Figures and Tables

Figures

Figure 2.1 Cigarette Consumption in the United States in the Twentieth Century ................................................................. 20
Figure 2.2 Trajectories as Phenotypic Pathways .................................................................................................................. 23
Figure 2.3 Multipoint Linkage Plot—Chromosome 6 ........................................................................................................... 41
Figure 2.4 Multipoint Linkage Plot—Chromosome 7 ........................................................................................................... 41
Figure 2.5 Multipoint Linkage Plot—Chromosome 8 ........................................................................................................... 42
Figure 3.1 Nomological Net: Evaluation Context for a Model of Dependence and Its Relation to Genetic Variants ................ 76
Figure 3.2 Watershed Model of Gene-to-Phenotype Influence .............................................................................................. 78
Figure 3.3 Etiologic Path and Locus of Phenotypic Assay ..................................................................................................... 83
Figure 3.4 Logistic Regression Curves Predicting Scores on the WISDM Subscales from Cigarettes Smoked per Month: Examples of an Early-Emergent Motive (Social/Environmental Goads) and a Late-Emergent Motive (Tolerance) ........................................................................ 91
Figure 3.5 Latent Class Results from the Combined Data Set ................................................................................................. 92
Figure 3.6 Associating Genes with Phenotypic Stages ........................................................................................................... 109
Figure 4.1 Nicotinic Receptor Subunit Structure ..................................................................................................................... 137
Figure 4.2 Three-Dimensional Structure of the Nicotinic Acetylcholine Receptor ........................................................................................................................................................................ 138
Figure 4.3 Influence of Subunit Composition on Nicotinic Receptors .................................................................................. 139
Figure 4.4 Nicotinic Receptors of Closely Related Subunit Composition Differing in Function through Variation in Subunit Stoichiometry .................................................................................................... 140
Figure 4.5 Genetic Influences on Nicotine Tolerance and Self-Administration ........................................................................ 146
Figure 5.1 Five-Class Solution for Waves 1–6 ....................................................................................................................... 226
Figure 5.2 Six-Class Solution for Waves 1–8 ....................................................................................................................... 228
Figure 6.1 Basic Path Diagram for the Analysis of Data Collected from Pairs of Monozygotic and Dizygotic Twins .................. 250
Figure 6.2 Three-Factor Latent Phenotype Model .................................................................................................................. 252
Figure 6.3 Causal Contingent Common Pathway Model ........................................................................................................ 253
Figure 6.4 Estimates of the Contributions of Additive Genetic and Shared Environmental Factors to Smoking Initiation by Sample, Age, and Gender in Published Studies of Adolescent Twins .................................................................................................................. 261
Figure 6.5 Estimates of the Contributions of Additive Genetic Factors in Common with Initiation, Total Additive Genetic, and Shared Environmental Factors to Smoking Persistence by Sample, Gender, Age, and Measure of Persistence .................................................................................. 265
Figure 6.6 Estimates of Factor Loadings and Thresholds of Nicotine-Dependence Items in Female Twins from the Virginia Twin Registry .............................................................. 272
Figure 6.7 Estimates of Factor Loadings and Thresholds of Nicotine-Dependence Items Plotted by Gender and Measurement Instrument (FTQ or FTND Scale) ...................................................................................... 273
Figure 6.8 Estimates of Nicotine-Dependence Item Characteristic Curves for 20-Year-Old Females .......................................................................................................................... 275
Figure 6.9 Estimates of Factor Loadings, Thresholds, Genetic Variance Components Due to the Factor, and Residual Item-Specific Genetic Variance Components in Virginia Twin Registry Males ......................................................... 277
Figure 7.1 Prevalence of Smoking and Drinking across the Four Study Waves ........................................................................................................................................................................ 309
Figure 7.2 Underlying General Growth Mixture Model for Characterizing Trajectories of Smoking and Trajectories of Drinking and for Characterizing Conjoint Trajectories of Smoking and Drinking ............................................................................................................................. 311
Figure 7.3 Trajectories of Smoking and Drinking ........................................................................................................................................................................................................ 314
Figure 7.4 Trajectories of Conjoint Drinking and Smoking ................................................................................................................................................................................................ 316
Figure 8.1 Hierarchical Structural Model and Hypothesized Physiological Concomitants ........................................................................................................................................................................ 345
Figure 8.2 Example of How Potential Endophenotypes Can Link Genes to Nicotine-Dependence Risk at or before Initial Nicotine Exposure .................................................................................................................................................................................................................. 347
Figure 9.1 Example of How Potential Endophenotypes Can Link Genes to Nicotine-Dependence Risk ........................................................................................................................................................................ 409
Figure 10.1 Phenotype Choice Points along the Smoking Trajectory ........................................................................................................................................................................................................................ 490
Figure 10.2 Example of Phenotypic Comparison for Drug Response Using the Proposed Approach ........................................................................................................................................................................ 491
Figure 10.3 Example of Phenotypic Comparison for Progression to Daily Smoking (Behavior of Interest) Using the Proposed Approach ........................................................................................................................................................................ 491
Figure 10.4 Example of Phenotypic Comparison for Sustained Smoking Cessation (Behavior of Interest) Using the Proposed Approach ........................................................................................................................................................................ 492
Figure 11.1 Located Cigarette Vendors in Rhode Island ........................................................................................................................................................................................................................ 521
Figure 11.2 Located Cigarette Vendors in Massachusetts ........................................................................................................................................................................................................................ 522
Figure 11.3 Percentage of Diary Responses Endorsing Cigarette Use Stratified by Social Contexts ........................................................................................................................................................................ 530
Figure 11.4 Pattern of Endorsed Smoking Epochs over a Six-Day Period for a Concordant Sibling Pair ........................................................................................................................................................................ 531
Figure 12.1 Evolutionary and Structural Analyses for the CYP2A6*2 Variant .................................................................................................................................................................................................................. 555
Figure 12.2 Examples of Networks ........................................................................................................................................................................................................................ 556
Figure 12.3 Shrinkage of Test Statistics ........................................................................................................................................................................................................................ 567
Figure 13.1 Some Examples of Hypothetical Gene to Phenotype Pathways ................. 590
Tables

Table 2.1  Results from the Genome-wide Association Study of Nicotine Dependence ................................................................. 44
Table 2.2  Results from the Candidate Gene Study of Nicotine Dependence ............................................................... 44
Table 2.3  Pleiotropic Associations of Genetic Variants Implicated in Smoking ............................................................. 48
Table 3.1  Subscales of the Wisconsin Inventory of Smoking Dependence Motives ............................................................... 85
Table 3.2  Dimensions on Which Groups Might Be Constructed to Contrast Putative High- and Low-Dependence Predispositions ................................................................. 96
Table 3.3  Causal Paths from Genetic Variant to Distal Phenotypes ............................................................................. 102
Table 3.4  Levels of Analysis in Characterizing the Phenotype .................................................................................. 109
Table 5.1  Studies of Smoking Trajectories .................................................................................................................. 203
Table 5.2  Trajectory Group Sizes and Relationship with Gender and Educational Attainment ......................................................... 227
Table 5.3  Stability of Classification across the Waves 1–6 and Waves 1–8 Models ........................................................................ 229
Table 5.4  Relationship of Trajectory Group Membership to Family History of Smoking ......................................................... 231
Table 5.5  Relationship of Trajectory Group Membership to Smoking Dependence Indices in Wave 8 ..................................................... 231
Table 6.1  Number of Alleles Shared Identical by Descent for a Pair of Full Siblings ........................................................................ 258
Table 6.2  Results from Fitting Measurement Noninvariance and Gender Heterogeneity Models to Nicotine Initiation and Dependence Data Collected from Twins ......................................................... 274
Table 7.1  Overview of the Literature on Conjoint Trajectories of Substance Use .................................................................................. 300
Table 7.2  Correlations across Smoking and Drinking at Each of the Four Waves for the Full Sample .......................................................... 312
Table 7.3  Fit Indices and Likelihood Ratio Tests for Relative Improvement in Fit for Smoking, Drinking, and Dual Smoking and Drinking ........................................................................ 313
Table 7.4  Cross-Tabulations of Frequency and Cell Proportions of Group Membership for Smoking and Drinking for the Full Sample ............................................................................ 315
Table 7.5  Cross-Tabulations of Frequency (Cell Proportion) of Group Membership for Twin 1 Versus Twin 2 (across Zygosity) for Smoking and for Drinking ............................................. 318
Table 7.6  Cross-Tabulations of Frequency (Cell Proportion) of Group Membership for Twin 1 Smoking by Twin 2 Drinking and Twin 2 Smoking by Twin 1 Drinking ........................................................................ 319
Table 8.1  Extant Data on Potential Endophenotypes and Their Measurement ...................................................................................... 355
Table 9.1  Putative Endophenotypes for Nicotine Dependence: Motivational Mechanisms and Nicotine or Abstinence Effects ................................................................. 453
Table 9.2  Putative Endophenotypes for Nicotine Dependence: Acute Smoking or Abstinence Effects ........................................................................ 453
Table 10.1  A Comparison of the Data Sets and Variables Used in the Analyses Presented in This Chapter ...................................................... 494
Table 10.2  Results from the Analysis of the ATBC Study Data ...................................................... 496
Table 10.3  Results from the Analysis of TUS-CPS Data ................................................................. 499
Table 10.4  Results from the Analysis of NHANES III Data .......................................................... 502
Table 11.1  Sibling Partners Diary Prompts ............................................................................... 528
Table 12.1  Results for Nicotine Clearance ............................................................................... 566
Table 12.2  Results for 3HC/COT Ratios .................................................................................. 569