

## Appendix

### Example code to fit model in Mplus

!example - 3 latent classes (patterns) - quadratic hazard functions within class

title: drug1 C3

data: file is drug1.txt;

variable: names are id female black hispanic orace

alc10-alc30 coc10-coc30 hal10-hal30 her10-her30 inh10-inh30

mj10-mj30 pd10-pd30 stim10-stim30 tob10-tob30;

usevariables = female alc10-alc30 coc10-coc30 hal10-hal30

her10-her30 inh10-inh30 mj10-mj30 pd10-pd30 stim10-stim30

tob10-tob30;

categorical are alc10-alc30 coc10-coc30 hal10-hal30

her10-her30 inh10-inh30 mj10-mj30 pd10-pd30 stim10-stim30

tob10-tob30;

classes=c(3); !3 classes

missing=all(999); !missing indicator in raw data is "999"

analysis: type=mixture;

starts=250 50; !may adjust based on whether log-likelihood is replicated

model:

%overall%

!influence of covariates on class membership

c on female;

!below is modeling hazard functions within class

!measuring time in decades (0, 0.1, 0.2, etc) rather than years (0, 1, 2)

!makes the model estimate faster in this case

!each drug type is measured with quadratic hazard functions

i1 s1 q1 | alc10@0 alc11@.1 alc12@.2

alc13@.3 alc14@.4 alc15@.5 alc16@.6

alc17@.7 alc18@.8 alc19@.9 alc20@1.0

alc21@1.1 alc22@1.2 alc23@1.3 alc24@1.4

alc25@1.5 alc26@1.6 alc27@1.7 alc28@1.8

alc29@1.9 alc30@2.0;

i2 s2 q2 | coc10@0 coc11@.1 coc12@.2

coc13@.3 coc14@.4 coc15@.5 coc16@.6

coc17@.7 coc18@.8 coc19@.9 coc20@1.0

coc21@1.1 coc22@1.2 coc23@1.3 coc24@1.4

coc25@1.5 coc26@1.6 coc27@1.7 coc28@1.8

coc29@1.9 coc30@2.0;

i3 s3 q3 | hal10@0 hal11@.1 hal12@.2

hal13@.3 hal14@.4 hal15@.5 hal16@.6

hal17@.7 hal18@.8 hal19@.9 hal20@1.0

hal21@1.1 hal22@1.2 hal23@1.3 hal24@1.4

hal25@1.5 hal26@1.6 hal27@1.7 hal28@1.8

hal29@1.9 hal30@2.0;

i4 s4 q4 | her10@0 her11@.1 her12@.2

her13@.3 her14@.4 her15@.5 her16@.6

her17@.7 her18@.8 her19@.9 her20@1.0

her21@1.1 her22@1.2 her23@1.3 her24@1.4

her25@1.5 her26@1.6 her27@1.7 her28@1.8  
her29@1.9 her30@2.0;

i5 s5 q5 | inh10@0 inh11@.1 inh12@.2  
inh13@.3 inh14@.4 inh15@.5 inh16@.6  
inh17@.7 inh18@.8 inh19@.9 inh20@1.0  
inh21@1.1 inh22@1.2 inh23@1.3 inh24@1.4  
inh25@1.5 inh26@1.6 inh27@1.7 inh28@1.8  
inh29@1.9 inh30@2.0;

i6 s6 q6 | mj10@0 mj11@.1 mj12@.2  
mj13@.3 mj14@.4 mj15@.5 mj16@.6  
mj17@.7 mj18@.8 mj19@.9 mj20@1.0  
mj21@1.1 mj22@1.2 mj23@1.3 mj24@1.4  
mj25@1.5 mj26@1.6 mj27@1.7 mj28@1.8  
mj29@1.9 mj30@2.0;

i7 s7 q7 | pd10@0 pd11@.1 pd12@.2  
pd13@.3 pd14@.4 pd15@.5 pd16@.6  
pd17@.7 pd18@.8 pd19@.9 pd20@1.0  
pd21@1.1 pd22@1.2 pd23@1.3 pd24@1.4  
pd25@1.5 pd26@1.6 pd27@1.7 pd28@1.8  
pd29@1.9 pd30@2.0;

i8 s8 q8 | stim10@0 stim11@.1 stim12@.2  
stim13@.3 stim14@.4 stim15@.5 stim16@.6  
stim17@.7 stim18@.8 stim19@.9 stim20@1.0  
stim21@1.1 stim22@1.2 stim23@1.3 stim24@1.4  
stim25@1.5 stim26@1.6 stim27@1.7 stim28@1.8  
stim29@1.9 stim30@2.0;

i9 s9 q9 | tob10@0 tob11@.1 tob12@.2  
tob13@.3 tob14@.4 tob15@.5 tob16@.6  
tob17@.7 tob18@.8 tob19@.9 tob20@1.0  
tob21@1.1 tob22@1.2 tob23@1.3 tob24@1.4  
tob25@1.5 tob26@1.6 tob27@1.7 tob28@1.8  
tob29@1.9 tob30@2.0;

[alc10\$1- alc30\$1@0  
coc10\$1- coc30\$1@0 hal10\$1- hal30\$1@0  
her10\$1- her30\$1@0 inh10\$1- inh30\$1@0  
mj10\$1- mj30\$1@0 pd10\$1- pd30\$1@0  
stim10\$1- stim30\$1@0 tob10\$1- tob30\$1@0];

! may want to provide starting values  
! could do this for intercept for first event in class one for example:  
! would be: “%c#1%”, “[I1\*-5.693](a1);”

! often need to constrain intercept due to logit scale  
! similar to empirical identification problem  
! this may be done for example: “model constraint:” “a1>-15;”