

Fixed vs. Random Effects

Fixed effect Data has been gathered from all the levels of the factor that are of interest. (Typically your experimental factors and maybe factors like gender).

Random effect The factor has many possible levels, interest is in all possible levels, but only a random sample of levels is included in the data. (Typically participants and items). Typically need > 5 levels in order to estimate effects.

For mixed effects linear modelling in R, we need to install the package *lme4*. This is the mixed effects model equivalent of *lm* which we used previously. We also want the *lmerTest* package and the *emmeans* package.

```
> install.packages("lme4")
```

```
> install.packages("lmerTest")
```

```
> install.packages("emmeans")
```




Gives us p-values for our model estimates.

Remember then to load them:

```
> library(lme4)
```

```
> library(lmerTest)
```

```
> library(emmeans)
```



Allows us to do pairwise comparisons.