Gibbs Sampler

Assume we have parameter $\theta_1, \theta_2, \theta_3$, and we use gibbs sampling to get MC chains. In the blue book, I saw the algorithm as

- $\theta_1^{(n+1)} \sim P(\theta_1 | \theta_2^{(n)}, \theta_3^{(n)})$
- $\theta_2^{(n+1)} \sim P(\theta_2 | \theta_1^{(n+1)}, \theta_3^{(n)})$
- $\theta_3^{(n+1)} \sim P(\theta_3 | \theta_1^{(n+1)}, \theta_2^{(n+1)})$

The send of third steps of above used updated θ_1 and θ_2 as condition in the sampling of the θ_2 and θ_3.

But what if we use estimates from last loop only in the conditions, shown as below

- $\theta_1^{(n+1)} \sim P(\theta_1 | \theta_2^{(n)}, \theta_3^{(n)})$
- $\theta_2^{(n+1)} \sim P(\theta_2 | \theta_1^{(n)}, \theta_3^{(n)})$
- $\theta_3^{(n+1)} \sim P(\theta_3 | \theta_1^{(n)}, \theta_2^{(n)})$

What will be the difference?

In my code for elliptical distribution, I see the sampling scheme of α's is using the second case instead of the first and it seems also working very well.