

Linear Mixed Models

What happens when we have many observations per person that we want to model?

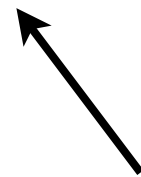
Imagine we are interested in how a person's reaction time varies whether they're responding to Large or Small target items.

We observe the same 10 people each responding to 5 Large and 5 Small target items.

We have 10 observations per person. These observations are not independent of each other as (which is an assumption of a linear model).

- We can get around the lack of independence by treating participants as a random effect such that each participant has their own *individual* reaction time baseline.
- This gives us a separate random intercept value for each participant - in other words, our model can account for individual variation.
- This is a *mixed effects model*:

$rt \sim \text{condition} + (1 \mid \text{subject}) + \text{error}$



This is our random effect and assumes a different intercept for each participant.