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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 |

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