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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 |

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