Table 1. Two level variance components model

Parameter*	aML (ML)	SAS (REML)	MLwiN (RIGLS)	R*** (REML)	STATA (ML)	HLM 5 (REML)	WINBUGS (MCMC)	SYSTAT (MML)	GenStat (REML)	SPSS (REML)	MIXREG (MML)
Fixed											
β_0	-0.010 (0.073)	-0.009 (0.078)	-0.009 (0.078)	-0.009 (-0.162,0.143)	-0.010 (0.076)	-0.091 (0.076)	-0.171	-0.009 (0.076)	-0.009 (0.078)	-0.009 (0.078)	-0.009 (0.076)
β_1	0.560 (0.012)	0.560 (0.012)	0.560 (0.012)	0.560 (0.535,0.584)	0.560 (0.012)	0.560 (0.012)	0.560 (0.535, 0.584)	0.560 (0.012)	0.560 (0..012)	0.560 (0.013)	0.560 (0.012)
β_2	0.167 (0.034)	0.167 (0.034)	0.167 (0.034)	0.167 (0.100,0.234)	0.168 (0.034)	0.167 (0.034)	0.167 (0.099, 0.234)	0.167 (0.034)	0.167 (0.034)	0.167 (0.034)	0.167 (0.034)
β_3	-0.159 (0.087)	-0.159 (0.089)	-0.159 (0.089)	-0.159 (-0.338,0.020)	-0.158 (0.087)	-0.159 (0.087)	0.176 (-0.036, 0.383)	- 0.159 (0.087)	-0.159 (0.089)	-0.159 (0.089)	-0.159 (0.087)
β_4	0.013 (0.123)	0.019 (0.126)	0.019 (0.126)	0.019 (-0.233,0.270)	0.021 (0.123)	0.019 (0.123)	0.162 (-0.006, 0.329)	0.019 (0.123)	0.019 (0.126)	0.019 (0.126)	0.019 (0.123)
Random											
σ_{u0}^2	0.081	0.086 (0.018)	0.086 (0.017)	0.086 (0.057,0.129)	0.081 (0.052,0.117)	0.086 (0.018)	0.088 (0.057, 0.131)	0.081 (0.016)	0.086 (0,018)	0.086 (0.018)	0.081 (0.016)
σ_{e0}^2	0.563	0.563 (0.013)	0.563 (0.013)	0.563 (0.539,0.588)	0.562 (0.538,0.587)	0.563 (0.013)	0.563 (0.539, 0.588)	0.562 (0.013)	0.563 (0.013)	0.563 (0.013)	0.562 (0.013)
-2LL**.		9347.7	9325.5**	9347.7	9314.9	9347.7		9325.4		9347.7	9325.4
Timing	4 - 5s	< 1 s	1- 3 s	1- 3 s	5 – 10 s	1- 3 s	5 - 10 m	5 - 10 s	< 1 s	3 –9 s	5-10s

* For this table the base category is chosen as mixed schools for all packages: Note that the WINBUGS analysis used a different parameterisation for school gender.

** MLwiN uses the ML likelihood value. *** The same results are also presented in the S-Plus main package review.

Table 2. Two level model with random coefficient and complex level 1 variance.

Parameter*	aML (ML)	SAS (REML)	MLwiN (IGLS)	R**** (REML)	HLM 5 (ML)	WINBUGS (MCMC)	GenStat (REML)	SPSS*** (REML)
β_0	-0.012 (0.073)	-0.012 (0.074)	-0.011 (0.073)	-0.012 (-0.157,0.133)	-0.011 (0.073)	-0.196	-0.013 (0.073)	-0.012 (0.074)
β_1	0.550 (0.026)	0.550 (0.026)	0.551 (0.026)	0.550 (0.499,0.601)	0.551 (0.026)	0.548 (0.493, 0.603)	0.554 (0.020)	0.550 (0.026)
β_2	0.169 (0.034)	0.169 (0.034)	0.168 (0.034)	0.169 (0.102,0.235)	0.169 (0.034)	0.169 (0.102, 0.232)	0.169 (0.034)	0.169 (0.034)
β_3	-0.179 (0.080)	-0.178 (0.082)	-0.179 (0.080)	-0.178 (-0.341,-0.015)	-0.179 (0.080)	0.193 (-0.003, 0.430)	-0.174 (0.081)	-0.178 (0.082)
β_4	-0.000 (0.114)	0.000 (0.116)	-0.001 (0.114)	0.000 (-0.234,0.232)	0.001 (0.114)	0.189 (0.022, 0.340)	-0.005 (0.114)	-0.000 (0.116)
β_5	0.007 (0.030)	0.007 (0.030)	0.007 (0.030)	0.007 (-0.051,0.065)	0.007 (0.016)	0.008 (-0.051, 0.064)	Not included	0.007 (0.030)
σ_{u0}^2	0.080	0.084 (0.017)	0.080 (0.016)	0.084 (0.056,0.126)	0.080 (0.016)	0.088 (0.058, 0.128)	0.084 (0.017)	0.084 (0.018)
σ_{u01}	0.020	0.021 (0.007)	0.020 (0.007)	0.021 (0.005,0.047)	0.020 (0.007)	0.022 (0.010, 0.038)	0.021 (0.007)	0.021 (0.007)
σ_{u1}^2	0.015	0.015 (0.005)	0.015 (0.004)	0.016 (0.008,0.028)	0.015 (0.004)	0.005 (0.009, 0.027)	0.015 (0.005)	0.015 (0.005)
σ_{e1}^2	0.587	0.588 (0.021)	0.588 (0.021)	0.588 (0.536,0.645)	0.587 (0.021)	0.589 (0.551, 0.631)	0.588 (0.021)	0.550 (0.012)
σ_{e2}^2	0.524	0.526 (0.015)	0.525 (0.015)	0.526 (0.496,0.557)	0.525 (0.015)	0.524 (0.499, 0.556)	0.525 (0.015)	N/A
-2LL**		9302.2	9275.1**	9302.2	9275.1			9308.2
Timing	40 - 50 s	1- 3 s	1- 4 s	50 - 60 s	1- 3 s	10 - 15 m	1-3 s	3-9 s

* For description of parameters see detailed reviews. Note school gender dummies here are mixed vs girls and boys versus girls . ** MLwiN reports only the ML likelihood value. *** SPSS cannot fit complex level 1 variance model. **** The main package S-Plus converged the model on the same estimates in shorter time than R , 1 – 4s. Note that the WINBUGS analysis used a different parameterisation for school gender.

Table 3. Three level variance components model

Parameter *	aML (ML)	SAS (REML)	MLwiN (RIGLS)	R***** (REML)	HLM 5 (ML)	WINBUGS (MCMC)	GenStat (REML)	SPSS**** (REML)
Fixed								
β_0	5.317 (0.058)	5.621 (0.031)	5.621 (0.031)	5.635 (5.574, 5.696)	5.635 (0.031)	5.635	5.31 (0.06)	-9.91 (0.109)
β_1		2.437 (0.017)	2.437 (0.017)	2.472 (2.439, 2.506)	2.473 (0.017)	2.473 (2.440, 2.505)	Not fitted	2.473 (0.017)
Random								
σ_{v0}^2	0.150	0.015 (0.014)	0.015 (0.014)	0.014 (0.002, 0.086)	0.014 (0.013)	0.009 (0.001, 0.045)	0.153 (0.051)	0.015 (0.014)
σ_{u0}^2	2.756	1.166 (0.056)	1.166 (0.056)	1.166 (1.071, 1.270)	1.166 (0.052)	1.170 (1.066, 1.281)	2.749 (0.116)	1.166 (0.056)
σ_{e0}^2	8.509	5.154 (0.043)	5.154 (0.043)	5.153 (5.072, 5.239)	5.154 (0.043)	5.155 (5.069, 5.241)	8.516 (0.071)	5.154 (0.056)
-2LL**		141,696.9	141,685.6**	141,696.9	141,685.5			141,728.0
Timing	> 10 hours***	3 - 5 m	3- 5 s	30 - 40 s	10 - 20 s	75 - 90 m	1 – 3 s	6 – 9 m

* For description of parameters see detailed reviews.   ** MLwiN reports only the ML likelihood value. *** The model with the slope was not run because of the length of time being taken. **** Variable centred differently. ***** The main package S-Plus converged the model on the same estimates in shorter time than R , 10 – 15s.

Table 4. Two level random intercepts model for binary data —logit link

Parameter*	aML (ML)	SAS (PQL1)	MLwiN (PQL2)	R (PQL1)	STATA (ML)	HLM 5 (ML)	EGRET (ML)	GenStat (PQL1)	WINBUGS (MCMC)	MIXOR (MML)
Fixed										
β_0	-1.686 (0.148)	-1.692 (0.148)	-1.690 (0.146)	-1.660 (-1.942, -1.38)	-1.697 (0.148)	-1.690 (0.130)	-1.694 (0.148)	-1.667 (0.146)	-1.732	-1.689 (0.129)
β_1	-0.026 (0.008)	-0.027 (0.008)	-0.027 (0.008)	-0.026 (-.041, -.011)	-0.027 (0.008)	-0.027 (0.010)	-0.027 (0.008)	-0.026 (0.008)	0.735 (0.501, 0.963)	0.733 (0.094)
β_2	0.733 (0.119)	0.732 (0.119)	0.733 (0.119)	0.719 (.491, .948)	0.728 (0.118)	0.732 (0.094)	0.730 (0.120)	0.720 (0.118)	-0.028 (-0.043, -0.012)	-0.027 (0.009)
β_3	1.117 (0.158)	1.109 (0.158)	1.110 (0.157)	1.092 (0.790, 1.394)	1.110 (0.158)	1.116 (0.135)	1.109 (0.158)	1.09 (0.15)	1.132 (0.834, 1.448)	1.109 (0.135)
β_4	1.359 (0.174)	1.377 (0.175)	1.377 (0.174)	1.354 (1.021,1.688)	1.376 (0.175)	1.367 (0.203)	1.378 (0.175)	1.35 (0.18)	1.403 (1.063, 1.750)	1.377 (0.204)
β_5	1.339 (0.180)	1.346 (0.180)	1.346 (0.178)	1.324 (0.982,1.666)	1.346 (0.180)	1.345 (0.188)	1.347 (0.180)	1.32 (0.18)	1.382 (1.022, 1.728)	1.346 (0.187)
Random										
σ^2_{u0}	0.221	0.216 (0.073)	0.212 (0.070)	0.209 (0.109,0.399)	0.225 (0.114, 0.446)	0.215 (0.095)	0.207 (0.071)	0.211 (0.070)	0.241 (0.117, 0.437)	0.215
-2LL					2413.2	2,984.1	2412.9			2413.4
Timing	20 - 25 s	40 - 50 s	1- 3 s	5 - 10 s	5 - 10 s	10 - 15 s	3 - 5 s	1 – 3 s	40 – 45 m	40 – 50 s
* For description of parameters see detailed reviews.										

Parameter*	SAS (REML)	MLwiN (IGLS)	R** (REML)	WINBUGS (MCMC)	SPSS (REML)
Table 5. Two level cross classified variance components model					
Fixed					
β_0	5.756 (0.185)	5.257 (0.181)	5.255 (4.893, 5.616)	5.253	5.235 (0.184)
β_1	0.499 (0.098)	0.499 (0.098)	0.498 (0.306, 0.691)	0.498 (0.304, 0.690)	0.499 (0.098)
Random					
σ^2_{u1}	1.104 (0.202)	1.104 (0.196)	1.109 (0.872, 1.409)	1.130 (0.770, 1.600)	1.110 (0.204)
σ^2_{u2}	0.346 (0.161)	0.346 (0.162)	0.370 (0.149, 0.918)	0.411 (0.138, 0.940)	0.370 (0.173)
σ^2_{e0}	8.053 (0.199)	8.053 (0.199)	8.054 (7.673, 8.451)	8.062 (7.687, 8.457)	8.055 (0.199)
-2LL	17123.5	17123.5	17127.9		17127.9
Timing	3 – 5 s	10 – 15 s	5 – 10 m	5 – 10 m	33 – 36 s

* * For description of parameters see detailed reviews. ** The main package S-Plus converged the model on the same estimates in shorter time than R , 2 – 5 m.

Table 6. Two level ordered multinomial model with logit link

Parameter	Symbol	aML (16 Quadrature points)	SAS (1st order ML)	MLwiN (PQL2)	HLM 5 (PQL1)	MIXOR (MML, 20 Quadrature points)
Fixed						
Scale cut point: 1	$\alpha^{(1)}$	-4.056 (0.640)	-3.858 (0.468)	-4.297 (0.643)	-3.852 (0.563)	-3.908 (0.600)
Scale cut point: 2	$\alpha^{(2)}$	-2.300 (0.604)	-2.104 (0.459)	-2.484 (0.603)	-2.212	-2.590
Scale cut point: 3	$\alpha^{(3)}$	0.510 (0.593)	0.692 (0.451)	0.345 (0.593)	0.350	-0.062
Scale cut point: 4	$\alpha^{(4)}$	1.449 (0.595)	1.628 (0.454)	1.353 (0.594)	1.231	1.065
Scale cut point: 5	$\alpha^{(5)}$	2.341 (0.501)	2.521 (0.460)	2.324 (0.596)	2.067	2.001
Scale cut point: 6	$\alpha^{(6)}$	3.384 (0.608)	3.571 (0.469)	3.460 (0.599)	3.051	2.971
CE vs RC	β_1	2.064 (0.634)	2.243 (0.507)	1.972 (0.637)	1.758 (0.561)	1.731 (0.610)
Other religions vs RC	β_2	0.688 (0.707)	0.976 (0.535)	0.707 (0.695)	0.635 (0.613)	0.503 (0.670)
None religion vs RC	β_3	2.841 (0.651)	3.010 (0.509)	2.781 (0.652)	2.473 (0.573)	2.726 (0.618)
Random						
	σ_{u0}^2	5.212	5.162 (0.667)	5.284 (0.555)	3.956 (0.427)	4.326
Timing		10 - 15 s	50 - 60 s	10 - 15 s	50 - 60 s	5 – 10 s