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| **Table S18.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 9.13669E-07 | 9.13669E-07 | 9.13669E-07 | 9.13669E-07 |
| CWOA | Friedman Aligned | 3.17443E-10 | 9.76748E-10 | 9.76748E-10 | 9.76748E-10 |
| CWOA | Quade | 4.21326E-01 | 5.35667E-01 | 5.35667E-01 | 4.21326E-01 |
| NNA | Friedman | 1.61653E-05 | 2.98438E-05 | 2.98438E-05 | 2.98434E-05 |
| NNA | Friedman Aligned | 3.15806E-10 | 8.01662E-10 | 8.01662E-10 | 8.01662E-10 |
| NNA | Quade | 4.21326E-01 | 8.89041E-01 | 8.89041E-01 | 6.04273E-01 |
| PSO | Friedman | 2.03695E-05 | 5.17077E-05 | 5.17077E-05 | 5.17065E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 4.21326E-01 | 6.62888E-01 | 6.62888E-01 | 4.94345E-01 |
| WW | Friedman | 5.48061E-05 | 1.68637E-04 | 1.68637E-04 | 1.68625E-04 |
| WW | Friedman Aligned | 2.17279E-09 | 7.52120E-09 | 7.52120E-09 | 7.52120E-09 |
| WW | Quade | 4.21326E-01 | 1.0 | 1.0 | 7.59069E-01 |
| ISCA | Friedman | 1.94934E-03 | 6.75178E-03 | 6.75178E-03 | 6.73155E-03 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 4.95300E-01 | 1.0 | 1.0 | 9.06235E-01 |
| GOTLBO | Friedman | 6.07282E-03 | 2.24595E-02 | 2.24595E-02 | 2.22401E-02 |
| GOTLBO | Friedman Aligned | 5.81901E-09 | 2.14856E-08 | 2.14856E-08 | 2.14856E-08 |
| GOTLBO | Quade | 6.39735E-01 | 1.0 | 1.0 | 9.76937E-01 |
| MABC | Friedman | 1.81819E-02 | 6.88217E-02 | 6.88217E-02 | 6.68248E-02 |
| MABC | Friedman Aligned | 3.53249E-07 | 1.33148E-06 | 1.33148E-06 | 1.33148E-06 |
| MABC | Quade | 6.39735E-01 | 1.0 | 1.0 | 9.76937E-01 |
| IJAYA | Friedman | 9.98394E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 9.08636E-01 | 1.0 | 1.0 | 9.99854E-01 |
| IJAYA | Quade | 9.65203E-01 | 1.0 | 1.0 | 9.99996E-01 |
| **Table S18** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S19.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 2.57175E-03 | 2.57480E-03 | 2.57480E-03 | 2.57175E-03 |
| MABC | Friedman | 2.13607E-13 | 3.94351E-13 | 3.94351E-13 | 3.94351E-13 |
| MABC | Friedman Aligned | 3.33763E-10 | 1.25803E-09 | 1.25803E-09 | 1.25803E-09 |
| MABC | Quade | 2.25210E-02 | 8.53328E-02 | 8.53328E-02 | 8.22748E-02 |
| GOTLBO | Friedman | 2.44012E-12 | 6.19416E-12 | 6.19416E-12 | 6.19416E-12 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 2.21704E-02 | 8.23542E-02 | 8.23542E-02 | 7.94473E-02 |
| ISCA | Friedman | 1.94065E-11 | 5.97122E-11 | 5.97122E-11 | 5.97122E-11 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.04000E-02 | 3.61159E-02 | 3.61159E-02 | 3.55416E-02 |
| WW | Friedman | 1.60152E-09 | 5.54373E-09 | 5.54373E-09 | 5.54373E-09 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 4.71779E-03 | 1.45400E-02 | 1.45400E-02 | 1.44453E-02 |
| PSO | Friedman | 4.11590E-09 | 1.51972E-08 | 1.51972E-08 | 1.51972E-08 |
| PSO | Friedman Aligned | 1.29144E-10 | 4.47038E-10 | 4.47038E-10 | 4.47038E-10 |
| PSO | Quade | 2.57175E-03 | 3.86298E-03 | 3.86298E-03 | 3.85615E-03 |
| NNA | Friedman | 5.85484E-09 | 2.20682E-08 | 2.20682E-08 | 2.20682E-08 |
| NNA | Friedman Aligned | 1.73241E-10 | 6.39659E-10 | 6.39659E-10 | 6.39659E-10 |
| NNA | Quade | 2.65209E-03 | 6.73911E-03 | 6.73911E-03 | 6.71851E-03 |
| IJAYA | Friedman | 7.80303E-08 | 2.88112E-07 | 2.74456E-07 | 2.88112E-07 |
| IJAYA | Friedman Aligned | 8.81170E-06 | 3.25356E-05 | 3.25356E-05 | 3.25351E-05 |
| IJAYA | Quade | 1.04801E-01 | 3.95158E-01 | 3.95158E-01 | 3.35534E-01 |
| **Table S19** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 7.92873E-08 | 2.88112E-07 | 2.74456E-07 | 2.88112E-07 |
| DE | Friedman Aligned | 3.00304E-05 | 1.03952E-04 | 1.03952E-04 | 1.03948E-04 |
| DE | Quade | 1.31444E-01 | 4.64771E-01 | 4.64771E-01 | 3.86031E-01 |
| NDE | Friedman | 6.84857E-06 | 2.10725E-05 | 2.10725E-05 | 2.10724E-05 |
| NDE | Friedman Aligned | 1.50161E-03 | 4.62113E-03 | 4.62113E-03 | 4.61313E-03 |
| NDE | Quade | 2.27244E-01 | 7.19509E-01 | 7.19509E-01 | 5.47608E-01 |
| TLBO | Friedman | 3.12274E-01 | 8.14506E-01 | 8.14506E-01 | 6.13379E-01 |
| TLBO | Friedman Aligned | 7.47586E-01 | 1.0 | 1.0 | 9.69641E-01 |
| TLBO | Quade | 7.92910E-01 | 1.0 | 1.0 | 9.81630E-01 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S20.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | 1.41434E-10 | 4.89580E-10 | 4.51671E-10 | 4.89580E-10 |
| PSO | Quade | 9.10568E-04 | 1.40843E-03 | 1.40843E-03 | 1.40752E-03 |
| NNA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Friedman Aligned | 1.41434E-10 | 4.89580E-10 | 4.51671E-10 | 4.89580E-10 |
| NNA | Quade | 1.00825E-03 | 2.56039E-03 | 2.56039E-03 | 2.55742E-03 |
| CWOA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 9.10568E-04 | 9.10951E-04 | 9.10951E-04 | 9.10568E-04 |
| MABC | Friedman | 2.70184E-12 | 8.31335E-12 | 8.31335E-12 | 8.31335E-12 |
| MABC | Friedman Aligned | 1.75948E-09 | 6.63187E-09 | 6.63187E-09 | 6.63187E-09 |
| MABC | Quade | 1.06705E-02 | 4.03192E-02 | 4.03192E-02 | 3.96291E-02 |
| GOTLBO | Friedman | 2.50012E-11 | 8.65428E-11 | 8.65428E-11 | 8.65428E-11 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.03648E-02 | 3.83774E-02 | 3.83774E-02 | 3.77392E-02 |
| ISCA | Friedman | 1.56474E-10 | 5.77749E-10 | 5.77749E-10 | 5.77749E-10 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 4.51230E-03 | 1.56412E-02 | 1.56412E-02 | 1.55329E-02 |
| IJAYA | Friedman | 5.89865E-09 | 2.22334E-08 | 1.97169E-08 | 2.22334E-08 |
| IJAYA | Friedman Aligned | 1.36159E-06 | 5.02741E-06 | 5.02741E-06 | 5.02740E-06 |
| IJAYA | Quade | 5.82602E-02 | 2.17592E-01 | 2.17592E-01 | 1.98793E-01 |
| DE | Friedman | 5.96217E-09 | 2.22334E-08 | 1.97169E-08 | 2.22334E-08 |
| DE | Friedman Aligned | 5.16020E-06 | 1.78623E-05 | 1.78623E-05 | 1.78621E-05 |
| DE | Quade | 7.57041E-02 | 2.65210E-01 | 2.65210E-01 | 2.38529E-01 |
| **Table S20** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 5.96217E-09 | 2.22334E-08 | 1.97169E-08 | 2.22334E-08 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 1.90142E-03 | 5.85437E-03 | 5.85437E-03 | 5.83897E-03 |
| NDE | Friedman | 6.71920E-07 | 2.06745E-06 | 2.06745E-06 | 2.06745E-06 |
| NDE | Friedman Aligned | 3.70876E-04 | 1.14121E-03 | 1.14121E-03 | 1.14072E-03 |
| NDE | Quade | 1.41276E-01 | 4.42227E-01 | 4.42227E-01 | 3.74146E-01 |
| TLBO | Friedman | 1.37223E-01 | 3.52222E-01 | 3.52222E-01 | 3.12487E-01 |
| TLBO | Friedman Aligned | 4.91056E-01 | 1.0 | 1.0 | 8.19950E-01 |
| TLBO | Quade | 6.15068E-01 | 1.0 | 9.33437E-01 | 9.11384E-01 |
| EBLSHADE | Friedman | 6.70491E-01 | 1.0 | 8.29657E-01 | 8.71202E-01 |
| EBLSHADE | Friedman Aligned | 7.33523E-01 | 1.0 | 1.0 | 9.12968E-01 |
| EBLSHADE | Quade | 8.24213E-01 | 1.0 | 9.33437E-01 | 9.59624E-01 |
| STLBO | Friedman | 8.29657E-01 | 1.0 | 8.29657E-01 | 8.71202E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 9.33437E-01 | 1.0 | 9.33437E-01 | 9.59624E-01 |

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| **Table S21.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 4.80155E-09 | 4.80155E-09 | 4.80155E-09 | 4.80155E-09 |
| CWOA | Friedman Aligned | 3.03064E-10 | 1.01341E-09 | 1.01341E-09 | 1.01341E-09 |
| CWOA | Quade | 2.02938E-01 | 2.24855E-01 | 2.24855E-01 | 2.02938E-01 |
| NNA | Friedman | 1.48126E-07 | 2.73464E-07 | 2.73464E-07 | 2.73464E-07 |
| NNA | Friedman Aligned | 3.03064E-10 | 9.32505E-10 | 9.32505E-10 | 9.32505E-10 |
| NNA | Quade | 2.02938E-01 | 4.07942E-01 | 4.07942E-01 | 3.40121E-01 |
| PSO | Friedman | 2.08081E-07 | 5.28205E-07 | 5.28205E-07 | 5.28205E-07 |
| PSO | Friedman Aligned | 4.93547E-11 | 1.25285E-10 | 1.25285E-10 | 1.25285E-10 |
| PSO | Quade | 2.02938E-01 | 2.88952E-01 | 2.88952E-01 | 2.53595E-01 |
| WW | Friedman | 6.93545E-07 | 2.13398E-06 | 2.13398E-06 | 2.13398E-06 |
| WW | Friedman Aligned | 1.17732E-08 | 4.43760E-08 | 4.43760E-08 | 4.43760E-08 |
| WW | Quade | 2.02938E-01 | 6.53907E-01 | 6.53907E-01 | 4.91488E-01 |
| ISCA | Friedman | 5.43490E-05 | 1.88134E-04 | 1.88134E-04 | 1.88118E-04 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.92346E-01 | 1.0 | 1.0 | 6.97900E-01 |
| GOTLBO | Friedman | 2.33350E-04 | 8.61656E-04 | 8.61656E-04 | 8.61331E-04 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 4.17424E-01 | 1.0 | 1.0 | 8.63978E-01 |
| MABC | Friedman | 9.80244E-04 | 3.69560E-03 | 3.69560E-03 | 3.68975E-03 |
| MABC | Friedman Aligned | 1.16884E-09 | 4.31572E-09 | 4.31572E-09 | 4.31572E-09 |
| MABC | Quade | 4.17424E-01 | 1.0 | 1.0 | 8.63978E-01 |
| DE | Friedman | 5.20298E-01 | 1.0 | 1.0 | 9.33618E-01 |
| DE | Friedman Aligned | 4.19991E-01 | 1.0 | 1.0 | 8.48253E-01 |
| DE | Quade | 8.52896E-01 | 1.0 | 1.0 | 9.98686E-01 |
| **Table S21** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 5.20298E-01 | 1.0 | 1.0 | 9.33618E-01 |
| IJAYA | Friedman Aligned | 2.96026E-01 | 1.0 | 1.0 | 7.26390E-01 |
| IJAYA | Quade | 7.90937E-01 | 1.0 | 1.0 | 9.96908E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S22.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 6.27529E-02 | 6.46470E-02 | 6.46470E-02 | 6.27529E-02 |
| CWOA | Friedman Aligned | 3.90675E-11 | 1.35234E-10 | 1.35234E-10 | 1.35234E-10 |
| CWOA | Quade | 9.63252E-01 | 1.0 | 1.0 | 9.63252E-01 |
| PSO | Friedman | 1.98011E-01 | 5.05235E-01 | 5.05235E-01 | 4.03816E-01 |
| PSO | Friedman Aligned | 8.64602E-09 | 3.19237E-08 | 3.19237E-08 | 3.19237E-08 |
| PSO | Quade | 9.63252E-01 | 1.0 | 1.0 | 9.79096E-01 |
| NNA | Friedman | 1.98011E-01 | 4.00536E-01 | 4.00536E-01 | 3.34604E-01 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 9.63252E-01 | 1.0 | 1.0 | 9.92351E-01 |
| WW | Friedman | 2.51369E-01 | 8.52274E-01 | 8.52274E-01 | 5.89672E-01 |
| WW | Friedman Aligned | 3.28118E-11 | 1.00959E-10 | 1.00959E-10 | 1.00959E-10 |
| WW | Quade | 9.63252E-01 | 1.0 | 1.0 | 9.98990E-01 |
| ISCA | Friedman | 7.68325E-01 | 1.0 | 1.0 | 9.93668E-01 |
| ISCA | Friedman Aligned | 7.18181E-12 | 1.82308E-11 | 1.82308E-11 | 1.82308E-11 |
| ISCA | Quade | 9.63252E-01 | 1.0 | 1.0 | 9.99986E-01 |
| GOTLBO | Friedman | 9.17851E-01 | 1.0 | 1.0 | 9.99902E-01 |
| GOTLBO | Friedman Aligned | 1.29896E-12 | 2.39808E-12 | 2.39808E-12 | 2.39808E-12 |
| GOTLBO | Quade | 9.98660E-01 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S22** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S23.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 2.30926E-13 | 2.30926E-13 | 2.30926E-13 | 2.30926E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.85517E-02 | 9.97146E-02 | 9.97146E-02 | 9.54079E-02 |
| GOTLBO | Friedman | 1.76370E-12 | 3.25606E-12 | 3.25606E-12 | 3.25606E-12 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 5.51141E-02 | 2.06606E-01 | 2.06606E-01 | 1.88865E-01 |
| WW | Friedman | 9.56997E-12 | 2.42930E-11 | 2.42930E-11 | 2.42930E-11 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 1.42835E-02 | 4.41684E-02 | 4.41684E-02 | 4.33008E-02 |
| MABC | Friedman | 1.61944E-11 | 4.98290E-11 | 4.98290E-11 | 4.98290E-11 |
| MABC | Friedman Aligned | 6.35232E-11 | 2.19888E-10 | 2.19888E-10 | 2.19888E-10 |
| MABC | Quade | 5.51141E-02 | 2.10249E-01 | 2.10249E-01 | 1.92225E-01 |
| PSO | Friedman | 2.85766E-11 | 9.89189E-11 | 9.89189E-11 | 9.89189E-11 |
| PSO | Friedman Aligned | 9.31095E-11 | 3.43789E-10 | 3.43789E-10 | 3.43789E-10 |
| PSO | Quade | 9.23007E-03 | 1.33680E-02 | 1.33680E-02 | 1.32864E-02 |
| NNA | Friedman | 4.87447E-11 | 1.79980E-10 | 1.79980E-10 | 1.79980E-10 |
| NNA | Friedman Aligned | 1.82343E-10 | 6.87292E-10 | 6.87292E-10 | 6.87292E-10 |
| NNA | Quade | 9.23007E-03 | 2.20922E-02 | 2.20922E-02 | 2.18717E-02 |
| CWOA | Friedman | 1.08691E-09 | 4.09682E-09 | 4.09682E-09 | 4.09682E-09 |
| CWOA | Friedman Aligned | 3.22900E-11 | 9.93539E-11 | 9.93539E-11 | 9.93539E-11 |
| CWOA | Quade | 9.23007E-03 | 9.26962E-03 | 9.26962E-03 | 9.23007E-03 |
| DE | Friedman | 2.08871E-05 | 7.71220E-05 | 7.16714E-05 | 7.71195E-05 |
| DE | Friedman Aligned | 1.67354E-04 | 5.79317E-04 | 5.79317E-04 | 5.79183E-04 |
| DE | Quade | 2.48241E-01 | 8.96274E-01 | 8.96274E-01 | 6.27573E-01 |
| **Table S23** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 2.08871E-05 | 7.71220E-05 | 7.16714E-05 | 7.71195E-05 |
| IJAYA | Friedman Aligned | 5.49245E-05 | 2.02800E-04 | 2.02800E-04 | 2.02783E-04 |
| IJAYA | Quade | 2.06971E-01 | 7.97941E-01 | 7.97941E-01 | 5.75239E-01 |
| NDE | Friedman | 7.17418E-04 | 2.20762E-03 | 2.20762E-03 | 2.20580E-03 |
| NDE | Friedman Aligned | 5.71229E-03 | 1.75879E-02 | 1.75879E-02 | 1.74722E-02 |
| NDE | Quade | 3.88843E-01 | 1.0 | 1.0 | 7.80209E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S24.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 1.92232E-01 | 2.11737E-01 | 2.11737E-01 | 1.92232E-01 |
| CWOA | Friedman Aligned | 6.82306E-09 | 1.25964E-08 | 1.25964E-08 | 1.25964E-08 |
| CWOA | Quade | 9.75324E-01 | 1.0 | 1.0 | 9.75324E-01 |
| PSO | Friedman | 4.39552E-01 | 1.0 | 1.0 | 7.28974E-01 |
| PSO | Friedman Aligned | 2.73702E-07 | 6.94782E-07 | 6.94782E-07 | 6.94781E-07 |
| PSO | Quade | 9.75324E-01 | 1.0 | 1.0 | 9.86727E-01 |
| NNA | Friedman | 4.39552E-01 | 1.0 | 1.0 | 6.56634E-01 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 9.75324E-01 | 1.0 | 1.0 | 9.95625E-01 |
| WW | Friedman | 4.92980E-01 | 1.0 | 1.0 | 8.76296E-01 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.75324E-01 | 1.0 | 1.0 | 9.99544E-01 |
| ISCA | Friedman | 9.57091E-01 | 1.0 | 1.0 | 9.99982E-01 |
| ISCA | Friedman Aligned | 5.54018E-01 | 1.0 | 1.0 | 9.16636E-01 |
| ISCA | Quade | 9.75324E-01 | 1.0 | 1.0 | 9.99997E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S24** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S25.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.28896E-03 | 1.28973E-03 | 1.28973E-03 | 1.28896E-03 |
| MABC | Friedman | 1.27587E-12 | 2.35545E-12 | 2.35545E-12 | 2.35545E-12 |
| MABC | Friedman Aligned | 1.75948E-09 | 6.63187E-09 | 6.63187E-09 | 6.63187E-09 |
| MABC | Quade | 1.37262E-02 | 5.19022E-02 | 5.19022E-02 | 5.07619E-02 |
| GOTLBO | Friedman | 1.19004E-11 | 3.02087E-11 | 3.02087E-11 | 3.02087E-11 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.33923E-02 | 4.96280E-02 | 4.96280E-02 | 4.85638E-02 |
| ISCA | Friedman | 7.79167E-11 | 2.39744E-10 | 2.39744E-10 | 2.39744E-10 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 5.97483E-03 | 2.07202E-02 | 2.07202E-02 | 2.05304E-02 |
| WW | Friedman | 4.49481E-09 | 1.55589E-08 | 1.55589E-08 | 1.55589E-08 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 2.57937E-03 | 7.94361E-03 | 7.94361E-03 | 7.91528E-03 |
| PSO | Friedman | 1.06456E-08 | 3.93067E-08 | 3.93067E-08 | 3.93067E-08 |
| PSO | Friedman Aligned | 1.41434E-10 | 4.89580E-10 | 4.51671E-10 | 4.89580E-10 |
| PSO | Quade | 1.28896E-03 | 1.97444E-03 | 1.97444E-03 | 1.97266E-03 |
| NNA | Friedman | 1.46074E-08 | 5.50586E-08 | 5.50586E-08 | 5.50586E-08 |
| NNA | Friedman Aligned | 1.41434E-10 | 4.89580E-10 | 4.51671E-10 | 4.89580E-10 |
| NNA | Quade | 1.39422E-03 | 3.54107E-03 | 3.54107E-03 | 3.53537E-03 |
| IJAYA | Friedman | 1.85427E-08 | 6.84653E-08 | 6.55898E-08 | 6.84653E-08 |
| IJAYA | Friedman Aligned | 1.36159E-06 | 5.02741E-06 | 5.02741E-06 | 5.02740E-06 |
| IJAYA | Quade | 7.11225E-02 | 2.66321E-01 | 2.66321E-01 | 2.38460E-01 |
| **Table S25** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.89482E-08 | 6.84653E-08 | 6.55898E-08 | 6.84653E-08 |
| DE | Friedman Aligned | 5.16020E-06 | 1.78623E-05 | 1.78623E-05 | 1.78621E-05 |
| DE | Quade | 9.13398E-02 | 3.20806E-01 | 3.20806E-01 | 2.82197E-01 |
| NDE | Friedman | 2.01368E-06 | 6.19594E-06 | 6.19594E-06 | 6.19592E-06 |
| NDE | Friedman Aligned | 3.70876E-04 | 1.14121E-03 | 1.14121E-03 | 1.14072E-03 |
| NDE | Quade | 1.66209E-01 | 5.21958E-01 | 5.21958E-01 | 4.28391E-01 |
| TLBO | Friedman | 2.05435E-01 | 5.30463E-01 | 5.30463E-01 | 4.42194E-01 |
| TLBO | Friedman Aligned | 4.91056E-01 | 1.0 | 1.0 | 8.19950E-01 |
| TLBO | Quade | 6.72809E-01 | 1.0 | 1.0 | 9.41340E-01 |
| EBLSHADE | Friedman | 8.26822E-01 | 1.0 | 1.0 | 9.60723E-01 |
| EBLSHADE | Friedman Aligned | 7.33523E-01 | 1.0 | 1.0 | 9.12968E-01 |
| EBLSHADE | Quade | 8.85007E-01 | 1.0 | 1.0 | 9.81556E-01 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S26.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 9.99088E-01 | 1.0 | 1.0 | 9.99088E-01 |
| CWOA | Friedman Aligned | 2.64607E-10 | 2.64607E-10 | 2.64607E-10 | 2.64607E-10 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 2.86786E-07 | 5.29452E-07 | 5.29452E-07 | 5.29452E-07 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S26** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S27.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 1.04337E-06 | 1.04337E-06 | 1.04337E-06 | 1.04337E-06 |
| CWOA | Friedman Aligned | 2.99270E-10 | 9.20832E-10 | 9.20832E-10 | 9.20832E-10 |
| CWOA | Quade | 5.51537E-01 | 7.77695E-01 | 7.77695E-01 | 5.51537E-01 |
| NNA | Friedman | 1.81715E-05 | 3.35477E-05 | 3.35477E-05 | 3.35472E-05 |
| NNA | Friedman Aligned | 2.90478E-10 | 7.37368E-10 | 7.37368E-10 | 7.37368E-10 |
| NNA | Quade | 5.51537E-01 | 1.0 | 1.0 | 7.31301E-01 |
| PSO | Friedman | 2.28284E-05 | 5.79495E-05 | 5.79495E-05 | 5.79480E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 5.51537E-01 | 9.45753E-01 | 9.45753E-01 | 6.26599E-01 |
| WW | Friedman | 6.10355E-05 | 1.87806E-04 | 1.87806E-04 | 1.87790E-04 |
| WW | Friedman Aligned | 1.09380E-09 | 3.78623E-09 | 3.78623E-09 | 3.78623E-09 |
| WW | Quade | 5.51537E-01 | 1.0 | 1.0 | 8.60596E-01 |
| ISCA | Friedman | 2.12534E-03 | 7.36176E-03 | 7.36176E-03 | 7.33772E-03 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 6.03485E-01 | 1.0 | 1.0 | 9.59322E-01 |
| GOTLBO | Friedman | 6.56427E-03 | 2.42803E-02 | 2.42803E-02 | 2.40239E-02 |
| GOTLBO | Friedman Aligned | 3.19607E-09 | 1.18009E-08 | 1.18009E-08 | 1.18009E-08 |
| GOTLBO | Quade | 7.44807E-01 | 1.0 | 1.0 | 9.93544E-01 |
| MABC | Friedman | 1.94748E-02 | 7.37379E-02 | 7.37379E-02 | 7.14482E-02 |
| MABC | Friedman Aligned | 1.63074E-06 | 6.14664E-06 | 6.14664E-06 | 6.14663E-06 |
| MABC | Quade | 7.44807E-01 | 1.0 | 1.0 | 9.93544E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S27** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S28.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 4.38236E-01 | 5.64070E-01 | 5.64070E-01 | 4.38236E-01 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 9.98650E-01 | 1.0 | 1.0 | 9.98650E-01 |
| PSO | Friedman | 7.26197E-01 | 1.0 | 1.0 | 9.41422E-01 |
| PSO | Friedman Aligned | 1.22720E-04 | 3.11535E-04 | 3.11535E-04 | 3.11491E-04 |
| PSO | Quade | 9.98650E-01 | 1.0 | 1.0 | 9.99526E-01 |
| NNA | Friedman | 7.26197E-01 | 1.0 | 1.0 | 9.08499E-01 |
| NNA | Friedman Aligned | 2.86687E-09 | 5.29268E-09 | 5.29268E-09 | 5.29268E-09 |
| NNA | Quade | 9.98650E-01 | 1.0 | 1.0 | 9.99934E-01 |
| WW | Friedman | 7.54881E-01 | 1.0 | 1.0 | 9.86782E-01 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.98650E-01 | 1.0 | 1.0 | 9.99999E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S28** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S29.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 9.99864E-01 | 1.0 | 1.0 | 9.99864E-01 |
| CWOA | Friedman Aligned | 9.57403E-01 | 1.0 | 1.0 | 9.57403E-01 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S29** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S30.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S30** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S31.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *n*1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 9.85182E-01 | 1.0 | 1.0 | 9.85182E-01 |
| CWOA | Friedman Aligned | 1.67199E-08 | 3.60651E-08 | 3.60651E-08 | 3.60651E-08 |
| CWOA | Quade | 9.99991E-01 | 1.0 | 1.0 | 9.99991E-01 |
| PSO | Friedman | 9.99446E-01 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 1.67199E-08 | 3.08676E-08 | 3.08676E-08 | 3.08676E-08 |
| PSO | Quade | 9.99991E-01 | 1.0 | 1.0 | 9.99999E-01 |
| NNA | Friedman | 9.99446E-01 | 1.0 | 1.0 | 9.99999E-01 |
| NNA | Friedman Aligned | 2.58561E-09 | 2.58561E-09 | 2.58561E-09 | 2.58561E-09 |
| NNA | Quade | 9.99991E-01 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S31** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 8.96669E-01 | 1.0 | 1.0 | 9.99613E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 2.25568E-01 | 7.56404E-01 | 7.56404E-01 | 5.44583E-01 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |