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| --- | --- | --- | --- | --- | --- |
| **Table S4.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 8.61820E-02 | 8.98122E-02 | 8.98122E-02 | 8.61820E-02 |
| WW | Friedman Aligned | 2.30441E-08 | 7.09049E-08 | 7.09049E-08 | 7.09049E-08 |
| WW | Quade | 9.80292E-01 | 1.0 | 1.0 | 9.80292E-01 |
| PSO | Friedman | 2.38076E-01 | 4.91631E-01 | 4.91631E-01 | 3.94673E-01 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 9.80292E-01 | 1.0 | 1.0 | 9.80292E-01 |
| MABC | Friedman | 5.95703E-01 | 1.0 | 1.0 | 8.99625E-01 |
| MABC | Friedman Aligned | 6.53233E-12 | 1.32871E-11 | 1.32871E-11 | 1.32871E-11 |
| MABC | Quade | 9.80292E-01 | 1.0 | 1.0 | 9.99953E-01 |
| ISCA | Friedman | 8.26230E-01 | 1.0 | 1.0 | 9.95414E-01 |
| ISCA | Friedman Aligned | 3.32249E-07 | 1.15009E-06 | 1.15009E-06 | 1.15009E-06 |
| ISCA | Quade | 9.80292E-01 | 1.0 | 1.0 | 9.99970E-01 |
| GOTLBO | Friedman | 9.94739E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 6.53233E-12 | 1.20597E-11 | 1.20597E-11 | 1.20597E-11 |
| GOTLBO | Quade | 9.80292E-01 | 1.0 | 1.0 | 9.99953E-01 |
| CWOA | Friedman | 9.94739E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 6.22265E-07 | 2.29759E-06 | 2.29759E-06 | 2.29759E-06 |
| CWOA | Quade | 9.80292E-01 | 1.0 | 1.0 | 9.99970E-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 |
| **Table S4** (*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 |
| 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 | 9.97117E-01 | 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S5.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 6.00409E-13 | 1.59650E-12 | 1.59650E-12 | 1.59650E-12 |
| DE | Friedman Aligned | 2.11188E-08 | 7.96017E-08 | 7.96017E-08 | 7.96017E-08 |
| DE | Quade | 4.39270E-02 | 1.66115E-01 | 1.30659E-01 | 1.54746E-01 |
| GOTLBO | Friedman | 6.00409E-13 | 6.00409E-13 | 6.00409E-13 | 6.00409E-13 |
| GOTLBO | Friedman Aligned | 1.14652E-08 | 3.96874E-08 | 3.70043E-08 | 3.96874E-08 |
| GOTLBO | Quade | 2.64966E-02 | 6.79570E-02 | 6.52926E-02 | 6.58962E-02 |
| ISCA | Friedman | 6.00409E-13 | 1.41664E-12 | 1.41664E-12 | 1.41664E-12 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.64966E-02 | 8.49735E-02 | 8.49735E-02 | 8.18808E-02 |
| CWOA | Friedman | 6.00409E-13 | 7.88702E-13 | 7.88702E-13 | 7.88702E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 2.64966E-02 | 8.09879E-02 | 8.09879E-02 | 7.81332E-02 |
| NDE | Friedman | 1.19158E-12 | 4.12470E-12 | 4.12470E-12 | 4.12470E-12 |
| NDE | Friedman Aligned | 1.71258E-03 | 5.27053E-03 | 5.27053E-03 | 5.26012E-03 |
| NDE | Quade | 4.39270E-02 | 1.66115E-01 | 1.30659E-01 | 1.54746E-01 |
| IJAYA | Friedman | 3.31860E-12 | 1.22533E-11 | 1.22533E-11 | 1.22533E-11 |
| IJAYA | Friedman Aligned | 1.17856E-07 | 4.07961E-07 | 4.07961E-07 | 4.07961E-07 |
| IJAYA | Quade | 4.36225E-02 | 1.66115E-01 | 1.30659E-01 | 1.54746E-01 |
| MABC | Friedman | 6.32573E-12 | 2.38431E-11 | 2.38431E-11 | 2.38431E-11 |
| MABC | Friedman Aligned | 1.14652E-08 | 3.96874E-08 | 3.70043E-08 | 3.96874E-08 |
| MABC | Quade | 2.64966E-02 | 6.79570E-02 | 6.52926E-02 | 6.58962E-02 |
| NNA | Friedman | 2.20572E-10 | 8.14419E-10 | 8.08514E-10 | 8.14419E-10 |
| NNA | Friedman Aligned | 3.72214E-08 | 1.37433E-07 | 1.37433E-07 | 1.37433E-07 |
| NNA | Quade | 4.39270E-02 | 1.66115E-01 | 1.30659E-01 | 1.54746E-01 |
| **Table S5** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 2.33571E-10 | 8.14419E-10 | 8.08514E-10 | 8.14419E-10 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.11341E-02 | 1.17606E-02 | 1.17606E-02 | 1.16974E-02 |
| WW | Friedman | 3.41671E-09 | 1.05129E-08 | 1.05129E-08 | 1.05129E-08 |
| WW | Friedman Aligned | 3.32036E-11 | 1.02165E-10 | 1.02165E-10 | 1.02165E-10 |
| WW | Quade | 1.11341E-02 | 1.11918E-02 | 1.11918E-02 | 1.11341E-02 |
| TLBO | Friedman | 1.30872E-01 | 3.35738E-01 | 3.35738E-01 | 2.99567E-01 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 6.24383E-01 | 1.0 | 1.0 | 9.16727E-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 S6.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Friedman Aligned | 4.81753E-11 | 1.66761E-10 | 1.66761E-10 | 1.66761E-10 |
| WW | Quade | 3.13831E-03 | 3.14287E-03 | 3.14287E-03 | 3.13831E-03 |
| DE | Friedman | <1E-13 | 2.10054E-13 | 2.10054E-13 | 2.10054E-13 |
| DE | Friedman Aligned | 3.56117E-11 | 1.09575E-10 | 1.09575E-10 | 1.09575E-10 |
| DE | Quade | 1.76412E-02 | 6.53596E-02 | 5.33566E-02 | 6.36053E-02 |
| NDE | Friedman | <1E-13 | 1.54543E-13 | 1.54543E-13 | 1.54543E-13 |
| NDE | Friedman Aligned | 2.17264E-05 | 6.68505E-05 | 6.68505E-05 | 6.68488E-05 |
| NDE | Quade | 1.76412E-02 | 6.53596E-02 | 5.33566E-02 | 6.36053E-02 |
| IJAYA | Friedman | <1E-13 | 3.04201E-13 | 3.04201E-13 | 3.04201E-13 |
| IJAYA | Friedman Aligned | 2.12767E-10 | 8.01968E-10 | 8.01968E-10 | 8.01968E-10 |
| IJAYA | Quade | 1.72505E-02 | 6.52823E-02 | 5.33566E-02 | 6.34840E-02 |
| CWOA | Friedman | 1.09690E-13 | 3.79696E-13 | 3.79696E-13 | 3.79696E-13 |
| CWOA | Friedman Aligned | 1.10735E-09 | 4.08867E-09 | 4.08867E-09 | 4.08867E-09 |
| CWOA | Quade | 9.04167E-03 | 2.85526E-02 | 2.85526E-02 | 2.81930E-02 |
| GOTLBO | Friedman | 1.28934E-13 | 4.76064E-13 | 4.76064E-13 | 4.76064E-13 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 9.04167E-03 | 2.30322E-02 | 2.22560E-02 | 2.27926E-02 |
| NNA | Friedman | 6.62388E-12 | 2.49669E-11 | 2.49669E-11 | 2.49669E-11 |
| NNA | Friedman Aligned | 5.41195E-11 | 1.99826E-10 | 1.99826E-10 | 1.99826E-10 |
| NNA | Quade | 1.76412E-02 | 6.53596E-02 | 5.33566E-02 | 6.36053E-02 |
| ISCA | Friedman | 6.84661E-12 | 2.52798E-11 | 2.52798E-11 | 2.52798E-11 |
| ISCA | Friedman Aligned | 1.38616E-09 | 4.79825E-09 | 4.79825E-09 | 4.79825E-09 |
| ISCA | Quade | 9.04167E-03 | 3.04966E-02 | 3.04966E-02 | 3.00928E-02 |
| **Table S6** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| MABC | Friedman | 9.26368E-11 | 3.20666E-10 | 3.20666E-10 | 3.20666E-10 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 9.04167E-03 | 2.30322E-02 | 2.22560E-02 | 2.27926E-02 |
| PSO | Friedman | 2.14340E-09 | 6.59507E-09 | 6.59507E-09 | 6.59507E-09 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 3.13831E-03 | 3.34101E-03 | 3.34101E-03 | 3.33590E-03 |
| TLBO | Friedman | 3.93259E-02 | 1.00134E-01 | 1.00134E-01 | 9.68289E-02 |
| TLBO | Friedman Aligned | 8.39430E-01 | 1.0 | 1.0 | 9.65839E-01 |
| TLBO | Quade | 4.09330E-01 | 1.0 | 8.45736E-01 | 7.37234E-01 |
| EBLSHADE | Friedman | 6.20041E-01 | 1.0 | 8.01816E-01 | 8.32456E-01 |
| EBLSHADE | Friedman Aligned | 3.15644E-01 | 8.23571E-01 | 8.23571E-01 | 6.18170E-01 |
| EBLSHADE | Quade | 7.62820E-01 | 1.0 | 8.45736E-01 | 9.29806E-01 |
| STLBO | Friedman | 8.01816E-01 | 1.0 | 8.01816E-01 | 8.32456E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 8.45736E-01 | 1.0 | 8.45736E-01 | 9.29806E-01 |

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| **Table S7.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 5.62824E-02 | 5.77994E-02 | 5.77994E-02 | 5.62824E-02 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 9.79432E-01 | 1.0 | 1.0 | 9.79432E-01 |
| PSO | Friedman | 1.72572E-01 | 3.44675E-01 | 3.44675E-01 | 2.95116E-01 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 9.79432E-01 | 1.0 | 1.0 | 9.79432E-01 |
| MABC | Friedman | 4.92255E-01 | 1.0 | 1.0 | 8.21025E-01 |
| MABC | Friedman Aligned | 9.56302E-10 | 3.31028E-09 | 3.29539E-09 | 3.31028E-09 |
| MABC | Quade | 9.79432E-01 | 1.0 | 1.0 | 9.99948E-01 |
| ISCA | Friedman | 7.39566E-01 | 1.0 | 1.0 | 9.84073E-01 |
| ISCA | Friedman Aligned | <1E-13 | 1.46549E-13 | 1.46549E-13 | 1.46549E-13 |
| ISCA | Quade | 9.79432E-01 | 1.0 | 1.0 | 9.99966E-01 |
| GOTLBO | Friedman | 9.74456E-01 | 1.0 | 1.0 | 9.99997E-01 |
| GOTLBO | Friedman Aligned | 9.56302E-10 | 3.31028E-09 | 3.29539E-09 | 3.31028E-09 |
| GOTLBO | Quade | 9.79432E-01 | 1.0 | 1.0 | 9.99948E-01 |
| CWOA | Friedman | 9.74456E-01 | 1.0 | 1.0 | 9.99997E-01 |
| CWOA | Friedman Aligned | <1E-13 | 2.86438E-13 | 2.86438E-13 | 2.86438E-13 |
| CWOA | Quade | 9.79432E-01 | 1.0 | 1.0 | 9.99966E-01 |
| DE | Friedman | 9.82263E-01 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 2.28343E-02 | 8.65263E-02 | 8.65263E-02 | 8.33830E-02 |
| DE | Quade | 9.99841E-01 | 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 S7** (*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 |
| 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 | 4.50905E-02 | 1.57187E-01 | 1.57187E-01 | 1.47610E-01 |
| IJAYA | Quade | 9.96518E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 2.79302E-02 | 1.03688E-01 | 1.03688E-01 | 9.93104E-02 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S8.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 9.04976E-01 | 1.0 | 1.0 | 9.04976E-01 |
| WW | Friedman Aligned | 3.09282E-08 | 3.09282E-08 | 3.09282E-08 | 3.09282E-08 |
| WW | Quade | 9.99971E-01 | 1.0 | 1.0 | 9.99971E-01 |
| PSO | Friedman | 9.83045E-01 | 1.0 | 1.0 | 9.99462E-01 |
| PSO | Friedman Aligned | 1.62361E-04 | 2.99763E-04 | 2.99763E-04 | 2.99722E-04 |
| PSO | Quade | 9.99971E-01 | 1.0 | 1.0 | 9.99971E-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 |
| 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 S8** (*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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S9.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.73195E-13 | 1.73195E-13 | 1.73195E-13 | 1.73195E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 7.37772E-02 | 7.87500E-02 | 7.87500E-02 | 7.59689E-02 |
| MABC | Friedman | 6.30140E-12 | 1.30429E-11 | 1.30429E-11 | 1.30429E-11 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 1.26592E-01 | 3.38277E-01 | 3.21918E-01 | 2.90779E-01 |
| WW | Friedman | 6.30140E-12 | 1.16334E-11 | 1.16334E-11 | 1.16334E-11 |
| WW | Friedman Aligned | 5.34616E-11 | 1.64497E-10 | 1.64497E-10 | 1.64497E-10 |
| WW | Quade | 7.37772E-02 | 7.64150E-02 | 7.64150E-02 | 7.37772E-02 |
| ISCA | Friedman | 1.24759E-10 | 3.83875E-10 | 3.83875E-10 | 3.83875E-10 |
| ISCA | Friedman Aligned | 8.36943E-10 | 3.09025E-09 | 2.80188E-09 | 3.09025E-09 |
| ISCA | Quade | 1.26592E-01 | 3.84352E-01 | 3.84352E-01 | 3.25573E-01 |
| GOTLBO | Friedman | 6.17865E-09 | 2.13876E-08 | 2.13876E-08 | 2.13876E-08 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.26592E-01 | 3.38277E-01 | 3.21918E-01 | 2.90779E-01 |
| CWOA | Friedman | 6.88175E-09 | 2.54096E-08 | 2.54096E-08 | 2.54096E-08 |
| CWOA | Friedman Aligned | 7.23793E-10 | 2.72814E-09 | 2.72814E-09 | 2.72814E-09 |
| CWOA | Quade | 1.26592E-01 | 3.77401E-01 | 3.77401E-01 | 3.19919E-01 |
| DE | Friedman | 1.20683E-08 | 4.54881E-08 | 4.54881E-08 | 4.54881E-08 |
| DE | Friedman Aligned | 1.38245E-10 | 4.78541E-10 | 4.78541E-10 | 4.78541E-10 |
| DE | Quade | 1.64554E-01 | 6.45899E-01 | 4.76691E-01 | 4.92200E-01 |
| NDE | Friedman | 2.44925E-08 | 9.04338E-08 | 9.04338E-08 | 9.04338E-08 |
| NDE | Friedman Aligned | 6.08400E-05 | 1.87201E-04 | 1.87201E-04 | 1.87188E-04 |
| NDE | Quade | 1.64554E-01 | 6.45899E-01 | 4.76691E-01 | 4.92200E-01 |
| **Table S9** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 5.66935E-08 | 1.96247E-07 | 1.96247E-07 | 1.96247E-07 |
| IJAYA | Friedman Aligned | 8.36943E-10 | 3.09025E-09 | 2.80188E-09 | 3.09025E-09 |
| IJAYA | Quade | 1.64554E-01 | 6.45899E-01 | 4.76691E-01 | 4.92200E-01 |
| NNA | Friedman | 1.68226E-06 | 5.17618E-06 | 5.17618E-06 | 5.17617E-06 |
| NNA | Friedman Aligned | 2.55778E-10 | 9.44411E-10 | 9.44411E-10 | 9.44411E-10 |
| NNA | Quade | 1.64554E-01 | 6.45899E-01 | 4.76691E-01 | 4.92200E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 4.42830E-01 | 1.0 | 1.0 | 7.73432E-01 |
| 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 S10.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.37121E-01 | 1.46648E-01 | 1.46648E-01 | 1.37121E-01 |
| WW | Friedman Aligned | 3.61499E-08 | 3.61499E-08 | 3.61499E-08 | 3.61499E-08 |
| WW | Quade | 9.99959E-01 | 1.0 | 1.0 | 9.99959E-01 |
| PSO | Friedman | 3.33849E-01 | 7.27025E-01 | 7.27025E-01 | 5.27624E-01 |
| PSO | Friedman Aligned | 1.81858E-04 | 3.35764E-04 | 3.35764E-04 | 3.35712E-04 |
| PSO | Quade | 9.99959E-01 | 1.0 | 1.0 | 9.99959E-01 |
| MABC | Friedman | 7.14527E-01 | 1.0 | 1.0 | 9.58507E-01 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.07106E-01 | 1.0 | 1.0 | 9.99332E-01 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | 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 |
| **Table S10** (*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 |
| 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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S11.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.67422E-13 | 2.22267E-13 | 2.22267E-13 | 2.22267E-13 |
| DE | Friedman Aligned | 3.49457E-11 | 1.07525E-10 | 1.07525E-10 | 1.07525E-10 |
| DE | Quade | 3.02027E-02 | 1.13113E-01 | 9.04256E-02 | 1.07775E-01 |
| GOTLBO | Friedman | 1.67422E-13 | 1.67422E-13 | 1.59872E-13 | 1.67422E-13 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.70097E-02 | 4.34638E-02 | 4.18609E-02 | 4.26152E-02 |
| CWOA | Friedman | 1.67422E-13 | 1.67422E-13 | 1.59872E-13 | 1.67422E-13 |
| CWOA | Friedman Aligned | 1.11444E-09 | 4.11484E-09 | 4.11484E-09 | 4.11484E-09 |
| CWOA | Quade | 1.70097E-02 | 5.26703E-02 | 5.26703E-02 | 5.14540E-02 |
| NDE | Friedman | 1.78968E-13 | 5.50671E-13 | 5.50671E-13 | 5.50671E-13 |
| NDE | Friedman Aligned | 2.14581E-05 | 6.60250E-05 | 6.60250E-05 | 6.60233E-05 |
| NDE | Quade | 3.02027E-02 | 1.13113E-01 | 9.04256E-02 | 1.07775E-01 |
| IJAYA | Friedman | 4.96492E-13 | 1.71863E-12 | 1.71863E-12 | 1.71863E-12 |
| IJAYA | Friedman Aligned | 2.08974E-10 | 7.87669E-10 | 7.87669E-10 | 7.87669E-10 |
| IJAYA | Quade | 2.98017E-02 | 1.13113E-01 | 9.04256E-02 | 1.07775E-01 |
| ISCA | Friedman | 1.94555E-12 | 7.18359E-12 | 7.18359E-12 | 7.18359E-12 |
| ISCA | Friedman Aligned | 1.39470E-09 | 4.82782E-09 | 4.82782E-09 | 4.82782E-09 |
| ISCA | Quade | 1.70097E-02 | 5.56810E-02 | 5.56810E-02 | 5.43433E-02 |
| MABC | Friedman | 3.23165E-11 | 1.21808E-10 | 1.20929E-10 | 1.21808E-10 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 1.70097E-02 | 4.34638E-02 | 4.18609E-02 | 4.26152E-02 |
| NNA | Friedman | 3.27515E-11 | 1.21808E-10 | 1.20929E-10 | 1.21808E-10 |
| NNA | Friedman Aligned | 5.31237E-11 | 1.96149E-10 | 1.96149E-10 | 1.96149E-10 |
| NNA | Quade | 3.02027E-02 | 1.13113E-01 | 9.04256E-02 | 1.07775E-01 |
| **Table S11** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 8.45375E-10 | 2.92630E-09 | 2.92630E-09 | 2.92630E-09 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.58951E-03 | 6.97972E-03 | 6.97972E-03 | 6.95743E-03 |
| WW | Friedman | 9.80423E-09 | 3.01669E-08 | 3.01669E-08 | 3.01669E-08 |
| WW | Friedman Aligned | 4.82405E-11 | 1.66986E-10 | 1.66986E-10 | 1.66986E-10 |
| WW | Quade | 6.58951E-03 | 6.60964E-03 | 6.60964E-03 | 6.58951E-03 |
| TLBO | Friedman | 7.11999E-02 | 1.81756E-01 | 1.81756E-01 | 1.70967E-01 |
| TLBO | Friedman Aligned | 8.37421E-01 | 1.0 | 9.97806E-01 | 9.65045E-01 |
| TLBO | Quade | 5.28241E-01 | 1.0 | 1.0 | 8.51492E-01 |
| EBLSHADE | Friedman | 8.00557E-01 | 1.0 | 1.0 | 9.49025E-01 |
| EBLSHADE | Friedman Aligned | 3.14299E-01 | 8.19952E-01 | 8.19952E-01 | 6.16263E-01 |
| EBLSHADE | Quade | 9.04532E-01 | 1.0 | 1.0 | 9.86919E-01 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 9.97806E-01 | 1.0 | 9.97806E-01 | 9.97806E-01 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S12.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 9.99908E-01 | 1.0 | 1.0 | 9.99908E-01 |
| WW | Friedman Aligned | 6.53248E-01 | 1.0 | 1.0 | 6.53248E-01 |
| WW | 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 S12** (*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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S13.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 3.32214E-02 | 3.37419E-02 | 3.37419E-02 | 3.32214E-02 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 9.87045E-01 | 1.0 | 1.0 | 9.87045E-01 |
| PSO | Friedman | 1.14549E-01 | 2.22512E-01 | 2.22512E-01 | 2.01165E-01 |
| PSO | Friedman Aligned | 1.21060E-09 | 3.72493E-09 | 3.72493E-09 | 3.72493E-09 |
| PSO | Quade | 9.87045E-01 | 1.0 | 1.0 | 9.87045E-01 |
| MABC | Friedman | 3.78814E-01 | 1.0 | 1.0 | 7.01392E-01 |
| MABC | Friedman Aligned | 5.00822E-13 | 1.02585E-12 | 1.02585E-12 | 1.02585E-12 |
| MABC | Quade | 9.87097E-01 | 1.0 | 1.0 | 9.99984E-01 |
| ISCA | Friedman | 6.26168E-01 | 1.0 | 1.0 | 9.51565E-01 |
| ISCA | Friedman Aligned | 4.74790E-08 | 1.64351E-07 | 1.64351E-07 | 1.64351E-07 |
| ISCA | Quade | 9.87097E-01 | 1.0 | 1.0 | 9.99992E-01 |
| GOTLBO | Friedman | 9.25970E-01 | 1.0 | 1.0 | 9.99878E-01 |
| GOTLBO | Friedman Aligned | 5.00822E-13 | 9.24594E-13 | 9.24594E-13 | 9.24594E-13 |
| GOTLBO | Quade | 9.87097E-01 | 1.0 | 1.0 | 9.99984E-01 |
| CWOA | Friedman | 9.25970E-01 | 1.0 | 1.0 | 9.99878E-01 |
| CWOA | Friedman Aligned | 9.31630E-08 | 3.43987E-07 | 3.43987E-07 | 3.43987E-07 |
| CWOA | Quade | 9.87097E-01 | 1.0 | 1.0 | 9.99991E-01 |
| DE | Friedman | 9.27163E-01 | 1.0 | 1.0 | 9.99948E-01 |
| DE | Friedman Aligned | 9.09797E-01 | 1.0 | 1.0 | 9.99885E-01 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 9.62357E-01 | 1.0 | 1.0 | 9.99994E-01 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S13** (*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 |
| 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 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 9.37660E-01 | 1.0 | 1.0 | 9.99965E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S14.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 5.46183E-01 | 7.66533E-01 | 7.66533E-01 | 5.46183E-01 |
| WW | Friedman Aligned | 1.67422E-13 | 1.67422E-13 | 1.67422E-13 | 1.67422E-13 |
| WW | Quade | 9.99427E-01 | 1.0 | 1.0 | 9.99427E-01 |
| PSO | Friedman | 7.98259E-01 | 1.0 | 1.0 | 9.47935E-01 |
| PSO | Friedman Aligned | 9.59407E-09 | 1.77121E-08 | 1.77121E-08 | 1.77121E-08 |
| PSO | Quade | 9.99427E-01 | 1.0 | 1.0 | 9.99427E-01 |
| MABC | Friedman | 9.84137E-01 | 1.0 | 1.0 | 9.99973E-01 |
| MABC | Friedman Aligned | 2.43064E-01 | 6.84667E-01 | 6.59303E-01 | 5.06830E-01 |
| MABC | Quade | 9.99765E-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 |
| 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 S14** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 2.43064E-01 | 6.84667E-01 | 6.59303E-01 | 5.06830E-01 |
| GOTLBO | Quade | 9.99765E-01 | 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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 9.99765E-01 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S15.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 3.15655E-03 | 3.16116E-03 | 3.16116E-03 | 3.15655E-03 |
| WW | Friedman Aligned | 2.84215E-08 | 8.74507E-08 | 8.74507E-08 | 8.74507E-08 |
| WW | Quade | 9.67443E-01 | 1.0 | 1.0 | 9.67443E-01 |
| PSO | Friedman | 1.67510E-02 | 3.11464E-02 | 3.11464E-02 | 3.07056E-02 |
| PSO | Friedman Aligned | 9.00108E-10 | 2.28489E-09 | 2.28489E-09 | 2.28489E-09 |
| PSO | Quade | 9.67443E-01 | 1.0 | 1.0 | 9.67443E-01 |
| MABC | Friedman | 9.36544E-02 | 2.46808E-01 | 2.46808E-01 | 2.20902E-01 |
| MABC | Friedman Aligned | 5.44120E-12 | 6.05649E-12 | 6.05649E-12 | 6.05649E-12 |
| MABC | Quade | 9.67711E-01 | 1.0 | 1.0 | 9.99836E-01 |
| ISCA | Friedman | 2.23633E-01 | 7.49303E-01 | 7.49303E-01 | 5.41072E-01 |
| ISCA | Friedman Aligned | 1.70405E-07 | 5.89862E-07 | 5.89862E-07 | 5.89862E-07 |
| ISCA | Quade | 9.67711E-01 | 1.0 | 1.0 | 9.99883E-01 |
| DE | Friedman | 5.36748E-01 | 1.0 | 1.0 | 9.41253E-01 |
| DE | Friedman Aligned | 9.87042E-01 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 9.90483E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 5.36748E-01 | 1.0 | 1.0 | 9.30303E-01 |
| GOTLBO | Friedman Aligned | 5.44120E-12 | 5.44120E-12 | 5.44120E-12 | 5.44120E-12 |
| GOTLBO | Quade | 9.67711E-01 | 1.0 | 1.0 | 9.99836E-01 |
| CWOA | Friedman | 5.36748E-01 | 1.0 | 1.0 | 9.30303E-01 |
| CWOA | Friedman Aligned | 3.24827E-07 | 1.19936E-06 | 1.19936E-06 | 1.19936E-06 |
| CWOA | Quade | 9.67711E-01 | 1.0 | 1.0 | 9.99883E-01 |
| NDE | Friedman | 5.75197E-01 | 1.0 | 1.0 | 9.57621E-01 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 9.90483E-01 | 1.0 | 1.0 | 1.0 |
| **Table S15** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 6.44122E-01 | 1.0 | 1.0 | 9.72022E-01 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 9.86183E-01 | 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 |
| 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 S16.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *I*01 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.20537E-01 | 1.27812E-01 | 1.27812E-01 | 1.20537E-01 |
| WW | Friedman Aligned | 2.91545E-13 | 2.91545E-13 | 2.91545E-13 | 2.91545E-13 |
| WW | Quade | 9.99748E-01 | 1.0 | 1.0 | 9.99748E-01 |
| PSO | Friedman | 3.04410E-01 | 6.51777E-01 | 6.51777E-01 | 4.88366E-01 |
| PSO | Friedman Aligned | 3.75852E-09 | 6.93880E-09 | 6.93880E-09 | 6.93880E-09 |
| PSO | Quade | 9.99748E-01 | 1.0 | 1.0 | 9.99748E-01 |
| MABC | Friedman | 6.81406E-01 | 1.0 | 1.0 | 9.45174E-01 |
| MABC | Friedman Aligned | 1.76838E-01 | 4.83063E-01 | 4.66752E-01 | 3.89813E-01 |
| MABC | Quade | 9.99953E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 8.86583E-01 | 1.0 | 1.0 | 9.98766E-01 |
| ISCA | Friedman Aligned | 9.96008E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 9.99795E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 1.76838E-01 | 4.83063E-01 | 4.66752E-01 | 3.89813E-01 |
| GOTLBO | Quade | 9.99953E-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 |
| **Table S16** (*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 |
| 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 |
| 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 |

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| **Table S17.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *I*01 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 S17** (*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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S32.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 1.58394E-05 | 1.58395E-05 | 1.58395E-05 | 1.58394E-05 |
| GOTLBO | Friedman Aligned | 1.10556E-12 | 2.04103E-12 | 2.04103E-12 | 2.04103E-12 |
| GOTLBO | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.22069E-01 |
| PSO | Friedman | 2.04155E-05 | 3.76906E-05 | 3.76906E-05 | 3.76899E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.53381E-01 | 1.0 | 1.0 | 6.53381E-01 |
| ISCA | Friedman | 4.72466E-05 | 1.19936E-04 | 1.19936E-04 | 1.19929E-04 |
| ISCA | Friedman Aligned | 1.10556E-12 | 2.72826E-12 | 2.72826E-12 | 2.72826E-12 |
| ISCA | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.12615E-01 |
| NNA | Friedman | 4.72466E-05 | 1.35747E-04 | 1.35747E-04 | 1.35739E-04 |
| NNA | Friedman Aligned | 1.10556E-12 | 2.75335E-12 | 2.75335E-12 | 2.75335E-12 |
| NNA | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.22069E-01 |
| CWOA | Friedman | 6.04602E-05 | 2.09289E-04 | 2.09289E-04 | 2.09270E-04 |
| CWOA | Friedman Aligned | 6.56553E-10 | 2.27268E-09 | 2.27268E-09 | 2.27268E-09 |
| CWOA | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.63921E-01 |
| WW | Friedman | 2.94224E-03 | 1.08723E-02 | 1.08723E-02 | 1.08207E-02 |
| WW | Friedman Aligned | 1.94472E-05 | 7.18054E-05 | 7.18054E-05 | 7.18031E-05 |
| WW | Quade | 6.53381E-01 | 1.0 | 1.0 | 9.31924E-01 |
| MABC | Friedman | 2.85543E-01 | 1.0 | 1.0 | 7.18420E-01 |
| MABC | Friedman Aligned | 5.68648E-01 | 1.0 | 1.0 | 9.57966E-01 |
| MABC | Quade | 7.47708E-01 | 1.0 | 1.0 | 9.94433E-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 |
| **Table S32** (*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 | 9.98751E-01 | 1.0 | 1.0 | 1.0 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S33.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 1.40443E-09 | 4.32133E-09 | 4.32133E-09 | 4.32133E-09 |
| GOTLBO | Quade | 2.61275E-03 | 4.15154E-03 | 3.95252E-03 | 4.14372E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 2.61275E-03 | 2.61590E-03 | 2.61590E-03 | 2.61275E-03 |
| MABC | Friedman | 1.66844E-12 | 4.23528E-12 | 4.23528E-12 | 4.23528E-12 |
| MABC | Friedman Aligned | 1.97530E-05 | 7.44541E-05 | 7.44541E-05 | 7.44517E-05 |
| MABC | Quade | 1.75248E-02 | 6.63245E-02 | 6.63245E-02 | 6.44687E-02 |
| WW | Friedman | 9.41487E-11 | 2.89688E-10 | 2.89688E-10 | 2.89688E-10 |
| WW | Friedman Aligned | <1E-13 | 2.10054E-13 | 2.10054E-13 | 2.10054E-13 |
| WW | Quade | 5.37659E-03 | 1.98809E-02 | 1.98809E-02 | 1.97088E-02 |
| CWOA | Friedman | 7.48653E-09 | 2.59149E-08 | 2.59149E-08 | 2.59149E-08 |
| CWOA | Friedman Aligned | 1.94632E-09 | 7.18643E-09 | 7.18643E-09 | 7.18643E-09 |
| CWOA | Quade | 2.61275E-03 | 6.00747E-03 | 6.00747E-03 | 5.99146E-03 |
| DE | Friedman | 8.54237E-09 | 3.15410E-08 | 3.15118E-08 | 3.15410E-08 |
| DE | Friedman Aligned | 7.66528E-04 | 2.83067E-03 | 2.83067E-03 | 2.82734E-03 |
| DE | Quade | 7.68637E-02 | 2.88156E-01 | 2.51938E-01 | 2.55695E-01 |
| NNA | Friedman | 8.54237E-09 | 3.15410E-08 | 3.15118E-08 | 3.15410E-08 |
| NNA | Friedman Aligned | 1.40443E-09 | 4.60157E-09 | 4.60157E-09 | 4.60157E-09 |
| NNA | Quade | 2.61275E-03 | 4.15154E-03 | 3.95252E-03 | 4.14372E-03 |
| ISCA | Friedman | 8.70900E-09 | 3.21563E-08 | 3.21563E-08 | 3.21563E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.61275E-03 | 3.70459E-03 | 3.70459E-03 | 3.69830E-03 |
| **Table S33** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.00756E-08 | 3.48770E-08 | 3.48770E-08 | 3.48770E-08 |
| IJAYA | Friedman Aligned | 1.77340E-03 | 6.14036E-03 | 6.14036E-03 | 6.12529E-03 |
| IJAYA | Quade | 7.68637E-02 | 2.88156E-01 | 2.51938E-01 | 2.55695E-01 |
| NDE | Friedman | 4.85736E-06 | 1.49457E-05 | 1.49457E-05 | 1.49457E-05 |
| NDE | Friedman Aligned | 6.70249E-02 | 2.07871E-01 | 2.07871E-01 | 1.92221E-01 |
| NDE | Quade | 1.61095E-01 | 5.05559E-01 | 5.05559E-01 | 4.17534E-01 |
| TLBO | Friedman | 2.01098E-01 | 5.19063E-01 | 5.19063E-01 | 4.34434E-01 |
| TLBO | Friedman Aligned | 7.84943E-01 | 1.0 | 1.0 | 9.79783E-01 |
| TLBO | Quade | 7.20831E-01 | 1.0 | 1.0 | 9.60794E-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 S34.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 2.23361E-09 | 6.87266E-09 | 6.87266E-09 | 6.87266E-09 |
| GOTLBO | Quade | 2.57827E-03 | 4.09880E-03 | 3.90245E-03 | 4.09117E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 2.57827E-03 | 2.58134E-03 | 2.58134E-03 | 2.57827E-03 |
| MABC | Friedman | 6.35048E-13 | 1.61204E-12 | 1.61204E-12 | 1.61204E-12 |
| MABC | Friedman Aligned | 7.88131E-06 | 2.97065E-05 | 2.97065E-05 | 2.97062E-05 |
| MABC | Quade | 1.73550E-02 | 6.56791E-02 | 6.56791E-02 | 6.38590E-02 |
| WW | Friedman | 1.84926E-10 | 5.69003E-10 | 5.69003E-10 | 5.69003E-10 |
| WW | Friedman Aligned | 3.15599E-13 | 8.01137E-13 | 8.01137E-13 | 8.01137E-13 |
| WW | Quade | 5.31725E-03 | 1.96611E-02 | 1.96611E-02 | 1.94928E-02 |
| DE | Friedman | 4.61292E-09 | 1.59678E-08 | 1.59678E-08 | 1.59678E-08 |
| DE | Friedman Aligned | 3.62181E-04 | 1.33738E-03 | 1.33738E-03 | 1.33663E-03 |
| DE | Quade | 7.62673E-02 | 2.85885E-01 | 2.49968E-01 | 2.53918E-01 |
| IJAYA | Friedman | 6.88175E-09 | 2.54096E-08 | 2.54096E-08 | 2.54096E-08 |
| IJAYA | Friedman Aligned | 8.79672E-04 | 3.04543E-03 | 3.04543E-03 | 3.04172E-03 |
| IJAYA | Quade | 7.62673E-02 | 2.85885E-01 | 2.49968E-01 | 2.53918E-01 |
| CWOA | Friedman | 8.73483E-09 | 3.29236E-08 | 3.29236E-08 | 3.29236E-08 |
| CWOA | Friedman Aligned | 4.27917E-09 | 1.58000E-08 | 1.58000E-08 | 1.58000E-08 |
| CWOA | Quade | 2.57827E-03 | 5.93402E-03 | 5.93402E-03 | 5.91840E-03 |
| NNA | Friedman | 1.17491E-08 | 4.33811E-08 | 4.27586E-08 | 4.33811E-08 |
| NNA | Friedman Aligned | 2.23361E-09 | 7.25937E-09 | 7.25937E-09 | 7.25937E-09 |
| NNA | Quade | 2.57827E-03 | 4.09880E-03 | 3.90245E-03 | 4.09117E-03 |
| **Table S34** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 1.23525E-08 | 4.33811E-08 | 4.27586E-08 | 4.33811E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.57827E-03 | 3.65691E-03 | 3.65691E-03 | 3.65079E-03 |
| NDE | Friedman | 2.55436E-06 | 7.85957E-06 | 7.85957E-06 | 7.85955E-06 |
| NDE | Friedman Aligned | 4.19953E-02 | 1.29854E-01 | 1.29854E-01 | 1.23666E-01 |
| NDE | Quade | 1.60056E-01 | 5.02233E-01 | 5.02233E-01 | 4.15313E-01 |
| TLBO | Friedman | 1.57702E-01 | 4.05499E-01 | 4.05499E-01 | 3.53159E-01 |
| TLBO | Friedman Aligned | 6.48054E-01 | 1.0 | 1.0 | 9.29409E-01 |
| TLBO | Quade | 7.18467E-01 | 1.0 | 1.0 | 9.59945E-01 |
| EBLSHADE | Friedman | 9.13338E-01 | 1.0 | 9.23824E-01 | 9.89059E-01 |
| EBLSHADE | Friedman Aligned | 8.67482E-01 | 1.0 | 1.0 | 9.76034E-01 |
| EBLSHADE | Quade | 9.98363E-01 | 1.0 | 1.0 | 9.99993E-01 |
| STLBO | Friedman | 9.23824E-01 | 1.0 | 9.23824E-01 | 9.89059E-01 |
| 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 S35.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 1.27739E-08 | 1.27739E-08 | 1.27739E-08 | 1.27739E-08 |
| GOTLBO | Friedman Aligned | 2.60296E-09 | 8.00911E-09 | 8.00911E-09 | 8.00911E-09 |
| GOTLBO | Quade | 3.14219E-01 | 4.69400E-01 | 4.39320E-01 | 3.81037E-01 |
| PSO | Friedman | 2.06453E-08 | 3.81143E-08 | 3.81143E-08 | 3.81143E-08 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 3.14219E-01 | 3.71777E-01 | 3.71777E-01 | 3.14219E-01 |
| ISCA | Friedman | 6.53133E-08 | 1.65795E-07 | 1.65795E-07 | 1.65795E-07 |
| ISCA | Friedman Aligned | 4.15456E-11 | 1.05462E-10 | 1.05462E-10 | 1.05462E-10 |
| ISCA | Quade | 3.14219E-01 | 4.50989E-01 | 4.39320E-01 | 3.68516E-01 |
| NNA | Friedman | 6.53133E-08 | 1.98658E-07 | 1.98658E-07 | 1.98658E-07 |
| NNA | Friedman Aligned | 2.77977E-09 | 9.62227E-09 | 9.62227E-09 | 9.62227E-09 |
| NNA | Quade | 3.14219E-01 | 4.69400E-01 | 4.39320E-01 | 3.81037E-01 |
| CWOA | Friedman | 1.02048E-07 | 3.53244E-07 | 3.53244E-07 | 3.53244E-07 |
| CWOA | Friedman Aligned | <1E-13 | 1.78524E-13 | 1.78524E-13 | 1.78524E-13 |
| CWOA | Quade | 3.14219E-01 | 5.48252E-01 | 5.48252E-01 | 4.32016E-01 |
| WW | Friedman | 1.69355E-05 | 6.25314E-05 | 6.25314E-05 | 6.25297E-05 |
| WW | Friedman Aligned | 4.63527E-09 | 1.71148E-08 | 1.71148E-08 | 1.71148E-08 |
| WW | Quade | 3.14219E-01 | 1.0 | 1.0 | 6.85077E-01 |
| MABC | Friedman | 1.47478E-02 | 5.57785E-02 | 5.57785E-02 | 5.44627E-02 |
| MABC | Friedman Aligned | 2.56191E-02 | 9.71425E-02 | 9.71425E-02 | 9.31905E-02 |
| MABC | Quade | 4.65703E-01 | 1.0 | 1.0 | 9.05822E-01 |
| DE | Friedman | 3.11442E-01 | 1.0 | 1.0 | 7.47869E-01 |
| DE | Friedman Aligned | 1.88248E-01 | 7.22700E-01 | 7.22700E-01 | 5.37019E-01 |
| DE | Quade | 8.21502E-01 | 1.0 | 1.0 | 9.98275E-01 |
| **Table S35** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 3.29145E-01 | 1.0 | 1.0 | 7.48888E-01 |
| IJAYA | Friedman Aligned | 2.72182E-01 | 9.87202E-01 | 9.87202E-01 | 6.67044E-01 |
| IJAYA | Quade | 8.21502E-01 | 1.0 | 1.0 | 9.98275E-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 S36.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 6.84156E-03 | 6.86326E-03 | 6.86326E-03 | 6.84156E-03 |
| GOTLBO | Friedman Aligned | 1.87628E-12 | 2.89635E-12 | 2.89635E-12 | 2.89635E-12 |
| GOTLBO | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.89041E-01 |
| PSO | Friedman | 6.84988E-03 | 1.26827E-02 | 1.26827E-02 | 1.26093E-02 |
| PSO | Friedman Aligned | 7.99504E-09 | 2.46001E-08 | 2.46001E-08 | 2.46001E-08 |
| PSO | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.80537E-01 |
| ISCA | Friedman | 1.11987E-02 | 2.85508E-02 | 2.85508E-02 | 2.81832E-02 |
| ISCA | Friedman Aligned | 5.83509E-10 | 1.48121E-09 | 1.48121E-09 | 1.48121E-09 |
| ISCA | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.88524E-01 |
| NNA | Friedman | 1.11987E-02 | 3.03504E-02 | 3.03504E-02 | 2.99392E-02 |
| NNA | Friedman Aligned | 1.87628E-12 | 1.87628E-12 | 1.87628E-12 | 1.87628E-12 |
| NNA | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.89041E-01 |
| CWOA | Friedman | 1.15188E-02 | 4.00150E-02 | 4.00150E-02 | 3.93107E-02 |
| CWOA | Friedman Aligned | 1.52119E-07 | 5.26565E-07 | 5.26565E-07 | 5.26565E-07 |
| CWOA | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.92456E-01 |
| WW | Friedman | 1.44016E-01 | 5.54046E-01 | 5.54046E-01 | 4.36826E-01 |
| WW | Friedman Aligned | 8.90158E-04 | 3.28753E-03 | 3.28753E-03 | 3.28280E-03 |
| WW | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.99848E-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 |
| **Table S36** (*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 S37.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 2.04947E-13 | 2.04947E-13 | 2.04947E-13 | 2.04947E-13 |
| WW | Friedman Aligned | 1.71270E-13 | 4.34763E-13 | 4.34763E-13 | 4.34763E-13 |
| WW | Quade | 2.09412E-02 | 7.77621E-02 | 7.77621E-02 | 7.51674E-02 |
| CWOA | Friedman | 2.93825E-11 | 5.42446E-11 | 5.42446E-11 | 5.42446E-11 |
| CWOA | Friedman Aligned | 5.78031E-10 | 1.77856E-09 | 1.71036E-09 | 1.77856E-09 |
| CWOA | Quade | 1.35083E-02 | 2.74130E-02 | 2.74130E-02 | 2.70814E-02 |
| ISCA | Friedman | 3.89592E-11 | 1.17459E-10 | 1.17459E-10 | 1.17459E-10 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.35083E-02 | 1.83968E-02 | 1.83968E-02 | 1.82425E-02 |
| NNA | Friedman | 3.89592E-11 | 9.88964E-11 | 9.88964E-11 | 9.88964E-11 |
| NNA | Friedman Aligned | 5.78031E-10 | 1.77856E-09 | 1.71036E-09 | 1.77856E-09 |
| NNA | Quade | 1.35083E-02 | 2.01743E-02 | 1.91111E-02 | 1.99904E-02 |
| PSO | Friedman | 1.23417E-10 | 4.27212E-10 | 4.27212E-10 | 4.27212E-10 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.35083E-02 | 1.35932E-02 | 1.35932E-02 | 1.35083E-02 |
| GOTLBO | Friedman | 2.64018E-10 | 9.74834E-10 | 9.74834E-10 | 9.74834E-10 |
| GOTLBO | Friedman Aligned | 5.78031E-10 | 1.77856E-09 | 1.71036E-09 | 1.77856E-09 |
| GOTLBO | Quade | 1.35083E-02 | 2.01743E-02 | 1.91111E-02 | 1.99904E-02 |
| MABC | Friedman | 6.34021E-09 | 2.38977E-08 | 2.38977E-08 | 2.38977E-08 |
| MABC | Friedman Aligned | 9.29163E-05 | 3.50231E-04 | 3.50231E-04 | 3.50178E-04 |
| MABC | Quade | 5.71120E-02 | 2.18187E-01 | 2.18187E-01 | 1.98812E-01 |
| DE | Friedman | 9.58882E-06 | 3.54050E-05 | 3.54050E-05 | 3.54044E-05 |
| DE | Friedman Aligned | 2.67052E-03 | 9.86544E-03 | 9.86544E-03 | 9.82497E-03 |
| DE | Quade | 1.93779E-01 | 7.44857E-01 | 6.46164E-01 | 5.48560E-01 |
| **Table S37** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.33429E-05 | 4.61871E-05 | 4.61871E-05 | 4.61862E-05 |
| IJAYA | Friedman Aligned | 5.66798E-03 | 1.96371E-02 | 1.96371E-02 | 1.94834E-02 |
| IJAYA | Quade | 1.93779E-01 | 7.44857E-01 | 6.46164E-01 | 5.48560E-01 |
| NDE | Friedman | 1.43301E-03 | 4.40998E-03 | 4.40998E-03 | 4.40270E-03 |
| NDE | Friedman Aligned | 1.41455E-01 | 4.42799E-01 | 4.42799E-01 | 3.74549E-01 |
| NDE | Quade | 3.43054E-01 | 1.0 | 1.0 | 7.25493E-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 S38.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *R*p1 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 |
| 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 | 2.72905E-06 | 2.72905E-06 | 2.72905E-06 | 2.72905E-06 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S38** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S39.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 2.23361E-09 | 6.87266E-09 | 6.87266E-09 | 6.87266E-09 |
| GOTLBO | Quade | 2.38776E-03 | 3.80690E-03 | 3.62535E-03 | 3.80032E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 2.38776E-03 | 2.39040E-03 | 2.39040E-03 | 2.38776E-03 |
| MABC | Friedman | 1.28357E-12 | 3.25828E-12 | 3.25828E-12 | 3.25828E-12 |
| MABC | Friedman Aligned | 7.88131E-06 | 2.97065E-05 | 2.97065E-05 | 2.97062E-05 |
| MABC | Quade | 1.64044E-02 | 6.20680E-02 | 6.20680E-02 | 6.04412E-02 |
| WW | Friedman | 1.13508E-10 | 3.49256E-10 | 3.49256E-10 | 3.49256E-10 |
| WW | Friedman Aligned | 3.15599E-13 | 8.01137E-13 | 8.01137E-13 | 8.01137E-13 |
| WW | Quade | 4.98681E-03 | 1.84376E-02 | 1.84376E-02 | 1.82896E-02 |
| DE | Friedman | 8.25810E-09 | 2.85857E-08 | 2.63838E-08 | 2.85857E-08 |
| DE | Friedman Aligned | 3.62181E-04 | 1.33738E-03 | 1.33738E-03 | 1.33663E-03 |
| DE | Quade | 7.29045E-02 | 2.73093E-01 | 2.38867E-01 | 2.43841E-01 |
| CWOA | Friedman | 8.25810E-09 | 2.85857E-08 | 2.63838E-08 | 2.85857E-08 |
| CWOA | Friedman Aligned | 4.27917E-09 | 1.58000E-08 | 1.58000E-08 | 1.58000E-08 |
| CWOA | Quade | 2.38776E-03 | 5.52683E-03 | 5.52683E-03 | 5.51327E-03 |
| IJAYA | Friedman | 9.53069E-09 | 3.59234E-08 | 3.04931E-08 | 3.59234E-08 |
| IJAYA | Friedman Aligned | 8.79672E-04 | 3.04543E-03 | 3.04543E-03 | 3.04172E-03 |
| IJAYA | Quade | 7.29045E-02 | 2.73093E-01 | 2.38867E-01 | 2.43841E-01 |
| ISCA | Friedman | 9.53069E-09 | 3.59234E-08 | 3.04931E-08 | 3.59234E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.38776E-03 | 3.39323E-03 | 3.39323E-03 | 3.38795E-03 |
| **Table S39** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| NNA | Friedman | 9.53069E-09 | 3.59234E-08 | 3.04931E-08 | 3.59234E-08 |
| NNA | Friedman Aligned | 2.23361E-09 | 7.25937E-09 | 7.25937E-09 | 7.25937E-09 |
| NNA | Quade | 2.38776E-03 | 3.80690E-03 | 3.62535E-03 | 3.80032E-03 |
| NDE | Friedman | 4.08314E-06 | 1.25635E-05 | 1.25635E-05 | 1.25635E-05 |
| NDE | Friedman Aligned | 4.19953E-02 | 1.29854E-01 | 1.29854E-01 | 1.23666E-01 |
| NDE | Quade | 1.54173E-01 | 4.83401E-01 | 4.83401E-01 | 4.02619E-01 |
| TLBO | Friedman | 1.88486E-01 | 4.85963E-01 | 4.85963E-01 | 4.11494E-01 |
| TLBO | Friedman Aligned | 6.48054E-01 | 1.0 | 1.0 | 9.29409E-01 |
| TLBO | Quade | 7.04858E-01 | 1.0 | 9.84554E-01 | 9.54846E-01 |
| EBLSHADE | Friedman | 9.78729E-01 | 1.0 | 1.0 | 9.99182E-01 |
| EBLSHADE | Friedman Aligned | 8.67482E-01 | 1.0 | 1.0 | 9.76034E-01 |
| EBLSHADE | Quade | 9.87023E-01 | 1.0 | 9.84554E-01 | 9.99671E-01 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 9.87023E-01 | 1.0 | 9.84554E-01 | 9.99671E-01 |

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| --- | --- | --- | --- | --- | --- |
| **Table S40.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *R*p1 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 S40** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S41.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.73564E-06 | 9.73569E-06 | 9.73569E-06 | 9.73564E-06 |
| GOTLBO | Friedman Aligned | 4.31832E-12 | 1.09619E-11 | 1.09619E-11 | 1.09619E-11 |
| GOTLBO | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.37556E-01 |
| PSO | Friedman | 1.27717E-05 | 2.35787E-05 | 2.35787E-05 | 2.35785E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.70250E-01 | 1.0 | 1.0 | 6.70250E-01 |
| ISCA | Friedman | 3.02807E-05 | 7.68673E-05 | 7.68673E-05 | 7.68646E-05 |
| ISCA | Friedman Aligned | 2.29483E-13 | 4.23661E-13 | 4.23661E-13 | 4.23661E-13 |
| ISCA | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.28467E-01 |
| NNA | Friedman | 3.02807E-05 | 8.73835E-05 | 8.73835E-05 | 8.73801E-05 |
| NNA | Friedman Aligned | 5.02987E-12 | 1.54765E-11 | 1.54765E-11 | 1.54765E-11 |
| NNA | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.37556E-01 |
| CWOA | Friedman | 3.93486E-05 | 1.36208E-04 | 1.36208E-04 | 1.36200E-04 |
| CWOA | Friedman Aligned | 1.16523E-10 | 4.03347E-10 | 4.03347E-10 | 4.03347E-10 |
| CWOA | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.78072E-01 |
| WW | Friedman | 2.10239E-03 | 7.76707E-03 | 7.76707E-03 | 7.74073E-03 |
| WW | Friedman Aligned | 5.51419E-06 | 2.03601E-05 | 2.03601E-05 | 2.03600E-05 |
| WW | Quade | 6.70250E-01 | 1.0 | 1.0 | 9.38720E-01 |
| MABC | Friedman | 2.41545E-01 | 9.68227E-01 | 9.68227E-01 | 6.47281E-01 |
| MABC | Friedman Aligned | 4.01332E-01 | 1.0 | 1.0 | 8.55401E-01 |
| MABC | Quade | 7.60748E-01 | 1.0 | 1.0 | 9.95442E-01 |
| DE | Friedman | 9.84761E-01 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 9.21905E-01 | 1.0 | 1.0 | 9.99918E-01 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S41** (*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 S42.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.99999E-01 | 1.0 | 1.0 | 9.99999E-01 |
| GOTLBO | Friedman Aligned | 9.23523E-01 | 1.0 | 1.0 | 9.92894E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 9.99999E-01 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 1.42884E-08 | 1.42884E-08 | 1.42884E-08 | 1.42884E-08 |
| PSO | 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 S42** (*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 |
| 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 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 9.23523E-01 | 1.0 | 1.0 | 9.91314E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S43.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.99996E-01 | 1.0 | 1.0 | 9.99996E-01 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 9.99996E-01 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 3.95810E-06 | 3.95810E-06 | 3.95810E-06 | 3.95810E-06 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.99999E-01 | 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 |
| 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 S43** (*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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S44.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.99951E-01 | 1.0 | 1.0 | 9.99951E-01 |
| GOTLBO | Friedman Aligned | 2.69091E-01 | 6.09156E-01 | 6.09156E-01 | 4.65633E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 9.99951E-01 | 1.0 | 1.0 | 9.99998E-01 |
| PSO | Friedman Aligned | 1.74407E-11 | 1.74407E-11 | 1.74407E-11 | 1.74407E-11 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.99951E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 7.07645E-01 | 1.0 | 1.0 | 9.77267E-01 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.99951E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 2.69091E-01 | 5.64974E-01 | 5.64974E-01 | 4.39377E-01 |
| 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 |
| **Table S44** (*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 |
| 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 |
| 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 S45.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *R*p1evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 7.42350E-01 | 1.0 | 1.0 | 7.42350E-01 |
| GOTLBO | Friedman Aligned | 6.80259E-04 | 1.52988E-03 | 1.52988E-03 | 1.52881E-03 |
| GOTLBO | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99953E-01 |
| PSO | Friedman | 7.42350E-01 | 1.0 | 1.0 | 8.46939E-01 |
| PSO | Friedman Aligned | 2.26308E-10 | 2.26308E-10 | 2.26308E-10 | 2.26308E-10 |
| PSO | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99837E-01 |
| ISCA | Friedman | 7.42350E-01 | 1.0 | 1.0 | 9.45174E-01 |
| ISCA | Friedman Aligned | 1.21307E-02 | 3.74832E-02 | 3.74832E-02 | 3.68572E-02 |
| ISCA | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99947E-01 |
| NNA | Friedman | 7.42350E-01 | 1.0 | 1.0 | 9.45174E-01 |
| NNA | Friedman Aligned | 6.80259E-04 | 1.25623E-03 | 1.25623E-03 | 1.25550E-03 |
| NNA | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99953E-01 |
| CWOA | Friedman | 7.42350E-01 | 1.0 | 1.0 | 9.61674E-01 |
| CWOA | Friedman Aligned | 1.44448E-01 | 5.24146E-01 | 5.24146E-01 | 4.17268E-01 |
| CWOA | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99984E-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 S45** (*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 S46.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.07433E-01 | 3.62209E-01 | 3.62209E-01 | 3.07433E-01 |
| PSO | Friedman Aligned | 1.93615E-05 | 1.93617E-05 | 1.93617E-05 | 1.93615E-05 |
| PSO | Quade | 9.96926E-01 | 1.0 | 1.0 | 9.96926E-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 |
| 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 S46** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S47.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 3.11751E-13 | 8.99281E-13 | 8.99281E-13 | 8.99281E-13 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 3.35107E-02 | 8.46505E-02 | 8.46505E-02 | 8.14674E-02 |
| IJAYA | Friedman | 3.11751E-13 | 8.41549E-13 | 8.41549E-13 | 8.41549E-13 |
| IJAYA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| IJAYA | Quade | 3.35107E-02 | 6.27616E-02 | 6.27616E-02 | 6.09874E-02 |
| NNA | Friedman | 3.11751E-13 | 3.32179E-13 | 3.32179E-13 | 3.32179E-13 |
| NNA | Friedman Aligned | 1.48834E-09 | 4.57951E-09 | 4.57951E-09 | 4.57951E-09 |
| NNA | Quade | 3.35256E-02 | 1.16402E-01 | 1.02123E-01 | 1.10644E-01 |
| CWOA | Friedman | 3.11751E-13 | 3.11751E-13 | 3.11751E-13 | 3.11751E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 3.35256E-02 | 1.04376E-01 | 9.59914E-02 | 9.96075E-02 |
| WW | Friedman | 3.11751E-13 | 3.30402E-13 | 3.30402E-13 | 3.30402E-13 |
| WW | Friedman Aligned | 2.28617E-13 | 7.91367E-13 | 7.91367E-13 | 7.91367E-13 |
| WW | Quade | 3.35256E-02 | 1.04376E-01 | 9.59914E-02 | 9.96075E-02 |
| MABC | Friedman | 3.78623E-13 | 1.39799E-12 | 1.24967E-12 | 1.39799E-12 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 3.35256E-02 | 1.16402E-01 | 1.02123E-01 | 1.10644E-01 |
| GOTLBO | Friedman | 3.78623E-13 | 1.39799E-12 | 1.22324E-12 | 1.39799E-12 |
| GOTLBO | Friedman Aligned | 4.42446E-10 | 1.63365E-09 | 1.63365E-09 | 1.63365E-09 |
| GOTLBO | Quade | 3.35256E-02 | 1.16402E-01 | 1.04050E-01 | 1.10644E-01 |
| ISCA | Friedman | 3.78623E-13 | 1.39799E-12 | 1.22324E-12 | 1.39799E-12 |
| ISCA | Friedman Aligned | 1.21214E-09 | 4.19586E-09 | 4.19586E-09 | 4.19586E-09 |
| ISCA | Quade | 3.35256E-02 | 1.16402E-01 | 1.11569E-01 | 1.10644E-01 |
| **Table S47** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| NDE | Friedman | 7.79360E-10 | 2.69779E-09 | 2.69779E-09 | 2.69779E-09 |
| NDE | Friedman Aligned | 4.65894E-12 | 1.72022E-11 | 1.72022E-11 | 1.72022E-11 |
| NDE | Quade | 5.14231E-02 | 1.59184E-01 | 1.59184E-01 | 1.49931E-01 |
| PSO | Friedman | 9.39925E-09 | 2.89208E-08 | 2.89208E-08 | 2.89208E-08 |
| PSO | Friedman Aligned | 6.99497E-11 | 2.63656E-10 | 2.63656E-10 | 2.63656E-10 |
| PSO | Quade | 4.42167E-03 | 4.43072E-03 | 4.43072E-03 | 4.42167E-03 |
| TLBO | Friedman | 1.21775E-01 | 3.12161E-01 | 3.12161E-01 | 2.80806E-01 |
| TLBO | Friedman Aligned | 2.56398E-01 | 6.65169E-01 | 6.65169E-01 | 5.28586E-01 |
| TLBO | Quade | 6.64444E-01 | 1.0 | 1.0 | 9.37458E-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 S48.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | 1.37251E-10 | 4.75100E-10 | 4.75100E-10 | 4.75100E-10 |
| PSO | Quade | 1.26537E-03 | 1.26611E-03 | 1.26611E-03 | 1.26537E-03 |
| MABC | Friedman | 1.32783E-13 | 2.45137E-13 | 2.37588E-13 | 2.45137E-13 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 1.30356E-02 | 4.64870E-02 | 4.07958E-02 | 4.55525E-02 |
| GOTLBO | Friedman | 1.32783E-13 | 2.61346E-13 | 2.37588E-13 | 2.61346E-13 |
| GOTLBO | Friedman Aligned | 3.62435E-09 | 1.33822E-08 | 1.33822E-08 | 1.33822E-08 |
| GOTLBO | Quade | 1.30356E-02 | 4.64870E-02 | 4.23263E-02 | 4.55525E-02 |
| ISCA | Friedman | 1.32783E-13 | 2.61346E-13 | 2.37588E-13 | 2.61346E-13 |
| ISCA | Friedman Aligned | 7.90632E-09 | 2.73680E-08 | 2.73680E-08 | 2.73680E-08 |
| ISCA | Quade | 1.34430E-02 | 4.66302E-02 | 4.66302E-02 | 4.57685E-02 |
| NNA | Friedman | 3.34843E-13 | 1.15907E-12 | 1.12266E-12 | 1.15907E-12 |
| NNA | Friedman Aligned | 9.12892E-09 | 2.80890E-08 | 2.80890E-08 | 2.80890E-08 |
| NNA | Quade | 1.30356E-02 | 4.64870E-02 | 4.07958E-02 | 4.55525E-02 |
| WW | Friedman | 3.34843E-13 | 1.15907E-12 | 1.12266E-12 | 1.15907E-12 |
| WW | Friedman Aligned | 1.56092E-12 | 4.80282E-12 | 4.80282E-12 | 4.80282E-12 |
| WW | Quade | 1.30356E-02 | 4.02919E-02 | 3.71360E-02 | 3.95691E-02 |
| CWOA | Friedman | 2.43957E-12 | 9.19531E-12 | 9.19531E-12 | 9.19531E-12 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.30356E-02 | 4.02919E-02 | 3.71360E-02 | 3.95691E-02 |
| IJAYA | Friedman | 6.38042E-12 | 2.35585E-11 | 2.26019E-11 | 2.35585E-11 |
| IJAYA | Friedman Aligned | 2.28953E-09 | 8.62977E-09 | 8.62977E-09 | 8.62977E-09 |
| IJAYA | Quade | 1.22051E-02 | 2.26497E-02 | 2.26497E-02 | 2.24160E-02 |
| **Table S48** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 6.52944E-12 | 2.35585E-11 | 2.26019E-11 | 2.35585E-11 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 1.24297E-02 | 3.17044E-02 | 3.17044E-02 | 3.12514E-02 |
| NDE | Friedman | 1.48064E-11 | 4.55582E-11 | 4.55582E-11 | 4.55582E-11 |
| NDE | Friedman Aligned | 6.02958E-10 | 2.22631E-09 | 2.22631E-09 | 2.22631E-09 |
| NDE | Quade | 2.30164E-02 | 7.10095E-02 | 7.10095E-02 | 6.91409E-02 |
| TLBO | Friedman | 3.18582E-02 | 8.10716E-02 | 8.10716E-02 | 7.89005E-02 |
| TLBO | Friedman Aligned | 3.76448E-02 | 9.58407E-02 | 9.58407E-02 | 9.28115E-02 |
| TLBO | Quade | 4.57286E-01 | 1.0 | 9.51773E-01 | 7.88058E-01 |
| EBLSHADE | Friedman | 5.87176E-01 | 1.0 | 8.11070E-01 | 8.04727E-01 |
| EBLSHADE | Friedman Aligned | 3.79133E-01 | 7.11894E-01 | 7.11894E-01 | 5.85196E-01 |
| EBLSHADE | Quade | 7.80025E-01 | 1.0 | 9.51773E-01 | 9.38917E-01 |
| STLBO | Friedman | 8.11070E-01 | 1.0 | 8.11070E-01 | 8.11070E-01 |
| STLBO | Friedman Aligned | 9.94880E-01 | 9.94880E-01 | 9.94880E-01 | 9.94880E-01 |
| STLBO | Quade | 9.51773E-01 | 1.0 | 9.51773E-01 | 9.51773E-01 |

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| **Table S49.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 4.14742E-04 | 4.14821E-04 | 4.14821E-04 | 4.14742E-04 |
| PSO | Friedman Aligned | 3.02198E-08 | 5.57904E-08 | 5.57904E-08 | 5.57904E-08 |
| PSO | Quade | 8.28789E-01 | 1.0 | 1.0 | 8.28789E-01 |
| DE | Friedman | 2.83400E-01 | 5.99704E-01 | 5.81181E-01 | 4.59472E-01 |
| DE | Friedman Aligned | 5.25358E-13 | 5.25358E-13 | 5.25358E-13 | 5.25358E-13 |
| DE | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99815E-01 |
| IJAYA | Friedman | 2.83400E-01 | 5.99704E-01 | 5.81181E-01 | 4.59472E-01 |
| IJAYA | Friedman Aligned | 1.33614E-02 | 4.94618E-02 | 4.94618E-02 | 4.84535E-02 |
| IJAYA | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99403E-01 |
| CWOA | Friedman | 2.83400E-01 | 7.89202E-01 | 7.89202E-01 | 5.60486E-01 |
| CWOA | Friedman Aligned | 3.39155E-06 | 1.04356E-05 | 1.04356E-05 | 1.04355E-05 |
| CWOA | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99926E-01 |
| NNA | Friedman | 3.54469E-01 | 1.0 | 1.0 | 7.80203E-01 |
| NNA | Friedman Aligned | 1.07552E-03 | 3.72420E-03 | 3.72420E-03 | 3.71804E-03 |
| NNA | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99931E-01 |
| WW | Friedman | 3.54469E-01 | 1.0 | 1.0 | 7.80203E-01 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99926E-01 |
| MABC | Friedman | 4.01459E-01 | 1.0 | 1.0 | 8.55518E-01 |
| MABC | Friedman Aligned | 1.04059E-07 | 2.64149E-07 | 2.64149E-07 | 2.64149E-07 |
| MABC | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99931E-01 |
| GOTLBO | Friedman | 4.01459E-01 | 1.0 | 1.0 | 8.55518E-01 |
| GOTLBO | Friedman Aligned | 6.40261E-03 | 2.41687E-02 | 2.41687E-02 | 2.39198E-02 |
| GOTLBO | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99931E-01 |
| **Table S49** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 4.01459E-01 | 1.0 | 1.0 | 8.55518E-01 |
| ISCA | Friedman Aligned | 1.50390E-03 | 5.55512E-03 | 5.55512E-03 | 5.54164E-03 |
| ISCA | Quade | 9.82071E-01 | 1.0 | 1.0 | 9.99931E-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 S50.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.32214E-02 | 3.37419E-02 | 3.37419E-02 | 3.32214E-02 |
| PSO | Friedman Aligned | 5.02265E-12 | 5.02265E-12 | 5.02265E-12 | 5.02265E-12 |
| PSO | Quade | 9.77998E-01 | 1.0 | 1.0 | 9.77998E-01 |
| DE | Friedman | 9.69804E-01 | 1.0 | 1.0 | 9.98438E-01 |
| DE | Friedman Aligned | 8.55596E-02 | 1.63995E-01 | 1.63995E-01 | 1.52213E-01 |
| DE | Quade | 9.99780E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 9.69804E-01 | 1.0 | 1.0 | 9.98438E-01 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 9.99780E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.69804E-01 | 1.0 | 1.0 | 9.99595E-01 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 9.99780E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.81260E-01 | 1.0 | 1.0 | 9.99999E-01 |
| NNA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.81260E-01 | 1.0 | 1.0 | 9.99999E-01 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.99780E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 9.99360E-01 | 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 |
| ISCA | Friedman | 9.99360E-01 | 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 |
| **Table S50** (*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 S51.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 5.47757E-11 | 5.47757E-11 | 5.47757E-11 | 5.47757E-11 |
| PSO | Friedman Aligned | 5.78066E-11 | 2.00100E-10 | 2.00100E-10 | 2.00100E-10 |
| PSO | Quade | 2.81980E-02 | 2.85718E-02 | 2.85718E-02 | 2.81980E-02 |
| DE | Friedman | 4.02282E-10 | 7.42675E-10 | 7.42675E-10 | 7.42675E-10 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 1.40685E-01 | 3.51358E-01 | 3.51358E-01 | 3.00292E-01 |
| IJAYA | Friedman | 4.02282E-10 | 7.97424E-10 | 7.97424E-10 | 7.97424E-10 |
| IJAYA | Friedman Aligned | 3.62409E-09 | 1.33812E-08 | 1.33812E-08 | 1.33812E-08 |
| IJAYA | Quade | 1.40685E-01 | 2.76675E-01 | 2.76675E-01 | 2.44151E-01 |
| CWOA | Friedman | 7.58384E-10 | 2.33349E-09 | 2.33349E-09 | 2.33349E-09 |
| CWOA | Friedman Aligned | 2.81525E-09 | 1.06113E-08 | 1.06113E-08 | 1.06113E-08 |
| CWOA | Quade | 1.40685E-01 | 4.12529E-01 | 3.77842E-01 | 3.43793E-01 |
| NNA | Friedman | 4.96355E-09 | 1.71815E-08 | 1.64311E-08 | 1.71815E-08 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.40685E-01 | 4.35460E-01 | 3.77842E-01 | 3.60942E-01 |
| WW | Friedman | 4.96355E-09 | 1.71815E-08 | 1.64311E-08 | 1.71815E-08 |
| WW | Friedman Aligned | 8.94877E-10 | 3.30416E-09 | 3.30416E-09 | 3.30416E-09 |
| WW | Quade | 1.40685E-01 | 4.12529E-01 | 3.77842E-01 | 3.43793E-01 |
| MABC | Friedman | 1.60093E-08 | 6.03426E-08 | 4.96032E-08 | 6.03426E-08 |
| MABC | Friedman Aligned | 8.61753E-09 | 2.98299E-08 | 2.55256E-08 | 2.98299E-08 |
| MABC | Quade | 1.40685E-01 | 4.35460E-01 | 3.77842E-01 | 3.60942E-01 |
| GOTLBO | Friedman | 1.60093E-08 | 6.03426E-08 | 4.96032E-08 | 6.03426E-08 |
| GOTLBO | Friedman Aligned | 8.61753E-09 | 2.98299E-08 | 2.55256E-08 | 2.98299E-08 |
| GOTLBO | Quade | 1.40685E-01 | 4.35460E-01 | 3.77842E-01 | 3.60942E-01 |
| **Table S51** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 1.60093E-08 | 6.03426E-08 | 4.96032E-08 | 6.03426E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.40685E-01 | 4.35460E-01 | 3.87838E-01 | 3.60942E-01 |
| NDE | Friedman | 5.77124E-06 | 1.77577E-05 | 1.77577E-05 | 1.77575E-05 |
| NDE | Friedman Aligned | 4.58966E-13 | 1.41220E-12 | 1.41220E-12 | 1.41220E-12 |
| NDE | Quade | 1.58827E-01 | 4.98296E-01 | 4.98296E-01 | 4.12676E-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 S52.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.58882E-02 | 3.64967E-02 | 3.64967E-02 | 3.58882E-02 |
| PSO | Friedman Aligned | 1.81719E-08 | 1.81719E-08 | 1.81719E-08 | 1.81719E-08 |
| PSO | Quade | 9.66028E-01 | 1.0 | 1.0 | 9.66028E-01 |
| DE | Friedman | 9.74166E-01 | 1.0 | 1.0 | 9.98829E-01 |
| DE | Friedman Aligned | 1.92213E-06 | 3.54855E-06 | 3.54855E-06 | 3.54855E-06 |
| DE | Quade | 9.99387E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 9.74166E-01 | 1.0 | 1.0 | 9.98829E-01 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 9.99387E-01 | 1.0 | 1.0 | 9.99999E-01 |
| CWOA | Friedman | 9.74166E-01 | 1.0 | 1.0 | 9.99716E-01 |
| CWOA | Friedman Aligned | 1.53881E-01 | 5.01146E-01 | 5.01146E-01 | 4.01985E-01 |
| CWOA | Quade | 9.99387E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.85128E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 8.70151E-01 | 1.0 | 1.0 | 9.99147E-01 |
| NNA | Quade | 9.99387E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.85128E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.99387E-01 | 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 S52** (*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 | 3.33973E-02 | 8.58886E-02 | 8.58886E-02 | 8.26128E-02 |
| MABC | Quade | 9.99387E-01 | 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 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 8.90777E-01 | 1.0 | 1.0 | 9.99719E-01 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S53.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | 1.36951E-10 | 4.74063E-10 | 4.74063E-10 | 4.74063E-10 |
| PSO | Quade | 1.62108E-03 | 1.62229E-03 | 1.62229E-03 | 1.62108E-03 |
| MABC | Friedman | 1.02474E-13 | 1.89182E-13 | 1.77636E-13 | 1.89182E-13 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 1.57469E-02 | 5.58419E-02 | 4.90027E-02 | 5.44965E-02 |
| GOTLBO | Friedman | 1.02474E-13 | 1.89182E-13 | 1.73417E-13 | 1.89182E-13 |
| GOTLBO | Friedman Aligned | 3.57744E-09 | 1.32090E-08 | 1.32090E-08 | 1.32090E-08 |
| GOTLBO | Quade | 1.57469E-02 | 5.58419E-02 | 5.06633E-02 | 5.44965E-02 |
| ISCA | Friedman | 1.02474E-13 | 1.89182E-13 | 1.73417E-13 | 1.89182E-13 |
| ISCA | Friedman Aligned | 7.81461E-09 | 2.70506E-08 | 2.70506E-08 | 2.70506E-08 |
| ISCA | Quade | 1.60006E-02 | 5.58419E-02 | 5.55239E-02 | 5.44965E-02 |
| NNA | Friedman | 1.02474E-13 | 2.11831E-13 | 2.02505E-13 | 2.11831E-13 |
| NNA | Friedman Aligned | 9.02635E-09 | 2.77734E-08 | 2.77734E-08 | 2.77734E-08 |
| NNA | Quade | 1.57469E-02 | 5.58419E-02 | 4.90027E-02 | 5.44965E-02 |
| WW | Friedman | 1.02474E-13 | 2.11831E-13 | 2.02505E-13 | 2.11831E-13 |
| WW | Friedman Aligned | 1.49597E-12 | 4.60298E-12 | 4.60298E-12 | 4.60298E-12 |
| WW | Quade | 1.57469E-02 | 4.87185E-02 | 4.48837E-02 | 4.76642E-02 |
| CWOA | Friedman | 5.07213E-13 | 1.91180E-12 | 1.91180E-12 | 1.91180E-12 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.57469E-02 | 4.87185E-02 | 4.48837E-02 | 4.76642E-02 |
| IJAYA | Friedman | 1.45953E-12 | 5.38902E-12 | 5.23359E-12 | 5.38902E-12 |
| IJAYA | Friedman Aligned | 2.25780E-09 | 8.51019E-09 | 8.51019E-09 | 8.51019E-09 |
| IJAYA | Quade | 1.49333E-02 | 2.77449E-02 | 2.77449E-02 | 2.73948E-02 |
| **Table S53** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.51193E-12 | 5.38902E-12 | 5.23359E-12 | 5.38902E-12 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 1.51015E-02 | 3.85593E-02 | 3.85593E-02 | 3.78906E-02 |
| NDE | Friedman | 7.43248E-11 | 2.28692E-10 | 2.28692E-10 | 2.28692E-10 |
| NDE | Friedman Aligned | 5.85711E-10 | 2.16263E-09 | 2.16263E-09 | 2.16263E-09 |
| NDE | Quade | 2.70504E-02 | 8.34946E-02 | 8.34946E-02 | 8.09165E-02 |
| TLBO | Friedman | 5.71734E-02 | 1.45785E-01 | 1.45785E-01 | 1.38816E-01 |
| TLBO | Friedman Aligned | 3.82516E-02 | 9.73902E-02 | 9.73902E-02 | 9.42628E-02 |
| TLBO | Quade | 4.94637E-01 | 1.0 | 1.0 | 8.23149E-01 |
| EBLSHADE | Friedman | 7.56821E-01 | 1.0 | 1.0 | 9.26494E-01 |
| EBLSHADE | Friedman Aligned | 3.82635E-01 | 7.18601E-01 | 7.18601E-01 | 5.89504E-01 |
| EBLSHADE | Quade | 8.24330E-01 | 1.0 | 1.0 | 9.59673E-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 S54.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *I*02 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 S54** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S55.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 2.91949E-01 | 3.40696E-01 | 3.40696E-01 | 2.91949E-01 |
| PSO | Friedman Aligned | 5.39802E-08 | 5.39802E-08 | 5.39802E-08 | 5.39802E-08 |
| PSO | Quade | 9.99326E-01 | 1.0 | 1.0 | 9.99326E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 4.13136E-07 | 7.62714E-07 | 7.62714E-07 | 7.62713E-07 |
| 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 | 1.40272E-02 | 3.58013E-02 | 3.58013E-02 | 3.52243E-02 |
| 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 | 9.38730E-01 | 1.0 | 1.0 | 9.99973E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S55** (*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 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 7.29777E-01 | 1.0 | 1.0 | 9.92025E-01 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 7.04009E-01 | 1.0 | 1.0 | 9.85215E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 7.90035E-02 | 2.50048E-01 | 2.50048E-01 | 2.23709E-01 |
| CWOA | 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 S56.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.58882E-02 | 3.64967E-02 | 3.64967E-02 | 3.58882E-02 |
| PSO | Friedman Aligned | 2.40712E-09 | 2.40712E-09 | 2.40712E-09 | 2.40712E-09 |
| PSO | Quade | 9.39986E-01 | 1.0 | 1.0 | 9.39986E-01 |
| DE | Friedman | 9.74166E-01 | 1.0 | 1.0 | 9.98829E-01 |
| DE | Friedman Aligned | 2.06881E-05 | 3.81937E-05 | 3.81937E-05 | 3.81931E-05 |
| DE | Quade | 9.97867E-01 | 1.0 | 1.0 | 9.99998E-01 |
| IJAYA | Friedman | 9.74166E-01 | 1.0 | 1.0 | 9.98829E-01 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 9.97867E-01 | 1.0 | 1.0 | 9.99988E-01 |
| CWOA | Friedman | 9.74166E-01 | 1.0 | 1.0 | 9.99716E-01 |
| CWOA | Friedman Aligned | 3.77795E-01 | 1.0 | 1.0 | 7.67754E-01 |
| CWOA | Quade | 9.97867E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.85128E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 9.96719E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Quade | 9.97867E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.85128E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.97867E-01 | 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 S56** (*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 | 1.17077E-01 | 3.11585E-01 | 3.11585E-01 | 2.71001E-01 |
| MABC | Quade | 9.97867E-01 | 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 | 9.97867E-01 | 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 S57.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 7.49779E-02 | 7.77045E-02 | 7.77045E-02 | 7.49779E-02 |
| PSO | Friedman Aligned | 1.24163E-09 | 1.24163E-09 | 1.24163E-09 | 1.24163E-09 |
| PSO | Quade | 9.78151E-01 | 1.0 | 1.0 | 9.78151E-01 |
| DE | Friedman | 9.96576E-01 | 1.0 | 1.0 | 9.99972E-01 |
| DE | Friedman Aligned | 4.03245E-05 | 7.44465E-05 | 7.44465E-05 | 7.44440E-05 |
| DE | Quade | 9.99784E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 9.96576E-01 | 1.0 | 1.0 | 9.99972E-01 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 9.99784E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.96576E-01 | 1.0 | 1.0 | 9.99998E-01 |
| CWOA | Friedman Aligned | 4.67657E-01 | 1.0 | 1.0 | 8.56281E-01 |
| CWOA | Quade | 9.99784E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.99994E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 9.99784E-01 | 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 S57** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.62259E-01 | 4.40367E-01 | 4.40367E-01 | 3.62005E-01 |
| 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 |
| 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 |

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| **Table S58.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.92232E-01 | 2.11737E-01 | 2.11737E-01 | 1.92232E-01 |
| PSO | Friedman Aligned | 3.20410E-13 | 3.20410E-13 | 3.20410E-13 | 3.20410E-13 |
| PSO | Quade | 9.91529E-01 | 1.0 | 1.0 | 9.91529E-01 |
| DE | Friedman | 9.99993E-01 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 9.96242E-03 | 1.84702E-02 | 1.84702E-02 | 1.83146E-02 |
| DE | Quade | 9.99984E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 9.99993E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| IJAYA | Quade | 9.99984E-01 | 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 | 9.42723E-01 | 1.0 | 1.0 | 9.99297E-01 |
| 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 S58** (*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 |
| 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 S59.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *I*02 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 7.76548E-02 | 8.05850E-02 | 8.05850E-02 | 7.76548E-02 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 9.90947E-01 | 1.0 | 1.0 | 9.90947E-01 |
| DE | Friedman | 9.96991E-01 | 1.0 | 1.0 | 9.99978E-01 |
| DE | Friedman Aligned | 2.24129E-10 | 5.68944E-10 | 5.68944E-10 | 5.68944E-10 |
| DE | Quade | 9.99980E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 9.96991E-01 | 1.0 | 1.0 | 9.99978E-01 |
| IJAYA | Friedman Aligned | 2.35391E-04 | 8.69175E-04 | 8.69175E-04 | 8.68860E-04 |
| IJAYA | Quade | 9.99980E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.96991E-01 | 1.0 | 1.0 | 9.99998E-01 |
| CWOA | Friedman Aligned | 5.19146E-09 | 1.59737E-08 | 1.59737E-08 | 1.59737E-08 |
| CWOA | 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 | 3.36136E-01 | 1.0 | 1.0 | 7.57830E-01 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.10441E-10 | 2.03890E-10 | 2.03890E-10 | 2.03890E-10 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S59** (*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 | 8.28991E-05 | 3.12472E-04 | 3.12472E-04 | 3.12430E-04 |
| 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 |
| ISCA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 1.16470E-05 | 4.30045E-05 | 4.30045E-05 | 4.30037E-05 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 7.14139E-06 | 2.47202E-05 | 2.47202E-05 | 2.47200E-05 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S60.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 3.92321E-10 | 3.92321E-10 | 3.92321E-10 | 3.92321E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 2.79373E-01 | 3.23540E-01 | 3.23540E-01 | 2.79373E-01 |
| PSO | Friedman | 2.88559E-05 | 5.32730E-05 | 5.32730E-05 | 5.32717E-05 |
| PSO | Friedman Aligned | 1.74677E-10 | 6.44961E-10 | 6.44961E-10 | 6.44961E-10 |
| PSO | Quade | 5.37934E-01 | 1.0 | 1.0 | 7.59568E-01 |
| CWOA | Friedman | 2.43825E-04 | 6.18999E-04 | 6.18999E-04 | 6.18825E-04 |
| CWOA | Friedman Aligned | 7.59015E-11 | 2.62736E-10 | 2.62736E-10 | 2.62736E-10 |
| CWOA | Quade | 5.65449E-01 | 1.0 | 1.0 | 8.79446E-01 |
| NNA | Friedman | 6.24368E-04 | 1.92155E-03 | 1.92155E-03 | 1.91989E-03 |
| NNA | Friedman Aligned | 3.95173E-11 | 1.21592E-10 | 1.21592E-10 | 1.21592E-10 |
| NNA | Quade | 5.65449E-01 | 1.0 | 1.0 | 9.06685E-01 |
| GOTLBO | Friedman | 2.71581E-02 | 9.48059E-02 | 9.48059E-02 | 9.09078E-02 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 7.47711E-01 | 1.0 | 1.0 | 9.91495E-01 |
| ISCA | Friedman | 1.51455E-01 | 5.83984E-01 | 5.83984E-01 | 4.54688E-01 |
| ISCA | Friedman Aligned | 4.49465E-10 | 1.69414E-09 | 1.69414E-09 | 1.69414E-09 |
| ISCA | Quade | 8.49293E-01 | 1.0 | 1.0 | 9.99077E-01 |
| MABC | Friedman | 7.73122E-01 | 1.0 | 1.0 | 9.96269E-01 |
| MABC | Friedman Aligned | 1.26240E-12 | 3.20455E-12 | 3.20455E-12 | 3.20455E-12 |
| MABC | Quade | 9.33013E-01 | 1.0 | 1.0 | 9.99962E-01 |
| IJAYA | Friedman | 9.84761E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman Aligned | 8.57775E-01 | 1.0 | 1.0 | 9.99254E-01 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S60** (*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 S61.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.36721E-03 | 2.52555E-03 | 2.52555E-03 | 2.52263E-03 |
| ISCA | Friedman | 1.78968E-13 | 3.30402E-13 | 3.30402E-13 | 3.30402E-13 |
| ISCA | Friedman Aligned | 1.55372E-10 | 5.73682E-10 | 5.73682E-10 | 5.73682E-10 |
| ISCA | Quade | 1.65281E-02 | 6.13009E-02 | 6.13009E-02 | 5.96818E-02 |
| GOTLBO | Friedman | 1.95883E-11 | 4.97242E-11 | 4.97242E-11 | 4.97242E-11 |
| GOTLBO | Friedman Aligned | 2.08030E-10 | 7.84112E-10 | 7.84112E-10 | 7.84112E-10 |
| GOTLBO | Quade | 8.54988E-03 | 2.96740E-02 | 2.96740E-02 | 2.92856E-02 |
| MABC | Friedman | 3.70161E-11 | 1.13896E-10 | 1.13896E-10 | 1.13896E-10 |
| MABC | Friedman Aligned | 4.17948E-11 | 1.28599E-10 | 1.28599E-10 | 1.28599E-10 |
| MABC | Quade | 2.91472E-02 | 1.10612E-01 | 1.10612E-01 | 1.05504E-01 |
| IJAYA | Friedman | 8.24453E-10 | 2.85388E-09 | 2.85388E-09 | 2.85388E-09 |
| IJAYA | Friedman Aligned | 2.11001E-09 | 7.30389E-09 | 7.30389E-09 | 7.30389E-09 |
| IJAYA | Quade | 5.50979E-02 | 2.05651E-01 | 1.80331E-01 | 1.88814E-01 |
| DE | Friedman | 1.26059E-09 | 4.65450E-09 | 4.65450E-09 | 4.65450E-09 |
| DE | Friedman Aligned | 9.99304E-10 | 3.68974E-09 | 3.68974E-09 | 3.68974E-09 |
| DE | Quade | 5.50979E-02 | 2.05651E-01 | 1.80331E-01 | 1.88814E-01 |
| NNA | Friedman | 2.52900E-09 | 9.53238E-09 | 9.53238E-09 | 9.53238E-09 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 2.46551E-03 | 7.59267E-03 | 7.59267E-03 | 7.56678E-03 |
| CWOA | Friedman | 7.00046E-09 | 2.58479E-08 | 2.31404E-08 | 2.58479E-08 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 2.22641E-03 | 5.65651E-03 | 5.65651E-03 | 5.64199E-03 |
| **Table S61** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 7.00046E-09 | 2.58479E-08 | 2.31404E-08 | 2.58479E-08 |
| WW | Friedman Aligned | 1.32567E-10 | 4.58885E-10 | 4.58885E-10 | 4.58885E-10 |
| WW | Quade | 1.69100E-04 | 1.69113E-04 | 1.69113E-04 | 1.69100E-04 |
| NDE | Friedman | 1.47046E-04 | 4.52458E-04 | 4.52458E-04 | 4.52382E-04 |
| NDE | Friedman Aligned | 6.50237E-07 | 2.00073E-06 | 2.00073E-06 | 2.00073E-06 |
| NDE | Quade | 2.62860E-01 | 8.36446E-01 | 8.36446E-01 | 6.08744E-01 |
| TLBO | Friedman | 1.57702E-01 | 4.05499E-01 | 4.05499E-01 | 3.53159E-01 |
| TLBO | Friedman Aligned | 4.66638E-01 | 1.0 | 1.0 | 7.97205E-01 |
| TLBO | Quade | 7.20268E-01 | 1.0 | 1.0 | 9.60593E-01 |
| STLBO | Friedman | 9.63022E-01 | 1.0 | 1.0 | 9.97729E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 9.70725E-01 | 1.0 | 1.0 | 9.98525E-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 S62.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.08556E-03 | 2.00503E-03 | 2.00503E-03 | 2.00319E-03 |
| ISCA | Friedman | 4.21441E-13 | 7.78044E-13 | 7.78044E-13 | 7.78044E-13 |
| ISCA | Friedman Aligned | 1.77441E-10 | 6.55168E-10 | 6.55168E-10 | 6.55168E-10 |
| ISCA | Quade | 1.38937E-02 | 5.14932E-02 | 5.14932E-02 | 5.03480E-02 |
| MABC | Friedman | 2.15926E-11 | 5.48119E-11 | 5.48119E-11 | 5.48119E-11 |
| MABC | Friedman Aligned | 5.46148E-11 | 1.68046E-10 | 1.68046E-10 | 1.68046E-10 |
| MABC | Quade | 2.48402E-02 | 9.41718E-02 | 9.41718E-02 | 9.04551E-02 |
| GOTLBO | Friedman | 2.92194E-11 | 8.99059E-11 | 8.99059E-11 | 8.99059E-11 |
| GOTLBO | Friedman Aligned | 1.87348E-10 | 7.06158E-10 | 7.06158E-10 | 7.06158E-10 |
| GOTLBO | Quade | 7.08114E-03 | 2.45652E-02 | 2.45652E-02 | 2.42987E-02 |
| IJAYA | Friedman | 3.81470E-10 | 1.32047E-09 | 1.32047E-09 | 1.32047E-09 |
| IJAYA | Friedman Aligned | 5.75403E-09 | 1.99178E-08 | 1.99178E-08 | 1.99178E-08 |
| IJAYA | Quade | 4.77133E-02 | 1.77825E-01 | 1.56099E-01 | 1.65159E-01 |
| DE | Friedman | 5.89532E-10 | 2.17673E-09 | 2.17673E-09 | 2.17673E-09 |
| DE | Friedman Aligned | 3.00876E-09 | 1.11092E-08 | 1.11092E-08 | 1.11092E-08 |
| DE | Quade | 4.77133E-02 | 1.77825E-01 | 1.56099E-01 | 1.65159E-01 |
| NNA | Friedman | 4.05858E-09 | 1.52977E-08 | 1.52977E-08 | 1.52977E-08 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.99442E-03 | 6.14092E-03 | 6.14092E-03 | 6.12398E-03 |
| WW | Friedman | 9.35983E-09 | 3.45594E-08 | 3.32115E-08 | 3.45594E-08 |
| WW | Friedman Aligned | 1.45939E-10 | 5.05172E-10 | 5.05172E-10 | 5.05172E-10 |
| WW | Quade | 1.29473E-04 | 1.29480E-04 | 1.29480E-04 | 1.29473E-04 |
| **Table S62** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 9.59443E-09 | 3.45594E-08 | 3.32115E-08 | 3.45594E-08 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.79060E-03 | 4.54851E-03 | 4.54851E-03 | 4.53912E-03 |
| NDE | Friedman | 8.95473E-05 | 2.75533E-04 | 2.75533E-04 | 2.75505E-04 |
| NDE | Friedman Aligned | 4.36010E-08 | 1.34157E-07 | 1.34157E-07 | 1.34157E-07 |
| NDE | Quade | 2.38174E-01 | 7.55260E-01 | 7.55260E-01 | 5.67008E-01 |
| TLBO | Friedman | 1.24750E-01 | 3.19870E-01 | 3.19870E-01 | 2.86976E-01 |
| TLBO | Friedman Aligned | 2.17176E-01 | 5.61378E-01 | 5.61378E-01 | 4.62882E-01 |
| TLBO | Quade | 6.79515E-01 | 1.0 | 9.53684E-01 | 9.44344E-01 |
| STLBO | Friedman | 8.79054E-01 | 1.0 | 9.04861E-01 | 9.79755E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 9.31129E-01 | 1.0 | 9.53684E-01 | 9.92841E-01 |
| EBLSHADE | Friedman | 9.04861E-01 | 1.0 | 9.04861E-01 | 9.79755E-01 |
| EBLSHADE | Friedman Aligned | 6.46794E-01 | 1.0 | 1.0 | 8.53584E-01 |
| EBLSHADE | Quade | 9.53684E-01 | 1.0 | 9.53684E-01 | 9.92841E-01 |

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| **Table S63.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 5.95906E-11 | 5.95906E-11 | 5.95906E-11 | 5.95906E-11 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 8.92612E-02 | 1.71378E-01 | 1.71378E-01 | 1.58537E-01 |
| WW | Friedman | 1.13108E-10 | 2.08814E-10 | 2.08814E-10 | 2.08814E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 2.45418E-02 | 2.48242E-02 | 2.48242E-02 | 2.45418E-02 |
| CWOA | Friedman | 8.66736E-10 | 2.20018E-09 | 2.20018E-09 | 2.20018E-09 |
| CWOA | Friedman Aligned | 1.27564E-10 | 4.71006E-10 | 4.71006E-10 | 4.71006E-10 |
| CWOA | Quade | 1.10293E-01 | 2.92688E-01 | 2.92688E-01 | 2.56697E-01 |
| NNA | Friedman | 4.29575E-09 | 1.32177E-08 | 1.32177E-08 | 1.32177E-08 |
| NNA | Friedman Aligned | 1.65481E-10 | 5.72820E-10 | 5.72820E-10 | 5.72820E-10 |
| NNA | Quade | 1.10293E-01 | 3.47534E-01 | 3.47534E-01 | 2.97926E-01 |
| GOTLBO | Friedman | 2.48635E-06 | 8.60661E-06 | 8.60661E-06 | 8.60658E-06 |
| GOTLBO | Friedman Aligned | 7.60474E-11 | 2.86640E-10 | 2.86640E-10 | 2.86640E-10 |
| GOTLBO | Quade | 2.22940E-01 | 8.32115E-01 | 8.32115E-01 | 5.82358E-01 |
| ISCA | Friedman | 7.67415E-05 | 2.83359E-04 | 2.83359E-04 | 2.83324E-04 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 3.11725E-01 | 1.0 | 1.0 | 7.48251E-01 |
| MABC | Friedman | 6.08165E-03 | 2.29554E-02 | 2.29554E-02 | 2.27308E-02 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 4.09668E-01 | 1.0 | 1.0 | 8.62846E-01 |
| IJAYA | Friedman | 2.38708E-02 | 8.85474E-02 | 8.85474E-02 | 8.53440E-02 |
| IJAYA | Friedman Aligned | 1.19504E-12 | 4.13669E-12 | 4.13669E-12 | 4.13669E-12 |
| IJAYA | Quade | 5.51337E-01 | 1.0 | 1.0 | 9.48146E-01 |
| **Table S63** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 2.75393E-02 | 9.57372E-02 | 9.57372E-02 | 9.21405E-02 |
| DE | Friedman Aligned | 1.55452E-11 | 5.73976E-11 | 5.73976E-11 | 5.73976E-11 |
| DE | Quade | 5.51337E-01 | 1.0 | 1.0 | 9.48146E-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 S64.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.84990E-08 | 1.84990E-08 | 1.84990E-08 | 1.84990E-08 |
| WW | Friedman Aligned | 2.64637E-10 | 8.14269E-10 | 8.14269E-10 | 8.14269E-10 |
| WW | Quade | 4.97749E-01 | 6.70733E-01 | 6.70733E-01 | 4.97749E-01 |
| PSO | Friedman | 4.25680E-04 | 7.86013E-04 | 7.86013E-04 | 7.85730E-04 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 7.58062E-01 | 1.0 | 1.0 | 9.27185E-01 |
| CWOA | Friedman | 2.60995E-03 | 6.63191E-03 | 6.63191E-03 | 6.61195E-03 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 7.72259E-01 | 1.0 | 1.0 | 9.76617E-01 |
| NNA | Friedman | 5.64123E-03 | 1.73916E-02 | 1.73916E-02 | 1.72562E-02 |
| NNA | Friedman Aligned | 1.26098E-09 | 4.36494E-09 | 4.36494E-09 | 4.36494E-09 |
| NNA | Quade | 7.72259E-01 | 1.0 | 1.0 | 9.84364E-01 |
| GOTLBO | Friedman | 1.24793E-01 | 4.49778E-01 | 4.49778E-01 | 3.69603E-01 |
| GOTLBO | Friedman Aligned | 2.57868E-13 | 6.54587E-13 | 6.54587E-13 | 6.54587E-13 |
| GOTLBO | Quade | 9.07365E-01 | 1.0 | 1.0 | 9.99735E-01 |
| ISCA | Friedman | 4.35559E-01 | 1.0 | 1.0 | 8.78968E-01 |
| ISCA | Friedman Aligned | 5.82208E-05 | 2.14973E-04 | 2.14973E-04 | 2.14952E-04 |
| ISCA | Quade | 9.69469E-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 |
| **Table S64** (*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 S65.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 5.46141E-12 | 5.46141E-12 | 5.46141E-12 | 5.46141E-12 |
| GOTLBO | Friedman Aligned | 1.85656E-10 | 6.85500E-10 | 6.85500E-10 | 6.85500E-10 |
| GOTLBO | Quade | 3.21257E-02 | 1.12323E-01 | 1.12323E-01 | 1.06876E-01 |
| NNA | Friedman | 5.46141E-12 | 7.30616E-12 | 7.30616E-12 | 7.30616E-12 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.10836E-02 | 3.42350E-02 | 3.42350E-02 | 3.37124E-02 |
| CWOA | Friedman | 1.70145E-11 | 4.31906E-11 | 4.31906E-11 | 4.31906E-11 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.04534E-02 | 2.66429E-02 | 2.66429E-02 | 2.63226E-02 |
| PSO | Friedman | 2.64060E-10 | 8.12492E-10 | 7.63813E-10 | 8.12492E-10 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 7.07405E-03 | 1.30990E-02 | 1.30990E-02 | 1.30207E-02 |
| ISCA | Friedman | 2.64060E-10 | 8.12492E-10 | 7.63813E-10 | 8.12492E-10 |
| ISCA | Friedman Aligned | 1.03659E-10 | 3.90714E-10 | 3.90714E-10 | 3.90714E-10 |
| ISCA | Quade | 5.54732E-02 | 2.07973E-01 | 2.07973E-01 | 1.90003E-01 |
| WW | Friedman | 3.54090E-10 | 1.30741E-09 | 1.30741E-09 | 1.30741E-09 |
| WW | Friedman Aligned | 9.35998E-11 | 3.45599E-10 | 3.45599E-10 | 3.45599E-10 |
| WW | Quade | 1.15226E-03 | 1.15287E-03 | 1.15287E-03 | 1.15226E-03 |
| MABC | Friedman | 2.07209E-07 | 7.81020E-07 | 7.81020E-07 | 7.81020E-07 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 8.81588E-02 | 3.39358E-01 | 3.39358E-01 | 2.93802E-01 |
| IJAYA | Friedman | 2.51710E-06 | 9.29391E-06 | 9.29391E-06 | 9.29387E-06 |
| IJAYA | Friedman Aligned | 3.03666E-10 | 1.05115E-09 | 1.05115E-09 | 1.05115E-09 |
| IJAYA | Quade | 1.47660E-01 | 5.61846E-01 | 4.88755E-01 | 4.45628E-01 |
| **Table S65** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 3.59231E-06 | 1.24349E-05 | 1.24349E-05 | 1.24349E-05 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 1.47660E-01 | 5.61846E-01 | 4.88755E-01 | 4.45628E-01 |
| NDE | Friedman | 2.32779E-02 | 7.18185E-02 | 7.18185E-02 | 6.99073E-02 |
| NDE | Friedman Aligned | 3.36822E-05 | 1.03638E-04 | 1.03638E-04 | 1.03634E-04 |
| NDE | Quade | 5.01560E-01 | 1.0 | 1.0 | 8.82625E-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 S66.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 5.37814E-04 | 5.37948E-04 | 5.37948E-04 | 5.37814E-04 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 8.88379E-01 | 1.0 | 1.0 | 8.88379E-01 |
| PSO | Friedman | 2.44230E-01 | 5.05979E-01 | 5.05979E-01 | 4.03667E-01 |
| PSO | Friedman Aligned | 1.12035E-10 | 2.06835E-10 | 2.06835E-10 | 2.06835E-10 |
| PSO | Quade | 9.77652E-01 | 1.0 | 1.0 | 9.99104E-01 |
| CWOA | Friedman | 4.83801E-01 | 1.0 | 1.0 | 8.13363E-01 |
| CWOA | Friedman Aligned | 7.28206E-09 | 1.84852E-08 | 1.84852E-08 | 1.84852E-08 |
| CWOA | Quade | 9.79642E-01 | 1.0 | 1.0 | 9.99949E-01 |
| NNA | Friedman | 5.92700E-01 | 1.0 | 1.0 | 9.36943E-01 |
| NNA | Friedman Aligned | 6.56552E-05 | 2.02020E-04 | 2.02020E-04 | 2.02002E-04 |
| NNA | Quade | 9.79642E-01 | 1.0 | 1.0 | 9.99984E-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 S66** (*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 |
| 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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S67.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.65138E-03 | 3.05083E-03 | 3.05083E-03 | 3.04656E-03 |
| ISCA | Friedman | 1.24123E-13 | 2.29150E-13 | 2.29150E-13 | 2.29150E-13 |
| ISCA | Friedman Aligned | 1.77441E-10 | 6.55168E-10 | 6.55168E-10 | 6.55168E-10 |
| ISCA | Quade | 1.90410E-02 | 7.06693E-02 | 7.06693E-02 | 6.85226E-02 |
| GOTLBO | Friedman | 1.37420E-11 | 3.48837E-11 | 3.48837E-11 | 3.48837E-11 |
| GOTLBO | Friedman Aligned | 1.87348E-10 | 7.06158E-10 | 7.06158E-10 | 7.06158E-10 |
| GOTLBO | Quade | 9.97190E-03 | 3.46246E-02 | 3.46246E-02 | 3.40965E-02 |
| MABC | Friedman | 5.56843E-11 | 1.71336E-10 | 1.71336E-10 | 1.71336E-10 |
| MABC | Friedman Aligned | 5.46148E-11 | 1.68046E-10 | 1.68046E-10 | 1.68046E-10 |
| MABC | Quade | 3.31985E-02 | 1.26107E-01 | 1.26107E-01 | 1.19493E-01 |
| IJAYA | Friedman | 1.20599E-09 | 4.17460E-09 | 4.17460E-09 | 4.17460E-09 |
| IJAYA | Friedman Aligned | 5.75403E-09 | 1.99178E-08 | 1.99178E-08 | 1.99178E-08 |
| IJAYA | Quade | 6.19298E-02 | 2.31468E-01 | 2.02790E-01 | 2.10260E-01 |
| DE | Friedman | 1.83414E-09 | 6.77223E-09 | 6.77223E-09 | 6.77223E-09 |
| DE | Friedman Aligned | 3.00876E-09 | 1.11092E-08 | 1.11092E-08 | 1.11092E-08 |
| DE | Quade | 6.19298E-02 | 2.31468E-01 | 2.02790E-01 | 2.10260E-01 |
| NNA | Friedman | 1.98348E-09 | 7.47618E-09 | 7.47618E-09 | 7.47618E-09 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 2.93233E-03 | 9.03172E-03 | 9.03172E-03 | 8.99510E-03 |
| CWOA | Friedman | 5.60543E-09 | 2.06970E-08 | 2.06949E-08 | 2.06970E-08 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 2.66069E-03 | 6.76098E-03 | 6.76098E-03 | 6.74024E-03 |
| **Table S67** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 5.97853E-09 | 2.06970E-08 | 2.06949E-08 | 2.06970E-08 |
| WW | Friedman Aligned | 1.45939E-10 | 5.05172E-10 | 5.05172E-10 | 5.05172E-10 |
| WW | Quade | 2.10491E-04 | 2.10511E-04 | 2.10511E-04 | 2.10491E-04 |
| NDE | Friedman | 1.87474E-04 | 5.76856E-04 | 5.76856E-04 | 5.76731E-04 |
| NDE | Friedman Aligned | 4.36010E-08 | 1.34157E-07 | 1.34157E-07 | 1.34157E-07 |
| NDE | Quade | 2.84587E-01 | 9.08417E-01 | 9.08417E-01 | 6.43152E-01 |
| TLBO | Friedman | 1.76463E-01 | 4.54482E-01 | 4.54482E-01 | 3.89108E-01 |
| TLBO | Friedman Aligned | 2.17176E-01 | 5.61378E-01 | 5.61378E-01 | 4.62882E-01 |
| TLBO | Quade | 7.54166E-01 | 1.0 | 1.0 | 9.71610E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 6.46794E-01 | 1.0 | 1.0 | 8.53584E-01 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S68.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 4.01067E-01 | 5.02631E-01 | 5.02631E-01 | 4.01067E-01 |
| WW | Friedman Aligned | 2.83462E-12 | 2.83462E-12 | 2.83462E-12 | 2.83462E-12 |
| WW | Quade | 9.99914E-01 | 1.0 | 1.0 | 9.99914E-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 |
| 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 S68** (*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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S69.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 7.43248E-10 | 7.43248E-10 | 7.43248E-10 | 7.43248E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 2.66782E-01 | 3.06638E-01 | 3.06638E-01 | 2.66782E-01 |
| PSO | Friedman | 4.54207E-05 | 8.38553E-05 | 8.38553E-05 | 8.38520E-05 |
| PSO | Friedman Aligned | 1.35070E-10 | 5.09112E-10 | 5.09112E-10 | 5.09112E-10 |
| PSO | Quade | 5.22216E-01 | 1.0 | 1.0 | 7.44252E-01 |
| CWOA | Friedman | 3.64540E-04 | 9.25501E-04 | 9.25501E-04 | 9.25112E-04 |
| CWOA | Friedman Aligned | 5.32651E-11 | 1.96671E-10 | 1.96671E-10 | 1.96671E-10 |
| CWOA | Quade | 5.50483E-01 | 1.0 | 1.0 | 8.68626E-01 |
| NNA | Friedman | 9.08440E-04 | 2.79608E-03 | 2.79608E-03 | 2.79256E-03 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 5.50483E-01 | 1.0 | 1.0 | 8.97503E-01 |
| GOTLBO | Friedman | 3.55101E-02 | 1.24289E-01 | 1.24289E-01 | 1.17640E-01 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 7.34526E-01 | 1.0 | 1.0 | 9.89856E-01 |
| ISCA | Friedman | 1.84143E-01 | 7.17234E-01 | 7.17234E-01 | 5.28316E-01 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 8.38066E-01 | 1.0 | 1.0 | 9.98796E-01 |
| MABC | Friedman | 8.30669E-01 | 1.0 | 1.0 | 9.98761E-01 |
| MABC | Friedman Aligned | 1.20936E-11 | 4.18625E-11 | 4.18625E-11 | 4.18625E-11 |
| MABC | Quade | 9.24393E-01 | 1.0 | 1.0 | 9.99941E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 9.98735E-01 | 1.0 | 1.0 | 1.0 |
| **Table S69** (*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 S70.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.49117E-05 | 1.49118E-05 | 1.49118E-05 | 1.49117E-05 |
| WW | Friedman Aligned | 1.07945E-10 | 1.99283E-10 | 1.99283E-10 | 1.99283E-10 |
| WW | Quade | 7.08152E-01 | 1.0 | 1.0 | 7.08152E-01 |
| PSO | Friedman | 3.30715E-02 | 6.19271E-02 | 6.19271E-02 | 6.01993E-02 |
| PSO | Friedman Aligned | 5.28264E-09 | 1.62543E-08 | 1.62543E-08 | 1.62543E-08 |
| PSO | Quade | 9.00243E-01 | 1.0 | 1.0 | 9.85813E-01 |
| CWOA | Friedman | 1.05547E-01 | 2.79535E-01 | 2.79535E-01 | 2.46592E-01 |
| CWOA | Friedman Aligned | 4.87572E-10 | 1.23768E-09 | 1.23768E-09 | 1.23768E-09 |
| CWOA | Quade | 9.05533E-01 | 1.0 | 1.0 | 9.97495E-01 |
| NNA | Friedman | 1.61730E-01 | 5.28346E-01 | 5.28346E-01 | 4.18890E-01 |
| NNA | Friedman Aligned | 4.82059E-13 | 4.82059E-13 | 4.82059E-13 | 4.82059E-13 |
| NNA | Quade | 9.05533E-01 | 1.0 | 1.0 | 9.98649E-01 |
| GOTLBO | Friedman | 7.82941E-01 | 1.0 | 1.0 | 9.94947E-01 |
| GOTLBO | Friedman Aligned | 2.23133E-03 | 7.72913E-03 | 7.72913E-03 | 7.70263E-03 |
| GOTLBO | Quade | 9.81758E-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 |
| **Table S70** (*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 S71.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 4.34105E-02 | 4.43053E-02 | 4.43053E-02 | 4.34105E-02 |
| WW | Friedman Aligned | 1.25781E-08 | 1.25781E-08 | 1.25781E-08 | 1.25781E-08 |
| WW | Quade | 9.93459E-01 | 1.0 | 1.0 | 9.93459E-01 |
| PSO | Friedman | 9.59537E-01 | 1.0 | 1.0 | 9.97318E-01 |
| PSO | Friedman Aligned | 1.41924E-05 | 2.62016E-05 | 2.62016E-05 | 2.62013E-05 |
| PSO | Quade | 9.99820E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.98121E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 2.92359E-01 | 8.43733E-01 | 8.43733E-01 | 5.84323E-01 |
| CWOA | Quade | 9.99978E-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 S71** (*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 | 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S72.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *n*2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.05634E-01 | 1.11163E-01 | 1.11163E-01 | 1.05634E-01 |
| WW | Friedman Aligned | 7.79425E-08 | 7.79425E-08 | 7.79425E-08 | 7.79425E-08 |
| WW | Quade | 9.97790E-01 | 1.0 | 1.0 | 9.97790E-01 |
| PSO | Friedman | 9.96116E-01 | 1.0 | 1.0 | 9.99965E-01 |
| PSO | Friedman Aligned | 1.94787E-02 | 3.62606E-02 | 3.62606E-02 | 3.56640E-02 |
| PSO | Quade | 9.99983E-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 |
| 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 S72** (*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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S73.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *n*2 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 S73** (*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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S74.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.85241E-05 | 3.85248E-05 | 3.85248E-05 | 3.85241E-05 |
| PSO | Friedman Aligned | 1.30970E-08 | 3.32462E-08 | 3.16401E-08 | 3.32462E-08 |
| PSO | Quade | 6.28939E-01 | 9.54531E-01 | 9.54531E-01 | 6.28939E-01 |
| CWOA | Friedman | 2.30207E-04 | 4.25038E-04 | 4.25038E-04 | 4.24956E-04 |
| CWOA | Friedman Aligned | 1.45657E-11 | 1.45657E-11 | 1.45657E-11 | 1.45657E-11 |
| CWOA | Quade | 6.36202E-01 | 1.0 | 1.0 | 8.45375E-01 |
| WW | Friedman | 5.14600E-04 | 1.30655E-03 | 1.30655E-03 | 1.30577E-03 |
| WW | Friedman Aligned | 1.30970E-08 | 3.32462E-08 | 3.16401E-08 | 3.32462E-08 |
| WW | Quade | 6.36202E-01 | 1.0 | 1.0 | 8.93749E-01 |
| MABC | Friedman | 9.08440E-04 | 2.79608E-03 | 2.79608E-03 | 2.79256E-03 |
| MABC | Friedman Aligned | 8.90533E-10 | 1.64406E-09 | 1.64406E-09 | 1.64406E-09 |
| MABC | Quade | 6.36202E-01 | 1.0 | 1.0 | 8.93749E-01 |
| NNA | Friedman | 3.83377E-03 | 1.32864E-02 | 1.32864E-02 | 1.32082E-02 |
| NNA | Friedman Aligned | 8.30815E-06 | 3.06763E-05 | 3.06763E-05 | 3.06759E-05 |
| NNA | Quade | 6.84588E-01 | 1.0 | 1.0 | 9.81577E-01 |
| GOTLBO | Friedman | 9.97395E-03 | 3.69263E-02 | 3.69263E-02 | 3.63352E-02 |
| GOTLBO | Friedman Aligned | 1.25934E-03 | 4.74813E-03 | 4.74813E-03 | 4.73848E-03 |
| GOTLBO | Quade | 6.84588E-01 | 1.0 | 1.0 | 9.81577E-01 |
| ISCA | Friedman | 2.90759E-02 | 1.10340E-01 | 1.10340E-01 | 1.05257E-01 |
| ISCA | Friedman Aligned | 1.94427E-03 | 7.18153E-03 | 7.18153E-03 | 7.16008E-03 |
| ISCA | Quade | 6.84588E-01 | 1.0 | 1.0 | 9.81577E-01 |
| NDE | Friedman | 3.23617E-01 | 1.0 | 1.0 | 7.63942E-01 |
| NDE | Friedman Aligned | 5.67700E-06 | 1.96512E-05 | 1.96512E-05 | 1.96510E-05 |
| NDE | Quade | 6.84588E-01 | 1.0 | 1.0 | 9.81577E-01 |
| **Table S74** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 8.26099E-01 | 1.0 | 1.0 | 9.97654E-01 |
| IJAYA | Friedman Aligned | 8.17591E-01 | 1.0 | 1.0 | 9.97233E-01 |
| IJAYA | Quade | 9.26311E-01 | 1.0 | 1.0 | 9.99880E-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 S75.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 2.82885E-13 | 2.82885E-13 | 2.82885E-13 | 2.82885E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 3.19021E-02 | 1.18526E-01 | 1.18526E-01 | 1.12824E-01 |
| GOTLBO | Friedman | 3.53606E-13 | 6.52811E-13 | 6.52811E-13 | 6.52811E-13 |
| GOTLBO | Friedman Aligned | 2.87605E-10 | 1.06193E-09 | 1.06193E-09 | 1.06193E-09 |
| GOTLBO | Quade | 3.16479E-02 | 1.10636E-01 | 1.05998E-01 | 1.05349E-01 |
| NNA | Friedman | 2.63833E-12 | 6.69731E-12 | 6.69731E-12 | 6.69731E-12 |
| NNA | Friedman Aligned | 4.20856E-09 | 1.45681E-08 | 1.45681E-08 | 1.45681E-08 |
| NNA | Quade | 3.16479E-02 | 1.10636E-01 | 1.05998E-01 | 1.05349E-01 |
| MABC | Friedman | 3.12516E-11 | 9.61586E-11 | 9.61586E-11 | 9.61586E-11 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 1.54402E-02 | 3.94292E-02 | 3.94292E-02 | 3.87301E-02 |
| WW | Friedman | 8.01828E-11 | 2.77556E-10 | 2.77556E-10 | 2.77556E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 1.54402E-02 | 4.15868E-02 | 4.15868E-02 | 4.08171E-02 |
| NDE | Friedman | 1.83881E-10 | 6.78945E-10 | 6.78945E-10 | 6.78945E-10 |
| NDE | Friedman Aligned | 4.73813E-09 | 1.45789E-08 | 1.45789E-08 | 1.45789E-08 |
| NDE | Quade | 3.16479E-02 | 1.18446E-01 | 1.18446E-01 | 1.12600E-01 |
| CWOA | Friedman | 2.39580E-10 | 9.03031E-10 | 9.03031E-10 | 9.03031E-10 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.49768E-02 | 2.78262E-02 | 2.78262E-02 | 2.74741E-02 |
| PSO | Friedman | 2.21287E-09 | 8.17061E-09 | 8.17061E-09 | 8.17061E-09 |
| PSO | Friedman Aligned | 4.91679E-11 | 1.85325E-10 | 1.85325E-10 | 1.85325E-10 |
| PSO | Quade | 9.54010E-03 | 9.58237E-03 | 9.58237E-03 | 9.54010E-03 |
| **Table S75** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 2.50012E-08 | 8.65425E-08 | 8.65425E-08 | 8.65425E-08 |
| IJAYA | Friedman Aligned | 9.85286E-13 | 3.63798E-12 | 3.63798E-12 | 3.63798E-12 |
| IJAYA | Quade | 1.03731E-01 | 3.65075E-01 | 3.65075E-01 | 3.15515E-01 |
| DE | Friedman | 1.88313E-07 | 5.79424E-07 | 5.79424E-07 | 5.79424E-07 |
| DE | Friedman Aligned | <1E-13 | 2.51799E-13 | 2.51799E-13 | 2.51799E-13 |
| DE | Quade | 1.44238E-01 | 4.51670E-01 | 4.51670E-01 | 3.80764E-01 |
| TLBO | Friedman | 8.79380E-02 | 2.24791E-01 | 2.24791E-01 | 2.08368E-01 |
| TLBO | Friedman Aligned | 1.36519E-03 | 3.46585E-03 | 3.46585E-03 | 3.46185E-03 |
| TLBO | Quade | 6.31532E-01 | 1.0 | 1.0 | 9.20691E-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 S76.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 1.54143E-12 | 1.54143E-12 | 1.54143E-12 | 1.54143E-12 |
| ISCA | Friedman Aligned | 6.19721E-09 | 2.14519E-08 | 2.14519E-08 | 2.14519E-08 |
| ISCA | Quade | 1.33574E-02 | 4.94471E-02 | 4.94471E-02 | 4.84395E-02 |
| NDE | Friedman | 1.23935E-11 | 2.57512E-11 | 2.57512E-11 | 2.57512E-11 |
| NDE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NDE | Quade | 1.28596E-02 | 4.86156E-02 | 4.86156E-02 | 4.76143E-02 |
| GOTLBO | Friedman | 1.23935E-11 | 2.28804E-11 | 2.28804E-11 | 2.28804E-11 |
| GOTLBO | Friedman Aligned | 7.46673E-09 | 2.29745E-08 | 2.29745E-08 | 2.29745E-08 |
| GOTLBO | Quade | 1.26457E-02 | 4.39450E-02 | 4.24241E-02 | 4.30964E-02 |
| NNA | Friedman | 4.65187E-11 | 1.43134E-10 | 1.43134E-10 | 1.43134E-10 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.26457E-02 | 4.39450E-02 | 4.24241E-02 | 4.30964E-02 |
| MABC | Friedman | 3.75683E-10 | 1.30044E-09 | 1.30044E-09 | 1.30044E-09 |
| MABC | Friedman Aligned | 2.94570E-11 | 1.01966E-10 | 1.01966E-10 | 1.01966E-10 |
| MABC | Quade | 5.47342E-03 | 1.39234E-02 | 1.39234E-02 | 1.38356E-02 |
| WW | Friedman | 8.36500E-10 | 3.08861E-09 | 3.08861E-09 | 3.08861E-09 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 5.47342E-03 | 1.48853E-02 | 1.48853E-02 | 1.47860E-02 |
| IJAYA | Friedman | 1.35369E-09 | 5.10235E-09 | 5.10235E-09 | 5.10235E-09 |
| IJAYA | Friedman Aligned | 2.63984E-09 | 9.74710E-09 | 9.74710E-09 | 9.74710E-09 |
| IJAYA | Quade | 5.07250E-02 | 1.76988E-01 | 1.76988E-01 | 1.64894E-01 |
| CWOA | Friedman | 2.10865E-09 | 7.78579E-09 | 7.78579E-09 | 7.78579E-09 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 5.10914E-03 | 9.45270E-03 | 9.45270E-03 | 9.41186E-03 |
| **Table S76** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.08138E-08 | 3.74326E-08 | 3.74326E-08 | 3.74326E-08 |
| DE | Friedman Aligned | 5.65963E-10 | 2.13325E-09 | 2.13325E-09 | 2.13325E-09 |
| DE | Quade | 7.46403E-02 | 2.31704E-01 | 2.31704E-01 | 2.12337E-01 |
| PSO | Friedman | 1.25898E-08 | 3.87379E-08 | 3.87379E-08 | 3.87379E-08 |
| PSO | Friedman Aligned | 1.07413E-10 | 3.96600E-10 | 3.96600E-10 | 3.96600E-10 |
| PSO | Quade | 2.95239E-03 | 2.95642E-03 | 2.95642E-03 | 2.95239E-03 |
| TLBO | Friedman | 2.48488E-02 | 6.31994E-02 | 6.31994E-02 | 6.18773E-02 |
| TLBO | Friedman Aligned | 1.59818E-06 | 4.05692E-06 | 4.05692E-06 | 4.05691E-06 |
| TLBO | Quade | 4.31217E-01 | 1.0 | 9.40692E-01 | 7.61251E-01 |
| EBLSHADE | Friedman | 6.28359E-01 | 1.0 | 7.46914E-01 | 8.39165E-01 |
| EBLSHADE | Friedman Aligned | 1.22462E-01 | 2.27198E-01 | 2.27198E-01 | 2.14293E-01 |
| EBLSHADE | Quade | 7.82837E-01 | 1.0 | 9.40692E-01 | 9.40351E-01 |
| STLBO | Friedman | 7.46914E-01 | 1.0 | 7.46914E-01 | 8.39165E-01 |
| STLBO | Friedman Aligned | 9.97806E-01 | 9.97806E-01 | 9.97806E-01 | 9.97806E-01 |
| STLBO | Quade | 9.40692E-01 | 1.0 | 9.40692E-01 | 9.40692E-01 |

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| --- | --- | --- | --- | --- | --- |
| **Table S77.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 7.80942E-03 | 7.83771E-03 | 7.83771E-03 | 7.80942E-03 |
| PSO | Friedman Aligned | 2.30926E-13 | 2.30926E-13 | 2.30926E-13 | 2.30926E-13 |
| PSO | Quade | 9.93803E-01 | 1.0 | 1.0 | 9.93803E-01 |
| CWOA | Friedman | 2.45863E-02 | 4.58695E-02 | 4.58695E-02 | 4.49174E-02 |
| CWOA | Friedman Aligned | 6.34585E-04 | 1.61126E-03 | 1.61126E-03 | 1.61008E-03 |
| CWOA | Quade | 9.93803E-01 | 1.0 | 1.0 | 9.99812E-01 |
| WW | Friedman | 3.91395E-02 | 1.00885E-01 | 1.00885E-01 | 9.63840E-02 |
| WW | Friedman Aligned | 5.71982E-01 | 1.0 | 1.0 | 9.26542E-01 |
| WW | Quade | 9.93803E-01 | 1.0 | 1.0 | 9.99958E-01 |
| MABC | Friedman | 5.36610E-02 | 1.68274E-01 | 1.68274E-01 | 1.56087E-01 |
| MABC | Friedman Aligned | 1.94364E-05 | 3.58829E-05 | 3.58829E-05 | 3.58823E-05 |
| MABC | Quade | 9.93803E-01 | 1.0 | 1.0 | 9.99958E-01 |
| NNA | Friedman | 1.31625E-01 | 4.75511E-01 | 4.75511E-01 | 3.86475E-01 |
| NNA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Quade | 9.97994E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 2.26749E-01 | 8.95302E-01 | 8.95302E-01 | 6.13059E-01 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 9.97994E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 4.01459E-01 | 1.0 | 1.0 | 8.55518E-01 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | 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 |
| **Table S77** (*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 |
| 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 S78.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.90021E-01 | 1.0 | 1.0 | 9.90021E-01 |
| PSO | Friedman Aligned | 1.47252E-02 | 1.48262E-02 | 1.48262E-02 | 1.47252E-02 |
| PSO | Quade | 9.99998E-01 | 1.0 | 1.0 | 9.99998E-01 |
| CWOA | Friedman | 9.98002E-01 | 1.0 | 1.0 | 9.99990E-01 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.99533E-01 | 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 |
| 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 |
| 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 S78** (*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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S79.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 4.24327E-13 | 4.24327E-13 | 4.24327E-13 | 4.24327E-13 |
| CWOA | Friedman Aligned | 1.58213E-08 | 5.84171E-08 | 5.84171E-08 | 5.84171E-08 |
| CWOA | Quade | 8.27070E-02 | 1.58322E-01 | 1.58322E-01 | 1.47324E-01 |
| PSO | Friedman | 5.47007E-13 | 1.00986E-12 | 1.00986E-12 | 1.00986E-12 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.29272E-02 | 6.48321E-02 | 6.48321E-02 | 6.29272E-02 |
| WW | Friedman | 1.17580E-12 | 2.98472E-12 | 2.98472E-12 | 2.98472E-12 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 8.27070E-02 | 2.15423E-01 | 2.15423E-01 | 1.95696E-01 |
| MABC | Friedman | 4.19564E-12 | 1.29097E-11 | 1.29097E-11 | 1.29097E-11 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 8.27070E-02 | 2.09263E-01 | 2.09263E-01 | 1.90452E-01 |
| NNA | Friedman | 7.84642E-11 | 2.71607E-10 | 2.71607E-10 | 2.71607E-10 |
| NNA | Friedman Aligned | 2.47028E-10 | 9.12102E-10 | 9.12102E-10 | 9.12102E-10 |
| NNA | Quade | 1.31675E-01 | 4.75701E-01 | 4.49624E-01 | 3.86597E-01 |
| GOTLBO | Friedman | 6.36465E-10 | 2.35003E-09 | 2.35003E-09 | 2.35003E-09 |
| GOTLBO | Friedman Aligned | 2.11298E-13 | 7.31415E-13 | 7.31415E-13 | 7.31415E-13 |
| GOTLBO | Quade | 1.31675E-01 | 4.75701E-01 | 4.49624E-01 | 3.86597E-01 |
| ISCA | Friedman | 7.32203E-09 | 2.75984E-08 | 2.75984E-08 | 2.75984E-08 |
| ISCA | Friedman Aligned | <1E-13 | 2.62013E-13 | 2.62013E-13 | 2.62013E-13 |
| ISCA | Quade | 1.31675E-01 | 4.80357E-01 | 4.66941E-01 | 3.92032E-01 |
| NDE | Friedman | 3.81094E-06 | 1.40712E-05 | 1.40712E-05 | 1.40711E-05 |
| NDE | Friedman Aligned | 3.64961E-10 | 1.37562E-09 | 1.37562E-09 | 1.37562E-09 |
| NDE | Quade | 1.31675E-01 | 4.80357E-01 | 4.66941E-01 | 3.92032E-01 |
| **Table S79** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.63384E-04 | 5.65573E-04 | 5.65573E-04 | 5.65445E-04 |
| IJAYA | Friedman Aligned | 3.87465E-07 | 1.34123E-06 | 1.34123E-06 | 1.34123E-06 |
| IJAYA | Quade | 3.02189E-01 | 1.0 | 1.0 | 7.12198E-01 |
| DE | Friedman | 6.56389E-04 | 2.01981E-03 | 2.01981E-03 | 2.01828E-03 |
| DE | Friedman Aligned | 2.66423E-06 | 8.19762E-06 | 8.19762E-06 | 8.19760E-06 |
| DE | Quade | 3.81323E-01 | 1.0 | 1.0 | 7.71781E-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 S80.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 5.86488E-01 | 8.53743E-01 | 8.53743E-01 | 5.86488E-01 |
| PSO | Friedman Aligned | 8.81758E-10 | 8.81758E-10 | 8.81758E-10 | 8.81758E-10 |
| PSO | Quade | 9.97484E-01 | 1.0 | 1.0 | 9.97484E-01 |
| CWOA | Friedman | 7.51157E-01 | 1.0 | 1.0 | 9.23302E-01 |
| CWOA | Friedman Aligned | 1.22647E-06 | 3.11335E-06 | 3.11335E-06 | 3.11335E-06 |
| CWOA | Quade | 9.97484E-01 | 1.0 | 1.0 | 9.99959E-01 |
| WW | Friedman | 7.99268E-01 | 1.0 | 1.0 | 9.83028E-01 |
| WW | Friedman Aligned | 3.57471E-02 | 1.11380E-01 | 1.11380E-01 | 1.05960E-01 |
| WW | Quade | 9.97484E-01 | 1.0 | 1.0 | 9.99994E-01 |
| MABC | Friedman | 8.32806E-01 | 1.0 | 1.0 | 9.95927E-01 |
| MABC | Friedman Aligned | 1.26421E-08 | 2.33393E-08 | 2.33393E-08 | 2.33393E-08 |
| MABC | Quade | 9.97484E-01 | 1.0 | 1.0 | 9.99994E-01 |
| NNA | Friedman | 9.66409E-01 | 1.0 | 1.0 | 9.99992E-01 |
| NNA | Friedman Aligned | 4.19070E-01 | 1.0 | 1.0 | 8.65391E-01 |
| NNA | Quade | 9.99955E-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 |
| **Table S80** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 4.05106E-01 | 1.0 | 1.0 | 8.34341E-01 |
| 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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S81.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 1.84741E-13 | 1.84741E-13 | 1.84741E-13 | 1.84741E-13 |
| ISCA | Friedman Aligned | 6.16534E-09 | 2.13416E-08 | 2.13416E-08 | 2.13416E-08 |
| ISCA | Quade | 1.65864E-02 | 6.14388E-02 | 6.14388E-02 | 5.98873E-02 |
| GOTLBO | Friedman | 1.50679E-12 | 2.78177E-12 | 2.78177E-12 | 2.78177E-12 |
| GOTLBO | Friedman Aligned | 7.42973E-09 | 2.28607E-08 | 2.28607E-08 | 2.28607E-08 |
| GOTLBO | Quade | 1.58830E-02 | 5.52505E-02 | 5.32410E-02 | 5.39130E-02 |
| NNA | Friedman | 9.56997E-12 | 2.42930E-11 | 2.42930E-11 | 2.42930E-11 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.58830E-02 | 5.52505E-02 | 5.32410E-02 | 5.39130E-02 |
| NDE | Friedman | 7.10301E-11 | 2.18554E-10 | 2.18554E-10 | 2.18554E-10 |
| NDE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NDE | Quade | 1.60291E-02 | 6.06427E-02 | 6.06427E-02 | 5.90891E-02 |
| MABC | Friedman | 7.53190E-11 | 2.60719E-10 | 2.60719E-10 | 2.60719E-10 |
| MABC | Friedman Aligned | 2.94091E-11 | 1.01801E-10 | 1.01801E-10 | 1.01801E-10 |
| MABC | Quade | 7.07439E-03 | 1.80071E-02 | 1.80071E-02 | 1.78605E-02 |
| WW | Friedman | 1.86658E-10 | 6.89200E-10 | 6.89200E-10 | 6.89200E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 7.07439E-03 | 1.91887E-02 | 1.91887E-02 | 1.90239E-02 |
| CWOA | Friedman | 6.11462E-10 | 2.30474E-09 | 2.30474E-09 | 2.30474E-09 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 6.66498E-03 | 1.23394E-02 | 1.23394E-02 | 1.22699E-02 |
| PSO | Friedman | 4.89640E-09 | 1.80790E-08 | 1.80790E-08 | 1.80790E-08 |
| PSO | Friedman Aligned | 1.07310E-10 | 3.96220E-10 | 3.96220E-10 | 3.96220E-10 |
| PSO | Quade | 3.94226E-03 | 3.94945E-03 | 3.94945E-03 | 3.94226E-03 |
| **Table S81** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 7.58306E-09 | 2.62490E-08 | 2.62490E-08 | 2.62490E-08 |
| IJAYA | Friedman Aligned | 2.61112E-09 | 9.64106E-09 | 9.64106E-09 | 9.64106E-09 |
| IJAYA | Quade | 6.06906E-02 | 2.12098E-01 | 2.12098E-01 | 1.94851E-01 |
| DE | Friedman | 6.24243E-08 | 1.92075E-07 | 1.92075E-07 | 1.92075E-07 |
| DE | Friedman Aligned | 5.59014E-10 | 2.10705E-09 | 2.10705E-09 | 2.10705E-09 |
| DE | Quade | 8.80902E-02 | 2.73906E-01 | 2.73906E-01 | 2.47035E-01 |
| TLBO | Friedman | 5.55943E-02 | 1.41741E-01 | 1.41741E-01 | 1.35150E-01 |
| TLBO | Friedman Aligned | 1.62041E-06 | 4.11334E-06 | 4.11334E-06 | 4.11334E-06 |
| TLBO | Quade | 4.76082E-01 | 1.0 | 1.0 | 8.06197E-01 |
| EBLSHADE | Friedman | 8.61718E-01 | 1.0 | 1.0 | 9.74075E-01 |
| EBLSHADE | Friedman Aligned | 1.23136E-01 | 2.28456E-01 | 2.28456E-01 | 2.15408E-01 |
| EBLSHADE | Quade | 8.37323E-01 | 1.0 | 1.0 | 9.65006E-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 S82.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *R*p2 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 S82** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S83.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 2.31344E-04 | 2.31368E-04 | 2.31368E-04 | 2.31344E-04 |
| PSO | Friedman Aligned | 6.11085E-09 | 1.55122E-08 | 1.55122E-08 | 1.55122E-08 |
| PSO | Quade | 7.91155E-01 | 1.0 | 1.0 | 7.91155E-01 |
| CWOA | Friedman | 1.13512E-03 | 2.09662E-03 | 2.09662E-03 | 2.09461E-03 |
| CWOA | Friedman Aligned | 9.81437E-13 | 9.81437E-13 | 9.81437E-13 | 9.81437E-13 |
| CWOA | Quade | 7.91155E-01 | 1.0 | 1.0 | 9.40998E-01 |
| WW | Friedman | 2.28574E-03 | 5.80737E-03 | 5.80737E-03 | 5.79207E-03 |
| WW | Friedman Aligned | 1.00298E-07 | 3.08611E-07 | 3.08611E-07 | 3.08611E-07 |
| WW | Quade | 7.91155E-01 | 1.0 | 1.0 | 9.65039E-01 |
| MABC | Friedman | 3.73238E-03 | 1.14991E-02 | 1.14991E-02 | 1.14398E-02 |
| MABC | Friedman Aligned | 1.20086E-10 | 2.21697E-10 | 2.21697E-10 | 2.21697E-10 |
| MABC | Quade | 7.91155E-01 | 1.0 | 1.0 | 9.65039E-01 |
| NNA | Friedman | 1.33622E-02 | 4.64453E-02 | 4.64453E-02 | 4.54980E-02 |
| NNA | Friedman Aligned | 5.19667E-05 | 1.91880E-04 | 1.91880E-04 | 1.91864E-04 |
| NNA | Quade | 8.14745E-01 | 1.0 | 1.0 | 9.97080E-01 |
| GOTLBO | Friedman | 3.06760E-02 | 1.14216E-01 | 1.14216E-01 | 1.08668E-01 |
| GOTLBO | Friedman Aligned | 4.97230E-03 | 1.87633E-02 | 1.87633E-02 | 1.86131E-02 |
| GOTLBO | Quade | 8.14745E-01 | 1.0 | 1.0 | 9.97080E-01 |
| ISCA | Friedman | 7.68884E-02 | 2.95155E-01 | 2.95155E-01 | 2.60335E-01 |
| ISCA | Friedman Aligned | 7.23856E-03 | 2.67643E-02 | 2.67643E-02 | 2.64676E-02 |
| ISCA | Quade | 8.14745E-01 | 1.0 | 1.0 | 9.97080E-01 |
| NDE | Friedman | 5.51498E-01 | 1.0 | 1.0 | 9.48214E-01 |
| NDE | Friedman Aligned | 3.71045E-05 | 1.28440E-04 | 1.28440E-04 | 1.28433E-04 |
| NDE | Quade | 8.14745E-01 | 1.0 | 1.0 | 9.97080E-01 |
| **Table S83** (*continued*) | | | | | |
| 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 |
| 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 S84.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 2.69676E-01 | 3.10499E-01 | 3.10499E-01 | 2.69676E-01 |
| PSO | Friedman Aligned | 1.90081E-09 | 1.90081E-09 | 1.90081E-09 | 1.90081E-09 |
| PSO | Quade | 9.89623E-01 | 1.0 | 1.0 | 9.89623E-01 |
| CWOA | Friedman | 4.39552E-01 | 1.0 | 1.0 | 6.56634E-01 |
| CWOA | Friedman Aligned | 5.21440E-07 | 1.32366E-06 | 1.32366E-06 | 1.32366E-06 |
| CWOA | Quade | 9.89623E-01 | 1.0 | 1.0 | 9.99557E-01 |
| WW | Friedman | 5.09275E-01 | 1.0 | 1.0 | 8.35864E-01 |
| WW | Friedman Aligned | 2.25658E-02 | 6.99826E-02 | 6.99826E-02 | 6.78193E-02 |
| WW | Quade | 9.89623E-01 | 1.0 | 1.0 | 9.99883E-01 |
| MABC | Friedman | 5.59198E-01 | 1.0 | 1.0 | 9.19580E-01 |
| MABC | Friedman Aligned | 4.73291E-09 | 8.73769E-09 | 8.73769E-09 | 8.73769E-09 |
| MABC | Quade | 9.89623E-01 | 1.0 | 1.0 | 9.99883E-01 |
| NNA | Friedman | 7.82941E-01 | 1.0 | 1.0 | 9.94947E-01 |
| NNA | Friedman Aligned | 3.27655E-01 | 1.0 | 1.0 | 7.69104E-01 |
| NNA | Quade | 9.94298E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 9.12830E-01 | 1.0 | 1.0 | 9.99878E-01 |
| GOTLBO | Friedman Aligned | 9.78655E-01 | 1.0 | 1.0 | 9.99999E-01 |
| GOTLBO | Quade | 9.94298E-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 S84** (*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 | 3.13388E-01 | 1.0 | 1.0 | 7.27874E-01 |
| NDE | Quade | 9.96741E-01 | 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 S85.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 8.48601E-01 | 1.0 | 1.0 | 8.48601E-01 |
| PSO | Friedman Aligned | 4.90719E-13 | 4.90719E-13 | 4.90719E-13 | 4.90719E-13 |
| PSO | Quade | 9.98135E-01 | 1.0 | 1.0 | 9.98135E-01 |
| CWOA | Friedman | 9.32174E-01 | 1.0 | 1.0 | 9.93041E-01 |
| CWOA | Friedman Aligned | 3.95822E-04 | 1.00493E-03 | 1.00493E-03 | 1.00447E-03 |
| CWOA | Quade | 9.98135E-01 | 1.0 | 1.0 | 9.99976E-01 |
| WW | Friedman | 9.51791E-01 | 1.0 | 1.0 | 9.99546E-01 |
| WW | Friedman Aligned | 4.91869E-01 | 1.0 | 1.0 | 8.75460E-01 |
| WW | Quade | 9.98135E-01 | 1.0 | 1.0 | 9.99997E-01 |
| MABC | Friedman | 9.66929E-01 | 1.0 | 1.0 | 9.99972E-01 |
| MABC | Friedman Aligned | 1.10045E-05 | 2.03160E-05 | 2.03160E-05 | 2.03159E-05 |
| MABC | Quade | 9.98135E-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 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 9.97980E-01 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table S85** (*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 | 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S86.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.99991E-01 | 1.0 | 1.0 | 9.99991E-01 |
| PSO | Friedman Aligned | 4.75831E-04 | 4.75935E-04 | 4.75935E-04 | 4.75831E-04 |
| PSO | 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 | 9.56126E-01 | 1.0 | 1.0 | 9.96886E-01 |
| 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 S86** (*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 |
| 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 S87.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *R*p2 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.98940E-01 | 1.0 | 1.0 | 9.98940E-01 |
| PSO | Friedman Aligned | 2.50197E-10 | 2.50197E-10 | 2.50197E-10 | 2.50197E-10 |
| PSO | Quade | 9.99995E-01 | 1.0 | 1.0 | 9.99995E-01 |
| CWOA | Friedman | 9.99937E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 4.02222E-02 | 1.03720E-01 | 1.03720E-01 | 9.89662E-02 |
| CWOA | Quade | 9.99997E-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 | 3.37036E-03 | 6.23109E-03 | 6.23109E-03 | 6.21332E-03 |
| MABC | Quade | 9.99999E-01 | 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 S87** (*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 |
| 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 |

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| **Table S88.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.65316E-06 | 1.65316E-06 | 1.65316E-06 | 1.65316E-06 |
| PSO | Friedman Aligned | 1.53731E-10 | 5.67622E-10 | 5.67622E-10 | 5.67622E-10 |
| PSO | Quade | 3.88398E-01 | 4.82491E-01 | 4.82491E-01 | 3.88398E-01 |
| GOTLBO | Friedman | 8.93210E-06 | 1.64901E-05 | 1.64901E-05 | 1.64900E-05 |
| GOTLBO | Friedman Aligned | 4.73962E-11 | 1.45834E-10 | 1.45834E-10 | 1.45834E-10 |
| GOTLBO | Quade | 4.90459E-01 | 1.0 | 1.0 | 7.11990E-01 |
| CWOA | Friedman | 1.88793E-04 | 4.79278E-04 | 4.79278E-04 | 4.79174E-04 |
| CWOA | Friedman Aligned | 7.33780E-11 | 2.54001E-10 | 2.54001E-10 | 2.54001E-10 |
| CWOA | Quade | 4.90459E-01 | 1.0 | 1.0 | 7.11990E-01 |
| NNA | Friedman | 2.35379E-04 | 7.24303E-04 | 7.24303E-04 | 7.24067E-04 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 4.90459E-01 | 1.0 | 1.0 | 8.02179E-01 |
| ISCA | Friedman | 2.53779E-04 | 8.78536E-04 | 8.78536E-04 | 8.78193E-04 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 4.90459E-01 | 1.0 | 1.0 | 8.02179E-01 |
| WW | Friedman | 2.94224E-03 | 1.08723E-02 | 1.08723E-02 | 1.08207E-02 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 4.90459E-01 | 1.0 | 1.0 | 8.86478E-01 |
| MABC | Friedman | 7.26555E-02 | 2.78617E-01 | 2.78617E-01 | 2.47469E-01 |
| MABC | Friedman Aligned | 6.49287E-08 | 2.44731E-07 | 2.44731E-07 | 2.44731E-07 |
| MABC | Quade | 7.38143E-01 | 1.0 | 1.0 | 9.93595E-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 |
| **Table S88** (*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 S89.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 1.34914E-10 | 4.67010E-10 | 4.67010E-10 | 4.67010E-10 |
| GOTLBO | Quade | 2.01733E-03 | 3.72749E-03 | 3.62027E-03 | 3.72113E-03 |
| MABC | Friedman | 5.02265E-13 | 9.27258E-13 | 9.27258E-13 | 9.27258E-13 |
| MABC | Friedman Aligned | 4.27647E-12 | 7.89502E-12 | 7.89502E-12 | 7.89502E-12 |
| MABC | Quade | 1.69013E-02 | 6.39553E-02 | 6.39553E-02 | 6.22288E-02 |
| WW | Friedman | 3.31974E-10 | 8.42703E-10 | 8.42703E-10 | 8.42703E-10 |
| WW | Friedman Aligned | 5.25791E-11 | 1.33470E-10 | 1.33470E-10 | 1.33470E-10 |
| WW | Quade | 3.73309E-03 | 1.37976E-02 | 1.37976E-02 | 1.37146E-02 |
| PSO | Friedman | 5.31136E-10 | 1.63426E-09 | 1.63426E-09 | 1.63426E-09 |
| PSO | Friedman Aligned | 2.13919E-10 | 8.06309E-10 | 8.06309E-10 | 8.06309E-10 |
| PSO | Quade | 6.98330E-04 | 6.98555E-04 | 6.98555E-04 | 6.98330E-04 |
| DE | Friedman | 3.19170E-09 | 1.10482E-08 | 1.10482E-08 | 1.10482E-08 |
| DE | Friedman Aligned | 5.47403E-03 | 2.02331E-02 | 2.02331E-02 | 2.00633E-02 |
| DE | Quade | 8.10275E-02 | 3.04024E-01 | 3.04024E-01 | 2.68016E-01 |
| ISCA | Friedman | 3.57233E-09 | 1.31901E-08 | 1.31901E-08 | 1.31901E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.22682E-03 | 6.90912E-03 | 6.90912E-03 | 6.88795E-03 |
| NNA | Friedman | 4.05858E-09 | 1.52977E-08 | 1.52977E-08 | 1.52977E-08 |
| NNA | Friedman Aligned | 5.32343E-11 | 1.63798E-10 | 1.63798E-10 | 1.63798E-10 |
| NNA | Quade | 2.22682E-03 | 6.85703E-03 | 6.85703E-03 | 6.83591E-03 |
| CWOA | Friedman | 5.60543E-09 | 2.06970E-08 | 2.06970E-08 | 2.06970E-08 |
| CWOA | Friedman Aligned | 1.69719E-10 | 6.26656E-10 | 6.26656E-10 | 6.26656E-10 |
| CWOA | Quade | 2.01733E-03 | 3.72749E-03 | 3.62027E-03 | 3.72113E-03 |
| **Table S89** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 3.52483E-08 | 1.22013E-07 | 1.22013E-07 | 1.22013E-07 |
| IJAYA | Friedman Aligned | 1.53493E-02 | 5.32586E-02 | 5.32586E-02 | 5.21360E-02 |
| IJAYA | Quade | 1.15779E-01 | 4.08298E-01 | 4.08298E-01 | 3.46842E-01 |
| NDE | Friedman | 3.42808E-06 | 1.05479E-05 | 1.05479E-05 | 1.05479E-05 |
| NDE | Friedman Aligned | 1.43525E-01 | 4.49397E-01 | 4.49397E-01 | 3.79176E-01 |
| NDE | Quade | 1.41545E-01 | 4.43086E-01 | 4.43086E-01 | 3.74750E-01 |
| TLBO | Friedman | 8.34811E-02 | 2.13320E-01 | 2.13320E-01 | 1.98511E-01 |
| TLBO | Friedman Aligned | 7.63709E-01 | 1.0 | 1.0 | 9.74324E-01 |
| TLBO | Quade | 5.70319E-01 | 1.0 | 9.87681E-01 | 8.82846E-01 |
| EBLSHADE | Friedman | 8.44298E-01 | 1.0 | 8.29657E-01 | 9.67726E-01 |
| EBLSHADE | Friedman Aligned | 8.82085E-01 | 1.0 | 1.0 | 9.80682E-01 |
| EBLSHADE | Quade | 9.74027E-01 | 1.0 | 9.87681E-01 | 9.98817E-01 |
| STLBO | Friedman | 8.44298E-01 | 1.0 | 8.29657E-01 | 9.67726E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 9.87681E-01 | 1.0 | 9.87681E-01 | 9.98817E-01 |

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| --- | --- | --- | --- | --- | --- |
| **Table S90.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 1.26962E-10 | 4.39482E-10 | 4.39482E-10 | 4.39482E-10 |
| GOTLBO | Quade | 2.37937E-03 | 4.39710E-03 | 4.26800E-03 | 4.38825E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | 2.13792E-10 | 8.05830E-10 | 8.05830E-10 | 8.05830E-10 |
| PSO | Quade | 8.38441E-04 | 8.38765E-04 | 8.38765E-04 | 8.38441E-04 |
| MABC | Friedman | <1E-13 | 1.83187E-13 | 1.83187E-13 | 1.83187E-13 |
| MABC | Friedman Aligned | 1.31339E-12 | 2.42473E-12 | 2.42473E-12 | 2.42473E-12 |
| MABC | Quade | 1.91431E-02 | 7.24764E-02 | 7.24764E-02 | 7.02637E-02 |
| WW | Friedman | 7.79167E-11 | 2.39744E-10 | 2.39744E-10 | 2.39744E-10 |
| WW | Friedman Aligned | 4.75574E-11 | 1.20723E-10 | 1.20723E-10 | 1.20723E-10 |
| WW | Quade | 4.31959E-03 | 1.59678E-02 | 1.59678E-02 | 1.58567E-02 |
| ISCA | Friedman | 1.68524E-09 | 5.83353E-09 | 5.83353E-09 | 5.83353E-09 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.60407E-03 | 8.07052E-03 | 8.07052E-03 | 8.04163E-03 |
| NNA | Friedman | 1.89918E-09 | 7.01236E-09 | 7.01236E-09 | 7.01236E-09 |
| NNA | Friedman Aligned | 4.85501E-11 | 1.49385E-10 | 1.49385E-10 | 1.49385E-10 |
| NNA | Quade | 2.60407E-03 | 8.01975E-03 | 8.01975E-03 | 7.99087E-03 |
| CWOA | Friedman | 2.65354E-09 | 1.00018E-08 | 1.00018E-08 | 1.00018E-08 |
| CWOA | Friedman Aligned | 1.61977E-10 | 5.98069E-10 | 5.98069E-10 | 5.98069E-10 |
| CWOA | Quade | 2.37937E-03 | 4.39710E-03 | 4.26800E-03 | 4.38825E-03 |
| DE | Friedman | 7.94319E-09 | 2.93287E-08 | 2.93287E-08 | 2.93287E-08 |
| DE | Friedman Aligned | 9.47613E-03 | 3.50528E-02 | 3.50528E-02 | 3.45449E-02 |
| DE | Quade | 8.93754E-02 | 3.35921E-01 | 3.35921E-01 | 2.92269E-01 |
| **Table S90** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.23860E-07 | 4.28745E-07 | 4.28745E-07 | 4.28745E-07 |
| IJAYA | Friedman Aligned | 2.49893E-02 | 8.68378E-02 | 8.68378E-02 | 8.38734E-02 |
| IJAYA | Quade | 1.26669E-01 | 4.47523E-01 | 4.47523E-01 | 3.74268E-01 |
| NDE | Friedman | 1.01613E-05 | 3.12657E-05 | 3.12657E-05 | 3.12654E-05 |
| NDE | Friedman Aligned | 2.00048E-01 | 6.31055E-01 | 6.31055E-01 | 4.96806E-01 |
| NDE | Quade | 1.54053E-01 | 4.83018E-01 | 4.83018E-01 | 4.02358E-01 |
| TLBO | Friedman | 1.34018E-01 | 3.43902E-01 | 3.43902E-01 | 3.05986E-01 |
| TLBO | Friedman Aligned | 8.84270E-01 | 1.0 | 1.0 | 9.95806E-01 |
| TLBO | Quade | 5.99326E-01 | 1.0 | 1.0 | 9.01893E-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 S91.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.61989E-10 | 3.61989E-10 | 3.61989E-10 | 3.61989E-10 |
| PSO | Friedman Aligned | 1.81743E-10 | 6.85032E-10 | 6.85032E-10 | 6.85032E-10 |
| PSO | Quade | 1.73209E-01 | 1.88818E-01 | 1.88818E-01 | 1.73209E-01 |
| GOTLBO | Friedman | 3.50712E-09 | 6.47468E-09 | 6.47468E-09 | 6.47468E-09 |
| GOTLBO | Friedman Aligned | 7.27926E-11 | 2.51974E-10 | 2.51974E-10 | 2.51974E-10 |
| GOTLBO | Quade | 2.54954E-01 | 5.31222E-01 | 5.04676E-01 | 4.19195E-01 |
| CWOA | Friedman | 1.94580E-07 | 4.93934E-07 | 4.93934E-07 | 4.93934E-07 |
| CWOA | Friedman Aligned | 1.03934E-10 | 3.83757E-10 | 3.83757E-10 | 3.83757E-10 |
| CWOA | Quade | 2.54954E-01 | 5.31222E-01 | 5.04676E-01 | 4.19195E-01 |
| NNA | Friedman | 2.78684E-07 | 8.57490E-07 | 8.57490E-07 | 8.57490E-07 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 2.54954E-01 | 7.17822E-01 | 6.91359E-01 | 5.25213E-01 |
| ISCA | Friedman | 3.30631E-07 | 1.14449E-06 | 1.14449E-06 | 1.14449E-06 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.54954E-01 | 7.17822E-01 | 6.91359E-01 | 5.25213E-01 |
| WW | Friedman | 9.61871E-06 | 3.55153E-05 | 3.55153E-05 | 3.55148E-05 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 2.54954E-01 | 9.90015E-01 | 9.90015E-01 | 6.52450E-01 |
| MABC | Friedman | 1.07108E-03 | 4.03815E-03 | 4.03815E-03 | 4.03117E-03 |
| MABC | Friedman Aligned | 2.42220E-11 | 7.45293E-11 | 7.45293E-11 | 7.45293E-11 |
| MABC | Quade | 4.99948E-01 | 1.0 | 1.0 | 9.26630E-01 |
| DE | Friedman | 2.54875E-01 | 9.93629E-01 | 9.93629E-01 | 6.62534E-01 |
| DE | Friedman Aligned | 2.74197E-01 | 1.0 | 1.0 | 6.93733E-01 |
| DE | Quade | 8.73049E-01 | 1.0 | 1.0 | 9.99510E-01 |
| **Table S91** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 4.94513E-01 | 1.0 | 1.0 | 9.05728E-01 |
| IJAYA | Friedman Aligned | 4.44005E-01 | 1.0 | 1.0 | 8.68915E-01 |
| IJAYA | Quade | 9.55250E-01 | 1.0 | 1.0 | 9.99979E-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 S92.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.61343E-02 | 1.62557E-02 | 1.62557E-02 | 1.61343E-02 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 8.83074E-01 | 1.0 | 1.0 | 8.83074E-01 |
| GOTLBO | Friedman | 3.55630E-02 | 6.66648E-02 | 6.66648E-02 | 6.46651E-02 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 9.16596E-01 | 1.0 | 1.0 | 9.89806E-01 |
| CWOA | Friedman | 1.70290E-01 | 4.63814E-01 | 4.63814E-01 | 3.77416E-01 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 9.16596E-01 | 1.0 | 1.0 | 9.89806E-01 |
| ISCA | Friedman | 1.70313E-01 | 5.91053E-01 | 5.91053E-01 | 4.57385E-01 |
| ISCA | Friedman Aligned | 6.75460E-13 | 2.49401E-12 | 2.49401E-12 | 2.49401E-12 |
| ISCA | Quade | 9.16596E-01 | 1.0 | 1.0 | 9.96412E-01 |
| NNA | Friedman | 1.70313E-01 | 5.58293E-01 | 5.58293E-01 | 4.37004E-01 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 9.16596E-01 | 1.0 | 1.0 | 9.96412E-01 |
| WW | Friedman | 4.65704E-01 | 1.0 | 1.0 | 9.01170E-01 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 9.16596E-01 | 1.0 | 1.0 | 9.99320E-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 |
| **Table S92** (*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 S93.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 1.11422E-12 | 1.19904E-12 | 1.19904E-12 | 1.19904E-12 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.05739E-02 | 6.19145E-02 | 6.12106E-02 | 6.02176E-02 |
| NNA | Friedman | 1.11422E-12 | 1.82943E-12 | 1.82943E-12 | 1.82943E-12 |
| NNA | Friedman Aligned | 4.34834E-11 | 1.33795E-10 | 1.33795E-10 | 1.33795E-10 |
| NNA | Quade | 2.05739E-02 | 6.19145E-02 | 6.12106E-02 | 6.02176E-02 |
| WW | Friedman | 1.11422E-12 | 1.11422E-12 | 1.11422E-12 | 1.11422E-12 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 2.85496E-02 | 1.06236E-01 | 1.06236E-01 | 1.01427E-01 |
| CWOA | Friedman | 1.22824E-12 | 3.77920E-12 | 3.77920E-12 | 3.77920E-12 |
| CWOA | Friedman Aligned | 1.53052E-10 | 5.65116E-10 | 5.65116E-10 | 5.65116E-10 |
| CWOA | Quade | 2.05739E-02 | 3.83174E-02 | 3.68718E-02 | 3.76516E-02 |
| GOTLBO | Friedman | 8.01828E-11 | 2.77556E-10 | 2.77556E-10 | 2.77556E-10 |
| GOTLBO | Friedman Aligned | 1.18047E-10 | 4.08623E-10 | 4.08623E-10 | 4.08623E-10 |
| GOTLBO | Quade | 2.05739E-02 | 3.83174E-02 | 3.68718E-02 | 3.76516E-02 |
| MABC | Friedman | 5.45986E-10 | 2.01595E-09 | 1.96197E-09 | 2.01595E-09 |
| MABC | Friedman Aligned | 2.04947E-13 | 5.20251E-13 | 5.20251E-13 | 5.20251E-13 |
| MABC | Quade | 9.31341E-02 | 3.58952E-01 | 3.58952E-01 | 3.08217E-01 |
| PSO | Friedman | 5.45986E-10 | 2.01595E-09 | 1.96197E-09 | 2.01595E-09 |
| PSO | Friedman Aligned | 2.12199E-10 | 7.99827E-10 | 7.99827E-10 | 7.99827E-10 |
| PSO | Quade | 9.34861E-03 | 9.38919E-03 | 9.38919E-03 | 9.34861E-03 |
| DE | Friedman | 3.05182E-05 | 1.12683E-04 | 1.12683E-04 | 1.12678E-04 |
| DE | Friedman Aligned | 1.72967E-02 | 6.40787E-02 | 6.40787E-02 | 6.23920E-02 |
| DE | Quade | 2.96784E-01 | 1.0 | 1.0 | 7.27477E-01 |
| **Table S93** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 2.29338E-04 | 7.93891E-04 | 7.93891E-04 | 7.93639E-04 |
| IJAYA | Friedman Aligned | 4.24809E-02 | 1.48029E-01 | 1.48029E-01 | 1.39519E-01 |
| IJAYA | Quade | 3.76114E-01 | 1.0 | 1.0 | 8.04679E-01 |
| NDE | Friedman | 4.96635E-03 | 1.52898E-02 | 1.52898E-02 | 1.52024E-02 |
| NDE | Friedman Aligned | 2.83997E-01 | 9.06459E-01 | 9.06459E-01 | 6.42247E-01 |
| NDE | Quade | 4.27401E-01 | 1.0 | 1.0 | 8.20144E-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 S94.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.99999E-01 | 1.0 | 1.0 | 9.99999E-01 |
| PSO | Friedman Aligned | 1.10006E-03 | 1.10062E-03 | 1.10062E-03 | 1.10006E-03 |
| PSO | Quade | 9.99999E-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 |
| 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 |
| **Table S94** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 7.09370E-01 | 1.0 | 1.0 | 8.97849E-01 |
| CWOA | 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 S95.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 1.34914E-10 | 4.67010E-10 | 4.67010E-10 | 4.67010E-10 |
| GOTLBO | Quade | 2.14059E-03 | 3.95545E-03 | 3.84083E-03 | 3.94829E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | 2.13919E-10 | 8.06309E-10 | 8.06309E-10 | 8.06309E-10 |
| PSO | Quade | 7.45736E-04 | 7.45992E-04 | 7.45992E-04 | 7.45736E-04 |
| MABC | Friedman | <1E-13 | 1.95399E-13 | 1.95399E-13 | 1.95399E-13 |
| MABC | Friedman Aligned | 4.27647E-12 | 7.89502E-12 | 7.89502E-12 | 7.89502E-12 |
| MABC | Quade | 1.76757E-02 | 6.68978E-02 | 6.68978E-02 | 6.50101E-02 |
| WW | Friedman | 8.30101E-11 | 2.55416E-10 | 2.55416E-10 | 2.55416E-10 |
| WW | Friedman Aligned | 5.25791E-11 | 1.33470E-10 | 1.33470E-10 | 1.33470E-10 |
| WW | Quade | 3.93413E-03 | 1.45414E-02 | 1.45414E-02 | 1.44493E-02 |
| ISCA | Friedman | 1.77301E-09 | 6.13733E-09 | 6.13733E-09 | 6.13733E-09 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.35565E-03 | 7.30587E-03 | 7.30587E-03 | 7.28220E-03 |
| NNA | Friedman | 1.99588E-09 | 7.36942E-09 | 7.36942E-09 | 7.36942E-09 |
| NNA | Friedman Aligned | 5.32343E-11 | 1.63798E-10 | 1.63798E-10 | 1.63798E-10 |
| NNA | Quade | 2.35565E-03 | 7.25406E-03 | 7.25406E-03 | 7.23042E-03 |
| CWOA | Friedman | 2.78373E-09 | 1.04925E-08 | 1.04925E-08 | 1.04925E-08 |
| CWOA | Friedman Aligned | 1.69719E-10 | 6.26656E-10 | 6.26656E-10 | 6.26656E-10 |
| CWOA | Quade | 2.14059E-03 | 3.95545E-03 | 3.84083E-03 | 3.94829E-03 |
| DE | Friedman | 7.39494E-09 | 2.73044E-08 | 2.73044E-08 | 2.73044E-08 |
| DE | Friedman Aligned | 5.47403E-03 | 2.02331E-02 | 2.02331E-02 | 2.00633E-02 |
| DE | Quade | 8.39403E-02 | 3.15141E-01 | 3.15141E-01 | 2.76546E-01 |
| **Table S95** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.15930E-07 | 4.01296E-07 | 4.01296E-07 | 4.01296E-07 |
| IJAYA | Friedman Aligned | 1.53493E-02 | 5.32586E-02 | 5.32586E-02 | 5.21360E-02 |
| IJAYA | Quade | 1.19590E-01 | 4.22010E-01 | 4.22010E-01 | 3.56536E-01 |
| NDE | Friedman | 9.60841E-06 | 2.95644E-05 | 2.95644E-05 | 2.95640E-05 |
| NDE | Friedman Aligned | 1.43525E-01 | 4.49397E-01 | 4.49397E-01 | 3.79176E-01 |
| NDE | Quade | 1.45931E-01 | 4.57073E-01 | 4.57073E-01 | 3.84528E-01 |
| TLBO | Friedman | 1.30872E-01 | 3.35738E-01 | 3.35738E-01 | 2.99567E-01 |
| TLBO | Friedman Aligned | 7.63709E-01 | 1.0 | 1.0 | 9.74324E-01 |
| TLBO | Quade | 5.80649E-01 | 1.0 | 1.0 | 8.89865E-01 |
| EBLSHADE | Friedman | 9.93529E-01 | 1.0 | 1.0 | 9.99909E-01 |
| EBLSHADE | Friedman Aligned | 8.82085E-01 | 1.0 | 1.0 | 9.80682E-01 |
| EBLSHADE | Quade | 9.83928E-01 | 1.0 | 1.0 | 9.99512E-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 S96.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *I*ph 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 S96** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S97.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.73246E-08 | 9.73246E-08 | 9.73246E-08 | 9.73246E-08 |
| PSO | Friedman Aligned | 1.70370E-10 | 6.29058E-10 | 6.29058E-10 | 6.29058E-10 |
| PSO | Quade | 2.46974E-01 | 2.80583E-01 | 2.80583E-01 | 2.46974E-01 |
| GOTLBO | Friedman | 6.35961E-07 | 1.17408E-06 | 1.17408E-06 | 1.17408E-06 |
| GOTLBO | Friedman Aligned | 5.77172E-11 | 1.77591E-10 | 1.77591E-10 | 1.77591E-10 |
| GOTLBO | Quade | 3.41083E-01 | 7.45945E-01 | 7.07294E-01 | 5.37051E-01 |
| CWOA | Friedman | 1.92373E-05 | 4.88336E-05 | 4.88336E-05 | 4.88325E-05 |
| CWOA | Friedman Aligned | 8.61309E-11 | 2.98146E-10 | 2.98146E-10 | 2.98146E-10 |
| CWOA | Quade | 3.41083E-01 | 7.45945E-01 | 7.07294E-01 | 5.37051E-01 |
| NNA | Friedman | 2.54032E-05 | 7.81643E-05 | 7.81643E-05 | 7.81616E-05 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 3.41083E-01 | 9.81080E-01 | 9.41198E-01 | 6.43922E-01 |
| ISCA | Friedman | 2.83482E-05 | 9.81294E-05 | 9.81294E-05 | 9.81251E-05 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 3.41083E-01 | 9.81080E-01 | 9.41198E-01 | 6.43922E-01 |
| WW | Friedman | 4.57580E-04 | 1.68973E-03 | 1.68973E-03 | 1.68849E-03 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 3.41083E-01 | 1.0 | 1.0 | 7.60671E-01 |
| MABC | Friedman | 1.94748E-02 | 7.37379E-02 | 7.37379E-02 | 7.14482E-02 |
| MABC | Friedman Aligned | 7.15972E-09 | 2.69866E-08 | 2.69866E-08 | 2.69866E-08 |
| MABC | Quade | 5.96552E-01 | 1.0 | 1.0 | 9.67332E-01 |
| DE | Friedman | 7.88581E-01 | 1.0 | 1.0 | 9.96777E-01 |
| DE | Friedman Aligned | 8.62956E-01 | 1.0 | 1.0 | 9.99350E-01 |
| DE | Quade | 9.44493E-01 | 1.0 | 1.0 | 9.99977E-01 |
| **Table S97** (*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 S98.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.04976E-01 | 1.0 | 1.0 | 9.04976E-01 |
| PSO | Friedman Aligned | 1.47451E-09 | 2.72216E-09 | 2.72216E-09 | 2.72216E-09 |
| PSO | Quade | 9.99878E-01 | 1.0 | 1.0 | 9.99878E-01 |
| GOTLBO | Friedman | 9.39917E-01 | 1.0 | 1.0 | 9.94436E-01 |
| GOTLBO | Friedman Aligned | 1.04059E-07 | 2.64149E-07 | 2.64149E-07 | 2.64149E-07 |
| GOTLBO | Quade | 9.99979E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.99718E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 5.38809E-11 | 5.38809E-11 | 5.38809E-11 | 5.38809E-11 |
| CWOA | Quade | 9.99979E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.99909E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 1.31567E-02 | 4.06680E-02 | 4.06680E-02 | 3.99318E-02 |
| NNA | Quade | 9.99994E-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 |
| **Table S98** (*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 |
| 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 |
| WW | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 5.21317E-02 | 1.83435E-01 | 1.83435E-01 | 1.69170E-01 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S99.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.33915E-01 | 1.0 | 1.0 | 9.33915E-01 |
| PSO | Friedman Aligned | 4.34003E-10 | 4.34003E-10 | 4.34003E-10 | 4.34003E-10 |
| PSO | Quade | 9.99928E-01 | 1.0 | 1.0 | 9.99928E-01 |
| GOTLBO | Friedman | 9.59537E-01 | 1.0 | 1.0 | 9.97318E-01 |
| GOTLBO | Friedman Aligned | 2.86941E-02 | 7.36566E-02 | 7.36566E-02 | 7.12394E-02 |
| GOTLBO | Quade | 9.99991E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.99963E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 3.00592E-04 | 5.55010E-04 | 5.55010E-04 | 5.54869E-04 |
| CWOA | 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 S99** (*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 |
| 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 S100.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.67662E-01 | 1.0 | 1.0 | 9.67662E-01 |
| PSO | Friedman Aligned | 1.24911E-01 | 1.32747E-01 | 1.32747E-01 | 1.24911E-01 |
| PSO | Quade | 9.99999E-01 | 1.0 | 1.0 | 9.99999E-01 |
| GOTLBO | Friedman | 9.81485E-01 | 1.0 | 1.0 | 9.99367E-01 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | 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 S100** (*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 |
| 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 S101.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *I*ph evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.92009E-01 | 4.88192E-01 | 4.88192E-01 | 3.92009E-01 |
| PSO | Friedman Aligned | 9.14469E-12 | 9.14469E-12 | 9.14469E-12 | 9.14469E-12 |
| PSO | Quade | 9.97302E-01 | 1.0 | 1.0 | 9.97302E-01 |
| GOTLBO | Friedman | 5.10410E-01 | 1.0 | 1.0 | 7.32463E-01 |
| GOTLBO | Friedman Aligned | 4.73013E-03 | 1.20291E-02 | 1.20291E-02 | 1.19636E-02 |
| GOTLBO | Quade | 9.98614E-01 | 1.0 | 1.0 | 9.99995E-01 |
| ISCA | Friedman | 8.70839E-01 | 1.0 | 1.0 | 9.97589E-01 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 9.98614E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 8.70839E-01 | 1.0 | 1.0 | 9.97192E-01 |
| NNA | Friedman Aligned | 9.40262E-01 | 1.0 | 1.0 | 9.99828E-01 |
| NNA | Quade | 9.98614E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 8.70839E-01 | 1.0 | 1.0 | 9.94458E-01 |
| CWOA | Friedman Aligned | 2.40580E-05 | 4.44153E-05 | 4.44153E-05 | 4.44144E-05 |
| CWOA | Quade | 9.98614E-01 | 1.0 | 1.0 | 9.99995E-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 S101** (*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 S102.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.12065E-07 | 1.12065E-07 | 1.12065E-07 | 1.12065E-07 |
| PSO | Friedman Aligned | 9.63011E-11 | 2.44457E-10 | 2.36238E-10 | 2.44457E-10 |
| PSO | Quade | 1.61148E-01 | 1.74539E-01 | 1.74539E-01 | 1.61148E-01 |
| NNA | Friedman | 1.32148E-02 | 2.45341E-02 | 2.45341E-02 | 2.42601E-02 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 8.03072E-01 | 1.0 | 1.0 | 9.50205E-01 |
| ISCA | Friedman | 2.56447E-02 | 6.57499E-02 | 6.57499E-02 | 6.38197E-02 |
| ISCA | Friedman Aligned | 1.65848E-09 | 6.12362E-09 | 6.12362E-09 | 6.12362E-09 |
| ISCA | Quade | 8.03072E-01 | 1.0 | 1.0 | 9.58241E-01 |
| WW | Friedman | 2.56658E-02 | 7.96836E-02 | 7.96836E-02 | 7.68862E-02 |
| WW | Friedman Aligned | 5.78214E-09 | 2.17942E-08 | 2.17942E-08 | 2.17942E-08 |
| WW | Quade | 8.03072E-01 | 1.0 | 1.0 | 9.56969E-01 |
| CWOA | Friedman | 7.51644E-02 | 2.66458E-01 | 2.66458E-01 | 2.36988E-01 |
| CWOA | Friedman Aligned | 9.81004E-12 | 1.81108E-11 | 1.81108E-11 | 1.81108E-11 |
| CWOA | Quade | 8.03072E-01 | 1.0 | 1.0 | 9.70509E-01 |
| GOTLBO | Friedman | 1.36860E-01 | 5.25381E-01 | 5.25381E-01 | 4.19245E-01 |
| GOTLBO | Friedman Aligned | 8.50149E-10 | 2.94282E-09 | 2.94282E-09 | 2.94282E-09 |
| GOTLBO | Quade | 8.03072E-01 | 1.0 | 1.0 | 9.95652E-01 |
| IJAYA | Friedman | 1.60075E-01 | 6.27579E-01 | 6.27579E-01 | 4.81863E-01 |
| IJAYA | Friedman Aligned | 9.63011E-11 | 2.44457E-10 | 2.36238E-10 | 2.44457E-10 |
| IJAYA | Quade | 8.03072E-01 | 1.0 | 1.0 | 9.95652E-01 |
| MABC | Friedman | 4.30602E-01 | 1.0 | 1.0 | 8.74997E-01 |
| MABC | Friedman Aligned | 2.44538E-03 | 9.03334E-03 | 9.03334E-03 | 8.99941E-03 |
| MABC | Quade | 8.68097E-01 | 1.0 | 1.0 | 9.99435E-01 |
| **Table S102** (*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 S103.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 4.61853E-13 | 4.61853E-13 | 4.61853E-13 | 4.61853E-13 |
| IJAYA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| IJAYA | Quade | 1.77868E-02 | 6.59918E-02 | 5.94563E-02 | 6.41177E-02 |
| GOTLBO | Friedman | 6.49480E-13 | 1.19904E-12 | 1.19904E-12 | 1.19904E-12 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.77868E-02 | 6.59918E-02 | 5.94563E-02 | 6.41177E-02 |
| MABC | Friedman | 7.57246E-13 | 1.92224E-12 | 1.92224E-12 | 1.92224E-12 |
| MABC | Friedman Aligned | 1.47660E-10 | 4.54338E-10 | 4.54338E-10 | 4.54338E-10 |
| MABC | Quade | 3.24065E-02 | 1.20412E-01 | 1.20412E-01 | 1.14530E-01 |
| CWOA | Friedman | 3.15142E-12 | 9.69669E-12 | 9.69669E-12 | 9.69669E-12 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 9.53581E-03 | 2.92630E-02 | 2.92630E-02 | 2.88853E-02 |
| WW | Friedman | 4.24027E-11 | 1.46779E-10 | 1.46779E-10 | 1.46779E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 9.53581E-03 | 2.05775E-02 | 2.05775E-02 | 2.03861E-02 |
| ISCA | Friedman | 5.89440E-11 | 2.17639E-10 | 2.17639E-10 | 2.17639E-10 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 9.53581E-03 | 2.25189E-02 | 2.25189E-02 | 2.22920E-02 |
| NNA | Friedman | 2.68345E-10 | 1.01145E-09 | 1.01145E-09 | 1.01145E-09 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 9.53581E-03 | 1.76760E-02 | 1.76760E-02 | 1.75335E-02 |
| DE | Friedman | 4.09489E-10 | 1.51196E-09 | 1.51196E-09 | 1.51196E-09 |
| DE | Friedman Aligned | 8.23115E-11 | 2.96018E-10 | 2.84924E-10 | 2.96018E-10 |
| DE | Quade | 7.19727E-02 | 2.51985E-01 | 2.51985E-01 | 2.27835E-01 |
| **Table S103** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.40866E-09 | 4.87613E-09 | 4.87613E-09 | 4.87613E-09 |
| PSO | Friedman Aligned | 8.01715E-11 | 2.96018E-10 | 2.84924E-10 | 2.96018E-10 |
| PSO | Quade | 1.23157E-04 | 1.23164E-04 | 1.23164E-04 | 1.23157E-04 |
| NDE | Friedman | 8.11697E-06 | 2.49753E-05 | 2.49753E-05 | 2.49751E-05 |
| NDE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NDE | Quade | 1.39601E-01 | 4.36892E-01 | 4.36892E-01 | 3.70384E-01 |
| TLBO | Friedman | 1.57702E-01 | 4.05499E-01 | 4.05499E-01 | 3.53159E-01 |
| TLBO | Friedman Aligned | 9.86791E-02 | 2.52471E-01 | 2.52471E-01 | 2.31820E-01 |
| TLBO | Quade | 6.59156E-01 | 1.0 | 1.0 | 9.34925E-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 S104.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| MABC | Friedman | 4.24327E-13 | 4.24327E-13 | 4.24327E-13 | 4.24327E-13 |
| MABC | Friedman Aligned | 1.30897E-10 | 4.93382E-10 | 4.67194E-10 | 4.93382E-10 |
| MABC | Quade | 2.61883E-02 | 9.71881E-02 | 9.71881E-02 | 9.33364E-02 |
| IJAYA | Friedman | 1.17484E-12 | 2.16893E-12 | 2.16893E-12 | 2.16893E-12 |
| IJAYA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| IJAYA | Quade | 1.40454E-02 | 5.20574E-02 | 4.69358E-02 | 5.08871E-02 |
| GOTLBO | Friedman | 2.08219E-12 | 5.28555E-12 | 5.28555E-12 | 5.28555E-12 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.40454E-02 | 5.20574E-02 | 4.69358E-02 | 5.08871E-02 |
| CWOA | Friedman | 1.27601E-11 | 3.92619E-11 | 3.92619E-11 | 3.92619E-11 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 7.23714E-03 | 2.25799E-02 | 2.25799E-02 | 2.23546E-02 |
| DE | Friedman | 1.39301E-10 | 4.82194E-10 | 4.57383E-10 | 4.82194E-10 |
| DE | Friedman Aligned | 1.37839E-10 | 4.93382E-10 | 4.77135E-10 | 4.93382E-10 |
| DE | Quade | 5.97508E-02 | 2.08782E-01 | 2.08782E-01 | 1.92059E-01 |
| WW | Friedman | 1.39301E-10 | 4.82194E-10 | 4.57383E-10 | 4.82194E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 7.23714E-03 | 1.56830E-02 | 1.56830E-02 | 1.55717E-02 |
| ISCA | Friedman | 1.59993E-10 | 6.03050E-10 | 6.03050E-10 | 6.03050E-10 |
| ISCA | Friedman Aligned | 2.51032E-06 | 7.72406E-06 | 7.72406E-06 | 7.72404E-06 |
| ISCA | Quade | 7.23714E-03 | 1.72329E-02 | 1.72329E-02 | 1.70999E-02 |
| NNA | Friedman | 6.61310E-10 | 2.44176E-09 | 2.44176E-09 | 2.44176E-09 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 7.23714E-03 | 1.34020E-02 | 1.34020E-02 | 1.33199E-02 |
| **Table S104** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 2.30556E-09 | 7.98080E-09 | 7.98080E-09 | 7.98080E-09 |
| PSO | Friedman Aligned | 1.30897E-10 | 4.93382E-10 | 4.67194E-10 | 4.93382E-10 |
| PSO | Quade | 8.49909E-05 | 8.49943E-05 | 8.49943E-05 | 8.49909E-05 |
| NDE | Friedman | 2.70991E-06 | 8.33820E-06 | 8.33820E-06 | 8.33817E-06 |
| NDE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NDE | Quade | 1.18862E-01 | 3.71008E-01 | 3.71008E-01 | 3.22508E-01 |
| TLBO | Friedman | 9.99240E-02 | 2.55682E-01 | 2.55682E-01 | 2.34510E-01 |
| TLBO | Friedman Aligned | 2.97627E-04 | 7.55533E-04 | 7.55533E-04 | 7.55343E-04 |
| TLBO | Quade | 6.04542E-01 | 1.0 | 9.88447E-01 | 9.05102E-01 |
| EBLSHADE | Friedman | 8.44298E-01 | 1.0 | 9.33322E-01 | 9.67726E-01 |
| EBLSHADE | Friedman Aligned | 5.75004E-02 | 1.06394E-01 | 1.06394E-01 | 1.03564E-01 |
| EBLSHADE | Quade | 9.49745E-01 | 1.0 | 9.88447E-01 | 9.95999E-01 |
| STLBO | Friedman | 9.33322E-01 | 1.0 | 9.33322E-01 | 9.67726E-01 |
| STLBO | Friedman Aligned | 9.97074E-01 | 9.97074E-01 | 9.97074E-01 | 9.97074E-01 |
| STLBO | Quade | 9.88447E-01 | 1.0 | 9.88447E-01 | 9.95999E-01 |

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| **Table S105.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 5.48450E-13 | 5.48450E-13 | 5.48450E-13 | 5.48450E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 5.93630E-02 | 6.10542E-02 | 6.10542E-02 | 5.93630E-02 |
| NNA | Friedman | 6.21587E-06 | 1.14755E-05 | 1.14755E-05 | 1.14754E-05 |
| NNA | Friedman Aligned | 8.83864E-11 | 3.26350E-10 | 3.26350E-10 | 3.26350E-10 |
| NNA | Quade | 5.46368E-01 | 1.0 | 1.0 | 7.67608E-01 |
| ISCA | Friedman | 2.15654E-05 | 5.47435E-05 | 5.47435E-05 | 5.47421E-05 |
| ISCA | Friedman Aligned | 5.41510E-11 | 2.04108E-10 | 2.04108E-10 | 2.04108E-10 |
| ISCA | Quade | 5.46368E-01 | 1.0 | 1.0 | 7.94113E-01 |
| WW | Friedman | 2.54032E-05 | 7.81643E-05 | 7.81643E-05 | 7.81616E-05 |
| WW | Friedman Aligned | 2.52162E-11 | 9.31060E-11 | 9.31060E-11 | 9.31060E-11 |
| WW | Quade | 5.46368E-01 | 1.0 | 1.0 | 7.87852E-01 |
| CWOA | Friedman | 1.70294E-04 | 5.89510E-04 | 5.89510E-04 | 5.89355E-04 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 5.46368E-01 | 1.0 | 1.0 | 8.32107E-01 |
| GOTLBO | Friedman | 5.51957E-04 | 2.03830E-03 | 2.03830E-03 | 2.03648E-03 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 5.46368E-01 | 1.0 | 1.0 | 9.41246E-01 |
| IJAYA | Friedman | 8.19698E-04 | 3.09021E-03 | 3.09021E-03 | 3.08612E-03 |
| IJAYA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| IJAYA | Quade | 5.46368E-01 | 1.0 | 1.0 | 9.41246E-01 |
| MABC | Friedman | 6.69221E-03 | 2.47416E-02 | 2.47416E-02 | 2.44879E-02 |
| MABC | Friedman Aligned | 1.31135E-09 | 4.53928E-09 | 4.53928E-09 | 4.53928E-09 |
| MABC | Quade | 6.42995E-01 | 1.0 | 1.0 | 9.77698E-01 |
| **Table S105** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 9.84763E-02 | 3.46279E-01 | 3.46279E-01 | 3.01524E-01 |
| DE | Friedman Aligned | 2.46722E-11 | 8.54037E-11 | 8.54037E-11 | 8.54037E-11 |
| DE | Quade | 8.43172E-01 | 1.0 | 1.0 | 9.98360E-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 S106.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.23303E-05 | 3.23308E-05 | 3.23308E-05 | 3.23303E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 3.74066E-01 | 4.60169E-01 | 4.60169E-01 | 3.74066E-01 |
| NNA | Friedman | 2.44230E-01 | 5.05979E-01 | 5.05979E-01 | 4.03667E-01 |
| NNA | Friedman Aligned | 3.04347E-08 | 9.36452E-08 | 9.36452E-08 | 9.36452E-08 |
| NNA | Quade | 9.60869E-01 | 1.0 | 1.0 | 9.97479E-01 |
| ISCA | Friedman | 3.34378E-01 | 9.86196E-01 | 9.86196E-01 | 6.44147E-01 |
| ISCA | Friedman Aligned | 2.68086E-11 | 6.80527E-11 | 6.80527E-11 | 6.80527E-11 |
| ISCA | Quade | 9.60869E-01 | 1.0 | 1.0 | 9.98098E-01 |
| WW | Friedman | 3.34378E-01 | 1.0 | 1.0 | 6.85519E-01 |
| WW | Friedman Aligned | 2.27968E-11 | 4.20863E-11 | 4.20863E-11 | 4.20863E-11 |
| WW | Quade | 9.60869E-01 | 1.0 | 1.0 | 9.98033E-01 |
| CWOA | Friedman | 5.44864E-01 | 1.0 | 1.0 | 9.34440E-01 |
| CWOA | Friedman Aligned | 2.33931E-04 | 8.09818E-04 | 8.09818E-04 | 8.09527E-04 |
| CWOA | Quade | 9.60869E-01 | 1.0 | 1.0 | 9.99016E-01 |
| GOTLBO | Friedman | 7.04380E-01 | 1.0 | 1.0 | 9.88888E-01 |
| GOTLBO | Friedman Aligned | 3.35103E-03 | 1.26406E-02 | 1.26406E-02 | 1.25723E-02 |
| GOTLBO | Quade | 9.60869E-01 | 1.0 | 1.0 | 9.99985E-01 |
| IJAYA | Friedman | 7.42795E-01 | 1.0 | 1.0 | 9.94013E-01 |
| IJAYA | Friedman Aligned | 9.34352E-04 | 3.45078E-03 | 3.45078E-03 | 3.44558E-03 |
| IJAYA | Quade | 9.60869E-01 | 1.0 | 1.0 | 9.99985E-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 S106** (*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 S107.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.24342E-03 | 1.24413E-03 | 1.24413E-03 | 1.24342E-03 |
| NNA | Friedman | 1.15463E-13 | 2.13163E-13 | 2.13163E-13 | 2.13163E-13 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 5.08290E-02 | 9.59217E-02 | 9.59217E-02 | 9.18149E-02 |
| ISCA | Friedman | 1.69346E-13 | 4.29878E-13 | 4.29878E-13 | 4.29878E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 5.08290E-02 | 1.14968E-01 | 1.14968E-01 | 1.09199E-01 |
| WW | Friedman | 2.55462E-13 | 7.86038E-13 | 7.86038E-13 | 7.86038E-13 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 5.08290E-02 | 1.07920E-01 | 1.07920E-01 | 1.02778E-01 |
| CWOA | Friedman | 6.62297E-12 | 2.29257E-11 | 2.29257E-11 | 2.29257E-11 |
| CWOA | Friedman Aligned | 1.32214E-10 | 4.88175E-10 | 4.88175E-10 | 4.88175E-10 |
| CWOA | Quade | 5.08290E-02 | 1.41499E-01 | 1.41499E-01 | 1.32919E-01 |
| GOTLBO | Friedman | 5.56590E-11 | 2.05510E-10 | 2.05510E-10 | 2.05510E-10 |
| GOTLBO | Friedman Aligned | 1.58709E-10 | 5.98211E-10 | 5.07874E-10 | 5.98211E-10 |
| GOTLBO | Quade | 7.32625E-02 | 2.76054E-01 | 2.47539E-01 | 2.44918E-01 |
| IJAYA | Friedman | 1.24403E-10 | 4.68905E-10 | 4.68905E-10 | 4.68905E-10 |
| IJAYA | Friedman Aligned | 1.58709E-10 | 5.98211E-10 | 5.07874E-10 | 5.98211E-10 |
| IJAYA | Quade | 7.32625E-02 | 2.76054E-01 | 2.47539E-01 | 2.44918E-01 |
| MABC | Friedman | 6.40678E-09 | 2.36558E-08 | 2.36558E-08 | 2.36558E-08 |
| MABC | Friedman Aligned | 1.58709E-10 | 5.98211E-10 | 5.07874E-10 | 5.98211E-10 |
| MABC | Quade | 1.14751E-01 | 4.33578E-01 | 4.33578E-01 | 3.62399E-01 |
| **Table S107** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.86918E-06 | 6.47023E-06 | 6.47023E-06 | 6.47021E-06 |
| DE | Friedman Aligned | 7.73811E-11 | 2.67858E-10 | 2.67858E-10 | 2.67858E-10 |
| DE | Quade | 2.13275E-01 | 7.65059E-01 | 7.65059E-01 | 5.64100E-01 |
| NDE | Friedman | 3.24249E-03 | 9.98062E-03 | 9.98062E-03 | 9.94333E-03 |
| NDE | Friedman Aligned | 1.10920E-09 | 3.41294E-09 | 3.41294E-09 | 3.41294E-09 |
| NDE | Quade | 3.50848E-01 | 1.0 | 1.0 | 7.35391E-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 S108.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.14886E-03 | 1.14947E-03 | 1.14947E-03 | 1.14886E-03 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.23178E-01 | 9.40245E-01 | 9.40245E-01 | 6.23178E-01 |
| NNA | Friedman | 7.90699E-01 | 1.0 | 1.0 | 9.44276E-01 |
| NNA | Friedman Aligned | 1.74782E-12 | 3.22675E-12 | 3.22675E-12 | 3.22675E-12 |
| NNA | Quade | 9.96635E-01 | 1.0 | 1.0 | 9.99973E-01 |
| ISCA | Friedman | 8.58987E-01 | 1.0 | 1.0 | 9.93075E-01 |
| ISCA | Friedman Aligned | 5.51352E-08 | 1.39958E-07 | 1.39958E-07 | 1.39958E-07 |
| ISCA | Quade | 9.96635E-01 | 1.0 | 1.0 | 9.99986E-01 |
| WW | Friedman | 8.58987E-01 | 1.0 | 1.0 | 9.95414E-01 |
| WW | Friedman Aligned | 3.83622E-04 | 1.18053E-03 | 1.18053E-03 | 1.17991E-03 |
| WW | Quade | 9.96635E-01 | 1.0 | 1.0 | 9.99983E-01 |
| CWOA | Friedman | 9.69231E-01 | 1.0 | 1.0 | 9.99994E-01 |
| CWOA | Friedman Aligned | 7.64084E-01 | 1.0 | 1.0 | 9.93258E-01 |
| CWOA | Quade | 9.96635E-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 S108** (*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 | 9.20605E-01 | 1.0 | 1.0 | 9.99913E-01 |
| IJAYA | Quade | 9.99972E-01 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S109.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| MABC | Friedman | 7.82263E-13 | 7.82263E-13 | 7.82263E-13 | 7.82263E-13 |
| MABC | Friedman Aligned | 1.30815E-10 | 4.93071E-10 | 4.68469E-10 | 4.93071E-10 |
| MABC | Quade | 2.72384E-02 | 1.01106E-01 | 1.01106E-01 | 9.69411E-02 |
| IJAYA | Friedman | 7.82263E-13 | 1.19904E-12 | 1.19904E-12 | 1.19904E-12 |
| IJAYA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| IJAYA | Quade | 1.46704E-02 | 5.43832E-02 | 4.90263E-02 | 5.31067E-02 |
| GOTLBO | Friedman | 1.18350E-12 | 3.00426E-12 | 3.00426E-12 | 3.00426E-12 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.46704E-02 | 5.43832E-02 | 4.90263E-02 | 5.31067E-02 |
| CWOA | Friedman | 7.72016E-12 | 2.37543E-11 | 2.37543E-11 | 2.37543E-11 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 7.61417E-03 | 2.36840E-02 | 2.36840E-02 | 2.34363E-02 |
| WW | Friedman | 9.08066E-11 | 3.14331E-10 | 3.14331E-10 | 3.14331E-10 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 7.61417E-03 | 1.64871E-02 | 1.64871E-02 | 1.63641E-02 |
| ISCA | Friedman | 1.23284E-10 | 4.55202E-10 | 4.55202E-10 | 4.55202E-10 |
| ISCA | Friedman Aligned | 2.50662E-06 | 7.71268E-06 | 7.71268E-06 | 7.71266E-06 |
| ISCA | Quade | 7.61417E-03 | 1.81029E-02 | 1.81029E-02 | 1.79562E-02 |
| DE | Friedman | 1.84419E-10 | 6.95118E-10 | 6.95118E-10 | 6.95118E-10 |
| DE | Friedman Aligned | 1.37739E-10 | 4.93071E-10 | 4.76787E-10 | 4.93071E-10 |
| DE | Quade | 6.18417E-02 | 2.16161E-01 | 2.16161E-01 | 1.98262E-01 |
| NNA | Friedman | 4.55458E-10 | 1.68169E-09 | 1.68169E-09 | 1.68169E-09 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 7.61417E-03 | 1.41024E-02 | 1.41024E-02 | 1.40116E-02 |
| **Table S109** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.92899E-09 | 6.67728E-09 | 6.67728E-09 | 6.67728E-09 |
| PSO | Friedman Aligned | 1.30815E-10 | 4.93071E-10 | 4.68469E-10 | 4.93071E-10 |
| PSO | Quade | 9.09831E-05 | 9.09869E-05 | 9.09869E-05 | 9.09831E-05 |
| NDE | Friedman | 4.08314E-06 | 1.25635E-05 | 1.25635E-05 | 1.25635E-05 |
| NDE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NDE | Quade | 1.22455E-01 | 3.82395E-01 | 3.82395E-01 | 3.30971E-01 |
| TLBO | Friedman | 1.18855E-01 | 3.04601E-01 | 3.04601E-01 | 2.74721E-01 |
| TLBO | Friedman Aligned | 3.01915E-04 | 7.66418E-04 | 7.66418E-04 | 7.66223E-04 |
| TLBO | Quade | 6.14412E-01 | 1.0 | 1.0 | 9.11000E-01 |
| EBLSHADE | Friedman | 9.04828E-01 | 1.0 | 1.0 | 9.86993E-01 |
| EBLSHADE | Friedman Aligned | 5.79889E-02 | 1.07300E-01 | 1.07300E-01 | 1.04422E-01 |
| EBLSHADE | Quade | 9.59583E-01 | 1.0 | 1.0 | 9.97324E-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 S110.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *R*s 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 S110** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S111.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 6.27525E-04 | 6.27707E-04 | 6.27707E-04 | 6.27525E-04 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.31482E-01 | 9.60899E-01 | 9.60899E-01 | 6.31482E-01 |
| NNA | Friedman | 6.91741E-01 | 1.0 | 1.0 | 8.86116E-01 |
| NNA | Friedman Aligned | 3.06237E-11 | 5.65361E-11 | 5.65361E-11 | 5.65361E-11 |
| NNA | Quade | 9.96978E-01 | 1.0 | 1.0 | 9.99978E-01 |
| ISCA | Friedman | 7.77272E-01 | 1.0 | 1.0 | 9.77902E-01 |
| ISCA | Friedman Aligned | 5.16236E-07 | 1.31045E-06 | 1.31045E-06 | 1.31045E-06 |
| ISCA | Quade | 9.96978E-01 | 1.0 | 1.0 | 9.99989E-01 |
| WW | Friedman | 7.77272E-01 | 1.0 | 1.0 | 9.84073E-01 |
| WW | Friedman Aligned | 1.81771E-03 | 5.59646E-03 | 5.59646E-03 | 5.58239E-03 |
| WW | Quade | 9.96978E-01 | 1.0 | 1.0 | 9.99987E-01 |
| CWOA | Friedman | 9.25970E-01 | 1.0 | 1.0 | 9.99878E-01 |
| CWOA | Friedman Aligned | 9.53239E-01 | 1.0 | 1.0 | 9.99975E-01 |
| CWOA | Quade | 9.96978E-01 | 1.0 | 1.0 | 9.99998E-01 |
| GOTLBO | Friedman | 9.90942E-01 | 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 |
| 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 S111** (*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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S112.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 3.32214E-02 | 3.37419E-02 | 3.37419E-02 | 3.32214E-02 |
| PSO | Friedman Aligned | 2.88658E-12 | 2.88658E-12 | 2.88658E-12 | 2.88658E-12 |
| PSO | Quade | 9.10497E-01 | 1.0 | 1.0 | 9.10497E-01 |
| NNA | Friedman | 9.99834E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 5.04334E-01 | 1.0 | 1.0 | 7.26301E-01 |
| 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 S112** (*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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 S113.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.22987E-02 | 9.64801E-02 | 9.64801E-02 | 9.22987E-02 |
| PSO | Friedman Aligned | 3.98146E-10 | 3.98146E-10 | 3.98146E-10 | 3.98146E-10 |
| PSO | Quade | 9.54610E-01 | 1.0 | 1.0 | 9.54610E-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 |
| 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 S113** (*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 |
| 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | 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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S114.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 4.36171E-03 | 4.37052E-03 | 4.37052E-03 | 4.36171E-03 |
| PSO | Friedman Aligned | 5.39684E-08 | 9.96340E-08 | 9.96340E-08 | 9.96340E-08 |
| PSO | Quade | 8.53378E-01 | 1.0 | 1.0 | 8.53378E-01 |
| NNA | Friedman | 9.47047E-01 | 1.0 | 1.0 | 9.95593E-01 |
| NNA | Friedman Aligned | 9.03118E-10 | 9.03118E-10 | 9.03118E-10 | 9.03118E-10 |
| NNA | Quade | 9.99981E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.73183E-01 | 1.0 | 1.0 | 9.99898E-01 |
| ISCA | Friedman Aligned | 4.17781E-06 | 1.06052E-05 | 1.06052E-05 | 1.06052E-05 |
| ISCA | Quade | 9.99981E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.73183E-01 | 1.0 | 1.0 | 9.99955E-01 |
| WW | Friedman Aligned | 7.30958E-03 | 2.25482E-02 | 2.25482E-02 | 2.23207E-02 |
| WW | Quade | 9.99981E-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 |
| **Table S114** (*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 S115.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, *R*s evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 2.42446E-02 | 2.45202E-02 | 2.45202E-02 | 2.42446E-02 |
| PSO | Friedman Aligned | 3.88231E-08 | 3.88231E-08 | 3.88231E-08 | 3.88231E-08 |
| PSO | Quade | 9.32459E-01 | 1.0 | 1.0 | 9.32459E-01 |
| NNA | Friedman | 9.99213E-01 | 1.0 | 1.0 | 9.99998E-01 |
| NNA | Friedman Aligned | 3.27961E-03 | 6.06308E-03 | 6.06308E-03 | 6.04626E-03 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.99986E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 2.53096E-01 | 7.16378E-01 | 7.16378E-01 | 5.23253E-01 |
| ISCA | 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 |
| **Table S115** (*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 | 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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S116.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 3.23303E-05 | 3.23308E-05 | 3.23308E-05 | 3.23303E-05 |
| WW | Friedman Aligned | 3.09062E-10 | 8.13039E-10 | 7.96436E-10 | 8.13039E-10 |
| WW | Quade | 7.59275E-01 | 1.0 | 1.0 | 7.97323E-01 |
| CWOA | Friedman | 1.22067E-04 | 2.25367E-04 | 2.25367E-04 | 2.25343E-04 |
| CWOA | Friedman Aligned | 3.09062E-10 | 7.84543E-10 | 7.65346E-10 | 7.84543E-10 |
| CWOA | Quade | 7.59275E-01 | 1.0 | 1.0 | 7.97323E-01 |
| NNA | Friedman | 1.53477E-04 | 3.89619E-04 | 3.89619E-04 | 3.89550E-04 |
| NNA | Friedman Aligned | 3.09062E-10 | 8.13039E-10 | 7.74680E-10 | 8.13039E-10 |
| NNA | Quade | 7.59275E-01 | 1.0 | 1.0 | 7.81433E-01 |
| ISCA | Friedman | 1.56918E-04 | 4.82851E-04 | 4.82851E-04 | 4.82746E-04 |
| ISCA | Friedman Aligned | 3.09062E-10 | 8.13039E-10 | 7.65346E-10 | 8.13039E-10 |
| ISCA | Quade | 7.59275E-01 | 1.0 | 1.0 | 7.59275E-01 |
| GOTLBO | Friedman | 2.31597E-03 | 8.02254E-03 | 8.02254E-03 | 7.99400E-03 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 7.59275E-01 | 1.0 | 1.0 | 9.45886E-01 |
| PSO | Friedman | 6.30413E-02 | 2.36852E-01 | 2.36852E-01 | 2.13709E-01 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 8.41580E-01 | 1.0 | 1.0 | 9.98890E-01 |
| MABC | Friedman | 6.64164E-01 | 1.0 | 1.0 | 9.83637E-01 |
| MABC | Friedman Aligned | 3.09062E-10 | 8.13039E-10 | 7.65346E-10 | 8.13039E-10 |
| MABC | Quade | 9.59880E-01 | 1.0 | 1.0 | 9.99995E-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 |
| **Table S116** (*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 S117.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.45556E-03 | 1.45654E-03 | 1.45654E-03 | 1.45556E-03 |
| NNA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.45556E-03 | 1.77232E-03 | 1.77232E-03 | 1.77088E-03 |
| CWOA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.45556E-03 | 2.10264E-03 | 2.10264E-03 | 2.10063E-03 |
| WW | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 1.45556E-03 | 2.18579E-03 | 2.18579E-03 | 2.18364E-03 |
| MABC | Friedman | 1.41904E-12 | 4.91207E-12 | 4.91207E-12 | 4.91207E-12 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 2.56699E-02 | 9.73363E-02 | 9.73363E-02 | 9.33686E-02 |
| PSO | Friedman | 4.78499E-12 | 1.76676E-11 | 1.76676E-11 | 1.76676E-11 |
| PSO | Friedman Aligned | 1.80279E-10 | 6.65645E-10 | 6.65645E-10 | 6.65645E-10 |
| PSO | Quade | 1.10383E-02 | 4.08787E-02 | 4.08787E-02 | 4.01550E-02 |
| DE | Friedman | 1.99447E-10 | 7.51762E-10 | 7.51762E-10 | 7.51762E-10 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 4.08670E-02 | 1.52102E-01 | 1.52102E-01 | 1.42782E-01 |
| GOTLBO | Friedman | 1.22587E-09 | 4.52629E-09 | 4.52629E-09 | 4.52629E-09 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 2.30921E-03 | 7.99910E-03 | 7.99910E-03 | 7.97072E-03 |
| **Table S117** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.01726E-06 | 3.52129E-06 | 3.52129E-06 | 3.52128E-06 |
| IJAYA | Friedman Aligned | 3.40542E-06 | 1.17880E-05 | 1.17880E-05 | 1.17879E-05 |
| IJAYA | Quade | 1.25398E-01 | 4.42937E-01 | 4.42937E-01 | 3.71110E-01 |
| NDE | Friedman | 3.37287E-03 | 1.03821E-02 | 1.03821E-02 | 1.03418E-02 |
| NDE | Friedman Aligned | 1.50714E-02 | 4.64546E-02 | 4.64546E-02 | 4.56516E-02 |
| NDE | Quade | 3.66833E-01 | 1.0 | 1.0 | 7.54932E-01 |
| TLBO | Friedman | 4.20792E-01 | 1.0 | 1.0 | 7.49986E-01 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 7.93916E-01 | 1.0 | 1.0 | 9.81856E-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 S118.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.09625E-03 | 1.09680E-03 | 1.09680E-03 | 1.09625E-03 |
| NNA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.09625E-03 | 1.34054E-03 | 1.34054E-03 | 1.33971E-03 |
| CWOA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.09625E-03 | 1.59708E-03 | 1.59708E-03 | 1.59592E-03 |
| MABC | Friedman | 2.33813E-13 | 7.19425E-13 | 7.19425E-13 | 7.19425E-13 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 2.11738E-02 | 8.02031E-02 | 8.02031E-02 | 7.74983E-02 |
| PSO | Friedman | 2.85766E-11 | 9.89189E-11 | 9.89189E-11 | 9.89189E-11 |
| PSO | Friedman Aligned | 1.82294E-10 | 6.73084E-10 | 6.73084E-10 | 6.73084E-10 |
| PSO | Quade | 8.90739E-03 | 3.29680E-02 | 3.29680E-02 | 3.24964E-02 |
| DE | Friedman | 3.71229E-11 | 1.37069E-10 | 1.37069E-10 | 1.37069E-10 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 3.41907E-02 | 1.27086E-01 | 1.27086E-01 | 1.20544E-01 |
| WW | Friedman | 3.79121E-10 | 1.42899E-09 | 1.42899E-09 | 1.42899E-09 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 1.09625E-03 | 1.66392E-03 | 1.66392E-03 | 1.66267E-03 |
| GOTLBO | Friedman | 3.71983E-09 | 1.37348E-08 | 1.37348E-08 | 1.37348E-08 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.80120E-03 | 6.23839E-03 | 6.23839E-03 | 6.22112E-03 |
| **Table S118** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 2.38212E-07 | 8.24579E-07 | 8.24579E-07 | 8.24578E-07 |
| IJAYA | Friedman Aligned | 1.92652E-06 | 6.66873E-06 | 6.66873E-06 | 6.66871E-06 |
| IJAYA | Quade | 1.08536E-01 | 3.82291E-01 | 3.82291E-01 | 3.28134E-01 |
| NDE | Friedman | 1.31676E-03 | 4.05218E-03 | 4.05218E-03 | 4.04603E-03 |
| NDE | Friedman Aligned | 1.08197E-02 | 3.33332E-02 | 3.33332E-02 | 3.29189E-02 |
| NDE | Quade | 3.30743E-01 | 1.0 | 1.0 | 7.09355E-01 |
| TLBO | Friedman | 2.78642E-01 | 7.24406E-01 | 7.24406E-01 | 5.63564E-01 |
| TLBO | Friedman Aligned | 9.40972E-01 | 1.0 | 1.0 | 9.99241E-01 |
| TLBO | Quade | 7.45664E-01 | 1.0 | 1.0 | 9.69051E-01 |
| EBLSHADE | Friedman | 8.09315E-01 | 1.0 | 1.0 | 9.53081E-01 |
| EBLSHADE | Friedman Aligned | 9.40972E-01 | 1.0 | 1.0 | 9.99241E-01 |
| EBLSHADE | Quade | 9.56989E-01 | 1.0 | 1.0 | 9.96998E-01 |
| 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 S119.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| CWOA | Friedman | 2.04947E-13 | 2.04947E-13 | 2.04947E-13 | 2.04947E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 6.08936E-02 | 7.94811E-02 | 7.94811E-02 | 7.66710E-02 |
| NNA | Friedman | 2.51132E-13 | 4.63629E-13 | 4.63629E-13 | 4.63629E-13 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 6.08936E-02 | 7.13516E-02 | 7.13516E-02 | 6.90638E-02 |
| ISCA | Friedman | 2.84809E-13 | 7.22977E-13 | 7.22977E-13 | 7.22977E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 6.08936E-02 | 6.26749E-02 | 6.26749E-02 | 6.08936E-02 |
| WW | Friedman | 2.98039E-13 | 9.17044E-13 | 9.17044E-13 | 9.17044E-13 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 6.08936E-02 | 7.99347E-02 | 7.99347E-02 | 7.71198E-02 |
| GOTLBO | Friedman | 3.48809E-11 | 1.20741E-10 | 1.20741E-10 | 1.20741E-10 |
| GOTLBO | Friedman Aligned | 1.79116E-10 | 6.61351E-10 | 6.61351E-10 | 6.61351E-10 |
| GOTLBO | Quade | 6.08936E-02 | 2.03799E-01 | 2.03799E-01 | 1.86283E-01 |
| PSO | Friedman | 4.01794E-08 | 1.48355E-07 | 1.48355E-07 | 1.48355E-07 |
| PSO | Friedman Aligned | 1.19200E-10 | 4.49293E-10 | 4.49293E-10 | 4.49293E-10 |
| PSO | Quade | 1.63536E-01 | 6.32903E-01 | 6.32903E-01 | 4.82809E-01 |
| MABC | Friedman | 4.55403E-05 | 1.71654E-04 | 1.71654E-04 | 1.71641E-04 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 2.71658E-01 | 1.0 | 1.0 | 6.97232E-01 |
| DE | Friedman | 8.96693E-04 | 3.31144E-03 | 3.31144E-03 | 3.30687E-03 |
| DE | Friedman Aligned | 1.27875E-12 | 4.72156E-12 | 4.72156E-12 | 4.72156E-12 |
| DE | Quade | 3.50621E-01 | 1.0 | 1.0 | 7.96911E-01 |
| **Table S119** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 7.33717E-02 | 2.56942E-01 | 2.56942E-01 | 2.31857E-01 |
| IJAYA | Friedman Aligned | 4.02808E-02 | 1.40313E-01 | 1.40313E-01 | 1.32656E-01 |
| IJAYA | Quade | 6.43209E-01 | 1.0 | 1.0 | 9.71773E-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 S120.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.04014E-03 | 1.04064E-03 | 1.04064E-03 | 1.04014E-03 |
| WW | Friedman Aligned | 3.59772E-11 | 1.24536E-10 | 1.24536E-10 | 1.24536E-10 |
| WW | Quade | 8.97219E-01 | 1.0 | 1.0 | 9.18511E-01 |
| CWOA | Friedman | 2.86600E-03 | 5.29751E-03 | 5.29751E-03 | 5.28467E-03 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 8.97219E-01 | 1.0 | 1.0 | 9.18511E-01 |
| ISCA | Friedman | 3.24679E-03 | 9.70884E-03 | 9.70884E-03 | 9.66653E-03 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 8.97219E-01 | 1.0 | 1.0 | 8.97219E-01 |
| NNA | Friedman | 3.24679E-03 | 8.25217E-03 | 8.25217E-03 | 8.22129E-03 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 8.97219E-01 | 1.0 | 1.0 | 9.09994E-01 |
| GOTLBO | Friedman | 2.71581E-02 | 9.48059E-02 | 9.48059E-02 | 9.09078E-02 |
| GOTLBO | Friedman Aligned | 1.40579E-09 | 5.19061E-09 | 5.19061E-09 | 5.19061E-09 |
| GOTLBO | Quade | 8.97219E-01 | 1.0 | 1.0 | 9.87898E-01 |
| PSO | Friedman | 3.11831E-01 | 1.0 | 1.0 | 7.48395E-01 |
| PSO | Friedman Aligned | 1.73195E-13 | 5.32907E-13 | 5.32907E-13 | 5.32907E-13 |
| PSO | Quade | 9.43078E-01 | 1.0 | 1.0 | 9.99975E-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 |
| **Table S120** (*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 S121.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.96287E-13 | 1.96287E-13 | 1.96287E-13 | 1.96287E-13 |
| PSO | Friedman Aligned | 1.80688E-10 | 6.67154E-10 | 6.67154E-10 | 6.67154E-10 |
| PSO | Quade | 2.94896E-02 | 1.09763E-01 | 1.09763E-01 | 1.04634E-01 |
| GOTLBO | Friedman | 6.25031E-11 | 1.15390E-10 | 1.15390E-10 | 1.15390E-10 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 7.28397E-03 | 2.52705E-02 | 2.52705E-02 | 2.49885E-02 |
| MABC | Friedman | 1.09197E-09 | 2.77193E-09 | 2.77193E-09 | 2.77193E-09 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 6.15993E-02 | 2.35585E-01 | 2.35585E-01 | 2.13090E-01 |
| ISCA | Friedman | 1.25475E-09 | 3.86077E-09 | 3.86077E-09 | 3.86077E-09 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 5.44202E-03 | 5.45574E-03 | 5.45574E-03 | 5.44202E-03 |
| NNA | Friedman | 1.37295E-09 | 4.75250E-09 | 4.75250E-09 | 4.75250E-09 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 5.44202E-03 | 6.49673E-03 | 6.49673E-03 | 6.47742E-03 |
| CWOA | Friedman | 2.09713E-09 | 7.74326E-09 | 7.74326E-09 | 7.74326E-09 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 5.44202E-03 | 7.55156E-03 | 7.55156E-03 | 7.52569E-03 |
| WW | Friedman | 9.53069E-09 | 3.59234E-08 | 3.59234E-08 | 3.59234E-08 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 5.44202E-03 | 7.76630E-03 | 7.76630E-03 | 7.73921E-03 |
| DE | Friedman | 4.24571E-08 | 1.56765E-07 | 1.56765E-07 | 1.56765E-07 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 9.15391E-02 | 3.44207E-01 | 3.44207E-01 | 2.98458E-01 |
| **Table S121** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 6.97445E-05 | 2.41426E-04 | 2.41426E-04 | 2.41402E-04 |
| IJAYA | Friedman Aligned | 3.05560E-06 | 1.05771E-05 | 1.05771E-05 | 1.05770E-05 |
| IJAYA | Quade | 2.37971E-01 | 8.57542E-01 | 8.57542E-01 | 6.09662E-01 |
| NDE | Friedman | 4.44651E-02 | 1.37531E-01 | 1.37531E-01 | 1.30599E-01 |
| NDE | Friedman Aligned | 1.41555E-02 | 4.36271E-02 | 4.36271E-02 | 4.29185E-02 |
| NDE | Quade | 5.71073E-01 | 1.0 | 1.0 | 9.26061E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 9.91583E-01 | 1.0 | 1.0 | 9.99995E-01 |
| 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 S122.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 9.04976E-01 | 1.0 | 1.0 | 9.04976E-01 |
| WW | Friedman Aligned | 1.67999E-12 | 1.67999E-12 | 1.67999E-12 | 1.67999E-12 |
| WW | Quade | 9.99991E-01 | 1.0 | 1.0 | 9.99997E-01 |
| ISCA | Friedman | 9.32174E-01 | 1.0 | 1.0 | 9.97839E-01 |
| ISCA | Friedman Aligned | 7.66599E-08 | 1.94598E-07 | 1.94598E-07 | 1.94598E-07 |
| ISCA | Quade | 9.99991E-01 | 1.0 | 1.0 | 9.99991E-01 |
| NNA | Friedman | 9.32174E-01 | 1.0 | 1.0 | 9.97323E-01 |
| NNA | Friedman Aligned | 3.08669E-09 | 5.69850E-09 | 5.69850E-09 | 5.69850E-09 |
| NNA | Quade | 9.99991E-01 | 1.0 | 1.0 | 9.99995E-01 |
| CWOA | Friedman | 9.32174E-01 | 1.0 | 1.0 | 9.93041E-01 |
| CWOA | Friedman Aligned | 2.23479E-06 | 6.87627E-06 | 6.87627E-06 | 6.87625E-06 |
| CWOA | Quade | 9.99991E-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 |
| 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 S122** (*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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S123.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.09625E-03 | 1.09680E-03 | 1.09680E-03 | 1.09625E-03 |
| NNA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 1.09625E-03 | 1.34054E-03 | 1.34054E-03 | 1.33971E-03 |
| CWOA | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 1.09625E-03 | 1.59708E-03 | 1.59708E-03 | 1.59592E-03 |
| MABC | Friedman | 2.33813E-13 | 7.19425E-13 | 7.19425E-13 | 7.19425E-13 |
| MABC | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| MABC | Quade | 2.11738E-02 | 8.02031E-02 | 8.02031E-02 | 7.74983E-02 |
| PSO | Friedman | 2.85766E-11 | 9.89189E-11 | 9.89189E-11 | 9.89189E-11 |
| PSO | Friedman Aligned | 1.82294E-10 | 6.73084E-10 | 6.73084E-10 | 6.73084E-10 |
| PSO | Quade | 8.90739E-03 | 3.29680E-02 | 3.29680E-02 | 3.24964E-02 |
| DE | Friedman | 3.71229E-11 | 1.37069E-10 | 1.37069E-10 | 1.37069E-10 |
| DE | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| DE | Quade | 3.41907E-02 | 1.27086E-01 | 1.27086E-01 | 1.20544E-01 |
| WW | Friedman | 3.79121E-10 | 1.42899E-09 | 1.42899E-09 | 1.42899E-09 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 1.09625E-03 | 1.66392E-03 | 1.66392E-03 | 1.66267E-03 |
| GOTLBO | Friedman | 3.71983E-09 | 1.37348E-08 | 1.37348E-08 | 1.37348E-08 |
| GOTLBO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Quade | 1.80120E-03 | 6.23839E-03 | 6.23839E-03 | 6.22112E-03 |
| **Table S123** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 2.38212E-07 | 8.24579E-07 | 8.24579E-07 | 8.24578E-07 |
| IJAYA | Friedman Aligned | 1.92652E-06 | 6.66873E-06 | 6.66873E-06 | 6.66871E-06 |
| IJAYA | Quade | 1.08536E-01 | 3.82291E-01 | 3.82291E-01 | 3.28134E-01 |
| NDE | Friedman | 1.31676E-03 | 4.05218E-03 | 4.05218E-03 | 4.04603E-03 |
| NDE | Friedman Aligned | 1.08197E-02 | 3.33332E-02 | 3.33332E-02 | 3.29189E-02 |
| NDE | Quade | 3.30743E-01 | 1.0 | 1.0 | 7.09355E-01 |
| TLBO | Friedman | 2.78642E-01 | 7.24406E-01 | 7.24406E-01 | 5.63564E-01 |
| TLBO | Friedman Aligned | 9.40972E-01 | 1.0 | 1.0 | 9.99241E-01 |
| TLBO | Quade | 7.45664E-01 | 1.0 | 1.0 | 9.69051E-01 |
| EBLSHADE | Friedman | 8.09315E-01 | 1.0 | 1.0 | 9.53081E-01 |
| EBLSHADE | Friedman Aligned | 9.40972E-01 | 1.0 | 1.0 | 9.99241E-01 |
| EBLSHADE | Quade | 9.56989E-01 | 1.0 | 1.0 | 9.96998E-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 S124.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 1.37121E-01 | 1.46648E-01 | 1.46648E-01 | 1.37121E-01 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 9.87878E-01 | 1.0 | 1.0 | 9.91564E-01 |
| ISCA | Friedman | 2.08923E-01 | 5.89641E-01 | 5.89641E-01 | 4.55419E-01 |
| ISCA | Friedman Aligned | 7.82109E-10 | 1.98535E-09 | 1.98535E-09 | 1.98535E-09 |
| ISCA | Quade | 9.87878E-01 | 1.0 | 1.0 | 9.87878E-01 |
| NNA | Friedman | 2.08923E-01 | 5.49729E-01 | 5.49729E-01 | 4.31038E-01 |
| NNA | Friedman Aligned | 7.43077E-09 | 2.28639E-08 | 2.28639E-08 | 2.28639E-08 |
| NNA | Quade | 9.87878E-01 | 1.0 | 1.0 | 9.90189E-01 |
| CWOA | Friedman | 2.08923E-01 | 4.24958E-01 | 4.24958E-01 | 3.51222E-01 |
| CWOA | Friedman Aligned | 3.54082E-11 | 6.53690E-11 | 6.53690E-11 | 6.53690E-11 |
| CWOA | Quade | 9.87878E-01 | 1.0 | 1.0 | 9.91564E-01 |
| GOTLBO | Friedman | 5.28655E-01 | 1.0 | 1.0 | 9.25997E-01 |
| GOTLBO | Friedman Aligned | 3.35675E-04 | 1.16207E-03 | 1.16207E-03 | 1.16147E-03 |
| GOTLBO | Quade | 9.87878E-01 | 1.0 | 1.0 | 9.99741E-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 S124** (*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 S125.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 7.01424E-09 | 7.01424E-09 | 7.01424E-09 | 7.01424E-09 |
| WW | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| WW | Quade | 3.33895E-01 | 4.68680E-01 | 4.61937E-01 | 3.80571E-01 |
| CWOA | Friedman | 4.86623E-08 | 8.98381E-08 | 8.98381E-08 | 8.98381E-08 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 3.33895E-01 | 4.68680E-01 | 4.61937E-01 | 3.80571E-01 |
| NNA | Friedman | 7.50035E-08 | 1.90393E-07 | 1.90393E-07 | 1.90393E-07 |
| NNA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| NNA | Quade | 3.33895E-01 | 4.37241E-01 | 4.37241E-01 | 3.59435E-01 |
| ISCA | Friedman | 8.49143E-08 | 2.61275E-07 | 2.61275E-07 | 2.61275E-07 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 3.33895E-01 | 4.00024E-01 | 4.00024E-01 | 3.33895E-01 |
| GOTLBO | Friedman | 3.57285E-06 | 1.23676E-05 | 1.23676E-05 | 1.23675E-05 |
| GOTLBO | Friedman Aligned | 2.09884E-10 | 7.74957E-10 | 7.74957E-10 | 7.74957E-10 |
| GOTLBO | Quade | 3.33895E-01 | 9.45824E-01 | 9.45824E-01 | 6.31865E-01 |
| PSO | Friedman | 5.02694E-04 | 1.85635E-03 | 1.85635E-03 | 1.85485E-03 |
| PSO | Friedman Aligned | 7.43825E-11 | 2.57478E-10 | 2.57478E-10 | 2.57478E-10 |
| PSO | Quade | 4.98202E-01 | 1.0 | 1.0 | 9.21610E-01 |
| MABC | Friedman | 4.25676E-02 | 1.62057E-01 | 1.62057E-01 | 1.51226E-01 |
| MABC | Friedman Aligned | 6.05896E-09 | 2.23716E-08 | 2.23716E-08 | 2.23716E-08 |
| MABC | Quade | 6.69600E-01 | 1.0 | 1.0 | 9.84613E-01 |
| DE | Friedman | 2.05603E-01 | 7.92421E-01 | 7.92421E-01 | 5.72528E-01 |
| DE | Friedman Aligned | 8.71728E-10 | 3.28574E-09 | 3.28574E-09 | 3.28574E-09 |
| DE | Quade | 7.68822E-01 | 1.0 | 1.0 | 9.95518E-01 |
| **Table S125** (*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 S126.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 9.99926E-01 | 1.0 | 1.0 | 9.99926E-01 |
| WW | Friedman Aligned | 6.29593E-01 | 9.56165E-01 | 9.56165E-01 | 6.29593E-01 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.99990E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.99996E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 9.94434E-01 | 1.0 | 1.0 | 9.99931E-01 |
| 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 |
| **Table S126** (*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 | 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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S127.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 9.99981E-01 | 1.0 | 1.0 | 9.99981E-01 |
| WW | Friedman Aligned | 9.68408E-01 | 1.0 | 1.0 | 9.68408E-01 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.99999E-01 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| 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 |
| **Table S127** (*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 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S128.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, RMSPE value). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 9.99999E-01 | 1.0 | 1.0 | 9.99999E-01 |
| WW | Friedman Aligned | 1.65346E-01 | 1.79488E-01 | 1.79488E-01 | 1.65346E-01 |
| WW | 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 S128** (*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 | 9.50839E-01 | 1.0 | 1.0 | 9.99523E-01 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 7.72845E-01 | 1.0 | 1.0 | 9.35186E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S129.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, RMSPE value). | | | | | |
| 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 S129** (*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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S130.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 4.50560E-01 | 7.36426E-01 | 7.16850E-01 | 5.32330E-01 |
| PSO | Friedman Aligned | 1.31972E-02 | 4.07936E-02 | 4.07936E-02 | 4.00528E-02 |
| PSO | Quade | 9.99988E-01 | 1.0 | 1.0 | 9.99998E-01 |
| CWOA | Friedman | 4.50560E-01 | 7.36426E-01 | 7.16850E-01 | 5.32330E-01 |
| CWOA | Friedman Aligned | 2.07247E-05 | 3.82613E-05 | 3.82613E-05 | 3.82606E-05 |
| CWOA | Quade | 9.99988E-01 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 4.50560E-01 | 5.85271E-01 | 5.85271E-01 | 4.50560E-01 |
| WW | Friedman Aligned | 2.92524E-07 | 2.92524E-07 | 2.92524E-07 | 2.92524E-07 |
| WW | Quade | 9.99988E-01 | 1.0 | 1.0 | 9.99988E-01 |
| GOTLBO | Friedman | 5.52020E-01 | 1.0 | 1.0 | 9.15482E-01 |
| GOTLBO | Friedman Aligned | 7.67176E-01 | 1.0 | 1.0 | 9.95399E-01 |
| GOTLBO | Quade | 9.99988E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 5.52020E-01 | 1.0 | 1.0 | 9.15482E-01 |
| NNA | Friedman Aligned | 6.53162E-04 | 1.65844E-03 | 1.65844E-03 | 1.65719E-03 |
| NNA | Quade | 9.99988E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 5.52204E-01 | 1.0 | 1.0 | 9.48515E-01 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 9.99988E-01 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 8.42576E-01 | 1.0 | 1.0 | 9.99059E-01 |
| MABC | Friedman Aligned | 4.90703E-01 | 1.0 | 1.0 | 9.03246E-01 |
| MABC | Quade | 9.99988E-01 | 1.0 | 1.0 | 1.0 |
| IJAYA | Friedman | 8.42576E-01 | 1.0 | 1.0 | 9.99059E-01 |
| IJAYA | Friedman Aligned | 9.62004E-01 | 1.0 | 1.0 | 9.99996E-01 |
| IJAYA | Quade | 9.99988E-01 | 1.0 | 1.0 | 1.0 |
| **Table S130** (*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 S131.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (EBLSHADE is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.30508E-05 | 2.46344E-05 | 2.46344E-05 | 2.46341E-05 |
| PSO | Friedman Aligned | 4.90853E-11 | 1.24601E-10 | 1.24601E-10 | 1.24601E-10 |
| PSO | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 8.40980E-01 |
| CWOA | Friedman | 1.30508E-05 | 2.35507E-05 | 2.35507E-05 | 2.35504E-05 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 8.86126E-01 |
| WW | Friedman | 1.30508E-05 | 1.30509E-05 | 1.30509E-05 | 1.30508E-05 |
| WW | Friedman Aligned | 8.76076E-10 | 3.03257E-09 | 3.03257E-09 | 3.03257E-09 |
| WW | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 7.93250E-01 |
| NNA | Friedman | 1.25380E-04 | 3.85802E-04 | 3.85802E-04 | 3.85735E-04 |
| NNA | Friedman Aligned | 1.73171E-09 | 6.52721E-09 | 6.52721E-09 | 6.52721E-09 |
| NNA | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| GOTLBO | Friedman | 1.26295E-04 | 4.37193E-04 | 4.37193E-04 | 4.37109E-04 |
| GOTLBO | Friedman Aligned | 5.58257E-11 | 1.71771E-10 | 1.71771E-10 | 1.71771E-10 |
| GOTLBO | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| ISCA | Friedman | 2.06680E-04 | 7.63167E-04 | 7.63167E-04 | 7.62912E-04 |
| ISCA | Friedman Aligned | 1.83740E-08 | 6.36024E-08 | 6.36024E-08 | 6.36024E-08 |
| ISCA | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| MABC | Friedman | 1.40828E-03 | 5.30987E-03 | 4.55132E-03 | 5.29780E-03 |
| MABC | Friedman Aligned | 3.00493E-12 | 5.54756E-12 | 5.54756E-12 | 5.54756E-12 |
| MABC | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| IJAYA | Friedman | 1.40828E-03 | 5.30987E-03 | 4.55132E-03 | 5.29780E-03 |
| IJAYA | Friedman Aligned | 8.76076E-10 | 3.10840E-09 | 3.10840E-09 | 3.10840E-09 |
| IJAYA | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| **Table S131** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 5.62340E-03 | 1.94825E-02 | 1.94825E-02 | 1.93313E-02 |
| DE | Friedman Aligned | 2.45853E-09 | 9.07765E-09 | 9.07765E-09 | 9.07765E-09 |
| DE | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| NDE | Friedman | 2.09529E-02 | 6.46277E-02 | 6.46277E-02 | 6.30782E-02 |
| NDE | Friedman Aligned | 2.37713E-02 | 7.33451E-02 | 5.14343E-02 | 7.13523E-02 |
| NDE | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.19984E-01 |
| TLBO | Friedman | 3.98503E-01 | 1.0 | 4.07382E-01 | 7.24836E-01 |
| TLBO | Friedman Aligned | 2.88150E-02 | 7.33451E-02 | 5.14343E-02 | 7.15329E-02 |
| TLBO | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.77197E-01 |
| STLBO | Friedman | 3.98503E-01 | 1.0 | 4.07382E-01 | 7.24836E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 7.98639E-01 | 1.0 | 7.98639E-01 | 9.77197E-01 |
| ADELI | Friedman | 4.07382E-01 | 1.0 | 4.07382E-01 | 7.24836E-01 |
| ADELI | Friedman Aligned | 2.88150E-02 | 7.33451E-02 | 5.14343E-02 | 7.15329E-02 |
| ADELI | Quade | 7.93250E-01 | 1.0 | 7.98639E-01 | 9.77197E-01 |

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| --- | --- | --- | --- | --- | --- |
| **Table S132.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 6.31318E-04 | 1.04935E-03 | 1.04935E-03 | 1.04885E-03 |
| PSO | Friedman Aligned | 1.18842E-10 | 3.01677E-10 | 3.01677E-10 | 3.01677E-10 |
| PSO | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.76795E-01 |
| CWOA | Friedman | 6.31318E-04 | 1.02471E-03 | 1.02471E-03 | 1.02423E-03 |
| CWOA | Friedman Aligned | 4.50306E-12 | 8.31335E-12 | 8.31335E-12 | 8.31335E-12 |
| CWOA | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.87201E-01 |
| WW | Friedman | 6.31318E-04 | 6.31502E-04 | 6.31502E-04 | 6.31318E-04 |
| WW | Friedman Aligned | 4.21371E-10 | 1.29653E-09 | 1.29653E-09 | 1.29653E-09 |
| WW | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.62893E-01 |
| GOTLBO | Friedman | 3.28358E-03 | 1.09916E-02 | 1.09916E-02 | 1.09381E-02 |
| GOTLBO | Friedman Aligned | 1.53943E-05 | 5.68406E-05 | 5.68406E-05 | 5.68392E-05 |
| GOTLBO | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| NNA | Friedman | 3.28358E-03 | 1.01148E-02 | 1.01148E-02 | 1.00689E-02 |
| NNA | Friedman Aligned | 5.08038E-13 | 5.08038E-13 | 5.08038E-13 | 5.08038E-13 |
| NNA | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| ISCA | Friedman | 4.57816E-03 | 1.69249E-02 | 1.69249E-02 | 1.68001E-02 |
| ISCA | Friedman Aligned | 8.26661E-04 | 2.86188E-03 | 2.86188E-03 | 2.85861E-03 |
| ISCA | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| MABC | Friedman | 2.05485E-02 | 7.78229E-02 | 6.67054E-02 | 7.52749E-02 |
| MABC | Friedman Aligned | 1.46218E-06 | 5.06140E-06 | 5.06140E-06 | 5.06139E-06 |
| MABC | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| IJAYA | Friedman | 2.05485E-02 | 7.78229E-02 | 6.67054E-02 | 7.52749E-02 |
| IJAYA | Friedman Aligned | 1.09560E-04 | 4.12967E-04 | 4.12967E-04 | 4.12893E-04 |
| IJAYA | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| **Table S132** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 5.66909E-02 | 1.97993E-01 | 1.97993E-01 | 1.82921E-01 |
| DE | Friedman Aligned | 2.35433E-04 | 8.69330E-04 | 8.69330E-04 | 8.69015E-04 |
| DE | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| NDE | Friedman | 1.46638E-01 | 4.59328E-01 | 4.59328E-01 | 3.86093E-01 |
| NDE | Friedman Aligned | 9.58524E-01 | 1.0 | 1.0 | 9.99944E-01 |
| NDE | Quade | 9.62893E-01 | 1.0 | 1.0 | 9.93168E-01 |
| TLBO | Friedman | 9.45602E-01 | 1.0 | 1.0 | 9.99383E-01 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 9.49185E-01 | 1.0 | 1.0 | 9.99383E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S133.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 1.55714E-01 | 2.24134E-01 | 2.20690E-01 | 2.02484E-01 |
| PSO | Friedman Aligned | 2.45681E-10 | 6.23651E-10 | 6.23651E-10 | 6.23651E-10 |
| PSO | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99926E-01 |
| CWOA | Friedman | 1.55714E-01 | 2.24134E-01 | 2.20690E-01 | 2.02484E-01 |
| CWOA | Friedman Aligned | 2.18658E-12 | 4.03677E-12 | 4.03677E-12 | 4.03677E-12 |
| CWOA | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99984E-01 |
| WW | Friedman | 1.55714E-01 | 1.68167E-01 | 1.68167E-01 | 1.55714E-01 |
| WW | Friedman Aligned | 2.49057E-10 | 7.66329E-10 | 7.66329E-10 | 7.66329E-10 |
| WW | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99775E-01 |
| GOTLBO | Friedman | 2.56546E-01 | 8.77639E-01 | 8.77639E-01 | 6.02847E-01 |
| GOTLBO | Friedman Aligned | 2.54839E-05 | 9.40951E-05 | 9.40951E-05 | 9.40913E-05 |
| GOTLBO | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99998E-01 |
| NNA | Friedman | 2.56546E-01 | 8.71786E-01 | 8.71786E-01 | 5.98341E-01 |
| NNA | Friedman Aligned | 1.12288E-12 | 1.12288E-12 | 1.12288E-12 | 1.12288E-12 |
| NNA | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99998E-01 |
| ISCA | Friedman | 2.68694E-01 | 1.0 | 1.0 | 6.85071E-01 |
| ISCA | Friedman Aligned | 1.22826E-03 | 4.25249E-03 | 4.25249E-03 | 4.24526E-03 |
| ISCA | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99998E-01 |
| MABC | Friedman | 5.32517E-01 | 1.0 | 1.0 | 9.43079E-01 |
| MABC | Friedman Aligned | 2.55400E-06 | 8.84079E-06 | 8.84079E-06 | 8.84076E-06 |
| MABC | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99998E-01 |
| IJAYA | Friedman | 5.32517E-01 | 1.0 | 1.0 | 9.43079E-01 |
| IJAYA | Friedman Aligned | 1.72659E-04 | 6.50817E-04 | 6.50817E-04 | 6.50635E-04 |
| IJAYA | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99998E-01 |
| **Table S133** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 7.62590E-01 | 1.0 | 1.0 | 9.93109E-01 |
| DE | Friedman Aligned | 3.62802E-04 | 1.33967E-03 | 1.33967E-03 | 1.33892E-03 |
| DE | Quade | 9.99775E-01 | 1.0 | 1.0 | 9.99998E-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 S134.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 8.30603E-01 | 1.0 | 1.0 | 8.84463E-01 |
| PSO | Friedman Aligned | 2.77918E-01 | 9.53341E-01 | 9.53341E-01 | 6.32817E-01 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 8.30603E-01 | 1.0 | 1.0 | 8.84463E-01 |
| CWOA | Friedman Aligned | 3.58148E-03 | 6.62200E-03 | 6.62200E-03 | 6.60193E-03 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 8.30603E-01 | 1.0 | 1.0 | 8.30603E-01 |
| WW | Friedman Aligned | 1.46115E-04 | 1.46124E-04 | 1.46124E-04 | 1.46115E-04 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 8.60298E-01 | 1.0 | 1.0 | 9.97657E-01 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 8.60298E-01 | 1.0 | 1.0 | 9.99247E-01 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 8.60298E-01 | 1.0 | 1.0 | 9.97657E-01 |
| NNA | Friedman Aligned | 4.14291E-02 | 1.06884E-01 | 1.06884E-01 | 1.01840E-01 |
| 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 |
| **Table S134** (*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 S135.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (TLBO is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.92560E-04 | 1.62336E-03 | 1.62336E-03 | 1.62216E-03 |
| PSO | Friedman Aligned | 1.04019E-10 | 2.64048E-10 | 2.64048E-10 | 2.64048E-10 |
| PSO | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.76514E-01 |
| CWOA | Friedman | 9.92560E-04 | 1.58954E-03 | 1.58954E-03 | 1.58839E-03 |
| CWOA | Friedman Aligned | 5.11791E-12 | 9.44844E-12 | 9.44844E-12 | 9.44844E-12 |
| CWOA | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.87026E-01 |
| WW | Friedman | 9.92560E-04 | 9.93015E-04 | 9.93015E-04 | 9.92560E-04 |
| WW | Friedman Aligned | 4.62743E-10 | 1.42383E-09 | 1.42383E-09 | 1.42383E-09 |
| WW | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.62491E-01 |
| GOTLBO | Friedman | 4.77179E-03 | 1.58963E-02 | 1.58963E-02 | 1.57845E-02 |
| GOTLBO | Friedman Aligned | 1.40291E-05 | 5.17999E-05 | 5.17999E-05 | 5.17987E-05 |
| GOTLBO | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-01 |
| NNA | Friedman | 4.77179E-03 | 1.47067E-02 | 1.47067E-02 | 1.46098E-02 |
| NNA | Friedman Aligned | 4.38760E-13 | 4.38760E-13 | 4.38760E-13 | 4.38760E-13 |
| NNA | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-01 |
| ISCA | Friedman | 6.51265E-03 | 2.40890E-02 | 2.40890E-02 | 2.38367E-02 |
| ISCA | Friedman Aligned | 7.68321E-04 | 2.65989E-03 | 2.65989E-03 | 2.65706E-03 |
| ISCA | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-01 |
| MABC | Friedman | 2.77009E-02 | 1.05088E-01 | 9.00750E-02 | 1.00471E-01 |
| MABC | Friedman Aligned | 1.31956E-06 | 4.56772E-06 | 4.56772E-06 | 4.56771E-06 |
| MABC | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-01 |
| IJAYA | Friedman | 2.77009E-02 | 1.05088E-01 | 9.00750E-02 | 1.00471E-01 |
| IJAYA | Friedman Aligned | 1.00742E-04 | 3.79729E-04 | 3.79729E-04 | 3.79667E-04 |
| IJAYA | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-01 |
| **Table S135** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 7.29030E-02 | 2.55281E-01 | 2.55281E-01 | 2.30511E-01 |
| DE | Friedman Aligned | 2.17370E-04 | 8.02629E-04 | 8.02629E-04 | 8.02360E-04 |
| DE | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-01 |
| NDE | Friedman | 1.80006E-01 | 5.66315E-01 | 5.66315E-01 | 4.56998E-01 |
| NDE | Friedman Aligned | 9.48516E-01 | 1.0 | 1.0 | 9.99891E-01 |
| NDE | Quade | 9.62491E-01 | 1.0 | 1.0 | 9.93062E-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 | 9.92596E-01 | 1.0 | 1.0 | 9.99996E-01 |
| ADELI | Quade | 9.99595E-01 | 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 S136.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.98888E-01 | 1.0 | 1.0 | 9.99669E-01 |
| PSO | Friedman Aligned | 9.17453E-02 | 2.91753E-01 | 2.91753E-01 | 2.56282E-01 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.98888E-01 | 1.0 | 1.0 | 9.99669E-01 |
| CWOA | Friedman Aligned | 4.72107E-04 | 8.71757E-04 | 8.71757E-04 | 8.71408E-04 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.98888E-01 | 1.0 | 1.0 | 9.98888E-01 |
| WW | Friedman Aligned | 1.21443E-05 | 1.21444E-05 | 1.21444E-05 | 1.21443E-05 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.99965E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 8.38840E-03 | 2.13627E-02 | 2.13627E-02 | 2.11564E-02 |
| 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 |
| **Table S136** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 9.12281E-01 | 1.0 | 1.0 | 9.99780E-01 |
| 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 |
| 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 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S137.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (STLBO is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 8.87311E-04 | 1.45708E-03 | 1.45708E-03 | 1.45612E-03 |
| PSO | Friedman Aligned | 1.30579E-10 | 4.01781E-10 | 4.01781E-10 | 4.01781E-10 |
| PSO | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.53136E-01 |
| CWOA | Friedman | 8.87311E-04 | 1.42576E-03 | 1.42576E-03 | 1.42483E-03 |
| CWOA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| CWOA | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.71605E-01 |
| WW | Friedman | 8.87311E-04 | 8.87675E-04 | 8.87675E-04 | 8.87311E-04 |
| WW | Friedman Aligned | 1.11147E-09 | 4.18940E-09 | 4.18940E-09 | 4.18940E-09 |
| WW | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.30369E-01 |
| GOTLBO | Friedman | 4.35052E-03 | 1.45102E-02 | 1.45102E-02 | 1.44170E-02 |
| GOTLBO | Friedman Aligned | 1.44695E-11 | 3.67302E-11 | 3.67302E-11 | 3.67302E-11 |
| GOTLBO | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| NNA | Friedman | 4.35052E-03 | 1.34064E-02 | 1.34064E-02 | 1.33258E-02 |
| NNA | Friedman Aligned | 3.90710E-09 | 1.44262E-08 | 1.44262E-08 | 1.44262E-08 |
| NNA | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| ISCA | Friedman | 5.96940E-03 | 2.20764E-02 | 2.20764E-02 | 2.18643E-02 |
| ISCA | Friedman Aligned | 4.50262E-09 | 1.55860E-08 | 1.55860E-08 | 1.55860E-08 |
| ISCA | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| MABC | Friedman | 2.57340E-02 | 9.75806E-02 | 8.36406E-02 | 9.35933E-02 |
| MABC | Friedman Aligned | 5.23914E-13 | 9.67226E-13 | 9.67226E-13 | 9.67226E-13 |
| MABC | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| IJAYA | Friedman | 2.57340E-02 | 9.75806E-02 | 8.36406E-02 | 9.35933E-02 |
| IJAYA | Friedman Aligned | 2.18045E-10 | 7.54772E-10 | 7.54772E-10 | 7.54772E-10 |
| IJAYA | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| **Table S137** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 6.85289E-02 | 2.39794E-01 | 2.39794E-01 | 2.17870E-01 |
| DE | Friedman Aligned | 7.42368E-10 | 2.74105E-09 | 2.74105E-09 | 2.74105E-09 |
| DE | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| NDE | Friedman | 1.71181E-01 | 5.37924E-01 | 5.37924E-01 | 4.38814E-01 |
| NDE | Friedman Aligned | 1.22573E-02 | 3.77682E-02 | 2.72258E-02 | 3.72367E-02 |
| NDE | Quade | 9.30369E-01 | 1.0 | 1.0 | 9.83227E-01 |
| TLBO | Friedman | 9.89408E-01 | 1.0 | 1.0 | 9.99990E-01 |
| TLBO | Friedman Aligned | 1.52045E-02 | 3.86414E-02 | 2.72258E-02 | 3.81458E-02 |
| TLBO | Quade | 9.44870E-01 | 1.0 | 1.0 | 9.99362E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 8.12763E-01 | 8.12763E-01 | 8.12763E-01 | 8.12763E-01 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.52045E-02 | 3.86414E-02 | 2.72258E-02 | 3.81458E-02 |
| ADELI | Quade | 9.44870E-01 | 1.0 | 1.0 | 9.99362E-01 |

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| --- | --- | --- | --- | --- | --- |
| **Table S138.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, Comp parameter). | | | | | |
| 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 S138** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| 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 | 8.54143E-01 | 1.0 | 1.0 | 9.92455E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 3.93493E-01 | 8.88533E-01 | 8.88533E-01 | 6.02734E-01 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 8.06951E-02 | 8.38658E-02 | 8.38658E-02 | 8.06951E-02 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S139.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (IJAYA is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 8.30603E-01 | 1.0 | 1.0 | 8.84463E-01 |
| PSO | Friedman Aligned | 2.55584E-02 | 7.93472E-02 | 7.93472E-02 | 7.65731E-02 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 8.30603E-01 | 1.0 | 1.0 | 8.84463E-01 |
| CWOA | Friedman Aligned | 5.81546E-05 | 1.07365E-04 | 1.07365E-04 | 1.07360E-04 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 8.30603E-01 | 1.0 | 1.0 | 8.30603E-01 |
| WW | Friedman Aligned | 9.75209E-07 | 9.75209E-07 | 9.75209E-07 | 9.75209E-07 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 8.60298E-01 | 1.0 | 1.0 | 9.97657E-01 |
| GOTLBO | Friedman Aligned | 8.87840E-01 | 1.0 | 1.0 | 9.99690E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 8.60298E-01 | 1.0 | 1.0 | 9.99247E-01 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 8.60298E-01 | 1.0 | 1.0 | 9.97657E-01 |
| NNA | Friedman Aligned | 1.53028E-03 | 3.88684E-03 | 3.88684E-03 | 3.87999E-03 |
| 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 |
| **Table S139** (*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 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 6.38258E-01 | 1.0 | 1.0 | 9.70394E-01 |
| 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S140.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ISCA is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.93692E-01 | 1.0 | 1.0 | 9.97469E-01 |
| PSO | Friedman Aligned | 4.05630E-03 | 1.24985E-02 | 1.24985E-02 | 1.24284E-02 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.93692E-01 | 1.0 | 1.0 | 9.97469E-01 |
| CWOA | Friedman Aligned | 3.47277E-06 | 6.41127E-06 | 6.41127E-06 | 6.41126E-06 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.93692E-01 | 1.0 | 1.0 | 9.93692E-01 |
| WW | Friedman Aligned | 3.59568E-08 | 3.59568E-08 | 3.59568E-08 | 3.59568E-08 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 9.96887E-01 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 5.31817E-01 | 1.0 | 1.0 | 9.39316E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.96887E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 1.47184E-04 | 3.73641E-04 | 3.73641E-04 | 3.73578E-04 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 8.75367E-01 | 1.0 | 1.0 | 9.99542E-01 |
| 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 S140** (*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 | 2.80474E-01 | 1.0 | 1.0 | 6.79991E-01 |
| 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 | 7.88732E-01 | 1.0 | 1.0 | 9.97148E-01 |
| IJAYA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S141.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, Comp parameter). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| PSO | Friedman | 9.99446E-01 | 1.0 | 1.0 | 9.99855E-01 |
| PSO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 9.99446E-01 | 1.0 | 1.0 | 9.99855E-01 |
| CWOA | Friedman Aligned | 9.57624E-01 | 1.0 | 1.0 | 9.97079E-01 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 9.99446E-01 | 1.0 | 1.0 | 9.99446E-01 |
| WW | Friedman Aligned | 6.15608E-01 | 9.21781E-01 | 9.21781E-01 | 6.15608E-01 |
| WW | 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 |
| **Table S141** (*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 | 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 |

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| --- | --- | --- | --- | --- | --- |
| **Table S142.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (CWOA is the control algorithm, Comp parameter). | | | | | |
| 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 S142** (*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 | 9.96187E-01 | 1.0 | 1.0 | 9.96187E-01 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S143.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (WW is the control algorithm, Comp parameter). | | | | | |
| 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 S143** (*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 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |