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| --- | --- | --- | --- | --- | --- |
| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (DE is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 1.58394E-05 | 1.58395E-05 | 1.58395E-05 | 1.58394E-05 |
| GOTLBO | Friedman Aligned | 1.10556E-12 | 2.04103E-12 | 2.04103E-12 | 2.04103E-12 |
| GOTLBO | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.22069E-01 |
| PSO | Friedman | 2.04155E-05 | 3.76906E-05 | 3.76906E-05 | 3.76899E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.53381E-01 | 1.0 | 1.0 | 6.53381E-01 |
| ISCA | Friedman | 4.72466E-05 | 1.19936E-04 | 1.19936E-04 | 1.19929E-04 |
| ISCA | Friedman Aligned | 1.10556E-12 | 2.72826E-12 | 2.72826E-12 | 2.72826E-12 |
| ISCA | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.12615E-01 |
| NNA | Friedman | 4.72466E-05 | 1.35747E-04 | 1.35747E-04 | 1.35739E-04 |
| NNA | Friedman Aligned | 1.10556E-12 | 2.75335E-12 | 2.75335E-12 | 2.75335E-12 |
| NNA | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.22069E-01 |
| CWOA | Friedman | 6.04602E-05 | 2.09289E-04 | 2.09289E-04 | 2.09270E-04 |
| CWOA | Friedman Aligned | 6.56553E-10 | 2.27268E-09 | 2.27268E-09 | 2.27268E-09 |
| CWOA | Quade | 6.53381E-01 | 1.0 | 1.0 | 7.63921E-01 |
| WW | Friedman | 2.94224E-03 | 1.08723E-02 | 1.08723E-02 | 1.08207E-02 |
| WW | Friedman Aligned | 1.94472E-05 | 7.18054E-05 | 7.18054E-05 | 7.18031E-05 |
| WW | Quade | 6.53381E-01 | 1.0 | 1.0 | 9.31924E-01 |
| MABC | Friedman | 2.85543E-01 | 1.0 | 1.0 | 7.18420E-01 |
| MABC | Friedman Aligned | 5.68648E-01 | 1.0 | 1.0 | 9.57966E-01 |
| MABC | Quade | 7.47708E-01 | 1.0 | 1.0 | 9.94433E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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 | 9.98751E-01 | 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 (EBLSHADE is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 1.40443E-09 | 4.32133E-09 | 4.32133E-09 | 4.32133E-09 |
| GOTLBO | Quade | 2.61275E-03 | 4.15154E-03 | 3.95252E-03 | 4.14372E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 2.61275E-03 | 2.61590E-03 | 2.61590E-03 | 2.61275E-03 |
| MABC | Friedman | 1.66844E-12 | 4.23528E-12 | 4.23528E-12 | 4.23528E-12 |
| MABC | Friedman Aligned | 1.97530E-05 | 7.44541E-05 | 7.44541E-05 | 7.44517E-05 |
| MABC | Quade | 1.75248E-02 | 6.63245E-02 | 6.63245E-02 | 6.44687E-02 |
| WW | Friedman | 9.41487E-11 | 2.89688E-10 | 2.89688E-10 | 2.89688E-10 |
| WW | Friedman Aligned | <1E-13 | 2.10054E-13 | 2.10054E-13 | 2.10054E-13 |
| WW | Quade | 5.37659E-03 | 1.98809E-02 | 1.98809E-02 | 1.97088E-02 |
| CWOA | Friedman | 7.48653E-09 | 2.59149E-08 | 2.59149E-08 | 2.59149E-08 |
| CWOA | Friedman Aligned | 1.94632E-09 | 7.18643E-09 | 7.18643E-09 | 7.18643E-09 |
| CWOA | Quade | 2.61275E-03 | 6.00747E-03 | 6.00747E-03 | 5.99146E-03 |
| DE | Friedman | 8.54237E-09 | 3.15410E-08 | 3.15118E-08 | 3.15410E-08 |
| DE | Friedman Aligned | 7.66528E-04 | 2.83067E-03 | 2.83067E-03 | 2.82734E-03 |
| DE | Quade | 7.68637E-02 | 2.88156E-01 | 2.51938E-01 | 2.55695E-01 |
| NNA | Friedman | 8.54237E-09 | 3.15410E-08 | 3.15118E-08 | 3.15410E-08 |
| NNA | Friedman Aligned | 1.40443E-09 | 4.60157E-09 | 4.60157E-09 | 4.60157E-09 |
| NNA | Quade | 2.61275E-03 | 4.15154E-03 | 3.95252E-03 | 4.14372E-03 |
| ISCA | Friedman | 8.70900E-09 | 3.21563E-08 | 3.21563E-08 | 3.21563E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.61275E-03 | 3.70459E-03 | 3.70459E-03 | 3.69830E-03 |
| **Table S3** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.00756E-08 | 3.48770E-08 | 3.48770E-08 | 3.48770E-08 |
| IJAYA | Friedman Aligned | 1.77340E-03 | 6.14036E-03 | 6.14036E-03 | 6.12529E-03 |
| IJAYA | Quade | 7.68637E-02 | 2.88156E-01 | 2.51938E-01 | 2.55695E-01 |
| NDE | Friedman | 4.85736E-06 | 1.49457E-05 | 1.49457E-05 | 1.49457E-05 |
| NDE | Friedman Aligned | 6.70249E-02 | 2.07871E-01 | 2.07871E-01 | 1.92221E-01 |
| NDE | Quade | 1.61095E-01 | 5.05559E-01 | 5.05559E-01 | 4.17534E-01 |
| TLBO | Friedman | 2.01098E-01 | 5.19063E-01 | 5.19063E-01 | 4.34434E-01 |
| TLBO | Friedman Aligned | 7.84943E-01 | 1.0 | 1.0 | 9.79783E-01 |
| TLBO | Quade | 7.20831E-01 | 1.0 | 1.0 | 9.60794E-01 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (ADELI is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 2.23361E-09 | 6.87266E-09 | 6.87266E-09 | 6.87266E-09 |
| GOTLBO | Quade | 2.57827E-03 | 4.09880E-03 | 3.90245E-03 | 4.09117E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 2.57827E-03 | 2.58134E-03 | 2.58134E-03 | 2.57827E-03 |
| MABC | Friedman | 6.35048E-13 | 1.61204E-12 | 1.61204E-12 | 1.61204E-12 |
| MABC | Friedman Aligned | 7.88131E-06 | 2.97065E-05 | 2.97065E-05 | 2.97062E-05 |
| MABC | Quade | 1.73550E-02 | 6.56791E-02 | 6.56791E-02 | 6.38590E-02 |
| WW | Friedman | 1.84926E-10 | 5.69003E-10 | 5.69003E-10 | 5.69003E-10 |
| WW | Friedman Aligned | 3.15599E-13 | 8.01137E-13 | 8.01137E-13 | 8.01137E-13 |
| WW | Quade | 5.31725E-03 | 1.96611E-02 | 1.96611E-02 | 1.94928E-02 |
| DE | Friedman | 4.61292E-09 | 1.59678E-08 | 1.59678E-08 | 1.59678E-08 |
| DE | Friedman Aligned | 3.62181E-04 | 1.33738E-03 | 1.33738E-03 | 1.33663E-03 |
| DE | Quade | 7.62673E-02 | 2.85885E-01 | 2.49968E-01 | 2.53918E-01 |
| IJAYA | Friedman | 6.88175E-09 | 2.54096E-08 | 2.54096E-08 | 2.54096E-08 |
| IJAYA | Friedman Aligned | 8.79672E-04 | 3.04543E-03 | 3.04543E-03 | 3.04172E-03 |
| IJAYA | Quade | 7.62673E-02 | 2.85885E-01 | 2.49968E-01 | 2.53918E-01 |
| CWOA | Friedman | 8.73483E-09 | 3.29236E-08 | 3.29236E-08 | 3.29236E-08 |
| CWOA | Friedman Aligned | 4.27917E-09 | 1.58000E-08 | 1.58000E-08 | 1.58000E-08 |
| CWOA | Quade | 2.57827E-03 | 5.93402E-03 | 5.93402E-03 | 5.91840E-03 |
| NNA | Friedman | 1.17491E-08 | 4.33811E-08 | 4.27586E-08 | 4.33811E-08 |
| NNA | Friedman Aligned | 2.23361E-09 | 7.25937E-09 | 7.25937E-09 | 7.25937E-09 |
| NNA | Quade | 2.57827E-03 | 4.09880E-03 | 3.90245E-03 | 4.09117E-03 |
| **Table S3** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| ISCA | Friedman | 1.23525E-08 | 4.33811E-08 | 4.27586E-08 | 4.33811E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.57827E-03 | 3.65691E-03 | 3.65691E-03 | 3.65079E-03 |
| NDE | Friedman | 2.55436E-06 | 7.85957E-06 | 7.85957E-06 | 7.85955E-06 |
| NDE | Friedman Aligned | 4.19953E-02 | 1.29854E-01 | 1.29854E-01 | 1.23666E-01 |
| NDE | Quade | 1.60056E-01 | 5.02233E-01 | 5.02233E-01 | 4.15313E-01 |
| TLBO | Friedman | 1.57702E-01 | 4.05499E-01 | 4.05499E-01 | 3.53159E-01 |
| TLBO | Friedman Aligned | 6.48054E-01 | 1.0 | 1.0 | 9.29409E-01 |
| TLBO | Quade | 7.18467E-01 | 1.0 | 1.0 | 9.59945E-01 |
| EBLSHADE | Friedman | 9.13338E-01 | 1.0 | 9.23824E-01 | 9.89059E-01 |
| EBLSHADE | Friedman Aligned | 8.67482E-01 | 1.0 | 1.0 | 9.76034E-01 |
| EBLSHADE | Quade | 9.98363E-01 | 1.0 | 1.0 | 9.99993E-01 |
| STLBO | Friedman | 9.23824E-01 | 1.0 | 9.23824E-01 | 9.89059E-01 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NDE is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 1.27739E-08 | 1.27739E-08 | 1.27739E-08 | 1.27739E-08 |
| GOTLBO | Friedman Aligned | 2.60296E-09 | 8.00911E-09 | 8.00911E-09 | 8.00911E-09 |
| GOTLBO | Quade | 3.14219E-01 | 4.69400E-01 | 4.39320E-01 | 3.81037E-01 |
| PSO | Friedman | 2.06453E-08 | 3.81143E-08 | 3.81143E-08 | 3.81143E-08 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 3.14219E-01 | 3.71777E-01 | 3.71777E-01 | 3.14219E-01 |
| ISCA | Friedman | 6.53133E-08 | 1.65795E-07 | 1.65795E-07 | 1.65795E-07 |
| ISCA | Friedman Aligned | 4.15456E-11 | 1.05462E-10 | 1.05462E-10 | 1.05462E-10 |
| ISCA | Quade | 3.14219E-01 | 4.50989E-01 | 4.39320E-01 | 3.68516E-01 |
| NNA | Friedman | 6.53133E-08 | 1.98658E-07 | 1.98658E-07 | 1.98658E-07 |
| NNA | Friedman Aligned | 2.77977E-09 | 9.62227E-09 | 9.62227E-09 | 9.62227E-09 |
| NNA | Quade | 3.14219E-01 | 4.69400E-01 | 4.39320E-01 | 3.81037E-01 |
| CWOA | Friedman | 1.02048E-07 | 3.53244E-07 | 3.53244E-07 | 3.53244E-07 |
| CWOA | Friedman Aligned | <1E-13 | 1.78524E-13 | 1.78524E-13 | 1.78524E-13 |
| CWOA | Quade | 3.14219E-01 | 5.48252E-01 | 5.48252E-01 | 4.32016E-01 |
| WW | Friedman | 1.69355E-05 | 6.25314E-05 | 6.25314E-05 | 6.25297E-05 |
| WW | Friedman Aligned | 4.63527E-09 | 1.71148E-08 | 1.71148E-08 | 1.71148E-08 |
| WW | Quade | 3.14219E-01 | 1.0 | 1.0 | 6.85077E-01 |
| MABC | Friedman | 1.47478E-02 | 5.57785E-02 | 5.57785E-02 | 5.44627E-02 |
| MABC | Friedman Aligned | 2.56191E-02 | 9.71425E-02 | 9.71425E-02 | 9.31905E-02 |
| MABC | Quade | 4.65703E-01 | 1.0 | 1.0 | 9.05822E-01 |
| DE | Friedman | 3.11442E-01 | 1.0 | 1.0 | 7.47869E-01 |
| DE | Friedman Aligned | 1.88248E-01 | 7.22700E-01 | 7.22700E-01 | 5.37019E-01 |
| DE | Quade | 8.21502E-01 | 1.0 | 1.0 | 9.98275E-01 |
| **Table S3** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 3.29145E-01 | 1.0 | 1.0 | 7.48888E-01 |
| IJAYA | Friedman Aligned | 2.72182E-01 | 9.87202E-01 | 9.87202E-01 | 6.67044E-01 |
| IJAYA | Quade | 8.21502E-01 | 1.0 | 1.0 | 9.98275E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (MABC is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 6.84156E-03 | 6.86326E-03 | 6.86326E-03 | 6.84156E-03 |
| GOTLBO | Friedman Aligned | 1.87628E-12 | 2.89635E-12 | 2.89635E-12 | 2.89635E-12 |
| GOTLBO | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.89041E-01 |
| PSO | Friedman | 6.84988E-03 | 1.26827E-02 | 1.26827E-02 | 1.26093E-02 |
| PSO | Friedman Aligned | 7.99504E-09 | 2.46001E-08 | 2.46001E-08 | 2.46001E-08 |
| PSO | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.80537E-01 |
| ISCA | Friedman | 1.11987E-02 | 2.85508E-02 | 2.85508E-02 | 2.81832E-02 |
| ISCA | Friedman Aligned | 5.83509E-10 | 1.48121E-09 | 1.48121E-09 | 1.48121E-09 |
| ISCA | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.88524E-01 |
| NNA | Friedman | 1.11987E-02 | 3.03504E-02 | 3.03504E-02 | 2.99392E-02 |
| NNA | Friedman Aligned | 1.87628E-12 | 1.87628E-12 | 1.87628E-12 | 1.87628E-12 |
| NNA | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.89041E-01 |
| CWOA | Friedman | 1.15188E-02 | 4.00150E-02 | 4.00150E-02 | 3.93107E-02 |
| CWOA | Friedman Aligned | 1.52119E-07 | 5.26565E-07 | 5.26565E-07 | 5.26565E-07 |
| CWOA | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.92456E-01 |
| WW | Friedman | 1.44016E-01 | 5.54046E-01 | 5.54046E-01 | 4.36826E-01 |
| WW | Friedman Aligned | 8.90158E-04 | 3.28753E-03 | 3.28753E-03 | 3.28280E-03 |
| WW | Quade | 9.80537E-01 | 1.0 | 1.0 | 9.99848E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| WW | Friedman | 2.04947E-13 | 2.04947E-13 | 2.04947E-13 | 2.04947E-13 |
| WW | Friedman Aligned | 1.71270E-13 | 4.34763E-13 | 4.34763E-13 | 4.34763E-13 |
| WW | Quade | 2.09412E-02 | 7.77621E-02 | 7.77621E-02 | 7.51674E-02 |
| CWOA | Friedman | 2.93825E-11 | 5.42446E-11 | 5.42446E-11 | 5.42446E-11 |
| CWOA | Friedman Aligned | 5.78031E-10 | 1.77856E-09 | 1.71036E-09 | 1.77856E-09 |
| CWOA | Quade | 1.35083E-02 | 2.74130E-02 | 2.74130E-02 | 2.70814E-02 |
| ISCA | Friedman | 3.89592E-11 | 1.17459E-10 | 1.17459E-10 | 1.17459E-10 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 1.35083E-02 | 1.83968E-02 | 1.83968E-02 | 1.82425E-02 |
| NNA | Friedman | 3.89592E-11 | 9.88964E-11 | 9.88964E-11 | 9.88964E-11 |
| NNA | Friedman Aligned | 5.78031E-10 | 1.77856E-09 | 1.71036E-09 | 1.77856E-09 |
| NNA | Quade | 1.35083E-02 | 2.01743E-02 | 1.91111E-02 | 1.99904E-02 |
| PSO | Friedman | 1.23417E-10 | 4.27212E-10 | 4.27212E-10 | 4.27212E-10 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 1.35083E-02 | 1.35932E-02 | 1.35932E-02 | 1.35083E-02 |
| GOTLBO | Friedman | 2.64018E-10 | 9.74834E-10 | 9.74834E-10 | 9.74834E-10 |
| GOTLBO | Friedman Aligned | 5.78031E-10 | 1.77856E-09 | 1.71036E-09 | 1.77856E-09 |
| GOTLBO | Quade | 1.35083E-02 | 2.01743E-02 | 1.91111E-02 | 1.99904E-02 |
| MABC | Friedman | 6.34021E-09 | 2.38977E-08 | 2.38977E-08 | 2.38977E-08 |
| MABC | Friedman Aligned | 9.29163E-05 | 3.50231E-04 | 3.50231E-04 | 3.50178E-04 |
| MABC | Quade | 5.71120E-02 | 2.18187E-01 | 2.18187E-01 | 1.98812E-01 |
| DE | Friedman | 9.58882E-06 | 3.54050E-05 | 3.54050E-05 | 3.54044E-05 |
| DE | Friedman Aligned | 2.67052E-03 | 9.86544E-03 | 9.86544E-03 | 9.82497E-03 |
| DE | Quade | 1.93779E-01 | 7.44857E-01 | 6.46164E-01 | 5.48560E-01 |
| **Table S3** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| IJAYA | Friedman | 1.33429E-05 | 4.61871E-05 | 4.61871E-05 | 4.61862E-05 |
| IJAYA | Friedman Aligned | 5.66798E-03 | 1.96371E-02 | 1.96371E-02 | 1.94834E-02 |
| IJAYA | Quade | 1.93779E-01 | 7.44857E-01 | 6.46164E-01 | 5.48560E-01 |
| NDE | Friedman | 1.43301E-03 | 4.40998E-03 | 4.40998E-03 | 4.40270E-03 |
| NDE | Friedman Aligned | 1.41455E-01 | 4.42799E-01 | 4.42799E-01 | 3.74549E-01 |
| NDE | Quade | 3.43054E-01 | 1.0 | 1.0 | 7.25493E-01 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (GOTLBO is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 2.72905E-06 | 2.72905E-06 | 2.72905E-06 | 2.72905E-06 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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 (STLBO is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| GOTLBO | Friedman Aligned | 2.23361E-09 | 6.87266E-09 | 6.87266E-09 | 6.87266E-09 |
| GOTLBO | Quade | 2.38776E-03 | 3.80690E-03 | 3.62535E-03 | 3.80032E-03 |
| PSO | Friedman | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 2.38776E-03 | 2.39040E-03 | 2.39040E-03 | 2.38776E-03 |
| MABC | Friedman | 1.28357E-12 | 3.25828E-12 | 3.25828E-12 | 3.25828E-12 |
| MABC | Friedman Aligned | 7.88131E-06 | 2.97065E-05 | 2.97065E-05 | 2.97062E-05 |
| MABC | Quade | 1.64044E-02 | 6.20680E-02 | 6.20680E-02 | 6.04412E-02 |
| WW | Friedman | 1.13508E-10 | 3.49256E-10 | 3.49256E-10 | 3.49256E-10 |
| WW | Friedman Aligned | 3.15599E-13 | 8.01137E-13 | 8.01137E-13 | 8.01137E-13 |
| WW | Quade | 4.98681E-03 | 1.84376E-02 | 1.84376E-02 | 1.82896E-02 |
| DE | Friedman | 8.25810E-09 | 2.85857E-08 | 2.63838E-08 | 2.85857E-08 |
| DE | Friedman Aligned | 3.62181E-04 | 1.33738E-03 | 1.33738E-03 | 1.33663E-03 |
| DE | Quade | 7.29045E-02 | 2.73093E-01 | 2.38867E-01 | 2.43841E-01 |
| CWOA | Friedman | 8.25810E-09 | 2.85857E-08 | 2.63838E-08 | 2.85857E-08 |
| CWOA | Friedman Aligned | 4.27917E-09 | 1.58000E-08 | 1.58000E-08 | 1.58000E-08 |
| CWOA | Quade | 2.38776E-03 | 5.52683E-03 | 5.52683E-03 | 5.51327E-03 |
| IJAYA | Friedman | 9.53069E-09 | 3.59234E-08 | 3.04931E-08 | 3.59234E-08 |
| IJAYA | Friedman Aligned | 8.79672E-04 | 3.04543E-03 | 3.04543E-03 | 3.04172E-03 |
| IJAYA | Quade | 7.29045E-02 | 2.73093E-01 | 2.38867E-01 | 2.43841E-01 |
| ISCA | Friedman | 9.53069E-09 | 3.59234E-08 | 3.04931E-08 | 3.59234E-08 |
| ISCA | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| ISCA | Quade | 2.38776E-03 | 3.39323E-03 | 3.39323E-03 | 3.38795E-03 |
| **Table S3** (*continued*) | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| NNA | Friedman | 9.53069E-09 | 3.59234E-08 | 3.04931E-08 | 3.59234E-08 |
| NNA | Friedman Aligned | 2.23361E-09 | 7.25937E-09 | 7.25937E-09 | 7.25937E-09 |
| NNA | Quade | 2.38776E-03 | 3.80690E-03 | 3.62535E-03 | 3.80032E-03 |
| NDE | Friedman | 4.08314E-06 | 1.25635E-05 | 1.25635E-05 | 1.25635E-05 |
| NDE | Friedman Aligned | 4.19953E-02 | 1.29854E-01 | 1.29854E-01 | 1.23666E-01 |
| NDE | Quade | 1.54173E-01 | 4.83401E-01 | 4.83401E-01 | 4.02619E-01 |
| TLBO | Friedman | 1.88486E-01 | 4.85963E-01 | 4.85963E-01 | 4.11494E-01 |
| TLBO | Friedman Aligned | 6.48054E-01 | 1.0 | 1.0 | 9.29409E-01 |
| TLBO | Quade | 7.04858E-01 | 1.0 | 9.84554E-01 | 9.54846E-01 |
| EBLSHADE | Friedman | 9.78729E-01 | 1.0 | 1.0 | 9.99182E-01 |
| EBLSHADE | Friedman Aligned | 8.67482E-01 | 1.0 | 1.0 | 9.76034E-01 |
| EBLSHADE | Quade | 9.87023E-01 | 1.0 | 9.84554E-01 | 9.99671E-01 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 9.87023E-01 | 1.0 | 9.84554E-01 | 9.99671E-01 |

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| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (PSO is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| STLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.73564E-06 | 9.73569E-06 | 9.73569E-06 | 9.73564E-06 |
| GOTLBO | Friedman Aligned | 4.31832E-12 | 1.09619E-11 | 1.09619E-11 | 1.09619E-11 |
| GOTLBO | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.37556E-01 |
| PSO | Friedman | 1.27717E-05 | 2.35787E-05 | 2.35787E-05 | 2.35785E-05 |
| PSO | Friedman Aligned | <1E-13 | <1E-13 | <1E-13 | <1E-13 |
| PSO | Quade | 6.70250E-01 | 1.0 | 1.0 | 6.70250E-01 |
| ISCA | Friedman | 3.02807E-05 | 7.68673E-05 | 7.68673E-05 | 7.68646E-05 |
| ISCA | Friedman Aligned | 2.29483E-13 | 4.23661E-13 | 4.23661E-13 | 4.23661E-13 |
| ISCA | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.28467E-01 |
| NNA | Friedman | 3.02807E-05 | 8.73835E-05 | 8.73835E-05 | 8.73801E-05 |
| NNA | Friedman Aligned | 5.02987E-12 | 1.54765E-11 | 1.54765E-11 | 1.54765E-11 |
| NNA | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.37556E-01 |
| CWOA | Friedman | 3.93486E-05 | 1.36208E-04 | 1.36208E-04 | 1.36200E-04 |
| CWOA | Friedman Aligned | 1.16523E-10 | 4.03347E-10 | 4.03347E-10 | 4.03347E-10 |
| CWOA | Quade | 6.70250E-01 | 1.0 | 1.0 | 7.78072E-01 |
| WW | Friedman | 2.10239E-03 | 7.76707E-03 | 7.76707E-03 | 7.74073E-03 |
| WW | Friedman Aligned | 5.51419E-06 | 2.03601E-05 | 2.03601E-05 | 2.03600E-05 |
| WW | Quade | 6.70250E-01 | 1.0 | 1.0 | 9.38720E-01 |
| MABC | Friedman | 2.41545E-01 | 9.68227E-01 | 9.68227E-01 | 6.47281E-01 |
| MABC | Friedman Aligned | 4.01332E-01 | 1.0 | 1.0 | 8.55401E-01 |
| MABC | Quade | 7.60748E-01 | 1.0 | 1.0 | 9.95442E-01 |
| DE | Friedman | 9.84761E-01 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 9.21905E-01 | 1.0 | 1.0 | 9.99918E-01 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.99999E-01 | 1.0 | 1.0 | 9.99999E-01 |
| GOTLBO | Friedman Aligned | 9.23523E-01 | 1.0 | 1.0 | 9.92894E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 9.99999E-01 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 1.42884E-08 | 1.42884E-08 | 1.42884E-08 | 1.42884E-08 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| TLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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 |
| NNA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 9.23523E-01 | 1.0 | 1.0 | 9.91314E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| CWOA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| WW | Quade | 1.0 | 1.0 | 1.0 | 1.0 |

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| --- | --- | --- | --- | --- | --- |
| **Table S3.** Adjusted *p*-values for multiple comparisons 1×*N* tests in single-IV case (NNA is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.99996E-01 | 1.0 | 1.0 | 9.99996E-01 |
| GOTLBO | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 9.99996E-01 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman Aligned | 3.95810E-06 | 3.95810E-06 | 3.95810E-06 | 3.95810E-06 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.99999E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| MABC | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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 |
| 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 (CWOA is the control algorithm, *R*p1 evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 9.99951E-01 | 1.0 | 1.0 | 9.99951E-01 |
| GOTLBO | Friedman Aligned | 2.69091E-01 | 6.09156E-01 | 6.09156E-01 | 4.65633E-01 |
| GOTLBO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| PSO | Friedman | 9.99951E-01 | 1.0 | 1.0 | 9.99998E-01 |
| PSO | Friedman Aligned | 1.74407E-11 | 1.74407E-11 | 1.74407E-11 | 1.74407E-11 |
| PSO | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman | 9.99951E-01 | 1.0 | 1.0 | 1.0 |
| ISCA | Friedman Aligned | 7.07645E-01 | 1.0 | 1.0 | 9.77267E-01 |
| ISCA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman | 9.99951E-01 | 1.0 | 1.0 | 1.0 |
| NNA | Friedman Aligned | 2.69091E-01 | 5.64974E-01 | 5.64974E-01 | 4.39377E-01 |
| NNA | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| NDE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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 | 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, *R*p1evaluation task). | | | | | |
| Algorithm | Test | post-hoc procedure | | | |
| Finner | Holm | Hochberg | Holland |
| GOTLBO | Friedman | 7.42350E-01 | 1.0 | 1.0 | 7.42350E-01 |
| GOTLBO | Friedman Aligned | 6.80259E-04 | 1.52988E-03 | 1.52988E-03 | 1.52881E-03 |
| GOTLBO | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99953E-01 |
| PSO | Friedman | 7.42350E-01 | 1.0 | 1.0 | 8.46939E-01 |
| PSO | Friedman Aligned | 2.26308E-10 | 2.26308E-10 | 2.26308E-10 | 2.26308E-10 |
| PSO | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99837E-01 |
| ISCA | Friedman | 7.42350E-01 | 1.0 | 1.0 | 9.45174E-01 |
| ISCA | Friedman Aligned | 1.21307E-02 | 3.74832E-02 | 3.74832E-02 | 3.68572E-02 |
| ISCA | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99947E-01 |
| NNA | Friedman | 7.42350E-01 | 1.0 | 1.0 | 9.45174E-01 |
| NNA | Friedman Aligned | 6.80259E-04 | 1.25623E-03 | 1.25623E-03 | 1.25550E-03 |
| NNA | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99953E-01 |
| CWOA | Friedman | 7.42350E-01 | 1.0 | 1.0 | 9.61674E-01 |
| CWOA | Friedman Aligned | 1.44448E-01 | 5.24146E-01 | 5.24146E-01 | 4.17268E-01 |
| CWOA | Quade | 9.99837E-01 | 1.0 | 1.0 | 9.99984E-01 |
| DE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| DE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| EBLSHADE | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Friedman Aligned | 1.0 | 1.0 | 1.0 | 1.0 |
| ADELI | Quade | 1.0 | 1.0 | 1.0 | 1.0 |
| **Table 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 |