

```

1  # Model 1
2  Mediation <- '# Mediation approach for executive_function ~ vascular_density with
   haematocrit as mediator
3      vascular_density =~ L1_ParaFovea_pre
4      # executive_function as latent variable
5      executive_function =~ updating
6      updating =~ Nback.RT_CV + nback.ACC_wm + Nback.meanRT_wm
7      # co-variances
8      executive_function ~~ Age
9      executive_function ~~ Education
10     vascular_density ~~ RRsyst
11     # direct effect
12     executive_function ~ c*vascular_density
13     # haematocrit as Mediator
14     HK_percent_pre ~ a*vascular_density
15     executive_function ~ b*HK_percent_pre
16     # indirect effect (a*b)
17     ab := a*b
18     # total effect
19     total := c + (a*b)';
20
21 # call
22 model_fit <- sem(Mediation, data=mydata, estimator="mlm")
23 summary(model_fit, fit.measures = TRUE, standardized=TRUE)
24
25 lavaan 0.6-19 ended normally after 79 iterations
26
27     Estimator                      ML
28     Optimization method            NLMINB
29     Number of model parameters      17
30
31                                     Used      Total
32     Number of observations          36         41
33
34 Model Test User Model:
35                                     Standard      Scaled
36     Test Statistic                  20.293      19.635
37     Degrees of freedom                19         19
38     P-value (Chi-square)             0.377      0.417
39     Scaling correction factor        1.034
40     Satorra-Bentler correction
41
42 Model Test Baseline Model:
43
44     Test statistic                   74.136      72.698
45     Degrees of freedom                28         28
46     P-value                          0.000      0.000
47     Scaling correction factor        1.020
48
49 User Model versus Baseline Model:
50
51     Comparative Fit Index (CFI)      0.972      0.986
52     Tucker-Lewis Index (TLI)        0.959      0.979
53
54     Robust Comparative Fit Index (CFI)      0.986
55     Robust Tucker-Lewis Index (TLI)        0.979
56
57 Loglikelihood and Information Criteria:
58
59     Loglikelihood user model (H0)      -1008.999  -1008.999
60     Loglikelihood unrestricted model (H1) -998.853  -998.853
61
62     Akaike (AIC)                     2051.999  2051.999
63     Bayesian (BIC)                   2078.919  2078.919
64     Sample-size adjusted Bayesian (SABIC) 2025.811  2025.811
65
66 Root Mean Square Error of Approximation:
67
68     RMSEA                            0.043      0.030
69     90 Percent confidence interval - lower 0.000      0.000
70     90 Percent confidence interval - upper 0.155      0.149

```

```

71 P-value H_0: RMSEA <= 0.050 0.482 0.524
72 P-value H_0: RMSEA >= 0.080 0.372 0.332
73
74 Robust RMSEA 0.031
75 90 Percent confidence interval - lower 0.000
76 90 Percent confidence interval - upper 0.153
77 P-value H_0: Robust RMSEA <= 0.050 0.519
78 P-value H_0: Robust RMSEA >= 0.080 0.342
79
80 Standardized Root Mean Square Residual:
81
82 SRMR 0.120 0.120
83
84 Parameter Estimates:
85
86 Standard errors Robust.sem
87 Information Expected
88 Information saturated (h1) model Structured
89
90 Latent Variables:
91 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
92 vascular_density =~
93 L1_ParaFove_pr 1.000 4.647 1.000
94 executive_function =~
95 updating 1.000 1.000 1.000
96 updating =~
97 Nback.RT_CV 1.000 4.409 0.790
98 nback.ACC_wm 1.608 0.543 2.963 0.003 7.091 0.458
99 Nback.menRT_wm -32.752 5.638 -5.809 0.000 -144.407 -0.962
100
101 Regressions:
102 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
103 executive_function ~
104 vsclr_dnst (c) -0.156 0.135 -1.156 0.247 -0.165 -0.165
105 HK_percent_pre ~
106 vsclr_dnst (a) 0.160 0.153 1.046 0.295 0.744 0.203
107 executive_function ~
108 HK_prcnt_p (b) 0.612 0.217 2.816 0.005 0.139 0.509
109
110 Covariances:
111 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
112 .executive_function ~~
113 Age -4.228 2.468 -1.713 0.087 -1.109 -0.313
114 Education 1.290 1.857 0.695 0.487 0.338 0.106
115 vascular_density ~~
116 RRsyst -18.645 8.415 -2.216 0.027 -4.012 -0.262
117
118 Variances:
119 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
120 .L1_ParaFove_pr 0.000 0.000 0.000
121 .Nback.RT_CV 11.676 4.939 2.364 0.018 11.676 0.375
122 .nback.ACC_wm 189.671 56.221 3.374 0.001 189.671 0.790
123 .Nback.menRT_wm 1658.423 3391.767 0.489 0.625 1658.423 0.074
124 .HK_percent_pre 12.894 2.477 5.205 0.000 12.894 0.959
125 Age 12.562 2.542 4.942 0.000 12.562 1.000
126 Education 10.180 4.584 2.221 0.026 10.180 1.000
127 RRsyst 235.046 69.566 3.379 0.001 235.046 1.000
128 vascular_dnsty 21.599 4.915 4.395 0.000 1.000 1.000
129 .executiv_fnctn 14.538 5.126 2.836 0.005 0.748 0.748
130 .updating 0.000 0.000 0.000
131
132 Defined Parameters:
133 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
134 ab 0.098 0.107 0.914 0.361 0.103 0.103
135 total -0.058 0.171 -0.341 0.733 -0.061 -0.061
136

```

```

1 # Model 2
2 Mediation <- '# Mediation approach for executive_function ~ vascular density with
haematocrit as mediator
3         vascular_density =~ L1_ParaFovea_pre
4         # executive_function as latent variable
5         executive_function =~ MMSE_overall_pre
6         # co-variances
7         executive_function ~~ Age
8         executive_function ~~ Education
9         vascular_density ~~ RRsyst
10        # direct effect
11        executive_function ~ c*vascular_density
12        # haematocrit as Mediator
13        HK_percent_pre ~ a*vascular_density
14        executive_function ~ b*HK_percent_pre
15        # indirect effect (a*b)
16        ab := a*b
17        # total effect
18        total := c + (a*b)';
19
20 # call
21 model_fit <- sem(Mediation, data=mydata, estimator="mlm")
22 summary(model_fit, fit.measures = TRUE, standardized=TRUE)
23
24 lavaan 0.6-19 ended normally after 56 iterations
25
26      Estimator              ML
27      Optimization method    NLMINB
28      Number of model parameters    12
29
30                                     Used      Total
31      Number of observations         38         41
32
33 Model Test User Model:
34                                     Standard      Scaled
35      Test Statistic                9.558        8.612
36      Degrees of freedom              9           9
37      P-value (Chi-square)          0.387        0.474
38      Scaling correction factor      1.110
39      Satorra-Bentler correction
40
41 Model Test Baseline Model:
42
43      Test statistic                16.381        16.313
44      Degrees of freedom              15           15
45      P-value                      0.357        0.362
46      Scaling correction factor      1.004
47
48 User Model versus Baseline Model:
49
50      Comparative Fit Index (CFI)    0.596        1.000
51      Tucker-Lewis Index (TLI)      0.327        1.492
52
53      Robust Comparative Fit Index (CFI)    1.000
54      Robust Tucker-Lewis Index (TLI)      1.544
55
56 Loglikelihood and Information Criteria:
57
58      Loglikelihood user model (H0)    -639.009    -639.009
59      Loglikelihood unrestricted model (H1) -634.230    -634.230
60
61      Akaike (AIC)                   1302.018    1302.018
62      Bayesian (BIC)                  1321.669    1321.669
63      Sample-size adjusted Bayesian (SABIC) 1284.148    1284.148
64
65 Root Mean Square Error of Approximation:
66
67      RMSEA                          0.040        0.000
68      90 Percent confidence interval - lower    0.000        0.000
69      90 Percent confidence interval - upper    0.190        0.170
70      P-value H_0: RMSEA <= 0.050            0.463        0.558

```

```

71 P-value H_0: RMSEA >= 0.080 0.430 0.336
72
73 Robust RMSEA 0.000
74 90 Percent confidence interval - lower 0.000
75 90 Percent confidence interval - upper 0.187
76 P-value H_0: Robust RMSEA <= 0.050 0.542
77 P-value H_0: Robust RMSEA >= 0.080 0.365
78
79 Standardized Root Mean Square Residual:
80
81 SRMR 0.111 0.111
82
83 Parameter Estimates:
84
85 Standard errors Robust.sem
86 Information Expected
87 Information saturated (hl) model Structured
88
89 Latent Variables:
90 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
91 vascular_density =~
92 L1_ParaFove_pr 1.000 4.583 1.000
93 executive_function =~
94 MMSE_overll_pr 1.000 1.355 1.000
95
96 Regressions:
97 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
98 executive_function ~
99 vsclr_dnst (c) 0.076 0.039 1.969 0.049 0.257 0.257
100 HK_percent_pre ~
101 vsclr_dnst (a) 0.115 0.152 0.755 0.450 0.526 0.140
102 executive_function ~
103 HK_prcnt_p (b) -0.016 0.054 -0.295 0.768 -0.012 -0.044
104
105 Covariances:
106 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
107 .executive_function ~~
108 Age -0.144 0.768 -0.187 0.852 -0.110 -0.031
109 Education 0.458 0.540 0.848 0.396 0.350 0.100
110 vascular_density ~~
111 RRsyst -20.768 8.151 -2.548 0.011 -4.532 -0.291
112
113 Variances:
114 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
115 .L1_ParaFove_pr 0.000 0.000 0.000
116 .MMSE_overll_pr 0.000 0.000 0.000
117 .HK_percent_pre 13.867 2.437 5.689 0.000 13.867 0.980
118 Age 12.147 2.371 5.124 0.000 12.147 1.000
119 Education 12.186 4.780 2.549 0.011 12.186 1.000
120 RRsyst 242.922 66.830 3.635 0.000 242.922 1.000
121 vascular_dnsty 21.003 4.676 4.492 0.000 1.000 1.000
122 .executiv_fnctn 1.716 0.339 5.067 0.000 0.935 0.935
123
124 Defined Parameters:
125 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
126 ab -0.002 0.006 -0.300 0.764 -0.006 -0.006
127 total 0.074 0.039 1.889 0.059 0.251 0.251
128

```

```

1  # Model 3
2  Mediation <- '# Mediation approach for executive_function ~ vascular density with
   haematocrit as mediator
3      vascular_density =~ L1_ParaFovea_pre
4      # executive_function as latent variable
5      executive_function =~ inhibition + MMSE_overall_pre
6      inhibition =~ Simon.meanRT_inh
7      # co-variances
8      executive_function ~~ Age
9      executive_function ~~ Education
10     vascular_density ~~ RRsyst
11     # direct effect
12     executive_function ~ c*vascular_density
13     # haematocrit as Mediator
14     HK_percent_pre ~ a*vascular_density
15     executive_function ~ b*HK_percent_pre
16     # indirect effect (a*b)
17     ab := a*b
18     # total effect
19     total := c + (a*b)';
20 # call
21 model_fit <- sem(Mediation, data=mydata, estimator="mlm")
22 summary(model_fit, fit.measures = TRUE, standardized=TRUE)
23
24 lavaan 0.6-19 ended normally after 270 iterations
25
26     Estimator                      ML
27 Optimization method                NLMINB
28 Number of model parameters         15
29
30                                     Used      Total
31 Number of observations              38         41
32
33 Model Test User Model:
34                                     Standard      Scaled
35 Test Statistic                     12.408      10.858
36 Degrees of freedom                  13         13
37 P-value (Chi-square)                0.495      0.623
38 Scaling correction factor           1.143
39 Satorra-Bentler correction
40
41 Model Test Baseline Model:
42
43 Test statistic                      20.949      21.797
44 Degrees of freedom                  21         21
45 P-value                            0.462      0.411
46 Scaling correction factor           0.961
47
48 User Model versus Baseline Model:
49
50 Comparative Fit Index (CFI)         1.000      1.000
51 Tucker-Lewis Index (TLI)           -17.760      5.339
52
53 Robust Comparative Fit Index (CFI)   1.000
54 Robust Tucker-Lewis Index (TLI)     6.159
55
56 Loglikelihood and Information Criteria:
57
58 Loglikelihood user model (H0)        -825.416    -825.416
59 Loglikelihood unrestricted model (H1) -819.212    -819.212
60
61 Akaike (AIC)                       1680.832    1680.832
62 Bayesian (BIC)                     1705.396    1705.396
63 Sample-size adjusted Bayesian (SABIC) 1658.495    1658.495
64
65 Root Mean Square Error of Approximation:
66
67 RMSEA                             0.000      0.000
68 90 Percent confidence interval - lower 0.000      0.000
69 90 Percent confidence interval - upper 0.155      0.129
70 P-value H_0: RMSEA <= 0.050         0.584      0.720

```

```

71 P-value H_0: RMSEA >= 0.080 0.299 0.181
72
73 Robust RMSEA 0.000
74 90 Percent confidence interval - lower 0.000
75 90 Percent confidence interval - upper 0.147
76 P-value H_0: Robust RMSEA <= 0.050 0.693
77 P-value H_0: Robust RMSEA >= 0.080 0.219
78
79 Standardized Root Mean Square Residual:
80
81 SRMR 0.105 0.105
82
83 Parameter Estimates:
84
85 Standard errors Robust.sem
86 Information Expected
87 Information saturated (hl) model Structured
88
89 Latent Variables:
90 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
91 vascular_density =~
92 L1_ParaFove_pr 1.000 4.583 1.000
93 executive_function =~
94 inhibition 1.000 0.753 0.753
95 MMSE_overll_pr -0.014 0.017 -0.801 0.423 -0.349 -0.258
96 inhibition =~
97 Simon.menRT_nh 1.000 33.871 1.000
98
99 Regressions:
100 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
101 executive_function ~
102 vsclr_dnst (c) -0.887 0.979 -0.906 0.365 -0.159 -0.159
103 HK_percent_pre ~
104 vsclr_dnst (a) 0.115 0.152 0.755 0.450 0.526 0.140
105 executive_function ~
106 HK_prcnt_p (b) 1.702 0.942 1.807 0.071 0.067 0.251
107
108 Covariances:
109 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
110 .executive_function ~~
111 Age -22.591 17.992 -1.256 0.209 -0.922 -0.265
112 Education -16.685 13.757 -1.213 0.225 -0.681 -0.195
113 vascular_density ~~
114 RRsyes -20.768 8.151 -2.548 0.011 -4.532 -0.291
115
116 Variances:
117 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
118 .L1_ParaFove_pr 0.000 0.000 0.000
119 .MMSE_overll_pr 1.706 0.368 4.635 0.000 1.706 0.933
120 .Simon.menRT_nh 0.000 0.000 0.000
121 .HK_percent_pre 13.867 2.437 5.689 0.000 13.867 0.980
122 Age 12.149 2.371 5.125 0.000 12.149 1.000
123 Education 12.188 4.780 2.550 0.011 12.188 1.000
124 RRsyes 242.923 66.830 3.635 0.000 242.923 1.000
125 vascular_dnsty 21.003 4.676 4.492 0.000 1.000 1.000
126 .executiv_fnctn 600.403 739.033 0.812 0.417 0.923 0.923
127 .inhibition 496.602 824.600 0.602 0.547 0.433 0.433
128
129 Defined Parameters:
130 Estimate Std.Err z-value P(>|z|) Std.lv Std.all
131 ab 0.195 0.242 0.806 0.420 0.035 0.035
132 total -0.692 0.934 -0.741 0.459 -0.124 -0.124
133

```