

Input For Two-Level Latent Class Analysis (Continued)

```
MODEL:      %WITHIN%  
            %OVERALL%  
            c#1 c#2 ON x;  
  
            %BETWEEN%  
            %OVERALL%  
            f BY c#1 c#2;  
            f ON w;  
OUTPUT:    TECH1 TECH8;
```

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Latent Transition Analysis

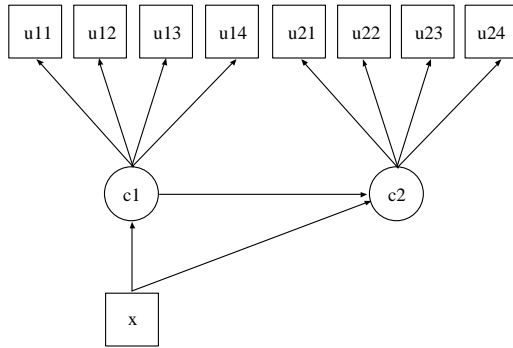
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Latent Transition Analysis

Transition Probabilities

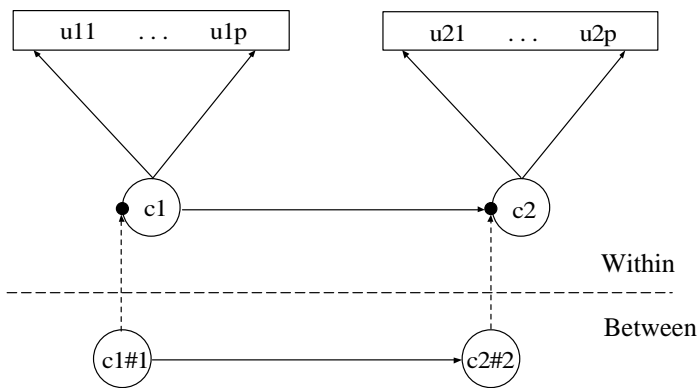
	c2	
	1	2
1	0.8	0.2
2	0.4	0.6

Time Point 1



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Two-Level Latent Transition Analysis



Asparouhov, T. & Muthen, B. (2006). Multilevel mixture models. Forthcoming in Hancock, G. R., & Samuelsen, K. M. (Eds.). (2007). Advances in latent variable mixture models. Charlotte, NC: Information Age Publishing, Inc.

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Input For Two-Level LTA

```
CLUSTER = classrm;
USEVAR = stublf bkrulelf bkthinlf-teaself athortlf
        stubls bkrulels bkthinls-teasels athortls;
CATEGORICAL = stublf-athortls;
MISSING = all (999);
CLASSES = cf(2) cs(2);

DEFINE:
    CUT stublf-athortls(1.5);

ANALYSIS:
    TYPE = TWOLEVEL MIXTURE MISSING;
    PROCESS = 2;

MODEL:
    %WITHIN%
    %OVERALL%
    cs#1 ON cf#1;
    %BETWEEN%
    OVERALL%
    cs#1 ON cf#1;
    cs#1*1 cf#1*1;
```

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Input For Two-Level LTA (Continued)

```
MODEL cf:
    %BETWEEN%
        %cf#1%
        [stublf$1-athortlf$1] (1-9);
        %cf#2%
        [stublf$1-athortlf$1] (11-19);
MODEL cs:
    %BETWEEN%
        %cs#1%
        [stubls$1-athortls$1] (1-9);
        %cs#2%
        [stubls$1-athortls$1] (11-19);

OUTPUT:
    TECH1 TECH8;

PLOT:
    TYPE = PLOT3;
    SERIES = stublf-athortlf(*);
```

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Output Excerpts Two-Level LTA

Categorical Latent Variables

Within Level

CS#1 ON

CF#1	3.938	0.407	9.669
------	-------	-------	-------

Means

CF#1	-0.126	0.189	-0.664
------	--------	-------	--------

CS#1	-1.514	0.221	-6.838
------	--------	-------	--------

Between Level

CS#1 ON

CF#1	0.411	0.15	2.735
------	-------	------	-------

Variances

CF#1	2.062	0.672	3.067
------	-------	-------	-------

Residual Variances

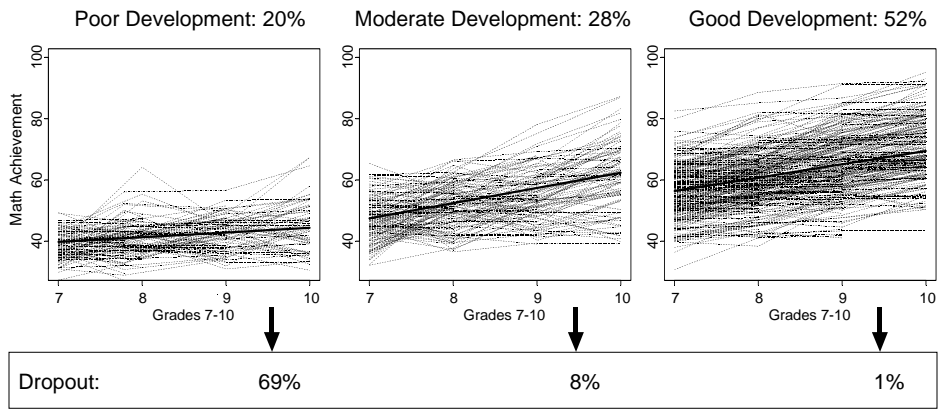
CS#1	0.469	0.237	1.984
------	-------	-------	-------

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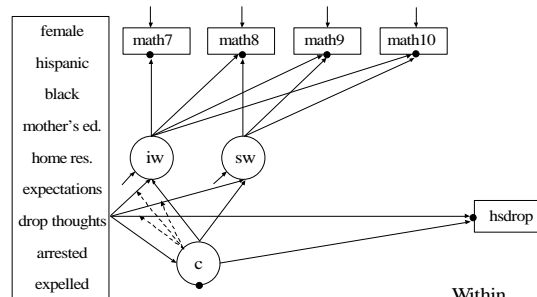
Multilevel Growth Mixture Modeling

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Growth Mixture Modeling: LSAY Math Achievement Trajectory Classes And The Prediction Of High School Dropout

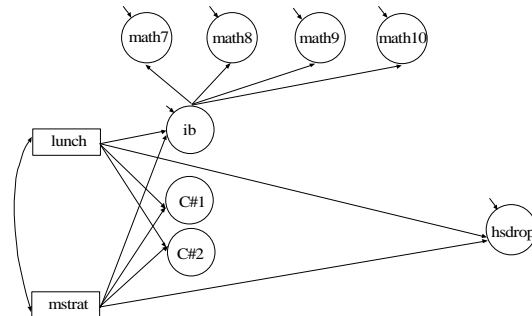


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Within

Between



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Input For A Multilevel Growth Mixture Model For LSAY Math Achievement

```
TITLE:      multilevel growth mixture model for LSAY math
            achievement

DATA:       FILE = lsayfull_Dropout.dat;

VARIABLE:   NAMES = female mothed homeres math7 math8 math9 math10
            expel arrest hisp black hsdrop expect lunch mstrat
            droptht7 schcode;
            !lunch = % of students eligible for full lunch
            !assistance (9th)
            !mstrat = ratio of students to full time math
            !teachers (9th)
            MISSING = ALL (9999);
            CATEGORICAL = hsdrop;
            CLASSES = c (3);
            CLUSTER = schcode;
            WITHIN = female mothed homeres expect droptht7 expel
            arrest hisp black;
            BETWEEN = lunch mstrat;
```

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Input For A Multilevel Growth Mixture Model For LSAY Math Achievement (Continued)

```
DEFINE:     lunch = lunch/100;
            mstrat = mstrat/1000;

ANALYSIS:   TYPE = MIXTURE TWOLEVEL MISSING;
            ALGORITHM = INTEGRATION;

OUTPUT:     SAMPSTAT STANDARDIZED TECH1 TECH8;

PLOT:       TYPE = PLOT3;
            SERIES = math7-math10 (s);
```

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Input For A Multilevel Growth Mixture Model For LSAY Math Achievement (Continued)

```
MODEL:      %WITHIN%

            %OVERALL%

            i s | math7@0 math8@1 math9@2 math10@3;

            i s ON female hisp black mothed homeres expect
            droptht7 expel arrest;

            c#1 c#2 ON female hisp black mothed homeres expect
            droptht7 expel arrest;

            hsdrop ON female hisp black mothed homeres expect
            droptht7 expel arrest;
```

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Input For A Multilevel Growth Mixture Model For LSAY Math Achievement (Continued)

```
%c#1%
[i*40 s*1];
math7-math10*20;
i*13 s*3;

%c#2%
[i*40 s*5];
math7-math10*30;
i*8 s*3;
i s ON female hisp black mothed homeres expect
droptht7 expel arrest;

%c#3%
[i*45 s*3];
math7-math10*10;
i*34 s*2;
i s ON female hisp black mothed homeres expect
droptht7 expel arrest;
```

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Input For A Multilevel Growth Mixture Model For LSAY Math Achievement (Continued)

```

%BETWEEN%

%OVERALL%

ib | math7-math10@1; [ib@0];

ib*1; hsdrop*1; ib WITH hsdrop;
math7-math10@0;

ib ON lunch mstrat;

c#1 c#2 ON lunch mstrat;

hsdrop ON lunch mstrat;

%c#1%
[hsdrop$1*-.3];

%c#2%
[hsdrop$1*.9];

%c#3%
[hsdrop$1*1.2];

```

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Output Excerpts A Multilevel Growth Mixture Model For LSAY Math Achievement

Summary of Data

Number of patterns	13
Number of y patterns	13
Number of u patterns	1
Number of clusters	44
Size (s)	Cluster ID with Size s
12	304
13	305
38	112
39	109
40	138
42	120
43	307
44	303
45	143 146

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**Output Excerpts A Multilevel Growth Mixture
Model For LSAY Math Achievement (Continued)**

46	101					
48	144	106				
51	102	308				
52	136	118	133	111		
53	140	142	108	131	122	124
54	301	117	127	137	126	
55	103	141	123			
56	110					
57	147					
58	121	105	145	135		
59	119					
73	104					
89	302					
94	309					
118	115					

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**Output Excerpts A Multilevel Growth Mixture
Model For LSAY Math Achievement (Continued)**

MAXIMUM LOG-LIKELIHOOD VALUE FOR THE UNRESTRICTED (H1) MODEL IS
-36393.088

THE STANDARD ERRORS OF THE MODEL PARAMETER ESTIMATES MAY NOT BE
TRUSTWORTHY FOR SOME PARAMETERS DUE TO A NON-POSITIVE DEFINITE
FIRST-ORDER DERIVATIVE PRODUCT MATRIX. THIS MAY BE DUE TO THE
STARTING VALUES BUT MAY ALSO BE AN INDICATION OF MODEL
NONIDENTIFICATION. THE CONDITION NUMBER IS -0.758D-16. PROBLEM
INVOLVING PARAMETER 54.

THE NONIDENTIFICATION IS MOST LIKELY DUE TO HAVING MORE
PARAMETERS THAN THE NUMBER OF CLUSTERS. REDUCE THE NUMBER OF
PARAMETERS.

THE MODEL ESTIMATION TERMINATED NORMALLY

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Output Excerpts A Multilevel Growth Mixture Model For LSAY Math Achievement (Continued)

Tests Of Model Fit

Loglikelihood		
	H0 Value	-26247.205
Information Criteria		
	Number of Free Parameters	122
	Akaike (AIC)	52738.409
	Bayesian (BIC)	53441.082
	Sample-Size Adjusted BIC ($n^* = (n + 2) / 24$)	53053.464
	Entropy	0.632

FINAL CLASS COUNTS AND PROPORTIONS OF TOTAL SAMPLE SIZE BASED ON ESTIMATED POSTERIOR PROBABILITIES

Class 1	686.43905	0.29285	
Class 2	430.83877	0.18380	
Class 3	1226.72218	0.52335	47

Output Excerpts A Multilevel Growth Mixture Model For LSAY Math Achievement (Continued)

Model Results

	Estimates	S.E.	Est./S.E.	Std	StdYX
Between Level					
CLASS 1					
IB ON					
LUNCH	-1.805	1.310	-1.378	-0.851	-0.176
MSTRAT	-13.365	3.086	-4.331	-6.299	-0.448
HSDROP ON					
LUNCH	1.087	0.543	2.004	1.087	0.290
MSTRAT	-0.178	1.478	-0.120	-0.178	-0.016
IB WITH					
HSDROP	-0.416	0.328	-1.267	-0.196	-0.253

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**Output Excerpts A Multilevel Growth Mixture
Model For LSAY Math Achievement (Continued)**

Intercepts					
MATH7	0.000	0.000	0.000	0.000	0.000
MATH8	0.000	0.000	0.000	0.000	0.000
MATH9	0.000	0.000	0.000	0.000	0.000
MATH10	0.000	0.000	0.000	0.000	0.000
IB	0.000	0.000	0.000	0.000	0.000
Residual Variances					
HSDROP	0.550	0.216	2.542	0.550	0.915
MATH7	0.000	0.000	0.000	0.000	0.000
MATH8	0.000	0.000	0.000	0.000	0.000
MATH9	0.000	0.000	0.000	0.000	0.000
MATH10	0.000	0.000	0.000	0.000	0.000
IB	3.456	1.010	3.422	0.768	0.768

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**Output Excerpts A Multilevel Growth Mixture
Model For LSAY Math Achievement (Continued)**

		Estimates	S.E.	Est./S.E.
Within Level				
C#1	ON			
	FEMALE	-0.751	0.188	-3.998
	HISP	0.094	0.705	0.133
	BLACK	0.900	0.385	2.339
	MOTHEd	-0.003	0.106	-0.028
	HOMERES	-0.060	0.069	0.864
	EXPECT	-0.251	0.074	-3.406
	DROPTHT7	1.616	0.451	3.583
	EXPEL	0.698	0.337	2.068
	ARREST	1.093	0.384	2.842

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**Output Excerpts A Multilevel Growth Mixture
Model For LSAY Math Achievement (Continued)**

		Estimates	S.E.	Est./S.E.
C#2	ON			
	FEMALE	-1.610	0.450	-3.577
	HISP	1.144	0.466	2.458
	BLACK	-0.961	0.656	-1.465
	MOTHEd	-0.234	0.139	-1.684
	HOMERES	0.102	0.094	1.085
	EXPECT	0.056	0.089	0.628
	DROPTHT7	0.570	0.657	0.869
	EXPEL	1.217	0.397	3.068
	ARREST	1.133	0.580	1.951
Intercepts				
C#1		0.492	0.535	0.921
C#2		-0.533	0.627	-0.849

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**Output Excerpts A Multilevel Growth Mixture
Model For LSAY Math Achievement (Continued)**

		Estimates	S.E.	Est./S.E.
Between Level				
C#1	ON			
	LUNCH	2.265	0.706	3.208
	MSTRAT	-2.876	2.909	-0.988
C#2	ON			
	LUNCH	-0.088	1.343	-0.065
	MSTRAT	-0.608	2.324	-0.262

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