

HW2

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3H1

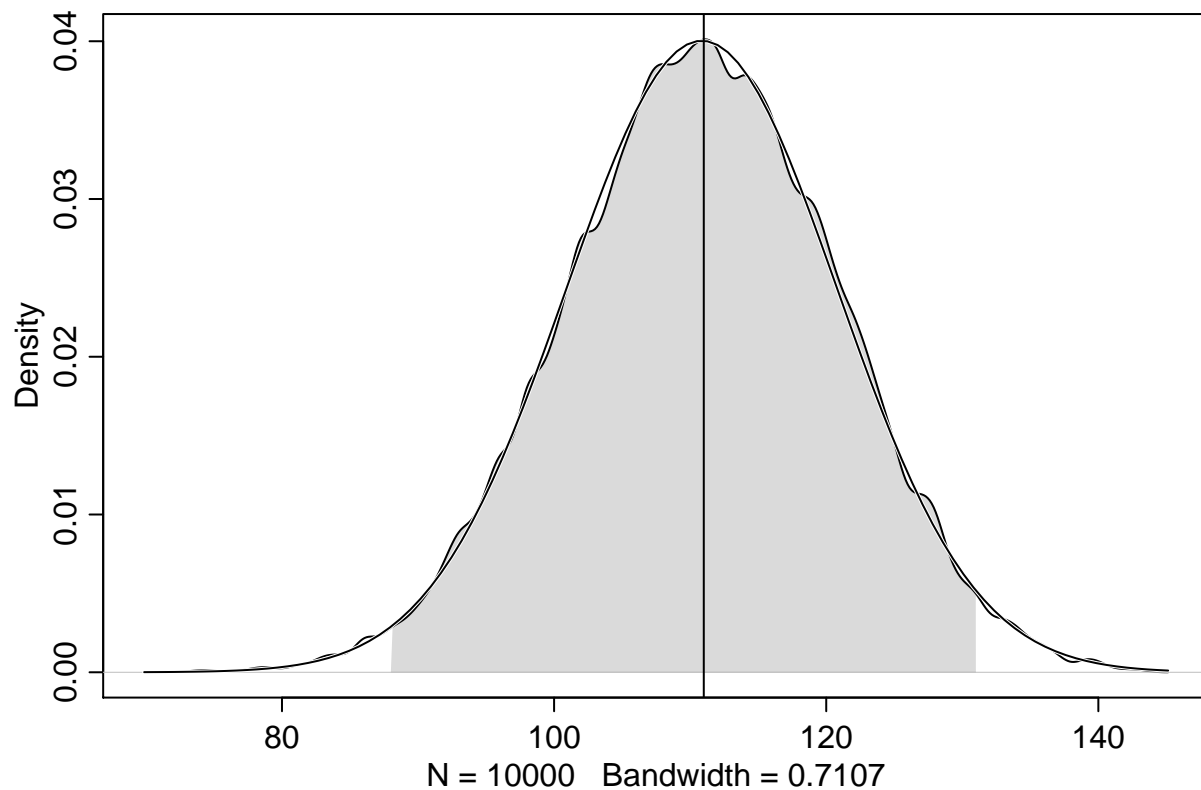
The value of theta that maximizes the posterior probability is 0.555.

3H2

```
## |0.5 0.5|
## 0.5288 0.5771
## |0.89 0.89|
## 0.4972 0.6102
## |0.97 0.97|
## 0.4810 0.6334
```

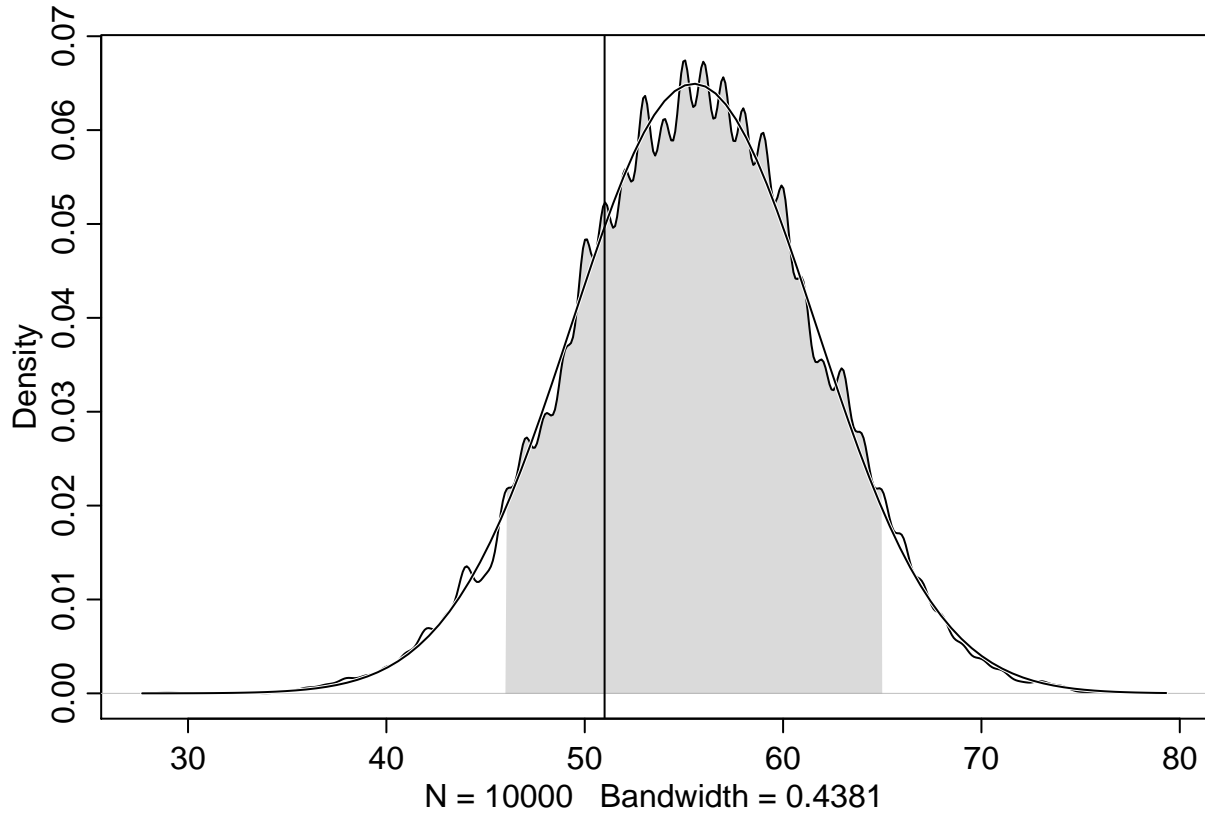
The 50 percent, 89 percent, and 97 percent HPDIs are given above.

3H3



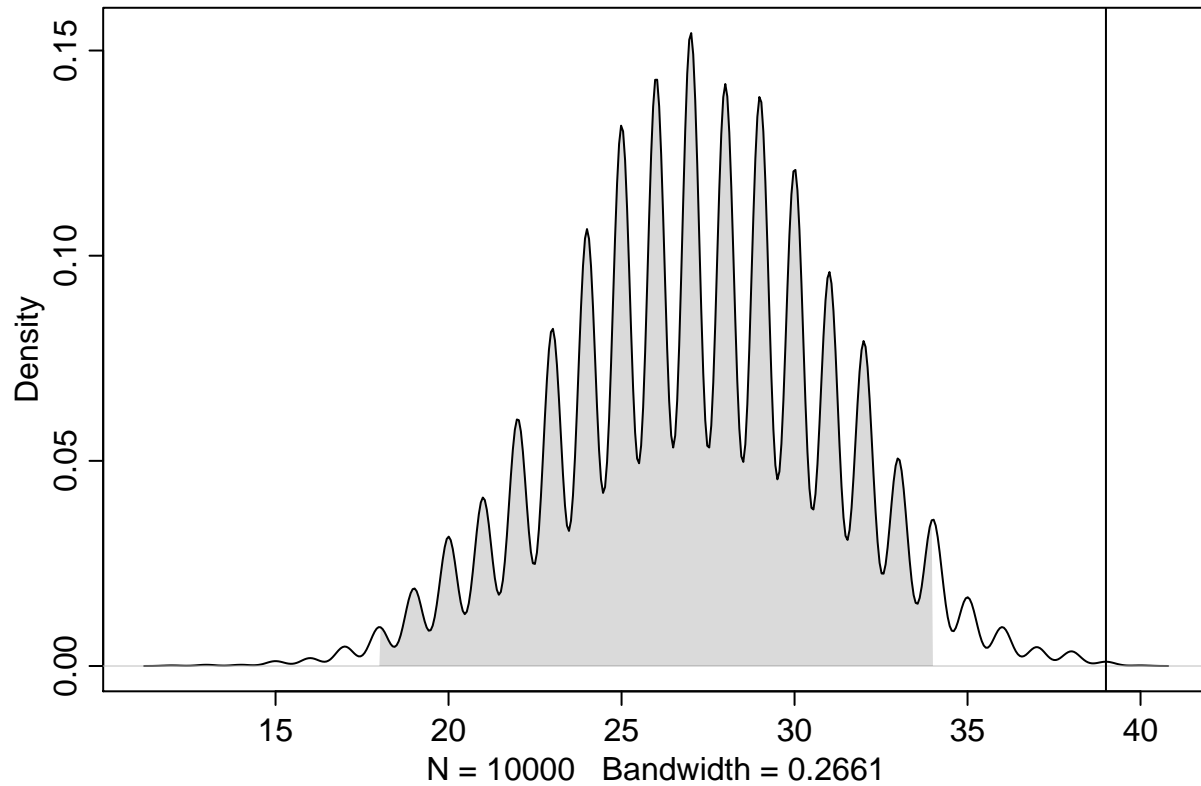
In this case, it does look like the model fits the data well because the total number of boys in the data falls pretty much right in the middle of the distribution of our approximated posterior.

3H4



In this case, the model looks a little bit worse, but still okay. Again, the number of firstborn boys (51) falls well within our 89 percent HPDI.

3H5



In this case, the model does not fit the data particularly well. The observed count of 39 is well outside of even a 97 percent HPDI. This implies that we should not necessarily assume that there is independence in the genders of first and second children.