**Stata code – Group trajectory modelling**

***NB:*** *ALSPAC*

**\*\*\*Clear space and set path**

clear all

cd "/Users/Desktop/STATA"

\*\*\*Import data

use STATA\_dataset.dta

**\*\*\*Create a variable for measurement point**

gen T1=1

gen T2=2

gen T3=3

gen T4=4

gen T5=5

**\*\*Summarize dataset**

summarize

**\*\*\*custom function to give APP and OCC in one table, along with group counts and proportions**

program summary\_table\_procTraj

preserve

\*\*

drop if missing(\_traj\_Group)

\*now lets look at the average posterior probability

gen Mp = 0

foreach i of varlist \_traj\_ProbG\* {

replace Mp = `i' if `i' > Mp

}

sort \_traj\_Group

\*and the odds of correct classification

by \_traj\_Group: gen countG = \_N

by \_traj\_Group: egen groupAPP = mean(Mp)

by \_traj\_Group: gen counter = \_n

gen n = groupAPP/(1 - groupAPP)

gen p = countG/ \_N

gen d = p/(1-p)

gen occ = n/d

\*Estimated proportion for each group

scalar idx = 0

gen TotProb = 0

foreach i of varlist \_traj\_ProbG\* {

scalar idx = idx + 1

quietly summarize `i'

replace TotProb = r(sum)/ \_N if \_traj\_Group == idx

}

gen GROUP\_APP = round(groupAPP,.1)

gen OCC = round(occ,.1)

gen Probab = round(p\*100,.1)

gen Prob\_post = round(TotProb\*100,.1)

list \_traj\_Group countG GROUP\_APP OCC Probab Prob\_post if counter == 1

restore

end

**\*\*\*Trajectories 1-9, trying out linear quadratic and cubic models for each model: Nb linear models, order is 1; quadratic models, order is 2; cubic models, order is 3;**

**\*1-TRAJ MODEL**

log using 1results.log, replace

**//linear**

traj, multgroups(1) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1) min3(0) max3(15)

summary\_table\_procTraj

**//quadratic**

traj, multgroups(1) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(1) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*2-TRAJ MODEL**

log using 2results.log, replace

**//linear**

traj, multgroups(2) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1) min3(0) max3(15)

summary\_table\_procTraj

**//quadratic**

traj, multgroups(2) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(2) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*3-TRAJ MODEL**

log using 3results.log, replace

**//linear**

traj, multgroups(3) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1) min3(0) max3(15)

summary\_table\_procTraj

**//quadratic**

traj, multgroups(3) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(3) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*4-TRAJ MODEL**

log using 4results.log, replace

**//linear**

traj, multgroups(4) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1 1) min3(0) max3(15)

summary\_table\_procTraj

//quadratic

traj, multgroups(4) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(4) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*5-TRAJ MODEL**

log using 5results.log, replace

**//linear**

traj, multgroups(5) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1 1 1) min3(0) max3(15)

summary\_table\_procTraj

**//quadratic**

traj, multgroups(5) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(5) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*6-TRAJ MODEL**

log using 6results.log, replace

//linear

traj, multgroups(6) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1 1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1 1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1 1 1 1) min3(0) max3(15)

summary\_table\_procTraj

**//quadratic**

traj, multgroups(6) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(6) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3 3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3 3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3 3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*7-TRAJ MODEL**

log using 7results.log, replace

**//linear**

traj, multgroups(7) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1 1 1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1 1 1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1 1 1 1 1) min3(0) max3(15)

summary\_table\_procTraj

**//quadratic**

traj, multgroups(7) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2 2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

**//cubic**

traj, multgroups(7) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3 3 3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3 3 3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3 3 3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*8-TRAJ MODEL (nb for models 8 and 9 for log open and close is for each model separately, recommend running each separately to avoid programme crashing when running all at once)**

**//linear**

log using 8lresults.log, replace

traj, multgroups(8) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1 1 1 1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1 1 1 1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1 1 1 1 1 1) min3(0) max3(15)

summary\_table\_procTraj

log close

**//quadratic**

log using 8qresults.log, replace

traj, multgroups(8) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2 2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2 2 2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2 2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

log close

**//cubic**

log using 8cresults.log, replace

traj, multgroups(8) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3 3 3 3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3 3 3 3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3 3 3 3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*9-TRAJ MODEL**

**//linear**

log using 9lresults.log, replace

traj, multgroups(9) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(1 1 1 1 1 1 1 1 1) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(1 1 1 1 1 1 1 1 1) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(1 1 1 1 1 1 1 1 1) min3(0) max3(15)

summary\_table\_procTraj

log close

**//quadratic**

log using 9qresults.log, replace

traj, multgroups(9) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2 2 2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2 2 2 2 2 2) min2(-5.5) max2(3) var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2 2 2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

log close

**//cubic**

log using 9cresults.log, replace

traj, multgroups(9) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(3 3 3 3 3 3 3 3 3) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(3 3 3 3 3 3 3 3 3) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(3 3 3 3 3 3 3 3 3) min3(0) max3(15)

summary\_table\_procTraj

log close

**\*Run and plot final model (5-group quadratic) and save data groupings**

log using FINAL5results.log, replace

//quadratic

traj, multgroups(5) var1(r\_emo\_1-r\_emo\_5) indep1(T1-T5) model1(cnorm) min1(-5.5) max1(3) order1(2 2 2 2 2) ///

var2(r\_ext\_1-r\_ext\_5) indep2(T1-T5) model2(cnorm) order2(2 2 2 2 2) min2(-5.5) max2(3) ///

var3(f\_sum1-f\_sum5) indep3(T1-T5) model3(cnorm) order3(2 2 2 2 2) min3(0) max3(15)

summary\_table\_procTraj

multtrajplot, xtitle("Timepoint") ytitle1("Resilience to emotional problems") ytitle2("Resilience to externalizing problems") ytitle3("Friendship support") ylabel1(-2(0.5)0.5) ylabel2(-2(0.5)0.75) ylabel3(11(0.5)13) xlabel(1(1)5)

graph export FINAL5\_quad.png, replace

log close

\*Save the data groupings

save data\_grouping, replace