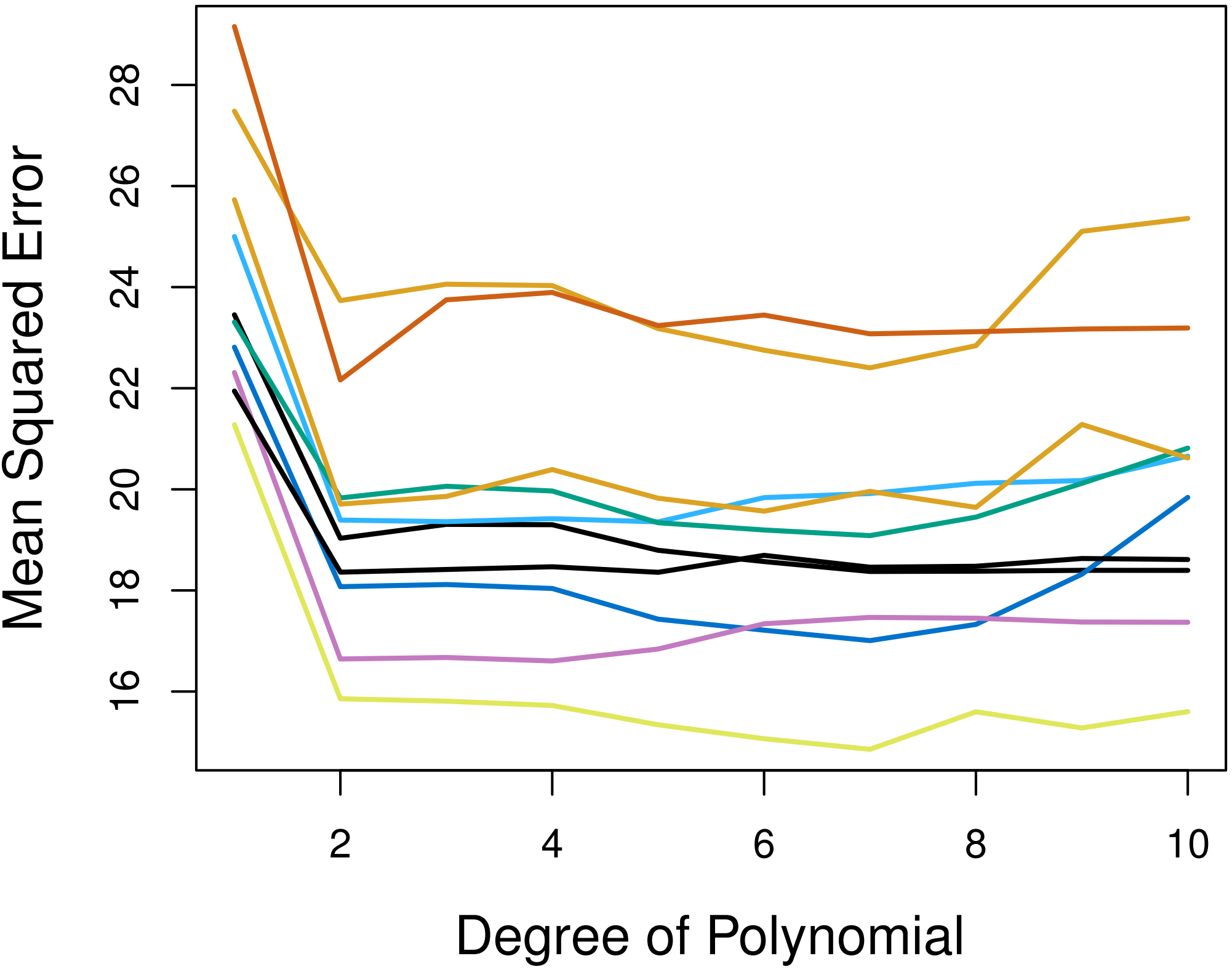
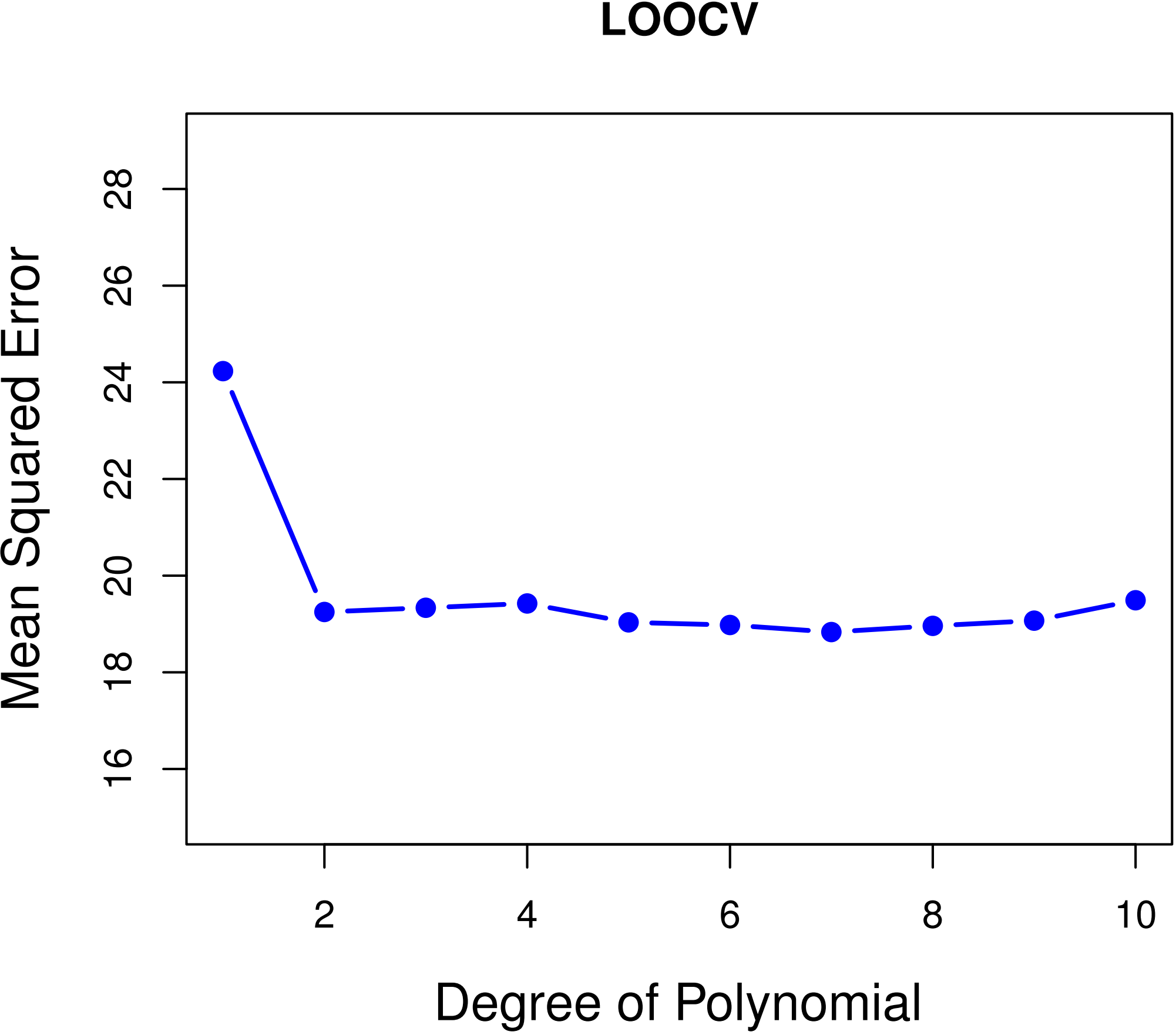
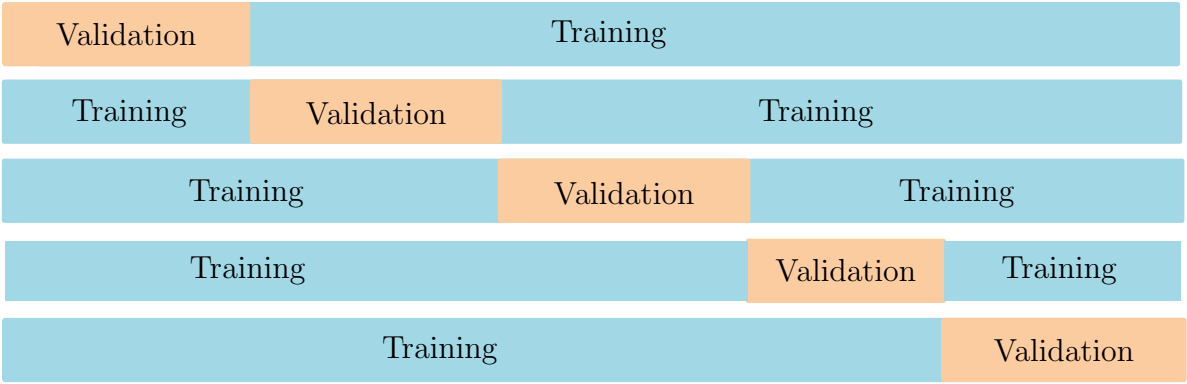
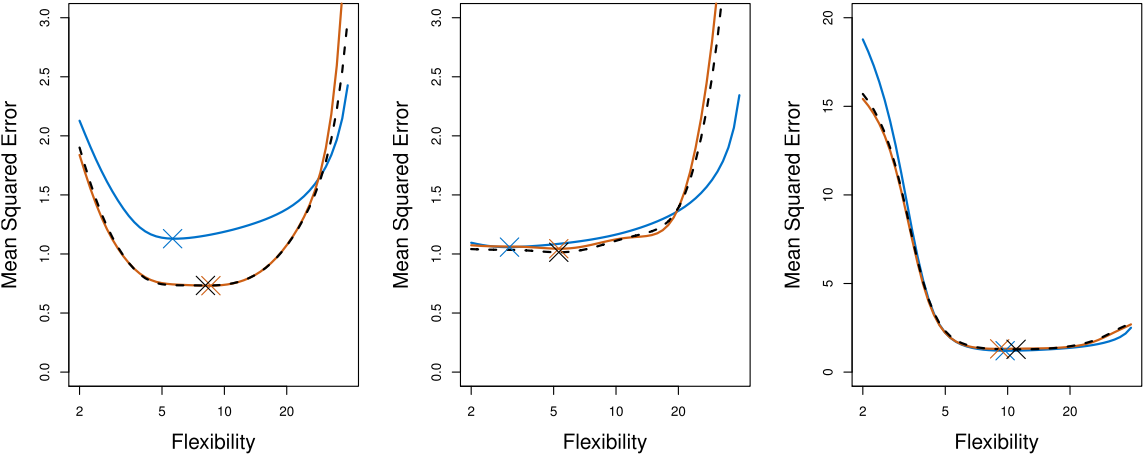
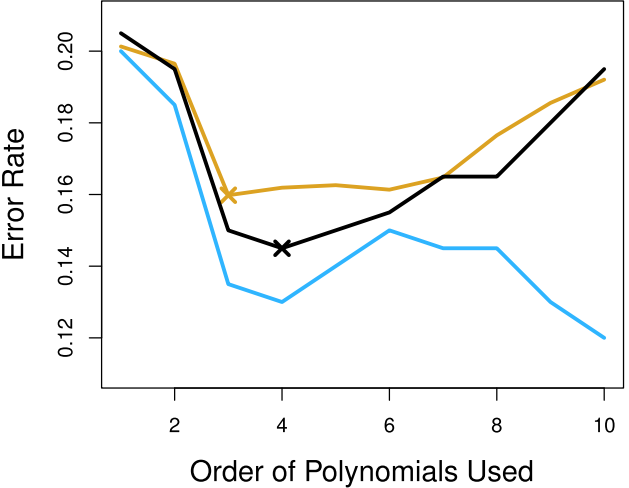
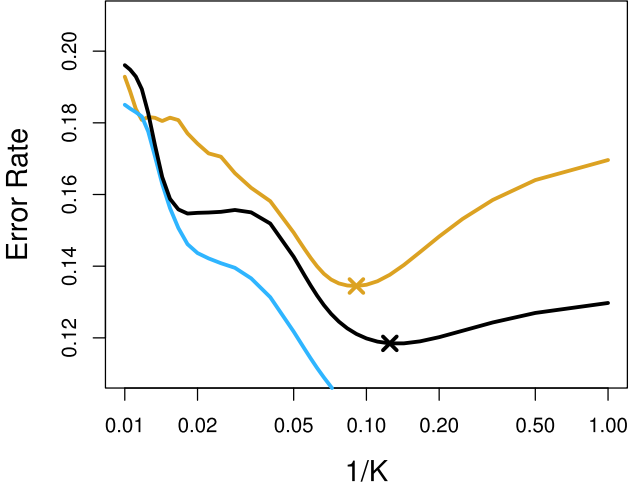

Mean Squared Error
16
18
20
22
24
26
28
2
4
6
8
10
Degree of Polynomial

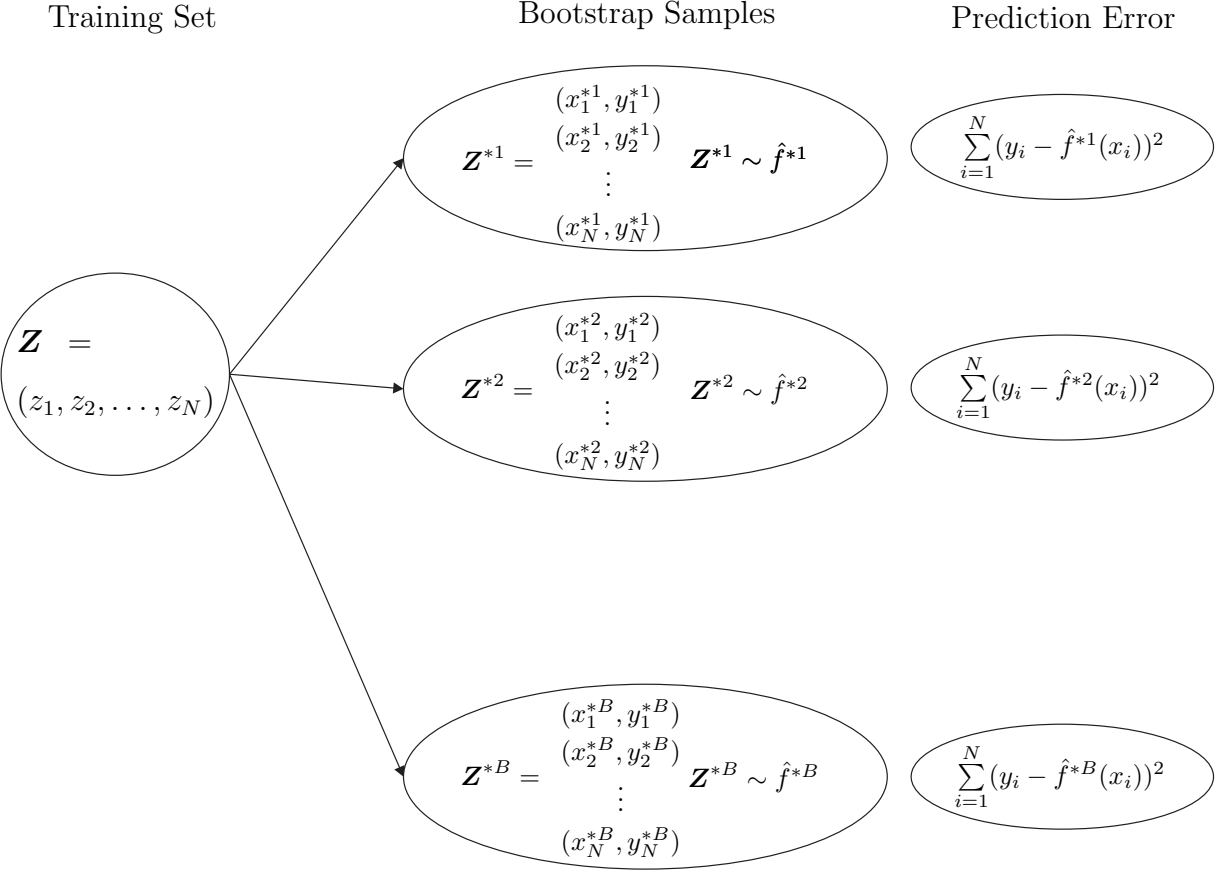

LOOCV
Mean Squared Error
16
18
20
22
24
26
28
2
4
6
8
10
Degree of Polynomial

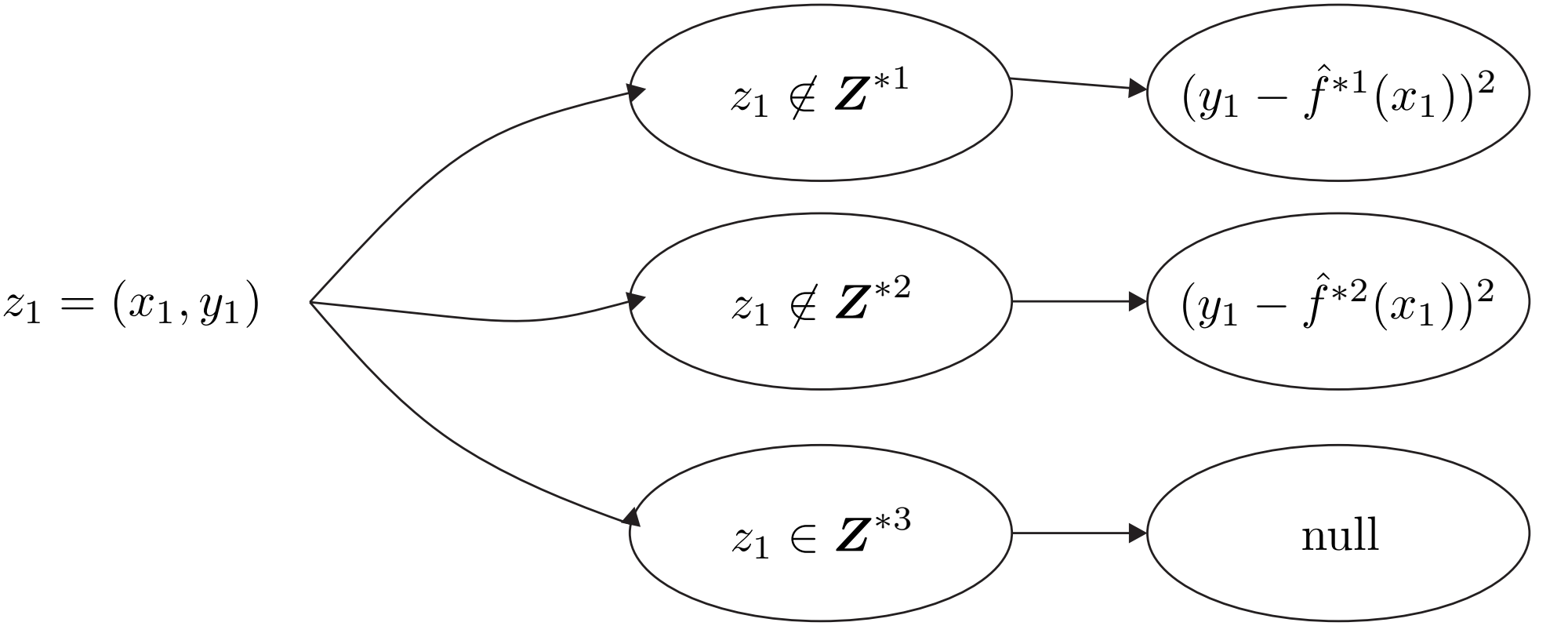

Validation
Training
Training
Validation
Training
Training
Validation
Training
Training
Validation
Training
Training
Validation


Mean Squared Error
0.0
0.5
1.0
1.5
2.0
2.5
3.0
2
5
10
20
Flexibility
Mean Squared Error
0.0
0.5
1.0
1.5
2.0
2.5
3.0
2
5
10
20
Flexibility
Mean Squared Error
0
5
10
15
20
2
5
10
20
Flexibility


Error Rate
0.12
0.14
0.16
0.18
0.20
2
4
6
8
10
Order of Polynomials Used


Error Rate
0.12
0.14
0.16
0.18
0.20
0.01
0.02
0.05
0.10
0.20
0.50
1.00
1/K


Training Set
Bootstrap Samples
Prediction Error
$\boldsymbol{Z} = (z_1, z_2, \ldots, z_N)$
$\boldsymbol{Z}^{*1} = \begin{matrix}(x_1^{*1}, y_1^{*1}) \\ (x_2^{*1}, y_2^{*1}) \\ \vdots \\ (x_N^{*1}, y_N^{*1})\end{matrix}$ $\boldsymbol{Z}^{*1} \sim \hat{f}^{*1}$
$\sum_{i=1}^{N}(y_i - \hat{f}^{*1}(x_i))^2$
$\boldsymbol{Z}^{*2} = \begin{matrix}(x_1^{*2}, y_1^{*2}) \\ (x_2^{*2}, y_2^{*2}) \\ \vdots \\ (x_N^{*2}, y_N^{*2})\end{matrix}$ $\boldsymbol{Z}^{*2} \sim \hat{f}^{*2}$
$\sum_{i=1}^{N}(y_i - \hat{f}^{*2}(x_i))^2$
$\boldsymbol{Z}^{*B} = \begin{matrix}(x_1^{*B}, y_1^{*B}) \\ (x_2^{*B}, y_2^{*B}) \\ \vdots \\ (x_N^{*B}, y_N^{*B})\end{matrix}$ $\boldsymbol{Z}^{*B} \sim \hat{f}^{*B}$
$\sum_{i=1}^{N}(y_i - \hat{f}^{*B}(x_i))^2$



$$\frac{1}{2} \sum_{b=1}^{2} (y_1 - \hat{f}^{*b}(x_1))^2$$