Statistics/Data Analysis

```
      name:  <unnamed>
       log:  /hdir/0/jhaber/Projects/charter_data/stats_team/logs/results_2_schpov_mi100_linear_0429
  log type:  smcl
 opened on:  29 Apr 2019, 13:25:01

1 . ** ------------------------------------------------------
2 . ** MIXED-EFFECTS NBREG MODELS PT 2: IBL, ACADEMICS -> POVERTY
3 . ** ------------------------------------------------------
4 .
5 . * Sequence of models:
6 . * 0. controls only
7 . * 1. IBL
8 . * 2. academic performance
9 . * 3. fully specified
10.
11. * FULL MI ESTIMATION (rather than just one imputation)
12. * mi est, dots post:
13.
14. * 0. controls only
15. mi xeq 1 / 5: mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: ,

  m=1 data:
  -> mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: , cov(unstruct
  Note: single-variable random-effects specification in geodistrict equation; covariance structure set

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood = -586.29422
  Iteration 1:   log likelihood = -586.29393
  Iteration 2:   log likelihood = -586.29393

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      6,259
  Group variable: geodistrict                     Number of groups  =      1,526

                                                  Obs per group:
                                                                min =          1
                                                                avg =        4.1
                                                                max =        278

                                                  Wald chi2(6)      =      70.86
  Log likelihood = -586.29393                     Prob > chi2       =     0.0000
```

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	-.0006567	.0088111	-0.07	0.941	-.017926	.0166127
middle	.0336106	.0129183	2.60	0.009	.0082913	.0589299
high	-.0055511	.0104859	-0.53	0.597	-.0261031	.0150009
lnage	.0050966	.003699	1.38	0.168	-.0021534	.0123465
lnstudents	-.015936	.0039038	-4.08	0.000	-.0235874	-.0082846
urban	.0660663	.0101943	6.48	0.000	.0460859	.0860467
_cons	.5545388	.0237218	23.38	0.000	.508045	.6010326

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	.0362494	.0023515	.0319216	.0411641
var(Residual)	.056619	.0011434	.0544217	.058905

LR test vs. linear model: chibar2(01) = **2069.84** Prob >= chibar2 = **0.0000**

m=2 data:
-> **mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: , cov(unstruct**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-611.16612**
Iteration 1: log likelihood = **-611.16577**
Iteration 2: log likelihood = **-611.16577**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**6**) = **57.19**
Log likelihood = **-611.16577** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	-.0012491	.008849	-0.14	0.888	-.0185928	.0160945
middle	.0344246	.012976	2.65	0.008	.0089922	.059857
high	-.007103	.0105312	-0.67	0.500	-.0277437	.0135377
lnage	.0033967	.0037147	0.91	0.361	-.0038839	.0106774
lnstudents	-.0124735	.0039194	-3.18	0.001	-.0201554	-.0047916
urban	.0597329	.0102241	5.84	0.000	.0396941	.0797717
_cons	.5433296	.0238133	22.82	0.000	.4966563	.5900028

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0360952	.0023572	.0317586	.041024
var(Residual)	.0571755	.0011548	.0549563	.0594844

LR test vs. linear model: chibar2(01) = **2058.37** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: , cov(unstruct**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-604.77561**
Iteration 1: log likelihood = **-604.77526**
Iteration 2: log likelihood = **-604.77526**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**6**) = **65.73**
Log likelihood = **-604.77526** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	-.0056313	.00884	-0.64	0.524	-.0229573	.0116947
middle	.0324811	.0129628	2.51	0.012	.0070745	.0578877
high	-.0091406	.0105205	-0.87	0.385	-.0297603	.0114792
lnage	.0035038	.0037109	0.94	0.345	-.0037695	.0107771
lnstudents	-.0134599	.0039154	-3.44	0.001	-.021134	-.0057858
urban	.064808	.0102135	6.35	0.000	.0447899	.0848261
_cons	.5476059	.023789	23.02	0.000	.5009803	.5942315

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	.0360164	.0023528	.031688	.0409361
var(Residual)	.0570601	.0011526	.0548452	.0593644

LR test vs. linear model: chibar2(01) = **2061.45** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: , cov(unstruct**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-614.20398**
Iteration 1: log likelihood = **-614.20363**
Iteration 2: log likelihood = **-614.20363**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**6**) = **65.87**
Log likelihood = **-614.20363** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	-.0038783	.0088524	-0.44	0.661	-.0212286	.0134721
middle	.0319477	.0129803	2.46	0.014	.0065068	.0573887
high	-.0081185	.0105352	-0.77	0.441	-.0287672	.0125301
lnage	.0043021	.0037162	1.16	0.247	-.0029816	.0115857
lnstudents	-.0143283	.0039213	-3.65	0.000	-.0220139	-.0066427
urban	.0648905	.0102324	6.34	0.000	.0448354	.0849456
_cons	.5505987	.0238258	23.11	0.000	.503901	.5972964

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	.0362671	.0023712	.0319051	.0412254
var(Residual)	.0571986	.0011561	.054977	.0595101

LR test vs. linear model: chibar2(01) = **2037.09** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: , cov(unstruct**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-643.34178**
Iteration 1: log likelihood = **-643.34139**
Iteration 2: log likelihood = **-643.34139**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**6**) = **67.35**
Log likelihood = **-643.34139** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
primary	-.0040798	.0088974	-0.46	0.647	-.0215184	.0133589
middle	.0323006	.0130492	2.48	0.013	.0067248	.0578765
high	-.010001	.010589	-0.94	0.345	-.030755	.0107531
lnage	.0036639	.0037348	0.98	0.327	-.0036561	.010984
lnstudents	-.0146447	.0039396	-3.72	0.000	-.0223662	-.0069232
urban	.065488	.0102656	6.38	0.000	.0453677	.0856083
_cons	.5547412	.0239331	23.18	0.000	.5078332	.6016492

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0360184	.002366	.0316672	.0409674
var(Residual)	.0578735	.0011688	.0556274	.0602103

LR test vs. linear model: chibar2(01) = **1998.71** — Prob >= chibar2 = **0.0000**

16. mi est, dots post: mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistri

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....80.....9

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **6,259**

Group variable: **geodistrict** — Number of groups = **1,526**
Obs per group:
min = **1**
avg = **4.1**
max = **278**
Average RVI = **0.0736**
Largest FMI = **0.1579**
DF adjustment: **Large sample** — DF: min = **3,993.44**
avg = **29,642.94**
max = **105,928.86**
Model F test: **Equal FMI** — F(**6,100170.4**) = **10.40**
Prob > F = **0.0000**

povertyschoolprop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
primary	-.0021427	.0092092	-0.23	0.816	-.0201935	.0159081
middle	.0347315	.0133689	2.60	0.009	.008528	.060935
high	-.0076307	.0108885	-0.70	0.483	-.0289727	.0137114
lnage	.0045435	.0038682	1.17	0.240	-.0030386	.0121256
lnstudents	-.0153371	.0042762	-3.59	0.000	-.0237209	-.0069534
urban	.0637203	.0104864	6.08	0.000	.0431668	.0842739
_cons	.5562295	.025456	21.85	0.000	.5063276	.6061314

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity sd(_cons)	.190485	.0063192	.1784936	.2032819
sd(Residual)	.2394212	.002547	.2344802	.2444662

```
17. est store pov0

18. est save "models/2a_schpov_controls_mi100_linear.ster", replace
  file models/2a_schpov_controls_mi100_linear.ster saved

19. outreg2 using "tables/2a_schpov_controls_mi100_linear.rtf", replace word label onecol addstat(Log-
  >  e(p), Prob > F, r(p), R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > addnote("", "Sources: American Community Survey 2012-16 (U.S. Census Bureau 2018), Common Core of
  > s for State Assessments (USDE 2018), and the author's data collection.") ///
  > title("TABLE 3", "Mixed Effects Models: Effects of IBL Emphasis and Academic Proficiency on Number
  > ctitle("M0: Controls only")
  tables/2a_schpov_controls_mi100_linear.rtf
  seeout

20. mi xeq 1: quietly mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistric

  m=1 data:
  -> quietly mixed povertyschoolprop primary middle high lnage lnstudents urban || geodistrict: , cov(
  -> estat ic

  Akaike's information criterion and Bayesian information criterion
```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	6,259	.	-586.2939	9	1190.588	1251.264

Note: N=Obs used in calculating BIC; see **[R] BIC note**.

```
  -> estat icc

  Residual intraclass correlation
```

Level	ICC	Std. Err.	[95% Conf.	Interval]
geodistrict	.3903312	.0170757	.3574252	.4242665

```
21.
22. * 1. IBL
23. mi xeq 1 / 5: mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpd

  m=1 data:
  -> mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpdfs || geodist
  Note: single-variable random-effects specification in geodistrict equation; covariance structure set

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood = -584.07384
  Iteration 1:   log likelihood = -584.07354
  Iteration 2:   log likelihood = -584.07354

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      6,259
  Group variable: geodistrict                     Number of groups  =      1,526

                                                  Obs per group:
                                                                min =          1
                                                                avg =        4.1
                                                                max =        278

                                                  Wald chi2(8)      =      75.50
  Log likelihood = -584.07354                     Prob > chi2       =     0.0000
```

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.275073	.6096415	-2.09	0.036	-2.469949	-.0801979
primary	-.0001949	.0088118	-0.02	0.982	-.0174658	.0170759
middle	.0328891	.0129241	2.54	0.011	.0075583	.0582198
high	-.0058504	.0104845	-0.56	0.577	-.0263997	.0146988
lnage	.0048725	.0036996	1.32	0.188	-.0023785	.0121235
lnstudents	-.0166177	.0039162	-4.24	0.000	-.0242933	-.0089421
urban	.0667625	.0101911	6.55	0.000	.0467883	.0867366
pctpdfs	.0182489	.0760161	0.24	0.810	-.1307399	.1672378
_cons	.5666447	.0244158	23.21	0.000	.5187907	.6144987

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	.0360679	.0023453	.0317521	.0409704
var(Residual)	.0566155	.0011434	.0544182	.0589015

```
  LR test vs. linear model: chibar2(01) = 2060.71       Prob >= chibar2 = 0.0000

  m=2 data:
  -> mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpdfs || geodist
  Note: single-variable random-effects specification in geodistrict equation; covariance structure set

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  -608.3923
  Iteration 1:   log likelihood = -608.39193
  Iteration 2:   log likelihood = -608.39193

  Computing standard errors:

  Mixed-effects ML regression                     Number of obs     =      6,259
  Group variable: geodistrict                     Number of groups  =      1,526
```

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(8) = 62.96
Log likelihood = -608.39193 Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.424847	.6122148	-2.33	0.020	-2.624766	-.2249282
primary	-.0007773	.0088492	-0.09	0.930	-.0181214	.0165669
middle	.0338539	.0129811	2.61	0.009	.0084114	.0592964
high	-.0073948	.0105291	-0.70	0.482	-.0280315	.0132418
lnage	.0031738	.003715	0.85	0.393	-.0041074	.0104551
lnstudents	-.0131977	.0039315	-3.36	0.001	-.0209032	-.0054922
urban	.0605554	.010219	5.93	0.000	.0405265	.0805843
pctpdfs	-.0311369	.0763232	-0.41	0.683	-.1807277	.1184538
_cons	.5569184	.0245085	22.72	0.000	.5088827	.6049541

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0358726	.0023494	.0315512	.0407859
var(Residual)	.0571701	.0011548	.054951	.0594789

LR test vs. linear model: chibar2(01) = 2048.30 Prob >= chibar2 = 0.0000

m=3 data:
-> **mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpdfs || geodist**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = -602.35177
Iteration 1: log likelihood = -602.3514
Iteration 2: log likelihood = -602.3514

Computing standard errors:

Mixed-effects ML regression Number of obs = 6,259
Group variable: **geodistrict** Number of groups = 1,526

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(8) = 70.76
Log likelihood = -602.3514 Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.346102	.6116002	-2.20	0.028	-2.544816	-.1473876
primary	-.0051538	.0088403	-0.58	0.560	-.0224805	.0121729
middle	.0317829	.0129678	2.45	0.014	.0063665	.0571992
high	-.0094465	.0105185	-0.90	0.369	-.0300623	.0111694
lnage	.0032792	.0037113	0.88	0.377	-.0039947	.0105532
lnstudents	-.0141711	.0039277	-3.61	0.000	-.0218692	-.006473
urban	.0655279	.0102106	6.42	0.000	.0455156	.0855403
pctpdfs	.0047009	.0762483	0.06	0.951	-.144743	.1541447
_cons	.5604077	.0244851	22.89	0.000	.5124178	.6083976

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	**.0358607**	**.0023475**	**.0315426**	**.0407698**
var(Residual)	**.0570463**	**.0011524**	**.0548318**	**.0593502**

LR test vs. linear model: chibar2(01) = **2053.25** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpdfs || geodist**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-610.88722**
Iteration 1: log likelihood = **-610.88683**
Iteration 2: log likelihood = **-610.88683**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**8**) = **72.77**
Log likelihood = **-610.88683** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	**-1.576872**	**.612408**	**-2.57**	**0.010**	**-2.77717**	**-.3765742**
primary	**-.0033402**	**.008852**	**-0.38**	**0.706**	**-.0206897**	**.0140093**
middle	**.0312103**	**.0129846**	**2.40**	**0.016**	**.005761**	**.0566595**
high	**-.0084622**	**.0105323**	**-0.80**	**0.422**	**-.0291052**	**.0121808**
lnage	**.0040419**	**.0037162**	**1.09**	**0.277**	**-.0032418**	**.0113255**
lnstudents	**-.0151438**	**.003933**	**-3.85**	**0.000**	**-.0228524**	**-.0074352**
urban	**.065784**	**.0102261**	**6.43**	**0.000**	**.0457412**	**.0858268**
pctpdfs	**-.0122478**	**.0763508**	**-0.16**	**0.873**	**-.1618926**	**.1373971**
_cons	**.5656043**	**.0245188**	**23.07**	**0.000**	**.5175483**	**.6136603**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	**.0360226**	**.0023621**	**.0316782**	**.0409629**
var(Residual)	**.0571869**	**.0011559**	**.0549656**	**.0594979**

LR test vs. linear model: chibar2(01) = **2027.02** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpdfs || geodist**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-639.22756**
Iteration 1: log likelihood = **-639.22713**
Iteration 2: log likelihood = **-639.22713**

Computing standard errors:

Mixed-effects ML regression — Number of obs = 6,259
Group variable: **geodistrict** — Number of groups = 1,526

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(8) = 75.88
Log likelihood = **-639.22713** — Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.765886	.6154284	-2.87	0.004	-2.972104	-.5596685
primary	-.0034554	.0088958	-0.39	0.698	-.0208909	.0139801
middle	.0313929	.0130516	2.41	0.016	.0058121	.0569736
high	-.0103998	.0105847	-0.98	0.326	-.0311454	.0103459
lnage	.0033658	.0037343	0.90	0.367	-.0039533	.0106849
lnstudents	-.0155774	.0039509	-3.94	0.000	-.023321	-.0078337
urban	.066453	.0102581	6.48	0.000	.0463476	.0865585
pctpdfs	.003953	.0767105	0.05	0.959	-.1463968	.1543029
_cons	.5715519	.0246272	23.21	0.000	.5232834	.6198203

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0357703	.002357	.0314365	.0407016
var(Residual)	.0578455	.0011684	.0556003	.0601814

LR test vs. linear model: chibar2(01) = **1988.10** — Prob >= chibar2 = **0.0000**

24. mi est, dots post: mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....80.....9

Multiple-imputation estimates — Imputations = 100
Mixed-effects ML regression — Number of obs = 6,259

Group variable: **geodistrict** — Number of groups = 1,526

Obs per group:
min = 1
avg = 4.1
max = 278

Average RVI = 0.0730
Largest FMI = 0.1563

DF adjustment: **Large sample** — DF: min = 4,076.02
avg = 29,079.49
max = 100,108.78

Model F test: **Equal FMI** — F(8,144750.8) = 8.54
Prob > F = 0.0000

povertyschoolprop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
inquiryprop	-1.492618	.6398578	-2.33	0.020	-2.746819	-.2384162
primary	-.0016145	.0092052	-0.18	0.861	-.0196576	.0164285
middle	.0339538	.0133747	2.54	0.011	.0077389	.0601687
high	-.0079701	.0108875	-0.73	0.464	-.0293102	.0133699
lnage	.0042903	.0038709	1.11	0.268	-.003297	.0118775
lnstudents	-.016125	.0042851	-3.76	0.000	-.0245261	-.0077239
urban	.0645395	.0104859	6.15	0.000	.0439869	.085092
pctpdfs	.0062896	.0782649	0.08	0.936	-.1471109	.1596901
_cons	.5704212	.0261455	21.82	0.000	.5191681	.6216743

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity sd(_cons)	**.189935**	**.0063206**	**.1779421**	**.2027363**
sd(Residual)	**.2393913**	**.0025474**	**.2344497**	**.2444372**

```
25. est store pov1

26. est save "models/2b_schpov_ibl_mi100_linear.ster", replace
  file models/2b_schpov_ibl_mi100_linear.ster saved

27. outreg2 using "tables/2b_schpov_ibl_mi100_linear.rtf", replace word label onecol addstat(Log-Likel
  > , Prob > F, r(p), R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M1: IBL emphasis")
  tables/2b_schpov_ibl_mi100_linear.rtf
  seeout

28. mi xeq 1: quietly mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban p
  > ; estat icc

  m=1 data:
  -> quietly mixed povertyschoolprop inquiryprop primary middle high lnage lnstudents urban pctpdfs ||
  -> estat ic

  Akaike's information criterion and Bayesian information criterion
```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	**6,259**	**.**	**-584.0735**	**11**	**1190.147**	**1264.307**

```
Note: N=Obs used in calculating BIC; see [R] BIC note.
-> estat icc

Residual intraclass correlation
```

Level	ICC	Std. Err.	[95% Conf.	Interval]
geodistrict	**.3891516**	**.0170959**	**.3562135**	**.4231336**

```
29.
30. * 2. academic performance
31. mi xeq 1 / 5: mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban r
  > d)

  m=1 data:
  -> mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban readlevel math
  Note: single-variable random-effects specification in geodistrict equation; covariance structure set

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  1.5164242  (not concave)
  Iteration 1:   log likelihood =  1.5166788
  Iteration 2:   log likelihood =  1.5167482
  Iteration 3:   log likelihood =  1.5167482

  Computing standard errors:

  Mixed-effects ML regression                    Number of obs     =      6,259
  Group variable: geodistrict                    Number of groups  =      1,526
```

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(10) = 1380.25
Log likelihood = 1.5167482 Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
readall	-.3859117	.0222562	-17.34	0.000	-.429533	-.3422904
mathall	-.1778496	.0216101	-8.23	0.000	-.2202046	-.1354945
primary	.0189527	.0081123	2.34	0.019	.0030529	.0348524
middle	.0526313	.0119036	4.42	0.000	.0293008	.0759618
high	.0013038	.0097771	0.13	0.894	-.0178589	.0204666
lnage	.0096086	.0033762	2.85	0.004	.0029914	.0162258
lnstudents	-.0008202	.0040899	-0.20	0.841	-.0088363	.007196
urban	.0552115	.0092693	5.96	0.000	.037044	.0733789
readlevel	-.0010833	.0006878	-1.57	0.115	-.0024315	.0002648
mathlevel	-.000764	.0006661	-1.15	0.251	-.0020695	.0005415
_cons	.7328395	.0260305	28.15	0.000	.6818206	.7838584

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0291811	.0019024	.0256809	.0331584
var(Residual)	.0471278	.0009499	.0453024	.0490267

LR test vs. linear model: chibar2(01) = 1766.52 Prob >= chibar2 = 0.0000

m=2 data:
-> **mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban readlevel math**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = -18.19906
Iteration 1: log likelihood = -18.198685
Iteration 2: log likelihood = -18.198685

Computing standard errors:

Mixed-effects ML regression Number of obs = 6,259
Group variable: **geodistrict** Number of groups = 1,526

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(10) = 1375.76
Log likelihood = -18.198685 Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
readall	-.4233179	.0228239	-18.55	0.000	-.4680518	-.3785839
mathall	-.1369623	.0222163	-6.16	0.000	-.1805055	-.0934191
primary	.0179579	.0081366	2.21	0.027	.0020104	.0339054
middle	.0541676	.011913	4.55	0.000	.0308186	.0775166
high	.000789	.0097839	0.08	0.936	-.0183872	.0199651
lnage	.0072026	.0033844	2.13	0.033	.0005693	.0138358
lnstudents	.0044283	.0040842	1.08	0.278	-.0035767	.0124332
urban	.0505255	.0092892	5.44	0.000	.032319	.068732
readlevel	.0004502	.0007287	0.62	0.537	-.000978	.0018784
mathlevel	-.0019829	.0007037	-2.82	0.005	-.0033621	-.0006038

_cons	.7119141	.0258259	27.57	0.000	.6612963	.7625318

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0292577	.0019174	.025731	.0332676
var(Residual)	.0474515	.0009569	.0456126	.0493645

LR test vs. linear model: chibar2(01) = **1745.59** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban readlevel math**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-26.243141**
Iteration 1: log likelihood = **-26.242692**
Iteration 2: log likelihood = **-26.242692**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**10**) = **1352.48**
Log likelihood = **-26.242692** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
readall	-.4175129	.0230702	-18.10	0.000	-.4627296	-.3722962
mathall	-.137475	.0227909	-6.03	0.000	-.1821445	-.0928056
primary	.012973	.0081676	1.59	0.112	-.0030352	.0289812
middle	.0519545	.011947	4.35	0.000	.0285388	.0753702
high	-.0014075	.0098239	-0.14	0.886	-.0206621	.0178471
lnage	.0089251	.0033913	2.63	0.008	.0022783	.0155719
lnstudents	.004589	.0040838	1.12	0.261	-.0034152	.0125931
urban	.0559432	.0092816	6.03	0.000	.0377515	.0741348
readlevel	-.0004074	.0007063	-0.58	0.564	-.0017916	.0009769
mathlevel	-.0010378	.0006751	-1.54	0.124	-.002361	.0002854
_cons	.703156	.0258594	27.19	0.000	.6524726	.7538395

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0286402	.0018902	.025165	.0325953
var(Residual)	.0477411	.0009617	.045893	.0496637

LR test vs. linear model: chibar2(01) = **1762.12** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban readlevel math**
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

```
Iteration 0:   log likelihood = -8.5675526
Iteration 1:   log likelihood = -8.5671539
Iteration 2:   log likelihood = -8.5671533

Computing standard errors:

Mixed-effects ML regression                     Number of obs     =      6,259
Group variable: geodistrict                     Number of groups  =      1,526

                                                Obs per group:
                                                              min =          1
                                                              avg =        4.1
                                                              max =        278

                                                Wald chi2(10)     =    1417.34
Log likelihood = -8.5671533                     Prob > chi2       =     0.0000
```

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
readall	-.4246235	.0228488	-18.58	0.000	-.4694064	-.3798406
mathall	-.1453274	.0222786	-6.52	0.000	-.1889926	-.1016623
primary	.0134265	.0081195	1.65	0.098	-.0024874	.0293404
middle	.0497776	.0118951	4.18	0.000	.0264636	.0730917
high	-.0006738	.0097964	-0.07	0.945	-.0198744	.0185268
lnage	.0090862	.0033803	2.69	0.007	.002461	.0157114
lnstudents	.0005963	.0040466	0.15	0.883	-.0073349	.0085274
urban	.0535209	.0092844	5.76	0.000	.0353239	.071718
readlevel	-.0012871	.0007035	-1.83	0.067	-.0026658	.0000916
mathlevel	-.0008027	.0006762	-1.19	0.235	-.002128	.0005225
_cons	.7377376	.0257569	28.64	0.000	.6872551	.7882201

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	.0292632	.0019224	.0257279	.0332843
var(Residual)	.0472828	.0009544	.0454487	.0491909

```
LR test vs. linear model: chibar2(01) = 1748.61       Prob >= chibar2 = 0.0000

m=5 data:
-> mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban readlevel math
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0:   log likelihood = -55.138965
Iteration 1:   log likelihood = -55.138542
Iteration 2:   log likelihood = -55.138542

Computing standard errors:

Mixed-effects ML regression                     Number of obs     =      6,259
Group variable: geodistrict                     Number of groups  =      1,526

                                                Obs per group:
                                                              min =          1
                                                              avg =        4.1
                                                              max =        278

                                                Wald chi2(10)     =    1376.56
Log likelihood = -55.138542                     Prob > chi2       =     0.0000
```

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
readall	-.4043107	.022854	-17.69	0.000	-.4491037	-.3595177
mathall	-.1584001	.0222344	-7.12	0.000	-.2019787	-.1148216
primary	.0142357	.0081953	1.74	0.082	-.0018268	.0302982
middle	.0514279	.0119896	4.29	0.000	.0279287	.0749271
high	-.0007989	.0098428	-0.08	0.935	-.0200903	.0184926
lnage	.0090595	.0034089	2.66	0.008	.0023782	.0157408
lnstudents	-.0007818	.0040554	-0.19	0.847	-.0087302	.0071667
urban	.0564736	.0093352	6.05	0.000	.0381769	.0747704
readlevel	-.0008431	.000694	-1.21	0.224	-.0022034	.0005172
mathlevel	-.0013246	.0006742	-1.96	0.049	-.002646	-3.21e-06
_cons	.7401609	.0257626	28.73	0.000	.689667	.7906547

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0292039	.0019235	.0256671	.033228
var(Residual)	.0481116	.0009698	.0462479	.0500505

LR test vs. linear model: chibar2(01) = **1695.28** Prob >= chibar2 = **0.0000**

32. mi est, dots post: mixed povertyschoolprop readall mathall primary middle high lnage lnstudents ur
> ctured)

Imputations (**100**):
.....10.....20.....30.....40.....50.....60.....70.....80.....9

Multiple-imputation estimates — Imputations = **100**
Mixed-effects ML regression — Number of obs = **6,259**

Group variable: **geodistrict** — Number of groups = **1,526**
Obs per group:
min = **1**
avg = **4.1**
max = **278**
Average RVI = **0.2179**
Largest FMI = **0.4283**
DF adjustment: **Large sample** — DF: min = **545.02**
avg = **8,486.24**
max = **33,549.17**
Model F test: **Equal FMI** — F(**10,24162.6**) = **109.28**
Prob > F = **0.0000**

povertyschoolprop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
readall	-.4155205	.0300971	-13.81	0.000	-.474641	-.3564
mathall	-.1442944	.0291598	-4.95	0.000	-.2015711	-.0870176
primary	.0163231	.0086034	1.90	0.058	-.0005413	.0331874
middle	.0529607	.0125402	4.22	0.000	.0283798	.0775417
high	.000037	.010312	0.00	0.997	-.0201763	.0202504
lnage	.0092996	.0036016	2.58	0.010	.0022397	.0163596
lnstudents	.0001109	.0046665	0.02	0.981	-.0090412	.0092631
urban	.0541958	.0096244	5.63	0.000	.0353314	.0730601
readlevel	-.0005998	.0008637	-0.69	0.488	-.0022946	.0010951
mathlevel	-.0013069	.0008136	-1.61	0.108	-.0029031	.0002892
_cons	.7330169	.0293042	25.01	0.000	.6755492	.7904846

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity sd(_cons)	**.1716265**	**.0057874**	**.1606497**	**.1833534**
sd(Residual)	**.2183768**	**.0024228**	**.2136778**	**.2231792**

```
33. est store pov2

34. est save "models/2c_schpov_acad_mi100_linear.ster", replace
  file models/2c_schpov_acad_mi100_linear.ster saved

35. outreg2 using "tables/2c_schpov_acad_mi100_linear.rtf", replace word label onecol addstat(Log-Like
  > ), Prob > F, r(p), R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M2: Academic proficiency")
  tables/2c_schpov_acad_mi100_linear.rtf
  seeout

36. mi xeq 1: quietly mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urb
  > tured); estat ic; estat icc

  m=1 data:
  -> quietly mixed povertyschoolprop readall mathall primary middle high lnage lnstudents urban readle
  -> estat ic

  Akaike's information criterion and Bayesian information criterion
```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	**6,259**	**.**	**1.516748**	**13**	**22.9665**	**110.6096**

```
Note: N=Obs used in calculating BIC; see [R] BIC note.
-> estat icc

Residual intraclass correlation
```

Level	ICC	Std. Err.	[95% Conf.	Interval]
geodistrict	**.3824078**	**.0170047**	**.3496767**	**.4162417**

```
37.
38. * 3. fully specified
39. mi xeq 1 / 5: mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstud
  > t: , cov(unstructured)

  m=1 data:
  -> mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstudents urban pc
  > ructured)
  Note: single-variable random-effects specification in geodistrict equation; covariance structure set

  Performing EM optimization:

  Performing gradient-based optimization:

  Iteration 0:   log likelihood =  6.2007034
  Iteration 1:   log likelihood =  6.2010544
  Iteration 2:   log likelihood =  6.2010545

  Computing standard errors:

  Mixed-effects ML regression                    Number of obs     =      6,259
  Group variable: geodistrict                    Number of groups  =      1,526
```

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(12) = 1392.06
Log likelihood = 6.2010545 Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.701931	.5563107	-3.06	0.002	-2.79228	-.6115823
readall	-.3857585	.0222435	-17.34	0.000	-.429355	-.3421621
mathall	-.1791233	.0216022	-8.29	0.000	-.2214629	-.1367836
primary	.019679	.008111	2.43	0.015	.0037816	.0355763
middle	.0518992	.0119037	4.36	0.000	.0285683	.0752301
high	.0006794	.0097736	0.07	0.945	-.0184766	.0198354
lnage	.0093255	.0033753	2.76	0.006	.0027101	.015941
lnstudents	-.0015751	.0040948	-0.38	0.700	-.0096008	.0064506
urban	.0560891	.009261	6.06	0.000	.0379378	.0742404
pctpdfs	.0079141	.0692023	0.11	0.909	-.1277198	.143548
readlevel	-.001192	.0006884	-1.73	0.083	-.0025412	.0001572
mathlevel	-.0006425	.0006669	-0.96	0.335	-.0019496	.0006646
_cons	.7485004	.0265135	28.23	0.000	.6965349	.8004659

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0289682	.0018938	.0254844	.0329282
var(Residual)	.0470979	.000949	.0452742	.0489951

LR test vs. linear model: chibar2(01) = 1747.41 Prob >= chibar2 = 0.0000

m=2 data:
-> **mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstudents urban pc**
> ructured)
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = -13.060751
Iteration 1: log likelihood = -13.060343
Iteration 2: log likelihood = -13.060342

Computing standard errors:

Mixed-effects ML regression Number of obs = 6,259
Group variable: **geodistrict** Number of groups = 1,526

Obs per group:
min = 1
avg = 4.1
max = 278

Wald chi2(12) = 1388.63
Log likelihood = -13.060342 Prob > chi2 = 0.0000

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.778629	.5576527	-3.19	0.001	-2.871608	-.6856492
readall	-.4230099	.0228092	-18.55	0.000	-.467715	-.3783047
mathall	-.1383872	.0222057	-6.23	0.000	-.1819095	-.0948649
primary	.0186821	.0081349	2.30	0.022	.0027379	.0346263
middle	.053553	.0119123	4.50	0.000	.0302053	.0769006
high	.000239	.0097795	0.02	0.981	-.0189284	.0194064
lnage	.0069227	.0033833	2.05	0.041	.0002916	.0135539
lnstudents	.0036296	.0040893	0.89	0.375	-.0043853	.0116445
urban	.0514779	.00928	5.55	0.000	.0332895	.0696663
pctpdfs	-.0273527	.0694175	-0.39	0.694	-.1634085	.1087031
readlevel	.0003598	.0007288	0.49	0.621	-.0010685	.0017882
mathlevel	-.001884	.0007039	-2.68	0.007	-.0032637	-.0005043
_cons	.7285322	.0263239	27.68	0.000	.6769384	.780126

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	.0290274	.0019088	.0255173	.0330203
var(Residual)	.0474175	.0009563	.0455798	.0493293

LR test vs. linear model: chibar2(01) = **1726.11** Prob >= chibar2 = **0.0000**

m=3 data:
-> **mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstudents urban pc**
> ructured)
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-21.875066**
Iteration 1: log likelihood = **-21.874588**
Iteration 2: log likelihood = **-21.874588**

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**12**) = **1363.40**
Log likelihood = **-21.874588** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-1.651404	.5593608	-2.95	0.003	-2.747731	-.5550773
readall	-.4164928	.0230616	-18.06	0.000	-.4616927	-.3712929
mathall	-.1394365	.0227892	-6.12	0.000	-.1841025	-.0947705
primary	.0136958	.0081665	1.68	0.094	-.0023102	.0297018
middle	.0511681	.0119472	4.28	0.000	.0277521	.0745841
high	-.001987	.0098203	-0.20	0.840	-.0212344	.0172603
lnage	.0086511	.0033905	2.55	0.011	.0020058	.0152964
lnstudents	.0037679	.0040907	0.92	0.357	-.0042497	.0117856
urban	.0567688	.0092754	6.12	0.000	.0385894	.0749482
pctpdfs	.0091729	.0695403	0.13	0.895	-.1271236	.1454694
readlevel	-.0005353	.0007072	-0.76	0.449	-.0019213	.0008507
mathlevel	-.0009103	.0006761	-1.35	0.178	-.0022354	.0004148
_cons	.7187746	.0263815	27.25	0.000	.6670679	.7704813

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	**.0284853**	**.0018848**	**.0250207**	**.0324296**
var(Residual)	**.0477026**	**.000961**	**.0458558**	**.0496238**

LR test vs. linear model: chibar2(01) = **1745.21** Prob >= chibar2 = **0.0000**

m=4 data:
-> **mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstudents urban pc**
> ructured)
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-3.3831191**
Iteration 1: log likelihood = **-3.3826847**
Iteration 2: log likelihood = **-3.3826812**
Iteration 3: log likelihood = **-3.3826812** (backed up)

Computing standard errors:

Mixed-effects ML regression — Number of obs = **6,259**
Group variable: **geodistrict** — Number of groups = **1,526**

Obs per group:
min = **1**
avg = **4.1**
max = **278**

Wald chi2(**12**) = **1430.46**
Log likelihood = **-3.3826812** — Prob > chi2 = **0.0000**

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	**-1.796231**	**.5574014**	**-3.22**	**0.001**	**-2.888717**	**-.703744**
readall	**-.4237886**	**.0228356**	**-18.56**	**0.000**	**-.4685456**	**-.3790317**
mathall	**-.1468346**	**.0222683**	**-6.59**	**0.000**	**-.1904797**	**-.1031896**
primary	**.0141659**	**.0081179**	**1.75**	**0.081**	**-.0017449**	**.0300767**
middle	**.049014**	**.0118949**	**4.12**	**0.000**	**.0257004**	**.0723276**
high	**-.0013061**	**.0097924**	**-0.13**	**0.894**	**-.020499**	**.0178867**
lnage	**.0087792**	**.0033793**	**2.60**	**0.009**	**.0021559**	**.0154025**
lnstudents	**-.0002639**	**.0040528**	**-0.07**	**0.948**	**-.0082072**	**.0076794**
urban	**.0544633**	**.0092744**	**5.87**	**0.000**	**.0362859**	**.0726407**
pctpdfs	**-.0080467**	**.0693097**	**-0.12**	**0.908**	**-.1438912**	**.1277978**
readlevel	**-.001431**	**.0007044**	**-2.03**	**0.042**	**-.0028117**	**-.0000503**
mathlevel	**-.0006547**	**.0006773**	**-0.97**	**0.334**	**-.0019822**	**.0006729**
_cons	**.7545344**	**.0262617**	**28.73**	**0.000**	**.7030624**	**.8060065**

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity				
var(_cons)	**.0290115**	**.0019124**	**.0254953**	**.0330126**
var(Residual)	**.0472533**	**.0009536**	**.0454207**	**.0491599**

LR test vs. linear model: chibar2(01) = **1728.63** Prob >= chibar2 = **0.0000**

m=5 data:
-> **mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstudents urban pc**
> ructured)
Note: single-variable random-effects specification in geodistrict equation; covariance structure set

Performing EM optimization:

```
Performing gradient-based optimization:

Iteration 0:   log likelihood = -48.571739
Iteration 1:   log likelihood = -48.571275
Iteration 2:   log likelihood = -48.571275

Computing standard errors:

Mixed-effects ML regression                     Number of obs     =      6,259
Group variable: geodistrict                     Number of groups  =      1,526

                                                Obs per group:
                                                              min =          1
                                                              avg =        4.1
                                                              max =        278

                                                Wald chi2(12)     =    1392.96
Log likelihood = -48.571275                     Prob > chi2       =     0.0000
```

povertyschoolprop	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
inquiryprop	-2.034146	.5615543	-3.62	0.000	-3.134772	-.9335196
readall	-.4034663	.0228354	-17.67	0.000	-.4482229	-.3587097
mathall	-.1602904	.0222206	-7.21	0.000	-.2038421	-.1167387
primary	.0151387	.008192	1.85	0.065	-.0009174	.0311947
middle	.0505576	.0119859	4.22	0.000	.0270656	.0740496
high	-.0015884	.0098367	-0.16	0.872	-.0208679	.0176912
lnage	.0087296	.0034069	2.56	0.010	.0020522	.0154071
lnstudents	-.0016655	.0040588	-0.41	0.682	-.0096206	.0062897
urban	.057514	.0093238	6.17	0.000	.0392397	.0757883
pctpdfs	.00983	.0698244	0.14	0.888	-.1270233	.1466833
readlevel	-.0009737	.0006944	-1.40	0.161	-.0023347	.0003873
mathlevel	-.0011695	.000675	-1.73	0.083	-.0024924	.0001534
_cons	.75851	.0262333	28.91	0.000	.7070936	.8099264

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity var(_cons)	.0289599	.0019144	.0254407	.0329659
var(Residual)	.0480551	.0009688	.0461933	.0499919

```
LR test vs. linear model: chibar2(01) = 1674.81       Prob >= chibar2 = 0.0000

40. mi est, dots post: mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage l
  > strict: , cov(unstructured)

Imputations (100):
  .........10.........20.........30.........40.........50.........60.........70.........80.........9

Multiple-imputation estimates                   Imputations       =        100
Mixed-effects ML regression                     Number of obs     =      6,259

Group variable: geodistrict                     Number of groups  =      1,526
                                                Obs per group:
                                                              min =          1
                                                              avg =        4.1
                                                              max =        278
                                                Average RVI       =     0.2021
                                                Largest FMI       =     0.4308
DF adjustment:   Large sample                   DF:     min       =     538.68
                                                        avg       =   9,146.05
                                                        max       =  31,981.29
Model F test:       Equal FMI                   F(  12,34492.5)   =      93.83
                                                Prob > F          =     0.0000
```

povertyschoolprop	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
inquiryprop	-1.784904	.589044	-3.03	0.002	-2.939543	-.6302637
readall	-.4145221	.0301477	-13.75	0.000	-.4737437	-.3553006
mathall	-.1463079	.0292091	-5.01	0.000	-.2036829	-.0889329
primary	.0171066	.0086002	1.99	0.047	.0002486	.0339647
middle	.052239	.0125403	4.17	0.000	.0276579	.0768202
high	-.0006053	.0103113	-0.06	0.953	-.0208172	.0196067
lnage	.0090059	.0036029	2.50	0.012	.0019432	.0160685
lnstudents	-.0006847	.0046624	-0.15	0.883	-.0098285	.0084591
urban	.0551265	.0096197	5.73	0.000	.0362712	.0739817
pctpdfs	.0000636	.0722749	0.00	0.999	-.1416017	.141729
readlevel	-.0007118	.0008634	-0.82	0.410	-.002406	.0009825
mathlevel	-.0011821	.0008141	-1.45	0.147	-.0027794	.0004152
_cons	.7493582	.029647	25.28	0.000	.6912215	.807495

Random-effects Parameters	Estimate	Std. Err.	[95% Conf.	Interval]
geodistrict: Identity sd(_cons)	.1709882	.0057889	.16001	.1827196
sd(Residual)	.2182901	.0024218	.2135929	.2230905

```
41. est store pov3

42. est save "models/2d_schpov_full_mi100_linear.ster", replace
  file models/2d_schpov_full_mi100_linear.ster saved

43. outreg2 using "tables/2d_schpov_full_mi100_linear.rtf", replace word label onecol addstat(Log-Like
  > ), Prob > F, r(p), R-squared, e(r2)) ///
  > alpha(.001, .01, .05) symbol(***, **, *) ///
  > ctitle("M3: Fully specified")
  tables/2d_schpov_full_mi100_linear.rtf
  seeout

44. mi xeq 1: quietly mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage ln
  > e: , cov(unstructured); estat ic; estat icc

  m=1 data:
  -> quietly mixed povertyschoolprop inquiryprop readall mathall primary middle high lnage lnstudents
  > unstructured)
  -> estat ic

  Akaike's information criterion and Bayesian information criterion
```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	6,259	.	-407.0245	15	844.0491	945.1757

```
Note: N=Obs used in calculating BIC; see [R] BIC note.
-> estat icc

Residual intraclass correlation
```

Level	ICC	Std. Err.	[95% Conf.	Interval]
cmoname	.3426701	.0252641	.2949942	.3937479

```
45.
46. log close
       name:  <unnamed>
        log:  /hdir/0/jhaber/Projects/charter_data/stats_team/logs/results_2_schpov_mi100_linear_0429
   log type:  smcl
  closed on:  29 Apr 2019, 13:52:37
```