

APPENDIX A

Figure A.1
Examples of Cross-Country Item Analysis
Population: 2 (B) Subject: Mathematics' Cluster: H Item: BSMNH07

Country	Correct Answer				Flags	Percentages for each alternative										Point biserials for each alternative					Rasch				Group Difficulties				International Mean	
	N	DIFF	DISCR			A	B	C	D	E	W	OMIT	NR	A	B	C	D	E	W	OMIT	NR	DIFF	SE	FIT	MAL	FEM	LOW	UPP	DIFF	DISCR
AUS	5172	78.5	0.36		q	3.3	9.8	78.5*	2.4	5.2	0.6	0.1	-0.21	-0.14	-3.6*	-0.10	-0.22	-0.07	-0.04	-0.04	-0.04	-0.14	0.04	1.07	77.9	79.1	70.3	78.7	68.1	0.38
AUT	2241	70.3	0.41		q	4.6	12.4	70.3*	3.4	2.9	0.5	0.2	-0.19	-0.16	-4.7*	-0.11	-0.19	-0.14	-0.06	-0.04	-0.07	-0.07	1.06	71.5	69.2	70.3	70.3	68.1	0.38	
BFL	2123	82.9	0.37		qG	2.7	8.4	82.9*	2.5	2.6	0.2	0.0	-0.21	-0.19	-3.1*	-0.13	-0.17	-0.07	-0.01	-0.01	-0.01	-0.07	1.00	83.3	82.6	82.1	83.8	68.1	0.38	
BFR	1841	72.5	0.39		q	8.0	12.2	72.5*	2.2	3.3	1.3	0.1	-0.24	-0.14	-3.9*	-0.09	-0.17	-0.11	-0.02	-0.02	-0.02	-0.11	1.05	73.6	71.7	70.1	74.6	68.1	0.38	
BGR	1285	59.2	0.46		qG	8.2	16.2	59.2*	4.4	6.8	3.1	0.0	-0.17	-0.15	-4.6*	-0.12	-0.21	-0.19	0.00	0.00	-0.01	-0.19	1.04	59.2	59.2	55.5	62.9	68.1	0.38	
CAN	6180	71.5	0.41		qG	5.5	10.9	71.5*	4.1	7.3	0.4	0.1	-0.21	-0.18	-4.1*	-0.11	-0.20	-0.08	-0.03	-0.03	-0.03	-0.08	1.00	72.0	71.2	69.3	73.7	68.1	0.38	
CHE	3718	77.4	0.42		qG	4.2	9.7	77.4*	3.1	3.6	0.7	0.2	-0.25	-0.19	-4.2*	-0.12	-0.15	-0.11	-0.04	-0.04	-0.04	-0.08	1.02	77.8	77.1	78.4	82.6	68.1	0.38	
CHE	588	79.8	0.38		qG	3.9	8.3	79.8*	2.2	4.3	0.5	0.0	-0.21	-0.17	-3.8*	-0.11	-0.19	-0.08	0.00	0.00	-0.01	-0.08	0.98	80.9	78.5	78.9	80.6	68.1	0.38	
CHE	570	75.8	0.38		qS	3.3	11.8	75.8*	3.2	3.9	0.4	0.4	-0.18	-0.15	-3.6*	-0.10	-0.20	-0.10	-0.10	-0.10	-0.10	-0.10	1.03	74.2	77.5	73.0	78.6	68.1	0.38	
COL	1978	35.9	0.25		qSSG	14.0	19.2	35.9*	7.7	14.8	5.8	1.6	0.00	-0.02	-2.5*	-0.05	-0.15	-0.08	-0.05	-0.05	-0.05	-0.05	1.07	66.3	35.7	35.4	36.5	68.1	0.38	
CSK	2465	64.8	0.38		qSS	5.5	19.7	64.8*	3.3	3.8	1.1	0.2	-0.21	-0.18	-3.8*	-0.10	-0.14	-0.08	-0.05	-0.02	-0.02	-0.02	1.11	67.3	62.3	62.7	66.9	68.1	0.38	
CYP	2129	53.9	0.35		q	9.1	16.6	53.9*	6.0	10.1	2.5	0.0	-0.12	-0.10	-3.5*	-0.08	-0.19	-0.12	-0.03	-0.03	-0.03	-0.12	1.10	54.7	53.0	52.1	55.6	68.1	0.38	
DEU	2258	70.2	0.41		q	5.3	9.8	70.2*	3.7	6.2	2.3	0.4	-0.22	-0.11	-4.1*	-0.09	-0.16	-0.19	-0.09	-0.09	-0.09	-0.09	1.03	70.4	70.7	68.8	73.6	68.1	0.38	
DNK	2372	77.4	0.43		q	3.7	9.6	77.4*	3.1	3.7	1.4	0.4	-0.20	-0.20	-4.3*	-0.13	-0.20	-0.14	-0.04	-0.04	-0.04	-0.04	1.03	78.4	76.3	78.0	86.4	68.1	0.38	
ESP	2813	54.7	0.40		qSS	8.7	19.0	54.7*	4.5	8.7	4.4	0.1	-0.19	-0.10	-4.0*	-0.09	-0.19	-0.15	0.00	0.00	-0.05	-0.05	1.03	56.8	52.6	50.5	58.8	68.1	0.38	
FRA	2245	75.6	0.35		qSS	6.1	11.4	75.6*	1.7	3.4	0.4	0.3	-0.20	-0.14	-3.5*	-0.06	-0.18	-0.05	-0.07	-0.07	-0.07	-0.05	1.04	78.1	73.2	70.7	80.7	68.1	0.38	
GBR	1322	77.5	0.42		qG	2.6	11.6	77.5*	2.7	5.2	0.4	0.0	-0.20	-0.20	-4.2*	-0.12	-0.23	-0.10	0.00	0.00	-0.10	-0.10	1.06	46.2	44.5	38.1	52.6	68.1	0.38	
HKG	3017	45.4	0.42		G	17.8	14.5	45.4*	6.5	11.2	2.8	0.1	-0.17	-0.07	-4.2*	-0.07	-0.22	-0.12	-0.02	0.02	0.04	-0.12	1.06	46.2	44.5	38.1	52.6	68.1	0.38	
HKG	2537	85.6	0.42		q	1.7	5.5	85.6*	2.8	3.9	0.4	0.0	-0.23	-0.24	-4.2*	-0.09	-0.22	-0.05	0.00	0.00	-0.05	-0.05	1.00	86.8	84.0	84.3	86.8	68.1	0.38	
HUN	2224	61.5	0.46		qSSG	9.2	15.5	61.5*	5.0	1.9	6.6	0.4	-0.24	-0.16	-4.6*	-0.18	-0.10	-0.17	-0.06	0.05	0.05	-0.17	1.02	62.9	60.4	55.0	68.3	68.1	0.38	
IRL	2332	77.7	0.41		qS	3.7	11.2	77.7*	3.1	3.6	0.1	0.0	-0.23	-0.20	-4.1*	-0.11	-0.19	-0.05	-0.03	-0.03	-0.03	-0.01	1.01	77.7	77.8	75.3	80.3	68.1	0.38	
IRL	2755	42.1	0.30		SG	17.5	20.3	42.1*	6.0	11.7	2.1	0.0	-0.13	-0.05	-3.0*	-0.04	-0.20	-0.01	0.00	0.00	-0.01	-0.01	1.05	41.3	43.1	35.5	48.8	68.1	0.38	
ISL	1388	73.1	0.40		q	3.6	13.4	73.1*	4.0	5.0	0.4	0.1	-0.18	-0.20	-4.0*	-0.15	-0.15	-0.06	-0.04	-0.04	-0.04	-0.06	0.98	73.5	72.7	69.3	77.5	68.1	0.38	
ISR	518	63.3	0.38		q	7.9	16.6	63.3*	5.0	5.6	1.2	0.0	-0.16	-0.15	-3.8*	-0.18	-0.10	-0.10	-0.16	-0.16	-0.16	-0.10	1.10	65.0	64.0	63.3	63.3	68.1	0.38	
JPN	3913	83.3	0.33		qSSG	1.9	8.6	83.3*	2.4	3.7	0.0	0.0	-0.17	-0.14	-3.3*	-0.13	-0.22	0.00	0.00	0.00	-0.06	-0.06	1.09	82.4	84.2	82.1	84.4	68.1	0.38	
KOR	2160	91.3	0.45		qSSG	1.7	3.1	91.3*	2.0	1.8	0.1	0.0	-0.19	-0.20	-4.5*	-0.21	-0.28	-0.04	0.00	0.00	-0.04	-0.04	0.91	92.9	89.3	90.7	91.9	68.1	0.38	
KOR	635	42.8	0.27		q	14.8	16.4	42.8*	7.1	14.5	4.1	0.3	-0.10	-0.03	-2.7*	-0.09	-0.14	-0.06	-0.10	-0.10	-0.06	-0.06	1.06	41.4	43.5	39.7	50.7	68.1	0.38	
KWT	1882	45.2	0.39		SS	10.2	24.0	45.2*	5.6	6.9	6.5	0.4	-0.15	-0.09	-3.9*	-0.04	-0.18	-0.22	-0.06	0.02	0.05	-0.22	1.02	72.0	73.3	70.2	74.8	68.1	0.38	
LVA	1867	47.3	0.35		q	8.2	26.0	47.3*	4.6	9.4	3.9	0.6	-0.16	-0.06	-3.5*	-0.07	-0.21	-0.12	-0.05	-0.05	-0.05	-0.12	1.10	46.7	47.9	43.5	51.2	68.1	0.38	
MEX	4371	48.2	0.33		q	16.4	18.6	48.2*	4.0	10.8	1.2	0.4	-0.17	-0.06	-3.3*	-0.05	-0.19	-0.07	-0.04	-0.04	-0.07	-0.07	1.02	48.3	48.0	45.8	50.7	68.1	0.38	
NLD	1546	78.4	0.36		q	3.2	13.8	78.4*	1.6	2.7	0.3	0.2	-0.27	-0.17	-3.6*	-0.08	-0.14	-0.11	-0.08	-0.08	-0.07	-0.07	1.06	78.4	78.2	74.9	82.0	68.1	0.38	
NOR	771	72.8	0.37		qG	4.2	12.3	72.8*	3.3	6.5	0.9	0.1	-0.21	-0.15	-3.7*	-0.08	-0.18	-0.12	-0.03	-0.03	-0.03	-0.03	1.02	73.3	70.2	74.8	82.0	68.1	0.38	
NZL	2543	77.1	0.41		qSS	4.3	10.5	77.1*	3.1	4.7	0.1	0.0	-0.20	-0.20	-4.1*	-0.14	-0.19	-0.02	-0.02	-0.02	-0.02	-0.02	1.00	79.0	75.2	73.9	79.8	68.1	0.38	
PHL	4478	49.3	0.15		qbBFG	6.5	25.8	49.3*	4.7	13.2	0.4	0.1	-0.06	0.03	-1.5*	-0.07	-0.16	-0.03	-0.02	-0.02	-0.02	-0.02	1.20	50.2	48.7	49.7	49.0	68.1	0.38	
PRT	2496	64.0	0.35		qSS	6.9	17.7	64.0*	3.0	6.1	2.2	0.2	-0.17	-0.13	-3.6*	-0.11	-0.15	-0.12	-0.04	-0.04	-0.04	-0.04	1.01	67.5	60.4	60.9	67.0	68.1	0.38	
ROM	2789	43.5	0.35		SS	16.6	16.9	43.5*	6.9	9.3	4.0	0.5	-0.12	-0.08	-3.5*	-0.07	-0.18	-0.12	-0.04	-0.04	-0.04	-0.04	1.09	45.9	41.1	39.9	47.1	68.1	0.38	
RUS	3036	54.4	0.31		qF	8.5	24.4	54.4*	2.6	5.6	3.3	0.4	-0.17	-0.04	-3.1*	-0.09	-0.20	-0.15	-0.03	-0.03	-0.03	-0.03	1.19	54.9	53.9	51.5	57.3	68.1	0.38	
SCO	2127	76.4	0.39		qS	1.8	12.4	76.4*	2.9	4.8	0.3	0.0	-0.22	-0.17	-3.6*	-0.11	-0.23	-0.07	-0.02	-0.02	-0.02	-0.02	1.01	76.1	76.6	73.9	78.9	68.1	0.38	
SGP	3096	85.5	0.36		qS	1.8	7.2	85.5*	2.2	3.2	0.3	0.0	-0.12	-0.24	-3.9*	-0.14	-0.17	-0.04	0.01	-0.01	-0.01	-0.04	1.02	84.4	86.4	82.0	88.2	68.1	0.38	
SLV	2650	61.1	0.37		qFG	5.5	20.8	61.1*	4.0	5.8	1.4	0.2	-0.17	-0.16	-3.7*	-0.08	-0.18	-0.09	-0.05	-0.05	-0.05	-0.05	1.13	60.3	61.8	58.6	63.6	68.1	0.38	
SVN	2086	68.2	0.38		qS	5.5	17.3	68.2*	3.5	4.2	0.8	0.0	-0.21	-0.19	-3.8*	-0.09	-0.13	-0.06	0.00	0.00	-0.04	-0.04	1.06	63.9	66.7	62.8	73.7	68.1	0.38	
SWE	3277	73.9	0.38		q	3.3	13.5	73.9*	4.0	3.7	0.3	0.1	-0.20	-0.16	-3.8*	-0.13	-0.20	-0.08	0.00	0.00	-0.04	-0.04	1.05	73.4	74.4	74.6	80.0	68.1	0.38	
USA	4108	69.7	0.37		qSS	5.4	14.5	69.7*	3.8	5.8	0.7	0.0	-0.21	-0.19	-3.7*	-0.11	-0.13	-0.07	0.01	-0.01	-0.01	-0.07	1.06	67.6	72.0	66.4	71.6	68.1	0.38	

Figure A.2
Example of Graphical Displays of Cross-Country Item Statistics - Mathematics - Population 2

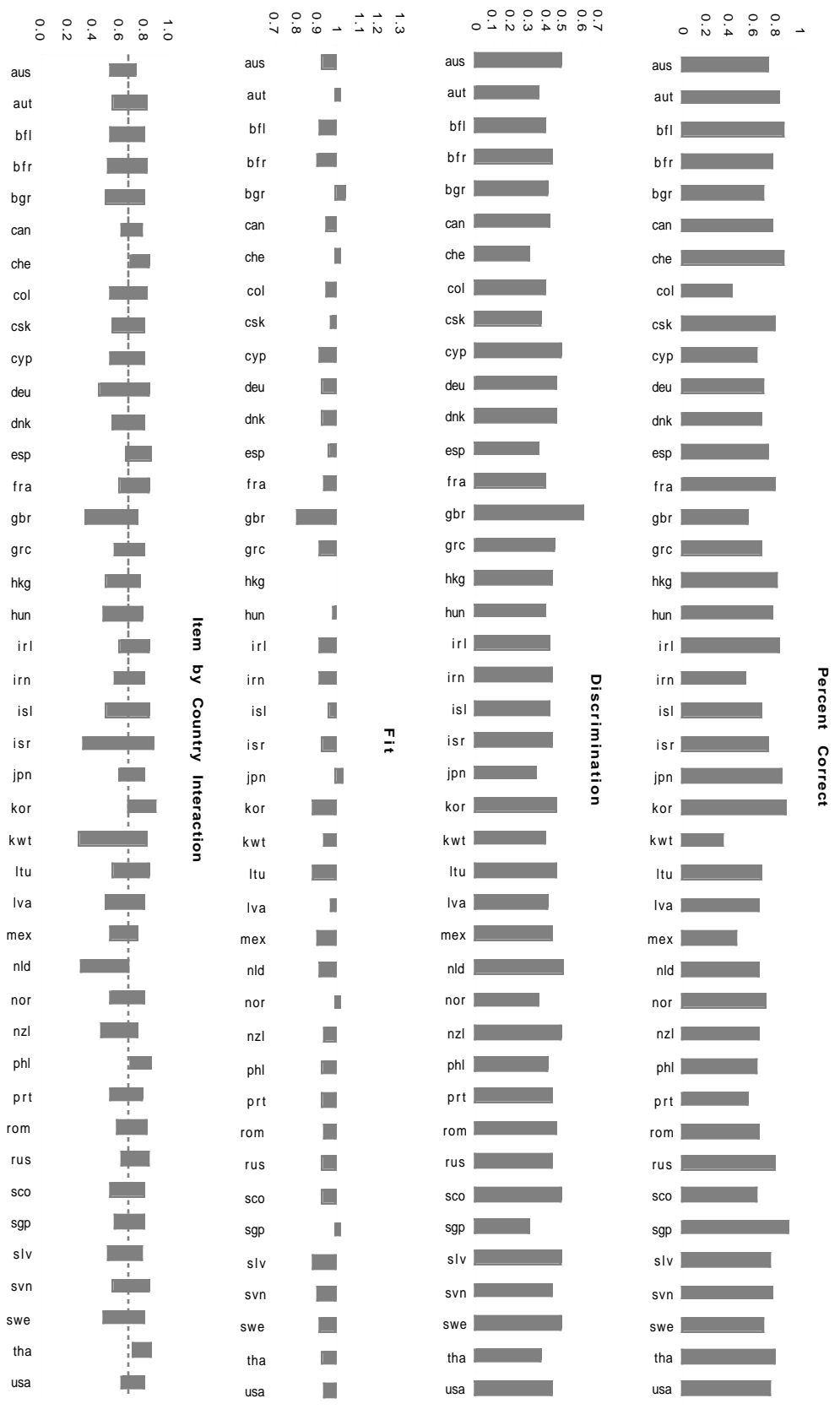


Figure A.3
Summary of Items with Poor Statistics for Some Countries

Country	Item by Country Interactions		Discrimination			Fit
	Easier than Expected	Harder than Expected	Non-key PB is Positive	Key PB is Negative	Ability not Ordered	Fit Large
	Tolerance=#Name					
<i>tem: 119</i>	<i>BSMSQ15</i>	<i>BSMS/WHICH IS NOT A CHEMICAL CHANGE (A)</i>				
DEU	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HKG	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ISL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ISR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NOR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PHL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>tem: 120</i>	<i>BSMSQ16</i>	<i>BSMS/HOW LONG TAKE LIGHT FROM STAR (D)</i>				
COL	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CYP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DEU	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GRC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HKG	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ISR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
KOR	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MEX	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ROM	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
THA	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
