**Electronic Supplemental Materials for “When Does Differential Item Functioning Matter for Screening? A Method for Empirical Evaluation”**

**Appendix 1.**  Additional tables for simulation study comparing the proposed simulation-based procedure and the procedure by Lai et al. (2019) to investigate the effect of DIF on classification accuracy of assessments comprised of binary items.

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| Table S1. *Relative bias for the sensitivity estimates from the proposed simulation-based approach compared to the analytical approach, and empirical standard deviation of the sensitivity estimates per condition.* | | | | | | | | |
|  | Case 2: Different Latent Mean and Standard Deviation | | | | | | | |
|  | Cases Sampled | | | | | | | |
|  | Relative bias for reference [focal] group | | | | Standard deviation for reference [focal] group | | | |
| *i* | 1,000 | 5,000 | 10,000 | 25,000 | 1,000 | 5,000 | 10,000 | 25,000 |
| 5 | -.005 [.015] | -.002 [.015] | -.003 [.016] | -.003 [.015] | .021 [0.016] | .010 [0.007] | .007 [0.005] | .004 [0.003] |
| 6 | -.001 [.009] | -.001 [.009] | -.001 [.009] | -.001 [.009] | .017 [0.012] | .008 [0.006] | .005 [0.004] | .004 [0.003] |
| 7 | -.001 [.005] | -.001 [.005] | -.001 [.005] | -.001 [.005] | .015 [0.011] | .006 [0.005] | .005 [0.003] | .003 [0.002] |
| 8 | -.002 [.002] | -.001 [.003] | -.001 [.003] | -.001 [.003] | .013 [0.010] | .006 [0.004] | .004 [0.003] | .003 [0.002] |
| 9 | -.001 [.001] | -.002 [.001] | -.002 [.001] | -.002 [.001] | .011 [0.008] | .005 [0.004] | .004 [0.003] | .002 [0.002] |
| 10 | -.002 [.000] | -.002 [.000] | -.002 [.000] | -.002 [.000] | .010 [0.008] | .004 [0.004] | .003 [0.003] | .002 [0.002] |
| 11 | -.002 [-.001] | -.002 [-.001] | -.002 [-.001] | -.002 [-.001] | .009 [0.007] | .004 [0.003] | .003 [0.002] | .002 [0.001] |
| 12 | -.002 [-.002] | -.002 [-.002] | -.002 [-.001] | -.002 [-.002] | .009 [0.007] | .004 [0.003] | .003 [0.002] | .002 [0.001] |
| 13 | -.001 [-.002] | -.002 [-.002] | -.002 [-.002] | -.002 [-.002] | .008 [0.006] | .004 [0.003] | .003 [0.002] | .002 [0.001] |
| 14 | -.002 [-.001] | -.002 [-.001] | -.002 [-.002] | -.002 [-.002] | .007 [0.006] | .003 [0.003] | .002 [0.002] | .001 [0.001] |
| 15 | -.002 [-.002] | -.002 [-.002] | -.002 [-.002] | -.002 [-.002] | .007 [0.006] | .003 [0.002] | .002 [0.002] | .001 [0.001] |
| Note: *i* is for number of items. All items are binary and the cut score was an observed score of 3. Relative bias is the estimate of the simulation-based procedure minus the estimate of the procedure by Lai et al (2019), divided by the estimate by the procedure of Lai et al (2019). | | | | | | | | |

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| Table S2. *Relative bias for the specificity estimates from the proposed simulation-based approach compared to the analytical approach, and empirical standard deviation of the specificity estimates per condition.* | | | | | | | | |
|  | Case 2: Different Latent Mean and Standard Deviation | | | | | | | |
|  | Cases Sampled | | | | | | | |
|  | Relative bias for reference [focal] group | | | | Standard deviation for reference [focal] group | | | |
| *i* | 1,000 | 5,000 | 10,000 | 25,000 | 1,000 | 5,000 | 10,000 | 25,000 |
| 5 | .019 [-.009] | .021 [-.008] | .021 [-.008] | .021 [-.008] | .021 [0.026] | .010 [0.011] | .007 [0.008] | .004 [0.005] |
| 6 | .021 [-.001] | .022 [-.002] | .022 [-.002] | .022 [-.002] | .026 [0.030] | .011 [0.013] | .008 [0.009] | .005 [0.006] |
| 7 | .020 [-.001] | .022 [.003] | .022 [.003] | .021 [.002] | .029 [0.036] | .013 [0.016] | .009 [0.011] | .006 [0.007] |
| 8 | .017 [.003] | .020 [.006] | .020 [.005] | .020 [.005] | .033 [0.039] | .015 [0.018] | . 010 [0.012] | .007 [0.008] |
| 9 | .019 [.004] | .016 [.006] | .017 [.007] | .016 [.006] | .037 [0.045] | .017 [0.019] | .012 [0.014] | .007 [0.009] |
| 10 | .012 [.002] | .013 [.007] | .013 [.007] | .014 [.006] | .040 [0.049] | .019 [0.021] | .013 [0.016] | .008 [0.010] |
| 11 | .008 [.007] | .008 [.006] | .010 [.007] | .009 [.007] | .047 [0.055] | .020 [0.024] | .015 [0.017] | .009 [0.011] |
| 12 | .003 [.002] | .004 [.006] | .004 [.005] | .005 [.004] | .051 [0.061] | .022 [0.025] | .015 [0.019] | .010 [0.011] |
| 13 | .006 [.002] | .002 [.006] | .002 [.003] | .002 [.005] | .054 [0.063] | .024 [0.029] | .017 [0.020] | .011 [0.013] |
| 14 | -.004 [.007] | -.004 [.001] | -.004 [.004] | -.004 [.003] | .060 [0.068] | .026 [0.032] | .019 [0.022] | .012 [0.014] |
| 15 | -.013 [.001] | -.008 [.003] | -.007 [.003] | -.007 [.001] | .065 [0.075] | .028 [0.032] | .020 [0.022] | .012 [0.015] |
| Note: *i* is for number of items. All items are binary and the cut score was an observed score of 3. Relative bias is the estimate of the simulation-based procedure minus the estimate of the procedure by Lai et al (2019), divided by the estimate by the procedure of Lai et al (2019). | | | | | | | | |

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| Table S3. *Relative bias for the sensitivity estimates from the proposed simulation-based approach compared to the analytical approach, and empirical standard deviation of the sensitivity estimates per condition.* | | | | | | | | |
|  | Case 3: DIF across groups | | | | | | | |
|  | Cases Sampled | | | | | | | |
|  | Relative bias for reference [focal] group | | | | Standard deviation for reference [focal] group | | | |
| *i* | 1,000 | 5,000 | 10,000 | 25,000 | 1,000 | 5,000 | 10,000 | 25,000 |
| 5 | -.033 [.061] | -.033 [.061] | -.033 [.060] | -.033 [.060] | .015 [0.022] | .007 [0.009] | .005 [0.007] | .003 [0.004] |
| 6 | -.019 [.031] | -.019 [.032] | -.018 [.032] | -.018 [.031] | .012 [0.016] | .005 [0.007] | .004 [0.005] | .002 [0.003] |
| 7 | -.011 [.016] | -.011 [.017] | -.011 [.016] | -.011 [.016] | .010 [0.012] | .005 [0.006] | .003 [0.004] | .002 [0.003] |
| 8 | -.006 [.008] | -.007 [.008] | -.007 [.008] | -.007 [.008] | .009 [0.011] | .004 [0.005] | .003 [0.003] | .002 [0.002] |
| 9 | -.005 [.003] | -.005 [.003] | -.005 [.003] | -.005 [.003] | .008 [0.009] | .004 [0.004] | .003 [0.003] | .002 [0.002] |
| 10 | -.004 [.000] | -.004 [.001] | -.004 [.001] | -.004 [.001] | .007 [0.008] | .003 [0.004] | .002 [0.003] | .001 [0.002] |
| 11 | -.003 [-.001] | -.003 [-.001] | -.003 [-.001] | -.003 [-.001] | .006 [0.007] | .003 [0.003] | .002 [0.002] | .001 [0.001] |
| 12 | -.003 [-.002] | -.003 [-.002] | -.003 [-.002] | -.003 [-.002] | .006 [0.006] | .003 [0.003] | .002 [0.002] | .001 [0.001] |
| 13 | -.002 [-.003] | -.002 [-.002] | -.002 [-.003] | -.002 [-.002] | .006 [0.006] | .003 [0.003] | .002 [0.002] | .001 [0.001] |
| 14 | -.002 [-.003] | -.002 [-.003] | -.002 [-.003] | -.002 [-.003] | .005 [0.005] | .002 [0.002] | .002 [0.002] | .001 [0.001] |
| 15 | -.002 [-.003] | -.002 [-.003] | -.002 [-.003] | -.002 [-.003] | .005 [0.005] | .002 [0.002] | .002 [0.002] | .001 [0.001] |
| Note: *i* is for number of items. All items are binary and the cut score was an observed score of 3. Relative bias is the estimate of the simulation-based procedure minus the estimate of the procedure by Lai et al (2019), divided by the estimate by the procedure of Lai et al (2019). | | | | | | | | |

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| Table S4. *Percentage of bias for the specificity estimates from the proposed simulation-based approach compared to the analytical approach, and empirical standard deviation of specificity estimates per condition.* | | | | | | | | |
|  | Case 3: DIF across groups | | | | | | | |
|  | Cases Sampled | | | | | | | |
|  | Relative bias for reference [focal] group | | | | Standard deviation for reference [focal] group | | | |
| *i* | 1,000 | 5,000 | 10,000 | 25,000 | 1,000 | 5,000 | 10,000 | 25,000 |
| 5 | .056 [-.018] | .055 [-.018] | .055 [-.018] | .055 [-.019] | .015 [0.014] | .007 [0.006] | .005 [0.005] | .003 [0.003] |
| 6 | .053 [-.015] | .052 [-.015] | .052 [-.014] | .052 [-.015] | .017 [0.016] | .008 [0.007] | .006 [0.006] | .004 [0.003] |
| 7 | .042 [-.010] | .045 [-.007] | .045 [-.009] | .045 [-.008] | .020 [0.020] | .009 [0.009] | .007 [0.006] | .004 [0.004] |
| 8 | .039 [-.003] | .037 [-.002] | .038 [-.002] | .037 [-.002] | .023 [0.023] | .010 [0.010] | .008 [0.007] | .005 [0.005] |
| 9 | .030 [.002] | .031 [.003] | .029 [.003] | .030 [.003] | .026 [0.026] | .012 [0.011] | .008 [0.008] | .005 [0.005] |
| 10 | .022 [.004] | .022 [.005] | .023 [.006] | .022 [.006] | .029 [0.030] | .013 [0.013] | .009 [0.010] | .006 [0.006] |
| 11 | .016 [.004] | .018 [.009] | .015 [.008] | .016 [.009] | .032 [0.033] | .014 [0.015] | .010 [0.010] | .006 [0.007] |
| 12 | .011 [.009] | .010 [.008] | .010 [.010] | .010 [.009] | .035 [0.037] | .016 [0.016] | .011 [0.011] | .007 [0.007] |
| 13 | .003 [.006] | .003 [.007] | .003 [.007] | .004 [.008] | .039 [0.038] | .017 [0.018] | .012 [0.012] | .007 [0.008] |
| 14 | -.003 [.009] | -.002 [.006] | -.001 [.007] | -.002 [.007] | .042 [0.043] | .019 [0.019] | .013 [0.014] | .008 [0.008] |
| 15 | -.006 [.005] | -.008 [.006] | -.009 [.006] | -.007 [.005] | .046 [0.046] | .021 [0.020] | .014 [0.015] | .009 [0.009] |
| Note: *i* is for number of items. All items are binary and the cut score was an observed score of 3. Relative bias is the estimate of the simulation-based procedure minus the estimate of the procedure by Lai et al (2019), divided by the estimate by the procedure of Lai et al (2019). | | | | | | | | |