Supplemental Online Content

Kalb LG, Singh V, Hong JS, et al. Analysis of race and sex bias in the Autism Diagnostic Observation Schedule (ADOS-2). *JAMA Netw Open.* 2022;5(4):e229498. doi:10.1001/jamanetworkopen.2022.9498

eTable 1. IRT Parameters and ADOS Characteristics for Items With Suspected DIF by Sex
eTable 2. IRT Parameters and ADOS Characteristics for Items With Suspected DIF by Race
eTable 3. Fit Statistics by ADOS-2 Algorithm
eFigure 1. Item Response Theory Curves by Race
eFigure 2. Item Response Theory Curves by Sex

This supplemental material has been provided by the authors to give readers additional information about their work.
Table 1: IRT Parameters and ADOS Characteristics for Items With Suspected DIF by Sex

| ADOS-2 Status (N, %) | Mod 1 - Algorithm 1 | Mod 2 - Algorithm 1 | Mod 2 - Algorithm 2 | Mod 3 |
|---------------------|---------------------|---------------------|---------------------|-------|
| No ASD/Autism       | 22 (12.0%)          | 35 (17.7%)          | 163 (19.4%)         | 75 (39.7%) |
| ASD                 | 12 (6.52%)          | 24 (12.1%)          | 120 (14.3%)         | 28 (14.8%) |
| Autism              | 150 (81.5%)         | 139 (70.2%)         | 558 (66.3%)         | 86 (45.5%) |

| ADOS-2 Items (M, SD) | Mod 1 - Algorithm 1 | Mod 2 - Algorithm 1 | Mod 2 - Algorithm 2 | Mod 3 |
|----------------------|---------------------|---------------------|---------------------|-------|
| Eye Contact          | 1.71 (0.71)         | 1.17 (0.99)         | 1.24 (0.98)         | 0.92 (1.00) |
| Gaze                 | 1.46 (0.68)         | 0.93 (0.79)         | 1.15 (0.81)         | 0.57 (0.66) |
| Facial Expressions   | 1.32 (0.62)         | 0.53 (0.58)         | 0.81 (0.67)         | 0.51 (0.63) |
| Vocalization         | 1.73 (0.56)         | 0.62 (0.72)         | 0.90 (0.75)         | 0.61 (0.67) |
| Social Overtures     | 1.24 (0.79)         | 0.35 (0.64)         | 0.57 (0.76)         | 0.44 (0.68) |
| RJA                  | 1.61 (0.61)         | 0.79 (0.63)         | 0.84 (0.60)         | 0.68 (0.59) |
| IJA                  | 1.07 (0.77)         | 0.64 (0.73)         | 0.71 (0.68)         | 0.75 (0.61) |
| Stereotyped Language | 0.98 (0.95)         | 0.95 (0.82)         | 0.69 (0.72)         | 0.46 (0.62) |
| Sensory Interest     | 1.18 (0.90)         | 0.93 (0.87)         | 0.62 (0.81)         | 0.18 (0.49) |
| Repetitive Interest  | 1.17 (0.95)         | 0.92 (0.92)         | 0.47 (0.77)         | 0.25 (0.60) |
| Hand Mannerisms      | 1.46 (0.75)         | 0.85 (0.78)         | 0.92 (0.78)         | 0.45 (0.66) |

* M (Male), F (Female), SA (Social Affect), RRB (Repetitive, Restrictive Behaviors), RAJ (Response to Joint Attention), IJA (Initiates Joint Attention)
| Race          | Mod 1 - Algorithm 1 | Mod 1 - Algorithm 2 | Mod 2 - Algorithm 1 | Mod 2 - Algorithm 2 | Mod3 |
|--------------|---------------------|---------------------|---------------------|---------------------|------|
| N (%)        | White (50.0%)       | Black/AA (50.0%)    | White (40.6%)       | Black/AA (28.6%)    |      |
| ADOS-2 Items (M, SD) |                |                     |                     |                     |      |
| Eye Contact  | 1.76 (0.66)         | 1.78 (0.63)         | 1.44 (0.90)         | 1.52 (0.85)         |      |
| Gaze         | 1.46 (0.68)         | 1.38 (0.66)         | 0.83 (0.69)         | 0.96 (0.67)         |      |
| Facial Expressions | 1.28 (0.60)     | 1.26 (0.60)         | 0.88 (0.60)         | 0.90 (0.58)         |      |
| Vocalization | 1.66 (0.59)         | 1.74 (0.52)         | 0.80 (0.67)         | 0.94 (0.69)         |      |
| Shared Enjoyment | 1.13 (0.76)    | 1.09 (0.77)         | 0.68 (0.76)         | 0.65 (0.71)         |      |
| Social Overtures | 1.51 (0.62)   | 1.57 (0.59)         | 1.02 (0.65)         | 1.15 (0.63)         |      |
| RJA          | 1.13 (0.80)         | 1.25 (0.79)         | 0.98 (0.79)         | 1.17 (0.78)         |      |
| Gestures     | 1.18 (0.73)         | 1.29 (0.64)         | 0.85 (0.68)         | 1.00 (0.74)         |      |
| Social Response | 1.72 (0.58)    | 1.72 (0.59)         | 1.17 (0.84)         | 1.30 (0.81)         |      |
| IJA          | 1.41 (0.81)         | 1.44 (0.77)         | 0.93 (0.86)         | 0.99 (0.86)         |      |
| Stereotyped Language | 0.84 (0.92) | 0.92 (0.94)         | 0.80 (0.81)         | 0.93 (0.81)         |      |
| Sensory Interest | 1.24 (0.89)    | 1.29 (0.84)         | 0.87 (0.87)         | 0.97 (0.89)         |      |
| Repetitive Interest | 1.30 (0.90)  | 1.17 (0.95)         | 0.93 (0.92)         | 0.91 (0.92)         |      |
| Hand Mannerisms | 1.56 (0.68)   | 1.57 (0.69)         | 1.36 (0.74)         | 1.38 (0.71)         |      |
| ADOS-2 CSS (M, SD) |                |                     |                     |                     |      |
| CSS          | 6.73 (2.30)         | 6.84 (2.17)         | 5.90 (2.81)         | 6.40 (2.50)         |      |
| SA CSS       | 6.27 (2.32)         | 6.40 (2.14)         | 5.46 (2.63)         | 5.96 (2.53)         |      |
| RRB CSS      | 7.86 (2.09)         | 7.90 (2.05)         | 7.37 (2.51)         | 7.54 (2.25)         |      |
| ADOS-2 Status (N, %) |                |                     |                     |                     |      |
| No ASD/Autism| 30 (10.5%)          | 20 (6.97%)          | 96 (23.0%)          | 44 (15.4%)          |      |
| ASD          | 31 (10.8%)          | 37 (12.9%)          | 67 (16.1%)          | 36 (12.6%)          |      |
| Autism       | 226 (78.7%)         | 230 (80.1%)         | 254 (60.9%)         | 205 (71.9%)         |      |

* M (Male), F (Female), SA (Social Affect), RRB (Repetitive, Restrictive Behaviors), RAJ (Response to Joint Attention), IJA (Initiates Joint Attention)
| Module   | Model         | M2/C2   | RMSEA          | SRMR  | TLI   | CFI   |
|----------|---------------|---------|----------------|-------|-------|-------|
| Module 1.1 | Two Factor    | 691.715 | 0.109 (0.102-0.117) | 0.19  | 0.89  | 0.90  |
|           | Unidimensional| 278.699 | 0.064 (0.057-0.072) | 0.06  | 0.96  | 0.97  |
|           | RRB Factor    | 7.234   | 0.057 (0.016-0.104) | 0.03  | 0.92  | 0.97  |
|           | SA Factor     | 392.108 | 0.129 (0.118-0.141) | 0.19  | 0.91  | 0.93  |
| Module 1.2 | Two Factor    | 768.831 | 0.102 (0.096-0.109) | 0.20  | 0.91  | 0.93  |
|           | Unidimensional| 329.332 | 0.063 (0.057-0.07)  | 0.05  | 0.97  | 0.97  |
|           | RRB Factor    | 8.043   | 0.054 (0.019-0.095) | 0.03  | 0.95  | 0.98  |
|           | SA Factor     | 495.219 | 0.13 (0.12-0.14)   | 0.20  | 0.92  | 0.94  |
| Module 2.1 | Two Factor    | 856.196 | 0.121 (0.114-0.129) | 0.20  | 0.85  | 0.87  |
|           | Unidimensional| 500.909 | 0.091 (0.084-0.098) | 0.06  | 0.91  | 0.93  |
|           | RRB Factor    | 0.268   | 0 (0-0.034)        | 0.01  | 1.01  | 1.00  |
|           | SA Factor     | 457.576 | 0.139 (0.128-0.15) | 0.16  | 0.85  | 0.89  |
| Module 2.2 | Two Factor    | 609.028 | 0.12 (0.111-0.129) | 0.21  | 0.87  | 0.89  |
|           | Unidimensional| 472.017 | 0.105 (0.096-0.114) | 0.07  | 0.90  | 0.92  |
|           | RRB Factor    | 15.274  | 0.107 (0.061-0.16) | 0.05  | 0.92  | 0.97  |
|           | SA Factor     | 301.433 | 0.132 (0.119-0.146) | 0.18  | 0.89  | 0.92  |
| Module 3  | Two Factor    | 2094.974 | 0.102 (0.098-0.106) | 0.18  | 0.91  | 0.92  |
|           | Unidimensional| 1463.464 | 0.085 (0.082-0.089) | 0.06  | 0.94  | 0.95  |
|           | RRB Factor    | 30.919  | 0.069 (0.049-0.092) | 0.04  | 0.91  | 0.97  |
|           | SA Factor     | 1256.446 | 0.123 (0.117-0.129) | 0.15  | 0.92  | 0.94  |

*RMSEA (Root Mean Squared Error of Association), TLI (Tucker Lewis Index), CFI (Comparative Fit Index)
eFigure 1: Item Response Theory Curves by Race
eFigure 2: Item Response Theory Curves by Sex