

# Appendix D



## *Item Parameters for IRT Analyses of TIMSS 2007 Data*

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics**

Item	Slope ( $a_j$ )	Location ( $b_j$ )	Guessing ( $c_j$ )	Step 1 ( $d_{j1}$ )	Step 2 ( $d_{j2}$ )
M011009	M01_01	1.200 (0.060)	-1.118 (0.059)	0.148 (0.031)	
M011010	M01_02	1.261 (0.059)	-0.201 (0.038)	0.136 (0.019)	
M012044	M01_03	0.955 (0.046)	-0.056 (0.044)	0.073 (0.019)	
M011011	M01_04	1.159 (0.059)	-0.769 (0.057)	0.170 (0.029)	
M011017	M01_05	0.710 (0.039)	-0.403 (0.075)	0.113 (0.028)	
M011018	M01_06	0.764 (0.039)	-1.066 (0.083)	0.117 (0.033)	
M011019	M01_07	0.718 (0.044)	-0.412 (0.090)	0.120 (0.035)	
M011020	M01_08	0.948 (0.074)	0.903 (0.047)	0.189 (0.018)	
M012065	M01_09	0.952 (0.057)	0.418 (0.046)	0.152 (0.019)	
M011023	M01_10	0.588 (0.039)	-0.999 (0.142)	0.171 (0.047)	
M011024	M01_11	0.824 (0.043)	-1.814 (0.097)	0.122 (0.039)	
M012048	M01_12	0.887 (0.052)	-0.064 (0.061)	0.142 (0.026)	
M011012	M02_01	0.888 (0.062)	-1.054 (0.087)	0.114 (0.035)	
M011013	M02_02	0.680 (0.079)	0.135 (0.129)	0.210 (0.043)	
M011014	M02_03	0.817 (0.062)	-1.645 (0.122)	0.136 (0.044)	
M011015	M02_04	0.662 (0.060)	-0.323 (0.117)	0.113 (0.041)	
M011016	M02_05	0.901 (0.087)	0.161 (0.081)	0.171 (0.033)	
M012078	M02_06	0.918 (0.065)	-0.888 (0.085)	0.122 (0.035)	
M012119	M02_07	0.625 (0.064)	-0.174 (0.136)	0.162 (0.045)	
M011021	M02_08	0.751 (0.065)	-0.634 (0.120)	0.136 (0.045)	
M012023	M02_09	0.800 (0.075)	-0.478 (0.122)	0.208 (0.046)	
M011022	M02_10	0.576 (0.047)	-1.006 (0.129)	0.119 (0.039)	
M011003	M02_11	0.682 (0.060)	-0.407 (0.115)	0.114 (0.041)	
M011004	M02_12	0.859 (0.065)	-0.913 (0.099)	0.138 (0.040)	
M011005	M02_13	0.513 (0.047)	-1.735 (0.197)	0.150 (0.050)	
M012126	M03_01	0.873 (0.065)	-0.604 (0.084)	0.127 (0.034)	
M011006	M03_02	0.465 (0.045)	-0.164 (0.140)	0.116 (0.037)	
M012117	M03_03	0.935 (0.101)	0.464 (0.077)	0.209 (0.029)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M011007	M03_04	0.973 (0.074)	-1.650 (0.111)	0.146 (0.045)	
M011008	M03_05	1.048 (0.083)	-0.436 (0.077)	0.166 (0.035)	
M011001	M03_06	0.664 (0.055)	-1.361 (0.147)	0.152 (0.048)	
M011002	M03_07	0.801 (0.082)	0.285 (0.089)	0.173 (0.033)	
M012069	M03_08	0.445 (0.071)	0.946 (0.182)	0.166 (0.046)	
M011025	M03_09	0.673 (0.071)	0.266 (0.106)	0.148 (0.036)	
M011026	M03_10	0.642 (0.059)	-0.528 (0.136)	0.161 (0.046)	
M011027	M03_11	0.897 (0.068)	-0.596 (0.086)	0.133 (0.036)	
M011028	M03_12	0.773 (0.063)	-0.535 (0.103)	0.140 (0.039)	
M031305	M04_01	0.665 (0.041)	-1.088 (0.068)		
M031310	M04_02	1.251 (0.093)	-0.720 (0.070)	0.163 (0.035)	
M031065	M04_03	1.003 (0.051)	0.001 (0.034)		
M031051	M04_04	0.939 (0.072)	-0.498 (0.081)	0.146 (0.034)	
M031220	M04_05	0.976 (0.067)	-0.837 (0.076)	0.114 (0.033)	
M031322	M04_06	0.588 (0.039)	-1.064 (0.075)		
M031298	M04_07	0.943 (0.054)	0.665 (0.043)		
M031327	M04_08	0.431 (0.034)	-0.017 (0.069)		
M031269	M04_09	0.403 (0.016)	-0.752 (0.051)		-1.551 (0.125) 1.551 (0.114)
M031264	M04_10	1.300 (0.069)	-0.923 (0.039)		
M031265	M04_11	0.636 (0.042)	0.296 (0.053)		
M031286	M05_01	0.815 (0.026)	0.183 (0.023)		
M031106	M05_02	0.810 (0.026)	0.079 (0.023)		
M031282	M05_03	0.711 (0.016)	0.781 (0.019)		-0.886 (0.042) 0.886 (0.046)
M031227	M05_04	1.103 (0.040)	1.198 (0.031)		
M031335	M05_05	1.178 (0.060)	0.018 (0.039)	0.218 (0.018)	
M031068	M05_06	1.174 (0.034)	0.244 (0.018)		
M031299	M05_07	1.151 (0.033)	-0.009 (0.018)		
M031301	M05_08	1.088 (0.033)	-0.660 (0.023)		
M031271	M05_09	0.737 (0.027)	-1.440 (0.047)		
M031134	M05_10	0.538 (0.024)	1.023 (0.050)		
M031045	M05_11	1.248 (0.052)	-0.463 (0.036)	0.117 (0.019)	
M031235	M06_01	0.752 (0.021)	0.434 (0.021)		
M031285	M06_02	0.712 (0.022)	0.807 (0.026)		
M031050	M06_03	1.197 (0.061)	0.598 (0.030)	0.227 (0.013)	
M031258	M06_04	0.975 (0.026)	0.758 (0.020)		
M031334	M06_05	1.126 (0.060)	0.716 (0.031)	0.220 (0.012)	
M031255	M06_06	0.860 (0.048)	0.144 (0.056)	0.232 (0.022)	
M031041	M06_07	0.803 (0.022)	0.108 (0.019)		
M031350A	M06_08A	1.099 (0.028)	0.470 (0.016)		
M031350B	M06_08B	1.114 (0.027)	0.067 (0.015)		
M031350C	M06_08C	0.797 (0.024)	0.825 (0.024)		
M031274	M06_09	0.837 (0.023)	-0.395 (0.022)		
M031240	M06_10	0.703 (0.020)	-0.361 (0.025)		
M031303	M07_01	1.064 (0.119)	-0.456 (0.109)	0.204 (0.046)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031309	M07_02	0.976 (0.071)	-0.372 (0.053)		
M031245	M07_03	1.302 (0.178)	1.047 (0.069)	0.105 (0.019)	
M031242A	M07_04A	1.056 (0.075)	-0.174 (0.048)		
M031242B	M07_04B	1.225 (0.086)	0.265 (0.042)		
M031242C	M07_04C	0.999 (0.124)	0.139 (0.097)	0.195 (0.038)	
M031247	M07_05	0.549 (0.041)	1.294 (0.088)		-0.282 (0.102) 0.282 (0.141)
M031219	M07_06	0.440 (0.072)	0.385 (0.218)	0.168 (0.051)	
M031173	M07_07	1.288 (0.124)	-0.273 (0.070)	0.130 (0.032)	
M031085	M07_08	0.566 (0.100)	0.638 (0.177)	0.189 (0.049)	
M031172	M07_09	1.227 (0.120)	-0.221 (0.073)	0.131 (0.033)	
M031029	M08_01	0.652 (0.081)	-0.205 (0.148)	0.159 (0.047)	
M031030	M08_02	0.646 (0.069)	1.468 (0.139)		
M031332	M08_03	0.914 (0.114)	0.065 (0.107)	0.190 (0.041)	
M031098	M08_04	1.394 (0.150)	0.209 (0.061)	0.151 (0.028)	
M031254	M08_05	1.155 (0.135)	0.180 (0.079)	0.176 (0.033)	
M031038	M08_06	0.673 (0.077)	-0.745 (0.162)	0.164 (0.050)	
M031276	M08_07	1.182 (0.139)	0.214 (0.077)	0.184 (0.032)	
M031064	M08_08	0.911 (0.123)	0.580 (0.089)	0.140 (0.032)	
M031006	M08_09	0.688 (0.074)	-0.893 (0.152)	0.150 (0.047)	
M031330	M08_10	0.563 (0.054)	-1.445 (0.136)		
M031351	M08_11	0.687 (0.082)	0.108 (0.117)	0.125 (0.038)	
M031135	M08_12	1.093 (0.102)	-0.612 (0.087)	0.124 (0.036)	
M031162	M09_01	0.641 (0.025)	-0.854 (0.041)		
M031341	M09_02	0.837 (0.042)	-0.815 (0.071)	0.129 (0.030)	
M031216	M09_03	0.913 (0.054)	-0.479 (0.075)	0.210 (0.032)	
M031249	M09_04	0.942 (0.040)	1.337 (0.042)		
M031347A	M09_05A	0.838 (0.030)	0.183 (0.025)		
M031347B	M09_05B	0.771 (0.029)	0.370 (0.028)		
M031347C	M09_05C	1.038 (0.036)	0.597 (0.023)		
M031348A	M09_06A	0.780 (0.031)	0.673 (0.032)		
M031348B	M09_06B	0.792 (0.028)	1.287 (0.030)	0.562 (0.029)	-0.562 (0.051)
M031190	M09_07	1.161 (0.065)	0.290 (0.038)	0.164 (0.017)	
M031306	M10_01	0.803 (0.028)	-0.420 (0.030)		
M031108	M10_02	1.312 (0.069)	0.362 (0.031)	0.149 (0.015)	
M031011	M10_03	0.854 (0.030)	0.053 (0.025)		
M031304	M10_04	0.977 (0.033)	-0.384 (0.025)		
M031023	M10_05	0.663 (0.052)	0.072 (0.102)	0.214 (0.034)	
M031008	M10_06	0.985 (0.092)	1.365 (0.052)	0.186 (0.014)	
M031338	M10_07	0.615 (0.039)	-0.197 (0.093)	0.128 (0.032)	
M031272A	M10_08A	1.032 (0.036)	-0.947 (0.032)		
M031272B	M10_08B	0.940 (0.037)	-1.436 (0.046)		
M031272C	M10_08C	1.092 (0.036)	0.146 (0.020)		
M031267	M10_09	0.628 (0.026)	0.369 (0.032)		
M031315	M10_10	1.048 (0.059)	0.398 (0.040)	0.147 (0.017)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031128	M11_01	0.372 (0.023)	-1.647 (0.110)		
M031016	M11_02	1.008 (0.041)	0.888 (0.031)		
M031183	M11_03	0.650 (0.023)	0.088 (0.023)	0.454 (0.040)	-0.454 (0.040)
M031187	M11_05	0.716 (0.055)	-0.511 (0.120)	0.216 (0.043)	
M031251	M11_06	1.654 (0.119)	0.689 (0.032)	0.253 (0.014)	
M031294	M11_07	1.162 (0.073)	0.040 (0.049)	0.198 (0.023)	
M031297	M11_08	0.691 (0.030)	0.410 (0.034)		
M031218	M11_09	1.189 (0.077)	0.149 (0.047)	0.212 (0.022)	
M031109	M11_10	0.651 (0.054)	-0.196 (0.123)	0.199 (0.042)	
M031159	M11_11	1.065 (0.065)	-0.237 (0.058)	0.178 (0.027)	
M031133	M11_12	0.843 (0.034)	-0.979 (0.041)		
M031210	M12_01	0.785 (0.076)	0.687 (0.072)	0.217 (0.026)	
M031009	M12_02	0.859 (0.035)	0.534 (0.029)		
M031252	M12_03	0.904 (0.054)	-0.224 (0.063)	0.141 (0.026)	
M031316	M12_04	0.558 (0.030)	-2.245 (0.106)		
M031317	M12_05	1.028 (0.071)	0.582 (0.042)	0.135 (0.018)	
M031079B	M12_06B	1.044 (0.038)	-0.711 (0.030)		
M031079C	M12_06C	0.718 (0.032)	0.559 (0.035)		
M031004	M12_07	1.164 (0.093)	1.068 (0.041)	0.152 (0.013)	
M031043	M12_08	1.256 (0.080)	0.358 (0.039)	0.198 (0.018)	
M031325	M12_09	0.826 (0.035)	0.680 (0.032)		
M031088	M12_10	0.838 (0.054)	-0.562 (0.087)	0.193 (0.035)	
M031093	M12_11	0.435 (0.041)	0.215 (0.149)	0.136 (0.040)	
M031155	M12_12	1.213 (0.075)	0.127 (0.044)	0.211 (0.020)	
M031344A	M13_01A	0.619 (0.055)	0.313 (0.075)		
M031344B	M13_01B	1.065 (0.078)	0.217 (0.047)		
M031344C	M13_01C	0.602 (0.029)	-0.023 (0.044)	-1.558 (0.139)	1.558 (0.138)
M031345A	M13_02A	0.776 (0.061)	-0.284 (0.062)		
M031345B	M13_02B	0.794 (0.063)	-0.169 (0.059)		
M031345C	M13_02C	0.515 (0.066)	1.924 (0.227)		
M031130	M13_03	0.913 (0.069)	-0.602 (0.061)		
M031097	M13_04	1.141 (0.144)	0.314 (0.081)	0.182 (0.033)	
M031178	M13_05	0.909 (0.118)	0.625 (0.087)	0.112 (0.029)	
M031333	M13_06	1.148 (0.151)	0.510 (0.076)	0.158 (0.030)	
M031346A	M14_01A	1.338 (0.092)	-0.423 (0.043)		
M031346B	M14_01B	1.318 (0.097)	0.480 (0.043)		
M031346C	M14_01C	0.976 (0.062)	0.251 (0.035)	0.373 (0.056)	-0.373 (0.060)
M031379	M14_02	0.996 (0.083)	0.846 (0.065)		
M031380	M14_03	0.967 (0.089)	1.179 (0.085)		
M031313	M14_05	0.664 (0.058)	-1.197 (0.104)		
M031083	M14_06	1.076 (0.113)	-0.361 (0.092)	0.148 (0.038)	
M031071	M14_07	1.043 (0.145)	0.708 (0.080)	0.139 (0.028)	
M031185	M14_08	1.500 (0.182)	0.255 (0.065)	0.212 (0.030)	
MF11009	M01F01	1.470 (0.076)	-1.044 (0.048)	0.127 (0.026)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF11010	M01F02	1.240 (0.062)	-0.236 (0.039)	0.107 (0.019)	
MF12044	M01F03	0.876 (0.043)	-0.110 (0.043)	0.049 (0.016)	
MF11011	M01F04	1.390 (0.065)	-0.785 (0.040)	0.090 (0.020)	
MF11017	M01F05	0.892 (0.040)	-0.469 (0.044)	0.055 (0.017)	
MF11018	M01F06	1.044 (0.047)	-0.861 (0.048)	0.069 (0.020)	
MF11019	M01F07	0.876 (0.043)	-0.403 (0.051)	0.059 (0.020)	
MF11020	M01F08	0.952 (0.070)	0.687 (0.045)	0.126 (0.018)	
MF12065	M01F09	0.729 (0.057)	0.664 (0.059)	0.107 (0.022)	
MF11023	M01F10	0.803 (0.038)	-0.840 (0.060)	0.073 (0.023)	
MF11024	M01F11	1.291 (0.064)	-1.141 (0.052)	0.105 (0.026)	
MF12048	M01F12	1.019 (0.046)	-0.195 (0.037)	0.051 (0.015)	
MF11012	M02F01	1.380 (0.061)	-0.729 (0.035)	0.064 (0.017)	
MF11013	M02F02	0.865 (0.049)	0.083 (0.050)	0.085 (0.020)	
MF11014	M02F03	1.238 (0.055)	-0.824 (0.040)	0.068 (0.019)	
MF11015	M02F04	0.797 (0.038)	-0.018 (0.041)	0.036 (0.014)	
MF11016	M02F05	1.041 (0.054)	0.281 (0.035)	0.063 (0.014)	
MF12078	M02F06	1.320 (0.056)	-0.337 (0.030)	0.053 (0.013)	
MF12119	M02F07	0.897 (0.042)	0.155 (0.036)	0.043 (0.013)	
MF11021	M02F08	1.212 (0.049)	-0.157 (0.028)	0.029 (0.010)	
MF12023	M02F09	1.199 (0.052)	-0.194 (0.031)	0.050 (0.013)	
MF11022	M02F10	1.083 (0.044)	-0.253 (0.030)	0.033 (0.010)	
MF11003	M02F11	1.052 (0.048)	0.120 (0.031)	0.037 (0.012)	
MF11004	M02F12	1.513 (0.066)	-0.144 (0.026)	0.056 (0.012)	
MF11005	M02F13	0.975 (0.044)	-0.419 (0.042)	0.062 (0.017)	
MF12126	M03F01	1.280 (0.119)	-0.085 (0.062)	0.109 (0.028)	
MF11006	M03F02	0.896 (0.096)	0.367 (0.075)	0.093 (0.027)	
MF12117	M03F03	1.192 (0.132)	0.564 (0.060)	0.101 (0.023)	
MF11007	M03F04	2.370 (0.251)	-0.335 (0.050)	0.206 (0.032)	
MF11008	M03F05	1.852 (0.167)	0.104 (0.042)	0.093 (0.021)	
MF11001	M03F06	1.546 (0.153)	-0.231 (0.064)	0.167 (0.032)	
MF11002	M03F07	1.328 (0.144)	0.518 (0.055)	0.110 (0.023)	
MF12069	M03F08	0.902 (0.115)	0.865 (0.084)	0.095 (0.024)	
MF11025	M03F09	1.237 (0.128)	0.518 (0.055)	0.087 (0.021)	
MF11026	M03F10	1.461 (0.144)	0.220 (0.052)	0.115 (0.025)	
MF11027	M03F11	1.815 (0.167)	0.134 (0.043)	0.097 (0.021)	
MF11028	M03F12	1.617 (0.147)	0.141 (0.045)	0.091 (0.021)	
MF31305	M04F01	0.811 (0.063)	-0.691 (0.072)		
MF31310	M04F02	1.440 (0.138)	-0.370 (0.068)	0.135 (0.033)	
MF31065	M04F03	1.179 (0.084)	0.198 (0.042)		
MF31051	M04F04	1.276 (0.121)	-0.109 (0.065)	0.118 (0.029)	
MF31220	M04F05	1.310 (0.116)	-0.323 (0.064)	0.098 (0.028)	
MF31322	M04F06	0.924 (0.070)	-0.332 (0.057)		
MF31298	M04F07	1.240 (0.096)	0.811 (0.050)		
MF31327	M04F08	0.726 (0.061)	0.413 (0.064)		

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF31269 M04F09	0.598 (0.030)	0.024 (0.044)		-1.178 (0.120)	1.178 (0.118)
MF31264 M04F10	1.456 (0.010)	-0.209 (0.039)			
MF31265 M04F11	0.920 (0.075)	0.620 (0.059)			
MF31286 M05F01	0.955 (0.071)	0.213 (0.050)			
MF31106 M05F02	0.960 (0.070)	0.054 (0.049)			
MF31282 M05F03	0.805 (0.043)	0.792 (0.042)		-0.779 (0.092)	0.779 (0.103)
MF31227 M05F04	1.120 (0.102)	1.252 (0.078)			
MF31335 M05F05	1.400 (0.142)	0.041 (0.062)	0.146 (0.028)		
MF31068 M05F06	1.538 (0.107)	0.317 (0.036)			
MF31299 M05F07	1.479 (0.100)	0.105 (0.036)			
MF31301 M05F08	1.435 (0.098)	-0.365 (0.041)			
MF31271 M05F09	1.001 (0.073)	-0.756 (0.061)			
MF31134 M05F10	0.686 (0.064)	0.963 (0.092)			
MF31045 M05F11	1.547 (0.136)	-0.134 (0.051)	0.089 (0.023)		
MF31235 M06F01	0.825 (0.065)	0.309 (0.057)			
MF31285 M06F02	0.817 (0.068)	0.723 (0.069)			
MF31050 M06F03	1.122 (0.153)	0.460 (0.084)	0.211 (0.033)		
MF31258 M06F04	0.930 (0.074)	0.683 (0.060)			
MF31334 M06F05	1.180 (0.160)	0.665 (0.075)	0.178 (0.028)		
MF31255 M06F06	0.851 (0.101)	-0.035 (0.111)	0.162 (0.041)		
MF31041 M06F07	0.816 (0.064)	0.165 (0.057)			
MF31350A M06F08A	1.319 (0.094)	0.463 (0.041)			
MF31350B M06F08B	1.426 (0.097)	0.098 (0.037)			
MF31350C M06F08C	1.083 (0.084)	0.735 (0.055)			
MF31274 M06F09	1.084 (0.076)	-0.334 (0.049)			
MF31240 M06F10	0.831 (0.063)	-0.129 (0.056)			
MF31303 M07F01	1.500 (0.158)	-0.322 (0.073)	0.199 (0.036)		
MF31309 M07F02	1.427 (0.096)	-0.183 (0.039)			
MF31245 M07F03	1.566 (0.189)	0.878 (0.053)	0.081 (0.016)		
MF31242A M07F04A	1.269 (0.088)	0.110 (0.040)			
MF31242B M07F04B	1.291 (0.094)	0.467 (0.042)			
MF31242C M07F04C	1.518 (0.187)	0.427 (0.060)	0.201 (0.026)		
MF31247 M07F05	0.732 (0.055)	1.341 (0.077)		-0.152 (0.083)	0.152 (0.123)
MF31219 M07F06	0.898 (0.129)	0.637 (0.096)	0.167 (0.033)		
MF31173 M07F07	1.767 (0.169)	0.130 (0.046)	0.109 (0.022)		
MF31085 M07F08	0.965 (0.151)	0.831 (0.093)	0.157 (0.030)		
MF31172 M07F09	1.515 (0.152)	0.239 (0.052)	0.107 (0.023)		
MF31029 M08F01	0.784 (0.096)	0.120 (0.111)	0.144 (0.039)		
MF31030 M08F02	0.714 (0.074)	1.445 (0.128)			
MF31332 M08F03	1.218 (0.136)	0.241 (0.070)	0.154 (0.030)		
MF31098 M08F04	1.722 (0.172)	0.228 (0.047)	0.117 (0.022)		
MF31254 M08F05	1.469 (0.161)	0.354 (0.056)	0.140 (0.025)		
MF31038 M08F06	1.311 (0.127)	-0.093 (0.064)	0.120 (0.029)		
MF31276 M08F07	1.376 (0.150)	0.341 (0.059)	0.143 (0.025)		

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF31064	M08F08	1.022 (0.126)	0.802 (0.075)	0.096 (0.022)	
MF31006	M08F09	1.147 (0.128)	-0.027 (0.082)	0.180 (0.035)	
MF31330	M08F10	0.859 (0.065)	-0.375 (0.058)		
MF31351	M08F11	1.073 (0.124)	0.556 (0.070)	0.106 (0.025)	
MF31135	M08F12	1.305 (0.125)	0.092 (0.058)	0.103 (0.025)	
MF31128	M11F01	0.633 (0.054)	-0.719 (0.083)		
MF31016	M11F02	1.267 (0.101)	0.870 (0.055)		
MF31183	M11F03	1.060 (0.066)	0.336 (0.034)	0.349 (0.051)	-0.349 (0.058)
MF31187	M11F05	1.113 (0.122)	-0.063 (0.083)	0.166 (0.035)	
MF31251	M11F06	1.483 (0.192)	0.672 (0.060)	0.159 (0.023)	
MF31294	M11F07	1.417 (0.138)	0.109 (0.055)	0.104 (0.024)	
MF31297	M11F08	1.186 (0.086)	0.412 (0.046)		
MF31218	M11F09	1.789 (0.165)	0.207 (0.041)	0.076 (0.018)	
MF31109	M11F10	1.087 (0.122)	0.253 (0.075)	0.130 (0.030)	
MF31159	M11F11	1.557 (0.151)	0.104 (0.051)	0.105 (0.023)	
MF31133	M11F12	1.082 (0.076)	-0.301 (0.047)		
MF31210	M12F01	1.214 (0.168)	0.611 (0.073)	0.173 (0.028)	
MF31009	M12F02	1.088 (0.082)	0.502 (0.050)		
MF31252	M12F03	0.982 (0.109)	-0.092 (0.094)	0.157 (0.037)	
MF31316	M12F04	0.843 (0.068)	-1.298 (0.089)		
MF31317	M12F05	1.074 (0.122)	0.429 (0.070)	0.105 (0.026)	
MF31079B	M12F06B	1.252 (0.086)	-0.470 (0.046)		
MF31079C	M12F06C	0.799 (0.069)	0.698 (0.073)		
MF31004	M12F07	1.036 (0.142)	0.910 (0.080)	0.108 (0.023)	
MF31043	M12F08	1.444 (0.163)	0.399 (0.057)	0.147 (0.024)	
MF31325	M12F09	1.047 (0.086)	0.855 (0.063)		
MF31088	M12F10	0.970 (0.109)	-0.070 (0.094)	0.162 (0.037)	
MF31093	M12F11	0.621 (0.097)	0.655 (0.140)	0.148 (0.040)	
MF31155	M12F12	1.310 (0.144)	0.215 (0.064)	0.151 (0.028)	
MF31344A	M13F01A	0.805 (0.034)	0.770 (0.035)		
MF31344B	M13F01B	1.415 (0.051)	0.566 (0.020)		
MF31344C	M13F01C	0.760 (0.018)	0.435 (0.019)	-1.313 (0.059)	1.313 (0.061)
MF31345A	M13F02A	0.995 (0.037)	0.230 (0.024)		
MF31345B	M13F02B	0.964 (0.036)	0.321 (0.025)		
MF31345C	M13F02C	0.663 (0.042)	2.083 (0.107)		
MF31130	M13F03	0.986 (0.036)	0.048 (0.024)		
MF31097	M13F04	1.685 (0.113)	0.823 (0.027)	0.151 (0.011)	
MF31178	M13F05	1.355 (0.093)	1.003 (0.032)	0.093 (0.010)	
MF31333	M13F06	1.542 (0.104)	0.913 (0.029)	0.119 (0.010)	
MF31346A	M14F01A	1.407 (0.049)	-0.196 (0.021)		
MF31346B	M14F01B	1.390 (0.051)	0.725 (0.021)		
MF31346C	M14F01C	1.088 (0.034)	0.495 (0.017)	0.407 (0.025)	-0.407 (0.028)
MF31379	M14F02	1.105 (0.046)	1.107 (0.032)		
MF31380	M14F03	1.090 (0.050)	1.375 (0.040)		

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF31313	M14F05	0.752 (0.030)	-0.554 (0.037)		
MF31083	M14F06	1.155 (0.064)	0.030 (0.042)	0.122 (0.020)	
MF31071	M14F07	0.985 (0.067)	0.845 (0.040)	0.099 (0.015)	
MF31185	M14F08	1.593 (0.087)	0.303 (0.029)	0.148 (0.015)	
MZ31286	M01_01	1.019 (0.057)	0.231 (0.037)		
MZ31106	M01_02	0.992 (0.056)	0.109 (0.037)		
MZ31282	M01_03	0.884 (0.036)	0.729 (0.029)	-0.629 (0.063)	0.629 (0.070)
MZ31227	M01_04	1.170 (0.075)	1.061 (0.048)		
MZ31335	M01_05	1.210 (0.107)	-0.035 (0.067)	0.208 (0.030)	
MZ31068	M01_06	1.325 (0.071)	0.239 (0.030)		
MZ31299	M01_07	1.282 (0.069)	-0.021 (0.032)		
MZ31301	M01_08	1.092 (0.061)	-0.626 (0.043)		
MZ31271	M01_09	0.660 (0.047)	-1.582 (0.102)		
MZ31134	M01_10	0.570 (0.044)	0.851 (0.076)		
MZ31045	M01_11	1.131 (0.084)	-0.622 (0.070)	0.115 (0.031)	
MZ41014	M02_01	0.795 (0.062)	-0.936 (0.103)	0.120 (0.037)	
MZ41039	M02_02	0.808 (0.077)	-0.225 (0.106)	0.177 (0.040)	
MZ41278	M02_03	0.497 (0.039)	0.239 (0.067)		
MZ41006	M02_04	1.107 (0.098)	0.351 (0.057)	0.127 (0.024)	
MZ41250	M02_05	0.920 (0.053)	-0.065 (0.040)		
MZ41094	M02_06	1.033 (0.127)	0.850 (0.072)	0.206 (0.025)	
MZ41330	M02_07	0.792 (0.075)	0.069 (0.091)	0.139 (0.034)	
MZ41300A	M02_08A	1.055 (0.060)	0.123 (0.036)		
MZ41300B	M02_08B	1.154 (0.065)	0.065 (0.034)		
MZ41300C	M02_08C	1.023 (0.061)	0.447 (0.039)		
MZ41300D	M02_08D	1.127 (0.068)	0.632 (0.039)		
MZ41173	M02_09	0.836 (0.107)	1.036 (0.085)	0.140 (0.026)	
MZ41274	M02_10	0.823 (0.052)	-0.441 (0.052)		
MZ41203	M02_11	0.865 (0.055)	0.041 (0.044)		
MZ31235	M03_01	0.786 (0.049)	0.496 (0.048)		
MZ31285	M03_02	0.791 (0.051)	0.752 (0.053)		
MZ31050	M03_03	1.171 (0.130)	0.606 (0.066)	0.235 (0.026)	
MZ31258	M03_04	1.060 (0.063)	0.656 (0.040)		
MZ31334	M03_05	1.261 (0.146)	0.782 (0.062)	0.237 (0.024)	
MZ31255	M03_06	0.945 (0.100)	0.113 (0.095)	0.225 (0.037)	
MZ31041	M03_07	0.950 (0.055)	0.099 (0.039)		
MZ31350A	M03_08A	1.061 (0.062)	0.486 (0.038)		
MZ31350B	M03_08B	1.056 (0.060)	0.051 (0.037)		
MZ31350C	M03_08C	0.811 (0.055)	0.857 (0.056)		
MZ31274	M03_09	0.798 (0.050)	-0.495 (0.054)		
MZ31240	M03_10	0.625 (0.043)	-0.489 (0.066)		
MZ41052	M04_01	0.780 (0.072)	-0.761 (0.136)	0.191 (0.049)	
MZ41056	M04_02	0.936 (0.054)	0.146 (0.039)		
MZ41069	M04_03	1.233 (0.121)	0.967 (0.051)	0.100 (0.017)	

( ) Standard errors appear in parentheses



**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ41076	M04_04	0.955 (0.054)	0.169 (0.039)		
MZ41281	M04_05	1.241 (0.095)	-0.249 (0.061)	0.133 (0.029)	
MZ41164	M04_06	0.684 (0.059)	-0.947 (0.136)	0.144 (0.045)	
MZ41146	M04_07	0.732 (0.047)	-0.443 (0.056)		
MZ41152	M04_08	1.090 (0.109)	0.511 (0.065)	0.177 (0.027)	
MZ41258A	M04_09A	0.932 (0.054)	-0.227 (0.043)		
MZ41258B	M04_09B	0.742 (0.047)	0.282 (0.048)		
MZ41131	M04_10	0.631 (0.109)	1.553 (0.142)	0.167 (0.031)	
MZ41275	M04_11	0.529 (0.021)	-0.634 (0.046)		-1.378 (0.118) 1.378 (0.107)
MZ41186	M04_12	0.973 (0.073)	-0.034 (0.062)	0.092 (0.025)	
MZ41336	M04_13	1.228 (0.143)	0.942 (0.060)	0.181 (0.022)	
MZ31303	M05_01	1.278 (0.111)	-0.312 (0.074)	0.221 (0.036)	
MZ31309	M05_02	1.175 (0.063)	-0.261 (0.036)		
MZ31245	M05_03	1.763 (0.163)	0.949 (0.037)	0.105 (0.013)	
MZ31242A	M05_04A	1.089 (0.060)	-0.226 (0.037)		
MZ31242B	M05_04B	1.212 (0.066)	0.256 (0.032)		
MZ31242C	M05_04C	1.028 (0.105)	0.156 (0.085)	0.239 (0.035)	
MZ31247	M05_05	0.552 (0.030)	1.228 (0.059)		-0.328 (0.077) 0.328 (0.100)
MZ31219	M05_06	0.507 (0.070)	0.597 (0.163)	0.167 (0.045)	
MZ31173	M05_07	1.559 (0.115)	-0.146 (0.047)	0.125 (0.024)	
MZ31085	M05_08	0.928 (0.116)	0.685 (0.087)	0.234 (0.032)	
MZ31172	M05_09	1.397 (0.103)	-0.243 (0.052)	0.113 (0.026)	
MZ41010	M06_01	1.027 (0.099)	-0.184 (0.094)	0.245 (0.039)	
MZ41098	M06_02	1.496 (0.144)	0.519 (0.050)	0.216 (0.023)	
MZ41064	M06_03	0.908 (0.053)	-0.524 (0.048)		
MZ41003	M06_04	0.783 (0.048)	-0.057 (0.046)		
MZ41104	M06_05	0.987 (0.056)	-0.121 (0.039)		
MZ41299	M06_06	1.193 (0.071)	0.819 (0.038)		
MZ41329	M06_07	0.711 (0.078)	-0.252 (0.148)	0.213 (0.050)	
MZ41143	M06_08	0.390 (0.016)	-0.352 (0.051)		-1.892 (0.141) 1.892 (0.134)
MZ41158	M06_09	0.799 (0.075)	-0.369 (0.115)	0.179 (0.043)	
MZ41328	M06_10	0.821 (0.049)	-0.339 (0.049)		
MZ41155	M06_11	0.890 (0.079)	0.210 (0.074)	0.129 (0.029)	
MZ41284	M06_12	0.749 (0.041)	0.700 (0.036)		0.499 (0.051) -0.499 (0.063)
MZ41335	M06_13	0.829 (0.067)	-0.935 (0.111)	0.135 (0.041)	
MZ41184	M06_14	1.001 (0.082)	-0.530 (0.085)	0.144 (0.037)	
MZ31029	M07_01	0.847 (0.081)	-0.015 (0.094)	0.155 (0.037)	
MZ31030	M07_02	0.725 (0.057)	1.530 (0.096)		
MZ31332	M07_03	0.979 (0.097)	-0.017 (0.091)	0.229 (0.037)	
MZ31098	M07_04	1.335 (0.117)	0.302 (0.052)	0.174 (0.024)	
MZ31254	M07_05	1.213 (0.108)	0.186 (0.061)	0.181 (0.028)	
MZ31038	M07_06	0.844 (0.070)	-0.626 (0.103)	0.144 (0.039)	
MZ31276	M07_07	1.358 (0.125)	0.194 (0.059)	0.227 (0.028)	
MZ31064	M07_08	0.999 (0.104)	0.595 (0.068)	0.160 (0.027)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ31006	M07_09	0.782 (0.069)	-0.767 (0.124)	0.164 (0.045)	
MZ31330	M07_10	0.695 (0.047)	-1.214 (0.084)		
MZ31351	M07_11	0.815 (0.076)	0.256 (0.081)	0.123 (0.031)	
MZ31135	M07_12	1.127 (0.086)	-0.587 (0.072)	0.128 (0.033)	
MZ41291	M08_01	0.557 (0.040)	-0.935 (0.084)		
MZ41289	M08_02	0.950 (0.091)	0.208 (0.079)	0.185 (0.032)	
MZ41068	M08_03	1.250 (0.106)	0.615 (0.046)	0.087 (0.019)	
MZ41065A	M08_04A	1.632 (0.142)	0.598 (0.039)	0.129 (0.018)	
MZ41065B	M08_04B	1.266 (0.076)	0.932 (0.040)		
MZ41096	M08_05	1.068 (0.097)	0.362 (0.062)	0.146 (0.026)	
MZ41125	M08_06	1.061 (0.103)	0.658 (0.058)	0.124 (0.023)	
MZ41135	M08_07	0.464 (0.048)	-1.103 (0.206)	0.155 (0.051)	
MZ41257	M08_08	0.729 (0.047)	0.500 (0.050)		
MZ41268	M08_09	1.726 (0.181)	0.922 (0.043)	0.180 (0.017)	
MZ41151	M08_10	0.608 (0.065)	-0.549 (0.172)	0.194 (0.053)	
MZ41264	M08_11	0.713 (0.078)	0.182 (0.114)	0.170 (0.040)	
MZ41182	M08_12	0.935 (0.060)	-1.369 (0.073)		
MZ41200	M08_13	0.584 (0.028)	-0.340 (0.041)		-0.280 (0.081) 0.280 (0.072)
MZ31128	M09_01	0.446 (0.037)	-1.531 (0.135)		
MZ31016	M09_02	1.182 (0.069)	0.734 (0.037)		
MZ31183	M09_03	0.795 (0.040)	0.170 (0.032)		0.632 (0.052) -0.632 (0.052)
MZ31187	M09_05	0.731 (0.063)	-0.695 (0.121)	0.147 (0.042)	
MZ31251	M09_06	1.449 (0.136)	0.442 (0.050)	0.193 (0.023)	
MZ31294	M09_07	1.235 (0.091)	-0.148 (0.054)	0.112 (0.025)	
MZ31297	M09_08	0.875 (0.053)	0.379 (0.043)		
MZ31218	M09_09	1.387 (0.117)	-0.019 (0.056)	0.179 (0.027)	
MZ31109	M09_10	0.779 (0.076)	-0.229 (0.115)	0.188 (0.041)	
MZ31159	M09_11	1.070 (0.088)	-0.335 (0.076)	0.150 (0.033)	
MZ31133	M09_12	0.918 (0.057)	-1.096 (0.065)		
MZ41107	M10_01	0.947 (0.075)	-1.173 (0.107)	0.140 (0.041)	
MZ41011	M10_02	1.200 (0.099)	-0.243 (0.069)	0.181 (0.031)	
MZ41122	M10_03	0.473 (0.022)	0.598 (0.044)		-0.903 (0.095) 0.903 (0.103)
MZ41041	M10_04	0.956 (0.103)	0.126 (0.096)	0.260 (0.037)	
MZ41320	M10_05	1.605 (0.138)	0.336 (0.044)	0.166 (0.022)	
MZ41115A	M10_06A	0.861 (0.050)	-0.345 (0.047)		
MZ41115B	M10_06B	1.075 (0.060)	0.106 (0.035)		
MZ41160A	M10_07A	0.976 (0.059)	-1.231 (0.066)		
MZ41160B	M10_07B	1.167 (0.073)	-1.325 (0.062)		
MZ41327	M10_08	0.546 (0.039)	-0.261 (0.066)		
MZ41148	M10_09	0.401 (0.028)	-0.025 (0.055)		0.358 (0.103) -0.358 (0.096)
MZ41265	M10_10	0.870 (0.088)	0.667 (0.070)	0.118 (0.025)	
MZ41175	M10_11	0.905 (0.073)	-1.103 (0.111)	0.139 (0.041)	
MZ41199	M10_12	1.343 (0.103)	-0.577 (0.065)	0.132 (0.031)	
MZ31210	M11_01	1.067 (0.107)	0.459 (0.066)	0.170 (0.027)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ31009	M11_02	0.907 (0.054)	0.463 (0.041)		
MZ31252	M11_03	0.935 (0.077)	-0.329 (0.083)	0.138 (0.033)	
MZ31316	M11_04	0.646 (0.048)	-2.001 (0.128)		
MZ31317	M11_05	1.184 (0.110)	0.553 (0.053)	0.137 (0.023)	
MZ31079B	M11_06B	1.132 (0.063)	-0.726 (0.046)		
MZ31079C	M11_06C	0.743 (0.048)	0.465 (0.049)		
MZ31004	M11_07	0.988 (0.113)	1.085 (0.067)	0.120 (0.020)	
MZ31043	M11_08	1.242 (0.109)	0.232 (0.057)	0.176 (0.026)	
MZ31325	M11_09	0.940 (0.057)	0.595 (0.042)		
MZ31088	M11_10	0.732 (0.064)	-0.742 (0.126)	0.154 (0.043)	
MZ31093	M11_11	0.456 (0.060)	0.256 (0.189)	0.163 (0.049)	
MZ31155	M11_12	1.233 (0.118)	0.207 (0.066)	0.235 (0.029)	
MZ41298	M12_01	1.194 (0.092)	-0.634 (0.073)	0.141 (0.034)	
MZ41007	M12_02	0.773 (0.084)	0.459 (0.091)	0.151 (0.033)	
MZ41280	M12_03	0.765 (0.087)	0.518 (0.094)	0.164 (0.033)	
MZ41059	M12_04	1.051 (0.058)	-0.057 (0.036)		
MZ41046	M12_05	1.269 (0.097)	0.149 (0.048)	0.098 (0.022)	
MZ41048	M12_06	1.227 (0.125)	0.468 (0.062)	0.220 (0.026)	
MZ41169	M12_07	0.838 (0.075)	0.005 (0.085)	0.135 (0.033)	
MZ41333	M12_08	1.170 (0.115)	0.693 (0.055)	0.150 (0.022)	
MZ41262	M12_09	1.027 (0.114)	0.675 (0.070)	0.198 (0.027)	
MZ41267	M12_10	0.460 (0.039)	0.791 (0.086)		
MZ41177	M12_11	1.018 (0.080)	-0.617 (0.083)	0.136 (0.035)	
MZ41271	M12_12	1.000 (0.078)	-0.386 (0.075)	0.121 (0.031)	
MZ41276A	M12_13A	0.988 (0.057)	0.080 (0.038)		
MZ41276B	M12_13B	0.796 (0.054)	0.688 (0.051)		
MZ31346A	M13_01A	1.552 (0.083)	-0.356 (0.030)		
MZ31346B	M13_01B	1.759 (0.094)	0.474 (0.025)		
MZ31346C	M13_01C	1.345 (0.063)	0.280 (0.022)	0.438 (0.033)	-0.438 (0.034)
MZ31379	M13_02	1.189 (0.070)	0.834 (0.039)		
MZ31380	M13_03	1.048 (0.068)	1.134 (0.053)		
MZ31313	M13_05	0.617 (0.043)	-1.207 (0.090)		
MZ31083	M13_06	0.897 (0.083)	-0.424 (0.106)	0.195 (0.042)	
MZ31071	M13_07	0.905 (0.093)	0.641 (0.071)	0.136 (0.027)	
MZ31185	M13_08	1.314 (0.118)	0.170 (0.059)	0.192 (0.028)	
MZ41004	M14_01	0.963 (0.077)	-1.300 (0.110)	0.150 (0.043)	
MZ41023	M14_02	1.448 (0.118)	-0.886 (0.071)	0.178 (0.036)	
MZ41034	M14_03	0.787 (0.062)	-0.367 (0.087)	0.108 (0.032)	
MZ41087	M14_04	0.784 (0.047)	-0.007 (0.045)		
MZ41124	M14_05	0.907 (0.052)	-0.218 (0.042)		
MZ41302A	M14_06A	0.693 (0.059)	-1.169 (0.140)	0.148 (0.046)	
MZ41302B	M14_06B	0.568 (0.039)	-0.457 (0.066)		
MZ41302C	M14_06C	0.949 (0.054)	-0.466 (0.045)		
MZ41254	M14_07	0.764 (0.079)	0.215 (0.098)	0.161 (0.035)	

( ) Standard errors appear in parentheses

**Exhibit D.1 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Mathematics (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ41153	M14_08	0.928 (0.086)	0.214 (0.075)	0.152 (0.030)		
MZ41132	M14_09	0.506 (0.069)	0.763 (0.147)	0.149 (0.040)		
MZ41165	M14_10	0.295 (0.015)	0.365 (0.064)		-1.536 (0.150)	1.536 (0.155)
MZ41174	M14_11	1.022 (0.059)	-0.789 (0.050)			
MZ41191	M14_12	0.881 (0.073)	-1.384 (0.124)	0.149 (0.045)		

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S011006	S01_01	0.571 (0.041)	-0.891 (0.146)	0.201 (0.044)	
S011007	S01_02	0.702 (0.041)	-0.817 (0.094)	0.162 (0.033)	
S011008	S01_03	0.806 (0.049)	-0.472 (0.080)	0.181 (0.031)	
S012033	S01_04	0.399 (0.038)	0.038 (0.167)	0.153 (0.041)	
S011001	S01_05	0.674 (0.039)	-1.602 (0.121)	0.155 (0.040)	
S011003	S01_06	0.783 (0.052)	-0.460 (0.092)	0.232 (0.034)	
S011004	S01_07	0.668 (0.040)	-0.656 (0.093)	0.149 (0.033)	
S011005	S01_08	0.858 (0.042)	-1.018 (0.070)	0.120 (0.028)	
S011021	S01_09	0.563 (0.034)	-1.556 (0.137)	0.143 (0.041)	
S011022	S01_10	0.526 (0.041)	-0.576 (0.149)	0.192 (0.043)	
S011023	S01_11	0.896 (0.047)	-0.454 (0.061)	0.134 (0.026)	
S011030	S02_01	0.520 (0.049)	-1.766 (0.214)	0.181 (0.053)	
S011031	S02_02	0.957 (0.074)	-1.649 (0.113)	0.148 (0.040)	
S011032	S02_03	0.656 (0.042)	0.209 (0.048)		
S011033	S02_04	0.300 (0.058)	1.547 (0.308)	0.179 (0.047)	
S011025	S02_05	0.578 (0.052)	-1.842 (0.198)	0.179 (0.052)	
S011026	S02_06	0.368 (0.040)	-2.873 (0.329)	0.163 (0.050)	
S011027	S02_07	0.781 (0.074)	-0.558 (0.125)	0.206 (0.045)	
S011029	S02_09	0.974 (0.079)	-1.762 (0.123)	0.165 (0.044)	
S011016	S02_10	0.716 (0.061)	-2.118 (0.173)	0.166 (0.049)	
S012007	S02_11	0.466 (0.046)	-1.436 (0.214)	0.171 (0.051)	
S011017	S03_01	0.586 (0.056)	-0.513 (0.140)	0.161 (0.042)	
S011018	S03_02	0.575 (0.053)	-2.814 (0.241)	0.167 (0.051)	
S012010	S03_03	0.733 (0.067)	-0.578 (0.124)	0.175 (0.043)	
S011019	S03_04	0.632 (0.040)	-1.194 (0.079)		
S011009	S03_05	0.477 (0.048)	-1.051 (0.194)	0.169 (0.049)	
S011010	S03_06	0.574 (0.054)	-2.913 (0.258)	0.176 (0.054)	
S011011	S03_07	0.878 (0.113)	0.733 (0.080)	0.222 (0.029)	
S011012	S03_08	0.649 (0.051)	-1.851 (0.149)	0.100 (0.039)	
S011013	S03_09	0.490 (0.066)	0.622 (0.138)	0.121 (0.039)	
S011014	S03_10	0.766 (0.069)	-0.253 (0.101)	0.168 (0.037)	
S011015	S03_11	0.506 (0.048)	-1.156 (0.185)	0.165 (0.048)	
S031017	S04_01	0.613 (0.056)	-0.871 (0.146)	0.163 (0.045)	
S031246	S04_02	0.723 (0.052)	1.044 (0.069)		
S031287	S04_03	0.662 (0.060)	-0.376 (0.116)	0.153 (0.039)	
S031251	S04_04	0.552 (0.044)	1.077 (0.089)		
S031053	S04_05	0.499 (0.024)	-0.089 (0.038)	-0.229 (0.078)	0.229 (0.075)
S031005	S04_06	0.642 (0.053)	1.447 (0.105)		
S031306	S04_07	0.920 (0.117)	0.863 (0.072)	0.181 (0.025)	
S031372A	S04_08A	0.887 (0.049)	-0.346 (0.041)		
S031372B	S04_08B	0.708 (0.033)	0.907 (0.039)	-0.341 (0.058)	0.341 (0.073)
S031082	S04_09	0.456 (0.048)	-0.896 (0.198)	0.167 (0.048)	
S031229	S05_01	1.266 (0.086)	0.654 (0.034)	0.259 (0.015)	
S031270	S05_02	0.501 (0.029)	1.827 (0.094)		

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S031026 S05_03	0.510 (0.012)	-0.176 (0.022)		-0.793 (0.050)	0.793 (0.047)
S031319 S05_04	1.133 (0.085)	1.047 (0.037)	0.186 (0.013)		
S031414A S05_05A	1.234 (0.036)	-0.315 (0.019)			
S031414B S05_05B	1.036 (0.032)	-0.395 (0.022)			
S031078 S05_06	0.639 (0.052)	-0.065 (0.115)	0.247 (0.038)		
S031009 S05_07	0.694 (0.025)	-0.230 (0.028)			
S031401 S05_08	1.032 (0.072)	0.548 (0.043)	0.240 (0.018)		
S031384A S05_09A	0.806 (0.029)	-1.336 (0.045)			
S031384B S05_09B	0.928 (0.030)	-0.482 (0.026)			
S031255 S06_01	0.847 (0.045)	-0.191 (0.062)	0.254 (0.024)		
S031240D S06_02D	0.640 (0.015)	-0.157 (0.017)		0.818 (0.030)	-0.818 (0.025)
S031239 S06_03	0.596 (0.050)	-0.083 (0.130)	0.372 (0.034)		
S031235A S06_04A	0.943 (0.026)	0.388 (0.017)			
S031235B S06_04B	1.000 (0.028)	0.641 (0.018)			
S031205 S06_05	0.710 (0.041)	0.144 (0.062)	0.218 (0.022)		
S031399A S06_06A	0.924 (0.025)	0.233 (0.017)			
S031399B S06_06B	0.936 (0.025)	-0.067 (0.017)			
S031393 S06_07	0.783 (0.023)	-1.347 (0.039)			
S031278 S06_08	0.615 (0.020)	-0.568 (0.030)			
S031317 S07_01	0.603 (0.083)	-0.530 (0.193)	0.204 (0.054)		
S031190 S07_02	0.817 (0.075)	0.752 (0.071)			
S031431 S07_03	0.691 (0.175)	1.789 (0.253)	0.161 (0.031)		
S031283 S07_04	0.510 (0.069)	-0.969 (0.231)	0.188 (0.055)		
S031426 S07_05	0.673 (0.090)	-0.389 (0.165)	0.201 (0.051)		
S031422 S07_06	0.787 (0.090)	-1.441 (0.179)	0.186 (0.052)		
S031427 S07_07	0.654 (0.084)	-0.265 (0.148)	0.170 (0.046)		
S031075 S07_08	0.327 (0.062)	0.139 (0.309)	0.194 (0.056)		
S031047 S07_09	0.614 (0.057)	0.025 (0.071)			
S031387 S07_10	0.948 (0.185)	1.208 (0.120)	0.170 (0.030)		
S031396D S07_11D	0.490 (0.033)	-1.081 (0.084)		-0.401 (0.146)	0.401 (0.112)
S031340 S08_01	1.079 (0.208)	1.002 (0.102)	0.254 (0.031)		
S031236 S08_02	0.593 (0.070)	-1.390 (0.204)	0.163 (0.049)		
S031391D S08_03D	0.485 (0.036)	0.390 (0.057)		-0.167 (0.106)	0.167 (0.114)
S031361 S08_04	0.564 (0.102)	0.560 (0.171)	0.202 (0.048)		
S031001 S08_05	0.780 (0.085)	-1.011 (0.148)	0.164 (0.046)		
S031410 S08_07	0.439 (0.065)	-0.502 (0.228)	0.172 (0.051)		
S031421 S08_08	0.386 (0.045)	-0.638 (0.128)			
S031298 S08_09	0.855 (0.204)	1.448 (0.173)	0.225 (0.031)		
S031076 S08_10	0.707 (0.068)	0.715 (0.078)			
S031275 S08_11	0.663 (0.159)	1.641 (0.225)	0.167 (0.033)		
S031349 S09_01	0.659 (0.036)	-1.419 (0.105)	0.127 (0.034)		
S031330 S09_02	0.888 (0.032)	-0.617 (0.031)			
S031212 S09_03	0.617 (0.041)	-0.688 (0.114)	0.167 (0.037)		
S031241D S09_04D	0.658 (0.022)	0.611 (0.023)		0.682 (0.033)	-0.682 (0.041)

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
S031038	S09_05	0.581 (0.043)	-0.894 (0.147)	0.219 (0.044)	
S031252	S09_06	0.523 (0.019)	-1.053 (0.039)		0.366 (0.062) -0.366 (0.041)
S031406A	S09_07A	1.015 (0.036)	-0.504 (0.027)		
S031406B	S09_07B	1.019 (0.043)	1.067 (0.033)		
S031383	S09_08	0.688 (0.047)	0.775 (0.050)	0.078 (0.017)	
S031379	S09_09	0.699 (0.051)	0.018 (0.081)	0.197 (0.029)	
S031060	S09_10	0.799 (0.093)	1.297 (0.072)	0.234 (0.020)	
S031269	S10_01	0.568 (0.054)	0.386 (0.105)	0.184 (0.034)	
S031284	S10_02	0.544 (0.079)	1.627 (0.119)	0.171 (0.026)	
S031338	S10_03	0.823 (0.045)	-0.618 (0.073)	0.157 (0.030)	
S031382	S10_04	0.750 (0.030)	0.147 (0.027)		
S031218	S10_05	0.748 (0.030)	-0.160 (0.029)		
S031326D	S10_06D	0.458 (0.017)	0.267 (0.026)		0.036 (0.050) -0.036 (0.051)
S031003	S10_07	0.677 (0.040)	-0.526 (0.085)	0.128 (0.031)	
S031035	S10_08	0.750 (0.046)	-0.991 (0.106)	0.199 (0.039)	
S031420	S10_09	0.652 (0.061)	0.945 (0.067)	0.130 (0.024)	
S031370	S10_10	0.938 (0.035)	0.156 (0.022)		
S031313	S10_11	0.858 (0.084)	0.969 (0.057)	0.225 (0.021)	
S031254	S11_01	0.249 (0.030)	0.053 (0.257)	0.214 (0.040)	
S031266	S11_02	2.388 (0.162)	0.728 (0.026)	0.369 (0.013)	
S031233	S11_03	0.363 (0.023)	-0.519 (0.066)		
S031204	S11_04	0.310 (0.024)	1.035 (0.098)		
S031273	S11_05	2.536 (0.177)	0.698 (0.026)	0.433 (0.013)	
S031299	S11_06	0.425 (0.027)	0.898 (0.067)		
S031281	S11_07	0.480 (0.034)	-1.812 (0.188)	0.160 (0.048)	
S031077	S11_08	0.342 (0.032)	-1.391 (0.275)	0.181 (0.054)	
S031311	S11_09	2.837 (0.190)	0.654 (0.024)	0.457 (0.012)	
S031088D	S11_10D	0.294 (0.009)	0.491 (0.056)		2.280 (0.083) -2.280 (0.096)
S031389	S11_11	1.521 (0.145)	1.124 (0.044)	0.282 (0.013)	
S031356	S12_01	0.457 (0.035)	-2.615 (0.254)	0.194 (0.059)	
S031291	S12_02	0.802 (0.049)	-1.174 (0.103)	0.161 (0.038)	
S031230	S12_03	0.598 (0.040)	-1.535 (0.149)	0.159 (0.044)	
S031325	S12_04	0.521 (0.029)	0.473 (0.044)		
S031068	S12_05	1.127 (0.096)	0.652 (0.044)	0.239 (0.019)	
S031418	S12_06	0.871 (0.089)	0.974 (0.057)	0.191 (0.020)	
S031197D	S12_07D	0.400 (0.013)	-0.838 (0.043)		-0.989 (0.085) 0.989 (0.072)
S031371	S12_08	1.106 (0.114)	0.959 (0.051)	0.278 (0.018)	
S031376	S12_09	1.076 (0.121)	1.170 (0.058)	0.253 (0.017)	
S031044	S12_10	0.618 (0.030)	0.120 (0.035)		
S031390D	S12_11D	0.516 (0.021)	0.353 (0.028)		0.293 (0.048) -0.293 (0.052)
S031409	S13_01	0.817 (0.100)	-0.242 (0.124)	0.181 (0.044)	
S031398	S13_02	0.675 (0.092)	-0.140 (0.150)	0.190 (0.047)	
S031072	S13_03	0.690 (0.047)	-0.070 (0.049)		0.813 (0.082) -0.813 (0.076)
S031061	S13_04	0.579 (0.078)	-0.491 (0.182)	0.186 (0.050)	

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S031439A	S13_05A	0.828 (0.089)	1.349 (0.115)			
S031439B	S13_05B	0.668 (0.061)	0.006 (0.068)			
S031440	S13_06	0.872 (0.081)	0.831 (0.071)			
S031441A	S13_07A	1.204 (0.089)	-0.236 (0.047)			
S031441B	S13_07B	0.983 (0.067)	0.555 (0.039)		0.597 (0.054)	-0.597 (0.067)
S031442	S13_08	1.143 (0.091)	0.166 (0.044)			
S031443	S13_09	0.896 (0.091)	1.008 (0.081)			
S031446A	S14_01A	0.923 (0.078)	0.623 (0.059)			
S031446B	S14_01B	0.716 (0.070)	0.882 (0.087)			
S031446C	S14_01C	0.762 (0.063)	-0.152 (0.061)			
S031445A	S14_02A	1.318 (0.098)	0.353 (0.039)			
S031445B	S14_02B	1.139 (0.083)	-0.639 (0.056)			
S031447	S14_03	0.447 (0.042)	1.025 (0.093)		0.396 (0.105)	-0.396 (0.144)
S031193	S14_04	0.497 (0.070)	-0.425 (0.202)	0.174 (0.050)		
S031264	S14_05	0.807 (0.086)	-0.451 (0.113)	0.141 (0.039)		
S031347	S14_06	0.598 (0.073)	-0.942 (0.185)	0.170 (0.049)		
S031346	S14_07	0.722 (0.082)	1.420 (0.134)			
S031081	S14_08	0.755 (0.064)	-0.692 (0.080)			
SF11006	S01F01	1.148 (0.054)	-0.238 (0.036)	0.083 (0.016)		
SF11007	S01F02	1.174 (0.053)	-0.201 (0.033)	0.063 (0.014)		
SF11008	S01F03	1.375 (0.059)	-0.143 (0.027)	0.040 (0.011)		
SF12033	S01F04	0.851 (0.046)	0.220 (0.038)	0.055 (0.014)		
SF11001	S01F05	1.775 (0.077)	-0.441 (0.027)	0.076 (0.014)		
SF11003	S01F06	1.420 (0.059)	-0.206 (0.026)	0.047 (0.011)		
SF11004	S01F07	1.460 (0.062)	-0.059 (0.024)	0.048 (0.010)		
SF11005	S01F08	1.959 (0.081)	-0.237 (0.021)	0.041 (0.009)		
SF11021	S01F09	1.610 (0.069)	-0.301 (0.027)	0.061 (0.012)		
SF11022	S01F10	1.200 (0.057)	-0.077 (0.032)	0.072 (0.014)		
SF11023	S01F11	1.743 (0.074)	0.000 (0.021)	0.040 (0.009)		
SF11030	S02F01	1.526 (0.060)	-0.191 (0.023)	0.033 (0.008)		
SF11031	S02F02	2.477 (0.101)	-0.265 (0.018)	0.026 (0.007)		
SF11032	S02F03	1.398 (0.057)	0.636 (0.020)			
SF11033	S02F04	0.920 (0.045)	0.682 (0.031)	0.017 (0.005)		
SF11025	S02F05	2.299 (0.090)	-0.126 (0.017)	0.018 (0.005)		
SF11026	S02F06	2.027 (0.077)	-0.122 (0.018)	0.018 (0.005)		
SF11027	S02F07	2.155 (0.085)	0.119 (0.015)	0.013 (0.004)		
SF11029	S02F09	3.846 (0.179)	-0.081 (0.013)	0.021 (0.005)		
SF11016	S02F10	3.123 (0.135)	-0.094 (0.014)	0.021 (0.005)		
SF12007	S02F11	2.034 (0.081)	0.073 (0.016)	0.018 (0.005)		
SF11017	S03F01	1.281 (0.123)	0.098 (0.053)	0.086 (0.024)		
SF11018	S03F02	2.164 (0.199)	-0.461 (0.049)	0.130 (0.029)		
SF12010	S03F03	1.744 (0.152)	0.014 (0.040)	0.062 (0.019)		
SF11019	S03F04	1.649 (0.117)	-0.000 (0.032)			
SF11009	S03F05	1.868 (0.160)	-0.014 (0.037)	0.067 (0.018)		

( ) Standard errors appear in parentheses



**Exhibit D.2 IRT Parameters for TIMSS Joint 2003–2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SF11010	S03F06	2.703 (0.256)	-0.275 (0.038)	0.114 (0.024)	
SF11011	S03F07	1.467 (0.156)	0.590 (0.046)	0.069 (0.018)	
SF11012	S03F08	2.554 (0.217)	-0.139 (0.032)	0.053 (0.017)	
SF11013	S03F09	1.302 (0.130)	0.571 (0.048)	0.043 (0.015)	
SF11014	S03F10	2.268 (0.202)	0.265 (0.029)	0.054 (0.015)	
SF11015	S03F11	1.989 (0.176)	0.010 (0.035)	0.070 (0.018)	
SF31017	S04F01	1.069 (0.110)	-0.395 (0.091)	0.146 (0.039)	
SF31246	S04F02	1.104 (0.099)	0.948 (0.063)		
SF31287	S04F03	0.985 (0.103)	-0.037 (0.079)	0.121 (0.032)	
SF31251	S04F04	0.917 (0.086)	0.952 (0.074)		
SF31053	S04F05	0.836 (0.049)	0.224 (0.034)		-0.201 (0.069) 0.201 (0.070)
SF31005	S04F06	1.066 (0.110)	1.307 (0.093)		
SF31306	S04F07	1.298 (0.167)	0.805 (0.060)	0.108 (0.021)	
SF31372A	S04F08A	1.664 (0.118)	0.214 (0.032)		
SF31372B	S04F08B	1.258 (0.082)	1.021 (0.039)		-0.189 (0.055) 0.189 (0.073)
SF31082	S04F09	1.039 (0.119)	0.179 (0.077)	0.142 (0.032)	
SF31229	S05F01	0.963 (0.139)	0.547 (0.087)	0.172 (0.033)	
SF31270	S05F02	0.665 (0.080)	1.591 (0.162)		
SF31026	S05F03	0.637 (0.034)	0.095 (0.042)		-0.739 (0.099) 0.739 (0.098)
SF31319	S05F04	1.021 (0.148)	0.913 (0.083)	0.118 (0.024)	
SF31414A	S05F05A	2.472 (0.178)	0.027 (0.026)		
SF31414B	S05F05B	2.058 (0.144)	-0.005 (0.029)		
SF31078	S05F06	1.098 (0.127)	0.197 (0.074)	0.130 (0.032)	
SF31009	S05F07	1.117 (0.084)	0.162 (0.043)		
SF31401	S05F08	1.260 (0.151)	0.534 (0.059)	0.122 (0.025)	
SF31384A	S05F09A	1.489 (0.103)	-0.371 (0.041)		
SF31384B	S05F09B	1.670 (0.117)	0.067 (0.033)		
SF31255	S06F01	1.001 (0.111)	-0.208 (0.095)	0.164 (0.038)	
SF31240D	S06F02D	0.786 (0.053)	-0.057 (0.041)		0.582 (0.071) -0.582 (0.064)
SF31239	S06F03	0.797 (0.098)	-0.209 (0.125)	0.184 (0.044)	
SF31235A	S06F04A	1.313 (0.099)	0.449 (0.040)		
SF31235B	S06F04B	1.522 (0.116)	0.577 (0.038)		
SF31205	S06F05	0.847 (0.101)	0.267 (0.088)	0.127 (0.032)	
SF31399A	S06F06A	1.661 (0.120)	0.354 (0.033)		
SF31399B	S06F06B	1.647 (0.117)	0.194 (0.032)		
SF31393	S06F07	1.289 (0.091)	-0.542 (0.049)		
SF31278	S06F08	0.933 (0.072)	-0.079 (0.051)		
SF31317	S07F01	0.882 (0.098)	-0.398 (0.113)	0.180 (0.042)	
SF31190	S07F02	1.094 (0.087)	0.605 (0.051)		
SF31431	S07F03	0.816 (0.171)	1.598 (0.181)	0.121 (0.024)	
SF31283	S07F04	0.788 (0.088)	-0.476 (0.124)	0.163 (0.043)	
SF31426	S07F05	1.054 (0.115)	-0.111 (0.085)	0.156 (0.035)	
SF31422	S07F06	1.444 (0.156)	-0.551 (0.086)	0.228 (0.042)	
SF31427	S07F07	0.941 (0.109)	0.101 (0.088)	0.146 (0.034)	

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SF31075	S07F08	0.652 (0.092)	0.275 (0.131)	0.158 (0.040)	
SF31047	S07F09	0.879 (0.070)	0.234 (0.053)		
SF31387	S07F10	0.938 (0.162)	1.180 (0.112)	0.129 (0.026)	
SF31396D	S07F11D	0.531 (0.028)	-0.330 (0.051)		-1.026 (0.126) 1.026 (0.119)
SF31340	S08F01	0.848 (0.135)	0.779 (0.104)	0.179 (0.034)	
SF31236	S08F02	0.827 (0.087)	-1.049 (0.138)	0.163 (0.045)	
SF31391D	S08F03D	0.621 (0.043)	0.432 (0.048)		0.023 (0.083) -0.023 (0.092)
SF31361	S08F04	0.703 (0.102)	0.373 (0.125)	0.180 (0.040)	
SF31001	S08F05	1.128 (0.109)	-0.637 (0.090)	0.155 (0.037)	
SF31410	S08F07	0.653 (0.087)	-0.121 (0.149)	0.182 (0.046)	
SF31421	S08F08	0.566 (0.052)	-0.219 (0.079)		
SF31298	S08F09	0.749 (0.162)	1.446 (0.170)	0.180 (0.031)	
SF31076	S08F10	0.832 (0.072)	0.702 (0.067)		
SF31275	S08F11	0.834 (0.167)	1.463 (0.153)	0.141 (0.026)	
SF31254	S11F01	1.039 (0.158)	0.491 (0.092)	0.245 (0.035)	
SF31266	S11F02	1.541 (0.161)	0.420 (0.047)	0.101 (0.020)	
SF31233	S11F03	1.067 (0.081)	0.271 (0.045)		
SF31204	S11F04	0.928 (0.082)	0.795 (0.066)		
SF31273	S11F05	2.176 (0.241)	0.524 (0.038)	0.133 (0.019)	
SF31299	S11F06	1.185 (0.100)	0.860 (0.057)		
SF31281	S11F07	2.420 (0.287)	0.232 (0.042)	0.227 (0.025)	
SF31077	S11F08	1.928 (0.231)	0.416 (0.047)	0.202 (0.024)	
SF31311	S11F09	1.966 (0.220)	0.521 (0.041)	0.132 (0.020)	
SF31088D	S11F10D	0.859 (0.061)	0.899 (0.049)		0.608 (0.056) -0.608 (0.088)
SF31389	S11F11	1.445 (0.195)	1.031 (0.065)	0.088 (0.016)	
SF31356	S12F01	0.863 (0.097)	-1.179 (0.159)	0.209 (0.053)	
SF31291	S12F02	1.293 (0.124)	-0.613 (0.082)	0.154 (0.037)	
SF31230	S12F03	1.006 (0.099)	-0.729 (0.103)	0.154 (0.040)	
SF31325	S12F04	0.817 (0.070)	0.555 (0.063)		
SF31068	S12F05	1.155 (0.154)	0.700 (0.068)	0.128 (0.025)	
SF31418	S12F06	0.948 (0.121)	0.629 (0.077)	0.110 (0.026)	
SF31197D	S12F07D	0.700 (0.038)	-0.191 (0.042)		-0.422 (0.090) 0.422 (0.084)
SF31371	S12F08	1.173 (0.149)	0.704 (0.064)	0.107 (0.023)	
SF31376	S12F09	0.926 (0.161)	1.033 (0.102)	0.154 (0.028)	
SF31044	S12F10	0.833 (0.071)	0.565 (0.062)		
SF31390D	S12F11D	0.907 (0.059)	0.457 (0.036)		0.131 (0.059) -0.131 (0.067)
SF31409	S13F01	1.403 (0.081)	-0.022 (0.038)	0.175 (0.020)	
SF31398	S13F02	0.992 (0.064)	0.065 (0.053)	0.183 (0.023)	
SF31072	S13F03	0.848 (0.029)	0.154 (0.020)		0.487 (0.033) -0.487 (0.032)
SF31061	S13F04	0.799 (0.055)	-0.157 (0.074)	0.191 (0.028)	
SF31439A	S13F05A	1.061 (0.051)	1.205 (0.040)		
SF31439B	S13F05B	0.945 (0.039)	0.385 (0.025)		
SF31440	S13F06	1.139 (0.049)	0.893 (0.029)		
SF31441A	S13F07A	1.396 (0.050)	0.021 (0.019)		

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SF31441B S13F07B	1.118 (0.038)	0.648 (0.017)		0.421 (0.023)	-0.421 (0.030)
SF31442 S13F08	1.027 (0.041)	0.388 (0.023)			
SF31443 S13F09	0.929 (0.045)	1.148 (0.042)			
SF31446A S14F01A	1.075 (0.046)	0.751 (0.027)			
SF31446B S14F01B	0.984 (0.044)	0.895 (0.032)			
SF31446C S14F01C	0.870 (0.036)	0.229 (0.026)			
SF31445A S14F02A	1.489 (0.057)	0.576 (0.018)			
SF31445B S14F02B	1.312 (0.047)	-0.222 (0.022)			
SF31447 S14F03	0.605 (0.026)	1.139 (0.037)		0.430 (0.039)	-0.430 (0.058)
SF31193 S14F04	0.838 (0.061)	0.247 (0.062)	0.180 (0.025)		
SF31264 S14F05	1.099 (0.062)	-0.044 (0.044)	0.127 (0.021)		
SF31347 S14F06	0.981 (0.069)	0.037 (0.061)	0.210 (0.027)		
SF31346 S14F07	1.030 (0.055)	1.443 (0.051)			
SF31081 S14F08	0.776 (0.033)	-0.073 (0.030)			
SZ31446A S01_01A	1.141 (0.073)	0.568 (0.036)			
SZ31446B S01_01B	0.984 (0.066)	0.748 (0.044)			
SZ31446C S01_01C	0.706 (0.048)	-0.064 (0.050)			
SZ31445A S01_02A	1.662 (0.093)	0.341 (0.024)			
SZ31445B S01_02B	1.054 (0.063)	-0.757 (0.053)			
SZ31447 S01_03	0.486 (0.034)	0.962 (0.061)		0.459 (0.074)	-0.459 (0.099)
SZ31193 S01_04	0.503 (0.064)	-0.316 (0.191)	0.194 (0.050)		
SZ31264 S01_05	0.731 (0.067)	-0.646 (0.119)	0.154 (0.039)		
SZ31347 S01_06	0.470 (0.054)	-1.184 (0.234)	0.182 (0.053)		
SZ31346 S01_07	0.718 (0.061)	1.245 (0.086)			
SZ31081 S01_08	0.679 (0.048)	-0.782 (0.075)			
SZ41007 S02_01	0.664 (0.071)	-0.284 (0.133)	0.180 (0.043)		
SZ41164 S02_02	0.984 (0.115)	0.635 (0.069)	0.180 (0.028)		
SZ41018 S02_03	0.637 (0.036)	-0.188 (0.038)		0.504 (0.068)	-0.504 (0.058)
SZ41160 S02_04	0.592 (0.115)	1.523 (0.167)	0.174 (0.034)		
SZ41042 S02_05	0.625 (0.058)	-1.341 (0.165)	0.152 (0.044)		
SZ41079 S02_06	0.942 (0.078)	-0.930 (0.102)	0.159 (0.038)		
SZ41073 S02_07	0.592 (0.044)	-0.172 (0.060)			
SZ41217 S02_08	1.051 (0.107)	0.283 (0.068)	0.175 (0.030)		
SZ41196 S02_09	0.664 (0.070)	-0.411 (0.136)	0.181 (0.044)		
SZ41211 S02_10	0.907 (0.056)	-0.072 (0.041)			
SZ41051 S02_11	0.873 (0.135)	1.023 (0.092)	0.217 (0.030)		
SZ41089 S02_12	1.003 (0.101)	0.029 (0.082)	0.206 (0.035)		
SZ41156A S02_13A	1.173 (0.102)	-0.203 (0.071)	0.173 (0.033)		
SZ41156B S02_13B	1.126 (0.069)	0.145 (0.034)			
SZ31229 S03_01	1.187 (0.134)	0.557 (0.061)	0.212 (0.028)		
SZ31270 S03_02	0.589 (0.059)	1.686 (0.141)			
SZ31026 S03_03	0.534 (0.025)	-0.219 (0.041)		-0.601 (0.088)	0.601 (0.081)
SZ31319 S03_04	1.151 (0.160)	1.064 (0.071)	0.209 (0.023)		
SZ31414A S03_05A	1.351 (0.075)	-0.285 (0.034)			

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
SZ31414B	S03_05B	1.190 (0.068)	-0.327 (0.038)		
SZ31078	S03_06	0.756 (0.082)	-0.026 (0.109)	0.189 (0.039)	
SZ31009	S03_07	0.713 (0.050)	-0.218 (0.054)		
SZ31401	S03_08	1.172 (0.138)	0.542 (0.066)	0.255 (0.029)	
SZ31384A	S03_09A	0.822 (0.056)	-1.292 (0.086)		
SZ31384B	S03_09B	0.924 (0.059)	-0.511 (0.053)		
SZ41165	S04_01	0.603 (0.086)	0.647 (0.125)	0.182 (0.039)	
SZ41023	S04_02	0.999 (0.061)	0.278 (0.036)		
SZ41047	S04_03	0.491 (0.052)	-0.907 (0.181)	0.150 (0.044)	
SZ41001	S04_04	0.365 (0.028)	0.446 (0.061)		0.338 (0.104) -0.338 (0.113)
SZ41029	S04_05	0.755 (0.050)	-0.791 (0.067)		
SZ41054	S04_06	0.597 (0.062)	-1.402 (0.206)	0.192 (0.053)	
SZ41308	S04_07	0.977 (0.115)	0.526 (0.075)	0.207 (0.031)	
SZ41179	S04_08	0.804 (0.056)	0.569 (0.047)		
SZ41087	S04_09	1.193 (0.126)	0.504 (0.058)	0.189 (0.027)	
SZ41205	S04_10	0.866 (0.090)	0.152 (0.086)	0.170 (0.034)	
SZ41216	S04_11	0.726 (0.052)	0.309 (0.048)		
SZ41061	S04_12	0.866 (0.056)	-0.256 (0.047)		
SZ41202	S04_13	0.555 (0.025)	0.617 (0.038)		-1.099 (0.092) 1.099 (0.098)
SZ41215	S04_14	0.948 (0.116)	0.751 (0.074)	0.162 (0.029)	
SZ31255	S05_01	0.755 (0.078)	-0.293 (0.121)	0.194 (0.043)	
SZ31240D	S05_02D	0.634 (0.033)	-0.114 (0.040)		0.909 (0.070) -0.909 (0.059)
SZ31239	S05_03	0.560 (0.069)	-0.518 (0.196)	0.220 (0.053)	
SZ31235A	S05_04A	1.184 (0.071)	0.382 (0.032)		
SZ31235B	S05_04B	1.241 (0.076)	0.573 (0.032)		
SZ31205	S05_05	0.550 (0.068)	0.040 (0.152)	0.182 (0.044)	
SZ31399A	S05_06A	1.210 (0.071)	0.222 (0.031)		
SZ31399B	S05_06B	1.101 (0.066)	-0.059 (0.036)		
SZ31393	S05_07	0.796 (0.057)	-1.275 (0.093)		
SZ31278	S05_08	0.534 (0.044)	-0.674 (0.089)		
SZ41117	S06_01	0.519 (0.053)	-2.498 (0.278)	0.180 (0.055)	
SZ41120	S06_02	0.938 (0.191)	1.271 (0.122)	0.372 (0.029)	
SZ41003	S06_03	0.669 (0.048)	0.196 (0.050)		
SZ41224	S06_04	1.039 (0.054)	0.495 (0.025)		0.374 (0.038) -0.374 (0.044)
SZ41163	S06_05	0.527 (0.088)	1.055 (0.151)	0.181 (0.039)	
SZ41039	S06_06	0.750 (0.050)	-0.030 (0.047)		
SZ41014	S06_07	1.251 (0.217)	1.430 (0.092)	0.217 (0.020)	
SZ41181	S06_08	0.703 (0.048)	-0.323 (0.056)		
SZ41174	S06_09	0.872 (0.060)	0.675 (0.046)		
SZ41049	S06_10	1.073 (0.115)	0.433 (0.067)	0.206 (0.029)	
SZ41208	S06_11	0.362 (0.066)	0.785 (0.255)	0.204 (0.053)	
SZ41060	S06_12	1.016 (0.075)	1.078 (0.057)		
SZ41201A	S06_13A	1.188 (0.071)	0.244 (0.032)		
SZ41201B	S06_13B	1.198 (0.075)	0.392 (0.032)		

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SZ31317	S07_01	0.768 (0.083)	-0.464 (0.140)	0.251 (0.047)	
SZ31190	S07_02	1.069 (0.067)	0.575 (0.037)		
SZ31431	S07_03	0.693 (0.125)	1.555 (0.147)	0.152 (0.027)	
SZ31283	S07_04	0.477 (0.054)	-0.957 (0.214)	0.177 (0.051)	
SZ31426	S07_05	0.756 (0.074)	-0.353 (0.115)	0.174 (0.040)	
SZ31422	S07_06	0.821 (0.078)	-1.255 (0.151)	0.209 (0.049)	
SZ31427	S07_07	0.745 (0.078)	-0.075 (0.109)	0.179 (0.038)	
SZ31075	S07_08	0.351 (0.057)	0.138 (0.274)	0.200 (0.055)	
SZ31047	S07_09	0.681 (0.048)	-0.036 (0.052)		
SZ31387	S07_10	0.866 (0.136)	1.279 (0.101)	0.160 (0.026)	
SZ31396D	S07_11D	0.510 (0.026)	-1.020 (0.066)		-0.462 (0.114) 0.462 (0.087)
SZ41009	S08_01	0.889 (0.086)	-0.566 (0.117)	0.227 (0.043)	
SZ41223	S08_02	0.927 (0.108)	0.183 (0.095)	0.261 (0.037)	
SZ41026	S08_03	0.587 (0.079)	0.544 (0.125)	0.174 (0.038)	
SZ41177	S08_04	0.451 (0.033)	1.024 (0.067)		0.377 (0.079) -0.377 (0.105)
SZ41183	S08_05	0.692 (0.032)	0.193 (0.038)		1.032 (0.059) -1.032 (0.059)
SZ41008	S08_06	1.048 (0.119)	0.590 (0.066)	0.192 (0.028)	
SZ41195	S08_08	0.748 (0.061)	1.133 (0.075)		
SZ41134A	S08_09A	0.888 (0.057)	0.324 (0.040)		
SZ41134B	S08_09B	0.750 (0.050)	-0.027 (0.047)		
SZ41134C	S08_09C	0.835 (0.090)	0.424 (0.078)	0.145 (0.030)	
SZ41191	S08_10	0.690 (0.010)	0.674 (0.113)	0.217 (0.038)	
SZ41107	S08_11	0.462 (0.021)	-0.576 (0.053)		-1.042 (0.114) 1.042 (0.100)
SZ41113	S08_12	0.886 (0.058)	0.274 (0.040)		
SZ31340	S09_01	0.851 (0.117)	0.789 (0.088)	0.222 (0.031)	
SZ31236	S09_02	0.624 (0.059)	-1.249 (0.164)	0.154 (0.043)	
SZ31391D	S09_03D	0.634 (0.036)	0.329 (0.034)		0.092 (0.063) -0.092 (0.065)
SZ31361	S09_04	0.729 (0.094)	0.432 (0.108)	0.213 (0.038)	
SZ31001	S09_05	1.008 (0.082)	-0.829 (0.093)	0.153 (0.036)	
SZ31410	S09_07	0.544 (0.067)	-0.142 (0.161)	0.180 (0.046)	
SZ31421	S09_08	0.468 (0.039)	-0.598 (0.089)		
SZ31298	S09_09	1.162 (0.210)	1.408 (0.099)	0.240 (0.022)	
SZ31076	S09_10	0.934 (0.061)	0.393 (0.039)		
SZ31275	S09_11	0.815 (0.136)	1.441 (0.121)	0.160 (0.025)	
SZ41311	S10_01	0.687 (0.066)	-2.334 (0.226)	0.184 (0.055)	
SZ41178	S10_02	0.949 (0.110)	0.479 (0.076)	0.196 (0.031)	
SZ41182	S10_03	0.632 (0.048)	0.324 (0.055)		
SZ41180	S10_04	1.467 (0.137)	0.225 (0.051)	0.212 (0.026)	
SZ41187	S10_05	0.927 (0.176)	1.547 (0.131)	0.185 (0.024)	
SZ41013A	S10_06A	0.534 (0.045)	0.577 (0.069)		
SZ41013B	S10_06B	0.466 (0.049)	1.565 (0.150)		
SZ41067	S10_07	0.830 (0.052)	-0.407 (0.051)		
SZ41305	S10_08	1.141 (0.124)	0.570 (0.060)	0.187 (0.027)	
SZ41048	S10_09	0.848 (0.055)	0.274 (0.041)		

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SZ41110	S10_10	0.739 (0.049)	-0.350 (0.055)		
SZ41069	S10_11	1.000 (0.119)	0.247 (0.090)	0.279 (0.036)	
SZ41100	S10_12	1.134 (0.109)	0.364 (0.058)	0.161 (0.026)	
SZ41092	S10_13	0.793 (0.092)	0.123 (0.109)	0.218 (0.040)	
SZ31254	S11_01	0.530 (0.077)	0.175 (0.180)	0.225 (0.050)	
SZ31266	S11_02	1.085 (0.100)	0.115 (0.065)	0.165 (0.029)	
SZ31233	S11_03	0.674 (0.046)	-0.335 (0.058)		
SZ31204	S11_04	0.646 (0.049)	0.497 (0.055)		
SZ31273	S11_05	1.345 (0.128)	0.200 (0.056)	0.207 (0.028)	
SZ31299	S11_06	0.672 (0.050)	0.487 (0.053)		
SZ31281	S11_07	0.880 (0.076)	-1.212 (0.124)	0.160 (0.041)	
SZ31077	S11_08	0.669 (0.070)	-0.667 (0.153)	0.194 (0.047)	
SZ31311	S11_09	1.012 (0.097)	0.043 (0.076)	0.176 (0.033)	
SZ31088D	S11_10D	0.616 (0.027)	0.196 (0.044)		1.319 (0.068) -1.319 (0.069)
SZ31389	S11_11	0.888 (0.117)	0.820 (0.081)	0.184 (0.030)	
SZ41027	S12_01	0.754 (0.052)	-1.811 (0.111)		
SZ41043	S12_02	0.577 (0.042)	-0.458 (0.068)		
SZ41050	S12_03	0.492 (0.069)	0.609 (0.148)	0.163 (0.039)	
SZ41070	S12_04	0.818 (0.084)	0.213 (0.084)	0.145 (0.032)	
SZ41006	S12_05	0.519 (0.033)	0.505 (0.043)		0.213 (0.072) -0.213 (0.080)
SZ41052	S12_06	0.732 (0.076)	-0.661 (0.147)	0.222 (0.047)	
SZ41301	S12_07	0.734 (0.054)	0.723 (0.055)		
SZ41080	S12_08	0.669 (0.110)	1.359 (0.127)	0.147 (0.029)	
SZ41033	S12_09	0.925 (0.066)	0.949 (0.054)		
SZ41077	S12_11	0.792 (0.053)	0.253 (0.043)		
SZ41209	S12_12	0.747 (0.103)	0.772 (0.098)	0.190 (0.034)	
SZ41081	S12_13	0.582 (0.030)	0.532 (0.037)		-0.363 (0.072) 0.363 (0.078)
SZ41102	S12_14	0.861 (0.094)	-0.041 (0.106)	0.236 (0.040)	
SZ31356	S13_01	0.792 (0.078)	-1.675 (0.186)	0.210 (0.054)	
SZ31291	S13_02	1.132 (0.089)	-1.012 (0.089)	0.150 (0.036)	
SZ31230	S13_03	0.665 (0.061)	-1.492 (0.171)	0.162 (0.046)	
SZ31325	S13_04	0.691 (0.049)	0.367 (0.049)		
SZ31068	S13_05	0.994 (0.105)	0.422 (0.069)	0.170 (0.029)	
SZ31418	S13_06	0.859 (0.094)	0.625 (0.072)	0.134 (0.027)	
SZ31197D	S13_07D	0.548 (0.027)	-0.714 (0.053)		-0.411 (0.097) 0.411 (0.077)
SZ31371	S13_08	0.951 (0.113)	0.566 (0.076)	0.198 (0.031)	
SZ31376	S13_09	0.952 (0.137)	1.027 (0.081)	0.204 (0.027)	
SZ31044	S13_10	0.738 (0.051)	0.176 (0.046)		
SZ31390D	S13_11D	0.857 (0.046)	0.230 (0.028)		0.326 (0.049) -0.326 (0.048)
SZ41010	S14_01	1.137 (0.089)	-0.694 (0.081)	0.157 (0.035)	
SZ41034	S14_02	0.529 (0.058)	-0.636 (0.174)	0.166 (0.046)	
SZ41017	S14_03	0.699 (0.112)	0.990 (0.113)	0.213 (0.035)	
SZ41124	S14_04	0.876 (0.135)	1.060 (0.093)	0.232 (0.029)	
SZ41186	S14_05	0.623 (0.053)	1.193 (0.089)		

( ) Standard errors appear in parentheses

**Exhibit D.2 IRT Parameters for TIMSS Joint 2003-2007 Fourth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SZ41037 S14_06	0.516 (0.028)	0.083 (0.040)		-0.224 (0.081)	0.224 (0.078)
SZ41119 S14_07	0.547 (0.071)	-0.580 (0.222)	0.251 (0.057)		
SZ41105 S14_08	0.923 (0.082)	-0.073 (0.077)	0.145 (0.031)		
SZ41193 S14_09	0.475 (0.049)	-0.815 (0.171)	0.137 (0.041)		
SZ41149D S14_10D	0.535 (0.024)	0.867 (0.044)		-1.158 (0.094)	1.158 (0.104)
SZ41032 S14_11	0.956 (0.063)	-1.331 (0.080)			
SZ41068 S14_12	0.665 (0.049)	0.342 (0.051)			
SZ41303 S14_13	0.506 (0.077)	0.709 (0.154)	0.171 (0.043)		

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M012001	M01_01	1.721 (0.067)	0.247 (0.020)	0.149 (0.010)	
M012002	M01_02	0.738 (0.035)	-0.355 (0.070)	0.155 (0.028)	
M012003	M01_03	1.075 (0.038)	0.092 (0.026)	0.065 (0.012)	
M012004	M01_04	1.216 (0.066)	0.771 (0.032)	0.262 (0.012)	
M012005	M01_05	0.760 (0.045)	0.246 (0.066)	0.205 (0.025)	
M012006	M01_06	0.768 (0.044)	-0.326 (0.086)	0.232 (0.033)	
M012037	M01_07	0.546 (0.032)	0.305 (0.083)	0.110 (0.027)	
M012038	M01_08	0.987 (0.051)	-0.196 (0.058)	0.291 (0.024)	
M012039	M01_09	1.141 (0.054)	0.368 (0.034)	0.198 (0.015)	
M012040	M01_10	1.071 (0.049)	-0.231 (0.046)	0.217 (0.021)	
M012041	M01_11	1.234 (0.048)	0.103 (0.027)	0.115 (0.013)	
M012042	M01_12	1.380 (0.061)	0.378 (0.027)	0.173 (0.013)	
M032570	M01_13	1.307 (0.068)	0.398 (0.034)	0.302 (0.014)	
M032643	M01_14	1.247 (0.064)	0.777 (0.029)	0.190 (0.011)	
M032693	M01_15	0.713 (0.021)	0.672 (0.026)		
M012013	M02_01	1.249 (0.086)	0.296 (0.045)	0.185 (0.020)	
M012014	M02_02	0.938 (0.068)	-0.545 (0.092)	0.235 (0.039)	
M012015	M02_03	0.954 (0.059)	-0.251 (0.061)	0.123 (0.027)	
M012016	M02_04	1.280 (0.140)	0.954 (0.059)	0.372 (0.017)	
M012017	M02_05	0.803 (0.053)	0.203 (0.061)	0.097 (0.023)	
M022251	M02_06	1.052 (0.109)	1.302 (0.058)	0.166 (0.016)	
M022185	M02_07	0.847 (0.079)	0.295 (0.090)	0.249 (0.033)	
M022188	M02_08	0.812 (0.088)	0.973 (0.077)	0.238 (0.024)	
M022189	M02_09	0.913 (0.055)	-0.564 (0.071)	0.141 (0.032)	
M022191	M02_10	0.824 (0.066)	-0.033 (0.090)	0.208 (0.034)	
M022194	M02_11	0.863 (0.064)	0.285 (0.064)	0.140 (0.025)	
M022196	M02_12	1.302 (0.081)	-0.115 (0.045)	0.144 (0.023)	
M022198	M02_13	1.126 (0.100)	0.789 (0.053)	0.235 (0.019)	
M022199	M02_14	1.318 (0.109)	0.721 (0.045)	0.214 (0.018)	
M022202	M02_15	0.734 (0.036)	0.865 (0.046)		
M012025	M03_01	0.892 (0.058)	-0.342 (0.072)	0.137 (0.031)	
M012026	M03_02	1.098 (0.084)	0.476 (0.051)	0.192 (0.020)	
M012027	M03_03	1.227 (0.090)	0.256 (0.049)	0.213 (0.022)	
M012028	M03_04	1.182 (0.073)	-0.213 (0.051)	0.156 (0.025)	
M012029	M03_05	1.057 (0.072)	0.199 (0.051)	0.145 (0.022)	
M012030	M03_06	1.363 (0.094)	0.654 (0.036)	0.139 (0.014)	
M022135	M03_07	0.664 (0.048)	0.911 (0.065)	0.068 (0.016)	
M022139	M03_08	1.259 (0.103)	1.021 (0.043)	0.153 (0.013)	
M022142	M03_09	1.405 (0.103)	0.556 (0.039)	0.190 (0.016)	
M022144	M03_10	0.576 (0.072)	0.801 (0.126)	0.212 (0.038)	
M022146	M03_11	1.516 (0.091)	0.112 (0.034)	0.147 (0.017)	
M022148	M03_12	0.989 (0.040)	0.037 (0.028)		
M022253	M03_13	1.252 (0.050)	0.076 (0.024)		
M022154	M03_14	0.934 (0.072)	0.330 (0.062)	0.165 (0.025)	

( ) Standard errors appear in parentheses



**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
M022156	M03_15	1.258 (0.049)	0.261 (0.024)		
M022002	M04_01	1.700 (0.119)	1.222 (0.036)	0.128 (0.009)	
M022004	M04_02	1.421 (0.117)	0.583 (0.044)	0.276 (0.018)	
M022005	M04_03	1.065 (0.121)	1.211 (0.063)	0.260 (0.017)	
M022008	M04_04	0.624 (0.033)	0.795 (0.051)		
M022010	M04_05	0.811 (0.053)	-0.321 (0.078)	0.141 (0.032)	
M022012	M04_06	0.604 (0.030)	-0.416 (0.044)		
M022021	M04_07	1.755 (0.123)	0.611 (0.030)	0.167 (0.013)	
M022016	M04_08	0.872 (0.098)	1.158 (0.069)	0.195 (0.021)	
M022252	M04_09	1.104 (0.087)	0.056 (0.066)	0.272 (0.028)	
M022261A	M04_10A	1.219 (0.048)	0.355 (0.025)		
M022261B	M04_10B	1.285 (0.055)	0.852 (0.029)		
M022261C	M04_10C	0.749 (0.024)	1.142 (0.030)	-1.910 (0.107)	1.910 (0.113)
M022227A	M04_11A	1.058 (0.043)	-0.216 (0.027)		
M022227B	M04_11B	1.505 (0.061)	0.547 (0.023)		
M022227C	M04_11C	1.353 (0.059)	0.899 (0.029)		
M022127	M04_12	1.592 (0.121)	1.327 (0.043)	0.170 (0.001)	
M022043	M05_01	0.635 (0.024)	-0.480 (0.058)	0.075 (0.022)	
M022046	M05_02	0.844 (0.023)	-0.449 (0.021)		
M022049	M05_03	0.556 (0.040)	0.123 (0.116)	0.243 (0.034)	
M022050	M05_04	0.918 (0.046)	0.948 (0.031)	0.111 (0.011)	
M022055	M05_05	1.231 (0.028)	0.508 (0.015)		
M022057	M05_06	0.453 (0.025)	-0.352 (0.119)	0.153 (0.034)	
M022257	M05_07	1.519 (0.069)	0.551 (0.024)	0.252 (0.001)	
M022062	M05_08	0.925 (0.039)	0.625 (0.029)	0.095 (0.011)	
M022066	M05_09	1.347 (0.044)	0.097 (0.021)	0.081 (0.010)	
M022232	M05_10	0.529 (0.011)	1.592 (0.029)	-2.177 (0.069)	2.177 (0.078)
M022234A	M05_11A	0.804 (0.014)	0.769 (0.014)	-0.633 (0.029)	0.633 (0.032)
M022234B	M05_11B	0.897 (0.017)	1.082 (0.015)	-1.479 (0.051)	1.479 (0.053)
M022243	M05_12	1.157 (0.027)	0.510 (0.016)		
M022097	M06_01	1.007 (0.028)	-0.193 (0.026)	0.084 (0.012)	
M022101	M06_02	0.769 (0.025)	-0.497 (0.046)	0.106 (0.020)	
M022104	M06_03	0.887 (0.025)	-0.493 (0.032)	0.074 (0.015)	
M022105	M06_04	0.605 (0.027)	0.695 (0.044)	0.082 (0.015)	
M022106	M06_05	0.935 (0.019)	0.753 (0.017)		
M022108	M06_06	0.875 (0.036)	0.199 (0.040)	0.206 (0.016)	
M022110	M06_07	0.433 (0.027)	0.328 (0.057)		
M022181	M06_08	1.080 (0.037)	-0.683 (0.043)	0.222 (0.021)	
M032307	M06_09	1.394 (0.028)	0.951 (0.014)		
M032523	M06_10	1.789 (0.058)	1.132 (0.016)	0.165 (0.005)	
M032701	M06_11	0.986 (0.064)	-0.931 (0.088)	0.190 (0.043)	
M032704	M06_12	1.101 (0.075)	-0.005 (0.058)	0.181 (0.027)	
M032525	M06_13	1.009 (0.074)	0.314 (0.060)	0.173 (0.025)	
M032579	M06_14	1.113 (0.036)	-0.145 (0.029)	0.170 (0.014)	

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M032691	M06_15	0.850 (0.017)	0.417 (0.016)			
M032142	M07_01	1.479 (0.230)	1.049 (0.075)	0.385 (0.021)		
M032198	M07_02	0.734 (0.092)	0.637 (0.112)	0.182 (0.037)		
M032640	M07_03	0.613 (0.032)	1.557 (0.068)		-0.797 (0.095)	0.797 (0.125)
M032344	M07_04	1.157 (0.066)	0.551 (0.038)			
M032754	M07_05	0.855 (0.052)	-0.429 (0.048)			
M032755	M07_06	1.099 (0.054)	1.224 (0.036)		-0.287 (0.057)	0.287 (0.072)
M032753A	M07_07A	1.118 (0.048)	0.737 (0.027)		-0.286 (0.050)	0.286 (0.057)
M032753B	M07_07B	1.206 (0.058)	0.911 (0.029)		-0.029 (0.043)	0.029 (0.054)
M032753C	M07_07C	1.049 (0.061)	0.463 (0.040)			
M032756	M07_08	0.776 (0.049)	0.360 (0.049)			
M032205	M07_09	0.585 (0.067)	0.032 (0.158)	0.192 (0.048)		
M032163	M07_10	1.389 (0.152)	0.637 (0.060)	0.231 (0.024)		
M032381	M08_01	1.042 (0.059)	0.263 (0.038)			
M032416	M08_02	1.328 (0.138)	0.894 (0.053)	0.126 (0.019)		
M032160	M08_03	1.909 (0.158)	1.226 (0.046)	0.142 (0.012)		
M032273	M08_04	1.021 (0.098)	-0.228 (0.095)	0.221 (0.040)		
M032540	M08_05	0.761 (0.090)	0.048 (0.138)	0.240 (0.048)		
M032698	M08_06	1.010 (0.108)	0.526 (0.065)	0.140 (0.026)		
M032097	M08_07	1.391 (0.170)	1.298 (0.065)	0.190 (0.016)		
M032575	M08_08	2.090 (0.206)	0.513 (0.040)	0.216 (0.019)		
M032414	M08_09	1.078 (0.064)	0.597 (0.041)			
M032294	M08_10	0.848 (0.082)	-0.149 (0.107)	0.188 (0.041)		
M032688	M08_11	0.858 (0.054)	0.744 (0.052)			
M032529	M08_12	1.644 (0.169)	0.907 (0.045)	0.148 (0.016)		
M032637A	M08_13A	1.038 (0.059)	-0.291 (0.040)			
M032637B	M08_13B	1.354 (0.073)	-0.074 (0.032)			
M032637C	M08_13C	1.325 (0.073)	0.355 (0.033)			
M032079	M09_01	1.191 (0.074)	1.198 (0.033)	0.199 (0.009)		
M032652	M09_02	1.278 (0.035)	1.010 (0.020)			
M032228	M09_03	1.304 (0.060)	0.406 (0.028)	0.195 (0.012)		
M032044	M09_04	1.177 (0.061)	0.650 (0.032)	0.216 (0.012)		
M032046	M09_05	1.378 (0.074)	1.194 (0.026)	0.121 (0.007)		
M032545	M09_06	1.200 (0.032)	0.879 (0.019)			
M032649A	M09_07A	1.045 (0.028)	0.612 (0.019)			
M032649B	M09_07B	1.226 (0.036)	1.221 (0.024)			
M032533	M09_08	1.474 (0.067)	0.503 (0.025)	0.208 (0.011)		
M032678	M09_09	1.634 (0.056)	0.459 (0.016)	0.062 (0.007)		
M032403	M09_10	0.898 (0.024)	-0.028 (0.019)			
M032261	M09_11	0.947 (0.049)	0.633 (0.037)	0.150 (0.014)		
M032489	M09_12	0.873 (0.041)	-0.449 (0.062)	0.176 (0.027)		
M032588	M09_13	0.902 (0.047)	0.169 (0.051)	0.212 (0.020)		
M032271	M09_14	1.371 (0.072)	0.702 (0.028)	0.241 (0.011)		
M032671	M10_01	1.019 (0.026)	-0.319 (0.018)			

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M032612	M10_02	1.115 (0.063)	1.034 (0.032)	0.173 (0.011)	
M032557	M10_03	1.185 (0.033)	0.979 (0.020)		
M032208	M10_04	1.352 (0.065)	0.429 (0.030)	0.235 (0.013)	
M032210	M10_05	1.714 (0.083)	0.800 (0.022)	0.197 (0.009)	
M032699	M10_06	0.652 (0.034)	-0.755 (0.105)	0.184 (0.040)	
M032762	M10_07	0.411 (0.008)	1.204 (0.029)		-2.657 (0.081) 2.657 (0.087)
M032763	M10_08	0.837 (0.021)	1.732 (0.027)		-0.761 (0.043) 0.761 (0.055)
M032764	M10_09	0.853 (0.021)	1.634 (0.026)		-0.427 (0.035) 0.427 (0.047)
M032647	M10_10	0.872 (0.084)	1.449 (0.058)	0.326 (0.015)	
M032689	M10_11	0.795 (0.072)	1.310 (0.060)	0.306 (0.016)	
M032094	M11_01	1.442 (0.080)	0.288 (0.034)	0.302 (0.015)	
M032662	M11_02	1.657 (0.076)	1.398 (0.027)	0.096 (0.006)	
M032064	M11_03	1.302 (0.038)	0.674 (0.018)		
M032419	M11_04	1.324 (0.083)	0.855 (0.033)	0.252 (0.012)	
M032477	M11_05	1.500 (0.075)	0.524 (0.027)	0.191 (0.012)	
M032538	M11_06	1.231 (0.036)	0.289 (0.017)		
M032324	M11_07	1.372 (0.072)	0.800 (0.027)	0.162 (0.010)	
M032116	M11_08	0.973 (0.062)	0.720 (0.044)	0.225 (0.016)	
M032100	M11_09	0.982 (0.046)	0.264 (0.036)	0.106 (0.015)	
M032402	M11_10	0.706 (0.059)	0.796 (0.075)	0.233 (0.025)	
M032734	M11_11	0.861 (0.026)	-0.259 (0.023)		
M032397	M11_12	1.127 (0.070)	0.845 (0.037)	0.212 (0.013)	
M032695	M11_13	0.554 (0.011)	-0.202 (0.020)		-1.064 (0.050) 1.064 (0.048)
M032132	M11_14	0.700 (0.036)	0.353 (0.052)	0.090 (0.019)	
M032352	M12_01	1.449 (0.098)	0.633 (0.038)	0.393 (0.013)	
M032725	M12_02	1.072 (0.033)	0.914 (0.024)		
M032683	M12_03	0.492 (0.011)	0.868 (0.025)		-1.599 (0.061) 1.599 (0.067)
M032738	M12_04	1.329 (0.068)	-0.102 (0.040)	0.263 (0.020)	
M032295	M12_05	1.507 (0.082)	-0.268 (0.041)	0.336 (0.021)	
M032331	M12_06	2.035 (0.084)	1.298 (0.025)	0.191 (0.007)	
M032623	M12_07	1.860 (0.087)	0.643 (0.020)	0.136 (0.008)	
M032679	M12_08	1.130 (0.062)	0.397 (0.039)	0.230 (0.016)	
M032047	M12_09	1.905 (0.110)	1.169 (0.033)	0.438 (0.009)	
M032398	M12_10	1.783 (0.105)	0.964 (0.028)	0.302 (0.001)	
M032507	M12_11	1.788 (0.087)	1.123 (0.025)	0.180 (0.007)	
M032424	M12_12	1.172 (0.058)	0.425 (0.032)	0.153 (0.014)	
M032681A	M12_13A	0.567 (0.021)	-0.530 (0.036)		
M032681B	M12_13B	0.532 (0.022)	0.983 (0.045)		
M032681C	M12_13C	1.026 (0.030)	0.536 (0.021)		
M032609	M13_01	0.924 (0.077)	-0.288 (0.084)	0.145 (0.035)	
M032690	M13_02	1.024 (0.142)	0.999 (0.082)	0.217 (0.026)	
M032727	M13_03	1.461 (0.137)	0.458 (0.050)	0.172 (0.021)	
M032743	M13_04	0.616 (0.044)	-0.081 (0.058)		
M032744	M13_05	0.910 (0.057)	0.619 (0.048)		

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M032745	M13_06	0.505 (0.033)	2.289 (0.134)		-1.434 (0.154)	1.434 (0.213)
M032233	M13_07	1.060 (0.049)	1.083 (0.034)		-0.470 (0.062)	0.470 (0.074)
M032670	M13_08	0.919 (0.075)	-0.989 (0.104)	0.165 (0.044)		
M032447	M13_09	1.460 (0.141)	0.542 (0.050)	0.168 (0.022)		
M032036	M13_10	1.219 (0.133)	0.446 (0.069)	0.234 (0.029)		
M032728	M13_11	1.420 (0.177)	0.842 (0.062)	0.255 (0.023)		
M032732	M13_12	0.898 (0.111)	0.328 (0.107)	0.269 (0.038)		
M032166	M14_01	1.015 (0.102)	0.111 (0.084)	0.203 (0.035)		
M032721	M14_02	0.716 (0.134)	1.404 (0.141)	0.251 (0.032)		
M032757	M14_03	0.481 (0.019)	-0.187 (0.041)		-2.275 (0.147)	2.275 (0.145)
M032760A	M14_04A	0.813 (0.032)	0.671 (0.031)		-1.390 (0.102)	1.390 (0.107)
M032760B	M14_04B	1.452 (0.091)	1.000 (0.041)			
M032760C	M14_04C	1.601 (0.110)	1.233 (0.045)			
M032761	M14_05	1.047 (0.052)	1.253 (0.039)		-0.406 (0.063)	0.406 (0.080)
M032692	M14_06	0.690 (0.030)	0.984 (0.042)		-0.995 (0.089)	0.995 (0.102)
M032626	M14_07	0.877 (0.096)	0.454 (0.087)	0.171 (0.032)		
M032595	M14_08	1.421 (0.129)	0.323 (0.051)	0.153 (0.023)		
M032673	M14_09	1.527 (0.156)	0.559 (0.051)	0.197 (0.022)		
MF12001	M01F01	1.715 (0.074)	0.205 (0.022)	0.136 (0.012)		
MF12002	M01F02	0.798 (0.035)	-0.313 (0.053)	0.103 (0.022)		
MF12003	M01F03	1.105 (0.043)	0.153 (0.027)	0.066 (0.012)		
MF12004	M01F04	1.133 (0.068)	0.769 (0.036)	0.218 (0.013)		
MF12005	M01F05	0.877 (0.051)	0.331 (0.052)	0.172 (0.021)		
MF12006	M01F06	0.874 (0.044)	-0.223 (0.057)	0.137 (0.025)		
MF12037	M01F07	0.617 (0.035)	0.424 (0.062)	0.086 (0.021)		
MF12038	M01F08	1.091 (0.050)	-0.213 (0.042)	0.148 (0.020)		
MF12039	M01F09	1.159 (0.057)	0.350 (0.033)	0.148 (0.015)		
MF12040	M01F10	1.220 (0.055)	-0.128 (0.036)	0.163 (0.018)		
MF12041	M01F11	1.349 (0.051)	0.140 (0.023)	0.066 (0.010)		
MF12042	M01F12	1.371 (0.058)	0.402 (0.024)	0.078 (0.010)		
MF32570	M01F13	1.212 (0.058)	0.247 (0.033)	0.167 (0.015)		
MF32643	M01F14	1.174 (0.065)	0.770 (0.032)	0.152 (0.012)		
MF32693	M01F15	0.810 (0.025)	0.538 (0.025)			
MF12013	M02F01	1.209 (0.057)	0.353 (0.031)	0.141 (0.014)		
MF12014	M02F02	1.065 (0.051)	-0.303 (0.048)	0.188 (0.023)		
MF12015	M02F03	1.092 (0.043)	0.033 (0.029)	0.068 (0.013)		
MF12016	M02F04	1.213 (0.088)	0.898 (0.042)	0.321 (0.014)		
MF12017	M02F05	1.030 (0.049)	0.449 (0.033)	0.101 (0.013)		
MF22251	M02F06	1.089 (0.082)	1.431 (0.042)	0.157 (0.010)		
MF22185	M02F07	0.892 (0.049)	0.294 (0.049)	0.153 (0.020)		
MF22188	M02F08	0.903 (0.062)	0.983 (0.045)	0.192 (0.015)		
MF22189	M02F09	1.105 (0.048)	-0.051 (0.035)	0.121 (0.016)		
MF22191	M02F10	0.945 (0.044)	0.171 (0.039)	0.104 (0.016)		
MF22194	M02F11	0.965 (0.050)	0.527 (0.037)	0.122 (0.015)		

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF22196	M02F12	1.605 (0.066)	0.219 (0.021)	0.098 (0.011)	
MF22198	M02F13	1.203 (0.067)	0.871 (0.031)	0.152 (0.011)	
MF22199	M02F14	1.459 (0.079)	0.829 (0.026)	0.147 (0.010)	
MF22202	M02F15	0.877 (0.029)	0.989 (0.029)		
MF12025	M03F01	0.960 (0.078)	-0.118 (0.075)	0.118 (0.031)	
MF12026	M03F02	1.088 (0.110)	0.633 (0.065)	0.147 (0.025)	
MF12027	M03F03	1.180 (0.106)	0.315 (0.061)	0.141 (0.027)	
MF12028	M03F04	1.269 (0.105)	0.113 (0.056)	0.131 (0.026)	
MF12029	M03F05	1.331 (0.110)	0.378 (0.049)	0.104 (0.021)	
MF12030	M03F06	1.584 (0.152)	0.801 (0.044)	0.132 (0.017)	
MF22135	M03F07	0.951 (0.089)	1.002 (0.064)	0.073 (0.017)	
MF22139	M03F08	1.434 (0.164)	1.117 (0.054)	0.148 (0.017)	
MF22142	M03F09	1.358 (0.125)	0.669 (0.049)	0.122 (0.019)	
MF22144	M03F10	0.740 (0.091)	0.859 (0.098)	0.141 (0.032)	
MF22146	M03F11	1.278 (0.099)	0.497 (0.045)	0.076 (0.017)	
MF22148	M03F12	1.213 (0.068)	0.431 (0.035)		
MF22253	M03F13	1.426 (0.079)	0.422 (0.031)		
MF22154	M03F14	1.220 (0.115)	0.618 (0.056)	0.136 (0.022)	
MF22156	M03F15	1.644 (0.091)	0.551 (0.029)		
MF22002	M04F01	1.634 (0.148)	1.359 (0.053)	0.111 (0.012)	
MF22004	M04F02	1.104 (0.131)	0.707 (0.075)	0.235 (0.029)	
MF22005	M04F03	0.930 (0.145)	1.271 (0.096)	0.241 (0.027)	
MF22008	M04F04	0.770 (0.054)	1.115 (0.068)		
MF22010	M04F05	0.953 (0.085)	0.216 (0.074)	0.139 (0.030)	
MF22012	M04F06	0.796 (0.050)	-0.003 (0.046)		
MF22021	M04F07	1.598 (0.158)	0.775 (0.045)	0.157 (0.019)	
MF22016	M04F08	0.808 (0.111)	1.250 (0.093)	0.132 (0.026)	
MF22252	M04F09	1.120 (0.109)	0.330 (0.070)	0.189 (0.030)	
MF22261A	M04F10A	1.519 (0.086)	0.711 (0.032)		
MF22261B	M04F10B	1.847 (0.117)	1.076 (0.034)		
MF22261C	M04F10C	1.094 (0.053)	1.310 (0.035)	-0.914 (0.088)	0.914 (0.098)
MF22227A	M04F11A	1.326 (0.073)	0.329 (0.032)		
MF22227B	M04F11B	1.832 (0.107)	0.808 (0.029)		
MF22227C	M04F11C	1.739 (0.109)	1.054 (0.035)		
MF22127	M04F12	1.626 (0.148)	1.449 (0.057)	0.117 (0.012)	
MF22043	M05F01	0.754 (0.062)	-0.339 (0.096)	0.115 (0.035)	
MF22046	M05F02	0.815 (0.049)	-0.384 (0.049)		
MF22049	M05F03	0.637 (0.073)	0.044 (0.149)	0.200 (0.047)	
MF22050	M05F04	0.921 (0.104)	0.976 (0.072)	0.111 (0.022)	
MF22055	M05F05	1.231 (0.070)	0.575 (0.036)		
MF22057	M05F06	0.583 (0.060)	-0.190 (0.148)	0.152 (0.046)	
MF22257	M05F07	1.536 (0.167)	0.644 (0.054)	0.239 (0.022)	
MF22062	M05F08	1.128 (0.109)	0.757 (0.057)	0.114 (0.020)	
MF22066	M05F09	1.452 (0.121)	0.317 (0.047)	0.120 (0.021)	

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF22232	M05F10	0.585 (0.030)	1.652 (0.068)		-2.112 (0.171)	2.112 (0.190)
MF22234A	M05F11A	0.932 (0.040)	0.865 (0.032)		-0.467 (0.061)	0.467 (0.070)
MF22234B	M05F11B	1.053 (0.049)	1.134 (0.032)		-1.130 (0.101)	1.130 (0.107)
MF22243	M05F12	1.243 (0.071)	0.570 (0.036)			
MF22097	M06F01	1.243 (0.103)	-0.174 (0.064)	0.158 (0.031)		
MF22101	M06F02	0.887 (0.076)	-0.368 (0.094)	0.159 (0.038)		
MF22104	M06F03	0.911 (0.075)	-0.339 (0.086)	0.145 (0.036)		
MF22105	M06F04	0.718 (0.081)	0.808 (0.093)	0.113 (0.029)		
MF22106	M06F05	0.967 (0.059)	0.756 (0.048)			
MF22108	M06F06	0.836 (0.084)	0.130 (0.097)	0.157 (0.037)		
MF22110	M06F07	0.475 (0.039)	0.320 (0.074)			
MF22181	M06F08	1.323 (0.108)	-0.433 (0.066)	0.168 (0.034)		
MF32307	M06F09	1.403 (0.086)	0.987 (0.041)			
MF32523	M06F10	1.634 (0.171)	1.163 (0.052)	0.163 (0.015)		
MF32701	M06F11	1.165 (0.094)	-0.544 (0.076)	0.160 (0.036)		
MF32704	M06F12	1.137 (0.104)	0.182 (0.067)	0.161 (0.029)		
MF32525	M06F13	0.980 (0.090)	0.362 (0.070)	0.130 (0.028)		
MF32579	M06F14	1.114 (0.099)	0.136 (0.067)	0.155 (0.029)		
MF32691	M06F15	0.993 (0.058)	0.511 (0.042)			
MF32142	M07F01	1.971 (0.221)	1.028 (0.056)	0.370 (0.017)		
MF32198	M07F02	1.000 (0.108)	0.571 (0.076)	0.166 (0.029)		
MF32640	M07F03	0.655 (0.033)	1.374 (0.058)		-0.651 (0.085)	0.651 (0.110)
MF32344	M07F04	1.336 (0.076)	0.611 (0.035)			
MF32754	M07F05	0.818 (0.049)	-0.170 (0.046)			
MF32755	M07F06	1.036 (0.054)	1.397 (0.044)		-0.295 (0.062)	0.295 (0.083)
MF32753A	M07F07A	0.796 (0.037)	1.147 (0.043)		-0.560 (0.073)	0.560 (0.089)
MF32753B	M07F07B	0.870 (0.044)	1.304 (0.046)		-0.302 (0.064)	0.302 (0.086)
MF32753C	M07F07C	0.763 (0.052)	1.003 (0.067)			
MF32756	M07F08	0.608 (0.045)	0.914 (0.077)			
MF32205	M07F09	0.686 (0.106)	0.877 (0.133)	0.234 (0.040)		
MF32163	M07F10	1.469 (0.183)	1.014 (0.059)	0.215 (0.019)		
MF32381	M08F01	1.178 (0.065)	0.348 (0.036)			
MF32416	M08F02	1.209 (0.122)	0.830 (0.057)	0.112 (0.019)		
MF32160	M08F03	2.064 (0.169)	1.135 (0.042)	0.127 (0.011)		
MF32273	M08F04	1.161 (0.112)	-0.107 (0.079)	0.235 (0.034)		
MF32540	M08F05	0.821 (0.010)	0.231 (0.121)	0.246 (0.042)		
MF32698	M08F06	1.266 (0.122)	0.620 (0.055)	0.133 (0.021)		
MF32097	M08F07	1.312 (0.175)	1.413 (0.075)	0.183 (0.016)		
MF32575	M08F08	1.966 (0.195)	0.545 (0.042)	0.199 (0.018)		
MF32414	M08F09	1.237 (0.072)	0.676 (0.039)			
MF32294	M08F10	1.078 (0.010)	0.182 (0.070)	0.161 (0.028)		
MF32688	M08F11	0.995 (0.062)	0.920 (0.052)			
MF32529	M08F12	1.709 (0.183)	1.059 (0.050)	0.180 (0.015)		
MF32637A	M08F13A	0.971 (0.055)	0.216 (0.041)			

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF32637B	M08F13B	1.107 (0.061)	0.145 (0.037)		
MF32637C	M08F13C	1.132 (0.065)	0.566 (0.040)		
MF32094	M11F01	1.379 (0.139)	0.262 (0.061)	0.238 (0.027)	
MF32662	M11F02	1.808 (0.158)	1.361 (0.051)	0.090 (0.010)	
MF32064	M11F03	1.623 (0.091)	0.509 (0.030)		
MF32419	M11F04	1.569 (0.188)	0.915 (0.054)	0.223 (0.019)	
MF32477	M11F05	1.675 (0.172)	0.719 (0.046)	0.171 (0.019)	
MF32538	M11F06	1.320 (0.075)	0.419 (0.033)		
MF32324	M11F07	1.361 (0.146)	1.011 (0.054)	0.124 (0.016)	
MF32116	M11F08	1.247 (0.143)	0.743 (0.064)	0.221 (0.023)	
MF32100	M11F09	1.126 (0.108)	0.582 (0.059)	0.136 (0.022)	
MF32402	M11F10	0.962 (0.127)	0.890 (0.084)	0.207 (0.028)	
MF32734	M11F11	0.974 (0.056)	0.166 (0.040)		
MF32397	M11F12	1.446 (0.174)	0.964 (0.057)	0.199 (0.019)	
MF32695	M11F13	0.557 (0.022)	0.354 (0.038)	-1.354 (0.103)	1.354 (0.107)
MF32132	M11F14	0.913 (0.100)	0.818 (0.074)	0.125 (0.024)	
MF32352	M12F01	1.432 (0.181)	0.572 (0.069)	0.355 (0.025)	
MF32725	M12F02	1.322 (0.078)	0.780 (0.039)		
MF32683	M12F03	0.694 (0.029)	0.732 (0.037)	-1.002 (0.087)	1.002 (0.095)
MF32738	M12F04	1.137 (0.099)	-0.168 (0.073)	0.166 (0.034)	
MF32295	M12F05	1.171 (0.103)	-0.339 (0.079)	0.185 (0.038)	
MF32331	M12F06	1.984 (0.180)	1.407 (0.057)	0.199 (0.013)	
MF32623	M12F07	1.757 (0.163)	0.619 (0.040)	0.136 (0.017)	
MF32679	M12F08	1.096 (0.119)	0.461 (0.072)	0.200 (0.029)	
MF32047	M12F09	1.797 (0.213)	1.243 (0.068)	0.378 (0.017)	
MF32398	M12F10	1.773 (0.203)	0.978 (0.052)	0.253 (0.018)	
MF32507	M12F11	1.998 (0.179)	1.151 (0.046)	0.167 (0.013)	
MF32424	M12F12	1.099 (0.126)	0.796 (0.067)	0.172 (0.024)	
MF32681A	M12F13A	0.555 (0.041)	-0.078 (0.062)		
MF32681B	M12F13B	0.627 (0.047)	0.988 (0.080)		
MF32681C	M12F13C	0.992 (0.060)	0.629 (0.045)		
MF32609	M13F01	1.012 (0.043)	-0.296 (0.041)	0.103 (0.019)	
MF32690	M13F02	1.157 (0.080)	1.131 (0.037)	0.195 (0.011)	
MF32727	M13F03	1.696 (0.082)	0.649 (0.022)	0.152 (0.009)	
MF32743	M13F04	0.607 (0.022)	0.283 (0.030)		
MF32744	M13F05	0.874 (0.029)	0.955 (0.029)		
MF32745	M13F06	0.564 (0.019)	2.402 (0.066)	-1.468 (0.083)	1.468 (0.113)
MF32233	M13F07	1.056 (0.027)	1.383 (0.021)	-0.519 (0.036)	0.519 (0.044)
MF32670	M13F08	0.728 (0.035)	-0.592 (0.073)	0.127 (0.029)	
MF32447	M13F09	1.422 (0.076)	0.901 (0.027)	0.139 (0.009)	
MF32036	M13F10	1.236 (0.076)	0.797 (0.035)	0.215 (0.013)	
MF32728	M13F11	1.616 (0.089)	1.248 (0.030)	0.219 (0.008)	
MF32732	M13F12	0.814 (0.063)	0.770 (0.060)	0.262 (0.020)	
MF32166	M14F01	1.024 (0.052)	0.201 (0.043)	0.177 (0.019)	

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MF32721	M14F02	0.709 (0.068)	1.483 (0.068)	0.206 (0.017)		
MF32757	M14F03	0.457 (0.009)	0.175 (0.022)		-2.463 (0.079)	2.463 (0.080)
MF32760A	M14F04A	0.864 (0.018)	0.973 (0.017)		-1.289 (0.052)	1.289 (0.056)
MF32760B	M14F04B	1.481 (0.051)	1.352 (0.025)			
MF32760C	M14F04C	1.742 (0.064)	1.514 (0.024)			
MF32761	M14F05	1.285 (0.036)	1.472 (0.019)		-0.214 (0.029)	0.214 (0.037)
MF32692	M14F06	0.646 (0.014)	1.239 (0.025)		-1.247 (0.054)	1.247 (0.061)
MF32626	M14F07	1.023 (0.059)	0.670 (0.040)	0.186 (0.015)		
MF32595	M14F08	1.327 (0.059)	0.474 (0.026)	0.108 (0.011)		
MF32673	M14F09	1.461 (0.075)	0.606 (0.027)	0.185 (0.012)		
MC22046	M05_02	0.818 (0.051)	-0.612 (0.052)			
MC22110	M06_07	0.528 (0.041)	-1.031 (0.089)			
MC32701	M06_11	1.219 (0.101)	-1.118 (0.087)	0.177 (0.044)		
MC32704	M06_12	1.184 (0.108)	-0.215 (0.075)	0.196 (0.034)		
MC32525	M06_13	1.008 (0.098)	0.094 (0.082)	0.187 (0.034)		
MZ22043	M01_01	0.652 (0.046)	-0.523 (0.105)	0.125 (0.037)		
MZ22046	M01_02	0.803 (0.037)	-0.555 (0.040)			
MZ22049	M01_03	0.619 (0.069)	0.174 (0.150)	0.252 (0.045)		
MZ22050	M01_04	0.961 (0.091)	1.015 (0.058)	0.143 (0.019)		
MZ22055	M01_05	1.236 (0.054)	0.538 (0.028)			
MZ22057	M01_06	0.452 (0.044)	-0.321 (0.191)	0.165 (0.051)		
MZ22257	M01_07	1.426 (0.117)	0.501 (0.046)	0.241 (0.019)		
MZ22062	M01_08	1.011 (0.081)	0.710 (0.052)	0.130 (0.019)		
MZ22066	M01_09	1.441 (0.093)	0.200 (0.037)	0.121 (0.017)		
MZ22232	M01_10	0.546 (0.021)	1.625 (0.053)		-2.323 (0.141)	2.323 (0.154)
MZ22234A	M01_11A	0.837 (0.029)	0.802 (0.027)		-0.429 (0.050)	0.429 (0.057)
MZ22234B	M01_11B	0.931 (0.034)	1.177 (0.029)		-1.381 (0.094)	1.381 (0.100)
MZ22243	M01_12	1.010 (0.050)	0.427 (0.031)			
MZ42003	M02_01	0.681 (0.051)	-0.352 (0.108)	0.161 (0.038)		
MZ42079	M02_02	0.908 (0.076)	-0.449 (0.106)	0.265 (0.042)		
MZ42018	M02_03	0.987 (0.044)	0.376 (0.032)			
MZ42055	M02_04	1.228 (0.121)	0.803 (0.058)	0.293 (0.020)		
MZ42039	M02_05	0.693 (0.049)	0.360 (0.070)	0.097 (0.023)		
MZ42199	M02_06	1.184 (0.087)	-0.181 (0.063)	0.224 (0.029)		
MZ42301A	M02_07A	0.522 (0.030)	-0.087 (0.051)			
MZ42301B	M02_07B	0.897 (0.042)	0.655 (0.037)			
MZ42301C	M02_07C	1.560 (0.073)	1.020 (0.030)			
MZ42263	M02_08	1.313 (0.061)	0.973 (0.033)			
MZ42265	M02_09	0.823 (0.067)	0.371 (0.074)	0.149 (0.027)		
MZ42137	M02_10	1.151 (0.102)	0.682 (0.056)	0.226 (0.020)		
MZ42148	M02_11	0.866 (0.075)	-0.195 (0.102)	0.255 (0.039)		
MZ42254	M02_12	0.659 (0.047)	-1.362 (0.133)	0.171 (0.047)		
MZ42250	M02_13	1.113 (0.050)	-0.726 (0.034)			
MZ42220	M02_14	0.691 (0.021)	0.441 (0.026)		-1.521 (0.084)	1.521 (0.086)

( ) Standard errors appear in parentheses



**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ22097	M03_01	1.106 (0.068)	-0.142 (0.050)	0.113 (0.023)	
MZ22101	M03_02	0.881 (0.060)	-0.379 (0.077)	0.148 (0.032)	
MZ22104	M03_03	0.953 (0.062)	-0.348 (0.067)	0.138 (0.029)	
MZ22105	M03_04	0.630 (0.059)	0.754 (0.090)	0.117 (0.028)	
MZ22106	M03_05	0.979 (0.045)	0.657 (0.035)		
MZ22108	M03_06	0.909 (0.080)	0.185 (0.082)	0.224 (0.032)	
MZ22110	M03_07	0.593 (0.033)	-0.695 (0.054)		
MZ22181	M03_08	1.069 (0.077)	-0.762 (0.085)	0.213 (0.040)	
MZ32307	M03_09	1.378 (0.063)	0.900 (0.031)		
MZ32523	M03_10	1.922 (0.139)	1.076 (0.036)	0.177 (0.011)	
MZ32701	M03_11	1.211 (0.082)	-1.098 (0.077)	0.185 (0.041)	
MZ32704	M03_12	1.190 (0.084)	-0.235 (0.059)	0.187 (0.029)	
MZ32525	M03_13	0.993 (0.073)	0.080 (0.064)	0.166 (0.027)	
MZ32579	M03_14	1.140 (0.083)	-0.205 (0.064)	0.199 (0.030)	
MZ32691	M03_15	0.873 (0.041)	0.327 (0.034)		
MZ42001	M04_01	0.741 (0.059)	-0.500 (0.112)	0.194 (0.042)	
MZ42022	M04_02	0.915 (0.097)	0.773 (0.075)	0.261 (0.024)	
MZ42082	M04_03	1.290 (0.108)	0.788 (0.045)	0.171 (0.016)	
MZ42088	M04_04	1.115 (0.090)	0.274 (0.057)	0.206 (0.024)	
MZ42304A	M04_05A	1.403 (0.059)	-0.473 (0.025)		
MZ42304B	M04_05B	0.966 (0.038)	0.670 (0.025)	0.412 (0.033)	-0.412 (0.044)
MZ42304C	M04_05C	1.414 (0.064)	0.723 (0.028)		
MZ42304D	M04_05D	0.580 (0.017)	0.233 (0.028)	-1.411 (0.080)	1.411 (0.082)
MZ42267	M04_06	1.310 (0.099)	0.664 (0.041)	0.142 (0.015)	
MZ42239	M04_07	1.243 (0.010)	0.967 (0.044)	0.109 (0.013)	
MZ42238	M04_08	1.171 (0.120)	1.155 (0.057)	0.188 (0.016)	
MZ42279	M04_09	1.065 (0.069)	-0.017 (0.051)	0.118 (0.022)	
MZ42036	M04_10	1.470 (0.115)	0.741 (0.038)	0.141 (0.014)	
MZ42130	M04_11	0.528 (0.031)	-0.128 (0.050)		
MZ42303A	M04_12A	1.158 (0.050)	0.193 (0.027)		
MZ42303B	M04_12B	0.373 (0.019)	0.787 (0.055)	-0.050 (0.081)	0.050 (0.097)
MZ42222	M04_13	0.998 (0.074)	0.387 (0.053)	0.131 (0.021)	
MZ32142	M05_01	1.617 (0.178)	1.068 (0.055)	0.409 (0.015)	
MZ32198	M05_02	0.770 (0.073)	0.461 (0.086)	0.183 (0.031)	
MZ32640	M05_03	0.607 (0.023)	1.394 (0.048)	-0.752 (0.070)	0.752 (0.090)
MZ32344	M05_04	1.184 (0.052)	0.518 (0.029)		
MZ32754	M05_05	0.828 (0.039)	-0.440 (0.037)		
MZ32755	M05_06	1.081 (0.043)	1.214 (0.030)	-0.185 (0.042)	0.185 (0.056)
MZ32753A	M05_07A	1.033 (0.036)	0.779 (0.023)	-0.246 (0.040)	0.246 (0.047)
MZ32753B	M05_07B	1.157 (0.044)	0.922 (0.024)	-0.032 (0.035)	0.032 (0.044)
MZ32753C	M05_07C	1.024 (0.047)	0.518 (0.033)		
MZ32756	M05_08	0.700 (0.036)	0.441 (0.043)		
MZ32205	M05_09	0.570 (0.061)	0.181 (0.150)	0.207 (0.045)	
MZ32163	M05_10	1.518 (0.135)	0.692 (0.044)	0.238 (0.017)	

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ42032	M06_01	0.762 (0.060)	-0.560 (0.119)	0.205 (0.045)	
MZ42031	M06_02	1.406 (0.113)	0.582 (0.044)	0.215 (0.018)	
MZ42186	M06_03	1.037 (0.045)	0.336 (0.030)		
MZ42059	M06_04	0.772 (0.026)	0.081 (0.024)		-0.179 (0.047) 0.179 (0.047)
MZ42236	M06_05	1.240 (0.098)	0.270 (0.055)	0.239 (0.024)	
MZ42226	M06_06	1.211 (0.051)	0.260 (0.026)		
MZ42103	M06_07	0.753 (0.042)	1.376 (0.063)		
MZ42086	M06_08	1.134 (0.050)	0.631 (0.030)		
MZ42228	M06_09	0.770 (0.038)	0.664 (0.042)		
MZ42245	M06_10	1.580 (0.124)	1.212 (0.040)	0.138 (0.011)	
MZ42270	M06_11	0.909 (0.041)	-0.045 (0.032)		
MZ42201	M06_12	1.211 (0.051)	0.098 (0.026)		
MZ42152	M06_13	0.752 (0.079)	0.840 (0.085)	0.187 (0.028)	
MZ42269	M06_14	0.800 (0.079)	0.218 (0.106)	0.272 (0.037)	
MZ42179	M06_15	0.925 (0.079)	0.396 (0.071)	0.197 (0.027)	
MZ42177	M06_16	1.160 (0.087)	0.212 (0.056)	0.203 (0.024)	
MZ42207	M06_17	0.436 (0.013)	-0.024 (0.034)		-2.991 (0.145) 2.991 (0.144)
MZ32381	M07_01	1.098 (0.047)	0.260 (0.028)		
MZ32416	M07_02	1.370 (0.102)	0.855 (0.038)	0.111 (0.013)	
MZ32160	M07_03	1.884 (0.119)	1.258 (0.035)	0.126 (0.001)	
MZ32273	M07_04	0.955 (0.076)	-0.251 (0.088)	0.239 (0.036)	
MZ32540	M07_05	1.058 (0.101)	0.311 (0.077)	0.330 (0.028)	
MZ32698	M07_06	1.025 (0.079)	0.566 (0.053)	0.144 (0.020)	
MZ32097	M07_07	1.273 (0.133)	1.361 (0.055)	0.189 (0.014)	
MZ32575	M07_08	1.890 (0.145)	0.574 (0.033)	0.208 (0.015)	
MZ32414	M07_09	1.083 (0.048)	0.602 (0.031)		
MZ32294	M07_10	0.909 (0.076)	0.008 (0.085)	0.218 (0.034)	
MZ32688	M07_11	0.815 (0.040)	0.764 (0.042)		
MZ32529	M07_12	1.529 (0.131)	1.010 (0.040)	0.166 (0.013)	
MZ32637A	M07_13A	0.827 (0.039)	-0.408 (0.038)		
MZ32637B	M07_13B	1.070 (0.050)	-0.432 (0.034)		
MZ32637C	M07_13C	1.039 (0.048)	0.177 (0.031)		
MZ42183	M08_01	0.674 (0.051)	-0.233 (0.103)	0.155 (0.036)	
MZ42060	M08_02	1.218 (0.087)	0.188 (0.051)	0.192 (0.022)	
MZ42019	M08_03	0.734 (0.036)	0.451 (0.040)		
MZ42023	M08_04	1.179 (0.051)	0.453 (0.028)		
MZ42197	M08_05	1.132 (0.052)	0.818 (0.033)		
MZ42234	M08_06	1.419 (0.100)	0.319 (0.041)	0.184 (0.019)	
MZ42066	M08_07	0.678 (0.034)	0.274 (0.041)		
MZ42243	M08_08	1.828 (0.110)	0.394 (0.027)	0.091 (0.012)	
MZ42248	M08_09	1.377 (0.060)	0.686 (0.027)		
MZ42229A	M08_10A	1.666 (0.073)	0.700 (0.024)		
MZ42229B	M08_10B	1.862 (0.083)	0.731 (0.022)		
MZ42080A	M08_11A	0.819 (0.039)	0.467 (0.037)		

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
MZ42080B	M08_11B	1.175 (0.061)	1.330 (0.044)		
MZ42120	M08_12	0.947 (0.078)	-0.109 (0.087)	0.243 (0.035)	
MZ42203	M08_13	1.417 (0.094)	0.156 (0.041)	0.160 (0.019)	
MZ42264	M08_14	0.737 (0.042)	1.384 (0.065)		
MZ42255	M08_15	0.639 (0.051)	-0.182 (0.112)	0.156 (0.038)	
MZ42224	M08_16	0.884 (0.040)	-0.080 (0.034)		
MZ32094	M09_01	1.174 (0.089)	0.021 (0.061)	0.226 (0.027)	
MZ32662	M09_02	1.836 (0.115)	1.319 (0.037)	0.122 (0.009)	
MZ32064	M09_03	1.302 (0.057)	0.704 (0.028)		
MZ32419	M09_04	1.363 (0.122)	0.805 (0.047)	0.239 (0.017)	
MZ32477	M09_05	1.713 (0.137)	0.628 (0.037)	0.230 (0.016)	
MZ32538	M09_06	1.231 (0.052)	0.244 (0.026)		
MZ32324	M09_07	1.179 (0.095)	0.772 (0.047)	0.170 (0.017)	
MZ32116	M09_08	1.079 (0.010)	0.771 (0.059)	0.238 (0.021)	
MZ32100	M09_09	0.955 (0.070)	0.404 (0.057)	0.132 (0.022)	
MZ32402	M09_10	0.784 (0.091)	0.777 (0.095)	0.266 (0.030)	
MZ32734	M09_11	0.773 (0.036)	-0.339 (0.039)		
MZ32397	M09_12	1.143 (0.106)	0.858 (0.055)	0.223 (0.019)	
MZ32695	M09_13	0.540 (0.017)	-0.149 (0.031)		-1.068 (0.078) 1.068 (0.076)
MZ32132	M09_14	0.675 (0.057)	0.430 (0.086)	0.130 (0.029)	
MZ42041	M10_01	1.160 (0.094)	-0.342 (0.080)	0.302 (0.035)	
MZ42024	M10_02	1.483 (0.097)	0.118 (0.039)	0.159 (0.019)	
MZ42016	M10_03	0.847 (0.074)	0.506 (0.073)	0.175 (0.027)	
MZ42002	M10_04	0.716 (0.038)	0.930 (0.051)		
MZ42198A	M10_05A	1.027 (0.047)	-0.863 (0.039)		
MZ42198B	M10_05B	0.983 (0.044)	0.338 (0.031)		
MZ42198C	M10_05C	1.517 (0.074)	1.096 (0.031)		
MZ42077	M10_06	1.308 (0.105)	0.361 (0.051)	0.238 (0.022)	
MZ42235	M10_07	1.559 (0.095)	0.174 (0.033)	0.112 (0.016)	
MZ42067	M10_08	1.484 (0.149)	1.112 (0.049)	0.270 (0.015)	
MZ42150	M10_09	0.818 (0.084)	0.930 (0.075)	0.190 (0.024)	
MZ42300A	M10_10A	1.216 (0.051)	0.084 (0.026)		
MZ42300B	M10_10B	1.266 (0.054)	0.316 (0.026)		
MZ42260	M10_11	0.847 (0.078)	0.046 (0.101)	0.269 (0.036)	
MZ42169A	M10_12A	1.033 (0.045)	0.277 (0.030)		
MZ42169B	M10_12B	0.352 (0.031)	1.897 (0.163)		
MZ42169C	M10_12C	0.759 (0.052)	1.929 (0.096)		
MZ32352	M11_01	1.376 (0.129)	0.384 (0.059)	0.379 (0.022)	
MZ32725	M11_02	1.226 (0.057)	0.830 (0.032)		
MZ32683	M11_03	0.533 (0.017)	0.790 (0.035)		-1.370 (0.083) 1.370 (0.090)
MZ32738	M11_04	1.210 (0.085)	-0.259 (0.060)	0.192 (0.029)	
MZ32295	M11_05	1.189 (0.086)	-0.631 (0.075)	0.222 (0.037)	
MZ32331	M11_06	1.957 (0.132)	1.209 (0.037)	0.188 (0.010)	
MZ32623	M11_07	1.676 (0.118)	0.627 (0.032)	0.132 (0.013)	

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ32679	M11_08	1.065 (0.084)	0.277 (0.060)	0.198 (0.025)	
MZ32047	M11_09	1.495 (0.180)	1.058 (0.061)	0.432 (0.016)	
MZ32398	M11_10	1.360 (0.132)	0.815 (0.051)	0.285 (0.018)	
MZ32507	M11_11	1.647 (0.137)	1.120 (0.041)	0.187 (0.012)	
MZ32424	M11_12	1.149 (0.082)	0.363 (0.047)	0.144 (0.020)	
MZ32681A	M11_13A	0.558 (0.032)	-0.595 (0.056)		
MZ32681B	M11_13B	0.589 (0.034)	0.794 (0.057)		
MZ32681C	M11_13C	1.101 (0.050)	0.481 (0.030)		
MZ42015	M12_01	0.923 (0.069)	-0.437 (0.088)	0.195 (0.038)	
MZ42196	M12_02	1.035 (0.067)	0.132 (0.049)	0.109 (0.021)	
MZ42194	M12_03	1.150 (0.050)	-0.446 (0.030)		
MZ42114A	M12_04A	1.388 (0.058)	-0.153 (0.024)		
MZ42114B	M12_04B	1.403 (0.059)	0.135 (0.023)		
MZ42112	M12_05	0.430 (0.064)	0.678 (0.230)	0.248 (0.054)	
MZ42109	M12_06	1.318 (0.130)	1.039 (0.051)	0.228 (0.016)	
MZ42050	M12_07	1.024 (0.047)	0.637 (0.033)		
MZ42074A	M12_08A	1.153 (0.051)	0.571 (0.030)		
MZ42074B	M12_08B	1.098 (0.050)	0.741 (0.033)		
MZ42074C	M12_08C	1.744 (0.084)	0.991 (0.027)		
MZ42151	M12_09	0.895 (0.041)	-0.077 (0.033)		
MZ42132	M12_10	1.392 (0.137)	1.195 (0.049)	0.192 (0.014)	
MZ42257	M12_11	0.712 (0.068)	0.782 (0.081)	0.145 (0.026)	
MZ42158	M12_12	0.737 (0.084)	0.332 (0.123)	0.307 (0.039)	
MZ42252	M12_13	1.120 (0.090)	0.746 (0.048)	0.149 (0.018)	
MZ42261	M12_14	0.694 (0.058)	0.092 (0.098)	0.159 (0.034)	
MZ32166	M13_01	0.996 (0.072)	-0.048 (0.065)	0.172 (0.028)	
MZ32721	M13_02	0.807 (0.102)	1.209 (0.086)	0.239 (0.023)	
MZ32757	M13_03	0.442 (0.014)	-0.435 (0.036)		-2.315 (0.119)
MZ32760A	M13_04A	0.898 (0.027)	0.592 (0.022)		-1.184 (0.069)
MZ32760B	M13_04B	1.564 (0.074)	0.935 (0.029)		1.184 (0.072)
MZ32760C	M13_04C	1.752 (0.090)	1.162 (0.031)		
MZ32761	M13_05	1.203 (0.046)	1.178 (0.026)		-0.173 (0.039)
MZ32692	M13_06	0.601 (0.020)	0.974 (0.035)		0.173 (0.050)
MZ32626	M13_07	0.826 (0.079)	0.393 (0.085)	0.209 (0.031)	-1.359 (0.082)
MZ32595	M13_08	1.398 (0.092)	0.181 (0.039)	0.124 (0.018)	1.359 (0.091)
MZ32673	M13_09	1.427 (0.106)	0.354 (0.042)	0.197 (0.019)	
MZ42182	M14_01	1.214 (0.104)	0.098 (0.065)	0.309 (0.027)	
MZ42081	M14_02	1.017 (0.047)	0.705 (0.035)		
MZ42049	M14_03	0.868 (0.074)	-0.216 (0.010)	0.242 (0.038)	
MZ42052	M14_04	1.594 (0.105)	-0.046 (0.039)	0.166 (0.020)	
MZ42076	M14_05	1.071 (0.086)	0.368 (0.057)	0.186 (0.023)	
MZ42302A	M14_06A	0.847 (0.028)	0.359 (0.023)		-0.302 (0.044)
MZ42302B	M14_06B	0.840 (0.026)	0.480 (0.023)		0.302 (0.047)
MZ42302C	M14_06C	0.529 (0.021)	1.426 (0.054)		-0.728 (0.053)
					0.728 (0.057)
					-0.810 (0.076)
					0.810 (0.097)

( ) Standard errors appear in parentheses

**Exhibit D.3 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Mathematics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
MZ42100 M14_07	1.253 (0.102)	0.191 (0.056)	0.265 (0.024)		
MZ42202 M14_08	1.403 (0.117)	0.485 (0.046)	0.259 (0.019)		
MZ42240 M14_09	1.322 (0.088)	0.150 (0.042)	0.147 (0.019)		
MZ42093 M14_10	1.463 (0.073)	1.129 (0.034)			
MZ42271 M14_11	1.092 (0.077)	0.272 (0.049)	0.135 (0.021)		
MZ42268 M14_12	1.364 (0.119)	1.056 (0.043)	0.140 (0.013)		
MZ42159 M14_13	0.559 (0.032)	-0.808 (0.060)			
MZ42164 M14_14	1.213 (0.054)	0.563 (0.029)			
MZ42167 M14_15	1.210 (0.058)	0.771 (0.032)			

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S012025	S01_01	0.474 (0.077)	1.698 (0.131)	0.333 (0.028)	
S012026	S01_02	0.681 (0.050)	-0.438 (0.129)	0.400 (0.036)	
S012027	S01_03	0.759 (0.035)	-0.793 (0.076)	0.148 (0.031)	
S012028	S01_04	0.766 (0.039)	0.394 (0.044)	0.121 (0.017)	
S012029	S01_05	0.553 (0.061)	0.774 (0.116)	0.366 (0.029)	
S012030	S01_06	0.572 (0.063)	1.254 (0.085)	0.262 (0.024)	
S022035	S01_07	0.372 (0.017)	0.296 (0.042)		
S022225	S01_08	1.112 (0.090)	1.800 (0.059)	0.130 (0.007)	
S022117	S01_09	0.682 (0.052)	0.869 (0.059)	0.214 (0.019)	
S022235	S01_10	0.687 (0.057)	0.463 (0.086)	0.324 (0.026)	
S022188	S01_11	0.987 (0.100)	1.207 (0.054)	0.413 (0.014)	
S022074	S01_12	1.117 (0.065)	0.513 (0.038)	0.279 (0.015)	
S022240	S01_13	1.163 (0.099)	1.544 (0.051)	0.279 (0.009)	
S022206	S01_14	0.728 (0.064)	1.071 (0.057)	0.235 (0.019)	
S022160	S01_15	0.585 (0.021)	0.795 (0.034)		
S022058	S01_16	0.895 (0.064)	0.358 (0.064)	0.380 (0.021)	
S012013	S02_01	0.674 (0.104)	1.785 (0.133)	0.164 (0.021)	
S012014	S02_02	0.834 (0.059)	-0.704 (0.096)	0.182 (0.038)	
S012015	S02_03	0.718 (0.066)	-0.119 (0.115)	0.262 (0.038)	
S012016	S02_04	0.498 (0.051)	-0.717 (0.221)	0.263 (0.056)	
S012017	S02_05	1.336 (0.103)	0.548 (0.041)	0.200 (0.018)	
S012018	S02_06	0.358 (0.045)	-0.058 (0.258)	0.248 (0.052)	
S012001	S02_07	0.540 (0.046)	-0.104 (0.121)	0.139 (0.036)	
S012002	S02_08	0.580 (0.058)	-0.123 (0.148)	0.242 (0.043)	
S012003	S02_09	0.993 (0.070)	-0.429 (0.076)	0.236 (0.032)	
S012004	S02_10	0.579 (0.056)	-0.303 (0.156)	0.240 (0.046)	
S012005	S02_11	0.660 (0.075)	0.339 (0.121)	0.282 (0.036)	
S012006	S02_12	0.817 (0.074)	0.415 (0.075)	0.214 (0.027)	
S032131	S02_13	0.863 (0.038)	-0.112 (0.032)		
S032202	S02_14	0.598 (0.024)	-0.041 (0.028)		0.216 (0.052) -0.216 (0.050)
S012037	S03_01	0.548 (0.043)	-1.802 (0.198)	0.223 (0.056)	
S012038	S03_02	0.965 (0.097)	0.348 (0.082)	0.356 (0.028)	
S012039	S03_03	0.741 (0.069)	-0.450 (0.137)	0.322 (0.044)	
S012040	S03_04	1.472 (0.128)	0.599 (0.043)	0.300 (0.018)	
S012041	S03_05	0.642 (0.075)	0.416 (0.124)	0.282 (0.037)	
S012042	S03_06	0.825 (0.101)	0.733 (0.088)	0.326 (0.028)	
S022086	S03_07	0.995 (0.043)	0.324 (0.028)		
S022198	S03_08	1.181 (0.150)	1.299 (0.062)	0.252 (0.016)	
S022275	S03_09	1.122 (0.123)	1.317 (0.058)	0.159 (0.014)	
S022041	S03_10	0.740 (0.055)	-0.620 (0.107)	0.197 (0.038)	
S022283	S03_11	0.890 (0.039)	-0.594 (0.037)		
S022202	S03_12	0.810 (0.116)	1.092 (0.090)	0.333 (0.025)	
S022152	S03_13	0.953 (0.042)	0.253 (0.029)		
S022154	S03_14	0.627 (0.032)	-0.134 (0.041)		

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S022187	S04_01	0.577 (0.073)	1.081 (0.104)	0.175 (0.030)	
S022161	S04_02	0.585 (0.032)	0.552 (0.047)		
S022222	S04_03	1.076 (0.089)	0.617 (0.049)	0.184 (0.020)	
S022191	S04_04	0.570 (0.019)	-0.283 (0.029)		-0.411 (0.061) 0.411 (0.056)
S022279	S04_05	0.628 (0.032)	0.294 (0.041)		
S022040	S04_06	0.674 (0.050)	-0.127 (0.088)	0.146 (0.030)	
S022088A	S04_07A	0.721 (0.034)	-0.454 (0.041)		
S022088B	S04_07B	0.532 (0.030)	0.342 (0.048)		
S022249D	S04_08D	0.836 (0.039)	0.356 (0.033)		
S022286	S04_09	0.786 (0.051)	1.703 (0.083)		
S032595	S04_10	1.157 (0.134)	1.420 (0.063)	0.153 (0.014)	
S032656	S04_11	1.069 (0.073)	0.335 (0.046)	0.132 (0.020)	
S032625A	S04_12A	0.822 (0.038)	0.249 (0.033)		
S032625B	S04_12B	1.005 (0.046)	0.615 (0.030)		
S022183	S05_01	1.222 (0.075)	0.967 (0.030)	0.263 (0.011)	
S022276	S05_02	0.876 (0.056)	0.582 (0.049)	0.305 (0.017)	
S022115	S05_03	0.887 (0.043)	0.074 (0.047)	0.218 (0.019)	
S022022	S05_04	0.612 (0.018)	0.136 (0.024)		
S022019	S05_05	0.826 (0.042)	-0.326 (0.068)	0.283 (0.025)	
S022002	S05_06	0.968 (0.049)	0.455 (0.037)	0.220 (0.015)	
S022294	S05_07	0.786 (0.048)	0.055 (0.072)	0.345 (0.023)	
S022106	S05_08	0.624 (0.078)	1.858 (0.114)	0.118 (0.017)	
S022244	S05_09	1.087 (0.030)	1.002 (0.021)		
S022150	S05_10	0.842 (0.052)	0.666 (0.045)	0.245 (0.016)	
S022042	S05_11	1.108 (0.047)	0.361 (0.029)	0.169 (0.012)	
S022289	S05_12	0.737 (0.017)	0.910 (0.018)		0.807 (0.021) -0.807 (0.032)
S022069	S05_13	0.851 (0.023)	0.496 (0.019)		
S022268	S05_14	0.614 (0.019)	0.730 (0.029)		
S022290	S06_01	1.004 (0.040)	0.327 (0.031)	0.225 (0.013)	
S022292	S06_02	0.599 (0.015)	0.556 (0.022)		
S022054	S06_03	0.985 (0.046)	0.627 (0.031)	0.255 (0.012)	
S022181	S06_04	1.066 (0.054)	0.896 (0.028)	0.264 (0.001)	
S022208	S06_05	1.119 (0.061)	1.072 (0.027)	0.265 (0.009)	
S022078	S06_06	1.086 (0.021)	0.111 (0.012)		
S022126	S06_07	0.528 (0.030)	0.344 (0.076)	0.166 (0.024)	
S022281	S06_08	0.554 (0.016)	1.165 (0.033)		
S032385	S06_09	0.783 (0.035)	0.030 (0.052)	0.255 (0.019)	
S032035	S06_10	1.181 (0.040)	0.377 (0.022)	0.167 (0.001)	
S032519	S06_11	0.695 (0.016)	0.458 (0.018)		
S032683	S06_12	0.996 (0.044)	0.767 (0.027)	0.198 (0.010)	
S032258	S06_13	0.831 (0.033)	-0.063 (0.044)	0.201 (0.017)	
S032120A	S06_14A	0.745 (0.021)	1.433 (0.032)		
S032120B	S06_14B	0.912 (0.022)	1.165 (0.022)		
S032606	S07_01	0.777 (0.077)	-0.873 (0.146)	0.227 (0.050)	

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S032015	S07_02	0.732 (0.052)	0.735 (0.059)		
S032310D	S07_03D	0.468 (0.026)	-0.064 (0.047)	-0.266 (0.095)	0.266 (0.091)
S032680	S07_04	0.598 (0.031)	-0.375 (0.042)	-0.066 (0.081)	0.066 (0.070)
S032672	S07_05	0.392 (0.062)	0.064 (0.282)	0.250 (0.059)	
S032392	S07_06	0.441 (0.051)	-1.584 (0.274)	0.227 (0.059)	
S032425	S07_07	0.828 (0.123)	0.816 (0.103)	0.256 (0.033)	
S032257	S07_08	1.174 (0.177)	1.079 (0.075)	0.239 (0.024)	
S032663	S07_09	0.471 (0.106)	1.703 (0.239)	0.228 (0.042)	
S032660	S07_10	0.822 (0.170)	1.641 (0.150)	0.216 (0.026)	
S032555	S07_11	1.049 (0.068)	0.848 (0.047)		
S032122	S07_12	0.591 (0.048)	1.004 (0.084)		
S032542	S08_01	1.271 (0.176)	0.859 (0.070)	0.293 (0.025)	
S032645	S08_02	0.959 (0.141)	0.884 (0.089)	0.265 (0.029)	
S032530D	S08_03D	0.478 (0.029)	0.525 (0.054)	0.895 (0.080)	-0.895 (0.095)
S032007	S08_04	0.728 (0.050)	0.398 (0.052)		
S032502	S08_05	1.028 (0.118)	0.754 (0.068)	0.164 (0.025)	
S032679	S08_06	0.809 (0.068)	1.524 (0.097)		
S032184	S08_07	0.463 (0.097)	1.394 (0.222)	0.248 (0.045)	
S032394	S08_08	0.893 (0.119)	0.591 (0.097)	0.262 (0.034)	
S032151	S08_09	1.197 (0.140)	0.817 (0.061)	0.186 (0.023)	
S032651A	S08_10A	1.243 (0.073)	0.380 (0.034)		
S032651B	S08_10B	0.967 (0.071)	1.149 (0.062)		
S032665A	S08_11A	0.954 (0.061)	0.661 (0.046)		
S032665B	S08_11B	0.958 (0.071)	1.235 (0.067)		
S032665C	S08_11C	0.825 (0.064)	1.294 (0.079)		
S032607	S09_01	0.856 (0.048)	0.055 (0.059)	0.249 (0.022)	
S032063	S09_02	0.677 (0.018)	1.319 (0.027)	-0.239 (0.032)	0.239 (0.044)
S032206	S09_03	1.128 (0.036)	1.175 (0.025)		
S032008	S09_04	0.946 (0.052)	0.160 (0.050)	0.246 (0.020)	
S032083	S09_05	0.789 (0.055)	1.242 (0.045)	0.115 (0.013)	
S032564	S09_06	1.668 (0.080)	1.238 (0.026)	0.186 (0.007)	
S032057	S09_07	1.211 (0.035)	0.941 (0.020)		
S032055	S09_08	1.021 (0.050)	-0.911 (0.069)	0.277 (0.031)	
S032626	S09_09	1.096 (0.029)	0.260 (0.016)		
S032281	S09_10	1.595 (0.070)	0.180 (0.025)	0.232 (0.013)	
S032150	S09_11	0.637 (0.039)	0.043 (0.081)	0.191 (0.027)	
S032301	S09_12	1.574 (0.087)	1.033 (0.025)	0.237 (0.009)	
S032446	S09_13	0.882 (0.059)	0.389 (0.060)	0.301 (0.022)	
S032637	S10_01	0.833 (0.059)	1.051 (0.044)	0.190 (0.015)	
S032386	S10_02	1.097 (0.085)	1.383 (0.040)	0.183 (0.010)	
S032682	S10_03	1.370 (0.083)	1.014 (0.027)	0.213 (0.001)	
S032652	S10_04	0.906 (0.055)	0.718 (0.040)	0.187 (0.015)	
S032437	S10_05	0.806 (0.074)	1.067 (0.058)	0.325 (0.017)	
S032242	S10_06	0.640 (0.024)	1.117 (0.039)		

( ) Standard errors appear in parentheses



**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S032709	S10_07	1.232 (0.037)	1.003 (0.020)		
S032711	S10_08	0.797 (0.017)	1.126 (0.019)	-0.554 (0.032)	0.554 (0.039)
S032712A	S10_09A	0.820 (0.026)	0.752 (0.024)		
S032712B	S10_09B	1.185 (0.042)	1.413 (0.030)		
S032713A	S10_10A	1.063 (0.037)	1.391 (0.032)		
S032713B	S10_10B	0.896 (0.043)	2.091 (0.069)		
S032465	S11_01	0.864 (0.064)	0.220 (0.072)	0.342 (0.024)	
S032315	S11_02	1.156 (0.083)	0.791 (0.040)	0.297 (0.015)	
S032306	S11_03	0.423 (0.009)	0.648 (0.026)	-1.812 (0.067)	1.812 (0.071)
S032640	S11_04	0.522 (0.021)	-0.039 (0.034)		
S032579	S11_05	0.818 (0.101)	1.552 (0.077)	0.297 (0.016)	
S032570	S11_06	0.703 (0.026)	0.925 (0.035)		
S032024	S11_07	1.227 (0.113)	1.453 (0.052)	0.305 (0.011)	
S032272	S11_08	0.930 (0.039)	1.617 (0.048)		
S032141	S11_09	1.665 (0.092)	1.133 (0.027)	0.201 (0.009)	
S032060	S11_10	0.737 (0.024)	-0.452 (0.028)		
S032463	S11_11	1.628 (0.101)	0.587 (0.029)	0.325 (0.013)	
S032650D	S11_12D	0.517 (0.014)	0.357 (0.022)	-0.179 (0.041)	0.179 (0.044)
S032514	S11_13	0.850 (0.079)	1.074 (0.057)	0.288 (0.018)	
S032611	S12_01	1.118 (0.098)	1.315 (0.045)	0.233 (0.012)	
S032614	S12_02	0.701 (0.024)	0.230 (0.026)		
S032451	S12_03	0.574 (0.012)	0.154 (0.019)	-1.345 (0.053)	1.345 (0.053)
S032156	S12_04	1.206 (0.073)	0.743 (0.032)	0.193 (0.013)	
S032056	S12_05	0.785 (0.027)	0.606 (0.026)		
S032087	S12_06	0.654 (0.060)	1.018 (0.068)	0.198 (0.022)	
S032279	S12_07	0.771 (0.076)	1.429 (0.063)	0.185 (0.016)	
S032238	S12_08	1.121 (0.066)	0.641 (0.034)	0.183 (0.014)	
S032369	S12_09	0.531 (0.015)	0.818 (0.026)	-0.259 (0.040)	0.259 (0.048)
S032160	S12_10	0.831 (0.065)	0.423 (0.070)	0.335 (0.023)	
S032654	S12_11	0.936 (0.064)	0.739 (0.044)	0.213 (0.017)	
S032126	S12_12	0.643 (0.024)	0.316 (0.029)		
S032510	S12_13	0.806 (0.051)	-0.282 (0.083)	0.270 (0.030)	
S032158	S12_14	0.837 (0.065)	0.470 (0.066)	0.315 (0.022)	
S032574	S13_01	0.900 (0.153)	0.945 (0.105)	0.309 (0.033)	
S032532	S13_02	0.747 (0.049)	-0.189 (0.052)		
S032562	S13_03	0.695 (0.030)	0.264 (0.033)	-0.549 (0.072)	0.549 (0.074)
S032422	S13_04	1.061 (0.107)	0.198 (0.076)	0.202 (0.031)	
S032375	S13_05	0.562 (0.025)	0.716 (0.043)	-1.025 (0.095)	1.025 (0.104)
S032714	S13_06	0.997 (0.110)	-0.294 (0.117)	0.322 (0.043)	
S032704	S13_07	0.847 (0.060)	0.777 (0.054)		
S032705A	S13_08A	0.879 (0.059)	0.539 (0.046)		
S032705B	S13_08B	0.930 (0.059)	0.153 (0.042)		
S032706A	S13_09A	0.890 (0.060)	0.728 (0.050)		
S032706B	S13_09B	1.038 (0.069)	0.822 (0.047)		

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S032707	S13_10	1.363 (0.109)	1.417 (0.062)		
S032115	S14_01	1.088 (0.113)	0.548 (0.064)	0.148 (0.026)	
S032565	S14_02	0.783 (0.058)	0.973 (0.066)		
S032403	S14_03	1.102 (0.166)	1.024 (0.080)	0.264 (0.025)	
S032273	S14_04	0.644 (0.157)	1.852 (0.227)	0.261 (0.031)	
S032019A	S14_05A	0.969 (0.075)	1.339 (0.074)		
S032019B	S14_05B	1.147 (0.106)	1.748 (0.098)		
S032516	S14_06	0.709 (0.047)	-0.218 (0.054)		
S032620	S14_07	0.780 (0.161)	1.693 (0.160)	0.190 (0.025)	
S032693A	S14_08A	0.942 (0.058)	0.190 (0.041)		
S032693B	S14_08B	1.133 (0.067)	0.049 (0.037)		
S032695	S14_09	0.703 (0.037)	0.782 (0.042)		-0.211 (0.068) 0.211 (0.080)
S032697D	S14_10D	0.840 (0.043)	0.669 (0.033)		-0.018 (0.054) 0.018 (0.063)
SF12025	S01F01	0.454 (0.051)	1.028 (0.121)	0.190 (0.033)	
SF12026	S01F02	0.818 (0.048)	-0.534 (0.085)	0.259 (0.032)	
SF12027	S01F03	0.959 (0.041)	-0.378 (0.044)	0.094 (0.020)	
SF12028	S01F04	0.857 (0.042)	0.400 (0.037)	0.084 (0.014)	
SF12029	S01F05	0.789 (0.063)	0.789 (0.057)	0.233 (0.020)	
SF12030	S01F06	0.507 (0.043)	0.862 (0.088)	0.136 (0.026)	
SF22035	S01F07	0.516 (0.022)	0.588 (0.038)		
SF22225	S01F08	1.053 (0.088)	1.642 (0.055)	0.094 (0.009)	
SF22117	S01F09	0.710 (0.048)	0.782 (0.051)	0.124 (0.018)	
SF22235	S01F10	0.719 (0.052)	0.420 (0.068)	0.178 (0.025)	
SF22188	S01F11	0.703 (0.059)	0.738 (0.067)	0.214 (0.023)	
SF22074	S01F12	1.167 (0.064)	0.454 (0.034)	0.186 (0.015)	
SF22240	S01F13	0.966 (0.087)	1.327 (0.050)	0.201 (0.013)	
SF22206	S01F14	0.672 (0.051)	0.927 (0.056)	0.120 (0.019)	
SF22160	S01F15	0.754 (0.028)	0.883 (0.032)		
SF22058	S01F16	0.850 (0.051)	0.141 (0.057)	0.191 (0.023)	
SF12013	S02F01	0.550 (0.060)	1.596 (0.089)	0.137 (0.021)	
SF12014	S02F02	0.970 (0.044)	-0.337 (0.046)	0.121 (0.021)	
SF12015	S02F03	0.877 (0.045)	-0.030 (0.052)	0.159 (0.021)	
SF12016	S02F04	0.779 (0.037)	-0.457 (0.061)	0.129 (0.024)	
SF12017	S02F05	1.298 (0.059)	0.383 (0.026)	0.111 (0.012)	
SF12018	S02F06	0.544 (0.030)	-0.050 (0.075)	0.100 (0.024)	
SF12001	S02F07	0.774 (0.033)	0.031 (0.039)	0.056 (0.014)	
SF12002	S02F08	0.793 (0.038)	-0.205 (0.053)	0.117 (0.021)	
SF12003	S02F09	1.274 (0.049)	-0.187 (0.028)	0.095 (0.014)	
SF12004	S02F10	0.943 (0.043)	0.061 (0.038)	0.104 (0.016)	
SF12005	S02F11	0.859 (0.048)	0.410 (0.044)	0.132 (0.017)	
SF12006	S02F12	1.006 (0.054)	0.618 (0.033)	0.115 (0.013)	
SF32131	S02F13	1.174 (0.034)	0.308 (0.017)		
SF32202	S02F14	0.778 (0.019)	0.485 (0.016)		-0.015 (0.028) 0.015 (0.031)
SF12037	S03F01	0.978 (0.085)	-0.531 (0.092)	0.177 (0.038)	

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SF12038	S03F02	1.007 (0.098)	0.191 (0.075)	0.170 (0.032)	
SF12039	S03F03	1.064 (0.093)	-0.125 (0.074)	0.166 (0.032)	
SF12040	S03F04	1.248 (0.124)	0.506 (0.056)	0.162 (0.025)	
SF12041	S03F05	0.807 (0.084)	0.433 (0.083)	0.142 (0.030)	
SF12042	S03F06	0.922 (0.093)	0.443 (0.072)	0.140 (0.028)	
SF22086	S03F07	1.342 (0.079)	0.554 (0.032)		
SF22198	S03F08	0.969 (0.144)	1.243 (0.086)	0.158 (0.024)	
SF22275	S03F09	1.141 (0.139)	1.196 (0.066)	0.102 (0.017)	
SF22041	S03F10	1.204 (0.099)	0.164 (0.054)	0.119 (0.024)	
SF22283	S03F11	1.087 (0.065)	0.203 (0.036)		
SF22202	S03F12	0.796 (0.108)	0.883 (0.094)	0.177 (0.031)	
SF22152	S03F13	1.237 (0.075)	0.631 (0.036)		
SF22154	S03F14	0.956 (0.061)	0.465 (0.041)		
SF22187	S04F01	0.818 (0.113)	1.014 (0.092)	0.162 (0.028)	
SF22161	S04F02	0.766 (0.057)	0.861 (0.062)		
SF22222	S04F03	1.456 (0.151)	0.862 (0.046)	0.111 (0.017)	
SF22191	S04F04	0.816 (0.036)	0.273 (0.029)		-0.280 (0.059) 0.280 (0.060)
SF22279	S04F05	0.945 (0.064)	0.759 (0.048)		
SF22040	S04F06	1.253 (0.111)	0.499 (0.049)	0.117 (0.021)	
SF22088A	S04F07A	1.234 (0.072)	0.350 (0.033)		
SF22088B	S04F07B	0.931 (0.064)	0.852 (0.052)		
SF22249D	S04F08D	1.182 (0.077)	0.873 (0.043)		
SF22286	S04F09	1.182 (0.115)	1.819 (0.108)		
SF32595	S04F10	1.520 (0.176)	1.395 (0.068)	0.127 (0.014)	
SF32656	S04F11	1.629 (0.149)	0.711 (0.039)	0.099 (0.016)	
SF32625A	S04F12A	1.278 (0.080)	0.766 (0.038)		
SF32625B	S04F12B	1.707 (0.113)	0.991 (0.036)		
SF22183	S05F01	1.246 (0.159)	0.923 (0.063)	0.207 (0.023)	
SF22276	S05F02	0.955 (0.101)	0.477 (0.074)	0.159 (0.028)	
SF22115	S05F03	1.185 (0.111)	0.342 (0.059)	0.161 (0.025)	
SF22022	S05F04	0.885 (0.057)	0.530 (0.046)		
SF22019	S05F05	1.347 (0.124)	0.073 (0.061)	0.212 (0.029)	
SF22002	S05F06	1.247 (0.127)	0.595 (0.056)	0.167 (0.023)	
SF22294	S05F07	1.099 (0.117)	0.279 (0.077)	0.239 (0.031)	
SF22106	S05F08	0.895 (0.141)	1.577 (0.117)	0.105 (0.019)	
SF22244	S05F09	1.503 (0.102)	1.101 (0.042)		
SF22150	S05F10	1.080 (0.117)	0.752 (0.062)	0.147 (0.023)	
SF22042	S05F11	1.453 (0.139)	0.620 (0.047)	0.145 (0.019)	
SF22289	S05F12	1.004 (0.056)	1.070 (0.037)		0.593 (0.041) -0.593 (0.068)
SF22069	S05F13	1.225 (0.076)	0.802 (0.040)		
SF22268	S05F14	0.887 (0.064)	1.116 (0.065)		
SF22290	S06F01	1.187 (0.120)	0.392 (0.064)	0.200 (0.027)	
SF22292	S06F02	0.744 (0.052)	0.616 (0.055)		
SF22054	S06F03	1.260 (0.130)	0.566 (0.057)	0.182 (0.024)	

( ) Standard errors appear in parentheses



**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SF32024	S11F07	0.871 (0.166)	1.396 (0.121)	0.248 (0.027)	
SF32272	S11F08	1.147 (0.092)	1.449 (0.072)		
SF32141	S11F09	1.422 (0.185)	1.088 (0.057)	0.167 (0.019)	
SF32060	S11F10	1.066 (0.062)	-0.034 (0.038)		
SF32463	S11F11	1.545 (0.165)	0.588 (0.050)	0.212 (0.022)	
SF32650D	S11F12D	0.686 (0.034)	0.549 (0.036)		-0.228 (0.066) 0.228 (0.073)
SF32514	S11F13	1.026 (0.161)	1.111 (0.085)	0.234 (0.025)	
SF32611	S12F01	0.842 (0.140)	1.378 (0.113)	0.182 (0.024)	
SF32614	S12F02	0.802 (0.051)	0.129 (0.047)		
SF32451	S12F03	0.644 (0.026)	0.221 (0.034)		-1.197 (0.095) 1.197 (0.096)
SF32156	S12F04	1.056 (0.139)	0.889 (0.074)	0.214 (0.025)	
SF32056	S12F05	0.934 (0.063)	0.777 (0.050)		
SF32087	S12F06	0.671 (0.106)	1.070 (0.120)	0.185 (0.033)	
SF32279	S12F07	0.718 (0.127)	1.491 (0.137)	0.165 (0.027)	
SF32238	S12F08	1.163 (0.124)	0.655 (0.059)	0.160 (0.023)	
SF32369	S12F09	0.617 (0.031)	0.673 (0.041)		-0.403 (0.075) 0.403 (0.085)
SF32160	S12F10	0.887 (0.126)	0.616 (0.103)	0.296 (0.034)	
SF32654	S12F11	1.001 (0.115)	0.778 (0.069)	0.154 (0.024)	
SF32126	S12F12	0.775 (0.053)	0.529 (0.052)		
SF32510	S12F13	0.882 (0.103)	-0.014 (0.116)	0.282 (0.041)	
SF32158	S12F14	0.943 (0.130)	0.626 (0.094)	0.290 (0.032)	
SF32574	S13F01	1.049 (0.086)	0.870 (0.047)	0.320 (0.016)	
SF32532	S13F02	0.760 (0.025)	-0.123 (0.025)		
SF32562	S13F03	0.677 (0.014)	0.441 (0.017)		-0.676 (0.038) 0.676 (0.040)
SF32422	S13F04	1.182 (0.064)	0.383 (0.036)	0.223 (0.015)	
SF32375	S13F05	0.589 (0.013)	0.907 (0.023)		-1.066 (0.048) 1.066 (0.054)
SF32714	S13F06	1.140 (0.063)	-0.134 (0.051)	0.301 (0.022)	
SF32704	S13F07	0.930 (0.033)	1.101 (0.031)		
SF32705A	S13F08A	0.953 (0.031)	0.748 (0.024)		
SF32705B	S13F08B	1.005 (0.030)	0.414 (0.020)		
SF32706A	S13F09A	0.953 (0.032)	0.914 (0.027)		
SF32706B	S13F09B	1.119 (0.038)	1.044 (0.025)		
SF32707	S13F10	1.558 (0.063)	1.446 (0.028)		
SF32115	S14F01	0.975 (0.052)	0.633 (0.034)	0.097 (0.014)	
SF32565	S14F02	0.838 (0.032)	1.231 (0.037)		
SF32403	S14F03	1.127 (0.090)	1.101 (0.040)	0.258 (0.013)	
SF32273	S14F04	0.679 (0.091)	1.786 (0.099)	0.233 (0.018)	
SF32019A	S14F05A	1.062 (0.043)	1.488 (0.038)		
SF32019B	S14F05B	1.150 (0.056)	1.891 (0.055)		
SF32516	S14F06	0.800 (0.026)	0.091 (0.023)		
SF32620	S14F07	0.840 (0.083)	1.667 (0.068)	0.139 (0.012)	
SF32693A	S14F08A	0.902 (0.029)	0.530 (0.023)		
SF32693B	S14F08B	1.088 (0.033)	0.281 (0.019)		
SF32695	S14F09	0.674 (0.019)	1.131 (0.027)		-0.315 (0.037) 0.315 (0.048)

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SF32697D S14F10D	0.688 (0.018)	1.001 (0.023)		-0.234 (0.033)	0.234 (0.042)
SZ32115 S01_01	0.984 (0.085)	0.629 (0.056)	0.148 (0.022)		
SZ32565 S01_02	0.772 (0.043)	0.923 (0.049)			
SZ32403 S01_03	1.074 (0.124)	0.964 (0.062)	0.263 (0.021)		
SZ32273 S01_04	0.722 (0.131)	1.697 (0.138)	0.253 (0.024)		
SZ32019A S01_05A	0.982 (0.055)	1.171 (0.048)			
SZ32019B S01_05B	1.079 (0.072)	1.660 (0.070)			
SZ32516 S01_06	0.781 (0.038)	-0.414 (0.041)			
SZ32620 S01_07	0.678 (0.111)	1.651 (0.128)	0.189 (0.024)		
SZ32693A S01_08A	0.935 (0.043)	0.102 (0.031)			
SZ32693B S01_08B	1.079 (0.048)	-0.164 (0.030)			
SZ32695 S01_09	0.668 (0.027)	0.633 (0.030)		-0.165 (0.051)	0.165 (0.059)
SZ32697D S01_10D	0.732 (0.029)	0.493 (0.027)		-0.040 (0.047)	0.040 (0.052)
SZ42009 S02_01	0.990 (0.135)	0.865 (0.083)	0.391 (0.025)		
SZ42313 S02_02	0.703 (0.036)	-0.694 (0.049)			
SZ42059 S02_03	0.855 (0.096)	0.795 (0.077)	0.243 (0.026)		
SZ42011 S02_04	0.790 (0.047)	1.270 (0.062)			
SZ42028 S02_05	0.837 (0.106)	1.273 (0.081)	0.186 (0.021)		
SZ42001 S02_06	0.993 (0.122)	1.367 (0.073)	0.165 (0.017)		
SZ42276 S02_07	0.714 (0.113)	1.085 (0.112)	0.321 (0.031)		
SZ42279 S02_08	0.389 (0.054)	0.477 (0.228)	0.224 (0.050)		
SZ42083 S02_09	0.793 (0.033)	1.073 (0.034)		-0.158 (0.046)	0.158 (0.061)
SZ42106 S02_10	1.035 (0.052)	0.859 (0.037)			
SZ42071 S02_11	0.875 (0.112)	1.107 (0.077)	0.234 (0.023)		
SZ42101 S02_12	0.831 (0.047)	1.069 (0.051)			
SZ42307 S02_13	0.562 (0.034)	0.561 (0.054)			
SZ42405 S02_14	0.945 (0.109)	0.714 (0.077)	0.309 (0.026)		
SZ42244A S02_15A	1.076 (0.057)	1.014 (0.040)			
SZ42244B S02_15B	0.909 (0.058)	1.492 (0.068)			
SZ42153 S02_16	0.806 (0.043)	0.395 (0.038)			
SZ22183 S03_01	1.365 (0.148)	1.018 (0.050)	0.258 (0.017)		
SZ22276 S03_02	0.753 (0.077)	0.338 (0.097)	0.224 (0.034)		
SZ22115 S03_03	0.929 (0.077)	0.058 (0.076)	0.217 (0.030)		
SZ22022 S03_04	0.672 (0.035)	0.091 (0.041)			
SZ22019 S03_05	0.877 (0.074)	-0.271 (0.097)	0.248 (0.037)		
SZ22002 S03_06	1.037 (0.093)	0.488 (0.060)	0.216 (0.024)		
SZ22294 S03_07	0.828 (0.084)	0.098 (0.106)	0.309 (0.036)		
SZ22244 S03_09	1.161 (0.059)	0.959 (0.036)			
SZ22150 S03_10	0.863 (0.087)	0.586 (0.075)	0.223 (0.027)		
SZ22042 S03_11	1.134 (0.093)	0.503 (0.051)	0.186 (0.021)		
SZ22289 S03_12	0.786 (0.033)	0.905 (0.031)		0.802 (0.038)	-0.802 (0.057)
SZ22069 S03_13	0.942 (0.047)	0.596 (0.035)			
SZ22268 S03_14	0.637 (0.038)	0.663 (0.050)			
SZ42013 S04_01	0.910 (0.069)	-0.786 (0.104)	0.231 (0.041)		

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SZ42006	S04_02	0.625 (0.078)	0.293 (0.148)	0.299 (0.043)	
SZ42310	S04_03	0.532 (0.021)	0.087 (0.032)		-0.277 (0.064) 0.277 (0.063)
SZ42052	S04_04	0.567 (0.026)	0.197 (0.033)		0.381 (0.057) -0.381 (0.058)
SZ42054	S04_05	0.325 (0.037)	-0.590 (0.277)	0.207 (0.053)	
SZ42043	S04_06	0.418 (0.032)	1.165 (0.096)		
SZ42196	S04_07	0.767 (0.047)	1.355 (0.067)		
SZ42061	S04_08	0.603 (0.090)	1.429 (0.117)	0.179 (0.028)	
SZ42292	S04_09	0.420 (0.016)	0.728 (0.043)		-1.126 (0.089) 1.126 (0.098)
SZ42109	S04_10	1.372 (0.111)	0.131 (0.055)	0.295 (0.025)	
SZ42232A	S04_11A	0.775 (0.039)	0.380 (0.037)		
SZ42232B	S04_11B	1.120 (0.082)	1.854 (0.082)		
SZ42232C	S04_11C	1.527 (0.183)	1.747 (0.094)	0.330 (0.012)	
SZ42294	S04_12	1.405 (0.145)	0.955 (0.046)	0.241 (0.017)	
SZ42149	S04_13	0.541 (0.033)	0.256 (0.050)		
SZ42155	S04_14	0.819 (0.043)	0.668 (0.040)		
SZ42150	S04_15	0.755 (0.087)	0.580 (0.098)	0.267 (0.032)	
SZ22290	S05_01	1.116 (0.097)	0.382 (0.059)	0.239 (0.024)	
SZ22292	S05_02	0.672 (0.038)	0.628 (0.046)		
SZ22054	S05_03	1.100 (0.108)	0.589 (0.060)	0.265 (0.024)	
SZ22181	S05_04	1.055 (0.111)	0.800 (0.061)	0.254 (0.022)	
SZ22208	S05_05	1.145 (0.133)	1.048 (0.059)	0.254 (0.019)	
SZ22078	S05_06	1.138 (0.051)	0.173 (0.027)		
SZ22126	S05_07	0.583 (0.066)	0.399 (0.127)	0.207 (0.038)	
SZ22281	S05_08	0.608 (0.039)	1.176 (0.071)		
SZ32385	S05_09	0.893 (0.083)	0.093 (0.088)	0.267 (0.033)	
SZ32035	S05_10	1.080 (0.083)	0.349 (0.052)	0.160 (0.022)	
SZ32519	S05_11	0.667 (0.037)	0.505 (0.044)		
SZ32683	S05_12	1.024 (0.102)	0.808 (0.058)	0.206 (0.022)	
SZ32258	S05_13	0.885 (0.073)	-0.046 (0.082)	0.209 (0.032)	
SZ32120A	S05_14A	0.784 (0.049)	1.369 (0.067)		
SZ32120B	S05_14B	0.901 (0.052)	0.962 (0.045)		
SZ42304	S06_01	0.731 (0.059)	-0.032 (0.089)	0.160 (0.032)	
SZ42038	S06_02	0.836 (0.074)	0.435 (0.072)	0.161 (0.027)	
SZ42298	S06_03	0.897 (0.043)	0.304 (0.033)		
SZ42261	S06_04	0.785 (0.044)	0.960 (0.049)		
SZ42051A	S06_05A	0.777 (0.038)	-0.024 (0.037)		
SZ42051B	S06_05B	1.168 (0.057)	0.817 (0.032)		
SZ42076	S06_06	0.907 (0.046)	0.708 (0.037)		
SZ42404	S06_07	0.695 (0.032)	1.301 (0.045)		-0.079 (0.051) 0.079 (0.073)
SZ42306	S06_08	1.217 (0.148)	1.133 (0.060)	0.276 (0.018)	
SZ42403	S06_09	0.830 (0.044)	0.808 (0.043)		
SZ42272	S06_10	0.836 (0.082)	0.403 (0.083)	0.241 (0.030)	
SZ42100	S06_11	0.442 (0.022)	0.597 (0.042)		-0.035 (0.070) 0.035 (0.079)
SZ42238A	S06_12A	0.728 (0.078)	0.907 (0.079)	0.159 (0.025)	

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SZ42238B	S06_12B	0.703 (0.044)	1.335 (0.071)		
SZ42141	S06_13	0.750 (0.060)	-0.320 (0.100)	0.185 (0.036)	
SZ42215	S06_14	0.525 (0.090)	1.555 (0.149)	0.196 (0.033)	
SZ32606	S07_01	0.907 (0.073)	-0.671 (0.109)	0.263 (0.042)	
SZ32015	S07_02	0.690 (0.037)	0.528 (0.044)		
SZ32310D	S07_03D	0.503 (0.020)	-0.257 (0.035)		-0.230 (0.070) 0.230 (0.065)
SZ32680	S07_04	0.654 (0.026)	-0.453 (0.031)		0.089 (0.058) -0.089 (0.049)
SZ32672	S07_05	0.380 (0.052)	0.096 (0.269)	0.252 (0.057)	
SZ32392	S07_06	0.433 (0.040)	-1.644 (0.243)	0.220 (0.056)	
SZ32425	S07_07	0.843 (0.098)	0.772 (0.081)	0.260 (0.027)	
SZ32257	S07_08	1.246 (0.144)	1.068 (0.056)	0.259 (0.018)	
SZ32663	S07_09	0.519 (0.093)	1.620 (0.159)	0.217 (0.034)	
SZ32660	S07_10	0.797 (0.115)	1.449 (0.096)	0.202 (0.022)	
SZ32555	S07_11	1.239 (0.058)	0.668 (0.029)		
SZ32122	S07_12	0.646 (0.040)	0.933 (0.058)		
SZ42053	S08_01	1.109 (0.089)	-0.082 (0.070)	0.265 (0.030)	
SZ42408	S08_02	0.761 (0.039)	0.471 (0.039)		
SZ42015	S08_03	0.854 (0.110)	0.896 (0.084)	0.294 (0.027)	
SZ42309	S08_04	0.340 (0.060)	1.364 (0.260)	0.220 (0.047)	
SZ42049A	S08_05A	0.948 (0.044)	-0.578 (0.037)		
SZ42049B	S08_05B	1.192 (0.052)	0.266 (0.026)		
SZ42182	S08_06	0.607 (0.056)	-0.377 (0.144)	0.212 (0.045)	
SZ42402	S08_07	0.762 (0.047)	1.344 (0.068)		
SZ42228A	S08_08A	1.213 (0.063)	1.079 (0.038)		
SZ42228B	S08_08B	1.121 (0.049)	-0.003 (0.028)		
SZ42228C	S08_08C	1.368 (0.061)	0.566 (0.025)		
SZ42126	S08_09	0.597 (0.076)	0.040 (0.184)	0.312 (0.051)	
SZ42210	S08_10	0.766 (0.132)	1.516 (0.116)	0.267 (0.025)	
SZ42176	S08_11	0.954 (0.047)	0.626 (0.035)		
SZ42211	S08_12	0.897 (0.042)	0.165 (0.032)		
SZ42135	S08_13	0.783 (0.039)	-0.013 (0.036)		
SZ42257	S08_14	0.747 (0.113)	1.172 (0.102)	0.287 (0.028)	
SZ32542	S09_01	1.199 (0.115)	0.674 (0.054)	0.262 (0.021)	
SZ32645	S09_02	0.950 (0.106)	0.796 (0.070)	0.261 (0.025)	
SZ32530D	S09_03D	0.540 (0.024)	0.321 (0.036)		0.886 (0.056) -0.886 (0.062)
SZ32007	S09_04	0.780 (0.039)	0.333 (0.037)		
SZ32502	S09_05	1.016 (0.088)	0.661 (0.053)	0.160 (0.021)	
SZ32679	S09_06	0.791 (0.051)	1.505 (0.074)		
SZ32184	S09_07	0.448 (0.072)	1.154 (0.175)	0.211 (0.042)	
SZ32394	S09_08	0.812 (0.095)	0.693 (0.088)	0.275 (0.029)	
SZ32151	S09_09	1.195 (0.107)	0.787 (0.047)	0.180 (0.018)	
SZ32651A	S09_10A	1.071 (0.049)	0.365 (0.029)		
SZ32651B	S09_10B	0.949 (0.053)	1.147 (0.048)		
SZ32665A	S09_11A	0.935 (0.047)	0.621 (0.035)		

( ) Standard errors appear in parentheses



**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
SZ32665B	S09_11B	1.032 (0.057)	1.119 (0.044)		
SZ32665C	S09_11C	0.938 (0.055)	1.064 (0.047)		
SZ42073	S10_01	0.453 (0.045)	-1.667 (0.275)	0.257 (0.065)	
SZ42017	S10_02	0.829 (0.112)	1.318 (0.085)	0.203 (0.022)	
SZ42007	S10_03	1.166 (0.113)	0.827 (0.052)	0.204 (0.020)	
SZ42024	S10_04	1.002 (0.148)	1.455 (0.085)	0.248 (0.019)	
SZ42095	S10_05	0.971 (0.074)	-0.191 (0.075)	0.204 (0.031)	
SZ42022	S10_06	0.879 (0.044)	0.535 (0.035)		
SZ42063	S10_07	0.761 (0.059)	-1.799 (0.162)	0.235 (0.057)	
SZ42197	S10_08	0.986 (0.103)	0.850 (0.062)	0.217 (0.022)	
SZ42297	S10_09	0.575 (0.024)	1.296 (0.048)		-0.694 (0.069) 0.694 (0.087)
SZ42305	S10_10	0.507 (0.028)	1.302 (0.058)		0.350 (0.059) -0.350 (0.088)
SZ42112	S10_11	0.439 (0.054)	0.274 (0.194)	0.213 (0.047)	
SZ42173	S10_12	0.460 (0.020)	-0.521 (0.045)		1.296 (0.080) -1.296 (0.063)
SZ42407	S10_13	0.425 (0.030)	0.653 (0.071)		
SZ42278	S10_14	0.787 (0.043)	0.832 (0.045)		
SZ42274	S10_15	0.975 (0.144)	1.493 (0.087)	0.222 (0.019)	
SZ42317	S10_17	0.574 (0.022)	-0.014 (0.031)		-0.415 (0.065) 0.415 (0.063)
SZ32465	S11_01	0.664 (0.061)	-0.230 (0.128)	0.215 (0.042)	
SZ32315	S11_02	0.818 (0.088)	0.671 (0.080)	0.233 (0.028)	
SZ32306	S11_03	0.479 (0.016)	0.478 (0.034)		-1.261 (0.084) 1.261 (0.088)
SZ32640	S11_04	0.617 (0.034)	-0.067 (0.045)		
SZ32579	S11_05	0.784 (0.132)	1.479 (0.110)	0.277 (0.024)	
SZ32570	S11_06	0.914 (0.045)	0.589 (0.035)		
SZ32024	S11_07	0.835 (0.137)	1.511 (0.107)	0.270 (0.022)	
SZ32272	S11_08	0.972 (0.060)	1.476 (0.063)		
SZ32141	S11_09	1.466 (0.147)	1.059 (0.044)	0.179 (0.016)	
SZ32060	S11_10	1.063 (0.050)	-0.364 (0.034)		
SZ32463	S11_11	1.350 (0.108)	0.329 (0.048)	0.236 (0.022)	
SZ32650D	S11_12D	0.734 (0.029)	0.151 (0.026)		0.126 (0.046) -0.126 (0.046)
SZ32514	S11_13	0.792 (0.108)	1.031 (0.092)	0.279 (0.028)	
SZ42042	S12_01	0.652 (0.061)	-0.524 (0.153)	0.246 (0.049)	
SZ42030	S12_02	0.822 (0.048)	1.269 (0.059)		
SZ42003	S12_03	0.529 (0.076)	0.915 (0.144)	0.229 (0.040)	
SZ42110	S12_04	0.592 (0.051)	-0.775 (0.158)	0.211 (0.048)	
SZ42222A	S12_05A	1.054 (0.060)	1.308 (0.050)		
SZ42222B	S12_05B	1.008 (0.053)	1.010 (0.041)		
SZ42222C	S12_05C	0.783 (0.072)	0.132 (0.094)	0.222 (0.034)	
SZ42065	S12_06	0.641 (0.058)	-1.115 (0.186)	0.264 (0.058)	
SZ42280	S12_07	1.277 (0.093)	0.289 (0.046)	0.175 (0.021)	
SZ42088	S12_08	0.620 (0.034)	-0.057 (0.045)		
SZ42218	S12_09	1.391 (0.128)	0.695 (0.046)	0.252 (0.019)	
SZ42104	S12_10	0.817 (0.046)	1.105 (0.052)		
SZ42064	S12_11	0.827 (0.045)	0.937 (0.046)		

( ) Standard errors appear in parentheses

**Exhibit D.4 IRT Parameters for TIMSS Joint 2003-2007 Eighth Grade Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
SZ42273	S12_12	0.990 (0.045)	0.179 (0.030)		
SZ42301	S12_13	0.907 (0.043)	0.079 (0.032)		
SZ42312	S12_14	0.442 (0.047)	-0.398 (0.213)	0.217 (0.052)	
SZ42217	S12_15	1.432 (0.136)	0.742 (0.046)	0.258 (0.019)	
SZ42406	S12_16	1.023 (0.050)	0.680 (0.033)		
SZ32611	S13_01	0.860 (0.121)	1.351 (0.087)	0.230 (0.022)	
SZ32614	S13_02	0.791 (0.039)	-0.012 (0.036)		
SZ32451	S13_03	0.627 (0.020)	0.106 (0.027)		-1.157 (0.074) 1.157 (0.073)
SZ32156	S13_04	1.173 (0.109)	0.741 (0.052)	0.221 (0.020)	
SZ32056	S13_05	0.879 (0.044)	0.597 (0.036)		
SZ32087	S13_06	0.688 (0.082)	0.929 (0.092)	0.188 (0.029)	
SZ32279	S13_07	0.962 (0.129)	1.410 (0.079)	0.201 (0.019)	
SZ32238	S13_08	1.074 (0.090)	0.578 (0.052)	0.169 (0.021)	
SZ32369	S13_09	0.614 (0.025)	0.725 (0.033)		-0.168 (0.054) 0.168 (0.063)
SZ32160	S13_10	0.747 (0.086)	0.344 (0.116)	0.307 (0.037)	
SZ32654	S13_11	0.872 (0.083)	0.622 (0.069)	0.185 (0.026)	
SZ32126	S13_12	0.729 (0.039)	0.257 (0.039)		
SZ32510	S13_13	0.752 (0.066)	-0.395 (0.123)	0.238 (0.043)	
SZ32158	S13_14	0.835 (0.088)	0.388 (0.093)	0.280 (0.033)	
SZ42258	S14_01	0.766 (0.095)	1.085 (0.083)	0.201 (0.026)	
SZ42005	S14_02	0.358 (0.013)	0.285 (0.041)		-1.948 (0.114) 1.948 (0.116)
SZ42016	S14_03	0.747 (0.130)	2.034 (0.162)	0.142 (0.018)	
SZ42300A	S14_04A	1.092 (0.049)	0.109 (0.028)		
SZ42300B	S14_04B	0.484 (0.038)	1.811 (0.130)		
SZ42300C	S14_04C	0.916 (0.044)	0.267 (0.032)		
SZ42319	S14_05	1.109 (0.055)	0.888 (0.035)		
SZ42068	S14_06	0.974 (0.118)	1.093 (0.068)	0.229 (0.022)	
SZ42216	S14_07	0.817 (0.088)	0.383 (0.096)	0.273 (0.034)	
SZ42249	S14_08	0.981 (0.100)	0.668 (0.067)	0.246 (0.025)	
SZ42094	S14_09	0.849 (0.043)	0.615 (0.038)		
SZ42293A	S14_10A	0.895 (0.042)	-0.319 (0.036)		
SZ42293B	S14_10B	0.736 (0.057)	2.031 (0.119)		
SZ42195	S14_11	0.550 (0.041)	1.779 (0.116)		
SZ42400	S14_12	0.889 (0.051)	1.189 (0.052)		
SZ42164	S14_14	1.144 (0.097)	0.722 (0.047)	0.153 (0.019)	

( ) Standard errors appear in parentheses

**Exhibit D.5 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Number**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031286	M01_01	1.268 (0.053)	0.358 (0.025)		
M031106	M01_02	1.066 (0.045)	0.255 (0.028)		
M031282	M01_03	0.999 (0.033)	0.865 (0.022)	-0.509 (0.045)	0.509 (0.051)
M031227	M01_04	1.138 (0.062)	1.310 (0.046)		
M031335	M01_05	1.170 (0.089)	0.146 (0.054)	0.231 (0.023)	
M031068	M01_06	1.303 (0.055)	0.389 (0.024)		
M031299	M01_07	1.455 (0.060)	0.109 (0.023)		
M031301	M01_08	1.228 (0.050)	-0.415 (0.029)		
M041014	M02_01	0.851 (0.064)	-0.588 (0.099)	0.197 (0.038)	
M041039	M02_02	1.012 (0.081)	0.137 (0.064)	0.223 (0.025)	
M041278	M02_03	0.701 (0.034)	0.338 (0.039)		
M041006	M02_04	1.079 (0.084)	0.618 (0.046)	0.140 (0.017)	
M041250	M02_05	1.128 (0.048)	0.175 (0.027)		
M041094	M02_06	1.284 (0.119)	0.919 (0.046)	0.208 (0.016)	
M031235	M03_01	0.858 (0.040)	0.567 (0.036)		
M031285	M03_02	0.818 (0.041)	0.902 (0.044)		
M031050	M03_03	1.243 (0.113)	0.717 (0.049)	0.249 (0.018)	
M031258	M03_04	1.146 (0.053)	0.811 (0.032)		
M031334	M03_05	1.483 (0.137)	0.899 (0.042)	0.237 (0.015)	
M031255	M03_06	1.147 (0.100)	0.370 (0.059)	0.286 (0.023)	
M041052	M04_01	0.820 (0.073)	-0.405 (0.119)	0.305 (0.040)	
M041056	M04_02	0.926 (0.041)	0.321 (0.031)		
M041069	M04_03	1.414 (0.112)	1.097 (0.037)	0.086 (0.010)	
M041076	M04_04	0.887 (0.040)	0.467 (0.034)		
M041281	M04_05	1.212 (0.071)	-0.199 (0.045)	0.104 (0.019)	
M031303	M05_01	1.415 (0.102)	-0.170 (0.053)	0.277 (0.024)	
M031309	M05_02	1.300 (0.052)	-0.167 (0.025)		
M031245	M05_03	1.727 (0.138)	1.043 (0.032)	0.106 (0.010)	
M031242A	M05_04A	0.945 (0.040)	-0.120 (0.031)		
M031247	M05_05	0.597 (0.026)	1.281 (0.046)	-0.187 (0.056)	0.187 (0.077)
M031173	M05_07	1.608 (0.096)	-0.078 (0.035)	0.125 (0.017)	
M041010	M06_01	1.041 (0.089)	-0.014 (0.077)	0.318 (0.029)	
M041098	M06_02	1.543 (0.131)	0.719 (0.039)	0.245 (0.016)	
M041064	M06_03	0.853 (0.037)	-0.292 (0.035)		
M041003	M06_04	0.907 (0.040)	0.163 (0.031)		
M041104	M06_05	1.102 (0.046)	0.062 (0.027)		
M041299	M06_06	1.343 (0.063)	0.916 (0.030)		
M031029	M07_01	1.252 (0.120)	0.656 (0.053)	0.317 (0.019)	
M031030	M07_02	0.819 (0.050)	1.662 (0.076)		
M031332	M07_03	1.087 (0.091)	0.170 (0.065)	0.285 (0.025)	
M031098	M07_04	1.367 (0.091)	0.329 (0.037)	0.140 (0.016)	
M031254	M07_05	1.181 (0.089)	0.342 (0.048)	0.192 (0.020)	
M031276	M07_07	1.444 (0.113)	0.382 (0.043)	0.251 (0.019)	
M031064	M07_08	1.028 (0.092)	0.747 (0.054)	0.192 (0.019)	

( ) Standard errors appear in parentheses

**Exhibit D.5 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Number (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M041291	M08_01	0.637 (0.030)	-0.750 (0.049)		
M041289	M08_02	1.072 (0.095)	0.536 (0.057)	0.252 (0.021)	
M041068	M08_03	1.186 (0.079)	0.755 (0.035)	0.061 (0.011)	
M041065A	M08_04A	1.896 (0.141)	0.798 (0.029)	0.143 (0.011)	
M041065B	M08_04B	1.280 (0.065)	1.152 (0.037)		
M041096	M08_05	0.948 (0.067)	0.409 (0.048)	0.098 (0.018)	
M041125	M08_06	1.193 (0.100)	0.850 (0.044)	0.157 (0.015)	
M031128	M09_01	0.559 (0.028)	-1.136 (0.064)		
M031016	M09_02	1.181 (0.055)	0.822 (0.031)		
M031183	M09_03	0.812 (0.031)	0.290 (0.025)	0.609 (0.038)	-0.609 (0.041)
M031187	M09_05	0.811 (0.065)	-0.458 (0.105)	0.218 (0.038)	
M031251	M09_06	1.493 (0.117)	0.637 (0.037)	0.203 (0.016)	
M031294	M09_07	1.271 (0.078)	0.055 (0.040)	0.113 (0.017)	
M031218	M09_09	1.453 (0.097)	0.162 (0.038)	0.163 (0.018)	
M041107	M10_01	0.997 (0.063)	-0.955 (0.081)	0.139 (0.034)	
M041011	M10_02	1.244 (0.086)	-0.054 (0.051)	0.204 (0.022)	
M041122	M10_03	0.471 (0.017)	0.660 (0.037)	-0.678 (0.071)	0.678 (0.079)
M041041	M10_04	1.061 (0.096)	0.359 (0.065)	0.299 (0.024)	
M041320	M10_05	1.565 (0.112)	0.557 (0.033)	0.166 (0.015)	
M041115A	M10_06A	0.933 (0.040)	-0.176 (0.032)		
M041115B	M10_06B	1.216 (0.051)	0.240 (0.025)		
M031210	M11_01	1.225 (0.107)	0.746 (0.046)	0.221 (0.017)	
M031009	M11_02	0.939 (0.043)	0.582 (0.033)		
M031252	M11_03	1.030 (0.073)	-0.045 (0.059)	0.164 (0.024)	
M031316	M11_04	0.690 (0.034)	-1.770 (0.072)		
M031317	M11_05	1.168 (0.090)	0.741 (0.041)	0.132 (0.015)	
M031079B	M11_06B	1.226 (0.049)	-0.503 (0.029)		
M031079C	M11_06C	0.858 (0.040)	0.587 (0.035)		
M031043	M11_08	1.290 (0.094)	0.382 (0.042)	0.180 (0.018)	
M041298	M12_01	1.110 (0.078)	-0.204 (0.062)	0.205 (0.026)	
M041007	M12_02	0.761 (0.073)	0.663 (0.073)	0.171 (0.025)	
M041280	M12_03	0.833 (0.082)	0.781 (0.068)	0.191 (0.023)	
M041059	M12_04	0.875 (0.040)	0.379 (0.033)		
M041046	M12_05	1.323 (0.093)	0.499 (0.037)	0.140 (0.016)	
M041048	M12_06	1.275 (0.113)	0.672 (0.048)	0.260 (0.019)	
M031346A	M13_01A	2.108 (0.087)	-0.202 (0.018)		
M031346B	M13_01B	2.312 (0.102)	0.550 (0.017)		
M031346C	M13_01C	1.796 (0.064)	0.367 (0.014)	0.437 (0.020)	-0.437 (0.022)
M031379	M13_02	1.267 (0.060)	0.917 (0.031)		
M031380	M13_03	1.135 (0.059)	1.227 (0.043)		
M031313	M13_05	0.627 (0.031)	-1.007 (0.057)		
M031185	M13_08	1.265 (0.100)	0.297 (0.050)	0.241 (0.022)	
M041004	M14_01	0.894 (0.063)	-1.138 (0.112)	0.193 (0.046)	
M041023	M14_02	1.369 (0.087)	-0.738 (0.057)	0.185 (0.028)	

( ) Standard errors appear in parentheses

**Exhibit D.5 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Number (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M041034	M14_03	0.780 (0.052)	-0.284 (0.072)	0.093 (0.026)		
M041087	M14_04	0.809 (0.037)	0.249 (0.034)			
M041124	M14_05	0.861 (0.038)	-0.015 (0.033)			

( ) Standard errors appear in parentheses

**Exhibit D.6 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Geometric Shapes and Measures**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031271	M01_09	0.678 (0.033)	-1.317 (0.061)			
M041330	M02_07	0.706 (0.073)	0.235 (0.095)	0.183 (0.033)		
M041300A	M02_08A	1.877 (0.079)	0.224 (0.018)			
M041300B	M02_08B	2.587 (0.113)	0.173 (0.015)			
M041300C	M02_08C	1.933 (0.087)	0.452 (0.019)			
M041300D	M02_08D	2.204 (0.103)	0.576 (0.018)			
M041173	M02_09	0.807 (0.102)	1.174 (0.080)	0.155 (0.021)		
M031041	M03_07	0.919 (0.043)	0.292 (0.031)			
M031350A	M03_08A	1.507 (0.068)	0.492 (0.022)			
M031350B	M03_08B	1.523 (0.066)	0.175 (0.022)			
M031350C	M03_08C	1.144 (0.058)	0.729 (0.031)			
M031274	M03_09	0.941 (0.042)	-0.210 (0.033)			
M041164	M04_06	0.852 (0.071)	-0.297 (0.097)	0.204 (0.036)		
M041146	M04_07	0.883 (0.040)	-0.182 (0.034)			
M041152	M04_08	0.940 (0.093)	0.751 (0.058)	0.191 (0.022)		
M041258A	M04_09A	1.275 (0.054)	0.042 (0.025)			
M041258B	M04_09B	1.087 (0.051)	0.481 (0.028)			
M041131	M04_10	0.851 (0.118)	1.475 (0.093)	0.187 (0.019)		
M031219	M05_06	0.751 (0.099)	0.899 (0.090)	0.268 (0.028)		
M031085	M05_08	1.070 (0.120)	0.832 (0.061)	0.294 (0.022)		
M041329	M06_07	1.132 (0.106)	0.225 (0.065)	0.338 (0.025)		
M041143	M06_08	0.457 (0.014)	-0.144 (0.033)		-1.557 (0.091)	1.557 (0.089)
M041158	M06_09	0.930 (0.074)	-0.184 (0.078)	0.202 (0.030)		
M041328	M06_10	1.025 (0.044)	-0.071 (0.029)			
M041155	M06_11	1.050 (0.079)	0.276 (0.048)	0.138 (0.020)		
M041284	M06_12	0.949 (0.039)	0.725 (0.024)		0.378 (0.033)	-0.378 (0.043)
M031038	M07_06	0.993 (0.074)	-0.382 (0.076)	0.189 (0.031)		
M031006	M07_09	1.086 (0.093)	-0.281 (0.083)	0.328 (0.032)		
M031330	M07_10	0.893 (0.038)	-0.838 (0.041)			
M031351	M07_11	1.124 (0.085)	0.405 (0.044)	0.142 (0.019)		
M041135	M08_07	0.722 (0.078)	-0.313 (0.153)	0.328 (0.046)		
M041257	M08_08	0.853 (0.043)	0.642 (0.037)			
M041268	M08_09	1.693 (0.158)	0.974 (0.036)	0.179 (0.013)		
M041151	M08_10	1.033 (0.096)	0.143 (0.074)	0.318 (0.028)		
M041264	M08_11	1.138 (0.097)	0.399 (0.052)	0.228 (0.022)		
M031297	M09_08	1.020 (0.048)	0.511 (0.030)			
M031109	M09_10	0.991 (0.092)	0.169 (0.073)	0.288 (0.027)		
M031159	M09_11	1.183 (0.090)	-0.043 (0.057)	0.230 (0.025)		
M041160A	M10_07A	1.572 (0.066)	-0.760 (0.029)			
M041160B	M10_07B	1.873 (0.083)	-0.809 (0.027)			
M041327	M10_08	0.684 (0.035)	0.195 (0.039)			
M041148	M10_09	0.478 (0.023)	0.180 (0.036)		0.259 (0.065)	-0.259 (0.066)
M041265	M10_10	1.156 (0.097)	0.744 (0.042)	0.130 (0.016)		
M031004	M11_07	1.120 (0.104)	1.030 (0.048)	0.122 (0.015)		

( ) Standard errors appear in parentheses

**Exhibit D.6 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Geometric Shapes and Measures (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031325 M11_09	0.889 (0.046)	0.818 (0.040)			
M031088 M11_10	0.984 (0.083)	-0.173 (0.082)	0.263 (0.032)		
M031093 M11_11	0.850 (0.098)	0.713 (0.076)	0.261 (0.027)		
M041169 M12_07	1.294 (0.094)	0.309 (0.041)	0.171 (0.018)		
M041333 M12_08	1.296 (0.103)	0.715 (0.037)	0.135 (0.015)		
M041262 M12_09	1.557 (0.138)	0.761 (0.037)	0.215 (0.015)		
M041267 M12_10	0.659 (0.037)	0.743 (0.049)			
M031083 M13_06	1.110 (0.085)	-0.158 (0.065)	0.231 (0.027)		
M031071 M13_07	1.130 (0.098)	0.734 (0.045)	0.155 (0.017)		
M041302A M14_06A	1.158 (0.076)	-0.626 (0.066)	0.161 (0.029)		
M041302B M14_06B	0.841 (0.037)	-0.199 (0.034)			
M041302C M14_06C	1.495 (0.061)	-0.170 (0.023)			
M041254 M14_07	1.146 (0.099)	0.490 (0.049)	0.219 (0.020)		
M041153 M14_08	1.242 (0.095)	0.412 (0.042)	0.172 (0.018)		
M041132 M14_09	0.668 (0.082)	0.839 (0.088)	0.184 (0.029)		
M041165 M14_10	0.444 (0.017)	0.640 (0.038)		-0.942 (0.078)	0.942 (0.086)

( ) Standard errors appear in parentheses

**Exhibit D.7 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Data Display**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031134	M01_10	0.721 (0.040)	0.892 (0.050)			
M031045	M01_11	1.658 (0.115)	-0.146 (0.042)	0.202 (0.020)		
M041274	M02_10	1.080 (0.048)	-0.020 (0.029)			
M041203	M02_11	1.052 (0.050)	0.236 (0.029)			
M031240	M03_10	0.794 (0.037)	-0.207 (0.038)			
M041275	M04_11	0.610 (0.018)	-0.318 (0.029)		-1.092 (0.074)	1.092 (0.070)
M041186	M04_12	1.440 (0.097)	0.145 (0.036)	0.130 (0.016)		
M041336	M04_13	1.062 (0.102)	0.938 (0.050)	0.147 (0.017)		
M031242B	M05_04B	1.608 (0.070)	0.351 (0.020)			
M031242C	M05_04C	2.263 (0.190)	0.430 (0.031)	0.332 (0.017)		
M031172	M05_09	1.569 (0.099)	-0.030 (0.035)	0.128 (0.017)		
M041335	M06_13	0.995 (0.076)	-0.608 (0.094)	0.208 (0.037)		
M041184	M06_14	1.166 (0.085)	-0.304 (0.065)	0.190 (0.027)		
M031135	M07_12	1.302 (0.090)	-0.321 (0.056)	0.184 (0.024)		
M041182	M08_12	1.017 (0.042)	-1.083 (0.041)			
M041200	M08_13	0.947 (0.032)	-0.013 (0.021)		-0.071 (0.040)	0.071 (0.037)
M031133	M09_12	1.172 (0.047)	-0.736 (0.034)			
M041175	M10_11	1.042 (0.079)	-0.724 (0.096)	0.228 (0.039)		
M041199	M10_12	1.631 (0.104)	-0.337 (0.042)	0.144 (0.020)		
M031155	M11_12	1.263 (0.109)	0.403 (0.047)	0.251 (0.020)		
M041177	M12_11	1.160 (0.084)	-0.379 (0.066)	0.196 (0.027)		
M041271	M12_12	1.186 (0.087)	-0.100 (0.055)	0.184 (0.023)		
M041276A	M12_13A	1.317 (0.058)	0.217 (0.024)			
M041276B	M12_13B	1.129 (0.059)	0.755 (0.032)			
M041174	M14_11	1.226 (0.049)	-0.508 (0.030)			
M041191	M14_12	1.031 (0.077)	-0.990 (0.109)	0.240 (0.046)		

( ) Standard errors appear in parentheses



**Exhibit D.8 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Knowing**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031286	M01_01	1.272 (0.056)	0.360 (0.024)		
M031271	M01_09	0.684 (0.034)	-1.222 (0.061)		
M041014	M02_01	0.862 (0.067)	-0.538 (0.098)	0.189 (0.039)	
M041278	M02_03	0.952 (0.044)	0.321 (0.030)		
M041006	M02_04	1.027 (0.087)	0.672 (0.049)	0.153 (0.019)	
M041250	M02_05	1.528 (0.065)	0.198 (0.021)		
M041173	M02_09	1.091 (0.124)	1.236 (0.064)	0.190 (0.017)	
M041052	M04_01	0.941 (0.086)	-0.298 (0.100)	0.331 (0.036)	
M041056	M04_02	1.065 (0.048)	0.286 (0.027)		
M041069	M04_03	1.646 (0.126)	0.952 (0.032)	0.083 (0.001)	
M041076	M04_04	1.106 (0.050)	0.401 (0.027)		
M041164	M04_06	1.088 (0.092)	-0.131 (0.073)	0.290 (0.030)	
M041131	M04_10	0.728 (0.010)	1.465 (0.103)	0.171 (0.022)	
M041186	M04_12	1.055 (0.072)	0.061 (0.048)	0.102 (0.020)	
M031242B	M05_04B	1.226 (0.054)	0.338 (0.025)		
M031219	M05_06	0.655 (0.084)	0.788 (0.104)	0.235 (0.032)	
M031085	M05_08	0.944 (0.102)	0.740 (0.068)	0.268 (0.024)	
M041010	M06_01	1.270 (0.109)	0.040 (0.060)	0.343 (0.025)	
M041003	M06_04	1.036 (0.046)	0.133 (0.028)		
M041104	M06_05	1.104 (0.048)	0.036 (0.027)		
M041299	M06_06	1.438 (0.069)	0.833 (0.028)		
M041329	M06_07	1.092 (0.102)	0.224 (0.068)	0.333 (0.026)	
M041143	M06_08	0.478 (0.015)	-0.117 (0.031)		-1.478 (0.087) 1.478 (0.085)
M041335	M06_13	0.936 (0.066)	-0.724 (0.089)	0.157 (0.036)	
M031029	M07_01	1.412 (0.132)	0.586 (0.047)	0.313 (0.019)	
M031030	M07_02	0.952 (0.057)	1.476 (0.064)		
M031332	M07_03	1.128 (0.094)	0.128 (0.060)	0.269 (0.025)	
M031038	M07_06	0.933 (0.068)	-0.446 (0.079)	0.164 (0.033)	
M031276	M07_07	1.517 (0.124)	0.401 (0.041)	0.267 (0.019)	
M031006	M07_09	0.793 (0.071)	-0.529 (0.126)	0.257 (0.045)	
M031330	M07_10	0.856 (0.038)	-0.852 (0.043)		
M041291	M08_01	0.753 (0.035)	-0.617 (0.042)		
M041068	M08_03	1.542 (0.103)	0.699 (0.029)	0.075 (0.011)	
M041065A	M08_04A	1.596 (0.126)	0.794 (0.033)	0.144 (0.013)	
M041096	M08_05	1.095 (0.076)	0.394 (0.040)	0.099 (0.017)	
M041135	M08_07	0.664 (0.072)	-0.396 (0.170)	0.303 (0.051)	
M041257	M08_08	0.883 (0.044)	0.636 (0.036)		
M031128	M09_01	0.610 (0.030)	-1.031 (0.059)		
M031294	M09_07	1.503 (0.095)	0.109 (0.034)	0.132 (0.017)	
M031109	M09_10	0.992 (0.087)	0.124 (0.071)	0.261 (0.028)	
M031159	M09_11	1.309 (0.097)	-0.008 (0.050)	0.228 (0.023)	
M041011	M10_02	1.407 (0.098)	-0.025 (0.044)	0.207 (0.022)	
M041122	M10_03	0.511 (0.019)	0.619 (0.034)		-0.622 (0.065) 0.622 (0.072)
M041041	M10_04	1.212 (0.108)	0.346 (0.055)	0.303 (0.023)	

( ) Standard errors appear in parentheses

**Exhibit D.8 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Knowing (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M041320	M10_05	1.996 (0.139)	0.488 (0.026)	0.161 (0.014)		
M041160A	M10_07A	1.088 (0.046)	-0.887 (0.038)			
M041148	M10_09	0.443 (0.022)	0.199 (0.038)		0.250 (0.069)	-0.250 (0.071)
M041175	M10_11	1.054 (0.072)	-0.763 (0.080)	0.156 (0.035)		
M031210	M11_01	1.361 (0.113)	0.632 (0.041)	0.207 (0.018)		
M031316	M11_04	0.736 (0.036)	-1.628 (0.068)			
M031317	M11_05	1.216 (0.091)	0.647 (0.038)	0.118 (0.015)		
M031093	M11_11	0.721 (0.086)	0.726 (0.095)	0.247 (0.031)		
M041298	M12_01	1.693 (0.108)	-0.180 (0.037)	0.177 (0.020)		
M041007	M12_02	0.888 (0.083)	0.625 (0.062)	0.183 (0.023)		
M041280	M12_03	0.940 (0.088)	0.681 (0.058)	0.185 (0.022)		
M041059	M12_04	1.320 (0.057)	0.316 (0.023)			
M041046	M12_05	1.778 (0.113)	0.384 (0.026)	0.115 (0.013)		
M041169	M12_07	1.054 (0.079)	0.279 (0.049)	0.147 (0.021)		
M041276A	M12_13A	0.974 (0.045)	0.234 (0.029)			
M031083	M13_06	1.137 (0.088)	-0.120 (0.063)	0.238 (0.027)		
M031071	M13_07	1.146 (0.098)	0.748 (0.045)	0.158 (0.017)		
M041004	M14_01	1.131 (0.083)	-0.894 (0.089)	0.245 (0.039)		
M041023	M14_02	1.974 (0.133)	-0.541 (0.041)	0.224 (0.023)		
M041034	M14_03	1.044 (0.070)	-0.150 (0.055)	0.128 (0.023)		
M041087	M14_04	0.906 (0.042)	0.234 (0.031)			
M041302A	M14_06A	1.054 (0.074)	-0.590 (0.076)	0.188 (0.033)		
M041254	M14_07	1.066 (0.093)	0.487 (0.053)	0.212 (0.022)		
M041174	M14_11	1.134 (0.048)	-0.480 (0.031)			

() Standard errors appear in parentheses

**Exhibit D.9 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Applying**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031299	M01_07	1.378 (0.058)	0.062 (0.023)		
M031301	M01_08	1.230 (0.050)	-0.441 (0.028)		
M031134	M01_10	0.670 (0.039)	0.899 (0.055)		
M041039	M02_02	0.928 (0.086)	0.185 (0.074)	0.252 (0.028)	
M041094	M02_06	1.164 (0.126)	0.958 (0.053)	0.225 (0.018)	
M041330	M02_07	0.877 (0.074)	0.182 (0.067)	0.160 (0.026)	
M041300A	M02_08A	1.369 (0.059)	0.259 (0.023)		
M041300B	M02_08B	1.491 (0.064)	0.190 (0.022)		
M041274	M02_10	0.884 (0.041)	-0.058 (0.033)		
M031050	M03_03	1.396 (0.134)	0.731 (0.044)	0.266 (0.018)	
M031334	M03_05	1.718 (0.170)	0.885 (0.037)	0.255 (0.015)	
M031255	M03_06	1.210 (0.115)	0.444 (0.056)	0.317 (0.022)	
M031041	M03_07	1.036 (0.047)	0.289 (0.028)		
M031350A	M03_08A	1.255 (0.058)	0.524 (0.026)		
M031350C	M03_08C	0.974 (0.050)	0.795 (0.037)		
M031274	M03_09	0.968 (0.043)	-0.201 (0.033)		
M031240	M03_10	0.782 (0.037)	-0.178 (0.038)		
M041281	M04_05	1.428 (0.089)	-0.083 (0.040)	0.138 (0.019)	
M041146	M04_07	0.822 (0.037)	-0.248 (0.036)		
M041152	M04_08	1.333 (0.112)	0.646 (0.041)	0.196 (0.017)	
M041275	M04_11	0.524 (0.016)	-0.315 (0.032)	-1.366 (0.085)	1.366 (0.081)
M031303	M05_01	1.674 (0.122)	-0.076 (0.044)	0.298 (0.022)	
M031309	M05_02	1.375 (0.056)	-0.130 (0.024)		
M031245	M05_03	2.095 (0.172)	0.971 (0.027)	0.113 (0.010)	
M031242A	M05_04A	1.040 (0.044)	-0.087 (0.028)		
M031173	M05_07	1.985 (0.119)	-0.002 (0.029)	0.141 (0.016)	
M031172	M05_09	1.626 (0.098)	-0.029 (0.034)	0.127 (0.017)	
M041098	M06_02	1.868 (0.162)	0.693 (0.033)	0.254 (0.015)	
M041064	M06_03	0.838 (0.037)	-0.283 (0.035)		
M041158	M06_09	1.061 (0.081)	-0.085 (0.066)	0.214 (0.027)	
M041328	M06_10	0.947 (0.042)	-0.029 (0.030)		
M041155	M06_11	1.183 (0.087)	0.343 (0.043)	0.150 (0.019)	
M031098	M07_04	1.970 (0.139)	0.421 (0.028)	0.191 (0.015)	
M031254	M07_05	1.481 (0.117)	0.424 (0.039)	0.233 (0.018)	
M031351	M07_11	1.046 (0.082)	0.411 (0.048)	0.141 (0.020)	
M041289	M08_02	1.171 (0.096)	0.400 (0.048)	0.216 (0.020)	
M041125	M08_06	1.385 (0.119)	0.801 (0.038)	0.166 (0.015)	
M041268	M08_09	1.870 (0.170)	0.939 (0.032)	0.179 (0.012)	
M041264	M08_11	1.053 (0.101)	0.503 (0.059)	0.267 (0.022)	
M041182	M08_12	1.015 (0.043)	-1.114 (0.041)		
M041200	M08_13	0.686 (0.023)	-0.089 (0.026)	-0.260 (0.053)	0.260 (0.050)
M031183	M09_03	0.869 (0.033)	0.268 (0.023)	0.568 (0.036)	-0.568 (0.038)
M031187	M09_05	0.919 (0.077)	-0.332 (0.094)	0.257 (0.035)	
M031251	M09_06	1.854 (0.146)	0.597 (0.031)	0.210 (0.015)	

( ) Standard errors appear in parentheses

**Exhibit D.9 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Applying (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M031297	M09_08	1.052 (0.049)	0.514 (0.030)			
M031218	M09_09	1.588 (0.112)	0.230 (0.036)	0.198 (0.018)		
M031133	M09_12	1.106 (0.046)	-0.770 (0.035)			
M041107	M10_01	1.090 (0.074)	-0.820 (0.082)	0.180 (0.036)		
M041115A	M10_06A	0.922 (0.040)	-0.172 (0.032)			
M041160B	M10_07B	1.299 (0.054)	-0.951 (0.034)			
M041327	M10_08	0.673 (0.034)	0.197 (0.040)			
M031009	M11_02	1.135 (0.052)	0.522 (0.027)			
M031252	M11_03	1.224 (0.086)	0.006 (0.050)	0.181 (0.022)		
M031079B	M11_06B	1.277 (0.051)	-0.466 (0.028)			
M031004	M11_07	1.147 (0.103)	0.993 (0.044)	0.113 (0.014)		
M031043	M11_08	1.538 (0.109)	0.360 (0.035)	0.181 (0.017)		
M031325	M11_09	0.859 (0.045)	0.839 (0.041)			
M031088	M11_10	1.067 (0.085)	-0.184 (0.073)	0.249 (0.030)		
M031155	M11_12	1.610 (0.135)	0.471 (0.039)	0.274 (0.019)		
M041333	M12_08	1.398 (0.108)	0.705 (0.034)	0.132 (0.014)		
M041262	M12_09	1.375 (0.129)	0.818 (0.042)	0.218 (0.016)		
M041267	M12_10	0.604 (0.035)	0.803 (0.055)			
M041177	M12_11	1.257 (0.087)	-0.301 (0.058)	0.206 (0.026)		
M031346A	M13_01A	1.169 (0.047)	-0.284 (0.028)			
M031313	M13_05	0.692 (0.032)	-0.957 (0.051)			
M041124	M14_05	0.981 (0.042)	-0.021 (0.029)			
M041153	M14_08	1.192 (0.093)	0.411 (0.044)	0.174 (0.019)		
M041132	M14_09	0.624 (0.077)	0.797 (0.095)	0.168 (0.031)		
M041165	M14_10	0.406 (0.015)	0.663 (0.042)		-1.061 (0.085)	1.061 (0.094)
M041191	M14_12	1.053 (0.084)	-0.874 (0.107)	0.284 (0.044)		

( ) Standard errors appear in parentheses

**Exhibit D.10 IRT Parameters for TIMSS 2007 Fourth Grade Mathematics - Reasoning**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
M031106	M01_02	0.871 (0.039)	0.263 (0.032)		
M031282	M01_03	0.913 (0.030)	0.860 (0.024)	-0.613 (0.049)	0.613 (0.055)
M031227	M01_04	1.291 (0.070)	1.209 (0.039)		
M031335	M01_05	1.365 (0.100)	0.157 (0.044)	0.235 (0.020)	
M031068	M01_06	1.474 (0.063)	0.372 (0.022)		
M031045	M01_11	1.335 (0.092)	-0.235 (0.050)	0.172 (0.023)	
M041300C	M02_08C	1.215 (0.056)	0.570 (0.027)		
M041300D	M02_08D	1.264 (0.060)	0.737 (0.029)		
M041203	M02_11	0.954 (0.045)	0.237 (0.032)		
M031235	M03_01	0.858 (0.041)	0.561 (0.035)		
M031285	M03_02	0.904 (0.045)	0.845 (0.039)		
M031258	M03_04	1.054 (0.051)	0.826 (0.034)		
M031350B	M03_08B	1.022 (0.046)	0.171 (0.029)		
M041258A	M04_09A	1.464 (0.062)	0.046 (0.023)		
M041258B	M04_09B	1.125 (0.051)	0.478 (0.027)		
M041336	M04_13	1.132 (0.111)	1.045 (0.050)	0.166 (0.017)	
M031242C	M05_04C	1.209 (0.110)	0.497 (0.056)	0.326 (0.022)	
M031247	M05_05	0.608 (0.027)	1.285 (0.046)		-0.210 (0.054) 0.210 (0.075)
M041284	M06_12	0.799 (0.034)	0.831 (0.029)	0.387 (0.038)	-0.387 (0.050)
M041184	M06_14	1.189 (0.083)	-0.338 (0.061)	0.174 (0.026)	
M031064	M07_08	1.179 (0.103)	0.768 (0.047)	0.205 (0.018)	
M031135	M07_12	1.370 (0.093)	-0.302 (0.051)	0.178 (0.023)	
M041065B	M08_04B	1.072 (0.058)	1.243 (0.046)		
M041151	M08_10	0.838 (0.078)	-0.003 (0.095)	0.262 (0.033)	
M031016	M09_02	1.195 (0.056)	0.815 (0.030)		
M041115B	M10_06B	1.102 (0.048)	0.221 (0.027)		
M041265	M10_10	0.982 (0.081)	0.752 (0.048)	0.114 (0.017)	
M041199	M10_12	1.485 (0.010)	-0.325 (0.047)	0.171 (0.022)	
M031079C	M11_06C	0.821 (0.040)	0.582 (0.037)		
M041048	M12_06	1.102 (0.103)	0.690 (0.055)	0.257 (0.020)	
M041271	M12_12	0.947 (0.071)	-0.152 (0.070)	0.158 (0.028)	
M041276B	M12_13B	0.771 (0.043)	0.926 (0.048)		
M031346B	M13_01B	2.957 (0.130)	0.535 (0.015)		
M031346C	M13_01C	1.636 (0.060)	0.386 (0.015)	0.415 (0.021)	-0.415 (0.024)
M031379	M13_02	1.526 (0.070)	0.860 (0.026)		
M031380	M13_03	1.277 (0.066)	1.158 (0.037)		
M031185	M13_08	1.227 (0.097)	0.321 (0.050)	0.244 (0.022)	
M041302B	M14_06B	0.637 (0.031)	-0.228 (0.043)		
M041302C	M14_06C	1.003 (0.042)	-0.220 (0.031)		

( ) Standard errors appear in parentheses

**Exhibit D.11 IRT Parameters for TIMSS 2007 Fourth Grade Science - Life Science**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S031193	S01_04	0.772 (0.082)	-0.013 (0.106)	0.276 (0.037)	
S031264	S01_05	0.881 (0.068)	-0.485 (0.084)	0.158 (0.032)	
S031347	S01_06	0.830 (0.080)	-0.417 (0.115)	0.290 (0.040)	
S031346	S01_07	0.900 (0.059)	1.166 (0.059)		
S041007	S02_01	0.813 (0.083)	0.121 (0.090)	0.259 (0.034)	
S041164	S02_02	1.662 (0.138)	0.645 (0.031)	0.173 (0.016)	
S041018	S02_03	0.865 (0.035)	0.049 (0.021)		0.349 (0.038) -0.349 (0.035)
S041160	S02_04	0.697 (0.118)	1.498 (0.131)	0.184 (0.025)	
S041042	S02_05	0.754 (0.065)	-0.972 (0.143)	0.211 (0.048)	
S031229	S03_01	1.673 (0.156)	0.580 (0.036)	0.268 (0.019)	
S031270	S03_02	0.690 (0.054)	1.566 (0.102)		
S031026	S03_03	0.680 (0.024)	0.034 (0.024)		-0.442 (0.052) 0.442 (0.050)
S031319	S03_04	1.558 (0.197)	1.090 (0.051)	0.224 (0.015)	
S041165	S04_01	0.780 (0.102)	0.786 (0.082)	0.250 (0.028)	
S041023	S04_02	1.297 (0.060)	0.297 (0.022)		
S041047	S04_03	0.569 (0.055)	-0.799 (0.174)	0.175 (0.050)	
S041001	S04_04	0.450 (0.024)	0.399 (0.039)		0.149 (0.067) -0.149 (0.074)
S041029	S04_05	0.975 (0.045)	-0.481 (0.035)		
S041179	S04_08	0.960 (0.053)	0.639 (0.034)		
S031255	S05_01	1.024 (0.086)	-0.071 (0.068)	0.244 (0.029)	
S031240D	S05_02D	0.783 (0.030)	0.005 (0.025)		0.724 (0.042) -0.724 (0.038)
S031239	S05_03	1.146 (0.130)	0.190 (0.081)	0.468 (0.029)	
S031235A	S05_04A	1.896 (0.084)	0.400 (0.017)		
S031235B	S05_04B	2.095 (0.094)	0.504 (0.016)		
S041003	S06_03	0.756 (0.041)	0.249 (0.035)		
S041224	S06_04	1.123 (0.046)	0.504 (0.018)		0.305 (0.027) -0.305 (0.032)
S041163	S06_05	0.786 (0.120)	1.148 (0.095)	0.240 (0.026)	
S041039	S06_06	0.977 (0.048)	0.135 (0.028)		
S041014	S06_07	1.638 (0.256)	1.342 (0.070)	0.233 (0.014)	
S041181	S06_08	0.821 (0.041)	-0.214 (0.036)		
S041174	S06_09	1.017 (0.053)	0.549 (0.030)		
S031317	S07_01	1.022 (0.105)	0.053 (0.084)	0.387 (0.031)	
S031190	S07_02	1.267 (0.064)	0.602 (0.026)		
S031431	S07_03	0.911 (0.139)	1.474 (0.106)	0.163 (0.019)	
S031283	S07_04	0.685 (0.075)	-0.322 (0.146)	0.288 (0.045)	
S031426	S07_05	1.084 (0.087)	-0.008 (0.060)	0.222 (0.027)	
S041009	S08_01	1.018 (0.087)	-0.489 (0.091)	0.316 (0.035)	
S041223	S08_02	1.201 (0.108)	0.244 (0.055)	0.289 (0.025)	
S041026	S08_03	1.119 (0.108)	0.567 (0.050)	0.224 (0.022)	
S041177	S08_04	0.560 (0.030)	1.051 (0.048)		0.377 (0.049) -0.377 (0.072)
S041183	S08_05	0.742 (0.028)	0.332 (0.027)		0.892 (0.041) -0.892 (0.046)
S041008	S08_06	1.513 (0.135)	0.582 (0.037)	0.224 (0.019)	
S031340	S09_01	1.047 (0.119)	0.797 (0.057)	0.227 (0.022)	
S031236	S09_02	1.037 (0.078)	-0.545 (0.077)	0.212 (0.032)	

( ) Standard errors appear in parentheses

**Exhibit D.11 IRT Parameters for TIMSS 2007 Fourth Grade Science - Life Science (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S031361	S09_04	0.988 (0.102)	0.487 (0.062)	0.244 (0.026)	
S031001	S09_05	1.352 (0.091)	-0.413 (0.053)	0.203 (0.026)	
S041178	S10_02	0.894 (0.111)	0.810 (0.070)	0.249 (0.025)	
S041182	S10_03	0.764 (0.044)	0.513 (0.039)		
S041180	S10_04	1.709 (0.129)	0.293 (0.034)	0.229 (0.020)	
S041013A	S10_06A	0.733 (0.043)	0.529 (0.040)		
S041013B	S10_06B	0.753 (0.050)	1.112 (0.064)		
S031254	S11_01	0.670 (0.099)	0.572 (0.120)	0.340 (0.036)	
S031266	S11_02	1.371 (0.098)	0.188 (0.038)	0.170 (0.020)	
S031233	S11_03	0.810 (0.041)	-0.176 (0.035)		
S031281	S11_07	1.189 (0.089)	-0.792 (0.080)	0.250 (0.034)	
S041027	S12_01	0.866 (0.040)	-1.301 (0.057)		
S041043	S12_02	0.729 (0.038)	-0.245 (0.039)		
S041006	S12_05	0.602 (0.028)	0.489 (0.030)	0.137 (0.048)	-0.137 (0.055)
S041301	S12_07	0.869 (0.050)	0.718 (0.039)		
S041033	S12_09	1.175 (0.064)	0.849 (0.035)		
S031356	S13_01	1.171 (0.102)	-1.016 (0.111)	0.381 (0.041)	
S031291	S13_02	1.523 (0.100)	-0.665 (0.053)	0.197 (0.027)	
S031230	S13_03	0.848 (0.068)	-1.047 (0.127)	0.213 (0.045)	
S031325	S13_04	0.833 (0.046)	0.449 (0.034)		
S031390D	S13_11D	1.149 (0.046)	0.254 (0.017)	0.255 (0.029)	-0.255 (0.029)
S041010	S14_01	1.467 (0.097)	-0.482 (0.051)	0.211 (0.026)	
S041034	S14_02	0.645 (0.065)	-0.404 (0.138)	0.208 (0.044)	
S041017	S14_03	0.856 (0.111)	0.915 (0.074)	0.232 (0.025)	
S041124	S14_04	1.327 (0.155)	0.895 (0.050)	0.258 (0.019)	
S041037	S14_06	0.625 (0.025)	0.241 (0.025)	-0.250 (0.051)	0.250 (0.053)
S041032	S14_11	1.185 (0.055)	-0.972 (0.043)		

( ) Standard errors appear in parentheses

**Exhibit D.12 IRT Parameters for TIMSS 2007 Fourth Grade Science - Physical Science**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S031446A	S01_01A	1.730 (0.081)	0.575 (0.021)		
S031446B	S01_01B	1.334 (0.068)	0.740 (0.029)		
S031446C	S01_01C	0.823 (0.042)	0.014 (0.033)		
S031445A	S01_02A	2.717 (0.116)	0.388 (0.014)		
S031445B	S01_02B	1.370 (0.061)	-0.467 (0.028)		
S031447	S01_03	0.552 (0.029)	0.931 (0.044)	0.490 (0.050)	-0.490 (0.071)
S041079	S02_06	0.934 (0.069)	-0.780 (0.089)	0.163 (0.033)	
S041073	S02_07	0.681 (0.037)	0.064 (0.038)		
S041217	S02_08	0.927 (0.080)	0.265 (0.058)	0.169 (0.024)	
S041196	S02_09	0.645 (0.070)	-0.295 (0.141)	0.242 (0.044)	
S041211	S02_10	0.887 (0.044)	-0.041 (0.031)		
S041051	S02_11	0.994 (0.147)	1.145 (0.083)	0.272 (0.022)	
S031414A	S03_05A	3.273 (0.140)	-0.028 (0.012)		
S031414B	S03_05B	2.932 (0.125)	-0.060 (0.013)		
S031078	S03_06	0.727 (0.078)	0.185 (0.096)	0.231 (0.034)	
S031009	S03_07	0.727 (0.039)	-0.133 (0.038)		
S041054	S04_06	0.548 (0.058)	-1.317 (0.269)	0.265 (0.072)	
S041308	S04_07	0.829 (0.094)	0.624 (0.074)	0.237 (0.027)	
S041216	S04_11	0.668 (0.039)	0.399 (0.041)		
S041061	S04_12	0.897 (0.045)	-0.108 (0.032)		
S031205	S05_05	0.556 (0.074)	0.312 (0.144)	0.237 (0.043)	
S031399A	S05_06A	3.148 (0.133)	0.279 (0.012)		
S031399B	S05_06B	2.890 (0.122)	0.122 (0.013)		
S041117	S06_01	0.503 (0.046)	-2.274 (0.332)	0.265 (0.091)	
S041120	S06_02	0.729 (0.149)	1.423 (0.157)	0.410 (0.026)	
S041049	S06_10	1.021 (0.098)	0.514 (0.055)	0.212 (0.023)	
S041060	S06_12	0.945 (0.060)	1.160 (0.057)		
S031422	S07_06	0.934 (0.080)	-0.963 (0.120)	0.279 (0.042)	
S031427	S07_07	0.841 (0.072)	-0.020 (0.071)	0.167 (0.028)	
S031075	S07_08	0.577 (0.107)	0.928 (0.156)	0.383 (0.037)	
S041195	S08_08	0.977 (0.059)	1.005 (0.048)		
S041134A	S08_09A	1.709 (0.075)	0.386 (0.019)		
S041134B	S08_09B	1.694 (0.073)	0.156 (0.019)		
S041134C	S08_09C	0.974 (0.089)	0.514 (0.052)	0.165 (0.022)	
S041191	S08_10	0.662 (0.095)	0.938 (0.010)	0.230 (0.030)	
S031410	S09_07	0.529 (0.072)	0.087 (0.176)	0.256 (0.048)	
S031421	S09_08	0.634 (0.034)	-0.423 (0.047)		
S031298	S09_09	1.133 (0.198)	1.543 (0.115)	0.253 (0.017)	
S031076	S09_10	1.007 (0.053)	0.499 (0.030)		
S041311	S10_01	0.748 (0.061)	-2.003 (0.213)	0.252 (0.075)	
S041187	S10_05	1.084 (0.190)	1.632 (0.128)	0.209 (0.016)	
S041067	S10_07	0.988 (0.046)	-0.222 (0.031)		
S041305	S10_08	1.409 (0.127)	0.618 (0.038)	0.200 (0.018)	
S041048	S10_09	1.038 (0.051)	0.293 (0.027)		

( ) Standard errors appear in parentheses



**Exhibit D.12 IRT Parameters for TIMSS 2007 Fourth Grade Science - Physical Science (Continued)**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
S041069	S10_11	1.235 (0.114)	0.333 (0.054)	0.296 (0.024)	
S031204	S11_04	0.760 (0.045)	0.572 (0.041)		
S031273	S11_05	1.784 (0.138)	0.345 (0.033)	0.235 (0.019)	
S031299	S11_06	0.723 (0.042)	0.517 (0.041)		
S031077	S11_08	1.145 (0.099)	-0.088 (0.068)	0.329 (0.029)	
S031311	S11_09	1.363 (0.108)	0.213 (0.045)	0.240 (0.023)	
S041050	S12_03	0.680 (0.085)	0.721 (0.088)	0.204 (0.029)	
S041070	S12_04	1.173 (0.094)	0.366 (0.044)	0.182 (0.021)	
S041052	S12_06	1.238 (0.102)	-0.133 (0.063)	0.332 (0.028)	
S041080	S12_08	0.812 (0.118)	1.394 (0.104)	0.169 (0.020)	
S041077	S12_11	1.152 (0.055)	0.344 (0.025)		
S031068	S13_05	1.198 (0.010)	0.486 (0.043)	0.173 (0.020)	
S031418	S13_06	1.200 (0.104)	0.664 (0.041)	0.145 (0.018)	
S031197D	S13_07D	0.645 (0.023)	-0.457 (0.031)		-0.377 (0.061) 0.377 (0.051)
S031371	S13_08	1.133 (0.105)	0.575 (0.048)	0.198 (0.021)	
S041186	S14_05	0.652 (0.044)	1.128 (0.069)		
S041119	S14_07	0.642 (0.084)	-0.141 (0.171)	0.383 (0.045)	
S041193	S14_09	0.494 (0.053)	-0.552 (0.197)	0.174 (0.053)	
S041068	S14_12	0.726 (0.041)	0.386 (0.038)		
S041303	S14_13	0.545 (0.080)	0.784 (0.126)	0.209 (0.038)	

( ) Standard errors appear in parentheses

**Exhibit D.13 IRT Parameters for TIMSS 2007 Fourth Grade Science - Earth Science**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S031081 S01_08	0.668 (0.034)	-0.574 (0.050)			
S041089 S02_12	1.350 (0.108)	0.277 (0.045)	0.268 (0.022)		
S041156A S02_13A	3.261 (0.222)	0.106 (0.021)	0.241 (0.018)		
S041156B S02_13B	1.652 (0.076)	0.283 (0.019)			
S031401 S03_08	1.552 (0.158)	0.708 (0.042)	0.291 (0.019)		
S031384A S03_09A	1.265 (0.057)	-0.985 (0.044)			
S031384B S03_09B	1.329 (0.066)	-0.274 (0.029)			
S041087 S04_09	1.908 (0.153)	0.563 (0.030)	0.222 (0.017)		
S041205 S04_10	1.507 (0.127)	0.458 (0.041)	0.276 (0.020)		
S041202 S04_13	0.544 (0.020)	0.662 (0.031)		-1.164 (0.073)	1.164 (0.079)
S041215 S04_14	1.837 (0.193)	0.849 (0.035)	0.235 (0.017)		
S031393 S05_07	0.700 (0.033)	-1.347 (0.068)			
S031278 S05_08	0.566 (0.032)	-0.595 (0.059)			
S041208 S06_11	0.592 (0.128)	1.399 (0.176)	0.379 (0.030)		
S041201A S06_13A	2.492 (0.106)	0.262 (0.014)			
S041201B S06_13B	2.385 (0.105)	0.353 (0.015)			
S031047 S07_09	0.727 (0.039)	0.028 (0.037)			
S031387 S07_10	1.199 (0.166)	1.176 (0.065)	0.197 (0.019)		
S031396D S07_11D	0.502 (0.018)	-0.912 (0.047)		-0.466 (0.085)	0.466 (0.067)
S041107 S08_11	0.555 (0.019)	-0.415 (0.034)		-0.847 (0.074)	0.847 (0.065)
S041113 S08_12	1.091 (0.056)	0.384 (0.026)			
S031391D S09_03D	0.630 (0.028)	0.487 (0.028)		0.034 (0.048)	-0.034 (0.053)
S031275 S09_11	1.144 (0.169)	1.288 (0.077)	0.206 (0.018)		
S041110 S10_10	0.835 (0.042)	-0.147 (0.035)			
S041100 S10_12	1.563 (0.125)	0.539 (0.035)	0.213 (0.018)		
S041092 S10_13	1.205 (0.117)	0.464 (0.055)	0.326 (0.023)		
S031088D S11_10D	0.613 (0.020)	0.283 (0.035)		1.299 (0.052)	-1.299 (0.056)
S031389 S11_11	1.003 (0.112)	0.881 (0.059)	0.204 (0.021)		
S041209 S12_12	1.163 (0.105)	0.637 (0.046)	0.199 (0.020)		
S041081 S12_13	0.653 (0.026)	0.552 (0.027)		-0.402 (0.051)	0.402 (0.056)
S041102 S12_14	1.448 (0.116)	0.203 (0.046)	0.305 (0.023)		
S031376 S13_09	1.068 (0.114)	0.854 (0.054)	0.206 (0.020)		
S031044 S13_10	1.082 (0.054)	0.211 (0.026)			
S041105 S14_08	1.336 (0.099)	0.209 (0.042)	0.235 (0.021)		
S041149D S14_10D	0.685 (0.025)	0.781 (0.028)		-0.784 (0.057)	0.784 (0.064)

( ) Standard errors appear in parentheses

**Exhibit D.14 IRT Parameters for TIMSS 2007 Fourth Grade Science - Knowing**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S041164	S02_02	1.360 (0.126)	0.718 (0.041)	0.194 (0.018)	
S041018	S02_03	0.746 (0.032)	0.008 (0.024)		0.342 (0.043) -0.342 (0.040)
S041160	S02_04	0.663 (0.118)	1.568 (0.148)	0.190 (0.026)	
S041042	S02_05	0.723 (0.062)	-1.044 (0.147)	0.202 (0.048)	
S041196	S02_09	0.774 (0.075)	-0.191 (0.104)	0.246 (0.038)	
S041089	S02_12	1.087 (0.092)	0.150 (0.057)	0.219 (0.027)	
S031229	S03_01	1.836 (0.185)	0.683 (0.038)	0.316 (0.018)	
S031319	S03_04	1.415 (0.179)	1.125 (0.056)	0.222 (0.017)	
S031414A	S03_05A	3.337 (0.143)	0.003 (0.012)		
S031414B	S03_05B	3.218 (0.138)	-0.024 (0.012)		
S031384A	S03_09A	0.789 (0.041)	-1.169 (0.063)		
S041165	S04_01	0.734 (0.097)	0.809 (0.090)	0.239 (0.031)	
S041023	S04_02	1.163 (0.056)	0.336 (0.024)		
S041308	S04_07	1.159 (0.118)	0.599 (0.053)	0.258 (0.024)	
S041202	S04_13	0.596 (0.021)	0.618 (0.029)		-1.066 (0.067) 1.066 (0.072)
S031255	S05_01	1.058 (0.084)	-0.111 (0.064)	0.224 (0.029)	
S031240D	S05_02D	0.877 (0.033)	0.009 (0.023)		0.685 (0.038) -0.685 (0.034)
S031239	S05_03	0.802 (0.093)	-0.054 (0.124)	0.397 (0.039)	
S031205	S05_05	0.832 (0.088)	0.322 (0.082)	0.250 (0.032)	
S031393	S05_07	0.919 (0.047)	-1.007 (0.054)		
S031278	S05_08	0.729 (0.041)	-0.428 (0.046)		
S041117	S06_01	0.610 (0.063)	-1.781 (0.288)	0.324 (0.079)	
S041120	S06_02	1.245 (0.237)	1.238 (0.092)	0.442 (0.019)	
S041003	S06_03	0.760 (0.042)	0.226 (0.034)		
S041224	S06_04	1.126 (0.046)	0.477 (0.018)		0.306 (0.027) -0.306 (0.032)
S041014	S06_07	1.744 (0.246)	1.251 (0.055)	0.227 (0.014)	
S041181	S06_08	0.883 (0.044)	-0.215 (0.033)		
S041208	S06_11	0.682 (0.122)	1.077 (0.127)	0.350 (0.033)	
S031317	S07_01	0.953 (0.103)	0.055 (0.094)	0.392 (0.034)	
S031283	S07_04	0.732 (0.073)	-0.367 (0.126)	0.260 (0.043)	
S031422	S07_06	1.084 (0.087)	-0.743 (0.092)	0.284 (0.038)	
S031396D	S07_11D	0.619 (0.024)	-0.699 (0.038)		-0.386 (0.069) 0.386 (0.054)
S041009	S08_01	0.996 (0.083)	-0.522 (0.091)	0.294 (0.036)	
S041223	S08_02	1.248 (0.112)	0.251 (0.053)	0.292 (0.025)	
S041026	S08_03	0.997 (0.096)	0.536 (0.056)	0.203 (0.024)	
S041008	S08_06	1.374 (0.119)	0.550 (0.040)	0.205 (0.020)	
S041191	S08_10	0.875 (0.112)	0.862 (0.075)	0.246 (0.026)	
S041107	S08_11	0.589 (0.020)	-0.375 (0.030)		-0.836 (0.069) 0.836 (0.062)
S031340	S09_01	1.115 (0.122)	0.787 (0.055)	0.234 (0.021)	
S031236	S09_02	0.977 (0.071)	-0.636 (0.078)	0.174 (0.031)	
S031391D	S09_03D	0.647 (0.029)	0.457 (0.028)		0.011 (0.046) -0.011 (0.052)
S031410	S09_07	0.637 (0.073)	0.024 (0.126)	0.238 (0.040)	
S031421	S09_08	0.682 (0.037)	-0.398 (0.044)		
S041311	S10_01	0.830 (0.077)	-1.665 (0.199)	0.331 (0.064)	

( ) Standard errors appear in parentheses

**Exhibit D.14 IRT Parameters for TIMSS 2007 Fourth Grade Science - Knowing (Continued)**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S041178 S10_02	1.013 (0.120)	0.797 (0.064)	0.263 (0.024)		
S041187 S10_05	1.220 (0.215)	1.499 (0.104)	0.208 (0.016)		
S041067 S10_07	1.113 (0.052)	-0.175 (0.027)			
S041110 S10_10	0.959 (0.047)	-0.114 (0.030)			
S041100 S10_12	1.506 (0.122)	0.466 (0.035)	0.192 (0.019)		
S041092 S10_13	1.127 (0.112)	0.366 (0.060)	0.295 (0.027)		
S031254 S11_01	0.631 (0.096)	0.588 (0.134)	0.335 (0.039)		
S031233 S11_03	0.850 (0.043)	-0.147 (0.033)			
S031299 S11_06	0.841 (0.047)	0.494 (0.035)			
S031281 S11_07	1.232 (0.088)	-0.770 (0.073)	0.225 (0.033)		
S031311 S11_09	1.393 (0.108)	0.184 (0.043)	0.216 (0.023)		
S031088D S11_10D	0.773 (0.026)	0.272 (0.028)		1.064 (0.041)	-1.064 (0.045)
S031389 S11_11	1.125 (0.123)	0.820 (0.054)	0.208 (0.022)		
S041027 S12_01	0.952 (0.045)	-1.175 (0.053)			
S041043 S12_02	0.730 (0.039)	-0.225 (0.038)			
S041070 S12_04	1.093 (0.089)	0.354 (0.047)	0.164 (0.022)		
S041052 S12_06	0.950 (0.083)	-0.265 (0.086)	0.277 (0.035)		
S041209 S12_12	0.954 (0.098)	0.660 (0.059)	0.192 (0.024)		
S041081 S12_13	0.696 (0.027)	0.526 (0.025)		-0.386 (0.048)	0.386 (0.053)
S031356 S13_01	1.188 (0.102)	-0.967 (0.105)	0.381 (0.041)		
S031230 S13_03	0.992 (0.077)	-0.873 (0.099)	0.235 (0.039)		
S031197D S13_07D	0.676 (0.024)	-0.396 (0.029)		-0.383 (0.057)	0.383 (0.049)
S031376 S13_09	1.019 (0.113)	0.843 (0.059)	0.200 (0.023)		
S041010 S14_01	1.528 (0.100)	-0.444 (0.049)	0.210 (0.027)		
S041034 S14_02	0.742 (0.069)	-0.310 (0.110)	0.218 (0.039)		
S041186 S14_05	0.793 (0.050)	0.988 (0.054)			
S041105 S14_08	1.199 (0.084)	0.045 (0.044)	0.144 (0.023)		
S041032 S14_11	1.341 (0.064)	-0.858 (0.038)			
S041068 S14_12	0.966 (0.051)	0.360 (0.029)			
S041303 S14_13	0.726 (0.085)	0.608 (0.085)	0.193 (0.032)		

( ) Standard errors appear in parentheses

**Exhibit D.15 IRT Parameters for TIMSS 2007 Fourth Grade Science - Applying**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
S031193	S01_04	0.641 (0.069)	-0.216 (0.130)	0.228 (0.040)	
S031264	S01_05	0.845 (0.067)	-0.531 (0.089)	0.167 (0.031)	
S031347	S01_06	0.672 (0.068)	-0.662 (0.153)	0.247 (0.045)	
S031081	S01_08	0.730 (0.038)	-0.513 (0.046)		
S041007	S02_01	0.749 (0.078)	0.085 (0.096)	0.249 (0.034)	
S041073	S02_07	0.740 (0.041)	0.126 (0.035)		
S041211	S02_10	1.060 (0.052)	0.042 (0.027)		
S041051	S02_11	1.218 (0.163)	1.028 (0.060)	0.264 (0.020)	
S041156A	S02_13A	2.273 (0.148)	0.061 (0.028)	0.211 (0.020)	
S041156B	S02_13B	1.674 (0.076)	0.284 (0.019)		
S031009	S03_07	0.833 (0.044)	-0.085 (0.034)		
S031401	S03_08	1.562 (0.146)	0.600 (0.039)	0.256 (0.020)	
S031384B	S03_09B	0.945 (0.048)	-0.392 (0.038)		
S041047	S04_03	0.524 (0.058)	-0.724 (0.210)	0.215 (0.055)	
S041001	S04_04	0.450 (0.024)	0.431 (0.039)		0.143 (0.067) -0.143 (0.074)
S041054	S04_06	0.699 (0.074)	-0.911 (0.186)	0.343 (0.051)	
S041087	S04_09	1.454 (0.117)	0.489 (0.036)	0.185 (0.019)	
S041205	S04_10	1.052 (0.087)	0.267 (0.052)	0.189 (0.024)	
S041216	S04_11	0.869 (0.047)	0.359 (0.032)		
S041061	S04_12	1.067 (0.052)	-0.067 (0.028)		
S041215	S04_14	1.240 (0.131)	0.809 (0.047)	0.193 (0.020)	
S031235A	S05_04A	1.458 (0.068)	0.435 (0.021)		
S031235B	S05_04B	1.534 (0.072)	0.555 (0.021)		
S031399A	S05_06A	1.661 (0.074)	0.328 (0.018)		
S031399B	S05_06B	1.505 (0.069)	0.143 (0.020)		
S041163	S06_05	0.795 (0.133)	1.248 (0.107)	0.263 (0.026)	
S041039	S06_06	0.955 (0.048)	0.131 (0.028)		
S041174	S06_09	0.916 (0.051)	0.570 (0.033)		
S041060	S06_12	1.175 (0.070)	1.047 (0.043)		
S041201A	S06_13A	1.858 (0.082)	0.281 (0.017)		
S041201B	S06_13B	1.710 (0.080)	0.375 (0.019)		
S031427	S07_07	0.906 (0.081)	0.160 (0.068)	0.216 (0.027)	
S031075	S07_08	0.678 (0.121)	0.940 (0.128)	0.394 (0.033)	
S031387	S07_10	1.121 (0.147)	1.126 (0.064)	0.177 (0.020)	
S041177	S08_04	0.519 (0.029)	1.104 (0.053)		0.382 (0.053) -0.382 (0.078)
S041183	S08_05	0.811 (0.030)	0.315 (0.026)		0.857 (0.038) -0.857 (0.042)
S041195	S08_08	0.974 (0.060)	1.025 (0.048)		
S041113	S08_12	1.069 (0.055)	0.361 (0.027)		
S031001	S09_05	1.269 (0.091)	-0.369 (0.058)	0.236 (0.027)	
S031298	S09_09	1.145 (0.227)	1.528 (0.122)	0.255 (0.018)	
S031275	S09_11	1.044 (0.146)	1.221 (0.076)	0.184 (0.019)	
S041182	S10_03	0.816 (0.046)	0.501 (0.036)		
S041180	S10_04	1.581 (0.118)	0.291 (0.036)	0.224 (0.020)	
S041013A	S10_06A	0.744 (0.044)	0.529 (0.040)		

( ) Standard errors appear in parentheses

**Exhibit D.15 IRT Parameters for TIMSS 2007 Fourth Grade Science - Applying (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S041013B S10_06B	0.748 (0.051)	1.121 (0.065)			
S041069 S10_11	1.251 (0.117)	0.369 (0.053)	0.303 (0.024)		
S031204 S11_04	0.788 (0.047)	0.570 (0.039)			
S031273 S11_05	1.570 (0.120)	0.334 (0.036)	0.219 (0.020)		
S031077 S11_08	1.038 (0.093)	-0.109 (0.075)	0.318 (0.030)		
S041006 S12_05	0.576 (0.028)	0.503 (0.031)		0.132 (0.051)	-0.132 (0.058)
S041301 S12_07	0.833 (0.049)	0.740 (0.041)			
S041033 S12_09	1.233 (0.066)	0.834 (0.033)			
S041077 S12_11	1.006 (0.052)	0.379 (0.028)			
S041102 S12_14	1.161 (0.102)	0.144 (0.059)	0.285 (0.027)		
S031291 S13_02	1.615 (0.112)	-0.568 (0.052)	0.244 (0.026)		
S031325 S13_04	0.833 (0.046)	0.455 (0.034)			
S031418 S13_06	1.044 (0.097)	0.721 (0.047)	0.143 (0.019)		
S031371 S13_08	1.071 (0.102)	0.604 (0.050)	0.197 (0.022)		
S031390D S13_11D	1.058 (0.043)	0.265 (0.018)		0.249 (0.031)	-0.249 (0.031)
S041017 S14_03	1.036 (0.128)	0.900 (0.062)	0.253 (0.022)		
S041124 S14_04	1.276 (0.160)	0.955 (0.054)	0.269 (0.019)		
S041119 S14_07	0.922 (0.102)	0.037 (0.098)	0.422 (0.032)		
S041193 S14_09	0.561 (0.058)	-0.490 (0.158)	0.177 (0.045)		

( ) Standard errors appear in parentheses

**Exhibit D.16 IRT Parameters for TIMSS 2007 Fourth Grade Science - Reasoning**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S031446A	S01_01A	1.572 (0.074)	0.662 (0.023)		
S031446B	S01_01B	1.244 (0.063)	0.833 (0.030)		
S031446C	S01_01C	0.771 (0.037)	0.043 (0.035)		
S031445A	S01_02A	2.449 (0.107)	0.463 (0.015)		
S031445B	S01_02B	1.270 (0.051)	-0.502 (0.029)		
S031447	S01_03	0.539 (0.027)	1.002 (0.045)	0.513 (0.051)	-0.513 (0.073)
S031346	S01_07	0.761 (0.050)	1.331 (0.070)		
S041079	S02_06	0.926 (0.067)	-0.741 (0.099)	0.181 (0.041)	
S041217	S02_08	0.998 (0.093)	0.422 (0.059)	0.212 (0.024)	
S031270	S03_02	0.676 (0.049)	1.634 (0.097)		
S031026	S03_03	0.654 (0.021)	0.030 (0.025)	-0.424 (0.054)	0.424 (0.052)
S031078	S03_06	0.770 (0.081)	0.195 (0.099)	0.234 (0.035)	
S041029	S04_05	0.777 (0.035)	-0.593 (0.041)		
S041179	S04_08	0.902 (0.046)	0.695 (0.036)		
S041049	S06_10	1.143 (0.102)	0.508 (0.048)	0.203 (0.020)	
S031190	S07_02	1.074 (0.053)	0.630 (0.031)		
S031431	S07_03	0.755 (0.127)	1.647 (0.132)	0.159 (0.020)	
S031426	S07_05	0.861 (0.081)	-0.056 (0.094)	0.245 (0.034)	
S031047	S07_09	0.670 (0.034)	-0.011 (0.040)		
S041134A	S08_09A	1.554 (0.068)	0.454 (0.020)		
S041134B	S08_09B	1.459 (0.062)	0.193 (0.022)		
S041134C	S08_09C	0.910 (0.088)	0.582 (0.058)	0.165 (0.023)	
S031361	S09_04	0.762 (0.101)	0.716 (0.091)	0.274 (0.031)	
S031076	S09_10	0.836 (0.043)	0.586 (0.036)		
S041305	S10_08	1.136 (0.109)	0.724 (0.047)	0.197 (0.019)	
S041048	S10_09	0.992 (0.045)	0.337 (0.028)		
S031266	S11_02	1.424 (0.099)	0.216 (0.038)	0.167 (0.018)	
S041050	S12_03	0.724 (0.101)	0.901 (0.089)	0.246 (0.029)	
S041080	S12_08	0.866 (0.128)	1.432 (0.095)	0.176 (0.019)	
S031068	S13_05	1.541 (0.139)	0.660 (0.037)	0.242 (0.017)	
S031044	S13_10	0.800 (0.039)	0.208 (0.034)		
S041037	S14_06	0.521 (0.020)	0.273 (0.030)	-0.325 (0.061)	0.325 (0.063)
S041149D	S14_10D	0.481 (0.018)	0.977 (0.041)	-1.220 (0.080)	1.220 (0.090)

( ) Standard errors appear in parentheses

**Exhibit D.17 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Number**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M022043	M01_01	0.643 (0.049)	-0.274 (0.125)	0.156 (0.045)	
M022046	M01_02	0.847 (0.031)	-0.266 (0.029)		
M022057	M01_06	0.542 (0.064)	0.304 (0.186)	0.285 (0.050)	
M022066	M01_09	1.164 (0.063)	0.370 (0.035)	0.083 (0.014)	
M022097	M03_01	1.121 (0.062)	0.092 (0.042)	0.112 (0.019)	
M022104	M03_03	0.993 (0.057)	-0.085 (0.053)	0.117 (0.024)	
M022106	M03_05	0.970 (0.038)	0.889 (0.033)		
M022110	M03_07	0.651 (0.028)	-0.421 (0.037)		
M022232	M01_10	0.642 (0.021)	1.707 (0.042)	-1.994 (0.109)	1.994 (0.121)
M022234B	M01_11B	0.823 (0.026)	1.392 (0.029)	-1.696 (0.097)	1.696 (0.103)
M032064	M09_03	1.557 (0.058)	0.815 (0.022)		
M032094	M09_01	1.302 (0.082)	0.158 (0.044)	0.227 (0.020)	
M032142	M05_01	1.197 (0.148)	1.335 (0.064)	0.406 (0.014)	
M032160	M07_03	2.167 (0.188)	1.394 (0.030)	0.139 (0.008)	
M032166	M13_01	0.918 (0.061)	0.155 (0.060)	0.155 (0.025)	
M032307	M03_09	1.385 (0.055)	1.108 (0.028)		
M032381	M07_01	1.057 (0.038)	0.463 (0.025)		
M032416	M07_02	1.209 (0.078)	0.985 (0.035)	0.092 (0.011)	
M032523	M03_10	1.893 (0.158)	1.267 (0.033)	0.168 (0.009)	
M032525	M03_13	0.927 (0.059)	0.180 (0.057)	0.135 (0.024)	
M032529	M07_12	1.927 (0.143)	1.104 (0.029)	0.160 (0.009)	
M032595	M13_08	1.148 (0.066)	0.346 (0.037)	0.096 (0.016)	
M032626	M13_07	0.665 (0.060)	0.538 (0.091)	0.166 (0.031)	
M032662	M09_02	1.769 (0.153)	1.442 (0.036)	0.126 (0.008)	
M032701	M03_11	1.289 (0.075)	-0.880 (0.062)	0.180 (0.037)	
M032704	M03_12	1.212 (0.071)	-0.093 (0.046)	0.164 (0.023)	
M032725	M11_02	0.930 (0.039)	1.114 (0.038)		
M032755	M05_06	0.853 (0.029)	1.499 (0.033)	-0.404 (0.046)	0.404 (0.062)
M042001	M04_01	0.764 (0.057)	-0.252 (0.104)	0.199 (0.041)	
M042002	M10_04	0.812 (0.034)	1.064 (0.041)		
M042003	M02_01	0.788 (0.060)	0.049 (0.091)	0.216 (0.034)	
M042015	M12_01	0.747 (0.056)	-0.248 (0.107)	0.199 (0.041)	
M042016	M10_03	0.961 (0.078)	0.760 (0.055)	0.216 (0.020)	
M042018	M02_03	0.965 (0.035)	0.597 (0.028)		
M042019	M08_03	0.916 (0.035)	0.687 (0.030)		
M042022	M04_02	0.954 (0.098)	1.105 (0.063)	0.283 (0.019)	
M042023	M08_04	1.161 (0.042)	0.617 (0.025)		
M042024	M10_02	1.548 (0.085)	0.284 (0.030)	0.137 (0.014)	
M042031	M06_02	1.426 (0.010)	0.698 (0.037)	0.224 (0.014)	
M042032	M06_01	0.921 (0.071)	-0.162 (0.092)	0.311 (0.035)	
M042039	M02_05	0.718 (0.049)	0.513 (0.062)	0.085 (0.022)	
M042041	M10_01	1.285 (0.081)	-0.192 (0.053)	0.257 (0.025)	
M042052	M14_04	1.133 (0.063)	0.049 (0.042)	0.115 (0.019)	
M042055	M02_04	1.263 (0.110)	0.973 (0.047)	0.289 (0.015)	

( ) Standard errors appear in parentheses



**Exhibit D.17 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Number (Continued)**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
M042059	M06_04	0.894 (0.024)	0.253 (0.018)	-0.108 (0.033)	0.108 (0.035)
M042060	M08_02	1.383 (0.079)	0.317 (0.034)	0.145 (0.015)	
M042079	M02_02	1.106 (0.080)	-0.083 (0.069)	0.320 (0.028)	
M042081	M14_02	0.937 (0.038)	0.919 (0.034)		
M042114A	M12_04A	3.182 (0.122)	-0.002 (0.012)		
M042114B	M12_04B	3.456 (0.137)	0.247 (0.011)		
M042182	M14_01	1.105 (0.086)	0.327 (0.059)	0.310 (0.022)	
M042183	M08_01	0.753 (0.053)	-0.057 (0.087)	0.151 (0.034)	
M042186	M06_03	1.033 (0.037)	0.500 (0.026)		
M042194	M12_03	1.060 (0.038)	-0.319 (0.024)		
M042196	M12_02	0.899 (0.051)	0.255 (0.045)	0.071 (0.018)	
M042197	M08_05	1.180 (0.046)	0.997 (0.029)		
M042302A	M14_06A	1.429 (0.041)	0.498 (0.014)	0.003 (0.023)	-0.003 (0.026)
M042302B	M14_06B	1.597 (0.044)	0.600 (0.013)	-0.226 (0.026)	0.226 (0.028)
M042302C	M14_06C	0.642 (0.021)	1.440 (0.039)	-0.590 (0.054)	0.590 (0.071)
M042304A	M04_05A	1.552 (0.053)	-0.243 (0.018)		
M042304B	M04_05B	1.304 (0.042)	0.798 (0.017)	0.431 (0.022)	-0.431 (0.030)
M042304C	M04_05C	2.070 (0.081)	0.857 (0.019)		
M042304D	M04_05D	0.699 (0.017)	0.428 (0.021)	-1.091 (0.055)	1.091 (0.058)

( ) Standard errors appear in parentheses

**Exhibit D.18 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Algebra**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M022050	M01_04	0.956 (0.084)	1.408 (0.057)	0.169 (0.013)	
M032047	M11_09	1.098 (0.134)	1.341 (0.072)	0.436 (0.015)	
M032163	M05_10	1.244 (0.099)	0.895 (0.043)	0.218 (0.014)	
M032198	M05_02	1.002 (0.071)	0.544 (0.050)	0.187 (0.019)	
M032273	M07_04	0.777 (0.058)	-0.141 (0.097)	0.222 (0.035)	
M032295	M11_05	1.202 (0.068)	-0.551 (0.055)	0.172 (0.027)	
M032352	M11_01	1.008 (0.095)	0.692 (0.069)	0.390 (0.020)	
M032419	M09_04	1.134 (0.096)	1.067 (0.048)	0.241 (0.014)	
M032424	M11_12	0.938 (0.067)	0.662 (0.051)	0.160 (0.018)	
M032477	M09_05	1.280 (0.095)	0.852 (0.041)	0.224 (0.014)	
M032538	M09_06	1.220 (0.042)	0.428 (0.023)		
M032540	M07_05	1.115 (0.088)	0.444 (0.058)	0.327 (0.020)	
M032640	M05_03	0.483 (0.017)	1.888 (0.060)		-0.943 (0.074) 0.943 (0.101)
M032673	M13_09	1.203 (0.088)	0.715 (0.043)	0.219 (0.016)	
M032683	M11_03	0.542 (0.015)	1.004 (0.031)		-1.394 (0.071) 1.394 (0.079)
M032698	M07_06	0.783 (0.060)	0.767 (0.061)	0.134 (0.020)	
M032738	M11_04	1.123 (0.064)	-0.212 (0.050)	0.151 (0.023)	
M032757	M13_03	0.500 (0.012)	-0.211 (0.026)		-1.889 (0.084) 1.889 (0.082)
M032760A	M13_04A	1.107 (0.030)	0.814 (0.017)		-0.898 (0.050) 0.898 (0.053)
M032760B	M13_04B	1.947 (0.083)	1.130 (0.022)		
M032760C	M13_04C	2.166 (0.106)	1.364 (0.024)		
M032761	M13_05	1.160 (0.041)	1.455 (0.026)		-0.181 (0.036) 0.181 (0.048)
M042049	M14_03	0.835 (0.062)	0.035 (0.085)	0.243 (0.031)	
M042050	M12_07	0.943 (0.037)	0.899 (0.033)		
M042066	M08_07	0.619 (0.026)	0.506 (0.040)		
M042067	M10_08	1.460 (0.139)	1.295 (0.045)	0.269 (0.012)	
M042074A	M12_08A	1.401 (0.051)	0.711 (0.023)		
M042074B	M12_08B	1.347 (0.051)	0.879 (0.025)		
M042074C	M12_08C	2.099 (0.093)	1.178 (0.022)		
M042076	M14_05	1.053 (0.076)	0.691 (0.048)	0.204 (0.017)	
M042077	M10_06	1.597 (0.106)	0.510 (0.034)	0.239 (0.014)	
M042080A	M08_11A	0.842 (0.032)	0.656 (0.033)		
M042080B	M08_11B	1.216 (0.055)	1.542 (0.041)		
M042082	M04_03	1.629 (0.107)	0.886 (0.029)	0.142 (0.010)	
M042086	M06_08	1.184 (0.044)	0.783 (0.027)		
M042088	M04_04	1.303 (0.089)	0.567 (0.040)	0.224 (0.015)	
M042093	M14_10	1.323 (0.060)	1.484 (0.036)		
M042100	M14_07	1.040 (0.069)	0.281 (0.053)	0.205 (0.021)	
M042103	M06_07	1.027 (0.044)	1.341 (0.040)		
M042109	M12_06	1.095 (0.107)	1.375 (0.056)	0.237 (0.014)	
M042112	M12_05	0.395 (0.055)	0.800 (0.241)	0.236 (0.054)	
M042198A	M10_05A	1.172 (0.041)	-0.579 (0.025)		
M042198B	M10_05B	1.118 (0.040)	0.495 (0.025)		
M042198C	M10_05C	1.804 (0.080)	1.256 (0.025)		

( ) Standard errors appear in parentheses

**Exhibit D.18 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Algebra (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M042199	M02_06	1.555 (0.147)	0.756 (0.048)	0.450 (0.015)	
M042202	M14_08	1.151 (0.090)	0.776 (0.048)	0.258 (0.016)	
M042226	M06_06	1.515 (0.052)	0.370 (0.020)		
M042228	M06_09	0.668 (0.029)	0.897 (0.044)		
M042229A	M08_10A	1.970 (0.076)	0.839 (0.019)		
M042229B	M08_10B	2.167 (0.087)	0.903 (0.019)		
M042234	M08_06	1.227 (0.074)	0.426 (0.038)	0.154 (0.015)	
M042235	M10_07	1.476 (0.079)	0.372 (0.029)	0.111 (0.012)	
M042236	M06_05	1.338 (0.085)	0.341 (0.039)	0.214 (0.016)	
M042238	M04_08	1.167 (0.101)	1.365 (0.048)	0.171 (0.012)	
M042239	M04_07	1.685 (0.109)	1.076 (0.028)	0.086 (0.008)	
M042240	M14_09	1.133 (0.063)	0.297 (0.039)	0.109 (0.016)	
M042243	M08_08	1.550 (0.080)	0.551 (0.026)	0.072 (0.009)	
M042245	M06_10	2.023 (0.161)	1.268 (0.029)	0.132 (0.008)	
M042248	M08_09	1.416 (0.053)	0.880 (0.024)		
M042263	M02_08	0.799 (0.036)	1.530 (0.054)		
M042267	M04_06	1.301 (0.076)	0.764 (0.031)	0.088 (0.010)	
M042301A	M02_07A	1.061 (0.037)	0.083 (0.024)		
M042301B	M02_07B	2.358 (0.092)	0.693 (0.016)		
M042301C	M02_07C	2.621 (0.122)	1.151 (0.019)		

( ) Standard errors appear in parentheses

**Exhibit D.19 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Geometry**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M022049	M01_03	0.804 (0.089)	0.704 (0.092)	0.364 (0.027)	
M022055	M01_05	1.429 (0.051)	0.673 (0.022)		
M022062	M01_08	1.099 (0.076)	0.813 (0.039)	0.119 (0.014)	
M022105	M03_04	0.735 (0.069)	0.998 (0.067)	0.148 (0.022)	
M022108	M03_06	0.946 (0.069)	0.326 (0.062)	0.207 (0.024)	
M022234A	M01_11A	0.858 (0.025)	0.945 (0.023)		-0.489 (0.043) 0.489 (0.050)
M022243	M01_12	1.246 (0.046)	0.592 (0.025)		
M032097	M07_07	1.588 (0.154)	1.383 (0.040)	0.192 (0.001)	
M032100	M09_09	0.988 (0.066)	0.560 (0.046)	0.130 (0.018)	
M032116	M09_08	1.447 (0.134)	1.044 (0.041)	0.294 (0.013)	
M032205	M05_09	0.645 (0.068)	0.455 (0.122)	0.252 (0.038)	
M032294	M07_10	1.036 (0.074)	0.163 (0.062)	0.252 (0.025)	
M032324	M09_07	1.340 (0.104)	0.932 (0.038)	0.196 (0.013)	
M032331	M11_06	2.522 (0.247)	1.356 (0.028)	0.204 (0.008)	
M032344	M05_04	1.391 (0.050)	0.657 (0.022)		
M032397	M09_12	1.285 (0.110)	1.015 (0.042)	0.228 (0.014)	
M032398	M11_10	2.144 (0.197)	1.055 (0.031)	0.313 (0.011)	
M032402	M09_10	0.892 (0.093)	0.936 (0.069)	0.293 (0.021)	
M032414	M07_09	1.173 (0.043)	0.699 (0.026)		
M032575	M07_08	2.346 (0.168)	0.752 (0.025)	0.224 (0.011)	
M032579	M03_14	1.289 (0.075)	-0.048 (0.044)	0.184 (0.021)	
M032623	M11_07	2.288 (0.160)	0.910 (0.023)	0.165 (0.009)	
M032679	M11_08	1.414 (0.109)	0.652 (0.041)	0.291 (0.016)	
M032691	M03_15	0.962 (0.035)	0.407 (0.027)		
M032692	M13_06	0.591 (0.016)	1.165 (0.032)		-1.386 (0.071) 1.386 (0.081)
M032734	M09_11	0.770 (0.029)	-0.183 (0.030)		
M032754	M05_05	0.679 (0.028)	-0.299 (0.034)		
M042036	M04_10	1.650 (0.114)	0.931 (0.029)	0.141 (0.001)	
M042120	M08_12	1.050 (0.076)	0.077 (0.067)	0.287 (0.026)	
M042130	M04_11	0.484 (0.024)	-0.022 (0.045)		
M042132	M12_10	1.659 (0.154)	1.306 (0.036)	0.202 (0.010)	
M042137	M02_10	1.299 (0.101)	0.823 (0.041)	0.229 (0.015)	
M042148	M02_11	0.901 (0.072)	0.040 (0.087)	0.300 (0.031)	
M042150	M10_09	0.946 (0.093)	1.134 (0.056)	0.213 (0.017)	
M042151	M12_09	0.965 (0.034)	0.060 (0.026)		
M042152	M06_13	0.924 (0.089)	1.014 (0.059)	0.227 (0.019)	
M042201	M06_12	1.322 (0.045)	0.219 (0.021)		
M042203	M08_13	1.695 (0.098)	0.319 (0.030)	0.172 (0.014)	
M042257	M12_11	0.817 (0.074)	0.954 (0.062)	0.171 (0.021)	
M042264	M08_14	0.833 (0.038)	1.365 (0.050)		
M042265	M02_09	0.977 (0.076)	0.690 (0.052)	0.191 (0.019)	
M042268	M14_12	1.533 (0.117)	1.148 (0.032)	0.125 (0.009)	
M042270	M06_11	0.924 (0.033)	0.069 (0.026)		
M042271	M14_11	1.057 (0.072)	0.547 (0.045)	0.156 (0.018)	

( ) Standard errors appear in parentheses

**Exhibit D.19 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Geometry (Continued)**

Item		Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M042279	M04_09	1.061 (0.064)	0.262 (0.045)	0.131 (0.019)		
M042300A	M10_10A	1.780 (0.060)	0.201 (0.017)			
M042300B	M10_10B	1.851 (0.064)	0.408 (0.017)			

( ) Standard errors appear in parentheses

**Exhibit D.20 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Data and Chance**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M022101	M03_02	1.308 (0.078)	0.007 (0.043)	0.195 (0.021)	
M022181	M03_08	1.115 (0.075)	-0.420 (0.073)	0.273 (0.034)	
M022257	M01_07	1.349 (0.110)	0.770 (0.041)	0.263 (0.015)	
M032132	M09_14	0.723 (0.056)	0.560 (0.070)	0.120 (0.025)	
M032507	M11_11	1.527 (0.140)	1.276 (0.039)	0.176 (0.010)	
M032637A	M07_13A	0.986 (0.036)	-0.199 (0.026)		
M032637B	M07_13B	2.177 (0.081)	-0.040 (0.016)		
M032637C	M07_13C	2.014 (0.076)	0.443 (0.017)		
M032681A	M11_13A	0.657 (0.028)	-0.296 (0.036)		
M032681B	M11_13B	0.674 (0.031)	0.949 (0.046)		
M032681C	M11_13C	1.572 (0.058)	0.634 (0.020)		
M032688	M07_11	0.835 (0.035)	0.955 (0.038)		
M032695	M09_13	0.568 (0.015)	0.065 (0.024)	-0.954 (0.059)	0.954 (0.059)
M032721	M13_02	0.809 (0.092)	1.438 (0.079)	0.246 (0.019)	
M032753A	M05_07A	3.229 (0.123)	0.823 (0.001)	0.127 (0.015)	-0.127 (0.016)
M032753B	M05_07B	3.621 (0.152)	0.945 (0.001)	0.183 (0.013)	-0.183 (0.016)
M032753C	M05_07C	1.487 (0.054)	0.582 (0.021)		
M032756	M05_08	0.823 (0.033)	0.479 (0.032)		
M042158	M12_12	0.638 (0.067)	0.418 (0.129)	0.272 (0.039)	
M042159	M14_13	0.640 (0.028)	-0.491 (0.038)		
M042164	M14_14	1.505 (0.057)	0.747 (0.022)		
M042167	M14_15	1.385 (0.057)	0.926 (0.026)		
M042169A	M10_12A	1.247 (0.044)	0.461 (0.022)		
M042169B	M10_12B	0.655 (0.033)	1.362 (0.061)		
M042169C	M10_12C	1.505 (0.079)	1.547 (0.041)		
M042177	M06_16	1.058 (0.081)	0.521 (0.053)	0.229 (0.021)	
M042179	M06_15	0.980 (0.082)	0.726 (0.056)	0.229 (0.021)	
M042207	M06_17	0.408 (0.010)	0.226 (0.030)	-3.173 (0.125)	3.173 (0.126)
M042220	M02_14	0.817 (0.021)	0.603 (0.020)	-1.231 (0.060)	1.231 (0.063)
M042222	M04_13	1.041 (0.067)	0.494 (0.041)	0.097 (0.016)	
M042224	M08_16	0.966 (0.035)	0.161 (0.026)		
M042250	M02_13	1.427 (0.050)	-0.495 (0.021)		
M042252	M12_13	1.552 (0.115)	0.893 (0.032)	0.165 (0.012)	
M042254	M02_12	0.822 (0.057)	-0.968 (0.126)	0.217 (0.056)	
M042255	M08_15	0.694 (0.053)	0.001 (0.010)	0.153 (0.037)	
M042260	M10_11	1.046 (0.080)	0.264 (0.062)	0.268 (0.025)	
M042261	M12_14	1.039 (0.081)	0.467 (0.056)	0.237 (0.022)	
M042269	M06_14	0.851 (0.086)	0.645 (0.084)	0.336 (0.027)	
M042303A	M04_12A	0.882 (0.034)	0.459 (0.030)		
M042303B	M04_12B	0.370 (0.016)	0.935 (0.051)	-0.037 (0.067)	0.037 (0.084)

( ) Standard errors appear in parentheses

**Exhibit D.21 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Knowing**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
M022043	M01_01	0.614 (0.048)	-0.347 (0.130)	0.151 (0.044)	
M022050	M01_04	1.112 (0.084)	1.025 (0.041)	0.128 (0.013)	
M022066	M01_09	1.982 (0.104)	0.344 (0.022)	0.106 (0.010)	
M022097	M03_01	1.111 (0.061)	0.077 (0.040)	0.104 (0.017)	
M022101	M03_02	0.963 (0.060)	-0.094 (0.059)	0.154 (0.025)	
M022104	M03_03	1.080 (0.061)	-0.065 (0.047)	0.126 (0.021)	
M022105	M03_04	0.679 (0.064)	0.979 (0.070)	0.132 (0.023)	
M022110	M03_07	0.614 (0.026)	-0.460 (0.039)		
M032094	M09_01	1.350 (0.088)	0.212 (0.042)	0.252 (0.018)	
M032132	M09_14	0.659 (0.052)	0.508 (0.074)	0.108 (0.026)	
M032166	M13_01	1.151 (0.074)	0.232 (0.045)	0.190 (0.019)	
M032198	M05_02	1.407 (0.103)	0.635 (0.037)	0.247 (0.015)	
M032295	M11_05	1.746 (0.110)	-0.242 (0.040)	0.300 (0.020)	
M032397	M09_12	1.335 (0.109)	0.980 (0.040)	0.225 (0.013)	
M032416	M07_02	1.584 (0.098)	0.879 (0.027)	0.010 (0.009)	
M032419	M09_04	1.441 (0.115)	0.914 (0.037)	0.243 (0.013)	
M032477	M09_05	1.839 (0.131)	0.747 (0.029)	0.236 (0.012)	
M032525	M03_13	1.159 (0.076)	0.309 (0.044)	0.196 (0.019)	
M032538	M09_06	1.380 (0.048)	0.380 (0.020)		
M032540	M07_05	1.462 (0.117)	0.503 (0.043)	0.366 (0.017)	
M032626	M13_07	1.023 (0.077)	0.560 (0.050)	0.209 (0.019)	
M032637B	M07_13B	0.965 (0.037)	-0.231 (0.028)		
M032673	M13_09	1.699 (0.115)	0.609 (0.030)	0.221 (0.013)	
M032679	M11_08	1.132 (0.081)	0.480 (0.046)	0.225 (0.018)	
M032681A	M11_13A	0.574 (0.026)	-0.338 (0.041)		
M032683	M11_03	0.676 (0.018)	0.876 (0.025)		-1.078 (0.058) 1.078 (0.064)
M032698	M07_06	1.012 (0.075)	0.710 (0.045)	0.158 (0.017)	
M032725	M11_02	1.313 (0.053)	0.954 (0.027)		
M032734	M09_11	0.762 (0.029)	-0.182 (0.031)		
M032738	M11_04	1.634 (0.097)	-0.005 (0.035)	0.234 (0.018)	
M032753C	M05_07C	0.677 (0.031)	0.828 (0.044)		
M042001	M04_01	0.771 (0.058)	-0.263 (0.101)	0.214 (0.037)	
M042003	M02_01	0.789 (0.058)	-0.051 (0.084)	0.184 (0.032)	
M042015	M12_01	1.387 (0.088)	-0.023 (0.045)	0.265 (0.021)	
M042019	M08_03	0.875 (0.034)	0.639 (0.032)		
M042022	M04_02	1.084 (0.097)	0.910 (0.050)	0.262 (0.016)	
M042024	M10_02	1.540 (0.091)	0.372 (0.030)	0.172 (0.014)	
M042032	M06_01	0.955 (0.072)	-0.195 (0.083)	0.298 (0.032)	
M042049	M14_03	1.024 (0.075)	0.043 (0.064)	0.270 (0.025)	
M042050	M12_07	1.286 (0.049)	0.768 (0.024)		
M042052	M14_04	1.864 (0.099)	0.090 (0.025)	0.142 (0.013)	
M042059	M06_04	0.667 (0.019)	0.274 (0.022)		-0.313 (0.043) 0.313 (0.045)
M042060	M08_02	1.371 (0.083)	0.333 (0.034)	0.174 (0.015)	
M042076	M14_05	1.252 (0.083)	0.501 (0.038)	0.184 (0.016)	

( ) Standard errors appear in parentheses

**Exhibit D.21 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Knowing (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M042077	M10_06	1.544 (0.100)	0.458 (0.033)	0.223 (0.015)	
M042079	M02_02	1.362 (0.104)	0.109 (0.054)	0.393 (0.021)	
M042080A	M08_11A	0.831 (0.033)	0.582 (0.032)		
M042080B	M08_11B	1.294 (0.060)	1.361 (0.037)		
M042081	M14_02	1.059 (0.042)	0.844 (0.030)		
M042082	M04_03	2.079 (0.146)	0.877 (0.025)	0.174 (0.001)	
M042088	M04_04	1.416 (0.092)	0.462 (0.035)	0.206 (0.015)	
M042100	M14_07	1.309 (0.091)	0.336 (0.042)	0.259 (0.018)	
M042103	M06_07	1.102 (0.049)	1.251 (0.037)		
M042114A	M12_04A	1.110 (0.039)	0.012 (0.023)		
M042120	M08_12	1.007 (0.078)	0.095 (0.068)	0.303 (0.025)	
M042148	M02_11	1.083 (0.084)	0.137 (0.064)	0.328 (0.024)	
M042150	M10_09	0.981 (0.088)	1.064 (0.052)	0.202 (0.016)	
M042152	M06_13	0.711 (0.075)	1.041 (0.076)	0.197 (0.024)	
M042158	M12_12	0.803 (0.083)	0.614 (0.087)	0.341 (0.027)	
M042169A	M10_12A	1.157 (0.042)	0.464 (0.023)		
M042169B	M10_12B	0.403 (0.028)	1.892 (0.126)		
M042183	M08_01	0.716 (0.054)	-0.093 (0.094)	0.165 (0.034)	
M042194	M12_03	1.127 (0.039)	-0.290 (0.024)		
M042196	M12_02	1.093 (0.063)	0.324 (0.038)	0.101 (0.016)	
M042198A	M10_05A	1.039 (0.036)	-0.580 (0.027)		
M042199	M02_06	1.589 (0.010)	0.122 (0.036)	0.258 (0.017)	
M042222	M04_13	0.913 (0.063)	0.578 (0.046)	0.103 (0.017)	
M042224	M08_16	0.914 (0.034)	0.091 (0.027)		
M042226	M06_06	1.700 (0.060)	0.381 (0.017)		
M042229B	M08_10B	2.007 (0.079)	0.813 (0.019)		
M042234	M08_06	1.625 (0.099)	0.414 (0.030)	0.185 (0.013)	
M042235	M10_07	1.870 (0.100)	0.374 (0.023)	0.119 (0.011)	
M042236	M06_05	1.836 (0.118)	0.409 (0.029)	0.242 (0.014)	
M042239	M04_07	1.791 (0.121)	1.030 (0.027)	0.102 (0.008)	
M042243	M08_08	2.050 (0.109)	0.497 (0.021)	0.090 (0.009)	
M042248	M08_09	1.542 (0.059)	0.767 (0.022)		
M042250	M02_13	1.052 (0.037)	-0.549 (0.027)		
M042260	M10_11	0.982 (0.079)	0.335 (0.065)	0.295 (0.024)	
M042261	M12_14	0.847 (0.068)	0.387 (0.068)	0.201 (0.025)	
M042301A	M02_07A	0.446 (0.023)	0.109 (0.048)		
M042303A	M04_12A	1.114 (0.041)	0.442 (0.024)		

( ) Standard errors appear in parentheses



**Exhibit D.22 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Applying**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
M022046	M01_02	0.831 (0.031)	-0.296 (0.029)		
M022055	M01_05	1.303 (0.048)	0.709 (0.024)		
M022057	M01_06	0.553 (0.066)	0.335 (0.178)	0.300 (0.048)	
M022062	M01_08	1.011 (0.074)	0.889 (0.043)	0.127 (0.015)	
M022106	M03_05	0.984 (0.038)	0.885 (0.032)		
M022108	M03_06	0.976 (0.074)	0.430 (0.060)	0.241 (0.023)	
M022181	M03_08	1.103 (0.071)	-0.495 (0.071)	0.242 (0.034)	
M022232	M01_10	0.639 (0.021)	1.685 (0.042)		-2.003 (0.109) 2.003 (0.121)
M022234A	M01_11A	0.959 (0.028)	0.940 (0.021)		-0.391 (0.039) 0.391 (0.045)
M022234B	M01_11B	1.029 (0.034)	1.300 (0.024)		-1.270 (0.078) 1.270 (0.083)
M022243	M01_12	1.120 (0.043)	0.639 (0.027)		
M022257	M01_07	1.561 (0.118)	0.754 (0.036)	0.265 (0.014)	
M032047	M11_09	1.449 (0.172)	1.243 (0.056)	0.445 (0.013)	
M032064	M09_03	1.366 (0.051)	0.871 (0.024)		
M032097	M07_07	1.310 (0.126)	1.490 (0.048)	0.186 (0.011)	
M032100	M09_09	0.969 (0.064)	0.586 (0.046)	0.126 (0.018)	
M032116	M09_08	1.348 (0.116)	1.019 (0.043)	0.278 (0.014)	
M032142	M05_01	1.751 (0.202)	1.263 (0.047)	0.418 (0.012)	
M032160	M07_03	2.161 (0.187)	1.405 (0.030)	0.139 (0.008)	
M032163	M05_10	1.590 (0.128)	0.927 (0.037)	0.249 (0.013)	
M032205	M05_09	0.572 (0.064)	0.486 (0.145)	0.248 (0.042)	
M032273	M07_04	1.037 (0.073)	0.003 (0.066)	0.265 (0.027)	
M032294	M07_10	0.918 (0.066)	0.125 (0.070)	0.217 (0.028)	
M032307	M03_09	1.449 (0.058)	1.099 (0.027)		
M032331	M11_06	2.251 (0.211)	1.375 (0.031)	0.199 (0.009)	
M032344	M05_04	1.112 (0.041)	0.720 (0.027)		
M032352	M11_01	1.612 (0.136)	0.618 (0.042)	0.400 (0.015)	
M032414	M07_09	1.102 (0.041)	0.761 (0.027)		
M032507	M11_11	1.916 (0.162)	1.286 (0.032)	0.185 (0.009)	
M032523	M03_10	2.145 (0.178)	1.258 (0.030)	0.170 (0.009)	
M032529	M07_12	1.774 (0.134)	1.144 (0.031)	0.163 (0.001)	
M032575	M07_08	2.291 (0.161)	0.764 (0.025)	0.217 (0.011)	
M032579	M03_14	1.168 (0.073)	0.003 (0.051)	0.203 (0.023)	
M032595	M13_08	1.340 (0.078)	0.378 (0.033)	0.122 (0.014)	
M032623	M11_07	1.858 (0.124)	0.896 (0.027)	0.153 (0.001)	
M032637A	M07_13A	0.841 (0.032)	-0.250 (0.029)		
M032637C	M07_13C	1.117 (0.043)	0.441 (0.026)		
M032681B	M11_13B	0.647 (0.030)	0.980 (0.048)		
M032681C	M11_13C	1.202 (0.045)	0.704 (0.025)		
M032688	M07_11	0.848 (0.035)	0.922 (0.036)		
M032691	M03_15	0.863 (0.033)	0.441 (0.030)		
M032695	M09_13	0.542 (0.014)	0.053 (0.025)		-1.011 (0.061) 1.011 (0.062)
M032701	M03_11	1.239 (0.075)	-0.878 (0.068)	0.208 (0.038)	
M032704	M03_12	1.251 (0.075)	-0.054 (0.046)	0.188 (0.022)	

( ) Standard errors appear in parentheses

**Exhibit D.22 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Applying (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )	
M032754	M05_05	0.728 (0.029)	-0.282 (0.033)			
M042016	M10_03	0.879 (0.073)	0.754 (0.060)	0.202 (0.021)		
M042018	M02_03	0.933 (0.035)	0.581 (0.029)			
M042023	M08_04	1.125 (0.041)	0.652 (0.025)			
M042031	M06_02	1.521 (0.113)	0.762 (0.037)	0.253 (0.013)		
M042039	M02_05	0.720 (0.047)	0.462 (0.060)	0.077 (0.021)		
M042041	M10_01	1.322 (0.096)	0.048 (0.055)	0.360 (0.023)		
M042055	M02_04	1.272 (0.115)	1.009 (0.048)	0.302 (0.015)		
M042067	M10_08	1.406 (0.146)	1.339 (0.048)	0.284 (0.012)		
M042086	M06_08	1.116 (0.042)	0.776 (0.028)			
M042093	M14_10	1.435 (0.064)	1.303 (0.032)			
M042109	M12_06	1.274 (0.121)	1.302 (0.048)	0.245 (0.013)		
M042112	M12_05	0.501 (0.080)	1.192 (0.169)	0.333 (0.040)		
M042114B	M12_04B	1.239 (0.043)	0.303 (0.022)			
M042130	M04_11	0.477 (0.024)	0.011 (0.045)			
M042137	M02_10	1.178 (0.093)	0.876 (0.045)	0.232 (0.015)		
M042151	M12_09	0.839 (0.031)	0.071 (0.028)			
M042159	M14_13	0.559 (0.025)	-0.589 (0.044)			
M042169C	M10_12C	0.786 (0.047)	2.085 (0.088)			
M042177	M06_16	1.128 (0.077)	0.368 (0.048)	0.208 (0.020)		
M042179	M06_15	0.898 (0.068)	0.520 (0.060)	0.184 (0.022)		
M042182	M14_01	1.232 (0.096)	0.358 (0.052)	0.330 (0.020)		
M042201	M06_12	1.252 (0.043)	0.228 (0.022)			
M042202	M14_08	1.360 (0.105)	0.676 (0.040)	0.267 (0.015)		
M042203	M08_13	1.526 (0.088)	0.347 (0.031)	0.158 (0.014)		
M042207	M06_17	0.441 (0.011)	0.134 (0.028)		-2.890 (0.116)	2.890 (0.116)
M042220	M02_14	0.692 (0.017)	0.654 (0.023)		-1.508 (0.070)	1.508 (0.074)
M042229A	M08_10A	1.415 (0.053)	0.903 (0.024)			
M042238	M04_08	1.151 (0.111)	1.416 (0.052)	0.188 (0.012)		
M042240	M14_09	1.114 (0.069)	0.304 (0.042)	0.140 (0.018)		
M042245	M06_10	1.510 (0.120)	1.324 (0.037)	0.133 (0.009)		
M042252	M12_13	1.289 (0.092)	0.913 (0.037)	0.157 (0.013)		
M042254	M02_12	0.624 (0.047)	-1.141 (0.189)	0.225 (0.068)		
M042255	M08_15	0.678 (0.052)	0.034 (0.103)	0.161 (0.037)		
M042267	M04_06	1.271 (0.088)	0.912 (0.036)	0.137 (0.012)		
M042270	M06_11	0.909 (0.033)	0.073 (0.027)			
M042271	M14_11	1.056 (0.064)	0.399 (0.040)	0.104 (0.016)		
M042300A	M10_10A	1.481 (0.050)	0.230 (0.019)			
M042300B	M10_10B	1.568 (0.055)	0.440 (0.019)			
M042302A	M14_06A	1.186 (0.033)	0.502 (0.016)		-0.074 (0.027)	0.074 (0.030)
M042302B	M14_06B	1.197 (0.032)	0.614 (0.016)		-0.417 (0.033)	0.417 (0.036)
M042304A	M04_05A	1.448 (0.049)	-0.250 (0.020)			
M042304B	M04_05B	1.059 (0.035)	0.849 (0.021)		0.420 (0.026)	-0.420 (0.036)
M042304C	M04_05C	1.652 (0.064)	0.915 (0.022)			

( ) Standard errors appear in parentheses

**Exhibit D.23 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Reasoning**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
M022049	M01_03	0.623 (0.072)	0.614 (0.138)	0.316 (0.038)	
M032324	M09_07	1.058 (0.086)	0.983 (0.048)	0.184 (0.016)	
M032381	M07_01	1.154 (0.040)	0.463 (0.024)		
M032398	M11_10	0.982 (0.104)	1.212 (0.065)	0.295 (0.017)	
M032402	M09_10	0.919 (0.094)	0.982 (0.069)	0.303 (0.021)	
M032424	M11_12	0.832 (0.064)	0.640 (0.062)	0.155 (0.023)	
M032640	M05_03	0.510 (0.018)	1.779 (0.057)		-0.925 (0.070) 0.925 (0.096)
M032662	M09_02	1.449 (0.136)	1.573 (0.046)	0.130 (0.009)	
M032692	M13_06	0.561 (0.016)	1.224 (0.034)		-1.493 (0.075) 1.493 (0.085)
M032721	M13_02	0.803 (0.101)	1.484 (0.081)	0.253 (0.020)	
M032753A	M05_07A	2.749 (0.100)	0.861 (0.011)		0.125 (0.016) -0.125 (0.019)
M032753B	M05_07B	3.058 (0.122)	0.998 (0.011)		0.202 (0.015) -0.202 (0.018)
M032755	M05_06	0.856 (0.029)	1.487 (0.034)		-0.398 (0.046) 0.398 (0.063)
M032756	M05_08	0.755 (0.031)	0.521 (0.034)		
M032757	M13_03	0.576 (0.014)	-0.170 (0.023)		-1.623 (0.073) 1.623 (0.071)
M032760A	M13_04A	1.257 (0.033)	0.762 (0.016)		-0.769 (0.044) 0.769 (0.047)
M032760B	M13_04B	2.167 (0.092)	1.057 (0.019)		
M032760C	M13_04C	2.405 (0.118)	1.273 (0.021)		
M032761	M13_05	1.224 (0.042)	1.366 (0.024)		-0.186 (0.034) 0.186 (0.045)
M042002	M10_04	0.626 (0.030)	1.248 (0.057)		
M042036	M04_10	1.056 (0.083)	1.022 (0.046)	0.139 (0.014)	
M042066	M08_07	0.760 (0.030)	0.439 (0.033)		
M042074A	M12_08A	1.761 (0.063)	0.619 (0.019)		
M042074B	M12_08B	1.702 (0.063)	0.771 (0.021)		
M042074C	M12_08C	2.275 (0.101)	1.103 (0.020)		
M042132	M12_10	1.447 (0.151)	1.491 (0.049)	0.221 (0.011)	
M042164	M14_14	1.181 (0.044)	0.836 (0.027)		
M042167	M14_15	1.121 (0.045)	1.027 (0.032)		
M042186	M06_03	0.821 (0.032)	0.611 (0.032)		
M042197	M08_05	1.213 (0.046)	0.981 (0.029)		
M042198B	M10_05B	1.651 (0.057)	0.408 (0.018)		
M042198C	M10_05C	2.970 (0.143)	1.093 (0.017)		
M042228	M06_09	0.698 (0.030)	0.936 (0.042)		
M042257	M12_11	0.646 (0.071)	1.158 (0.088)	0.181 (0.027)	
M042263	M02_08	0.973 (0.042)	1.320 (0.042)		
M042264	M08_14	0.761 (0.036)	1.471 (0.056)		
M042265	M02_09	0.753 (0.069)	0.805 (0.075)	0.189 (0.026)	
M042268	M14_12	1.190 (0.108)	1.440 (0.048)	0.147 (0.011)	

( ) Standard errors appear in parentheses

**Exhibit D.23 IRT Parameters for TIMSS 2007 Eighth Grade Mathematics - Reasoning (Continued)**

Item		Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
M042269	M06_14	0.756 (0.072)	0.476 (0.101)	0.284 (0.033)		
M042279	M04_09	1.106 (0.073)	0.308 (0.047)	0.171 (0.020)		
M042301B	M02_07B	1.713 (0.062)	0.682 (0.020)			
M042301C	M02_07C	4.022 (0.214)	1.043 (0.014)			
M042302C	M14_06C	0.488 (0.017)	1.720 (0.054)		-0.907 (0.069)	0.907 (0.093)
M042303B	M04_12B	0.391 (0.017)	0.889 (0.048)		-0.019 (0.063)	0.019 (0.079)
M042304D	M04_05D	0.487 (0.012)	0.430 (0.028)		-1.752 (0.078)	1.752 (0.082)

( ) Standard errors appear in parentheses

**Exhibit D.24 IRT Parameters for TIMSS 2007 Eighth Grade Science - Biology**

Item	Slope (a <sub>j</sub> )	Location (b <sub>j</sub> )	Guessing (c <sub>j</sub> )	Step 1 (d <sub>1j</sub> )	Step 2 (d <sub>2j</sub> )
S022115	S03_03	1.229 (0.090)	0.228 (0.047)	0.265 (0.022)	
S022126	S05_07	0.656 (0.068)	0.434 (0.095)	0.206 (0.033)	
S022150	S03_10	1.079 (0.090)	0.543 (0.048)	0.224 (0.021)	
S022289	S03_12	0.904 (0.033)	0.873 (0.024)		0.661 (0.027) -0.661 (0.044)
S032007	S09_04	0.910 (0.039)	0.363 (0.027)		
S032015	S07_02	0.889 (0.039)	0.516 (0.029)		
S032035	S05_10	1.349 (0.090)	0.402 (0.035)	0.171 (0.017)	
S032087	S13_06	0.856 (0.090)	0.885 (0.063)	0.205 (0.023)	
S032122	S07_12	0.750 (0.040)	0.891 (0.045)		
S032126	S13_12	0.792 (0.036)	0.293 (0.030)		
S032258	S05_13	1.109 (0.077)	0.059 (0.052)	0.224 (0.025)	
S032306	S11_03	0.552 (0.016)	0.592 (0.026)		-1.202 (0.062) 1.202 (0.067)
S032310D	S07_03D	0.630 (0.021)	-0.094 (0.023)		-0.118 (0.045) 0.118 (0.042)
S032315	S11_02	0.977 (0.093)	0.711 (0.055)	0.238 (0.022)	
S032385	S05_09	0.925 (0.077)	0.058 (0.075)	0.293 (0.030)	
S032451	S13_03	0.652 (0.017)	0.174 (0.020)		-1.171 (0.057) 1.171 (0.058)
S032465	S11_01	0.821 (0.065)	0.013 (0.077)	0.219 (0.031)	
S032514	S11_13	0.754 (0.102)	1.051 (0.086)	0.277 (0.026)	
S032530D	S09_03D	0.578 (0.022)	0.379 (0.028)		0.753 (0.042) -0.753 (0.049)
S032542	S09_01	1.185 (0.106)	0.674 (0.046)	0.252 (0.019)	
S032606	S07_01	1.226 (0.093)	-0.314 (0.069)	0.406 (0.030)	
S032611	S13_01	0.846 (0.110)	1.281 (0.079)	0.206 (0.020)	
S032614	S13_02	0.865 (0.037)	0.046 (0.027)		
S032620	S01_07	0.830 (0.117)	1.461 (0.094)	0.179 (0.019)	
S032640	S11_04	0.653 (0.031)	-0.026 (0.034)		
S032645	S09_02	1.042 (0.106)	0.756 (0.055)	0.271 (0.022)	
S032665A	S09_11A	1.126 (0.048)	0.631 (0.026)		
S032665B	S09_11B	1.751 (0.075)	0.876 (0.023)		
S032665C	S09_11C	1.560 (0.070)	0.833 (0.024)		
S032693A	S01_08A	1.177 (0.046)	0.247 (0.021)		
S032693B	S01_08B	1.290 (0.049)	0.009 (0.020)		
S032695	S01_09	0.837 (0.028)	0.632 (0.021)		-0.139 (0.034) 0.139 (0.041)
S032697D	S01_10D	0.935 (0.031)	0.523 (0.019)		-0.020 (0.031) 0.020 (0.036)
S042001	S02_06	1.393 (0.143)	1.164 (0.045)	0.171 (0.012)	
S042003	S12_03	0.533 (0.073)	0.844 (0.123)	0.217 (0.037)	
S042005	S14_02	0.397 (0.012)	0.341 (0.031)		-1.812 (0.085) 1.812 (0.088)
S042006	S04_02	0.764 (0.085)	0.394 (0.098)	0.345 (0.032)	
S042007	S10_03	1.145 (0.101)	0.772 (0.044)	0.201 (0.018)	
S042009	S02_01	1.199 (0.131)	0.785 (0.054)	0.361 (0.019)	
S042011	S02_04	0.999 (0.050)	1.156 (0.045)		
S042013	S04_01	1.216 (0.080)	-0.428 (0.061)	0.294 (0.029)	
S042015	S08_03	1.075 (0.106)	0.755 (0.052)	0.266 (0.020)	
S042016	S14_03	0.775 (0.114)	1.728 (0.123)	0.126 (0.017)	
S042017	S10_02	0.957 (0.108)	1.139 (0.061)	0.194 (0.018)	

( ) Standard errors appear in parentheses

**Exhibit D.24 IRT Parameters for TIMSS 2007 Eighth Grade Science - Biology (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S042022 S10_06	0.999 (0.043)	0.542 (0.027)			
S042024 S10_04	0.982 (0.146)	1.425 (0.087)	0.257 (0.018)		
S042028 S02_05	0.868 (0.110)	1.276 (0.076)	0.194 (0.019)		
S042030 S12_02	0.910 (0.046)	1.117 (0.046)			
S042038 S06_02	1.149 (0.081)	0.467 (0.040)	0.145 (0.019)		
S042042 S12_01	0.686 (0.065)	-0.376 (0.137)	0.297 (0.044)		
S042043 S04_06	0.415 (0.029)	1.136 (0.087)			
S042049A S08_05A	1.172 (0.045)	-0.294 (0.023)			
S042049B S08_05B	1.431 (0.053)	0.344 (0.018)			
S042051A S06_05A	0.972 (0.040)	0.176 (0.024)			
S042051B S06_05B	1.415 (0.059)	0.796 (0.024)			
S042052 S04_04	0.700 (0.027)	0.249 (0.022)		0.300 (0.038)	-0.300 (0.040)
S042053 S08_01	1.327 (0.090)	0.034 (0.046)	0.278 (0.023)		
S042054 S04_05	0.385 (0.054)	-0.162 (0.311)	0.256 (0.068)		
S042059 S02_03	1.213 (0.118)	0.826 (0.046)	0.260 (0.018)		
S042222A S12_05A	2.074 (0.091)	0.951 (0.021)			
S042222B S12_05B	1.952 (0.079)	0.765 (0.019)			
S042222C S12_05C	0.928 (0.077)	0.252 (0.065)	0.251 (0.027)		
S042258 S14_01	0.918 (0.099)	0.947 (0.060)	0.213 (0.021)		
S042261 S06_04	0.890 (0.043)	0.870 (0.038)			
S042297 S10_09	0.671 (0.023)	1.179 (0.036)		-0.707 (0.052)	0.707 (0.066)
S042298 S06_03	1.196 (0.047)	0.401 (0.022)			
S042300A S14_04A	1.595 (0.058)	0.155 (0.017)			
S042300B S14_04B	0.651 (0.041)	1.493 (0.083)			
S042300C S14_04C	1.483 (0.055)	0.288 (0.018)			
S042304 S06_01	0.927 (0.066)	0.152 (0.057)	0.173 (0.025)		
S042309 S08_04	0.438 (0.087)	1.444 (0.190)	0.266 (0.043)		
S042310 S04_03	0.648 (0.021)	0.144 (0.021)		-0.234 (0.043)	0.234 (0.044)
S042313 S02_02	0.826 (0.035)	-0.499 (0.033)			
S042319 S14_05	1.300 (0.056)	0.890 (0.029)			
S042408 S08_02	0.830 (0.037)	0.434 (0.030)			

( ) Standard errors appear in parentheses

**Exhibit D.25 IRT Parameters for TIMSS 2007 Eighth Grade Science - Chemistry**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S022181	S05_04	1.002 (0.010)	0.945 (0.056)	0.252 (0.019)	
S022183	S03_01	1.176 (0.112)	1.046 (0.047)	0.227 (0.015)	
S022208	S05_05	1.027 (0.103)	1.029 (0.054)	0.240 (0.018)	
S022276	S03_02	0.773 (0.076)	0.503 (0.086)	0.253 (0.030)	
S032056	S13_05	0.869 (0.036)	0.674 (0.032)		
S032156	S13_04	1.249 (0.108)	0.869 (0.042)	0.223 (0.016)	
S032502	S09_05	1.148 (0.098)	0.887 (0.044)	0.199 (0.016)	
S032565	S01_02	0.740 (0.035)	1.046 (0.047)		
S032570	S11_06	0.968 (0.039)	0.682 (0.030)		
S032579	S11_05	1.141 (0.136)	1.291 (0.062)	0.292 (0.015)	
S032672	S07_05	0.377 (0.064)	0.379 (0.371)	0.331 (0.072)	
S032679	S09_06	0.643 (0.038)	1.802 (0.089)		
S032680	S07_04	0.580 (0.020)	-0.330 (0.026)	0.030 (0.049)	-0.030 (0.045)
S032683	S05_12	0.991 (0.084)	0.845 (0.048)	0.165 (0.018)	
S042063	S10_07	0.804 (0.059)	-1.553 (0.173)	0.266 (0.077)	
S042064	S12_11	0.785 (0.036)	0.953 (0.042)		
S042065	S12_06	0.730 (0.061)	-0.834 (0.165)	0.281 (0.061)	
S042068	S14_06	1.001 (0.101)	1.105 (0.055)	0.215 (0.017)	
S042071	S02_11	1.124 (0.112)	1.047 (0.051)	0.245 (0.016)	
S042073	S10_01	0.616 (0.057)	-1.110 (0.243)	0.319 (0.078)	
S042076	S06_06	0.988 (0.039)	0.667 (0.029)		
S042083	S02_09	0.837 (0.028)	1.097 (0.029)	-0.141 (0.037)	0.141 (0.050)
S042088	S12_08	0.696 (0.030)	0.087 (0.033)		
S042094	S14_09	0.907 (0.037)	0.697 (0.032)		
S042095	S10_05	1.005 (0.070)	-0.074 (0.067)	0.222 (0.029)	
S042100	S06_11	0.409 (0.017)	0.747 (0.041)	-0.083 (0.061)	0.083 (0.073)
S042101	S02_12	0.956 (0.043)	1.068 (0.039)		
S042104	S12_10	0.887 (0.040)	1.101 (0.042)		
S042106	S02_10	1.028 (0.044)	0.954 (0.034)		
S042109	S04_10	1.256 (0.087)	0.168 (0.048)	0.258 (0.022)	
S042110	S12_04	0.658 (0.056)	-0.588 (0.160)	0.229 (0.056)	
S042112	S10_11	0.420 (0.058)	0.388 (0.250)	0.229 (0.061)	
S042228A	S08_08A	0.978 (0.046)	1.294 (0.046)		
S042228B	S08_08B	2.449 (0.086)	0.145 (0.013)		
S042228C	S08_08C	3.519 (0.146)	0.583 (0.012)		
S042232A	S04_11A	0.818 (0.034)	0.513 (0.031)		
S042232B	S04_11B	1.195 (0.069)	1.825 (0.064)		
S042232C	S04_11C	1.691 (0.278)	1.771 (0.078)	0.332 (0.011)	
S042305	S10_10	0.546 (0.024)	1.306 (0.047)	0.363 (0.045)	-0.363 (0.071)
S042306	S06_08	1.363 (0.133)	1.060 (0.044)	0.265 (0.014)	
S042400	S14_12	0.934 (0.044)	1.240 (0.045)		

( ) Standard errors appear in parentheses

**Exhibit D.26 IRT Parameters for TIMSS 2007 Eighth Grade Science - Physics**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S022002	S03_06	1.023 (0.081)	0.494 (0.051)	0.199 (0.021)	
S022019	S03_05	0.904 (0.072)	-0.128 (0.087)	0.263 (0.035)	
S022022	S03_04	0.837 (0.034)	0.199 (0.028)		
S022042	S03_11	1.367 (0.094)	0.553 (0.034)	0.171 (0.015)	
S022054	S05_03	0.997 (0.086)	0.536 (0.056)	0.243 (0.022)	
S022069	S03_13	0.999 (0.042)	0.673 (0.029)		
S022268	S03_14	0.672 (0.033)	0.783 (0.044)		
S022281	S05_08	0.574 (0.032)	1.254 (0.069)		
S022292	S05_02	0.753 (0.033)	0.614 (0.036)		
S032024	S11_07	0.902 (0.121)	1.468 (0.083)	0.243 (0.017)	
S032141	S11_09	1.580 (0.138)	1.045 (0.036)	0.187 (0.012)	
S032158	S13_14	0.845 (0.084)	0.467 (0.081)	0.290 (0.029)	
S032184	S09_07	0.688 (0.100)	1.238 (0.098)	0.270 (0.027)	
S032238	S13_08	1.281 (0.092)	0.600 (0.037)	0.176 (0.016)	
S032257	S07_08	1.203 (0.128)	1.176 (0.052)	0.237 (0.015)	
S032272	S11_08	0.993 (0.051)	1.490 (0.056)		
S032273	S01_04	0.702 (0.113)	1.644 (0.117)	0.249 (0.022)	
S032279	S13_07	1.127 (0.123)	1.332 (0.059)	0.198 (0.014)	
S032369	S13_09	0.630 (0.022)	0.750 (0.029)		-0.091 (0.043) 0.091 (0.052)
S032392	S07_06	0.496 (0.047)	-1.225 (0.285)	0.257 (0.083)	
S032394	S09_08	1.108 (0.109)	0.804 (0.053)	0.301 (0.019)	
S032403	S01_03	1.168 (0.114)	0.984 (0.048)	0.251 (0.016)	
S032425	S07_07	0.877 (0.092)	0.827 (0.066)	0.262 (0.023)	
S042061	S04_08	0.709 (0.095)	1.424 (0.090)	0.190 (0.022)	
S042173	S10_12	0.565 (0.019)	-0.359 (0.030)		1.109 (0.052) -1.109 (0.044)
S042176	S08_11	0.990 (0.040)	0.648 (0.029)		
S042182	S08_06	0.698 (0.064)	-0.140 (0.128)	0.243 (0.045)	
S042195	S14_11	0.609 (0.037)	1.688 (0.089)		
S042196	S04_07	0.811 (0.042)	1.388 (0.058)		
S042197	S10_08	0.914 (0.093)	0.981 (0.059)	0.212 (0.020)	
S042210	S08_10	0.931 (0.128)	1.423 (0.082)	0.277 (0.018)	
S042211	S08_12	1.005 (0.038)	0.200 (0.024)		
S042216	S14_07	1.001 (0.091)	0.460 (0.063)	0.287 (0.024)	
S042217	S12_15	1.372 (0.113)	0.733 (0.039)	0.245 (0.016)	
S042218	S12_09	1.435 (0.113)	0.679 (0.037)	0.245 (0.015)	
S042238A	S06_12A	0.920 (0.085)	0.916 (0.053)	0.169 (0.019)	
S042238B	S06_12B	0.692 (0.037)	1.361 (0.064)		
S042244A	S02_15A	1.202 (0.053)	1.030 (0.033)		
S042244B	S02_15B	1.028 (0.054)	1.453 (0.054)		
S042249	S14_08	1.029 (0.088)	0.674 (0.050)	0.218 (0.020)	
S042272	S06_10	0.889 (0.077)	0.425 (0.067)	0.228 (0.026)	
S042273	S12_12	1.088 (0.040)	0.196 (0.023)		
S042274	S10_15	1.177 (0.136)	1.356 (0.061)	0.229 (0.014)	
S042276	S02_07	1.156 (0.159)	1.273 (0.070)	0.387 (0.016)	

( ) Standard errors appear in parentheses



**Exhibit D.26 IRT Parameters for TIMSS 2007 Eighth Grade Science - Physics (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S042278	S10_14	0.751 (0.035)	0.892 (0.043)		
S042279	S02_08	0.474 (0.085)	1.025 (0.196)	0.327 (0.047)	
S042280	S12_07	1.385 (0.097)	0.441 (0.037)	0.214 (0.017)	
S042292	S04_09	0.488 (0.016)	0.767 (0.034)		-0.843 (0.062)
S042293A	S14_10A	0.979 (0.036)	-0.248 (0.026)		0.843 (0.071)
S042293B	S14_10B	0.757 (0.049)	2.042 (0.105)		
S042294	S04_12	1.434 (0.133)	0.981 (0.040)	0.251 (0.014)	
S042402	S08_07	0.778 (0.039)	1.296 (0.056)		
S042403	S06_09	0.894 (0.039)	0.805 (0.035)		
S042407	S10_13	0.419 (0.026)	0.674 (0.063)		

( ) Standard errors appear in parentheses

**Exhibit D.27 IRT Parameters for TIMSS 2007 Eighth Grade Science - Earth Science**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S022078	S05_06	1.065 (0.039)	0.272 (0.024)		
S022244	S03_09	1.256 (0.054)	1.012 (0.030)		
S022290	S05_01	1.080 (0.087)	0.459 (0.051)	0.254 (0.021)	
S022294	S03_07	0.863 (0.085)	0.248 (0.091)	0.358 (0.030)	
S032019A	S01_05A	1.647 (0.073)	1.059 (0.025)		
S032019B	S01_05B	1.813 (0.097)	1.405 (0.034)		
S032060	S11_10	1.119 (0.040)	-0.278 (0.025)		
S032115	S01_01	0.775 (0.064)	0.645 (0.057)	0.108 (0.021)	
S032120A	S05_14A	1.052 (0.051)	1.222 (0.041)		
S032120B	S05_14B	1.025 (0.048)	0.949 (0.034)		
S032151	S09_09	1.091 (0.084)	0.725 (0.040)	0.152 (0.016)	
S032160	S13_10	0.882 (0.091)	0.492 (0.080)	0.346 (0.027)	
S032463	S11_11	1.261 (0.088)	0.360 (0.041)	0.220 (0.018)	
S032510	S13_13	0.910 (0.074)	-0.141 (0.091)	0.303 (0.034)	
S032516	S01_06	0.723 (0.029)	-0.372 (0.034)		
S032519	S05_11	0.801 (0.034)	0.583 (0.033)		
S032555	S07_11	1.215 (0.049)	0.775 (0.026)		
S032650D	S11_12D	0.718 (0.024)	0.253 (0.022)	0.164 (0.038)	-0.164 (0.039)
S032651A	S09_10A	1.391 (0.051)	0.424 (0.020)		
S032651B	S09_10B	1.349 (0.060)	1.036 (0.029)		
S032654	S13_11	1.309 (0.107)	0.749 (0.039)	0.237 (0.016)	
S032660	S07_10	1.126 (0.125)	1.329 (0.058)	0.200 (0.014)	
S032663	S07_09	0.742 (0.112)	1.466 (0.098)	0.265 (0.022)	
S042126	S08_09	0.752 (0.106)	0.609 (0.120)	0.437 (0.032)	
S042135	S08_13	0.739 (0.030)	-0.030 (0.031)		
S042141	S06_13	0.775 (0.064)	-0.142 (0.102)	0.227 (0.037)	
S042149	S04_13	0.590 (0.027)	0.258 (0.038)		
S042150	S04_15	0.875 (0.093)	0.780 (0.068)	0.286 (0.023)	
S042153	S02_16	0.750 (0.035)	0.585 (0.036)		
S042155	S04_14	0.947 (0.039)	0.690 (0.030)		
S042164	S14_14	1.015 (0.077)	0.727 (0.042)	0.133 (0.016)	
S042215	S06_14	0.638 (0.093)	1.413 (0.099)	0.207 (0.025)	
S042257	S08_14	0.861 (0.109)	1.123 (0.072)	0.291 (0.021)	
S042301	S12_13	0.930 (0.035)	0.175 (0.026)		
S042307	S02_13	0.668 (0.030)	0.539 (0.038)		
S042312	S12_14	0.467 (0.058)	-0.218 (0.271)	0.275 (0.067)	
S042317	S10_17	0.532 (0.017)	0.036 (0.027)		-0.393 (0.056) 0.393 (0.055)
S042404	S06_07	0.680 (0.027)	1.407 (0.043)		-0.227 (0.045) 0.227 (0.067)
S042405	S02_14	0.856 (0.100)	0.882 (0.072)	0.309 (0.023)	
S042406	S12_16	1.145 (0.046)	0.745 (0.026)		

( ) Standard errors appear in parentheses

**Exhibit D.28 IRT Parameters for TIMSS 2007 Eighth Grade Science - Knowing**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S022126	S05_07	0.727 (0.071)	0.431 (0.081)	0.217 (0.030)	
S022181	S05_04	1.279 (0.114)	0.724 (0.041)	0.237 (0.018)	
S022183	S03_01	2.151 (0.178)	0.784 (0.026)	0.231 (0.012)	
S022208	S05_05	1.347 (0.130)	0.853 (0.041)	0.246 (0.016)	
S022276	S03_02	0.827 (0.073)	0.352 (0.068)	0.216 (0.027)	
S022290	S05_01	1.426 (0.104)	0.384 (0.038)	0.256 (0.019)	
S022294	S03_07	1.219 (0.101)	0.220 (0.056)	0.358 (0.024)	
S032007	S09_04	1.065 (0.044)	0.317 (0.023)		
S032015	S07_02	1.058 (0.044)	0.476 (0.025)		
S032024	S11_07	1.347 (0.179)	1.267 (0.060)	0.265 (0.014)	
S032035	S05_10	1.300 (0.084)	0.363 (0.034)	0.153 (0.017)	
S032087	S13_06	0.990 (0.094)	0.789 (0.052)	0.200 (0.020)	
S032115	S01_01	1.256 (0.085)	0.537 (0.034)	0.127 (0.016)	
S032122	S07_12	0.725 (0.040)	0.914 (0.048)		
S032126	S13_12	0.857 (0.039)	0.290 (0.028)		
S032151	S09_09	1.605 (0.118)	0.646 (0.029)	0.177 (0.014)	
S032158	S13_14	1.087 (0.097)	0.448 (0.056)	0.301 (0.024)	
S032160	S13_10	1.050 (0.102)	0.443 (0.064)	0.352 (0.025)	
S032257	S07_08	1.276 (0.151)	1.118 (0.052)	0.242 (0.016)	
S032258	S05_13	1.078 (0.076)	0.060 (0.053)	0.228 (0.025)	
S032273	S01_04	0.849 (0.134)	1.445 (0.102)	0.256 (0.020)	
S032310D	S07_03D	0.714 (0.024)	-0.072 (0.020)		-0.068 (0.040) 0.068 (0.038)
S032385	S05_09	1.031 (0.079)	0.030 (0.063)	0.282 (0.027)	
S032403	S01_03	1.227 (0.119)	0.857 (0.044)	0.235 (0.017)	
S032425	S07_07	1.229 (0.121)	0.765 (0.047)	0.286 (0.019)	
S032463	S11_11	1.532 (0.101)	0.316 (0.033)	0.216 (0.018)	
S032465	S11_01	1.028 (0.079)	0.138 (0.059)	0.266 (0.026)	
S032510	S13_13	1.041 (0.079)	-0.116 (0.068)	0.302 (0.029)	
S032514	S11_13	1.031 (0.122)	0.942 (0.061)	0.293 (0.021)	
S032519	S05_11	0.744 (0.037)	0.577 (0.036)		
S032530D	S09_03D	0.609 (0.023)	0.343 (0.027)		0.739 (0.040) -0.739 (0.046)
S032606	S07_01	1.350 (0.101)	-0.262 (0.061)	0.414 (0.028)	
S032611	S13_01	1.020 (0.124)	1.184 (0.064)	0.216 (0.018)	
S032614	S13_02	0.901 (0.038)	0.049 (0.026)		
S032640	S11_04	0.648 (0.032)	-0.017 (0.034)		
S032645	S09_02	1.188 (0.111)	0.679 (0.047)	0.269 (0.020)	
S032660	S07_10	1.209 (0.144)	1.220 (0.057)	0.203 (0.015)	
S032672	S07_05	0.587 (0.079)	0.374 (0.153)	0.355 (0.042)	
S042001	S02_06	1.176 (0.123)	1.153 (0.052)	0.153 (0.014)	
S042003	S12_03	0.713 (0.088)	0.847 (0.086)	0.256 (0.028)	
S042006	S04_02	0.738 (0.077)	0.278 (0.099)	0.310 (0.033)	
S042009	S02_01	1.054 (0.100)	0.569 (0.056)	0.295 (0.022)	
S042013	S04_01	1.123 (0.076)	-0.475 (0.066)	0.277 (0.030)	
S042015	S08_03	1.288 (0.120)	0.718 (0.043)	0.275 (0.018)	

( ) Standard errors appear in parentheses

**Exhibit D.28 IRT Parameters for TIMSS 2007 Eighth Grade Science - Knowing (Continued)**

Item	Slope (a)	Location (b)	Guessing (c)	Step 1 (d <sub>1</sub> )	Step 2 (d <sub>2</sub> )
S042016	S14_03	1.054 (0.135)	1.488 (0.081)	0.138 (0.014)	
S042024	S10_04	1.350 (0.181)	1.257 (0.060)	0.270 (0.014)	
S042028	S02_05	1.026 (0.105)	1.027 (0.053)	0.170 (0.017)	
S042038	S06_02	1.126 (0.087)	0.526 (0.043)	0.171 (0.020)	
S042042	S12_01	0.922 (0.081)	-0.119 (0.089)	0.369 (0.032)	
S042054	S04_05	0.461 (0.062)	-0.028 (0.234)	0.284 (0.057)	
S042059	S02_03	1.076 (0.095)	0.682 (0.047)	0.211 (0.020)	
S042065	S12_06	1.095 (0.098)	-0.198 (0.085)	0.474 (0.030)	
S042068	S14_06	1.146 (0.115)	0.955 (0.048)	0.209 (0.017)	
S042071	S02_11	1.259 (0.122)	0.860 (0.043)	0.229 (0.017)	
S042073	S10_01	0.741 (0.084)	-0.465 (0.171)	0.505 (0.043)	
S042076	S06_06	1.161 (0.048)	0.590 (0.025)		
S042095	S10_05	1.201 (0.075)	-0.062 (0.046)	0.207 (0.023)	
S042100	S06_11	0.480 (0.021)	0.649 (0.035)		-0.064 (0.052) 0.064 (0.062)
S042109	S04_10	2.032 (0.131)	0.202 (0.029)	0.278 (0.017)	
S042112	S10_11	0.537 (0.065)	0.326 (0.143)	0.234 (0.043)	
S042126	S08_09	0.866 (0.113)	0.539 (0.098)	0.436 (0.030)	
S042135	S08_13	0.907 (0.038)	0.001 (0.026)		
S042141	S06_13	0.933 (0.069)	-0.087 (0.068)	0.230 (0.029)	
S042149	S04_13	0.558 (0.030)	0.259 (0.040)		
S042150	S04_15	0.993 (0.089)	0.544 (0.055)	0.242 (0.023)	
S042153	S02_16	0.741 (0.038)	0.559 (0.037)		
S042164	S14_14	1.678 (0.111)	0.587 (0.027)	0.146 (0.013)	
S042182	S08_06	0.938 (0.085)	0.155 (0.076)	0.345 (0.029)	
S042210	S08_10	0.971 (0.141)	1.295 (0.081)	0.273 (0.019)	
S042215	S06_14	0.775 (0.096)	1.140 (0.077)	0.197 (0.023)	
S042217	S12_15	1.781 (0.145)	0.667 (0.031)	0.254 (0.015)	
S042249	S14_08	0.996 (0.084)	0.603 (0.050)	0.194 (0.021)	
S042257	S08_14	1.260 (0.144)	0.945 (0.051)	0.309 (0.018)	
S042261	S06_04	0.981 (0.046)	0.817 (0.034)		
S042272	S06_10	1.156 (0.096)	0.474 (0.048)	0.264 (0.022)	
S042274	S10_15	0.988 (0.123)	1.250 (0.069)	0.199 (0.018)	
S042279	S02_08	0.464 (0.072)	0.675 (0.178)	0.268 (0.047)	
S042293A	S14_10A	1.029 (0.041)	-0.195 (0.025)		
S042301	S12_13	1.041 (0.042)	0.159 (0.023)		
S042306	S06_08	1.373 (0.144)	0.954 (0.043)	0.260 (0.016)	
S042307	S02_13	0.716 (0.036)	0.501 (0.036)		
S042312	S12_14	0.563 (0.064)	-0.160 (0.173)	0.283 (0.049)	
S042317	S10_17	0.663 (0.022)	0.066 (0.022)		-0.298 (0.045) 0.298 (0.044)

( ) Standard errors appear in parentheses

**Exhibit D.29 IRT Parameters for TIMSS 2007 Eighth Grade Science - Applying**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S022002	S03_06	1.186 (0.095)	0.535 (0.044)	0.227 (0.020)	
S022019	S03_05	1.026 (0.077)	-0.060 (0.067)	0.278 (0.029)	
S022054	S05_03	1.035 (0.092)	0.539 (0.054)	0.249 (0.022)	
S022069	S03_13	1.146 (0.048)	0.624 (0.026)		
S022078	S05_06	1.297 (0.048)	0.236 (0.020)		
S022150	S03_10	0.960 (0.082)	0.520 (0.055)	0.206 (0.023)	
S022281	S05_08	0.659 (0.037)	1.118 (0.060)		
S032019A	S01_05A	1.249 (0.059)	1.081 (0.036)		
S032019B	S01_05B	1.383 (0.078)	1.442 (0.050)		
S032056	S13_05	0.974 (0.042)	0.596 (0.029)		
S032060	S11_10	1.211 (0.046)	-0.267 (0.023)		
S032120A	S05_14A	1.037 (0.052)	1.160 (0.044)		
S032120B	S05_14B	1.099 (0.053)	0.853 (0.033)		
S032141	S11_09	1.836 (0.169)	0.978 (0.032)	0.198 (0.012)	
S032184	S09_07	0.582 (0.085)	1.069 (0.112)	0.220 (0.034)	
S032238	S13_08	1.385 (0.103)	0.598 (0.035)	0.189 (0.016)	
S032279	S13_07	1.120 (0.132)	1.270 (0.061)	0.195 (0.015)	
S032306	S11_03	0.594 (0.017)	0.542 (0.024)		-1.086 (0.057)
S032369	S13_09	0.730 (0.026)	0.679 (0.025)		-0.067 (0.037)
S032392	S07_06	0.498 (0.050)	-1.206 (0.275)	0.269 (0.074)	0.067 (0.045)
S032394	S09_08	1.146 (0.111)	0.712 (0.051)	0.289 (0.020)	
S032451	S13_03	0.638 (0.017)	0.167 (0.021)		-1.206 (0.059)
S032502	S09_05	1.401 (0.101)	0.643 (0.032)	0.161 (0.015)	
S032516	S01_06	0.836 (0.035)	-0.330 (0.030)		
S032542	S09_01	1.474 (0.122)	0.641 (0.037)	0.261 (0.017)	
S032570	S11_06	1.132 (0.046)	0.597 (0.026)		
S032579	S11_05	0.987 (0.130)	1.185 (0.070)	0.271 (0.019)	
S032650D	S11_12D	0.821 (0.028)	0.199 (0.019)		0.143 (0.033)
S032651A	S09_10A	1.341 (0.051)	0.417 (0.020)		-0.143 (0.035)
S032663	S07_09	0.630 (0.108)	1.483 (0.126)	0.253 (0.027)	
S032679	S09_06	0.906 (0.049)	1.358 (0.057)		
S032683	S05_12	1.272 (0.103)	0.726 (0.037)	0.173 (0.016)	
S032697D	S01_10D	0.818 (0.028)	0.521 (0.021)		-0.060 (0.035)
S042005	S14_02	0.365 (0.011)	0.349 (0.034)		0.060 (0.040)
S042007	S10_03	1.423 (0.118)	0.721 (0.036)	0.214 (0.016)	
S042011	S02_04	1.016 (0.050)	1.129 (0.043)		
S042017	S10_02	1.036 (0.115)	1.110 (0.057)	0.202 (0.017)	
S042030	S12_02	0.904 (0.045)	1.118 (0.046)		
S042043	S04_06	0.440 (0.029)	1.077 (0.080)		
S042049A	S08_05A	1.056 (0.040)	-0.345 (0.025)		
S042051A	S06_05A	0.941 (0.038)	0.156 (0.025)		
S042052	S04_04	0.638 (0.025)	0.254 (0.024)		0.295 (0.041)
S042053	S08_01	1.433 (0.099)	0.057 (0.044)	0.301 (0.022)	-0.295 (0.044)
S042061	S04_08	0.679 (0.092)	1.319 (0.092)	0.169 (0.024)	

( ) Standard errors appear in parentheses

**Exhibit D.29 IRT Parameters for TIMSS 2007 Eighth Grade Science - Applying (Continued)**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S042063	S10_07	0.853 (0.069)	-1.356 (0.159)	0.346 (0.060)	
S042064	S12_11	0.990 (0.044)	0.797 (0.033)		
S042088	S12_08	0.718 (0.033)	0.084 (0.031)		
S042094	S14_09	0.986 (0.043)	0.632 (0.029)		
S042101	S02_12	1.074 (0.049)	0.945 (0.035)		
S042106	S02_10	1.290 (0.054)	0.801 (0.027)		
S042110	S12_04	0.692 (0.059)	-0.523 (0.133)	0.244 (0.047)	
S042155	S04_14	1.006 (0.043)	0.628 (0.028)		
S042173	S10_12	0.499 (0.018)	-0.387 (0.033)	1.171 (0.058)	-1.171 (0.049)
S042195	S14_11	0.749 (0.044)	1.418 (0.070)		
S042196	S04_07	0.959 (0.050)	1.217 (0.049)		
S042211	S08_12	1.030 (0.041)	0.182 (0.023)		
S042216	S14_07	1.054 (0.107)	0.574 (0.062)	0.330 (0.024)	
S042218	S12_09	1.618 (0.129)	0.639 (0.033)	0.250 (0.015)	
S042222A	S12_05A	1.332 (0.063)	1.125 (0.035)		
S042222B	S12_05B	1.283 (0.056)	0.892 (0.029)		
S042222C	S12_05C	0.981 (0.084)	0.300 (0.064)	0.275 (0.026)	
S042228C	S08_08C	1.496 (0.058)	0.616 (0.021)		
S042244A	S02_15A	1.262 (0.057)	0.957 (0.031)		
S042244B	S02_15B	1.146 (0.062)	1.321 (0.049)		
S042258	S14_01	0.892 (0.094)	0.912 (0.060)	0.202 (0.022)	
S042273	S12_12	1.114 (0.043)	0.199 (0.022)		
S042276	S02_07	1.070 (0.158)	1.176 (0.074)	0.375 (0.018)	
S042278	S10_14	0.946 (0.042)	0.751 (0.033)		
S042292	S04_09	0.551 (0.018)	0.699 (0.030)	-0.737 (0.055)	0.737 (0.062)
S042293B	S14_10B	0.855 (0.057)	1.821 (0.094)		
S042298	S06_03	1.080 (0.043)	0.401 (0.024)		
S042300A	S14_04A	1.589 (0.057)	0.146 (0.017)		
S042300B	S14_04B	0.681 (0.041)	1.440 (0.076)		
S042300C	S14_04C	1.439 (0.053)	0.284 (0.018)		
S042305	S10_10	0.590 (0.027)	1.169 (0.044)	0.308 (0.042)	-0.308 (0.065)
S042309	S08_04	0.439 (0.085)	1.376 (0.188)	0.259 (0.044)	
S042313	S02_02	0.799 (0.034)	-0.534 (0.034)		
S042400	S14_12	1.085 (0.052)	1.075 (0.039)		
S042402	S08_07	0.862 (0.044)	1.162 (0.050)		
S042404	S06_07	0.844 (0.032)	1.189 (0.034)	-0.146 (0.037)	0.146 (0.054)
S042405	S02_14	1.237 (0.120)	0.686 (0.048)	0.309 (0.019)	
S042406	S12_16	1.129 (0.048)	0.686 (0.027)		
S042407	S10_13	0.419 (0.027)	0.661 (0.064)		
S042408	S08_02	0.773 (0.035)	0.433 (0.032)		

( ) Standard errors appear in parentheses

**Exhibit D.30 IRT Parameters for TIMSS 2007 Eighth Grade Science - Reasoning**

Item	Slope (a <sub>i</sub> )	Location (b <sub>i</sub> )	Guessing (c <sub>i</sub> )	Step 1 (d <sub>1i</sub> )	Step 2 (d <sub>2i</sub> )
S022022	S03_04	0.693 (0.029)	0.216 (0.034)		
S022042	S03_11	1.273 (0.092)	0.656 (0.038)	0.194 (0.015)	
S022115	S03_03	0.937 (0.072)	0.158 (0.069)	0.239 (0.027)	
S022244	S03_09	1.072 (0.046)	1.095 (0.035)		
S022268	S03_14	0.690 (0.032)	0.783 (0.042)		
S022289	S03_12	0.744 (0.026)	1.024 (0.029)	0.815 (0.033)	-0.815 (0.054)
S022292	S05_02	0.634 (0.029)	0.737 (0.043)		
S032156	S13_04	1.188 (0.099)	0.901 (0.043)	0.216 (0.015)	
S032272	S11_08	0.810 (0.045)	1.742 (0.072)		
S032315	S11_02	0.871 (0.088)	0.869 (0.065)	0.255 (0.022)	
S032555	S07_11	1.297 (0.050)	0.779 (0.024)		
S032565	S01_02	0.769 (0.035)	1.049 (0.044)		
S032620	S01_07	0.772 (0.110)	1.747 (0.104)	0.195 (0.017)	
S032651B	S09_10B	0.768 (0.040)	1.437 (0.059)		
S032654	S13_11	0.903 (0.085)	0.863 (0.059)	0.227 (0.021)	
S032665A	S09_11A	0.921 (0.038)	0.750 (0.032)		
S032665B	S09_11B	1.709 (0.073)	1.006 (0.023)		
S032665C	S09_11C	1.461 (0.064)	0.962 (0.026)		
S032680	S07_04	0.640 (0.020)	-0.318 (0.024)	0.106 (0.045)	-0.106 (0.041)
S032693A	S01_08A	1.033 (0.037)	0.267 (0.025)		
S032693B	S01_08B	1.147 (0.040)	-0.021 (0.023)		
S032695	S01_09	0.701 (0.023)	0.750 (0.026)	-0.145 (0.041)	0.145 (0.049)
S042022	S10_06	0.852 (0.034)	0.616 (0.032)		
S042049B	S08_05B	1.051 (0.039)	0.410 (0.025)		
S042051B	S06_05B	1.154 (0.047)	0.955 (0.030)		
S042083	S02_09	0.640 (0.022)	1.272 (0.038)	-0.300 (0.047)	0.300 (0.064)
S042104	S12_10	0.847 (0.039)	1.166 (0.044)		
S042176	S08_11	0.875 (0.036)	0.719 (0.033)		
S042197	S10_08	0.979 (0.102)	1.138 (0.057)	0.241 (0.017)	
S042228A	S08_08A	1.207 (0.054)	1.196 (0.035)		
S042228B	S08_08B	1.066 (0.038)	0.171 (0.024)		
S042232A	S04_11A	0.979 (0.037)	0.488 (0.027)		
S042232B	S04_11B	1.261 (0.074)	1.813 (0.059)		
S042232C	S04_11C	1.637 (0.280)	1.786 (0.078)	0.329 (0.011)	
S042238A	S06_12A	0.789 (0.076)	0.998 (0.062)	0.159 (0.021)	
S042238B	S06_12B	0.672 (0.035)	1.430 (0.064)		
S042280	S12_07	1.453 (0.086)	0.335 (0.032)	0.155 (0.015)	
S042294	S04_12	1.173 (0.116)	1.133 (0.049)	0.249 (0.015)	
S042297	S10_09	0.531 (0.018)	1.439 (0.046)	-0.903 (0.065)	0.903 (0.083)
S042304	S06_01	0.833 (0.065)	0.211 (0.075)	0.196 (0.028)	
S042310	S04_03	0.498 (0.016)	0.167 (0.027)	-0.347 (0.055)	0.347 (0.057)
S042319	S14_05	1.107 (0.047)	1.057 (0.033)		
S042403	S06_09	0.800 (0.035)	0.895 (0.039)		

( ) Standard errors appear in parentheses

