

How can I convert a multilevel model to a mixed model in Stata?

Authored by
stats writer

July 1, 2024

RECOMMENDED CITATION

stats writer (2024). *How can I convert a multilevel model to a mixed model in Stata?*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=164845>

To convert a multilevel model to a mixed model in Stata, the "xtmixed" command is used. This command allows for the incorporation of both fixed and random effects in the model, making it suitable for handling multilevel data. The syntax for the "xtmixed" command is similar to the "mixed" command in other statistical software. However, Stata also offers additional options for specifying the random effects structure and estimating the model parameters. By using the "xtmixed" command, researchers can take into account the hierarchical structure of their data and obtain more accurate estimates for their parameters.

How can I convert a multilevel model to a mixed model? | Stata FAQ

Many multilevel models can be estimated using mixed model procedures however the syntax will be rather different. The ml2mixed command (search ml2mixed; (see How can I use the search command to search for programs and get additional help? for more information about using search) can be used to help you convert from the multilevel model specification to the mixed syntax. The ml2mixed command will work for multilevel models with either two or three levels. For two level models ml2mixed allows for both random intercepts and random slopes at level 2 while the three level model only allows for random intercepts.

We will begin with a simple example of a 2-level unconditional model with random intercepts. The dependent variable is placed in the dep() option and the

level-2 cluster variable is put into the l2id().

ml2mixed, dep(math) l2id(class)

Multilevel Model

Level 1 Model

math =

Level 2 Model -- id = class

=

Stata Mixed Model -- Stata 11 notation

xtmixed math ///

|| class:

Now we can add two level-1 predictors hmwk and gender using the l1() option.

ml2mixed, dep(math) l1(hmwk gender) l2id(class)

Multilevel Model

Level 1 Model

math = hmwk gender

Level 2 Model -- id = class

=

Stata Mixed Model -- Stata 11 notation

```
xtmixed math hmwk gender ///
```

```
|| class:
```

For the next example we will keep the two level-1 predictors and add a level-2 predictor of the random intercept. The level-2 intercept predictor is placed in the `l2i()` option.

In addition, we will include the `notes` option which displays some hopefully helpful comments.

```
ml2mixed, dep(math) l1(hmwk gender) l2id(class)  
l2i(meanses) notes
```

Multilevel Model

Level 1 Model

math = hmwk gender

Level 2 Model -- id = class

= meanses

Stata Mixed Model -- Stata 11 notation

```
xtmixed math hmwk gender meanses ///
```

```
|| class:
```

Stata Notes

1) Categorical predictors need the `i.` prefix.

- 2) Continuous variables in interactions need the `c.` prefix.
- 3) Use `var` option to get variances instead of standard deviations.
- 4) If outcome variable is binary use `-xtmelogit-` command.
- 5) If outcome variable is a count use `-xtmepoisson-` command.

Next is a model with a random slope for `hmwk` in addition to having a random intercept. The random slope is indicated by putting the level-1 variable inside square brackets within the `l2s()` option. This example also includes the `sas` and `spss` options with provide the syntax for the SAS `proc mixed` and for the SPSS `mixed` procedures respectively.

```
ml2mixed, dep(math) l1(hmwk) l2id(class) l2i(meanses) l2s() sas spss
```

Multilevel Model

Level 1 Model

`math = hmwk`

Level 2 Model -- id = class

= meanses

slope =

Stata Mixed Model -- Stata 11 notation

```
xtmixed math hmwk meanses ///
```

```
|| class: hmwk , cov(unstr)
```

SAS Proc Mixed

```
proc mixed;
```

```
class class ;
```

```
model math = hmwk meanses / solution;
```

```
random intercept hmwk / subject=class type=un;
```

```
run;
```

SPSS Mixed

```
mixed math with hmwk meanses
```

```
/print = solution
```

```
/fixed = hmwk meanses
```

```
/random = intercept hmwk | subject(class) covtype(un).
```

In the next model we include a predictor for the random slopes. We do this by including the variable names after the square brackets in the `I2s()` option.

Please note that the `ses#meanses` term in the model is Stata 11 syntax. If you are running an earlier version of Stata you will need to create interactions using the `xi` or create them manually.

```
ml2mixed, dep(math) l1(hmwk ses) l2id(class)
l2i(meanses) l2s( meanses meanses) notes
```

Multilevel Model

Level 1 Model

`math = hmwk ses`

Level 2 Model -- id = class

`= meanses`

`slope = meanses`

`slope = meanses`

Stata Mixed Model -- Stata 11 notation

```
xtmixed math hmwk ses meanses ses#meanses
```

```
hmwk#meanses ///
```

```
|| class: ses hmwk , cov(unstr)
```

Stata Notes

- 1) Categorical predictors need the `i.` prefix.
- 2) Continuous variables in interactions need the `c.`

prefix.

3) Use `var` option to get variances instead of standard deviations.

4) If outcome variable is binary use `-xtmelogit-` command.

5) If outcome variable is a count use `-xtmepoisson-` command.

The final model is a 3-level model with a level-3 variable, `poverty`, predicting the random intercept for `hmwk`. The level-3 identified is indicated with the `l3id()` option and the level-3 predictor variable with the `l3i()` option.

```
ml2mixed, dep(math) l1(hmwk) l2id(class)
l2i(meanmath) l2s(meanmath) l3id(school) l3i(poverty)
```

Multilevel Model

Level 1 Model

`math = hmwk`

Level 2 Model -- id = class

`= meanmath`

`slope = meanmath`

Level 3 Model -- id = school

= poverty

Stata Mixed Model -- Stata 11 notation

```
xtmixed math hmwk meanmath poverty  
hmwk#meanmath ///  
|| school: || class: hmwk , cov(unstr)
```

ARABPSYCHOLOGY.COM