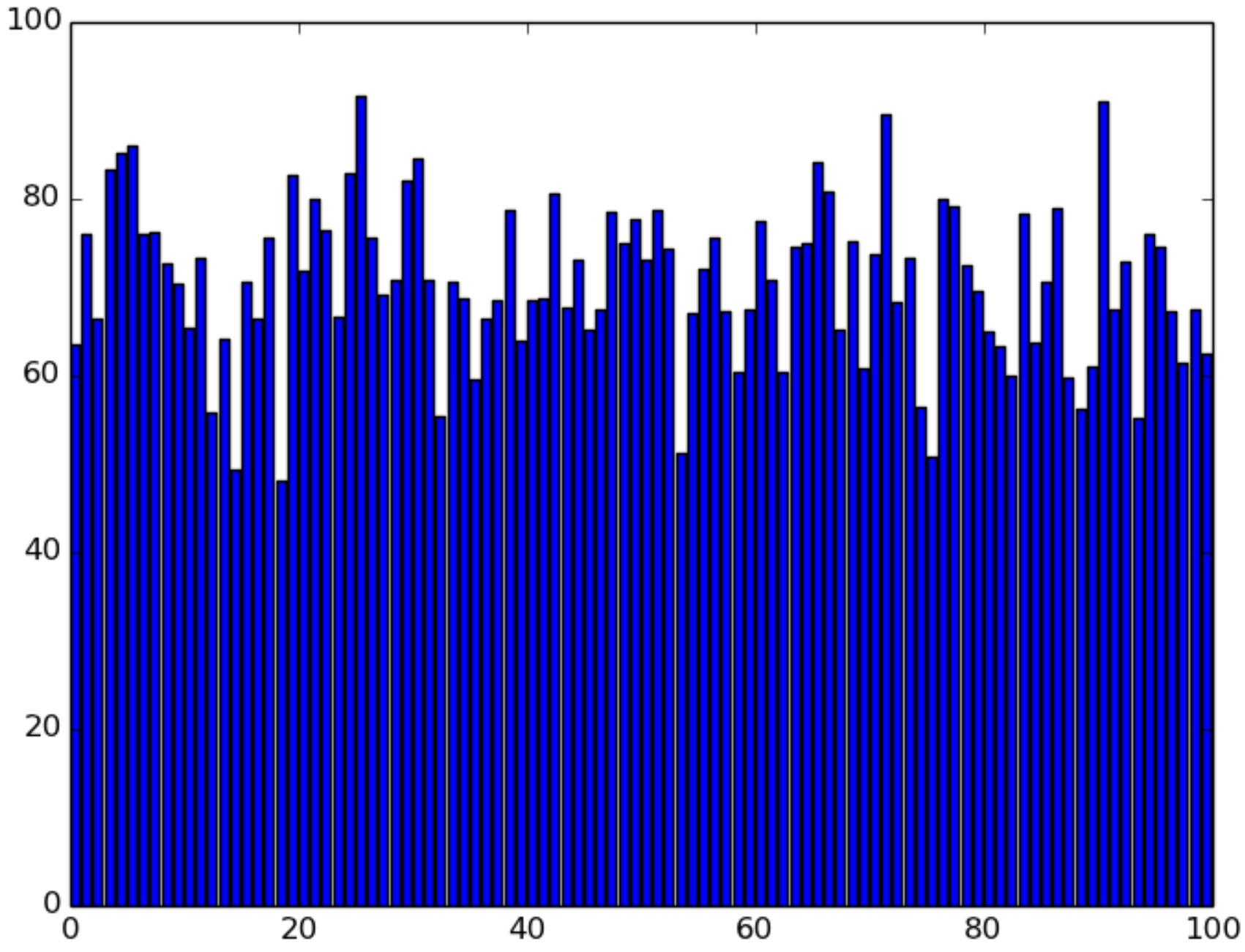
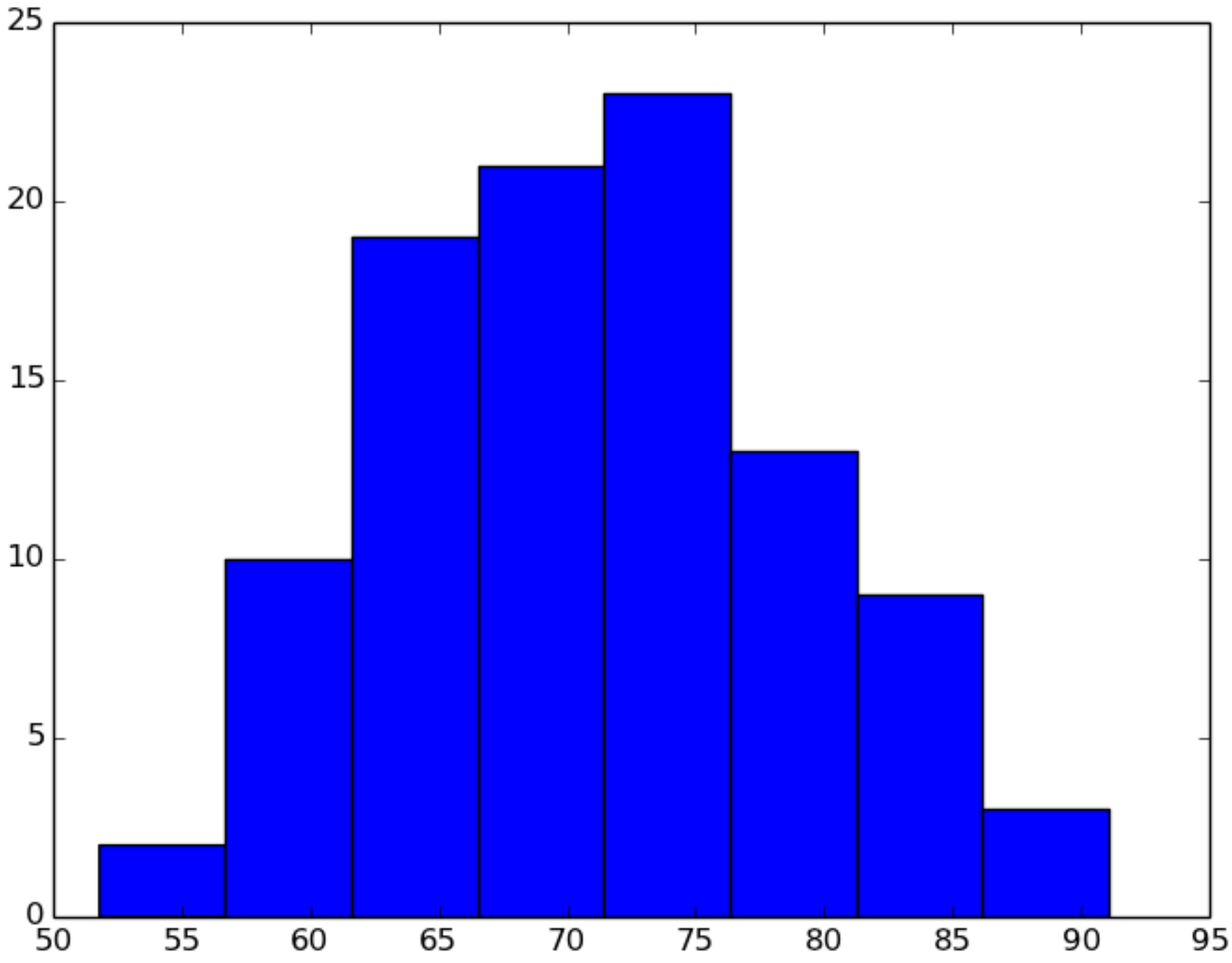
Harpending Lecture 6

Quantitative Genetics


100
80
60
40
20
0
0
20
40
60
80
100


25
20
15
10
5
0
50
55
60
65
70
75
80
85
90
95

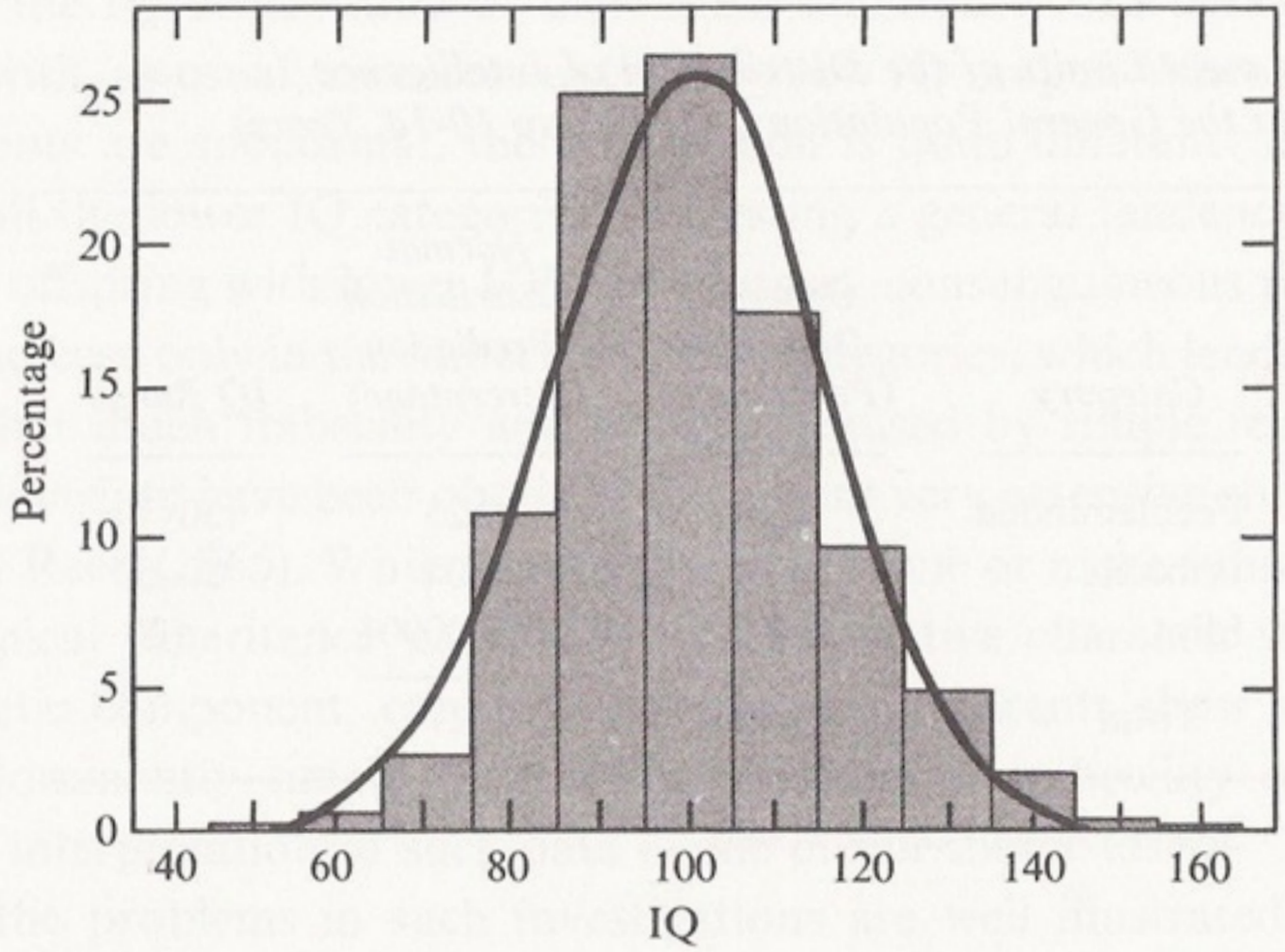
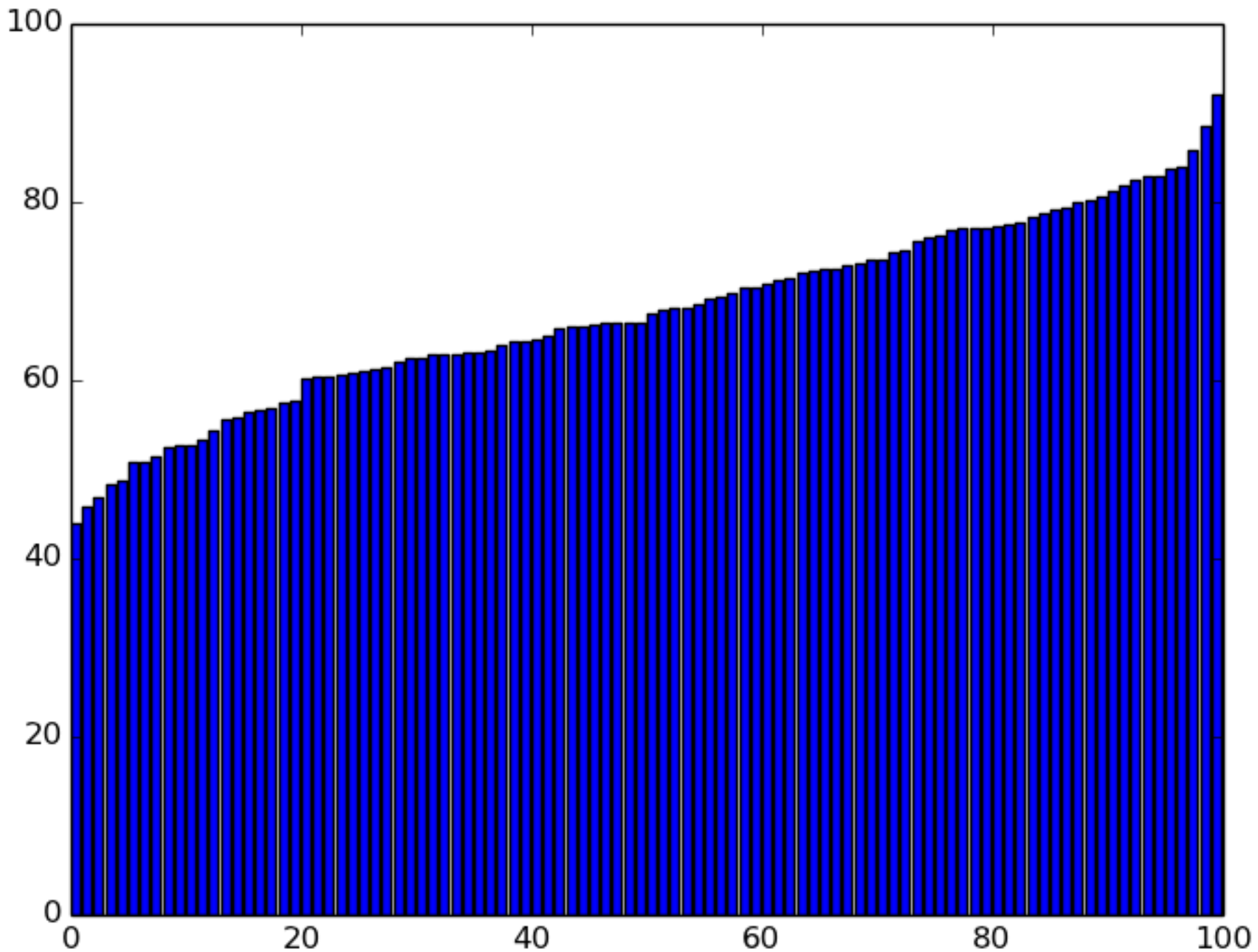
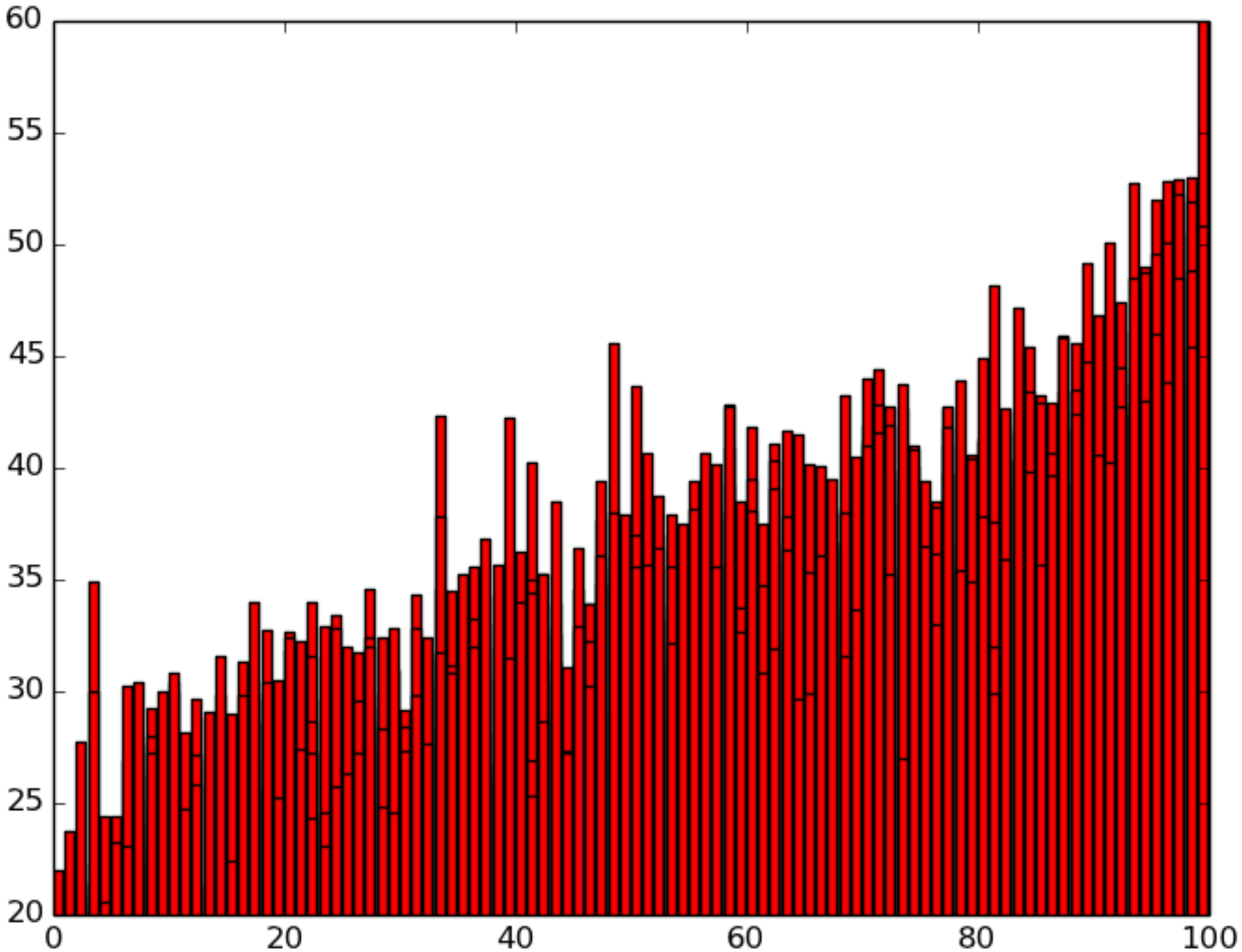
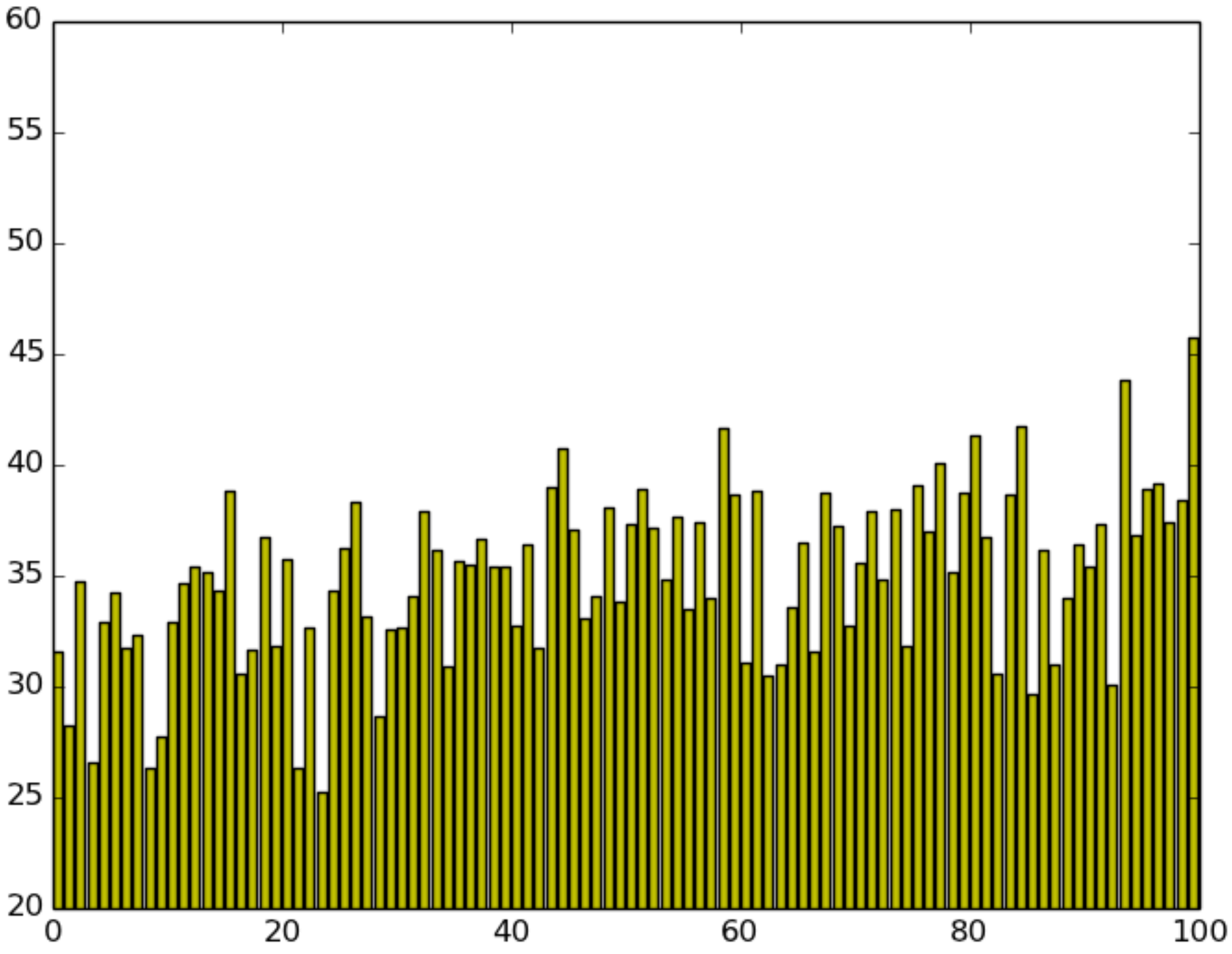
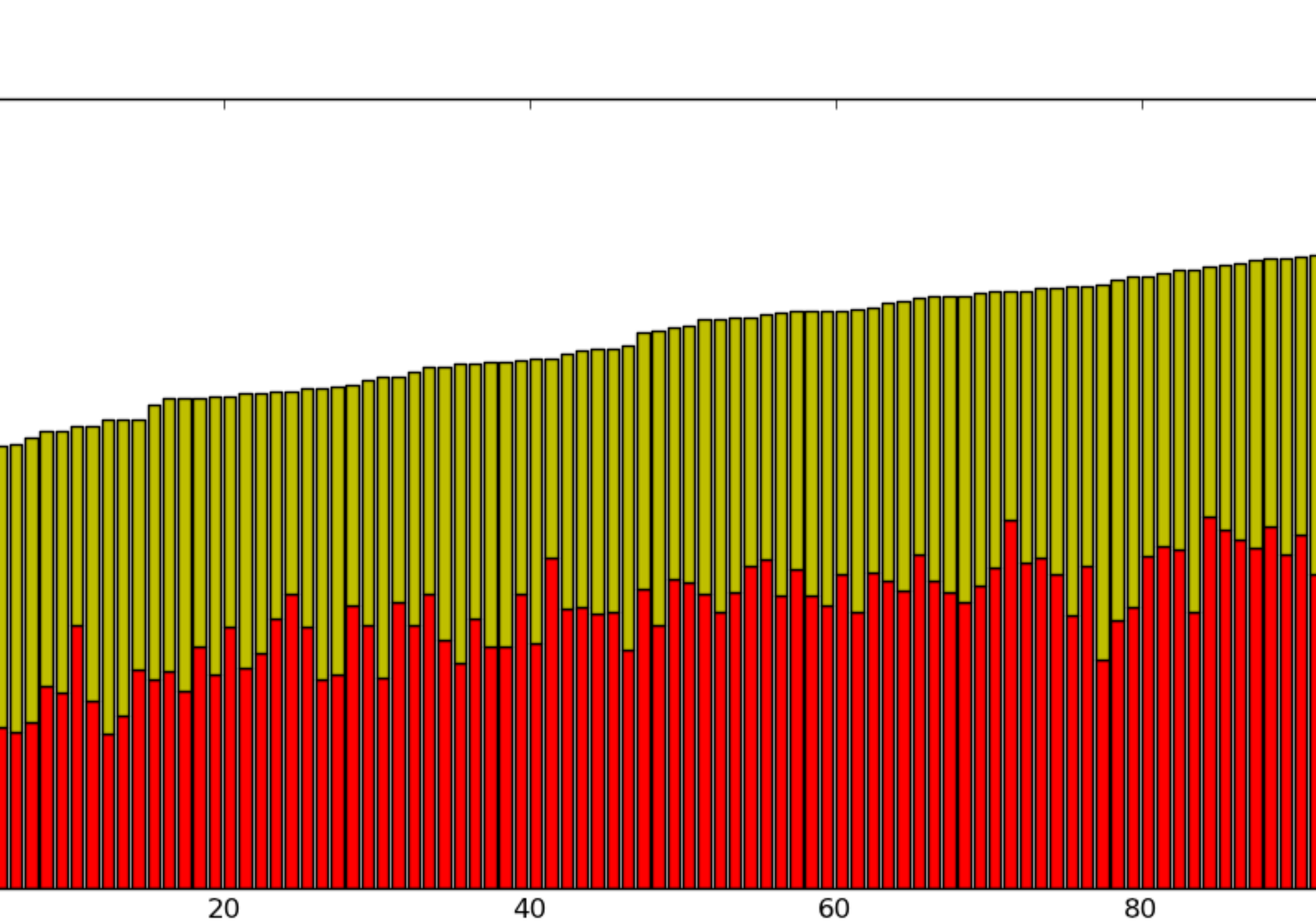


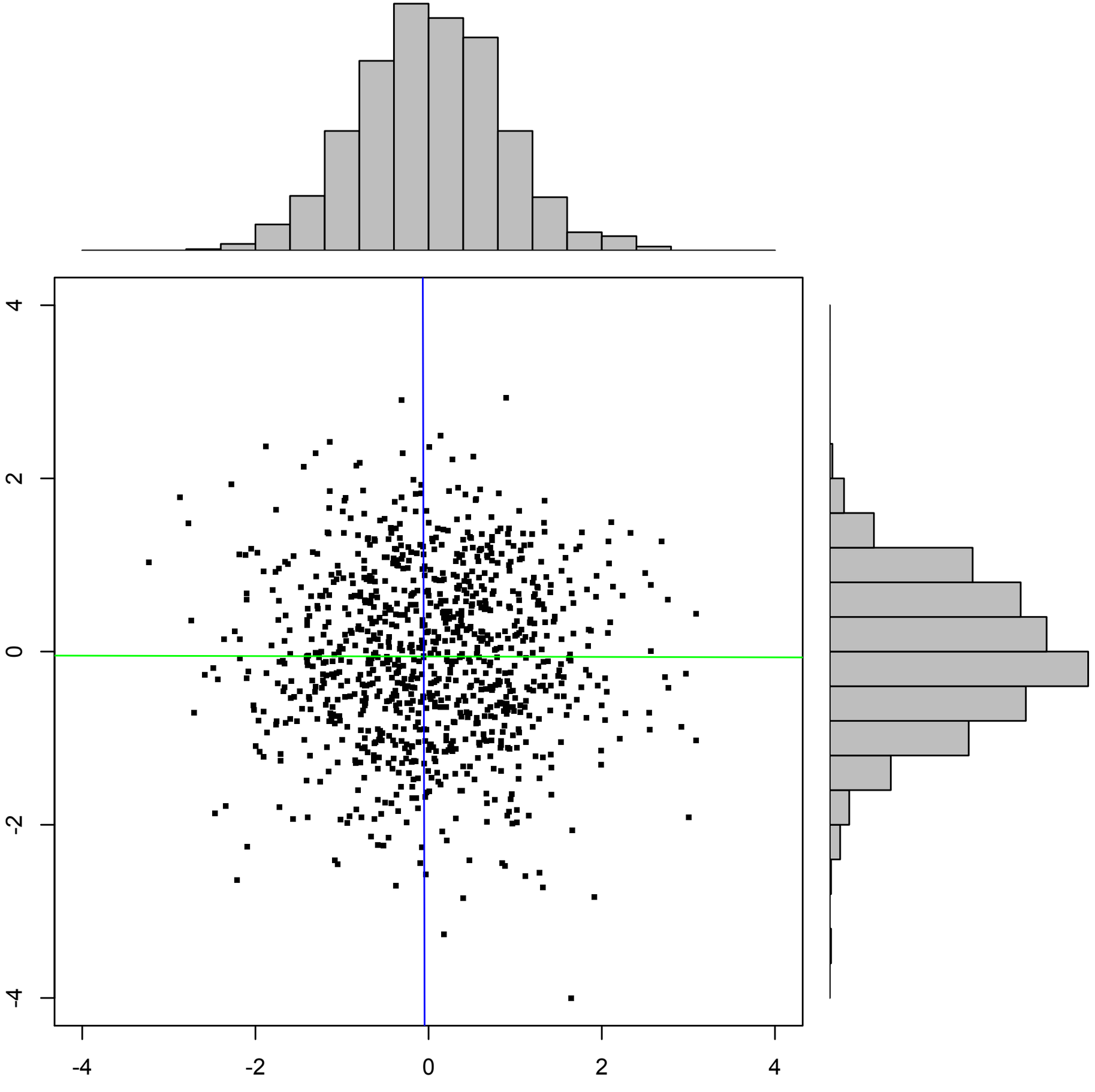
FIGURE 9.4
The distribution of IQ among the 14,963 children born in Scotland on February 1, May 1, August 1, and November 1, 1926. The shaded histogram shows the percentages of the group with IQ's in various ranges of 10 points. This grouping is artificial and is done solely for ease of representation: it does not imply any discontinuity in the values of IQ that children can show. The continuous curve shows the ideal distribution calculated from the observations and representing the statistical population of which the children actually observed are regarded as forming a sample. (Data from MacMeekan; from Mather 1964.)

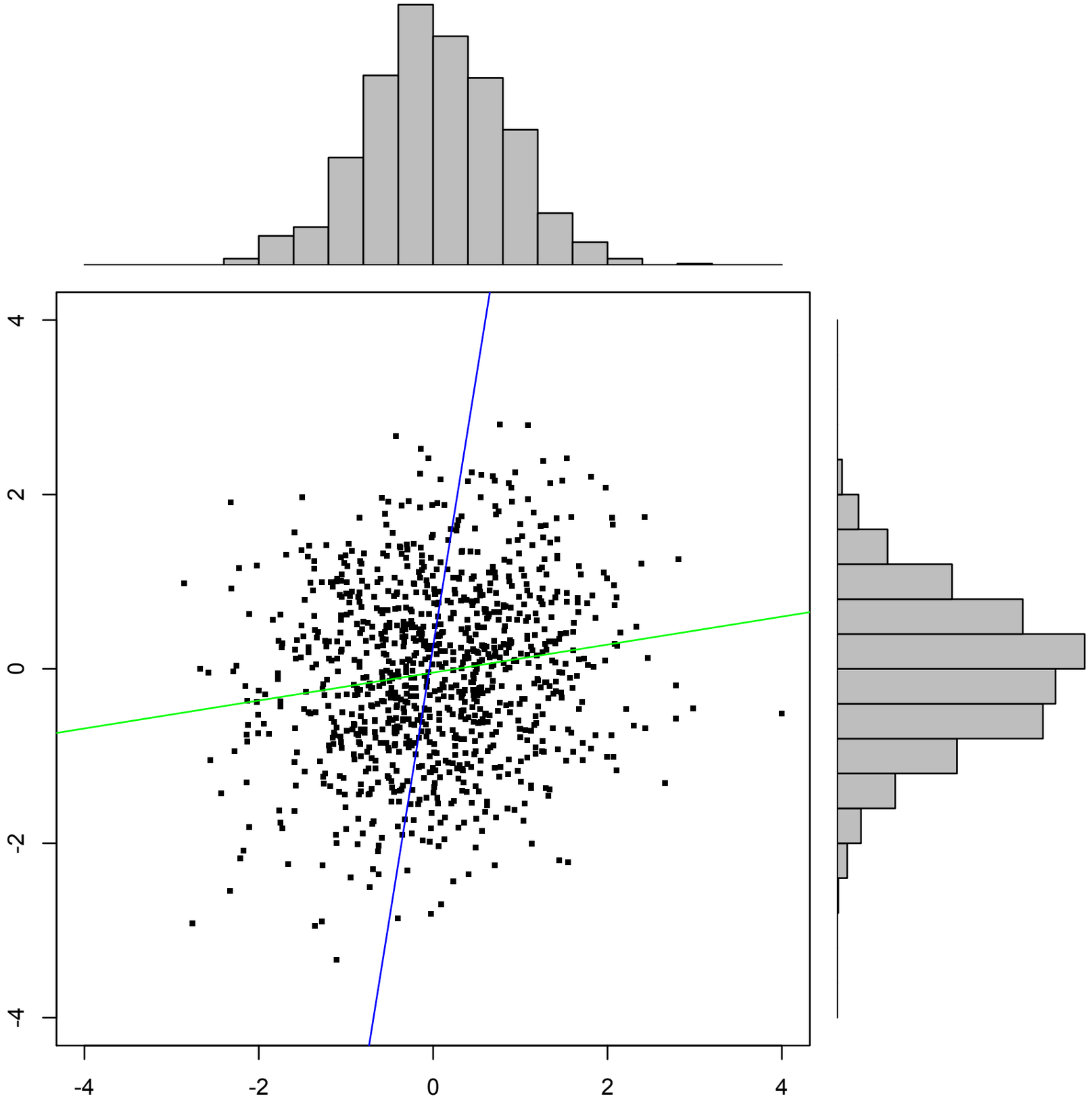

100
80
60
40
20
0
0
20
40
60
80
100

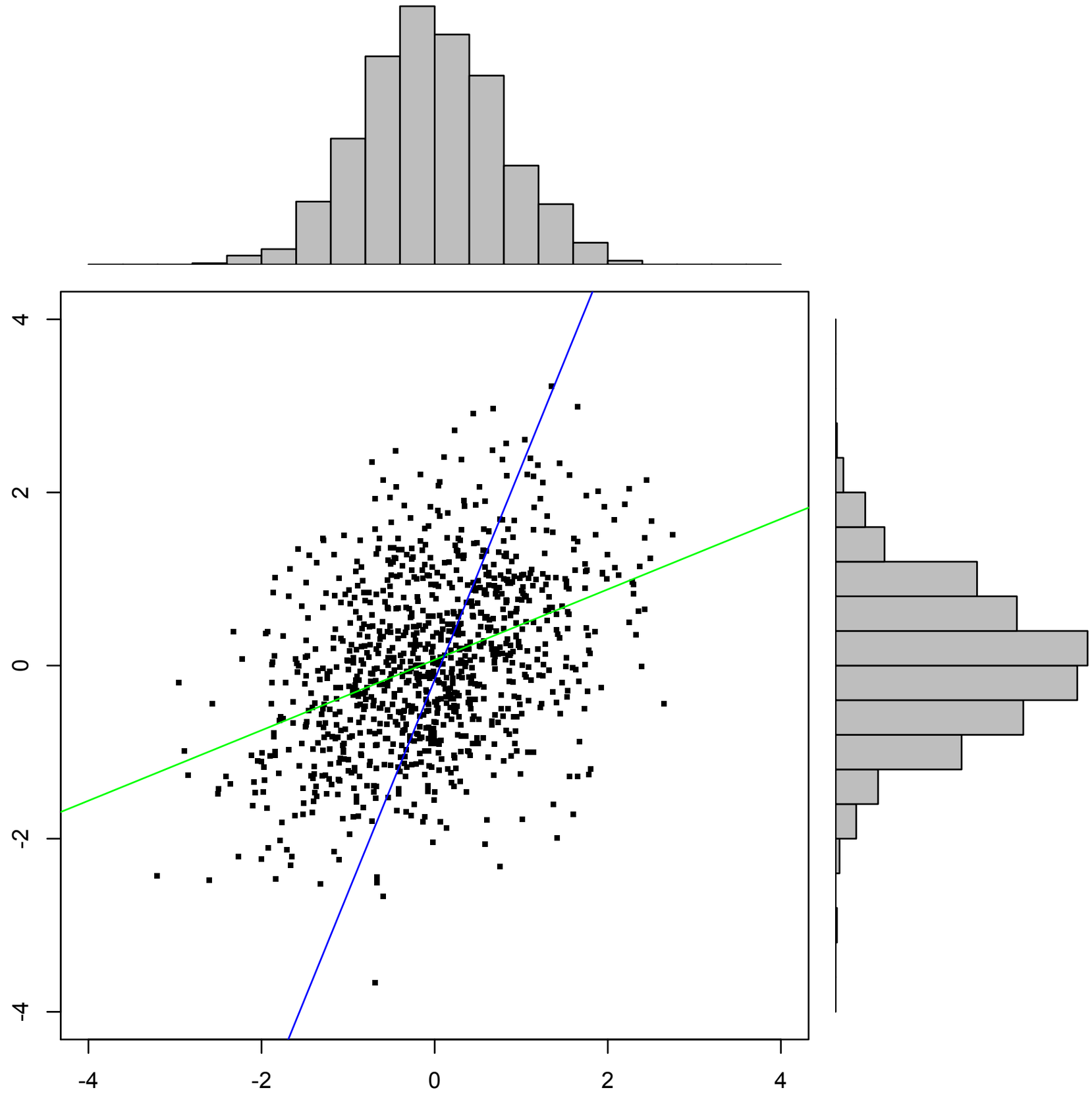

60
55
50
45
40
35
30
25
20
0
20
40
60
80
100

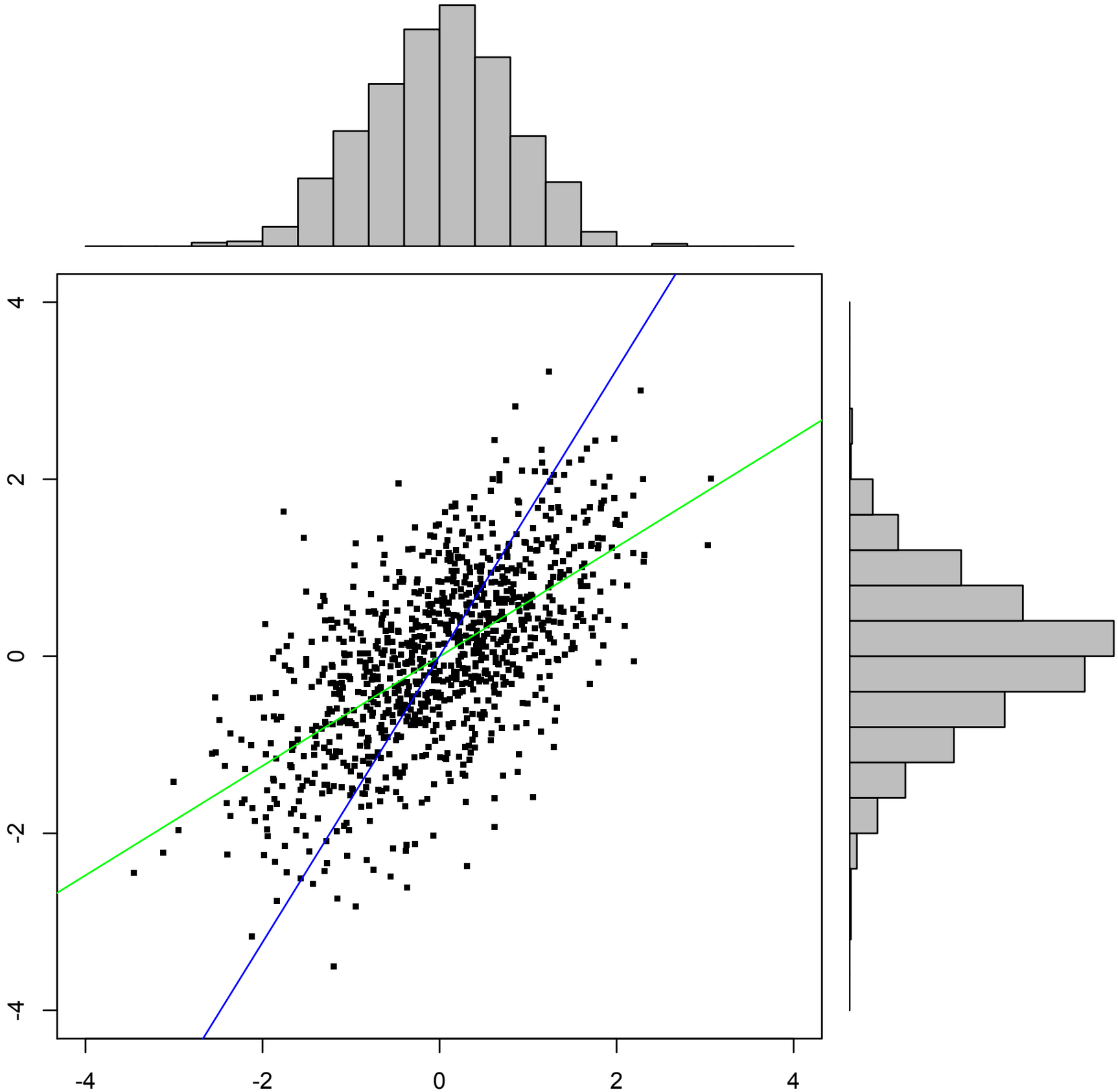

60
55
50
45
40
35
30
25
20
0
20
40
60
80
100

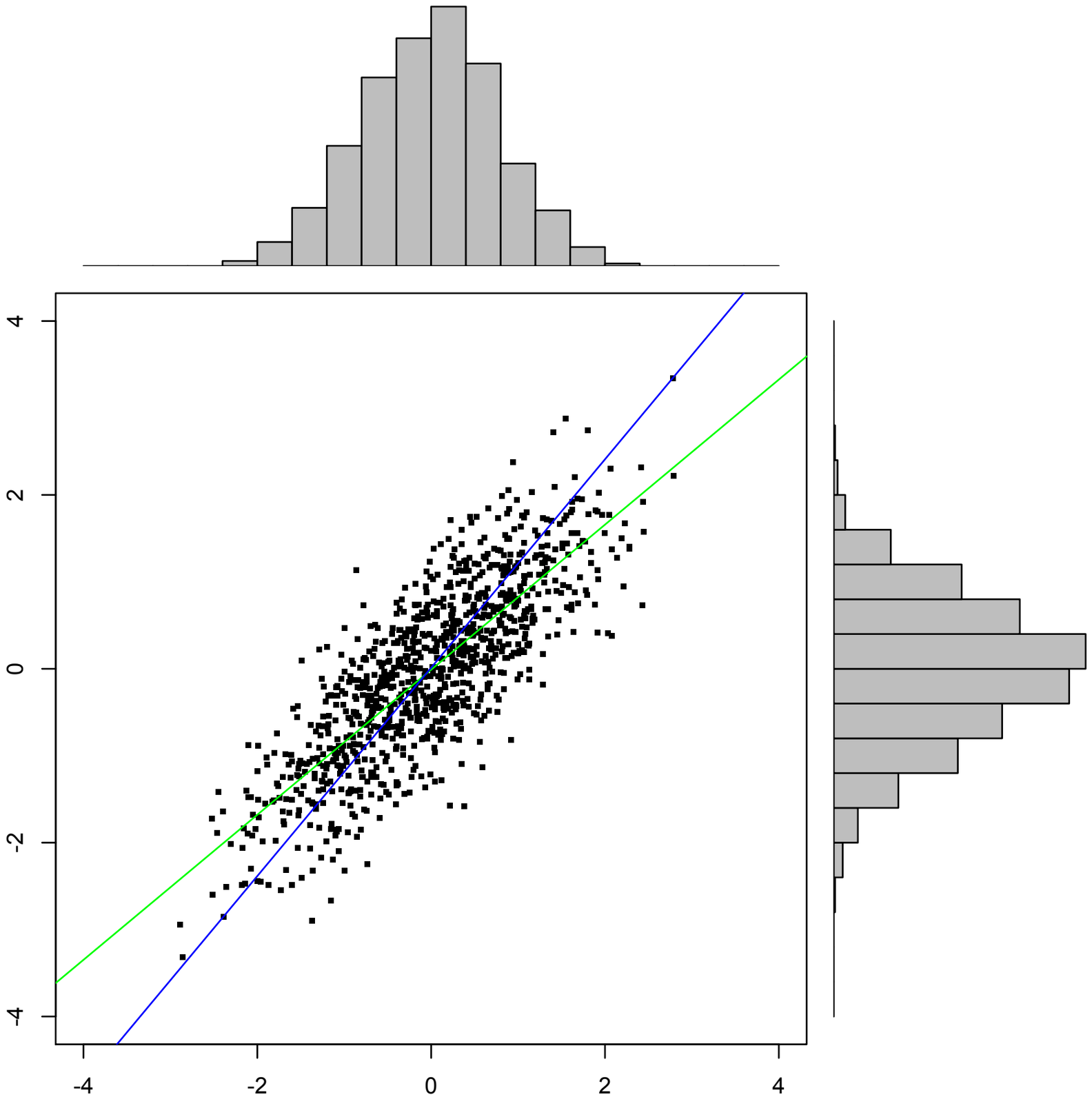

20
40
60
80

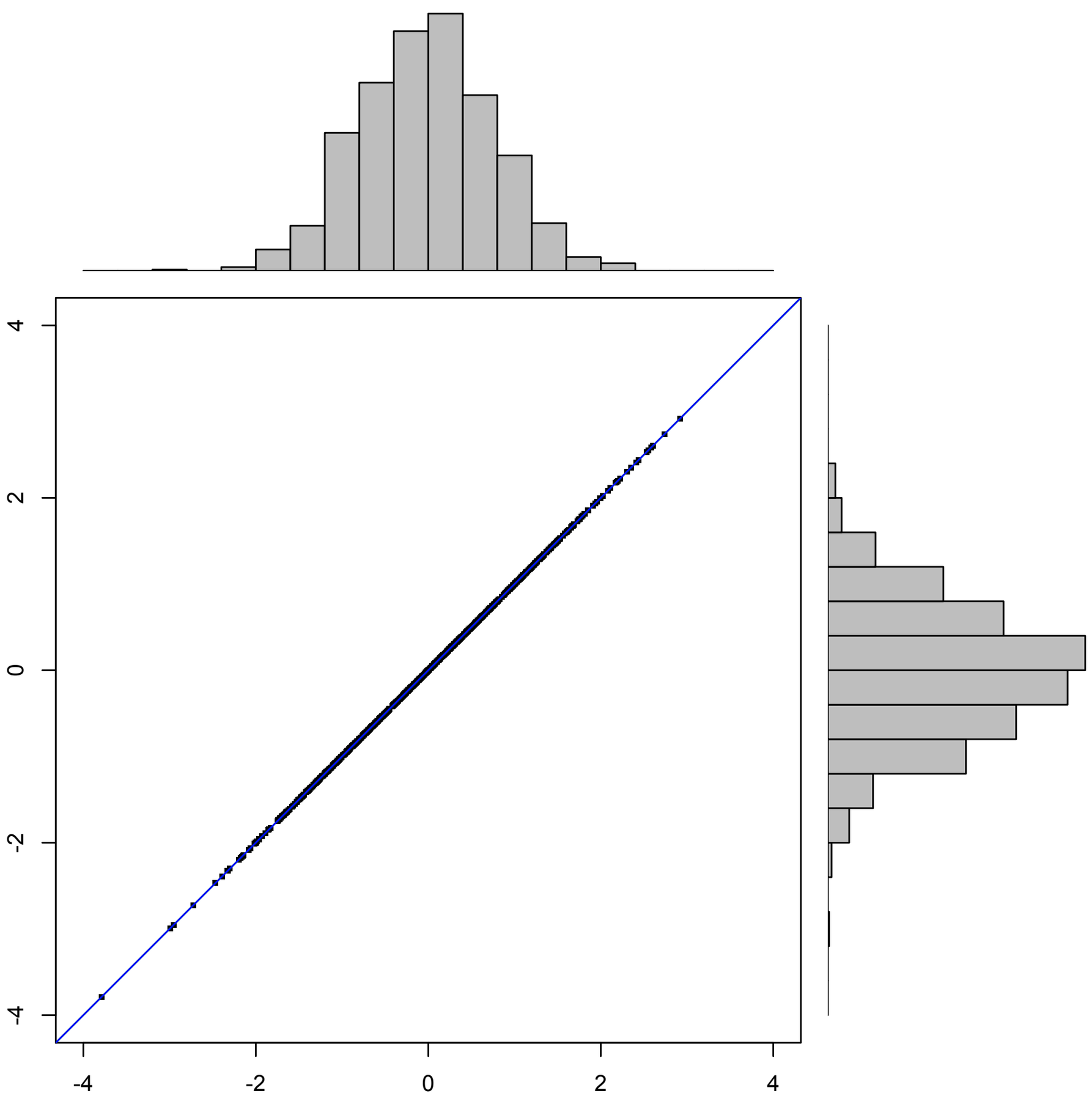

4
2
0
-2
-4
-4
-2
0
2
4


4
2
0
-2
-4
-4
-2
0
2
4


4
2
0
-2
-4
-4
-2
0
2
4


4
2
0
-2
-4
-4
-2
0
2
4


4
2
0
-2
-4
-4
-2
0
2
4

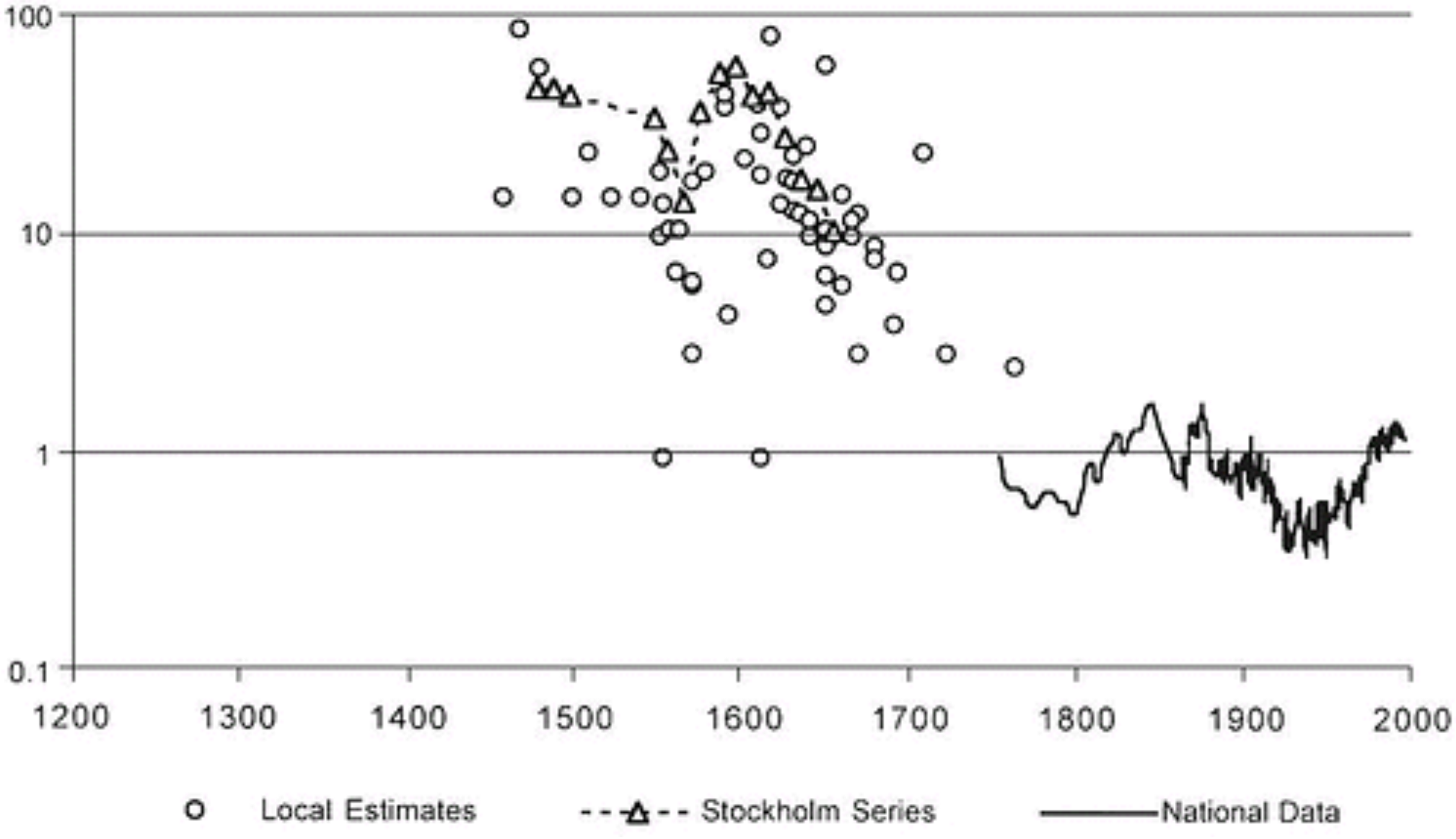

4
2
0
-2
-4
-4
-2
0
2
4

Breeder's Equation

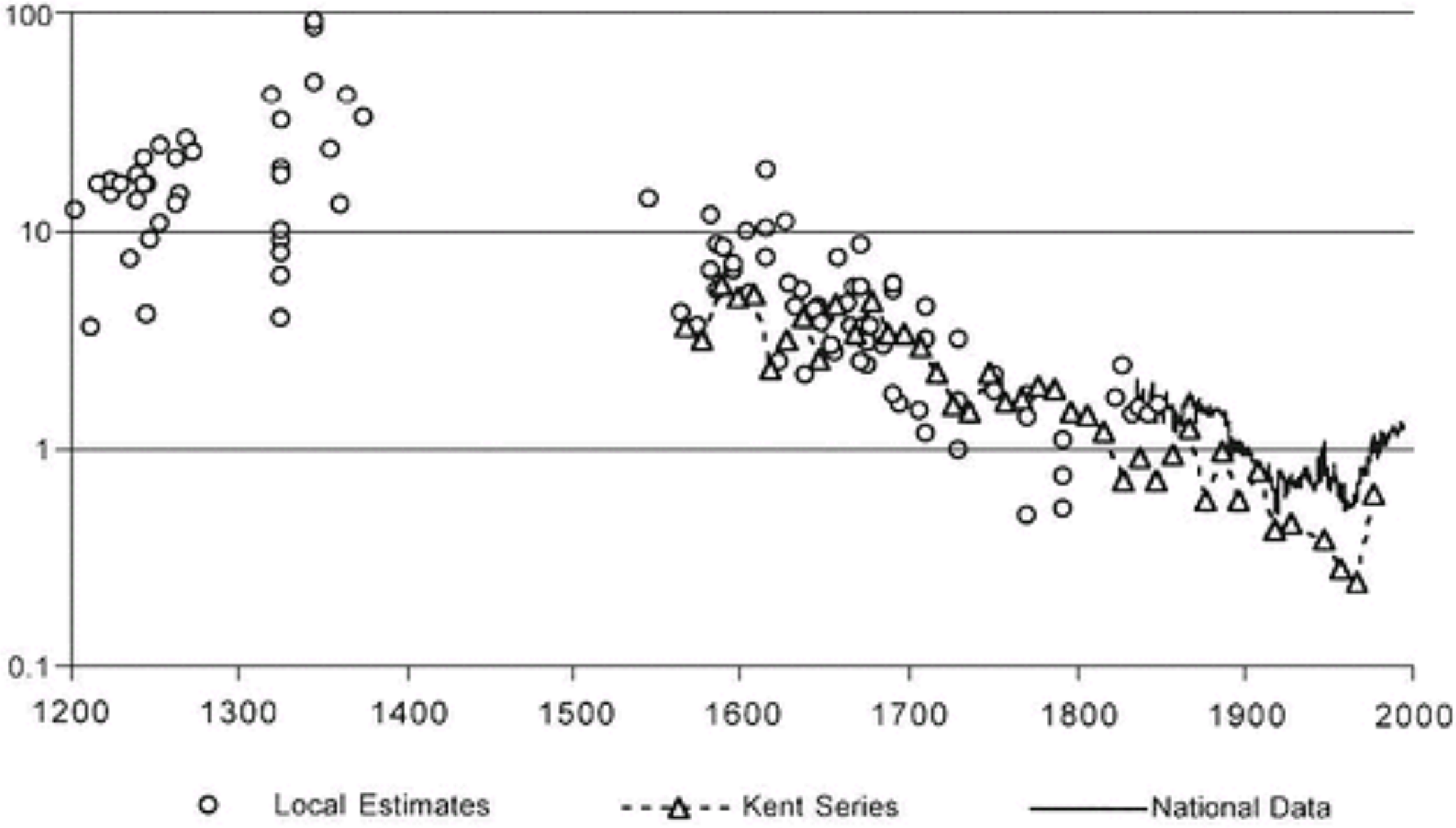
$$r=h^2s$$

r = response to selection
h^2 = heritability
s = selection differential

Scandinavia

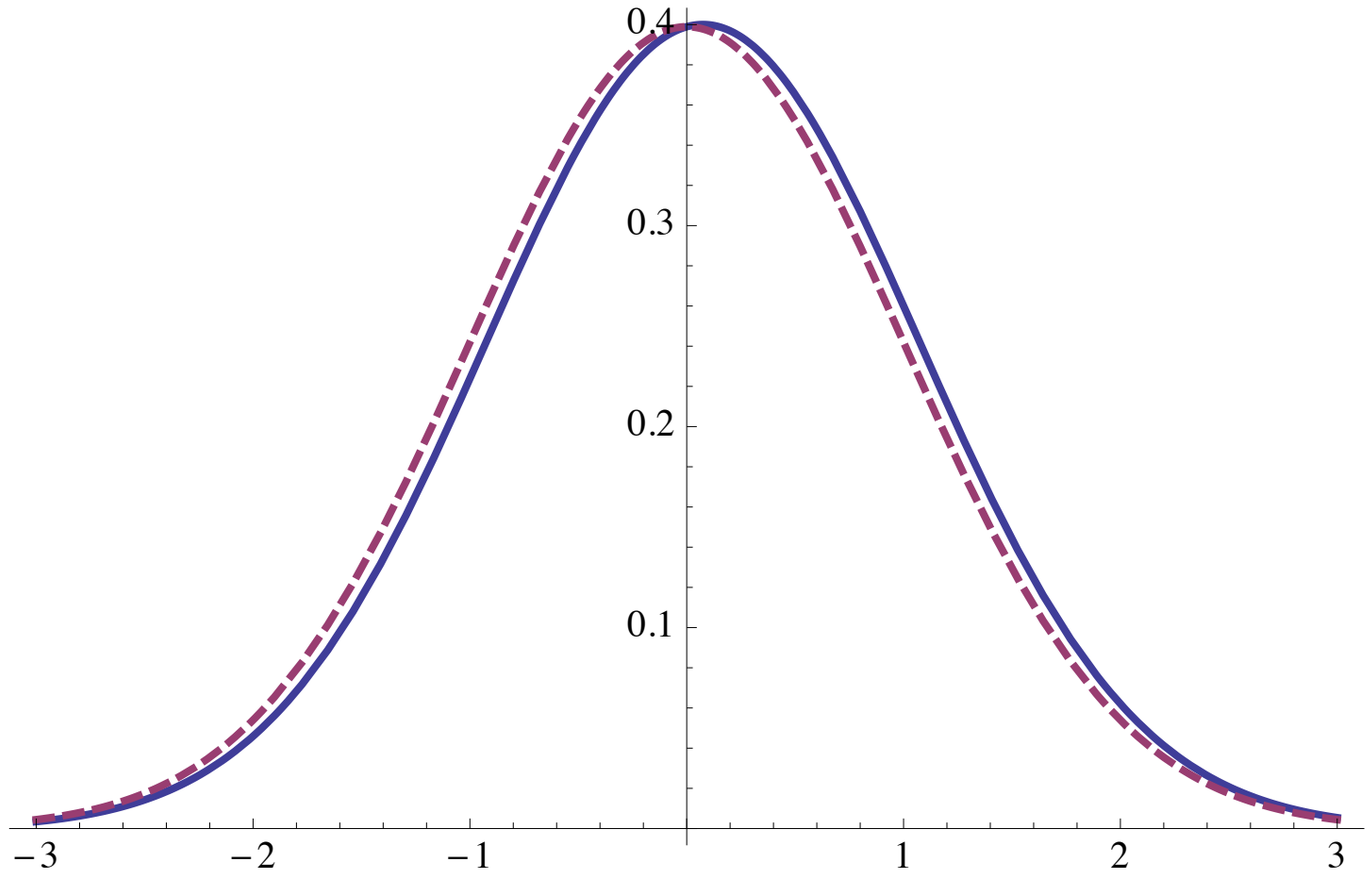


England


100
10
1
0.1
1200
1300
1400
1500
1600
1700
1800
1900
2000
Local Estimates
Kent Series
National Data

English Homicide

- From 50 to 0.5 per 100,000 in 800 years
- Equivalent to change of 1.3 sds under threshold model
- Quantile (50/10000) = -2.6
- Quantile (0.5/100000) = -3.9
- 1.3 sds / 32 generations ~ .04 sds/generation
- If violence h^2 is 0.5, implied s ~ .08


0.4
0.3
0.2
0.1
−3
−2
−1
1
2
3