

Advanced Bayesian modeling

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Order of operations

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Sum of sums:

$$\sum_{r=1}^2 \left(\sum_{c=1}^3 x_{rc} \right) = \sum_{c=1}^3 \left(\sum_{r=1}^2 x_{rc} \right)$$

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Sum of products vs. product of sums:

$$\sum_{r=1}^2 \left(\prod_{c=1}^3 x_{rc} \right) \neq \prod_{c=1}^3 \left(\sum_{r=1}^2 x_{rc} \right)$$

Order of operations

In general, order of operations matters:

$$f \circ g(x) \neq g \circ f(x)$$

Estimating parameters is an operation

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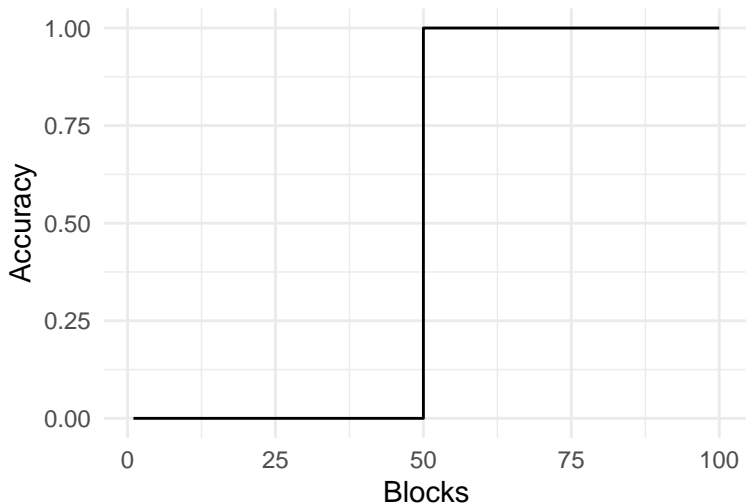
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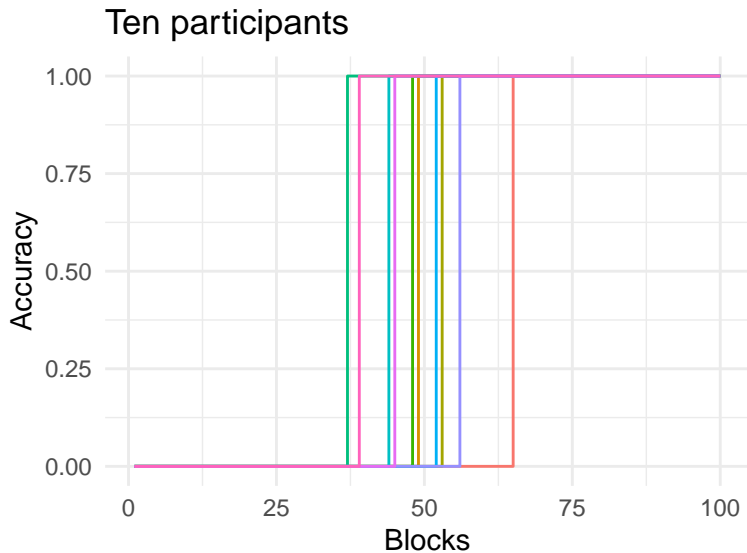
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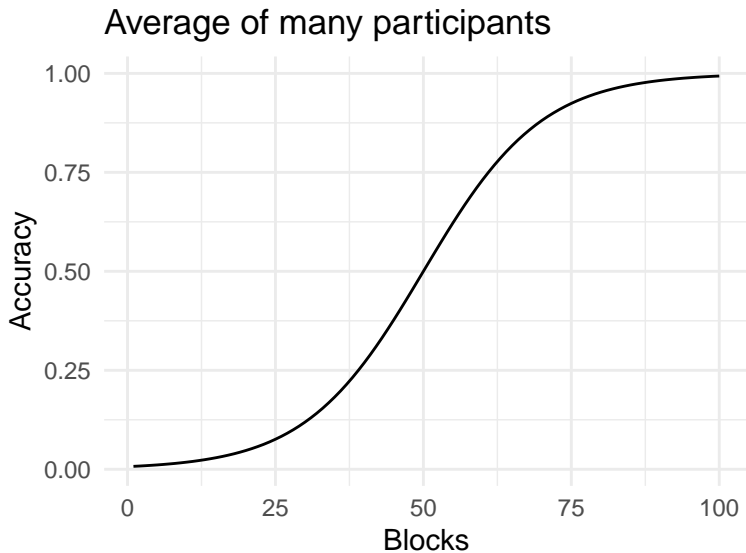
Do we want the **average model parameters of the data** or the **model parameters of the average data**?

$$\overline{f(x)} \neq f(\overline{x})$$

One-shot learning, one participant







The “average” learning curve looks nothing like the person-specific learning curve!

