Sequential M-MED

Kristyn Pantoja

10/15/2019

Another Example

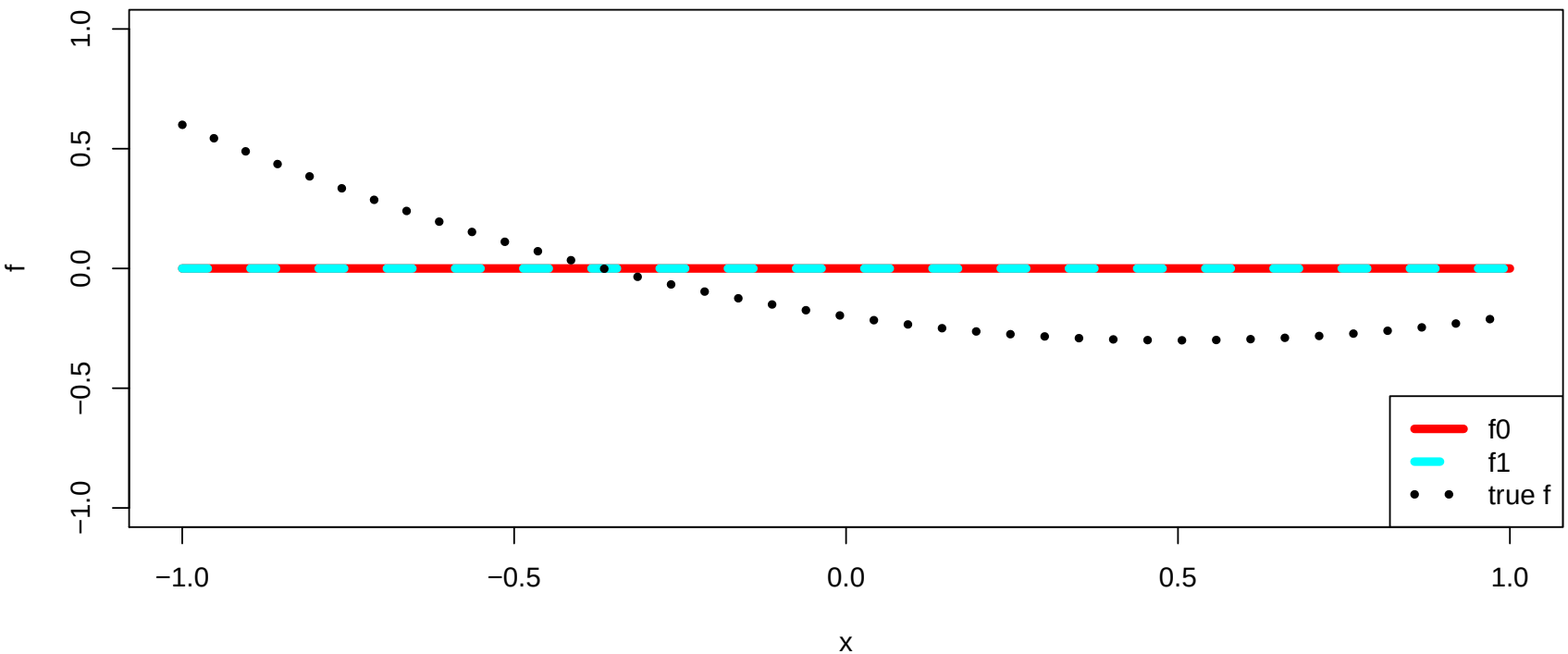
A More Extreme Example

f0, f1, true f

Another Example

f0, f1, true f

```
mu0 = c(0, 0)
mu1 = c(0, 0, 0)
betaT = c(-0.2, -0.4, 0.4)
```

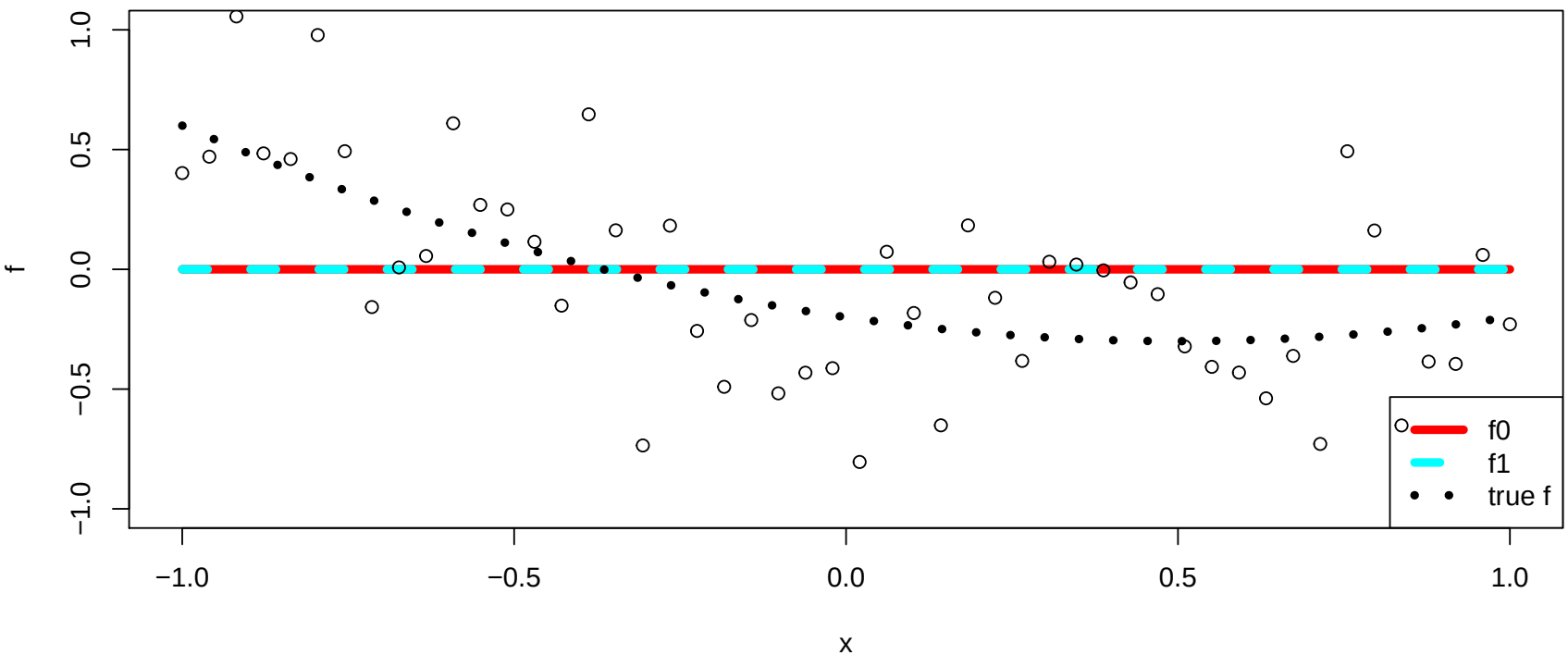


Some observations

From my limited experiments with our current null and alternative hypothesis at the line $y = 0$ for both the linear and quadratic model, no matter what the true quadratic model was, the sequential M-MED will always have its modes at -1, 0, and 1. This might explain why the quadratic D-optimal design performs so well; those points are optimal for other reasons besides where the hypothesized models differ the most.

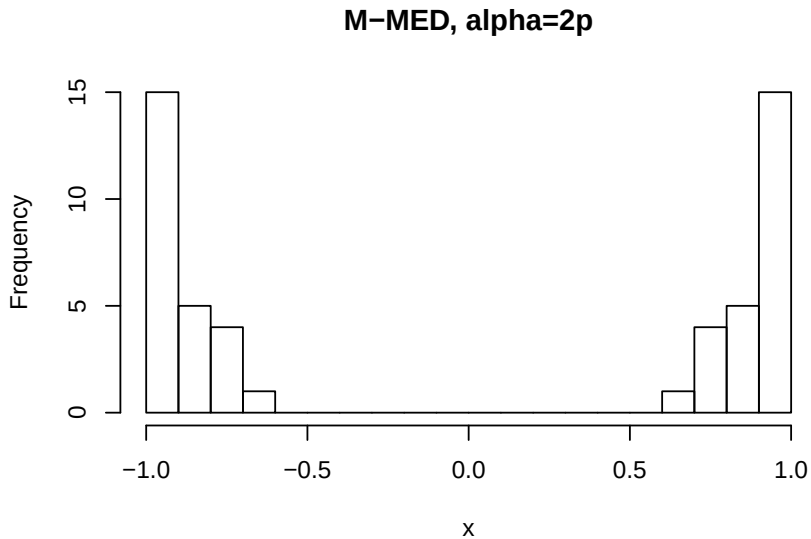
sigmasq01 less than sigmasq

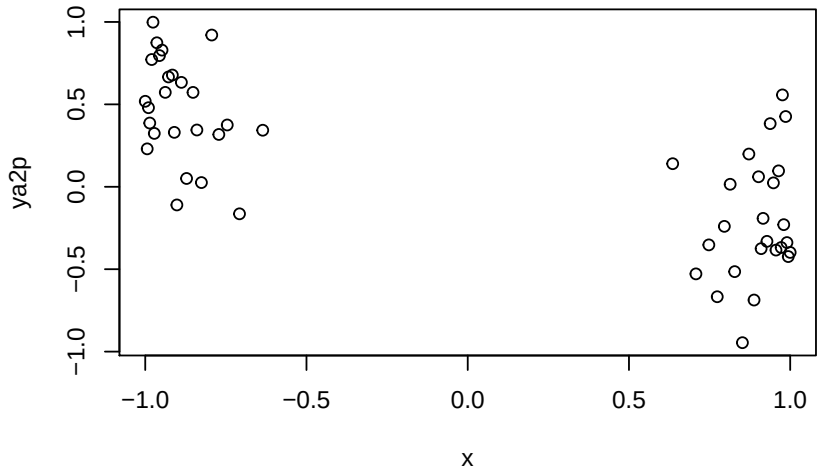
```
sigmasq01 = 0.025
sigmasq = 0.125
```

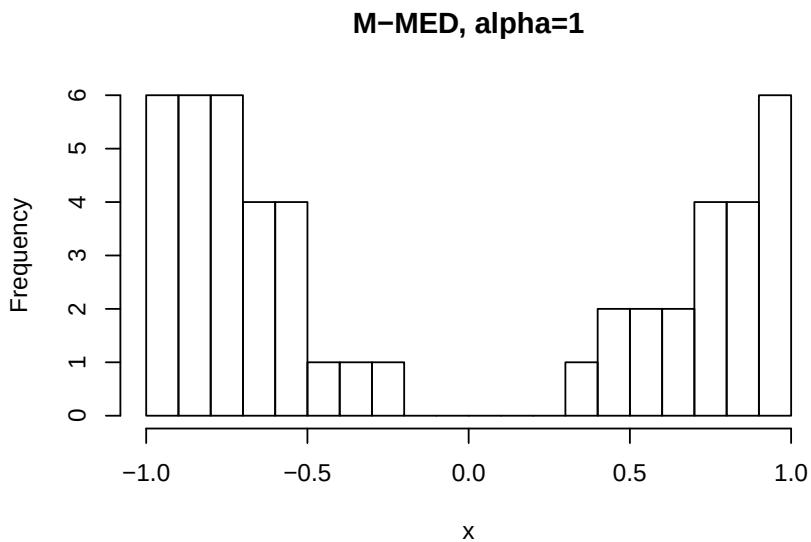


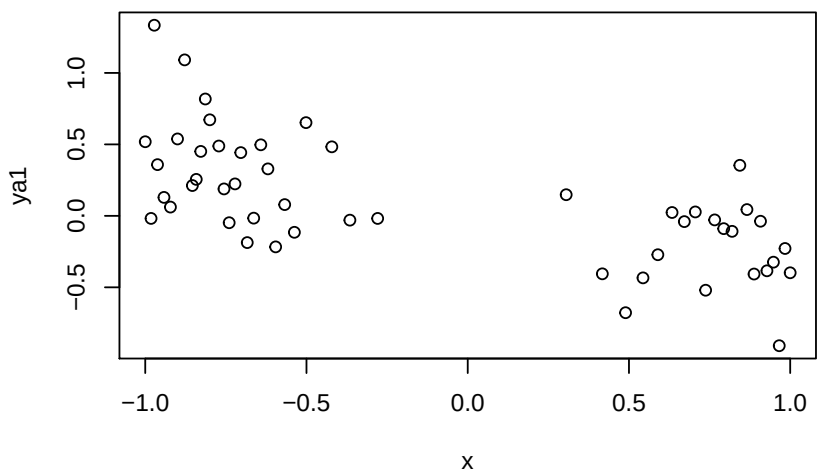
M-MED Without Data

I generate 50 design points from M-MED with no data, one with $\alpha = 2p$.



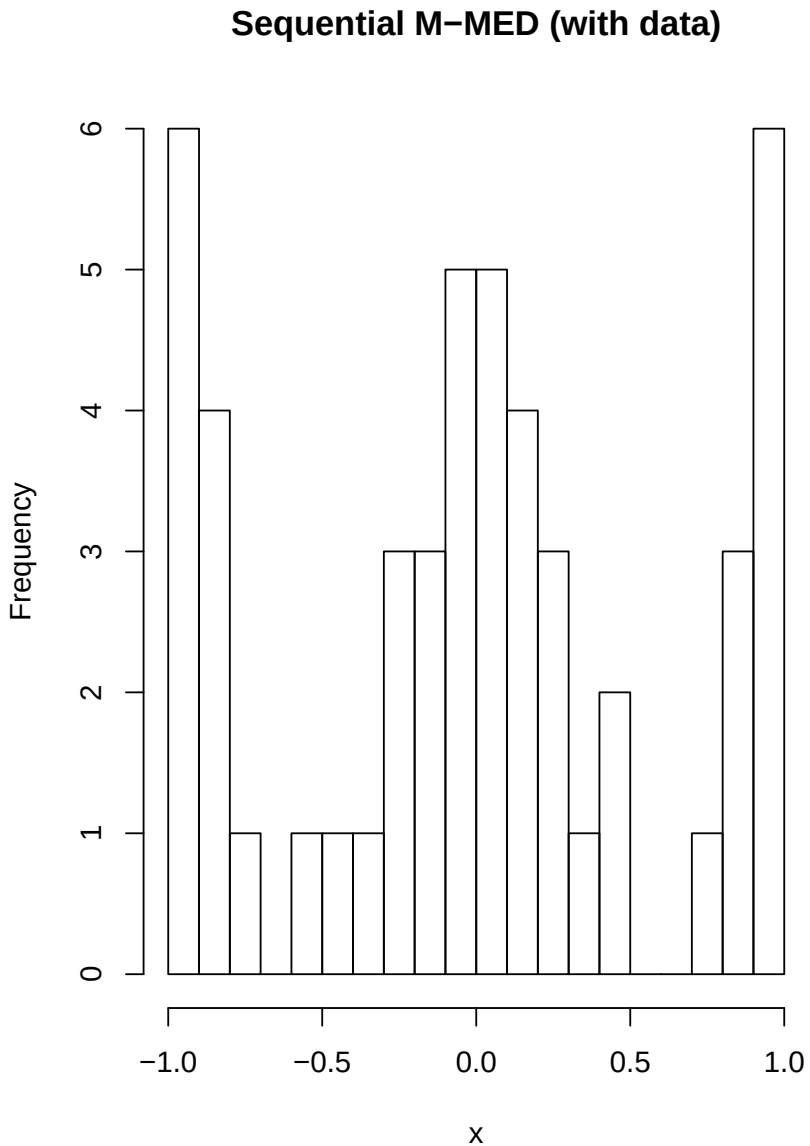


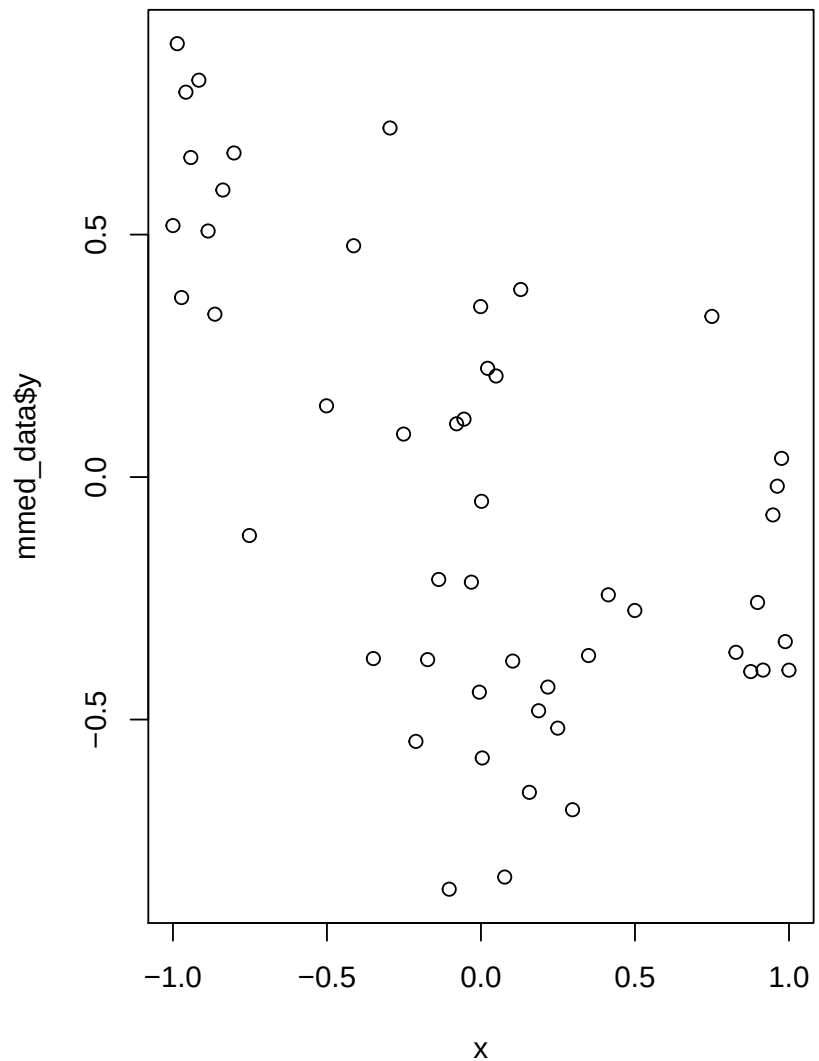




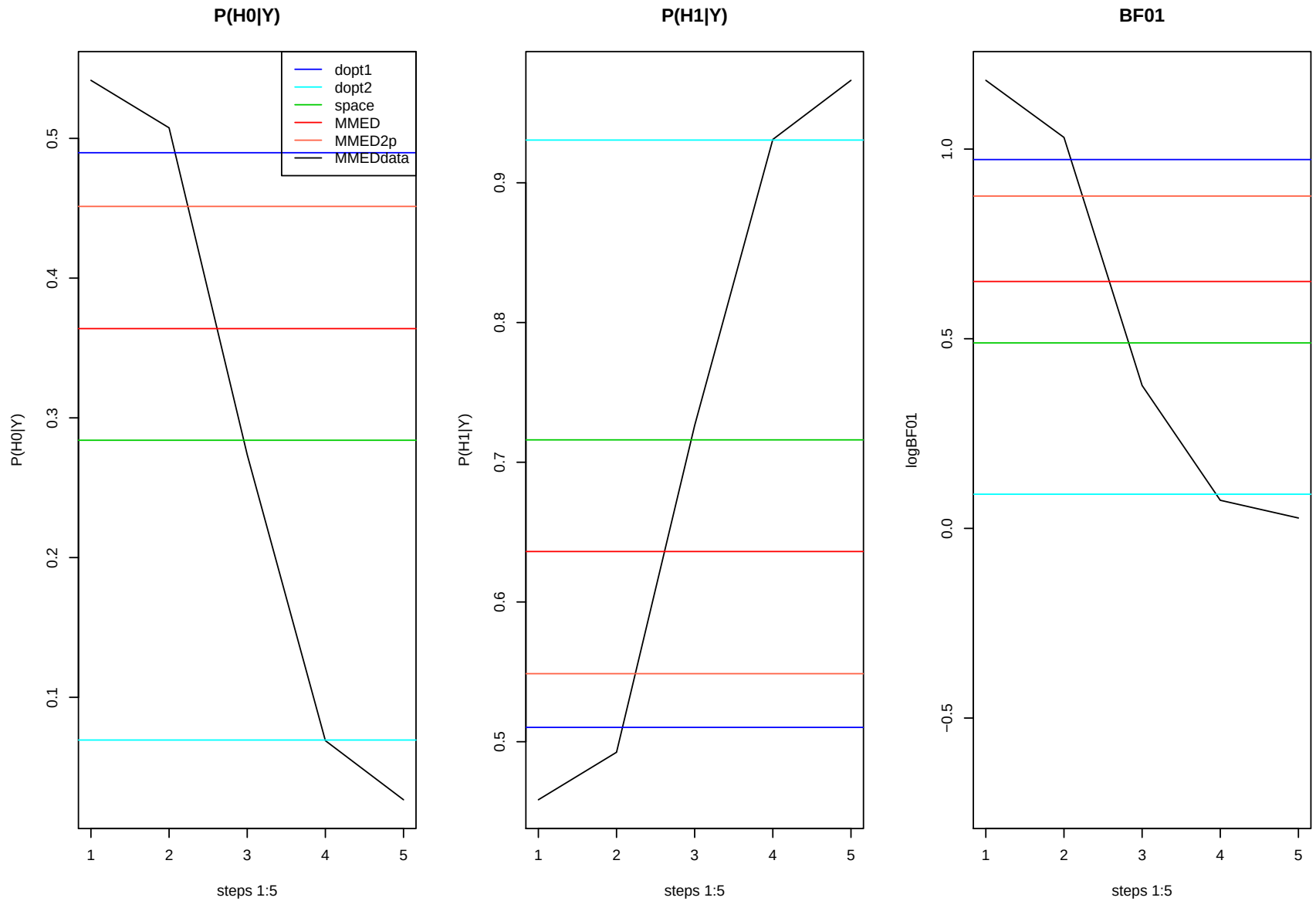
M-MED With Data

I work with a sequence of 5 steps, generating 10 points in each step, and resulting in 50 points, too.





Hypothesis Testing



	E[P(H0|Y)|D]	E[P(H1|Y)|D]	E[BF01|Y,D]
dopt1	0.490	0.510	0.972
dopt2	0.069	0.931	0.090
space	0.284	0.716	0.489
MMED	0.364	0.636	0.651
MMED2p	0.451	0.549	0.876
MMEDdata	0.027	0.973	0.027

A More Extreme Example

f0, f1, true f

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mu0 = c(0, 0)
mu1 = c(0, 0, 0)
betaT = c(0, -0.2, 0.2)
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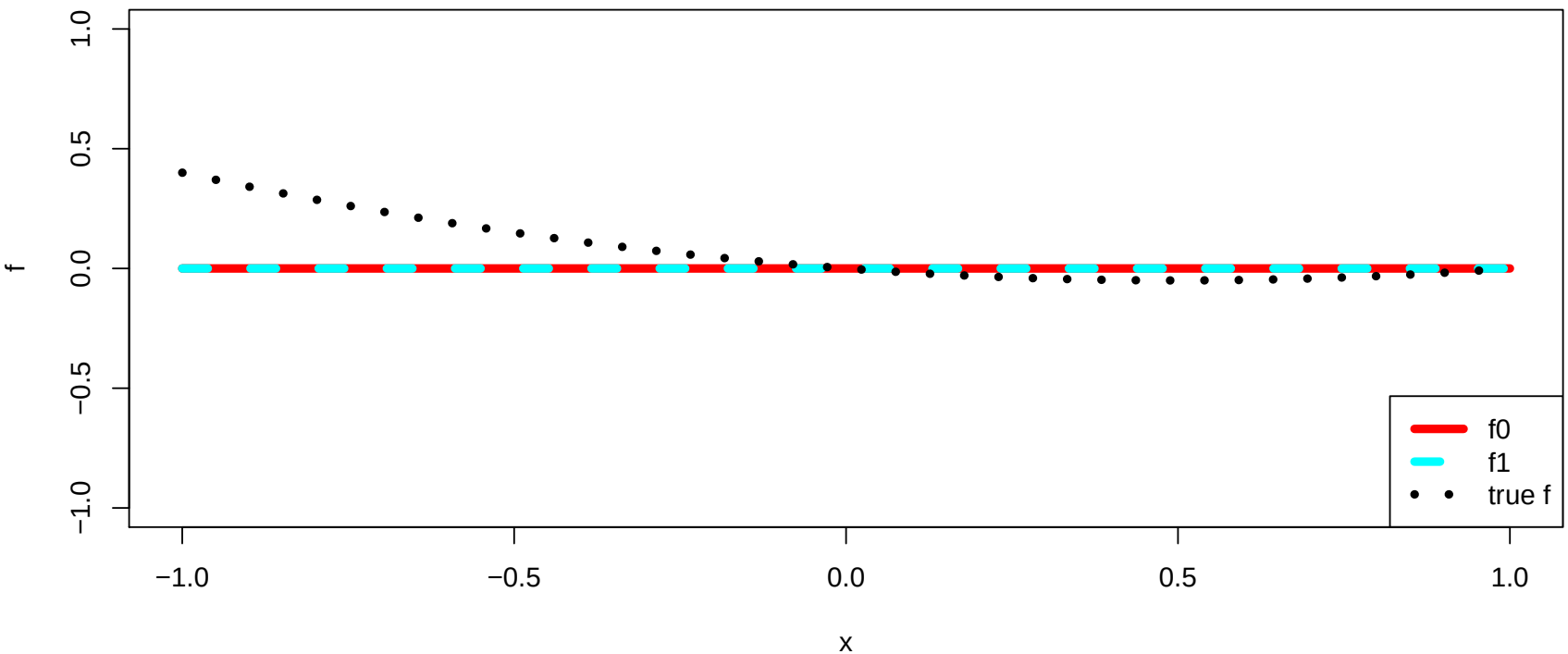

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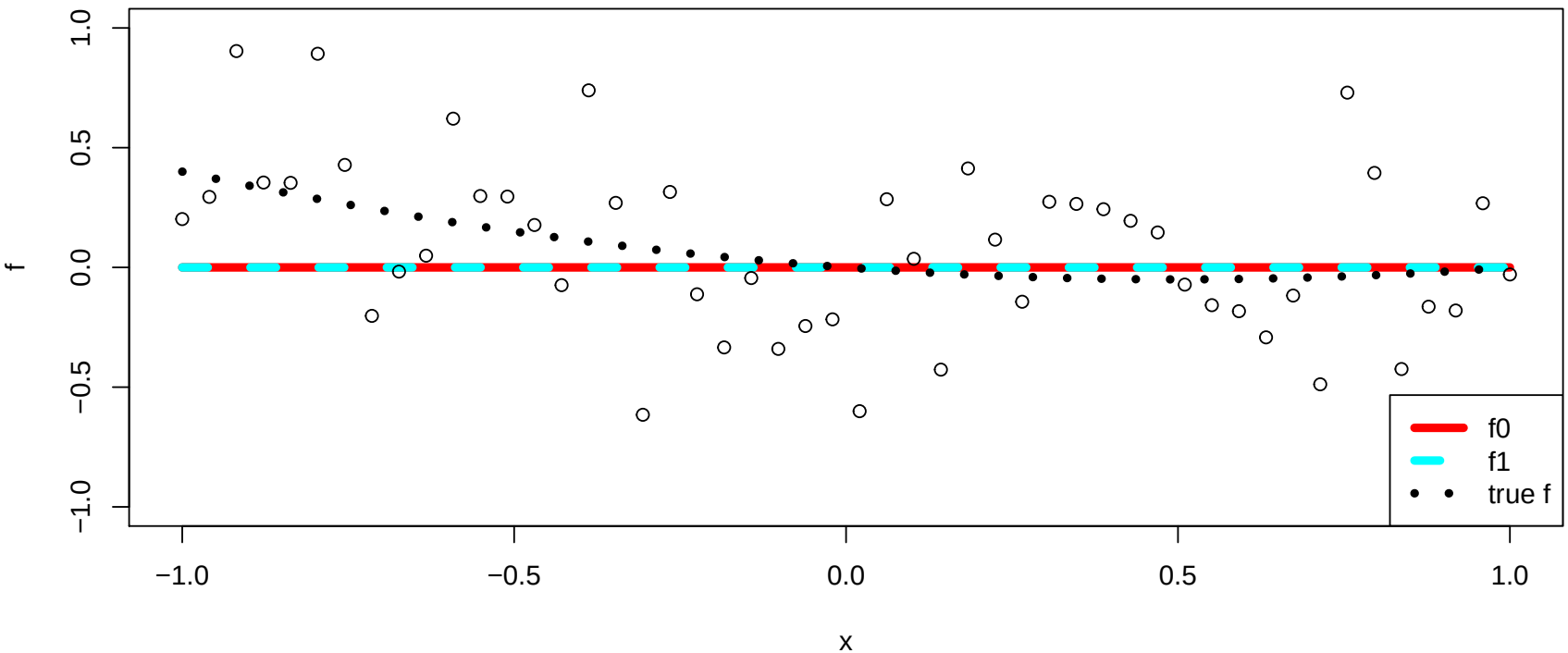

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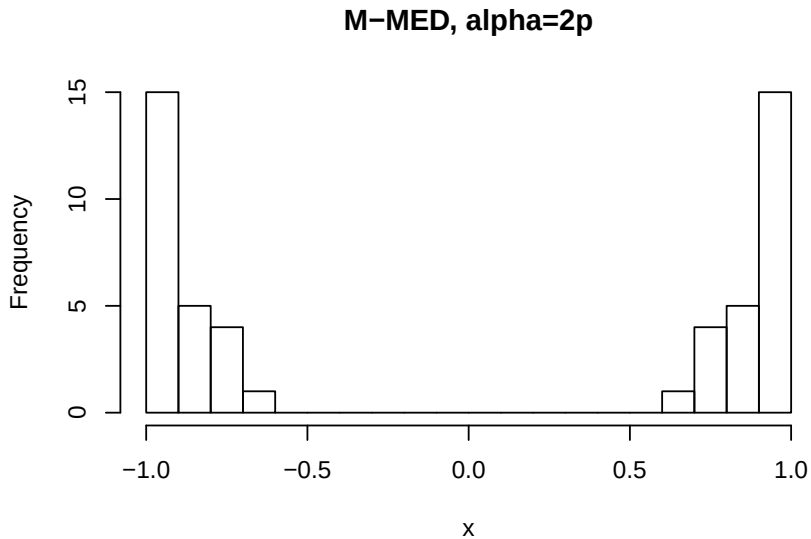

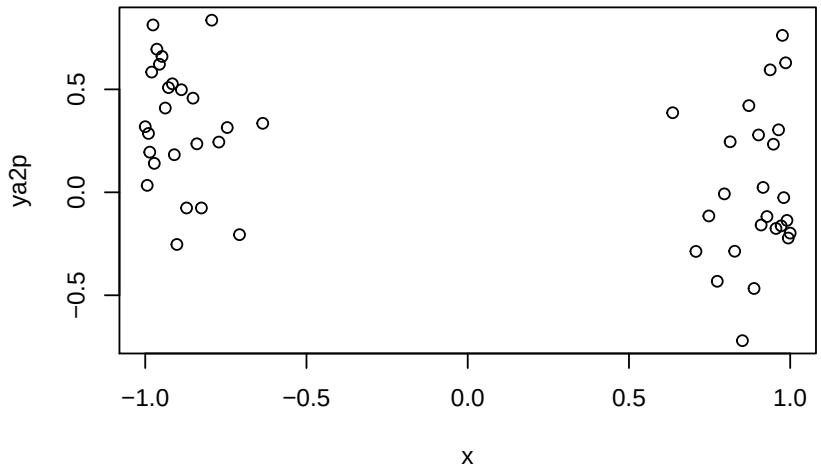

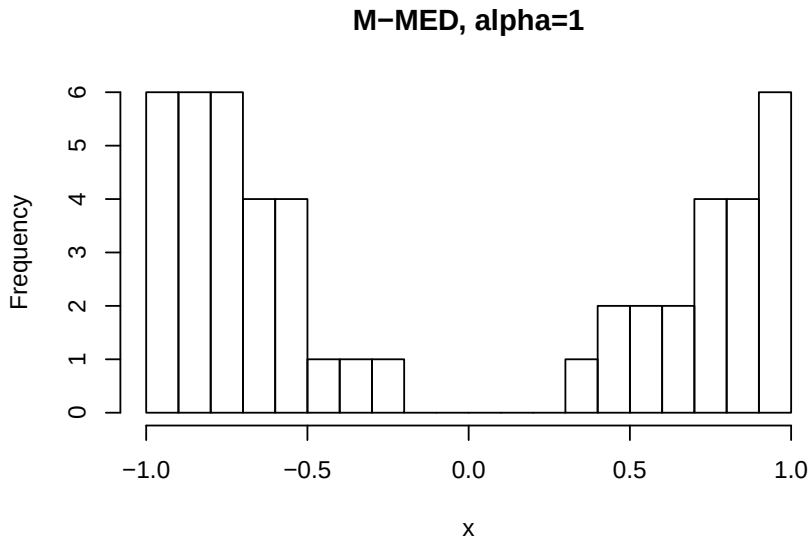

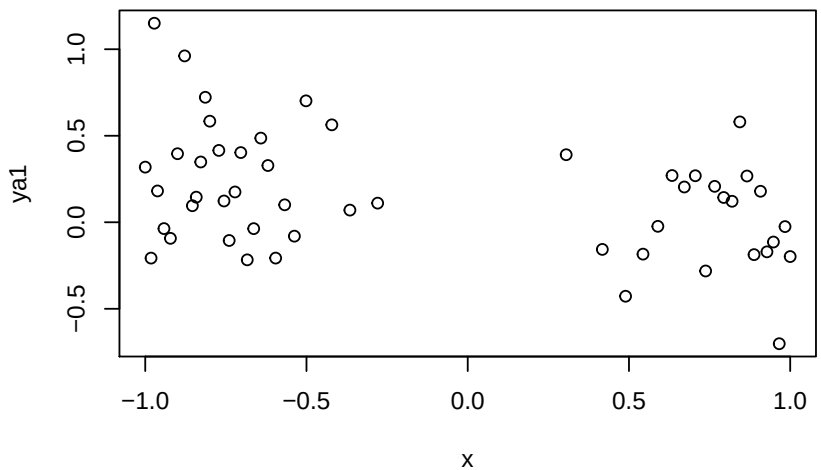

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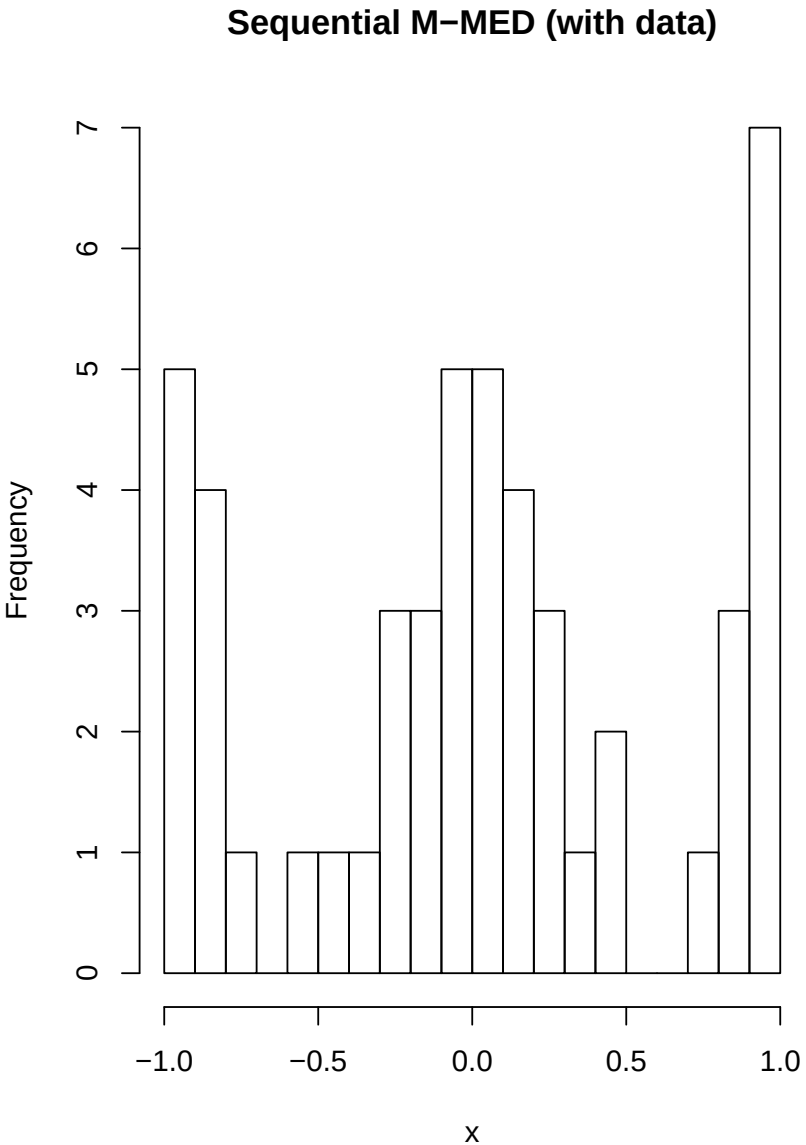
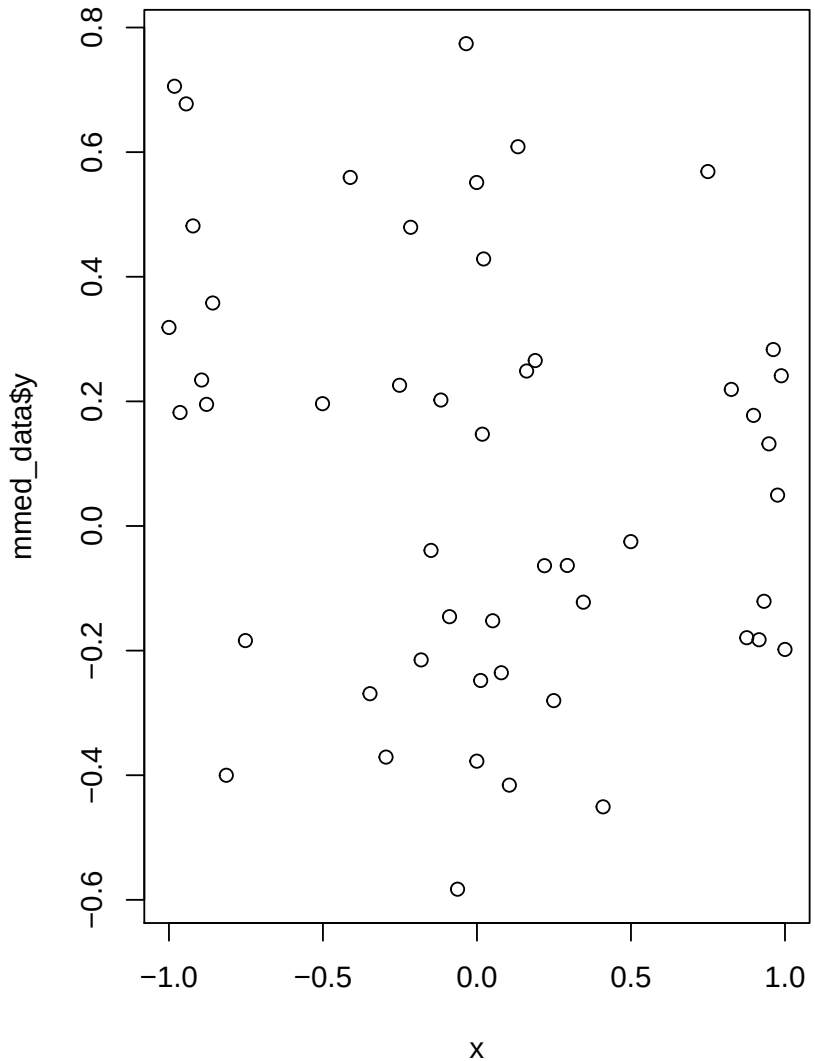
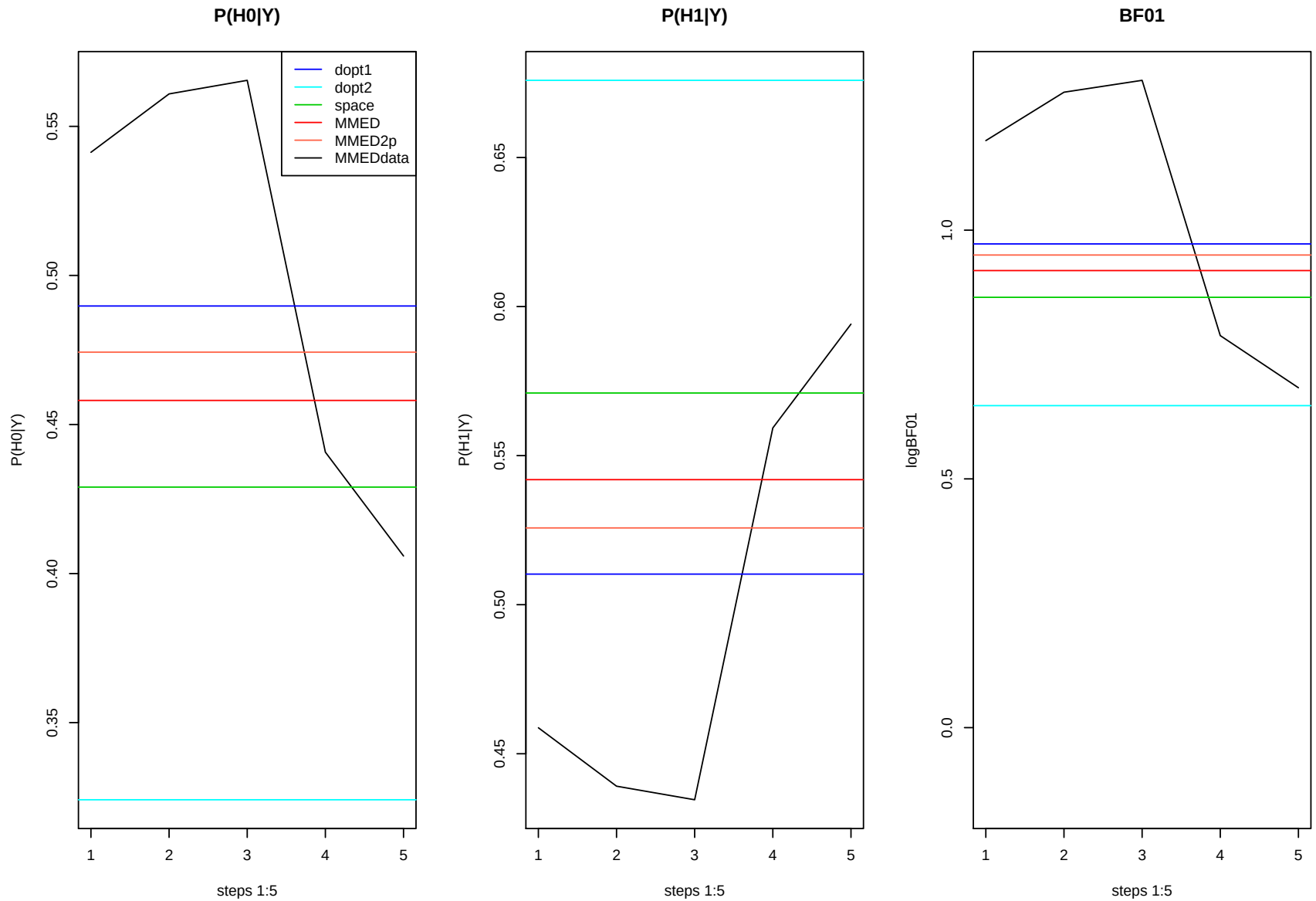




Hypothesis Testing



	E[P(H0|Y)|D]	E[P(H1|Y)|D]	E[BF01|Y,D]
dopt1	0.490	0.510	0.972
dopt2	0.324	0.676	0.647
space	0.429	0.571	0.865
MMED	0.458	0.542	0.919
MMED2p	0.474	0.526	0.950
MMEDdata	0.406	0.594	0.683