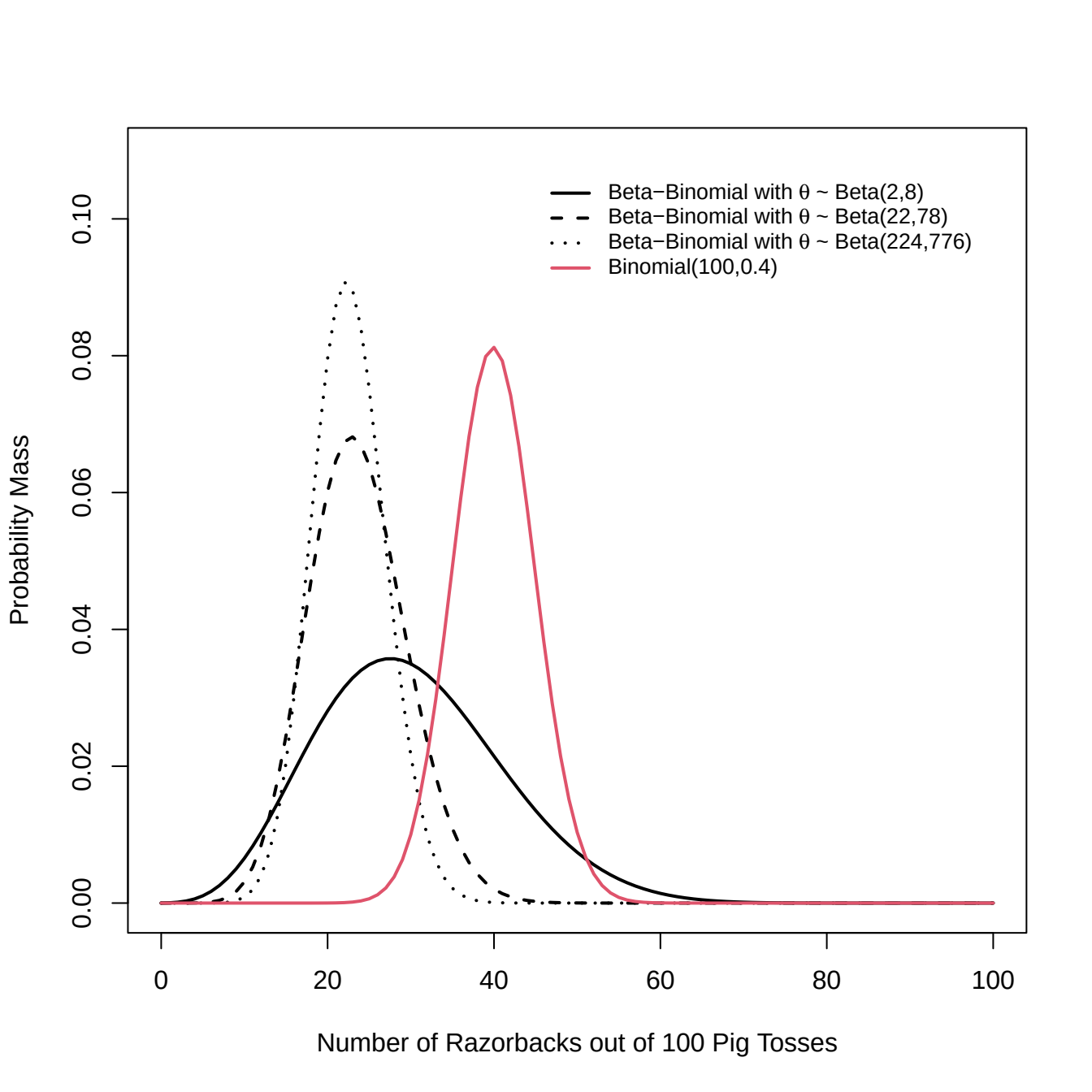
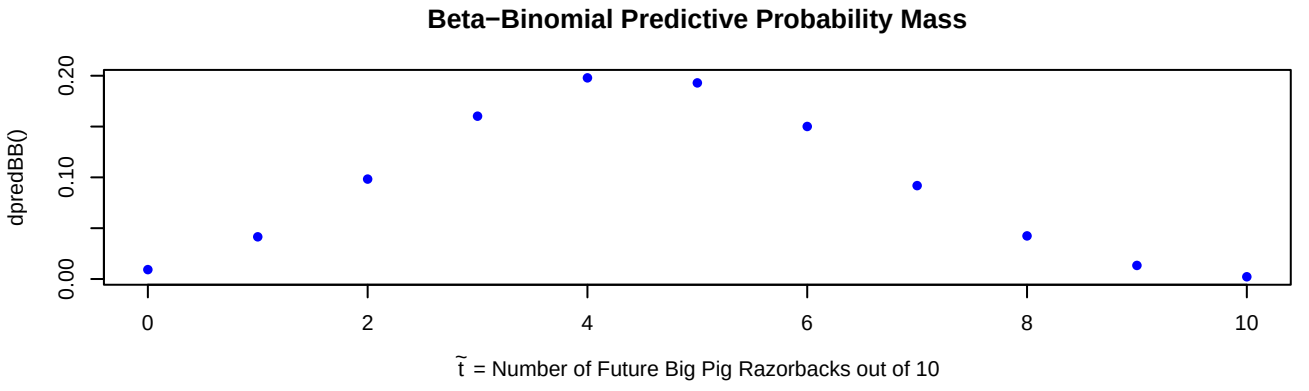
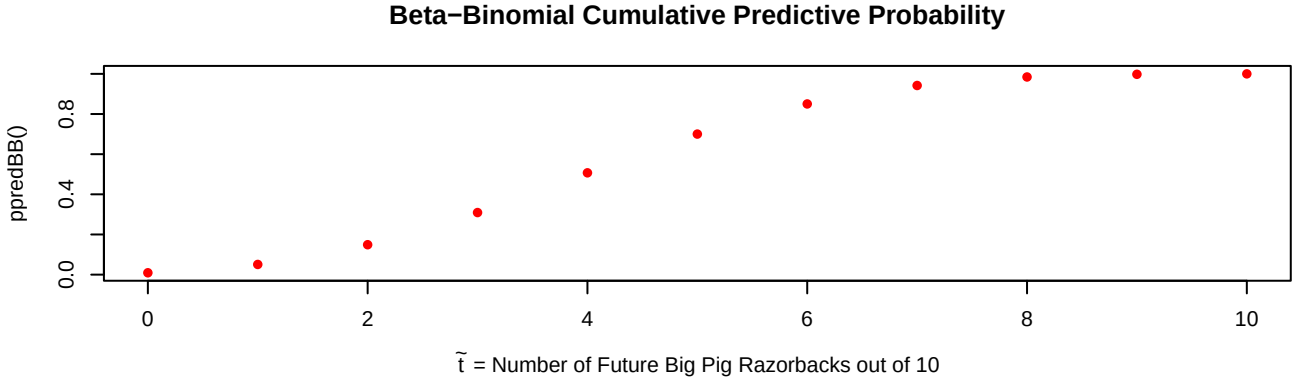
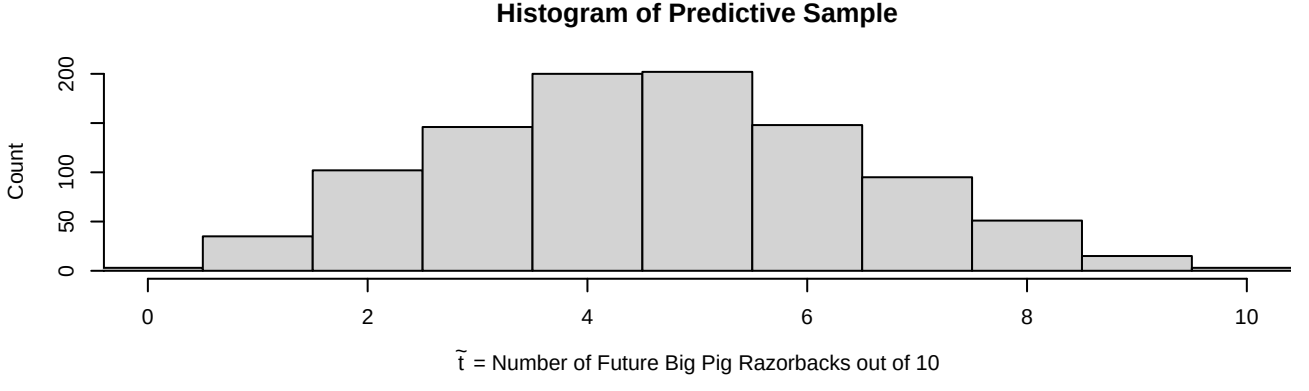
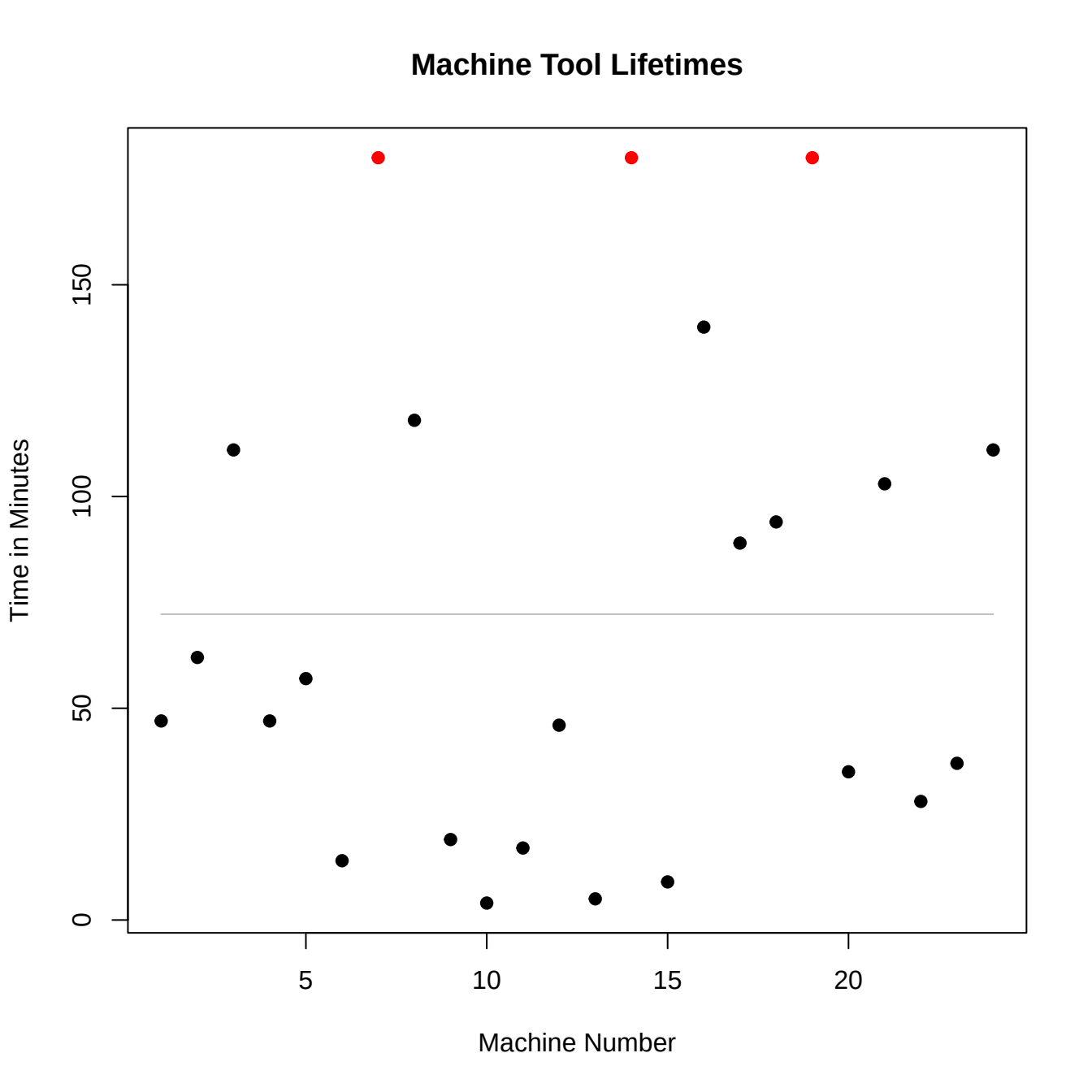
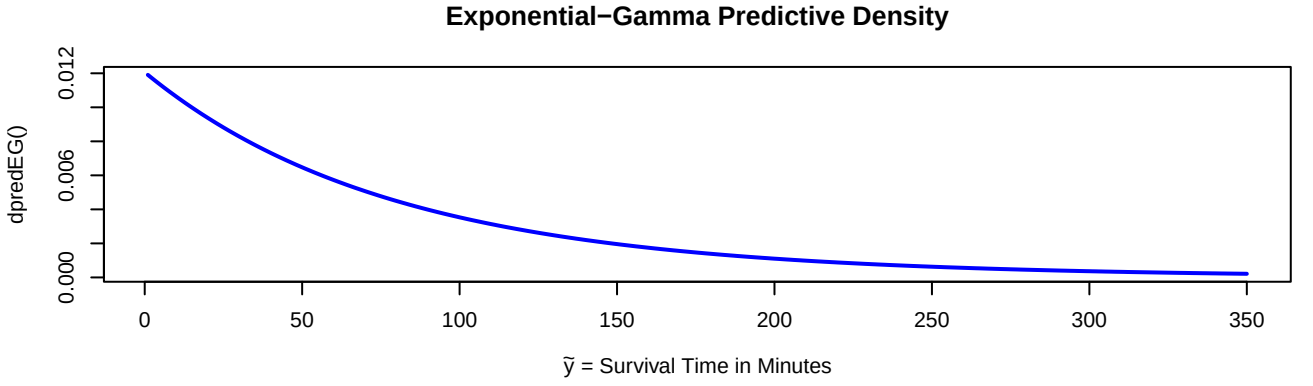

Beta−Binomial with θ ~ Beta(2,8)
Beta−Binomial with θ ~ Beta(22,78)
Beta−Binomial with θ ~ Beta(224,776)
Binomial(100,0.4)
Probability Mass
0.00
0.02
0.04
0.06
0.08
0.10
0
20
40
60
80
100
Number of Razorbacks out of 100 Pig Tosses

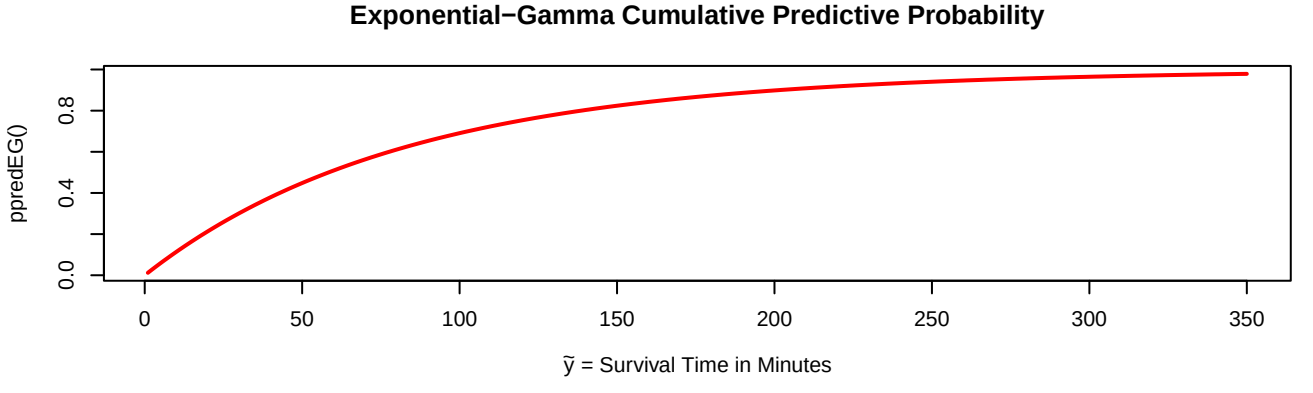

Beta−Binomial Predictive Probability Mass
dpredBB()
0.00
0.10
0.20
0
2
4
6
8
10
t̃ = Number of Future Big Pig Razorbacks out of 10

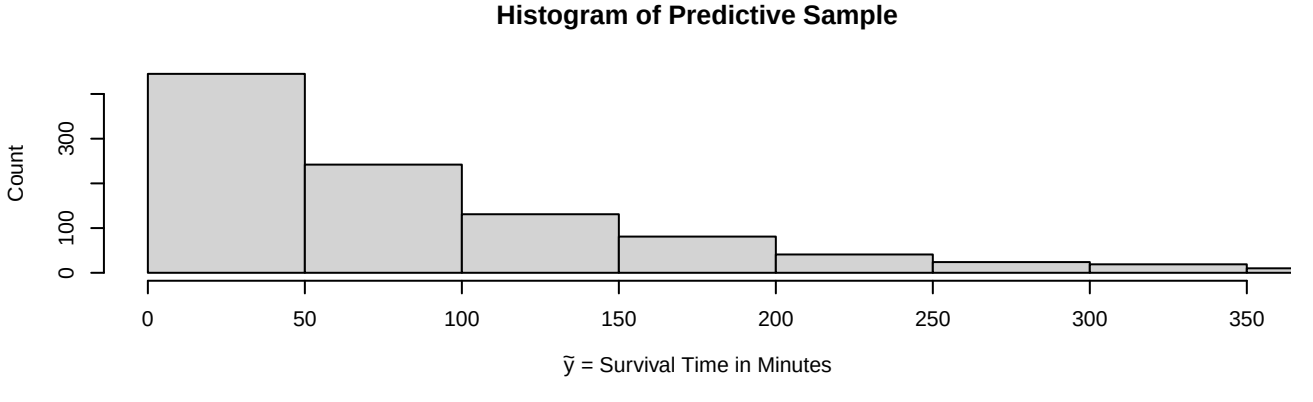

Beta−Binomial Cumulative Predictive Probability
ppredBB()
0.0
0.4
0.8
0
2
4
6
8
10
t̃ = Number of Future Big Pig Razorbacks out of 10

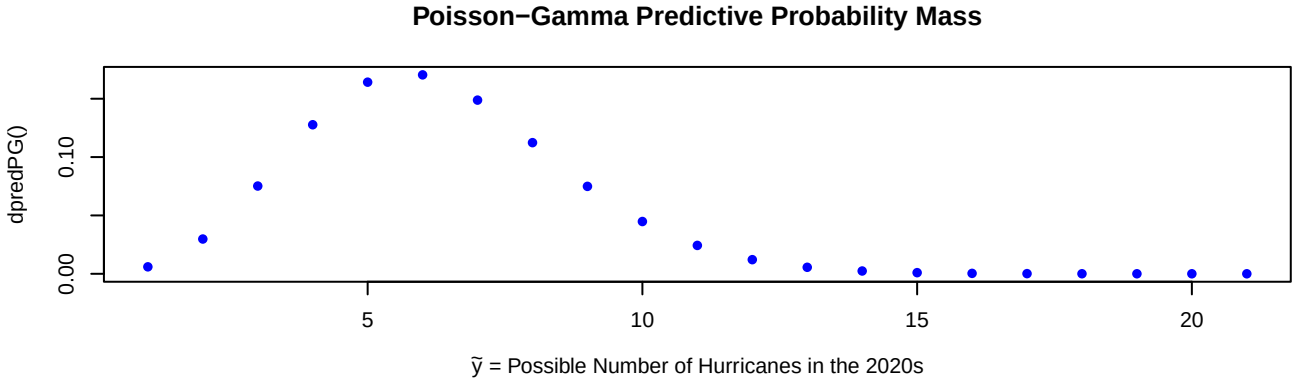

Histogram of Predictive Sample
Count
0
50
100
200
0
2
4
6
8
10
t̃ = Number of Future Big Pig Razorbacks out of 10

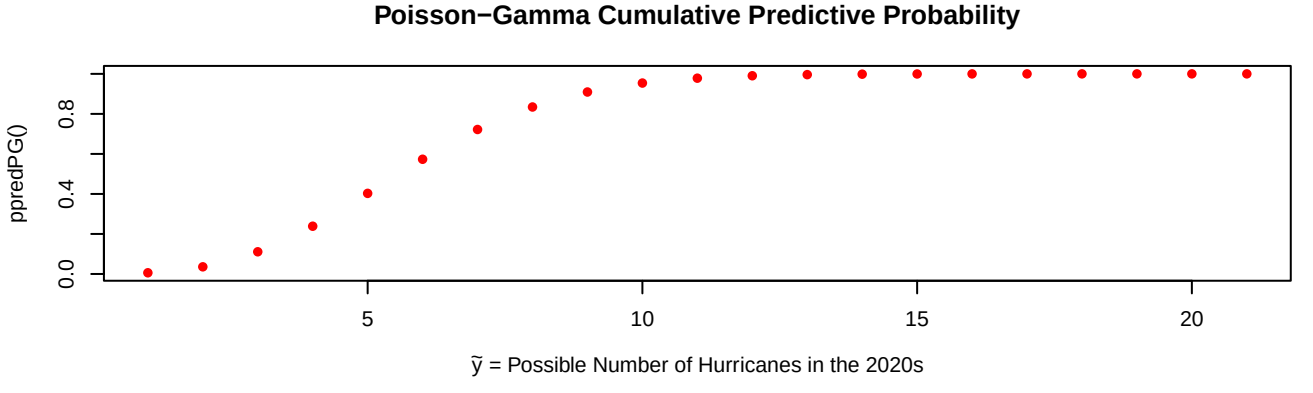

Machine Tool Lifetimes
Time in Minutes
0
50
100
150
5
10
15
20
Machine Number

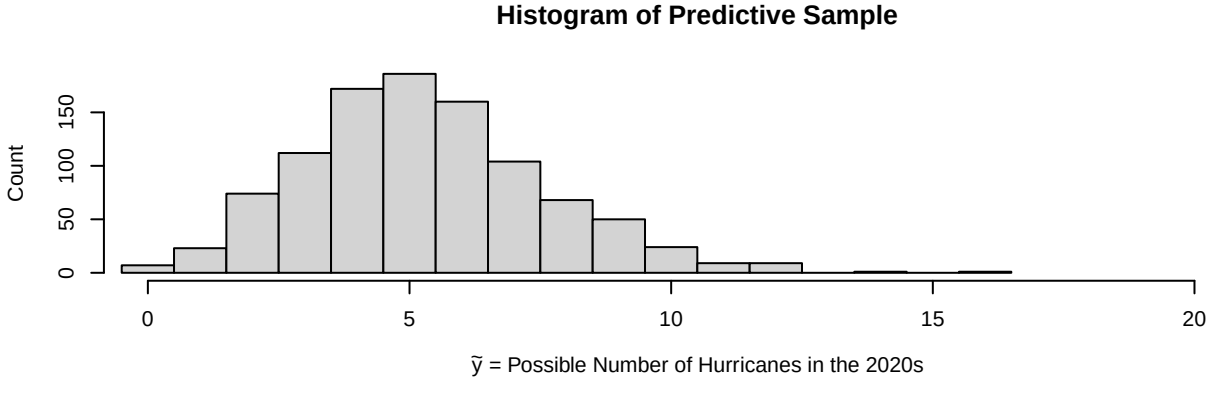

Exponential−Gamma Predictive Density
dpredEG()
0.000
0.006
0.012
0
50
100
150
200
250
300
350
ỹ = Survival Time in Minutes

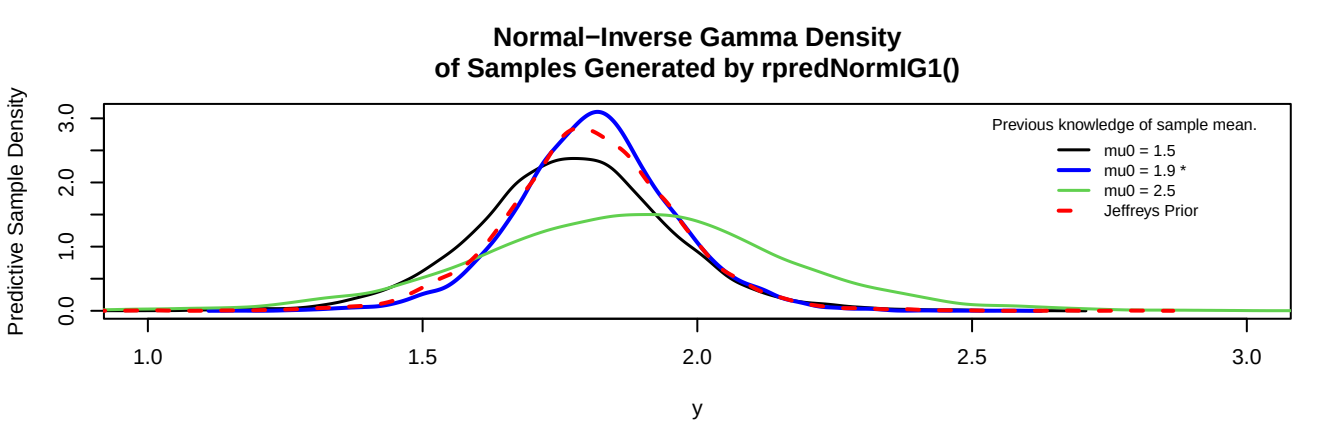

Exponential−Gamma Cumulative Predictive Probability
ppredEG()
0.0
0.4
0.8
0
50
100
150
200
250
300
350
ỹ = Survival Time in Minutes

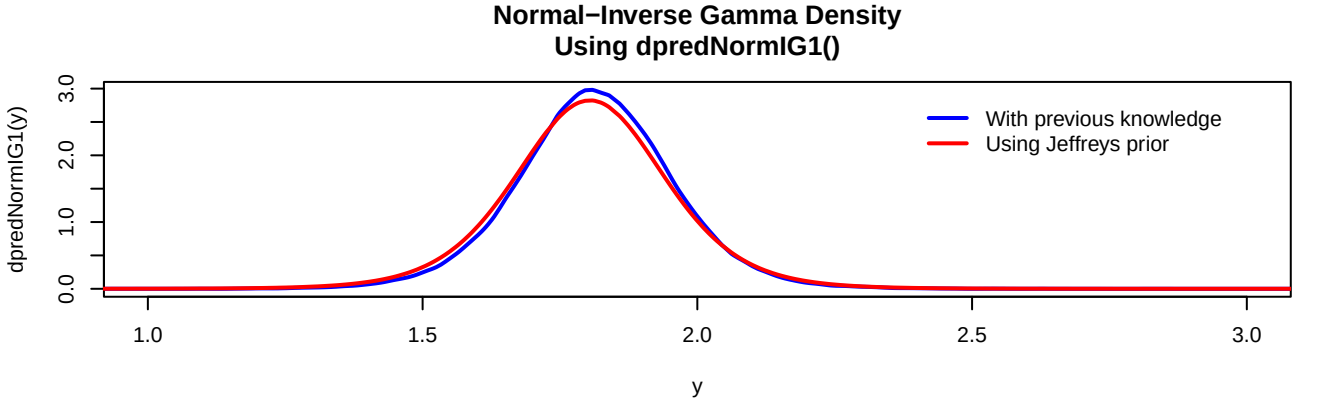

Histogram of Predictive Sample
Count
0
100
300
0
50
100
150
200
250
300
350
ỹ = Survival Time in Minutes

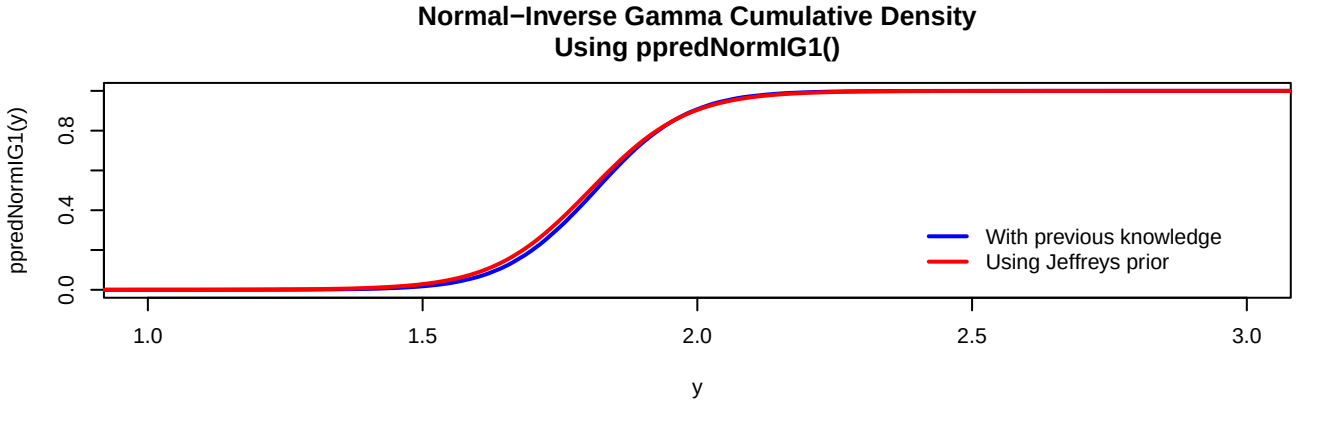

Poisson−Gamma Predictive Probability Mass
dpredPG()
0.00
0.10
5
10
15
20
ỹ = Possible Number of Hurricanes in the 2020s

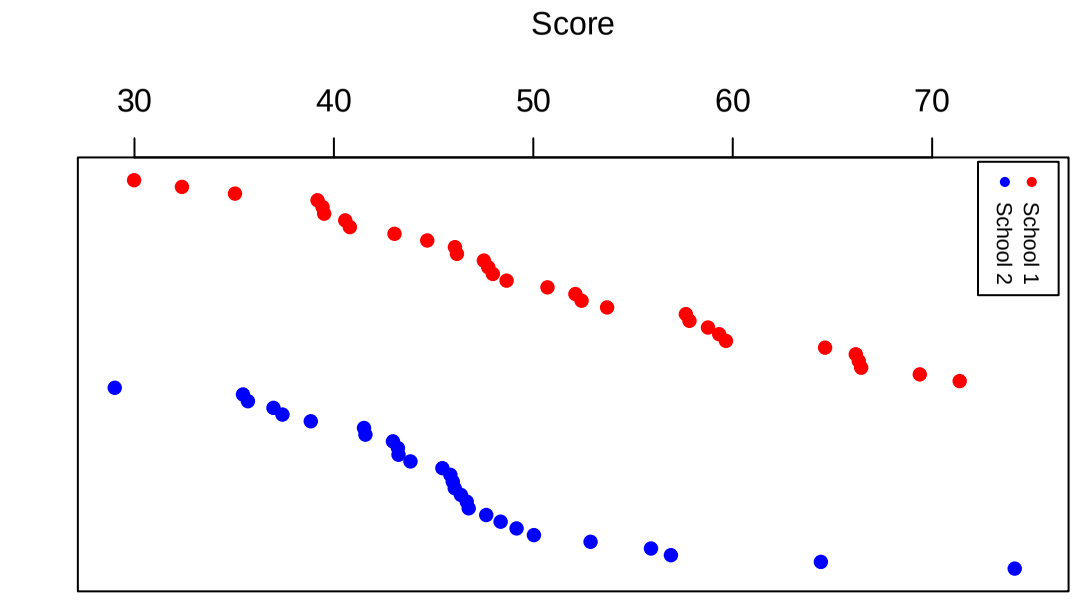

Poisson−Gamma Cumulative Predictive Probability
ppredPG()
0.0
0.4
0.8
5
10
15
20
ỹ = Possible Number of Hurricanes in the 2020s

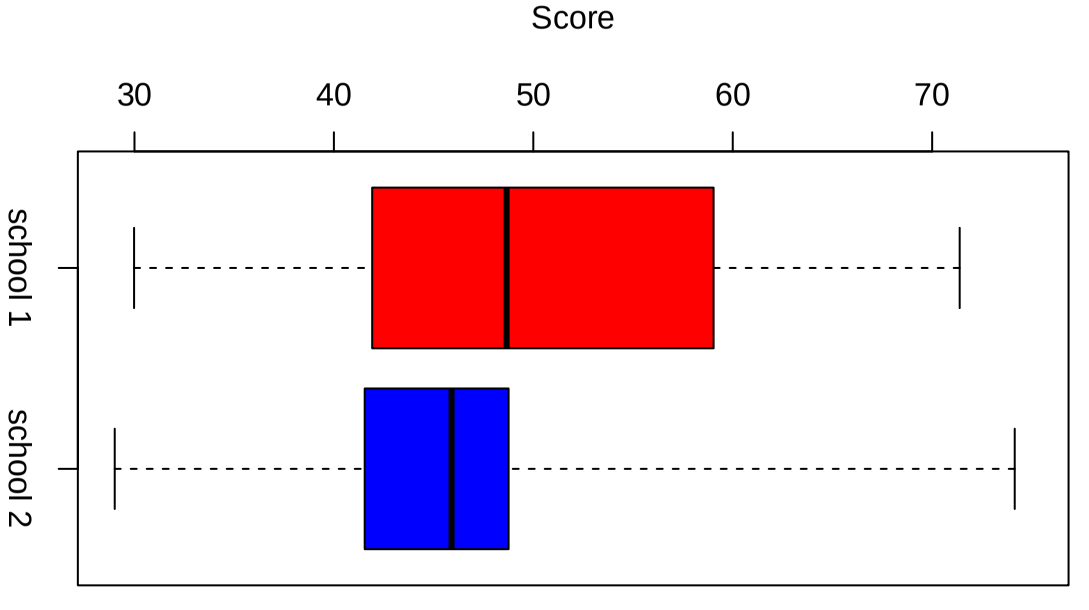

Histogram of Predictive Sample
Count
0
50
100
150
0
5
10
15
20
ỹ = Possible Number of Hurricanes in the 2020s

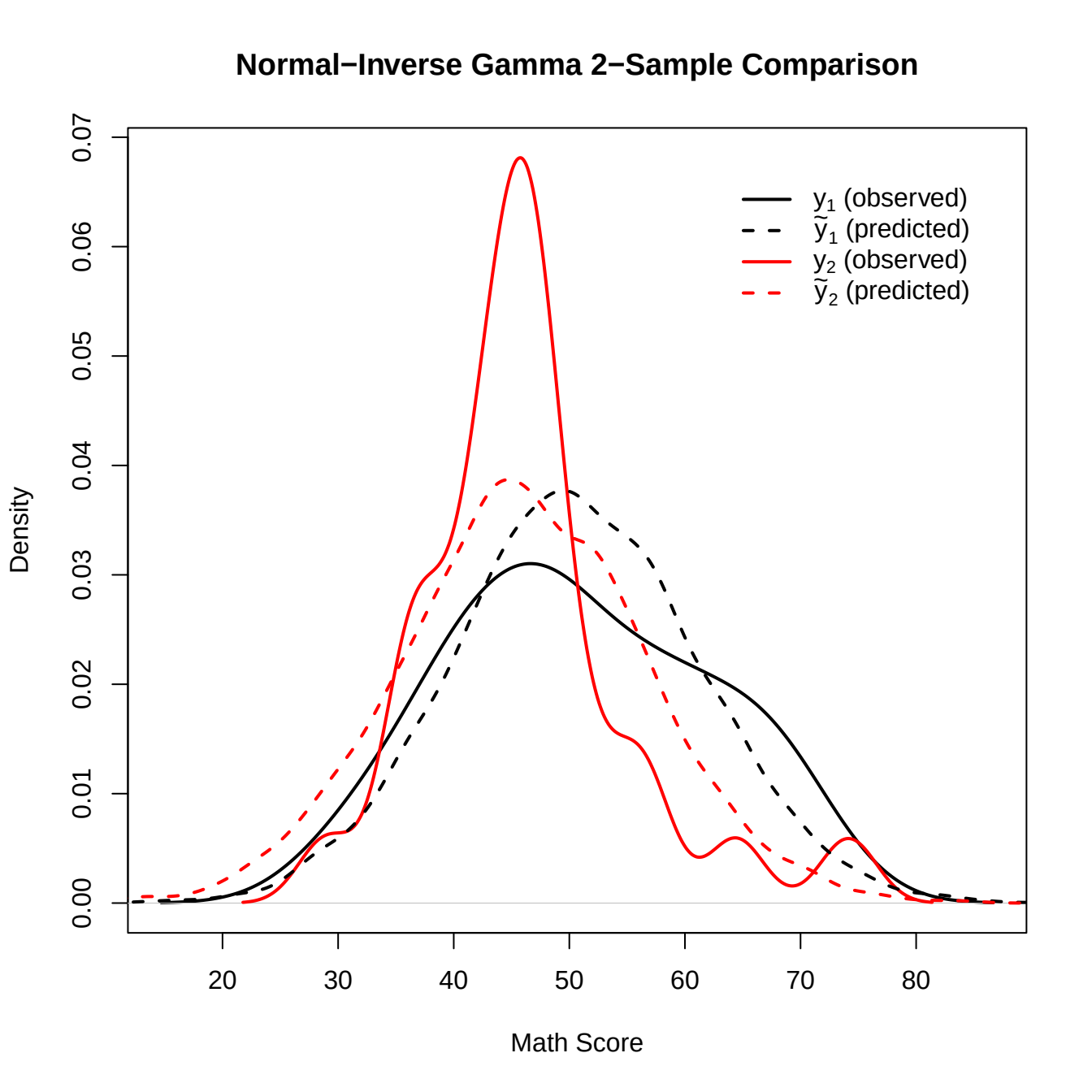

Normal−Inverse Gamma Density
of Samples Generated by rpredNormIG1()
Predictive Sample Density
0.0
1.0
2.0
3.0
1.0
1.5
2.0
2.5
3.0
y
Previous knowledge of sample mean.
mu0 = 1.5
mu0 = 1.9 *
mu0 = 2.5
Jeffreys Prior

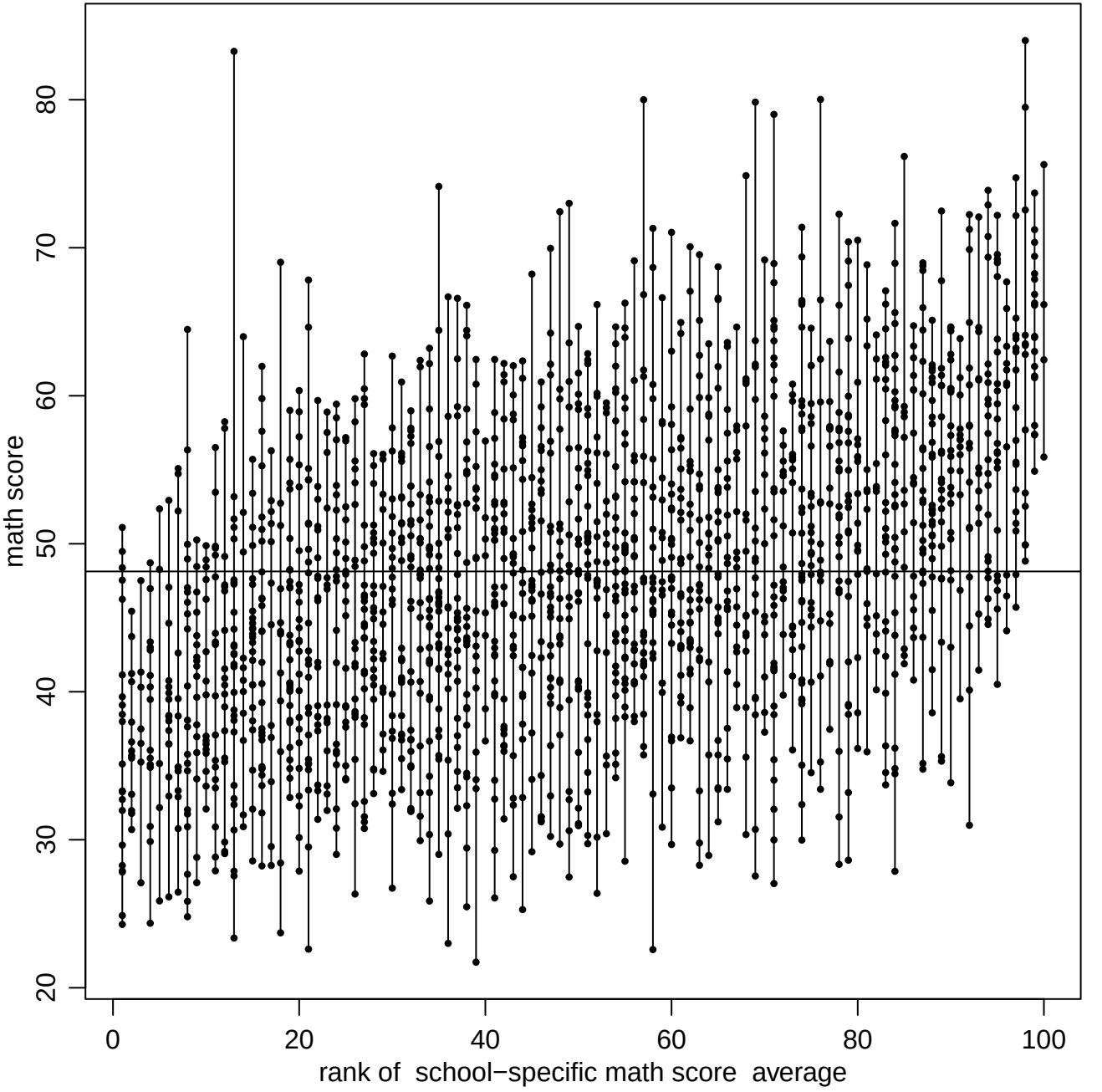

Normal−Inverse Gamma Density
Using dpredNormIG1()
dpredNormIG1(y)
0.0
1.0
2.0
3.0
1.0
1.5
2.0
2.5
3.0
y
With previous knowledge
Using Jeffreys prior

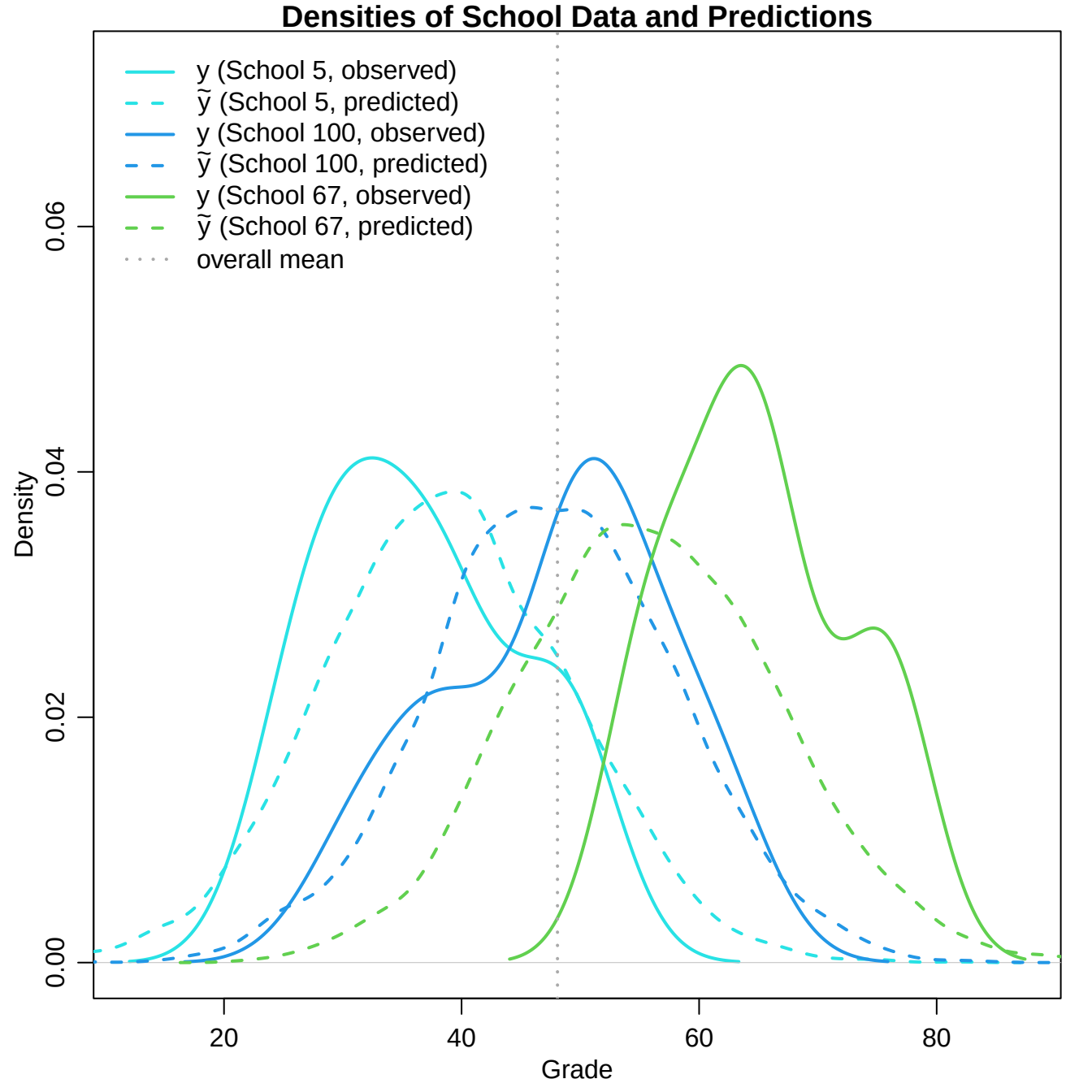

Normal−Inverse Gamma Cumulative Density
Using ppredNormIG1()
ppredNormIG1(y)
0.0
0.4
0.8
1.0
1.5
2.0
2.5
3.0
y
With previous knowledge
Using Jeffreys prior

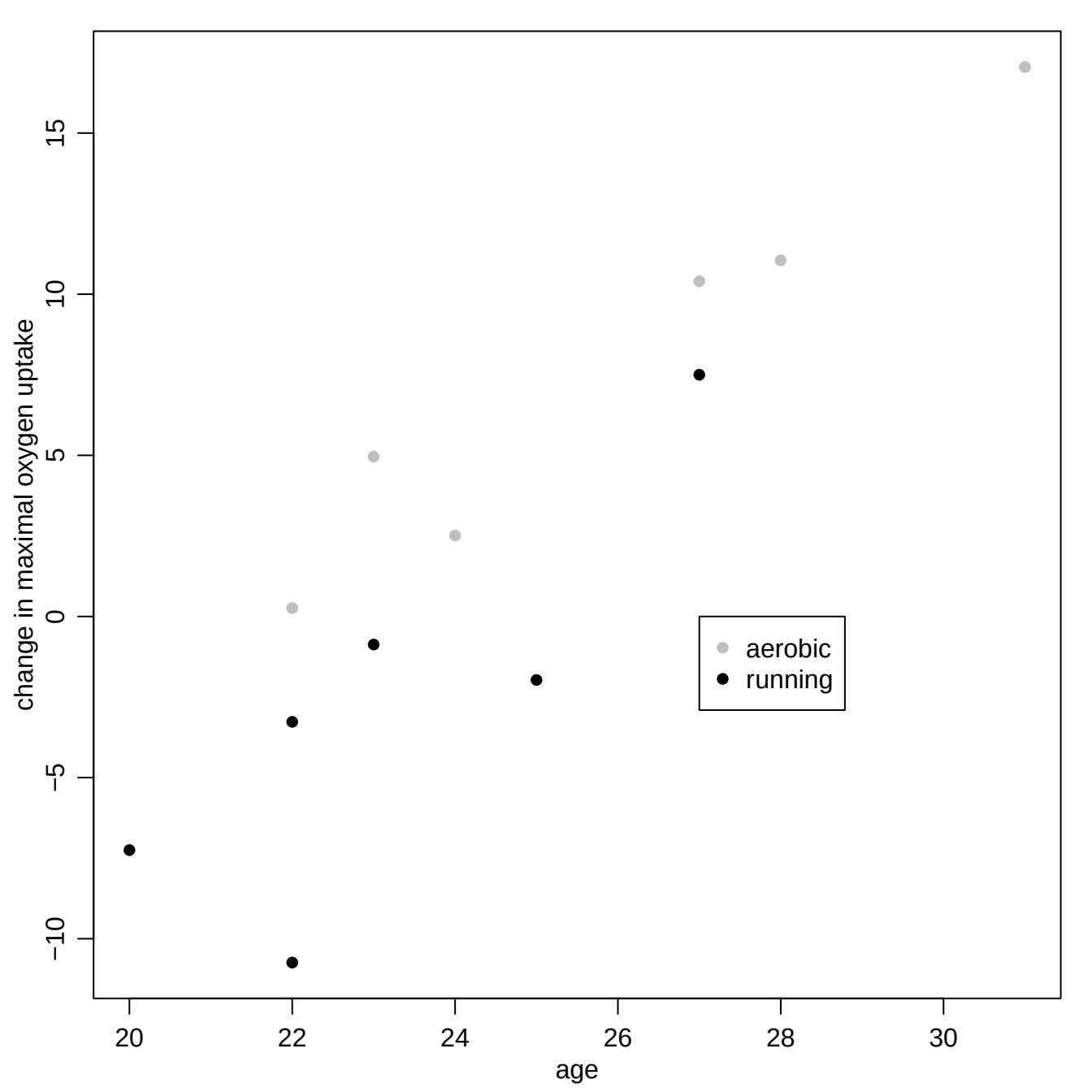

Score
30
40
50
60
70
School 1
School 2

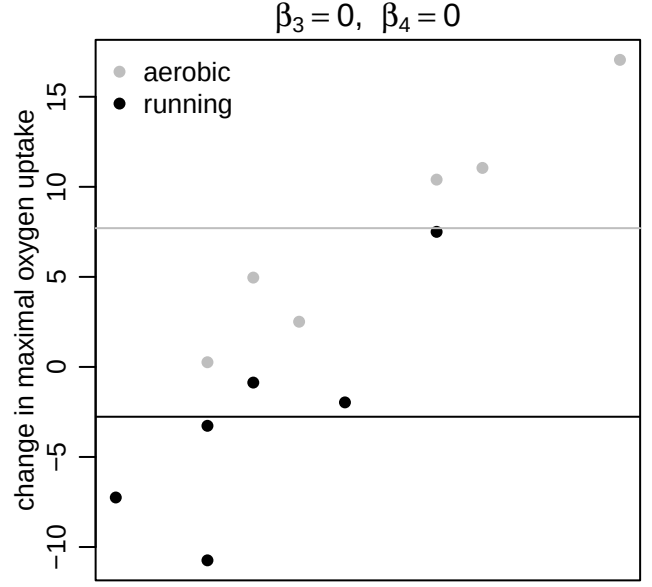

Score
30
40
50
60
70
school 1
school 2

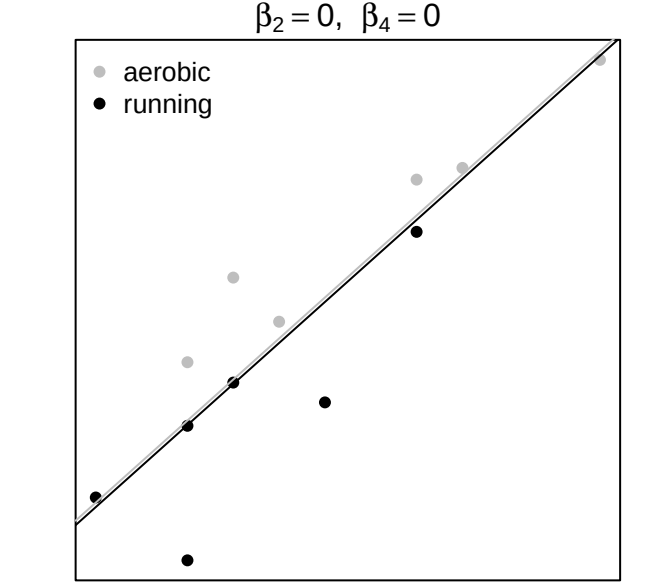

Normal−Inverse Gamma 2−Sample Comparison
Density
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
20
30
40
50
60
70
80
Math Score
y1 (observed)
ỹ1 (predicted)
y2 (observed)
ỹ2 (predicted)

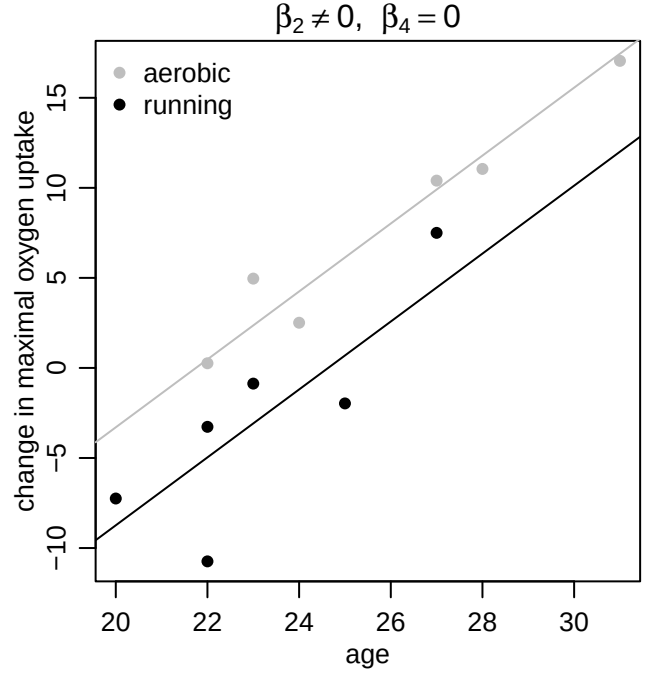

math score
20
30
40
50
60
70
80
0
20
40
60
80
100
rank of school−specific math score average

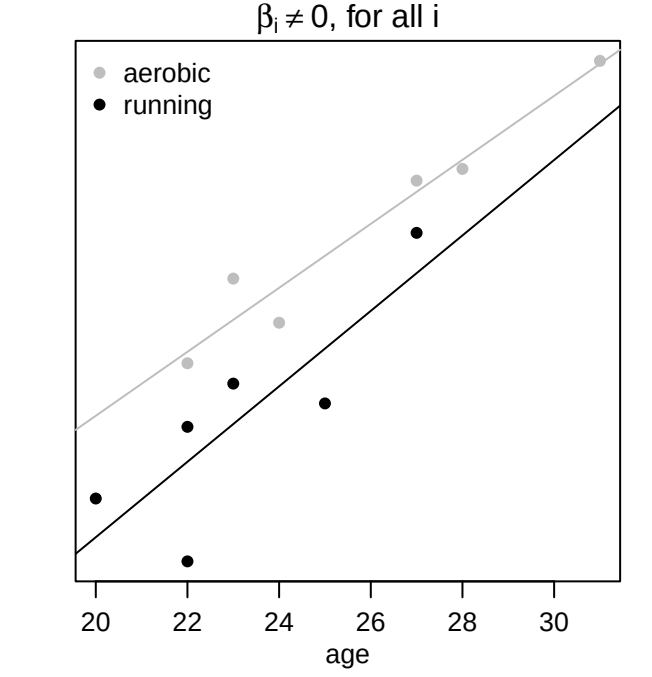

Densities of School Data and Predictions
y (School 5, observed)
ỹ (School 5, predicted)
y (School 100, observed)
ỹ (School 100, predicted)
y (School 67, observed)
ỹ (School 67, predicted)
overall mean
Density
0.00
0.02
0.04
0.06
20
40
60
80
Grade

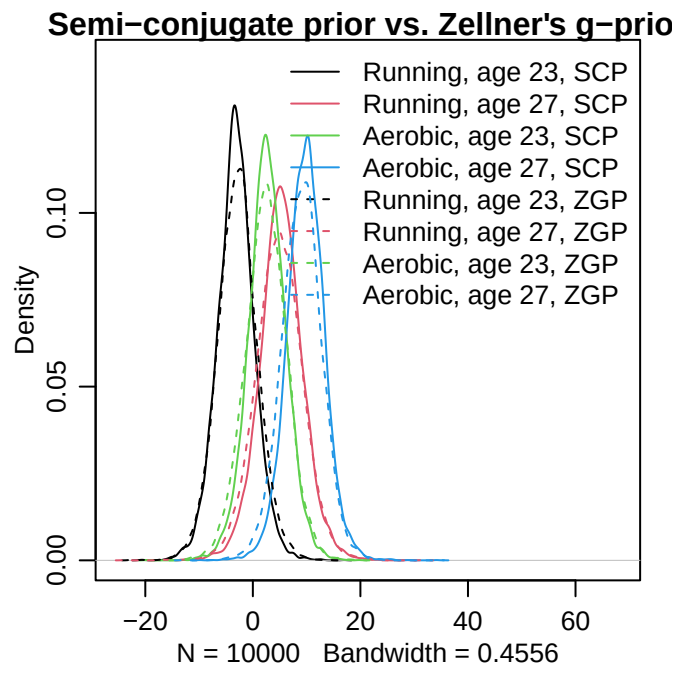

change in maximal oxygen uptake
15
10
5
0
−5
−10
20
22
24
26
28
30
age
aerobic
running


$\beta_3 = 0,\ \beta_4 = 0$
aerobic
running
change in maximal oxygen uptake
15
10
5
0
−5
−10


$\beta_2 = 0,\ \beta_4 = 0$
aerobic
running


$\beta_2 \neq 0,\ \beta_4 = 0$
aerobic
running
change in maximal oxygen uptake
15
10
5
0
−5
−10
20
22
24
26
28
30
age


$\beta_i \neq 0$, for all i
aerobic
running
20
22
24
26
28
30
age


Semi−conjugate prior vs. Zellner's g−prio
Running, age 23, SCP
Running, age 27, SCP
Aerobic, age 23, SCP
Aerobic, age 27, SCP
Running, age 23, ZGP
Running, age 27, ZGP
Aerobic, age 23, ZGP
Aerobic, age 27, ZGP
Density
0.00
0.05
0.10
−20
0
20
40
60
N = 10000 Bandwidth = 0.4556