**Supplementary Table S1.** Latent class analysis model results and fit statistics for the WHEALS cohort, Detroit, MI

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **1 Class** | **2 Classes** | **3 Classes** | **4 Classes** | **5 Classes** | **6 Classes** |
| **Log-likelihood** | -4590.491 | -3534.285 | -3421.879 | -3387.676 | -3380.744 | -3375.126 |
| **AIC** | 9192.982 | 7094.570 | 6883.759 | **6829.352** | 6829.489 | 6832.253 |
| **BIC** | 9223.806 | 7161.355 | 6986.504 | **6968.058** | 7004.156 | 7042.881 |
| **SSA-BIC** | 9204.747 | 7120.061 | 6922.975 | **6882.294** | 6896.156 | 6912.646 |
| **LMR P value** | NA | <0.001 | <0.001 | **<0.001** | 0.11 | 0.020 |
| **BLRT P value** | NA | <0.001 | <0.001 | **<0.001** | 0.24 | 0.43 |
| **Entropy** | NA | 0.913 | 0.807 | 0.738 | 0.870 | 0.882 |
| **% per class** | 100% | 26%, 74% | 62%, 17%, 20% | 9%, 20%, 54%, 18% | 56%, 12%, 5%, 11%, 17% | 9%, 4%, 13%, 8%, 56%, 10% |

AIC, Akaike Information Criterion; BIC, Bayesian Information Criteria; BLRT P value, Bootstrap Likelihood Ratio Test; LMR P value, Lo-Mendell-Rubin Adjusted Likelihood Ratio Test; SSA-BIC, Sample-size adjusted Bayesian Information Criteria; NA, Non-applicable; WHEALS, Wayne County Health, Environment, Allergy, and Asthma Longitudinal Study.

Bold indicates “best” fit for each statistic.

**Supplemental Table 2.** Association Between Baseline Characteristics and Participation Classes in WHEALSa

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Class 1: High Early Participation with Gradual LTFU N=109** | **Class 2: Sporadic Participation****N=252** | **Class 3: Consistently High Participation N=675** | **Class 4: Consistently Low Participation N=222** |
|  | **Mean (SD) or N (Column %)** |
| *Maternal Characteristics* |
| Age at birth (years) | 29.4 (5.17) | 28.4 (5.10) | 30.2 (5.19) | 29.0 (5.30) |
| Race-ethnicity: |  |  |  |  |
|  White | 33 (30.3%) | 38 (15.1%) | 186 (27.6%) | 33 (14.9%) |
|  Black | 61 (56.0%) | 180 (71.4%) | 377 (55.9%) | 160 (72.1%) |
|  Hispanic | 6 (5.5%) | 12 (4.8%) | 47 (7.0%) | 13 (5.9%) |
|  MENA | 7 (6.4%) | 13 (5.2%) | 33 (4.9%) | 6 (2.7%) |
|  Other/Mixed | 2 (1.8%) | 9 (3.6%) | 32 (4.7%) | 10 (4.5%) |
| Education: |  |  |  |  |
|  <HS diploma | 11 (10.1%) | 18 (7.1%) | 27 (4.0%) | 18 (8.1%) |
|  HS diploma | 22 (20.2%) | 50 (19.8%) | 102 (15.1%) | 54 (24.3%) |
|  Some college | 49 (45.0%) | 143 (56.7%) | 295 (43.7%) | 118 (53.2%) |
|  ≥Bachelor’s degree | 27 (24.8%) | 41 (16.3%) | 251 (37.2%) | 32 (14.4%) |
| Employment categoryb: |  |  |  |  |
|  Employed | 76 (70.4%) | 197 (78.5%) | 527 (78.5%) | 160 (72.4%) |
|  Unemployed | 29 (26.9%) | 43 (17.1%) | 115 (17.1%) | 52 (23.5%) |
|  Student | 3 (2.78%) | 11 (4.4%) | 29 (4.3%) | 9 (4.1%) |
| Insurance coverageb: |  |  |  |  |
|  Private | 53 (50.0%) | 106 (54.1%) | 431 (65.4%) | 33 (56.9%) |
|  Medicaid | 30 (28.3%) | 41 (20.9%) | 122 (18.5%) | 14 (24.1%) |
|  Other insurance | 10 (9.4%) | 25 (12.8%) | 66 (10.0%) | 3 (5.2%) |
|  No insurance | 3 (2.8%) | 2 (1.0%) | 9 (1.4%) | 1 (1.7%) |
|  Refused/Don't know | 10 (9.4%) | 22 (11.2%) | 31 (4.7%) | 7 (12.1%) |
| Prenatal smoking: |  |  |  |  |
|  No | 89 (81.7%) | 213 (84.5%) | 617 (91.4%) | 189 (85.1%) |
|  Yes | 20 (18.3%) | 39 (15.5%) | 58 (8.6%) | 33 (14.9%) |
| Alcohol use during pregnancyb: |  |  |  |  |
|  No | 102 (94.4%) | 246 (97.6%) | 644 (95.5%) | 214 (96.8%) |
|  Yes | 6 (5.6%) | 6 (2.4%) | 30 (4.5%) | 7 (3.2%) |
| History of allergiesb: |  |  |  |  |
|  No | 96 (88.1%) | 205 (82.0%) | 562 (84.8%) | 191 (87.2%) |
|  Yes | 13 (11.9%) | 45 (18.0%) | 101 (15.2%) | 28 (12.8%) |
| History of asthmab: |  |  |  |  |
|  No | 88 (80.7%) | 198 (78.6%) | 539 (80.0%) | 180 (81.1%) |
|  Yes | 21 (19.3%) | 54 (21.4%) | 135 (20.0%) | 42 (18.9%) |
| *Delivery Characteristics* |
| First pregnancy: |  |  |  |  |
|  No | 79 (72.5%) | 203 (80.6%) | 513 (76.0%) | 177 (79.7%) |
|  Yes | 30 (27.5%) | 49 (19.4%) | 162 (24.0%) | 45 (20.3%) |
| First born child: |  |  |  |  |
|  No | 64 (58.7%) | 163 (64.7%) | 417 (61.8%) | 154 (69.4%) |
|  Yes | 45 (41.3%) | 89 (35.3%) | 258 (38.2%) | 68 (30.6%) |
| Mode of deliveryb: |  |  |  |  |
|  Vaginal | 78 (71.6%) | 150 (59.5%) | 430 (63.9%) | 133 (61.0%) |
|  C-Section | 31 (28.4%) | 102 (40.5%) | 243 (36.1%) | 85 (39.0%) |
| *Paternal Characteristics* |
| Age at birth (years) | 32.6 (7.78) | 31.1 (6.62) | 33.1 (6.63) | 30.9 (6.50) |
| Race-ethnicityb: |  |  |  |  |
|  White | 32 (30.8%) | 39 (16.2%) | 173 (27.1%) | 27 (13.1%) |
|  Black | 52 (50.0%) | 172 (71.7%) | 360 (56.4%) | 154 (74.8%) |
|  Hispanic | 6 (5.8%) | 11 (4.6%) | 36 (5.6%) | 8 (3.9%) |
|  MENA | 9 (8.7%) | 14 (5.8%) | 39 (6.1%) | 10 (4.9%) |
|  Other/Mixed | 5 (4.81%) | 4 (1.7%) | 30 (4.7%) | 7 (3.4%) |
| Educationb: |  |  |  |  |
|  <HS diploma | 4 (3.9%) | 31 (13.0%) | 45 (7.1%) | 18 (8.9%) |
|  HS diploma | 28 (26.9%) | 98 (41.2%) | 171 (27.0%) | 80 (39.4%) |
|  Some college | 51 (49.0%) | 84 (35.3%) | 228 (36.0%) | 78 (38.4%) |
|  ≥Bachelor’s degree | 21 (20.2%) | 25 (10.5%) | 190 (30.0%) | 27 (13.3%) |
| Employment categoryb: |  |  |  |  |
|  Employed | 93 (92.1%) | 205 (88.4%) | 574 (91.5%) | 168 (85.3%) |
|  Unemployed | 7 (6.9%) | 25 (10.8%) | 41 (6.5%) | 23 (11.7%) |
|  Student | 1 (1.0%) | 2 (0.9%) | 12 (1.9%) | 6 (3.1%) |
| History of allergiesb: |  |  |  |  |
|  No | 80 (87.0%) | 197 (90.8%) | 484 (84.9%) | 176 (92.6%) |
|  Yes | 12 (13.0%) | 20 (9.2%) | 86 (15.1%) | 14 (7.4%) |
| History of asthmab: |  |  |  |  |
|  No | 76 (76.0%) | 189 (82.2%) | 516 (86.6%) | 175 (88.8%) |
|  Yes | 24 (24.0%) | 41 (17.8%) | 80 (13.4%) | 22 (11.2%) |
| *Household Characteristics* |
| Location of residence: |  |  |  |  |
|  Suburban | 57 (52.3%) | 87 (34.5%) | 336 (49.8%) | 75 (33.8%) |
|  Urban | 52 (47.7%) | 165 (65.5%) | 339 (50.2%) | 147 (66.2%) |
| Household income: |  |  |  |  |
|  <$20,000 | 22 (20.2%) | 46 (18.3%) | 67 (9.9%) | 47 (21.2%) |
|  $20,000-<$40,000 | 21 (19.3%) | 62 (24.6%) | 144 (21.3%) | 68 (30.6%) |
|  $40,000-<$80,000 | 38 (34.9%) | 75 (29.8%) | 180 (26.7%) | 54 (24.3%) |
|  $80,000-<$100,000 | 7 (6.4%) | 19 (7.5%) | 96 (14.2%) | 13 (5.9%) |
|  ≥$100,000 | 6 (5.5%) | 23 (9.1%) | 102 (15.1%) | 17 (7.7%) |
|  Refused to answer | 15 (13.8%) | 27 (10.7%) | 86 (12.7%) | 23 (10.4%) |
| ETS exposure during pregnancy: |  |  |  |  |
|  No | 76 (69.7%) | 165 (65.5%) | 525 (77.8%) | 145 (65.3%) |
|  Yes | 33 (30.3%) | 87 (34.5%) | 150 (22.2%) | 77 (34.7%) |
| Prenatal indoor dogs: |  |  |  |  |
|  No | 84 (77.1%) | 194 (77.0%) | 490 (72.6%) | 187 (84.2%) |
|  Yes | 25 (22.9%) | 58 (23.0%) | 185 (27.4%) | 35 (15.8%) |
| Prenatal indoor cats: |  |  |  |  |
|  No | 89 (81.7%) | 216 (85.7%) | 558 (82.7%) | 192 (86.5%) |
|  Yes | 20 (18.3%) | 36 (14.3%) | 117 (17.3%) | 30 (13.5%) |
| *Infant Characteristics* |
| Child sexb: |  |  |  |  |
|  Male | 60 (55.0%) | 119 (47.2%) | 338 (50.1%) | 105 (47.5%) |
|  Female | 49 (45.0%) | 133 (52.8%) | 337 (49.9%) | 116 (52.5%) |
| Daycare attendance at 1-monthb: |  |  |  |  |
|  No | 98 (92.5%) | 184 (93.9%) | 640 (97.0%) | 54 (93.1%) |
|  Yes | 8 (7.6%) | 12 (6.1%) | 20 (3.0%) | 4 (6.9%) |
| Breastfeeding status at 1-monthb: |  |  |  |  |
|  Formula feeding only | 33 (30.8%) | 48 (23.0%) | 135 (20.2%) | 15 (23.4%) |
|  Mixed feeding | 63 (58.9%) | 152 (72.7%) | 422 (63.1%) | 44 (68.8%) |
|  Breastfeeding only | 11 (10.3%) | 9 (4.3%) | 112 (16.7%) | 5 (7.8%) |

ETS, environmental tobacco smoke; HS, high school; LTFU, lost to follow-up; MENA, Middle East and North Africa; SD, standard deviation; WHEALS, Wayne County Health, Environment, Allergy, and Asthma Longitudinal Study.

aCalculated using analysis of variance for continuous variables or the chi-squared test for categorical variables (unless expected frequencies are less than 5 in some cells, in which case Fisher’s exact test was utilized).

bColumn totals do not add up due to missingness.

**Supplemental Table S3.** Probability of each participation class within each terminal node using conditional inference tree modeling

|  |  |  |
| --- | --- | --- |
| **Node** | **Participation class** | **Percent** |
| Node 2 | Class 1: High early participation with gradual LTFU | 9.0% |
|  | Class 2: Sporadic participation | 23.3% |
|  | Class 3: Consistently high participation | 46.7% |
|  | Class 4: Consistently low participation | 20.9% |
| Node 5 | Class 1: High early participation with gradual LTFU | 14.3% |
|  | Class 2: Sporadic participation | 14.3% |
|  | Class 3: Consistently high participation | 59.3% |
|  | Class 4: Consistently low participation | 12.1% |
| Node 6 | Class 1: High early participation with gradual LTFU | 3.6% |
|  | Class 2: Sporadic participation | 9.2% |
|  | Class 3: Consistently high participation | 82.1% |
|  | Class 4: Consistently low participation | 5.1% |
| Node 7 | Class 1: High early participation with gradual LTFU | 0.0% |
|  | Class 2: Sporadic participation | 18.8% |
|  | Class 3: Consistently high participation | 50.0% |
|  | Class 4: Consistently low participation | 31.2% |

LTFU, loss to follow-up.