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| --- | --- | --- | --- | --- | --- |
| **Table S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 S3.** 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 S3** (*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 |