considerations 59
Model Extensions 63
Selecting a Network Panel Model 63
Conclusion 67

4. Modeling Relational Event Data **68**
What Are Relational Event Data? 69
The Relational Event Model (REM) 69
The Intuition 71
Assumptions 72
Model Specification 73
Example 4.1. Illegal Drug Trade on the Dark Web 75
Other Modeling Considerations 81
Model Extensions 85
An Alternative: The Dynamic Network Actor Model 87
When to Use REM? 90
Conclusion 91

5. Network Influence Models **92**
What Do Network Influence Data Look Like? 93
The Temporal Network Autocorrelation Model (TNAM) 94
The Intuition 95
Assumptions 96
Model Specification 97
Example 5.1. A Network Influence Model of Adolescent Smoking Behavior 99
Other Modeling Considerations 102
Coevolution Models: SAOM for Behavioral and Network Change 105
The Intuition 108
Assumptions 109
Model Specification 110
Example 5.2. A Coevolution Influence Model of Adolescent Drinking Behavior 111
An Alternative Approach: Simulating Network Diffusion 118
How Should We Think About Network Influence? 119
Conclusion 121

6. Conclusion **122**
Missing Data 122
Measurement Error 123
Interpretation 124
Causal Inference 125
Models for Relational Event Data 126
Unobserved Heterogeneity in Network Panel Models 126
Scalability 127
Conclusion 128

References **129**

Index **138**