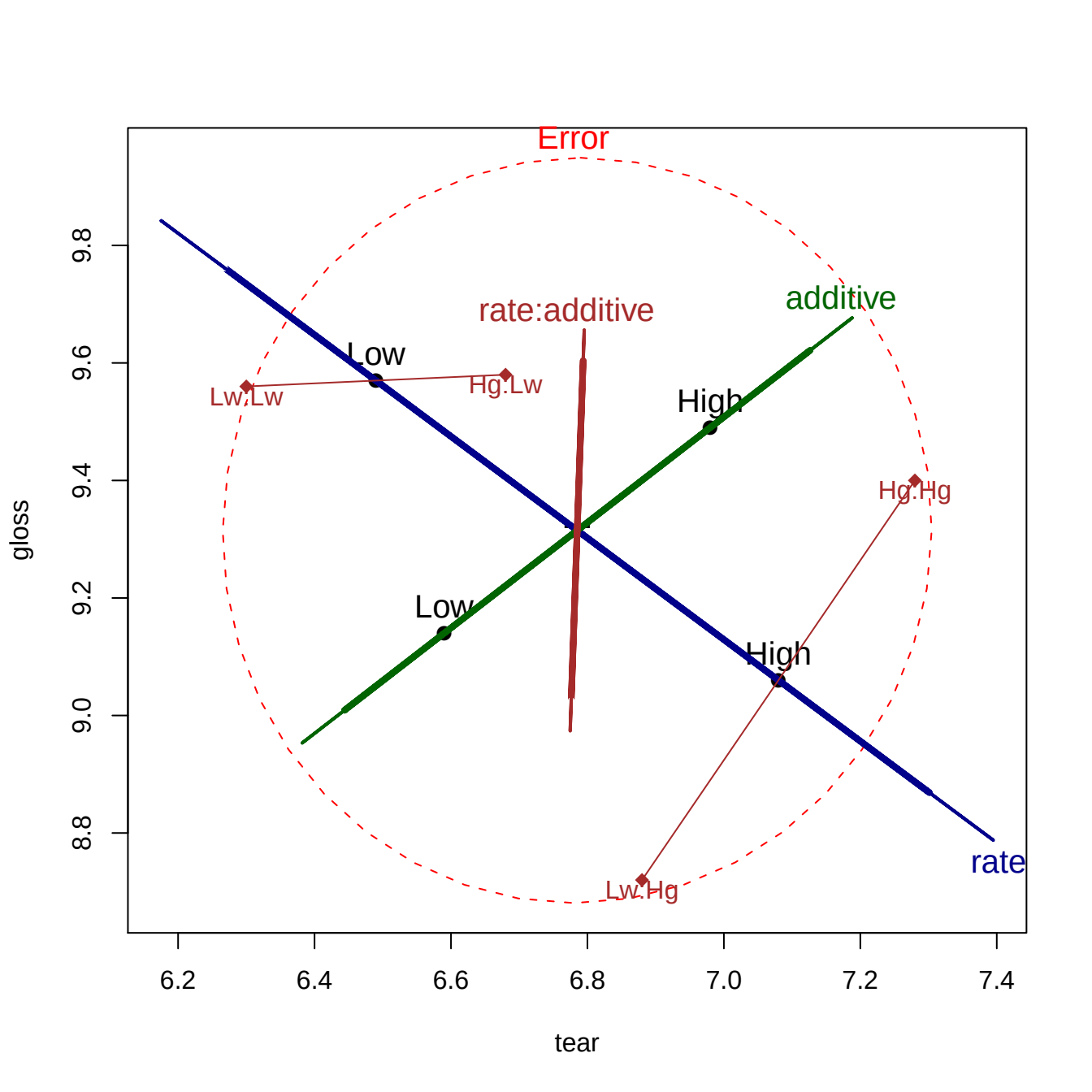
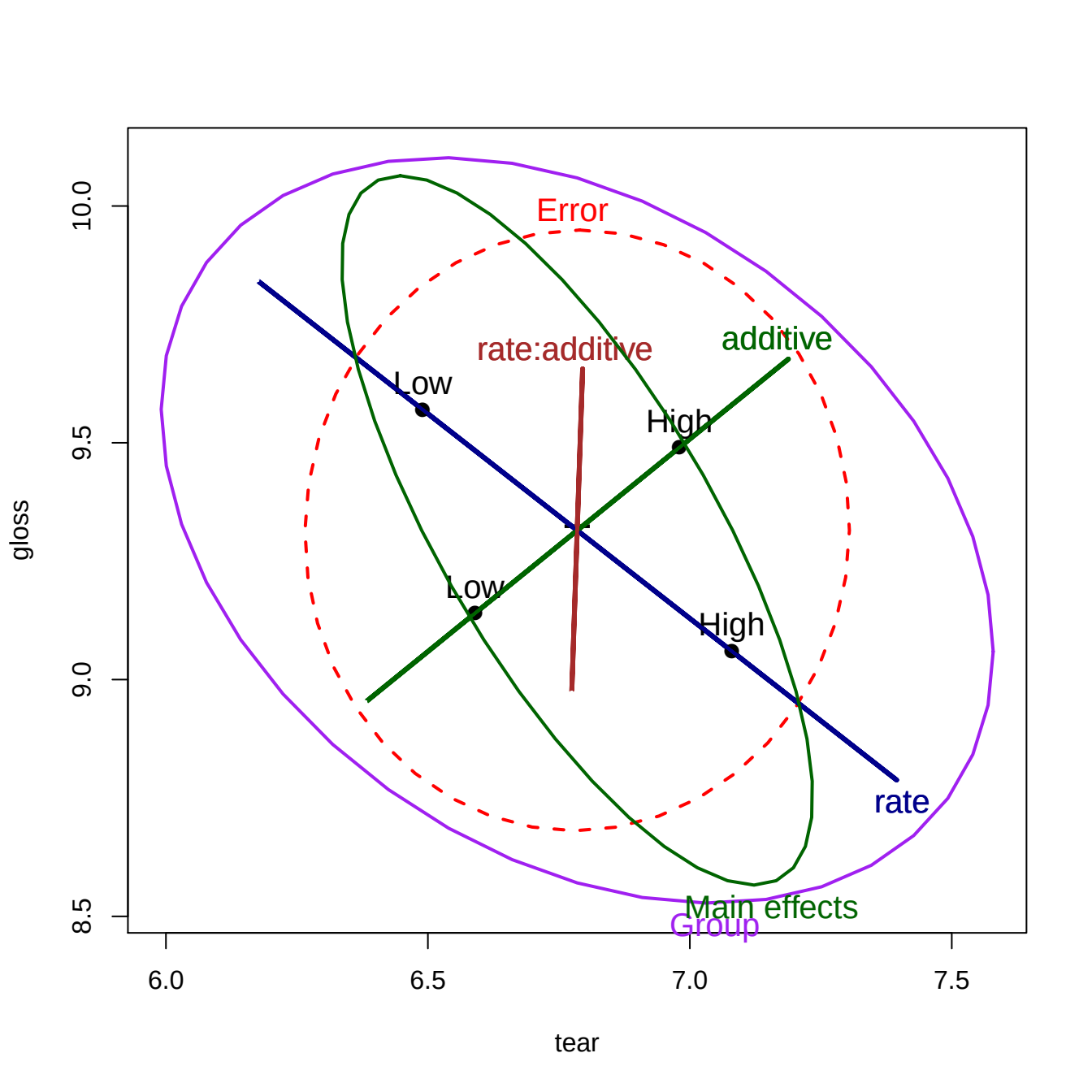
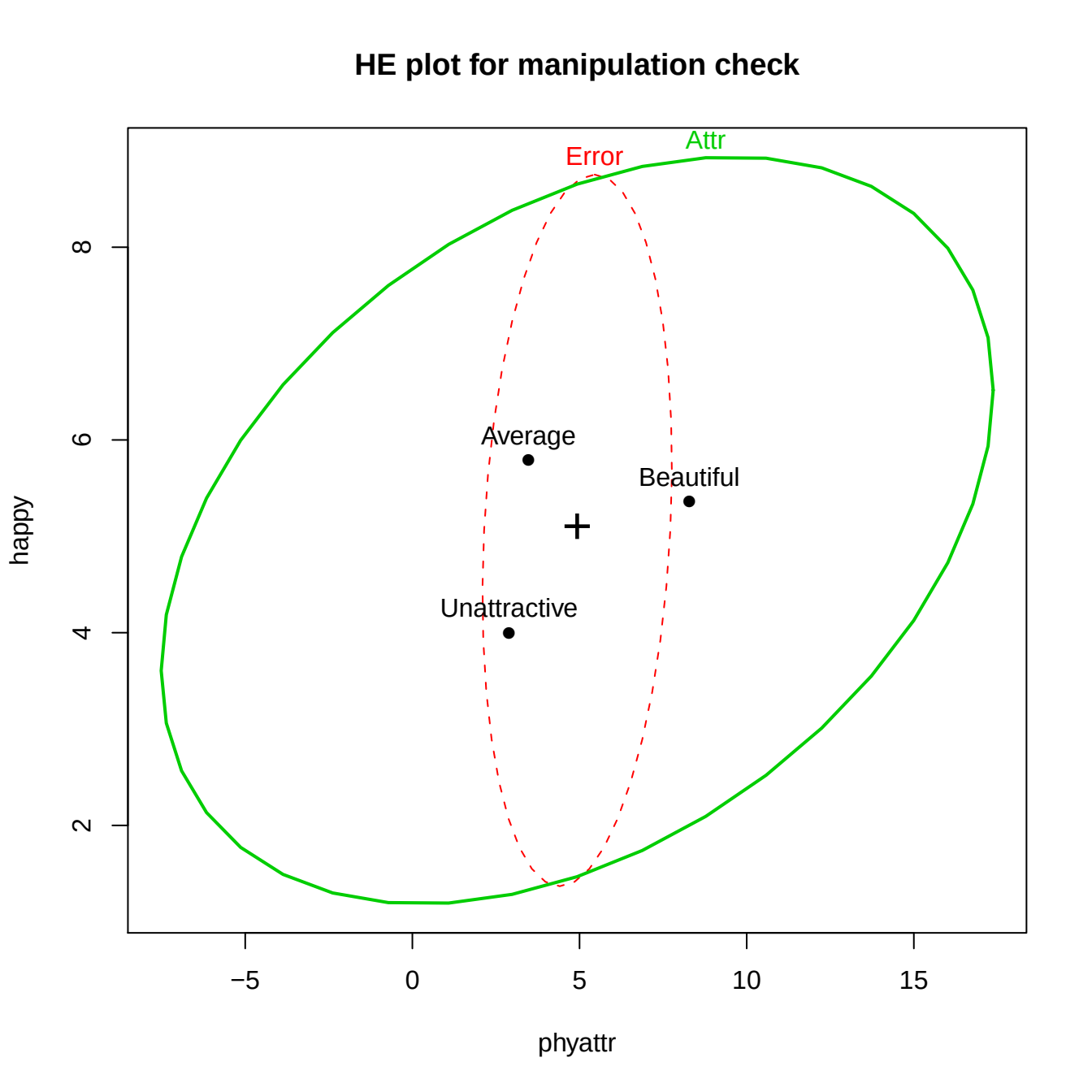
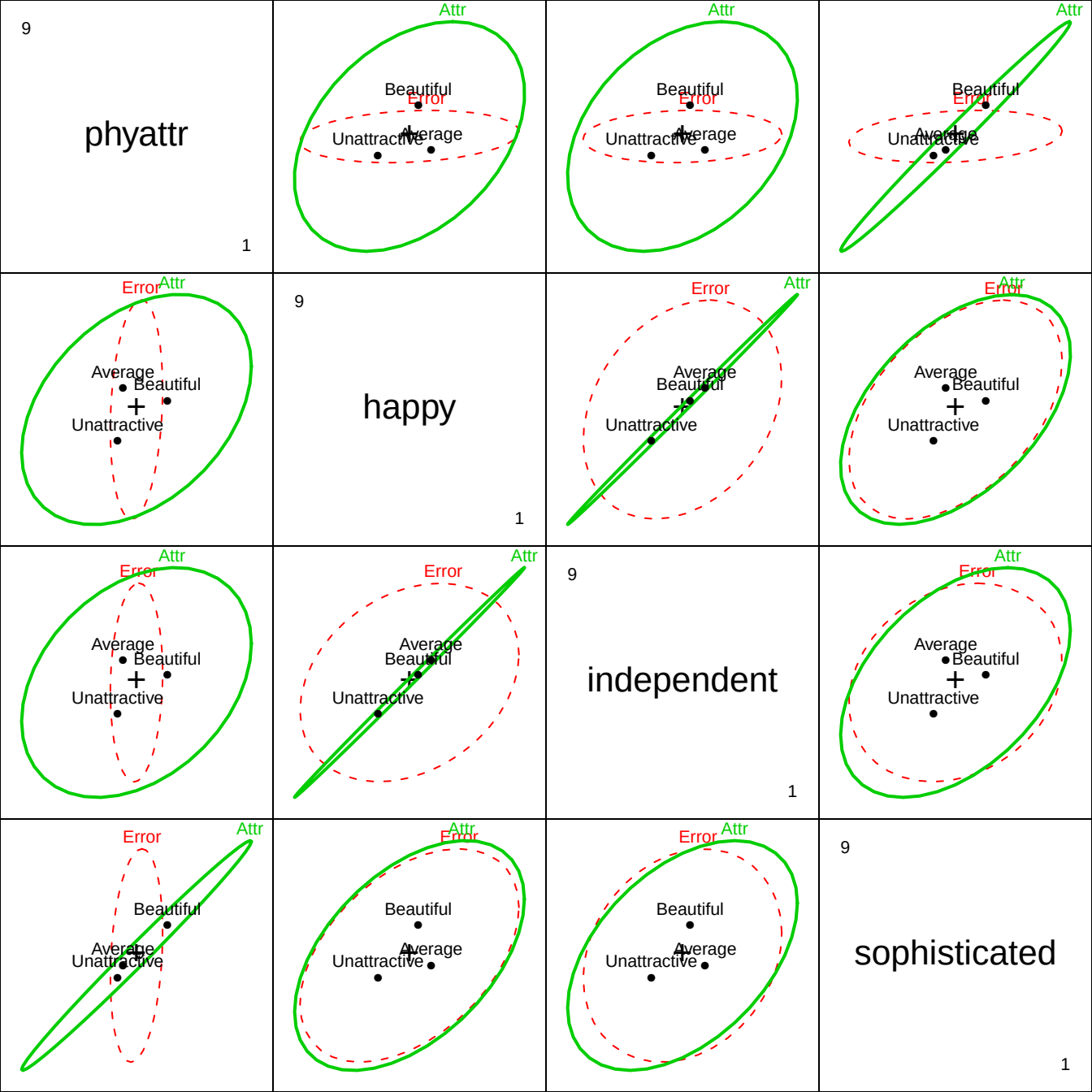
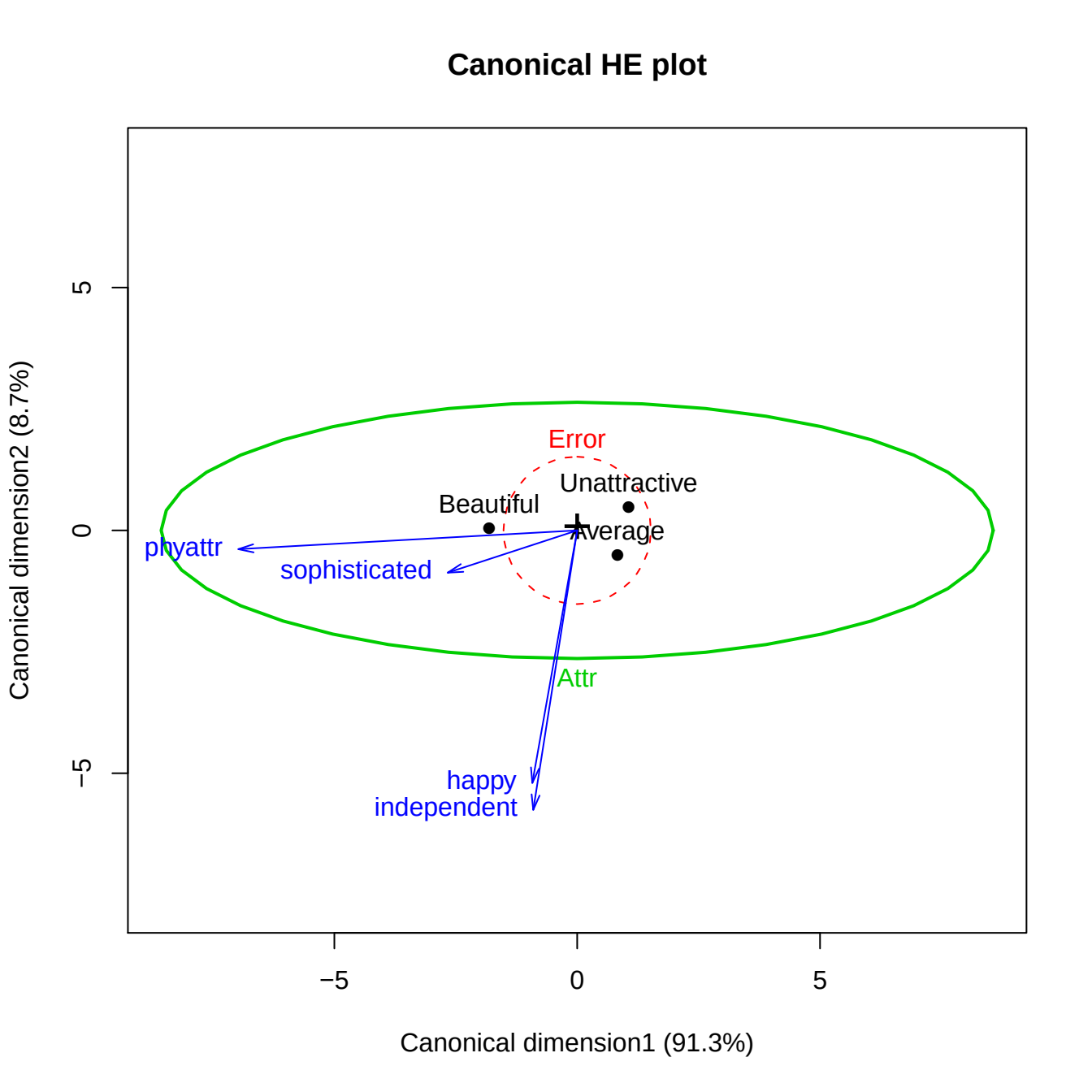
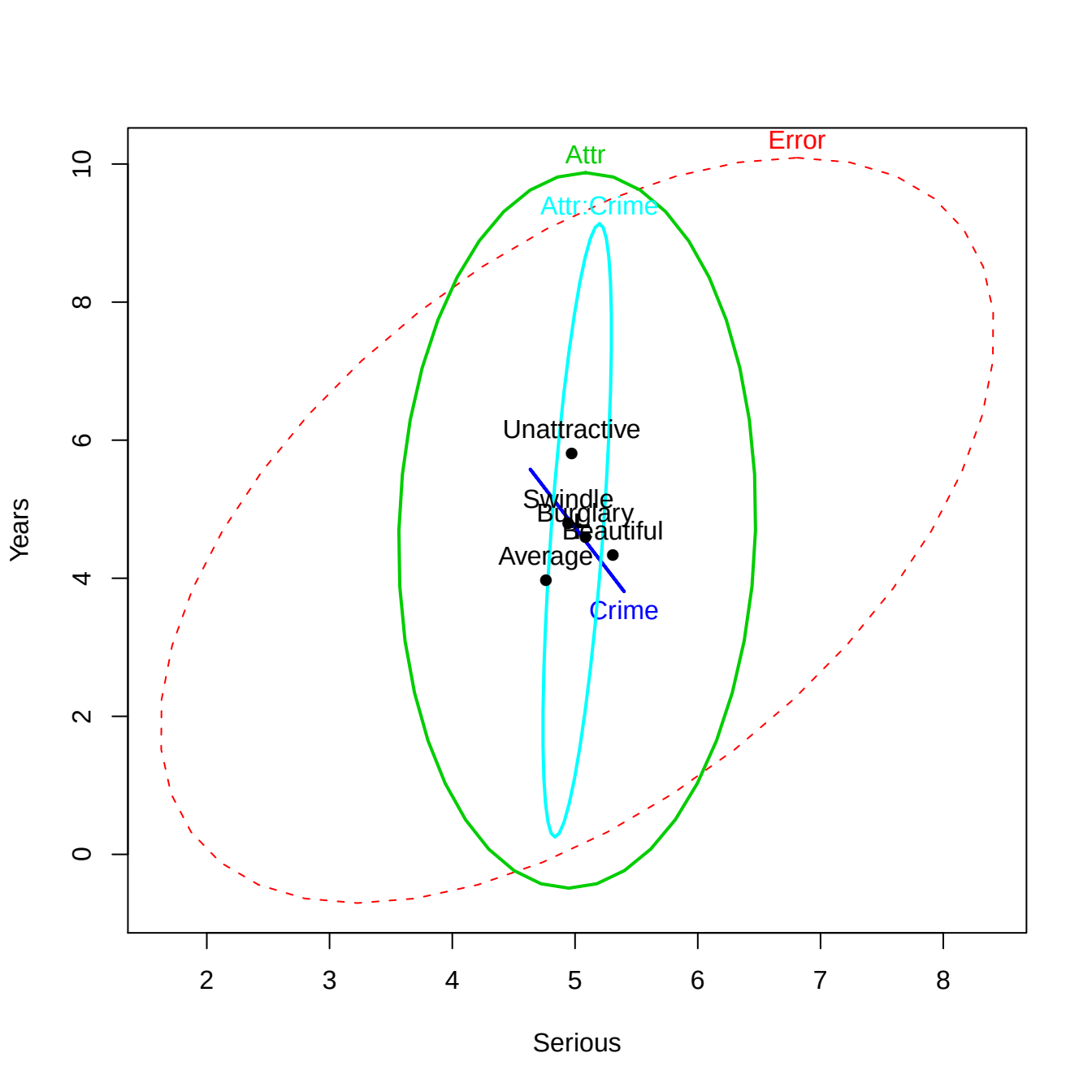

Error
rate:additive
additive
Low
High
Lw:Lw
Hg:Lw
Hg:Hg
Low
High
Lw:Hg
rate
gloss
tear
9.8
9.6
9.4
9.2
9.0
8.8
6.2
6.4
6.6
6.8
7.0
7.2
7.4

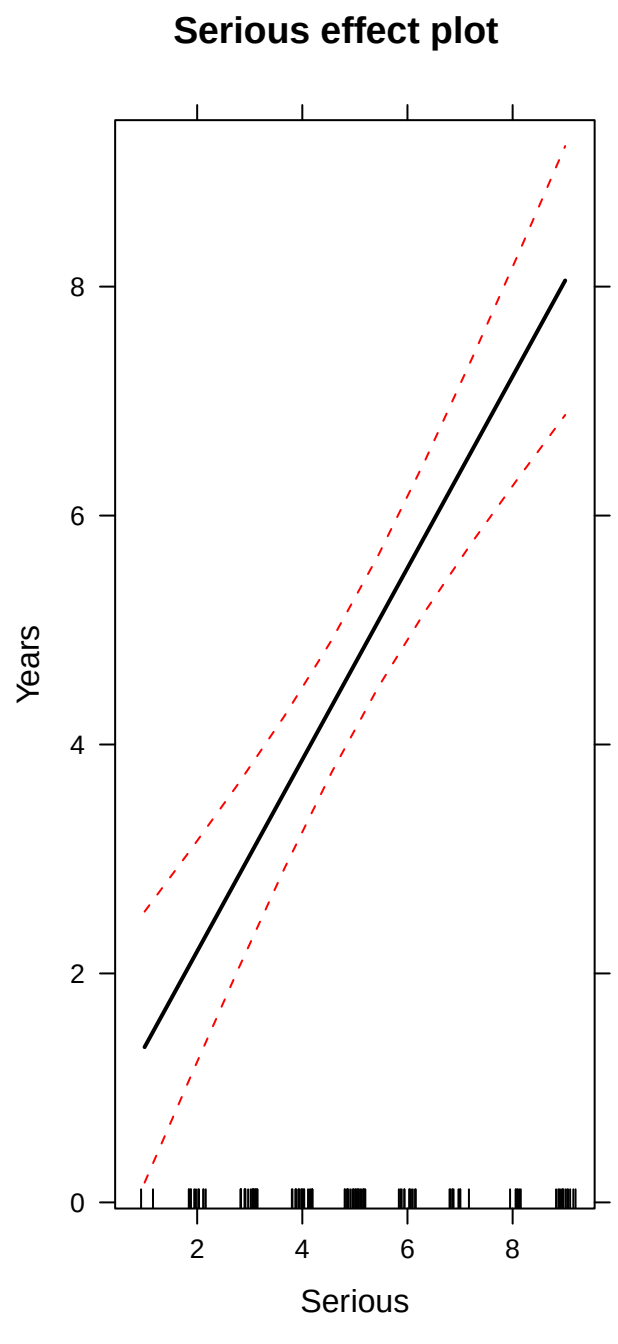

Error
rate:additive
additive
Low
High
Low
High
rate
Main effects
Group
10.0
9.5
9.0
8.5
gloss
6.0
6.5
7.0
7.5
tear

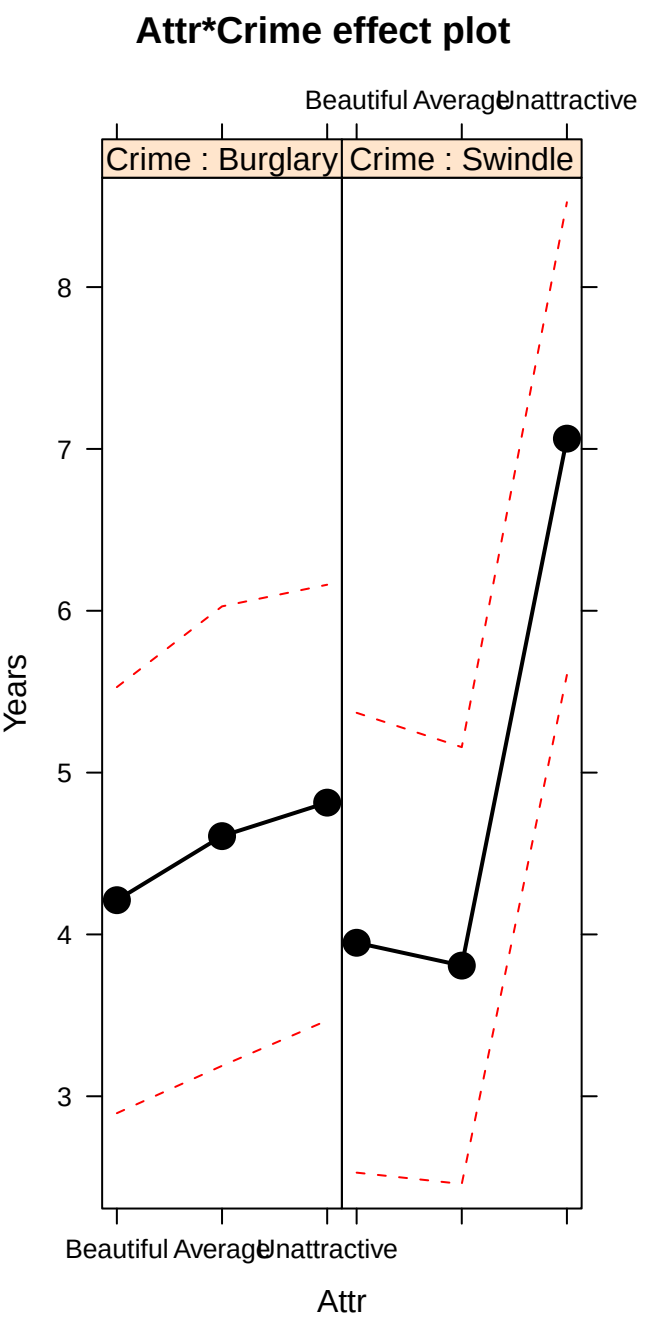

HE plot for manipulation check
Error
Attr
Average
Beautiful
Unattractive
happy
phyattr
2
4
6
8
−5
0
5
10
15

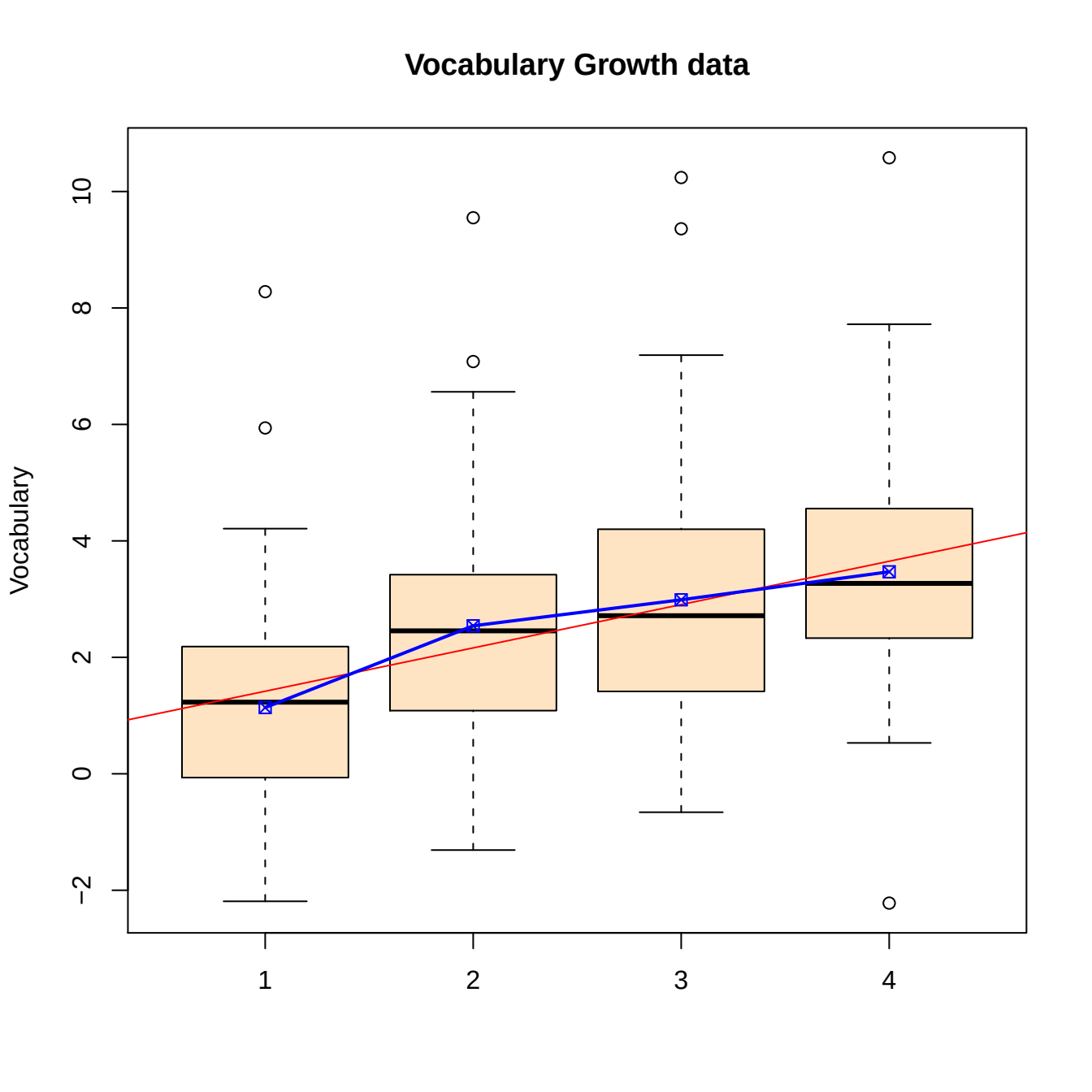

9
phyattr
1
Attr
Error
Beautiful
Average
Unattractive
happy
independent
sophisticated

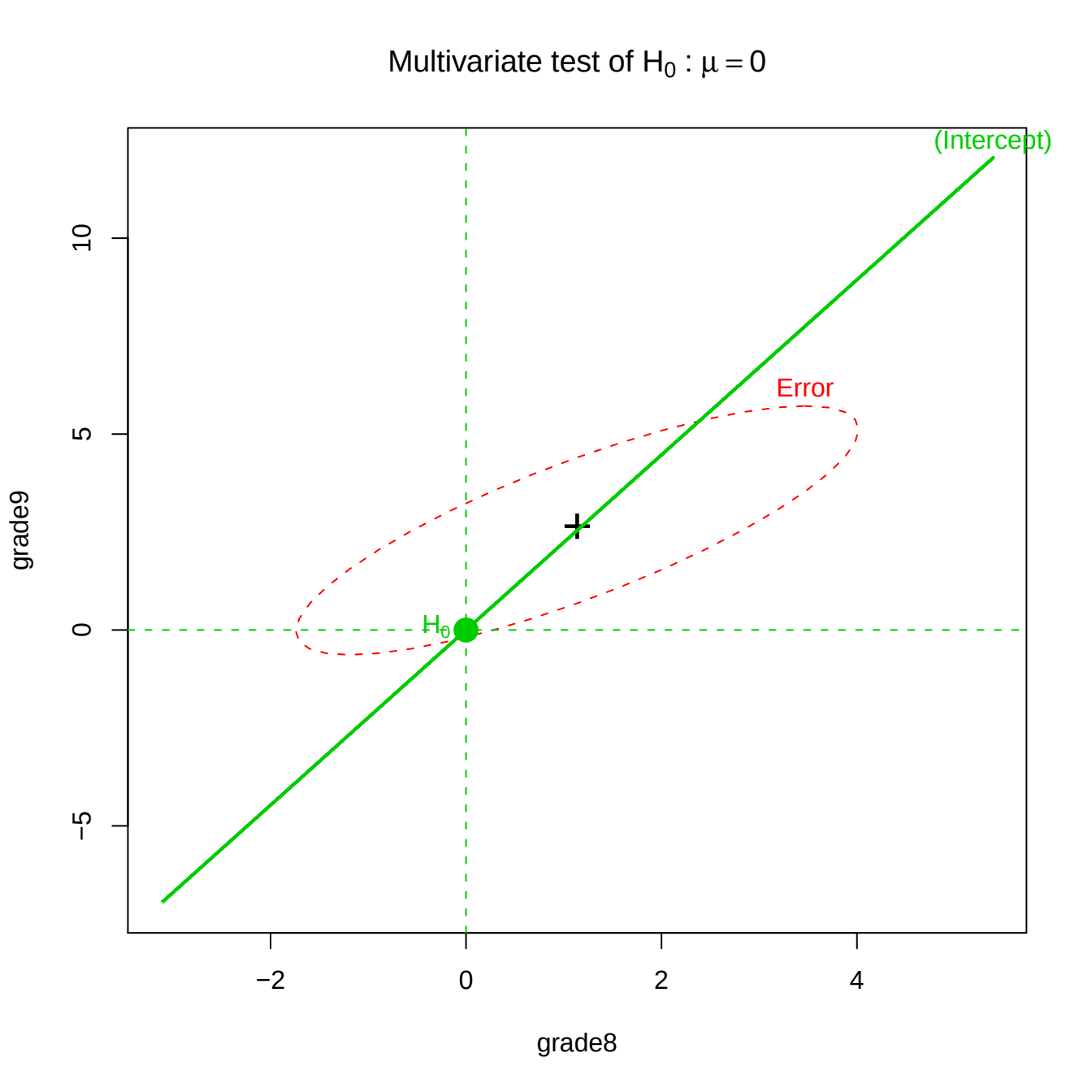

Canonical HE plot
Error
Unattractive
Beautiful
Average
phyattr
sophisticated
Attr
happy
independent
5
0
−5
Canonical dimension2 (8.7%)
−5
0
5
Canonical dimension1 (91.3%)

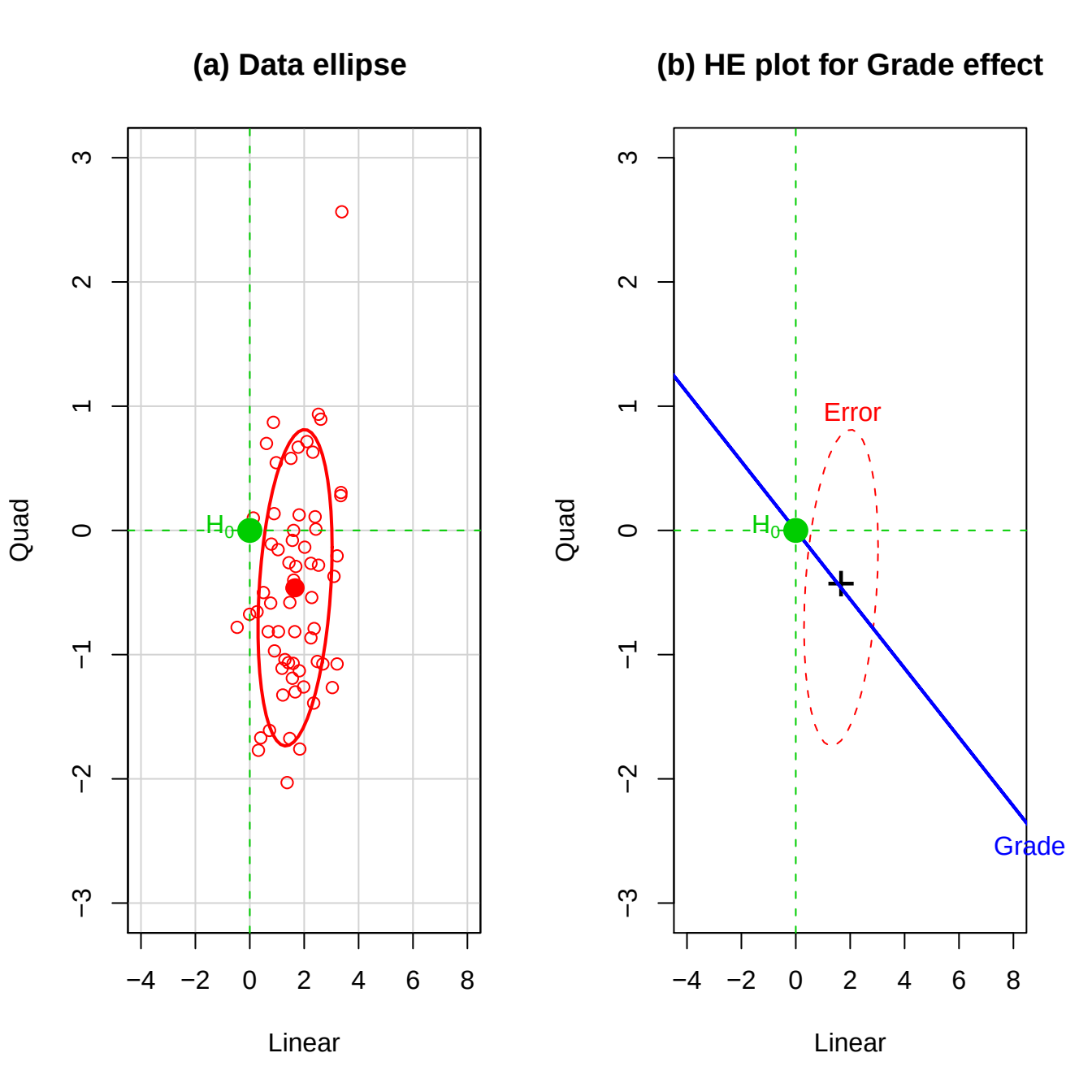

Error
Attr
Attr:Crime
Unattractive
Swindle
Burglary
Beautiful
Average
Crime
Years
Serious
0
2
4
6
8
10
2
3
4
5
6
7
8

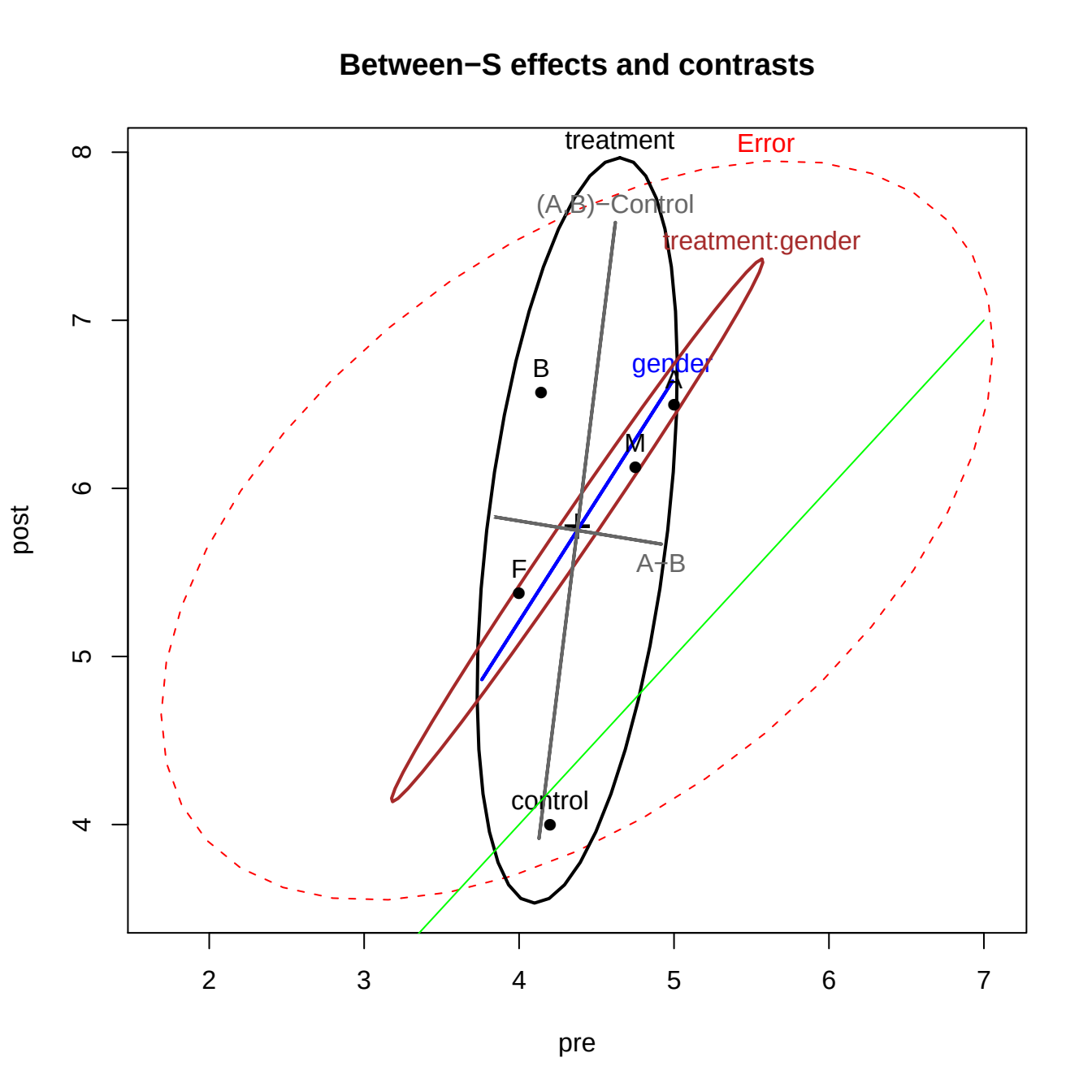

Serious effect plot
Years
Serious
0
2
4
6
8
2
4
6
8


Attr*Crime effect plot
Beautiful Average Unattractive
Crime : Burglary
Crime : Swindle
Years
Attr
3
4
5
6
7
8
Beautiful Average Unattractive


Vocabulary Growth data
Vocabulary
10
8
6
4
2
0
−2
1
2
3
4


Multivariate test of $H_0 : \mu = 0$
(Intercept)
Error
H_0
grade9
grade8
10
5
0
−5
−2
0
2
4

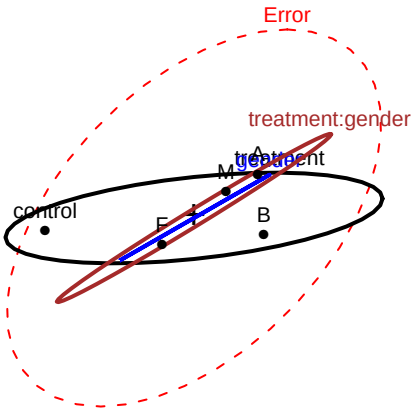

(a) Data ellipse
(b) HE plot for Grade effect
Quad
Linear
H0
Error
Grade
3
2
1
0
−1
−2
−3
−4
−2
0
2
4
6
8

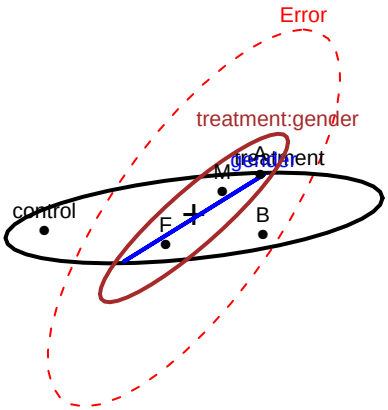

Between−S effects and contrasts
treatment
Error
(A,B)−Control
treatment:gender
gender
B
A
M
F
A−B
control
post
pre
8
7
6
5
4
2
3
4
5
6
7

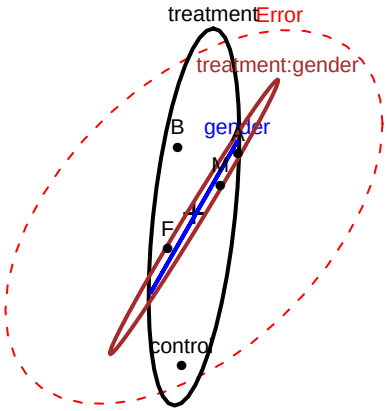
8

pre

2



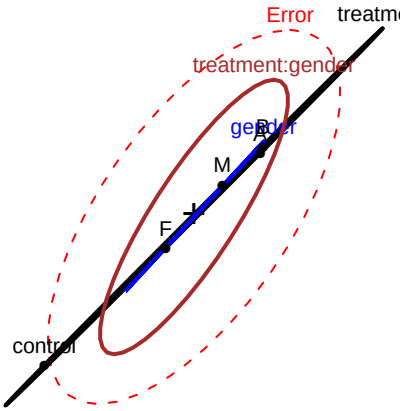


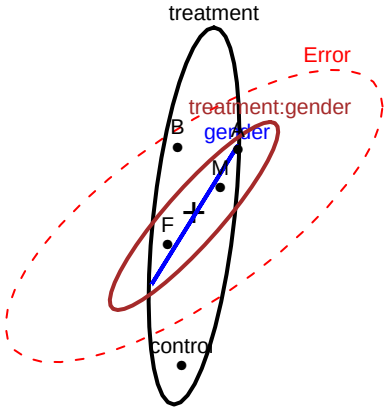


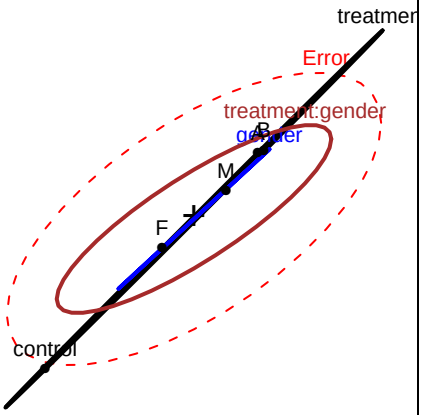
9

post

3



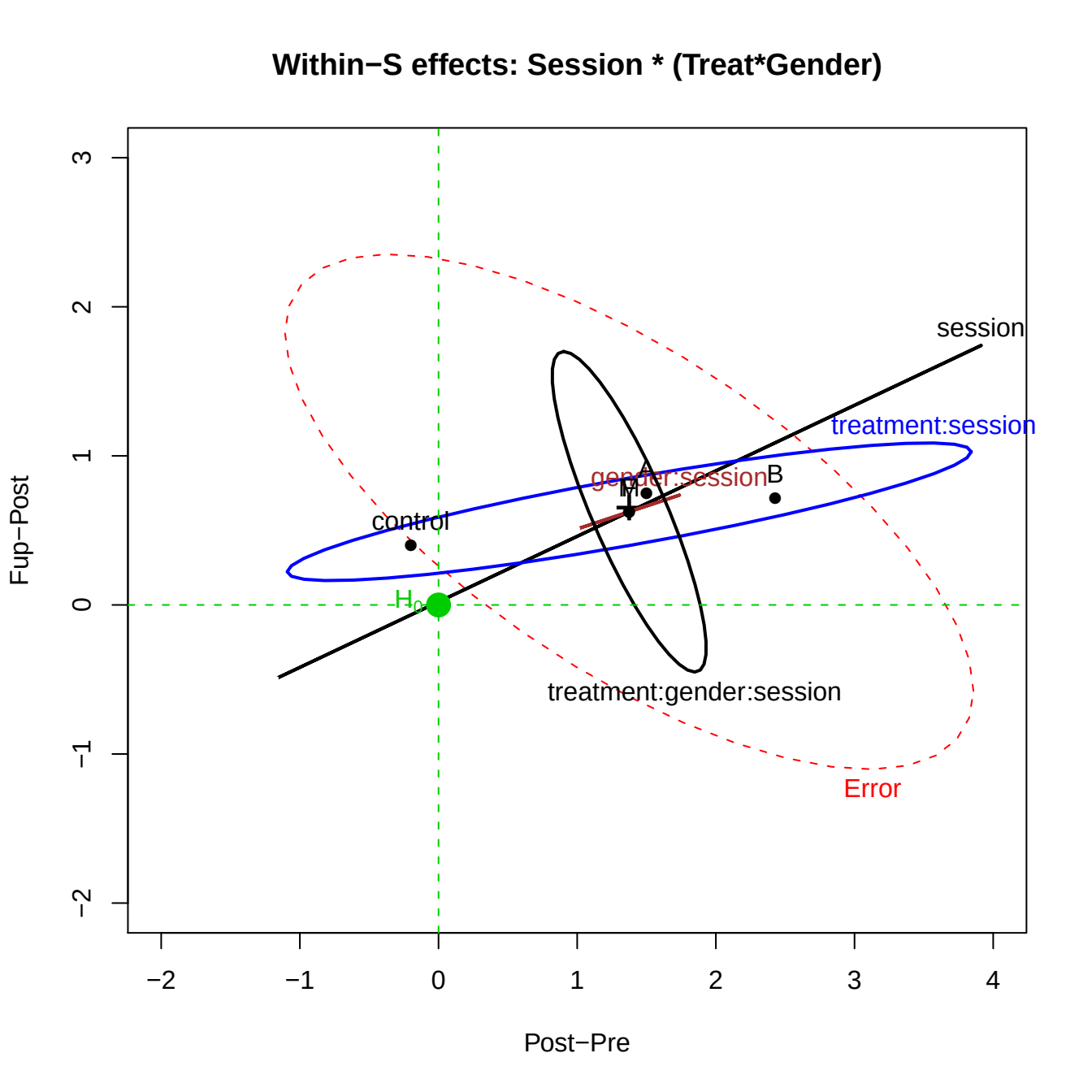


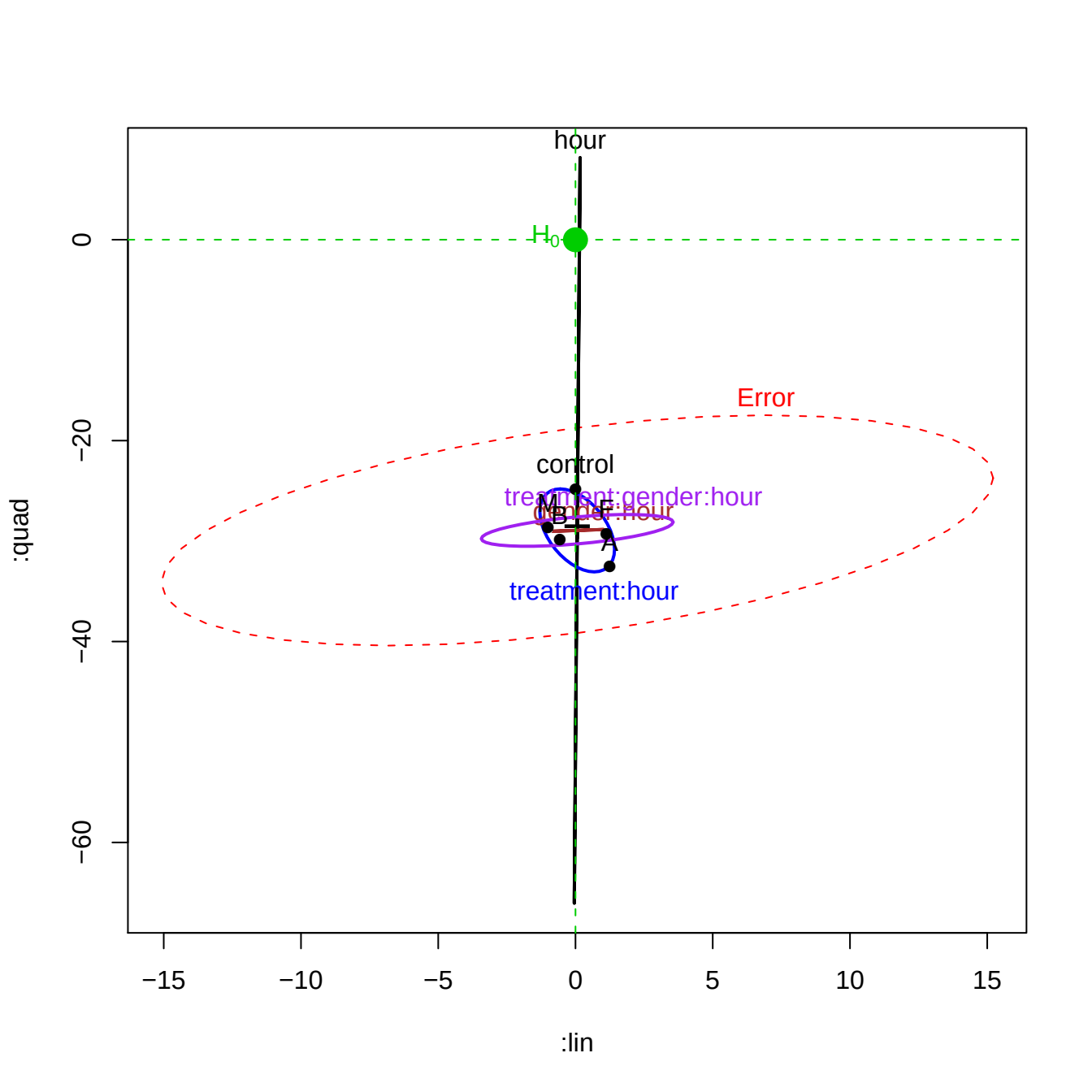


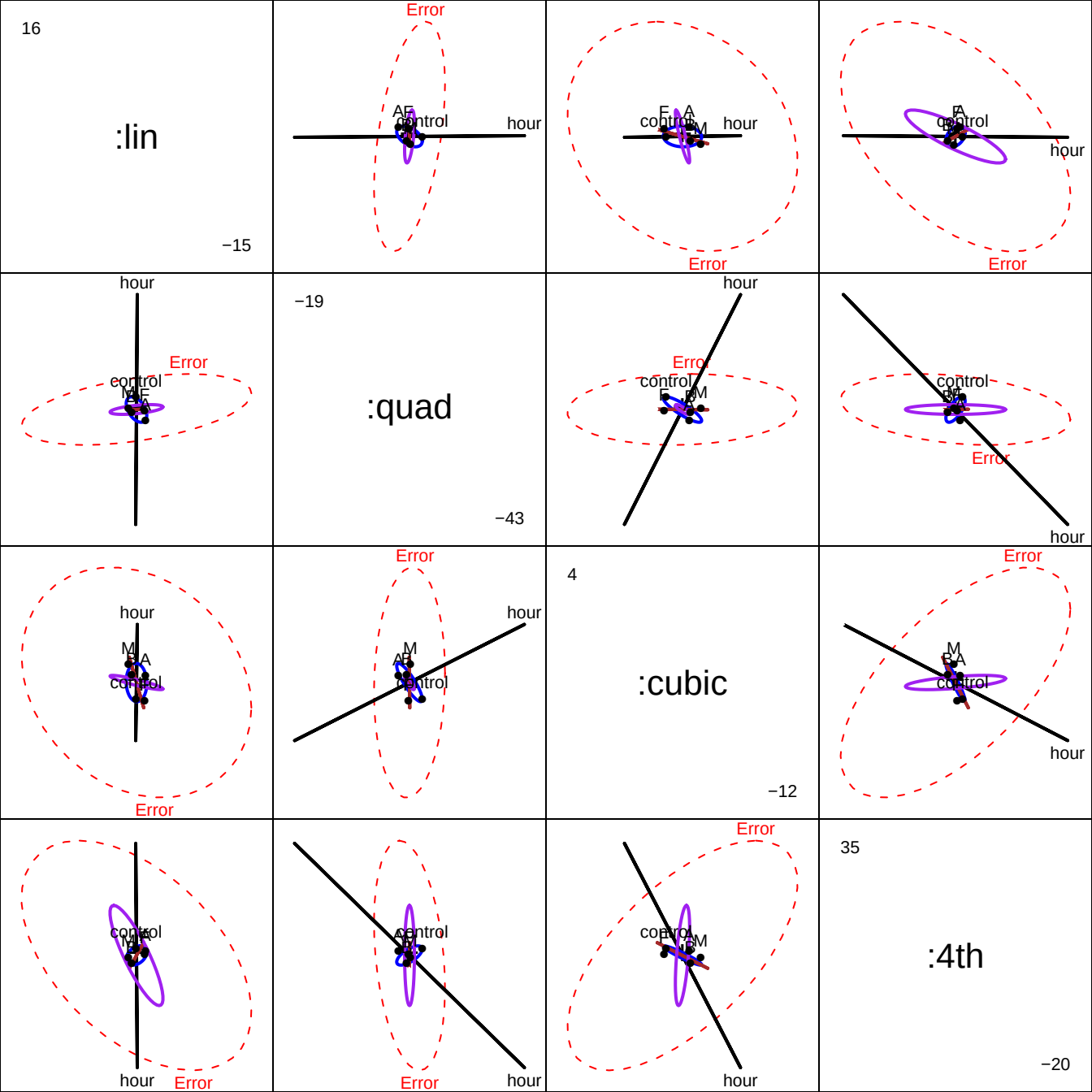
9

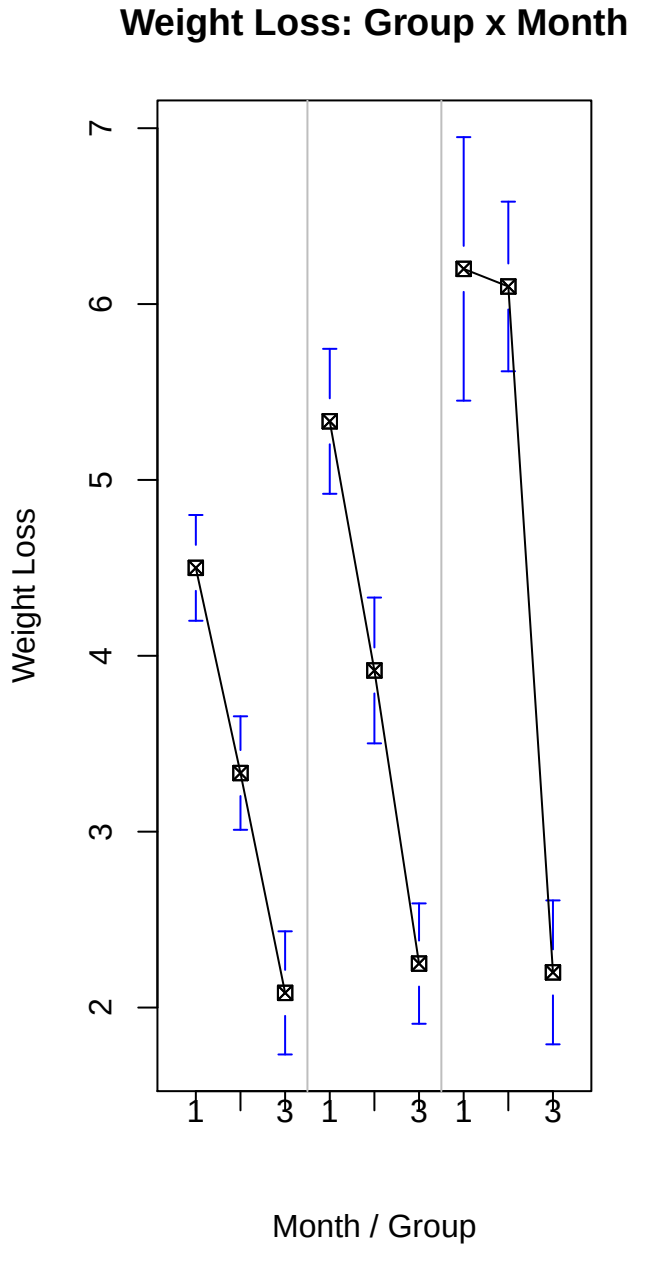
fup

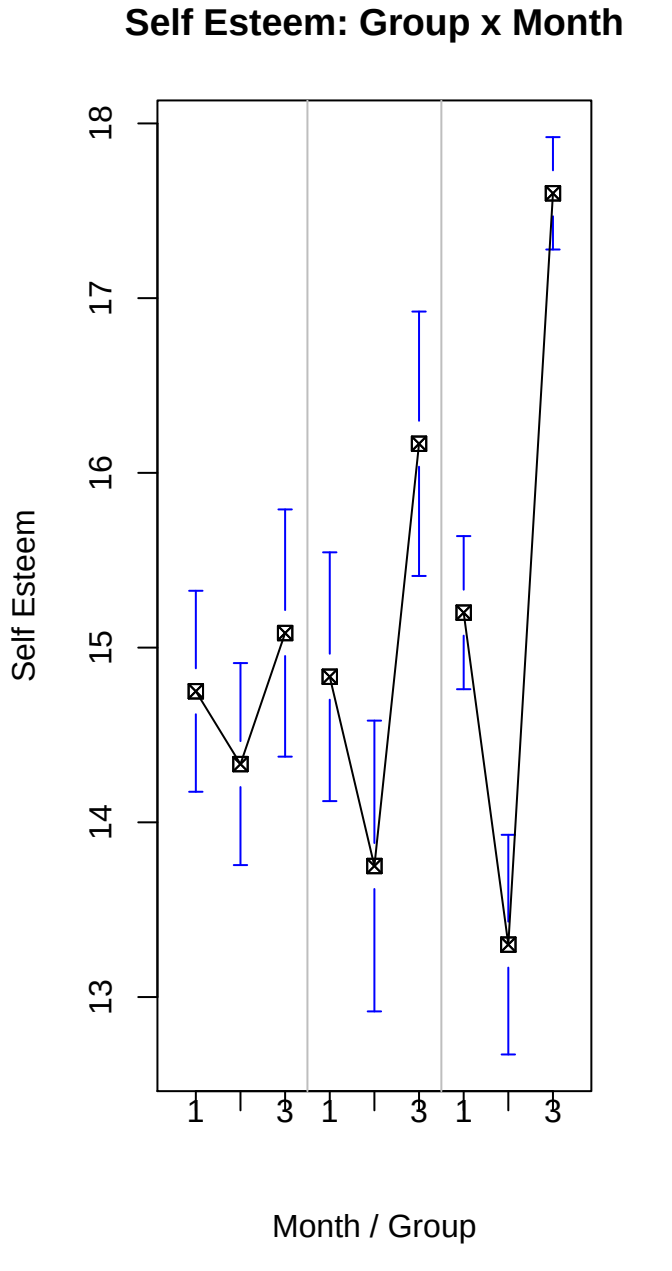
3

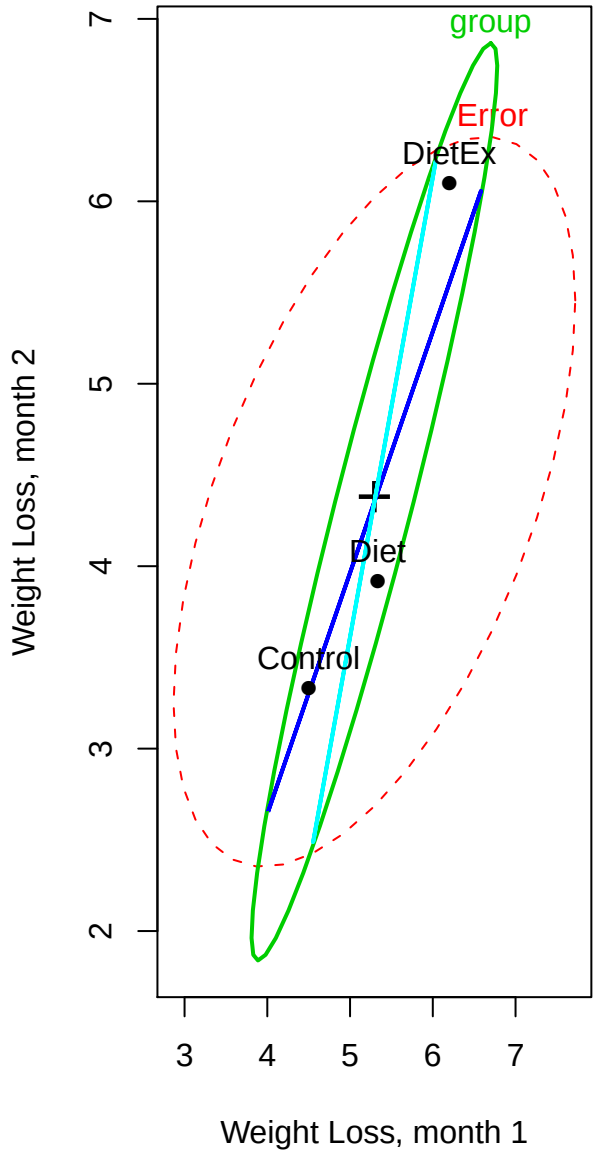

Within−S effects: Session * (Treat*Gender)
session
treatment:session
gender:session
treatment:gender:session
Error
control
A
B
M
F
H0
Fup−Post
Post−Pre
−2
−1
0
1
2
3
4

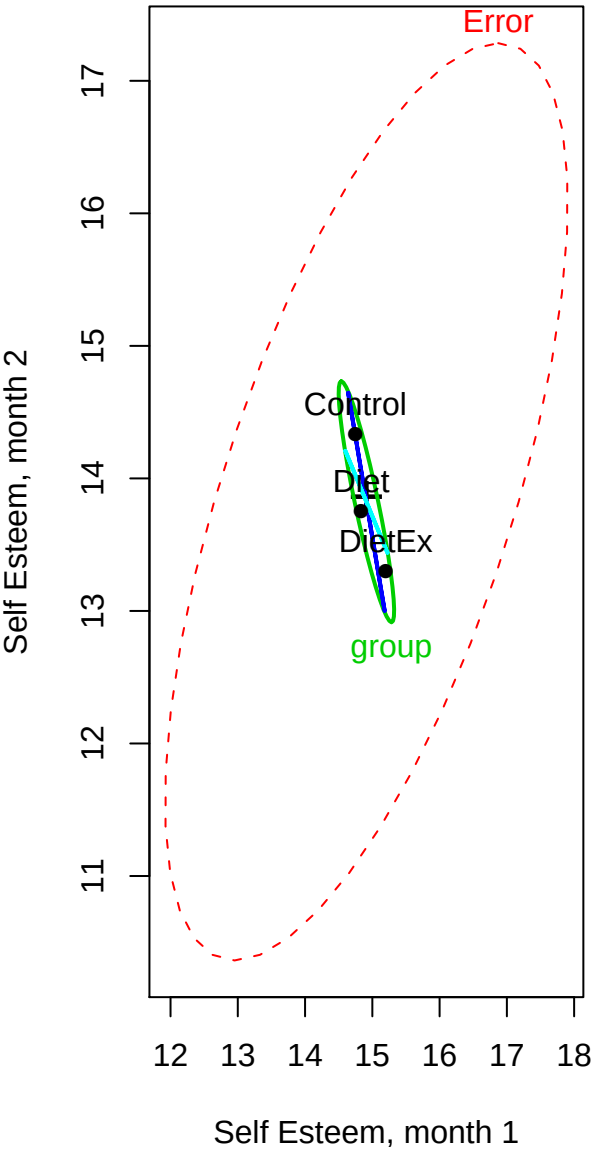

hour
H_0
Error
control
treatment:gender:hour
gender:hour
M
B
F
A
treatment:hour
0
−20
−40
−60
:quad
−15
−10
−5
0
5
10
15
:lin

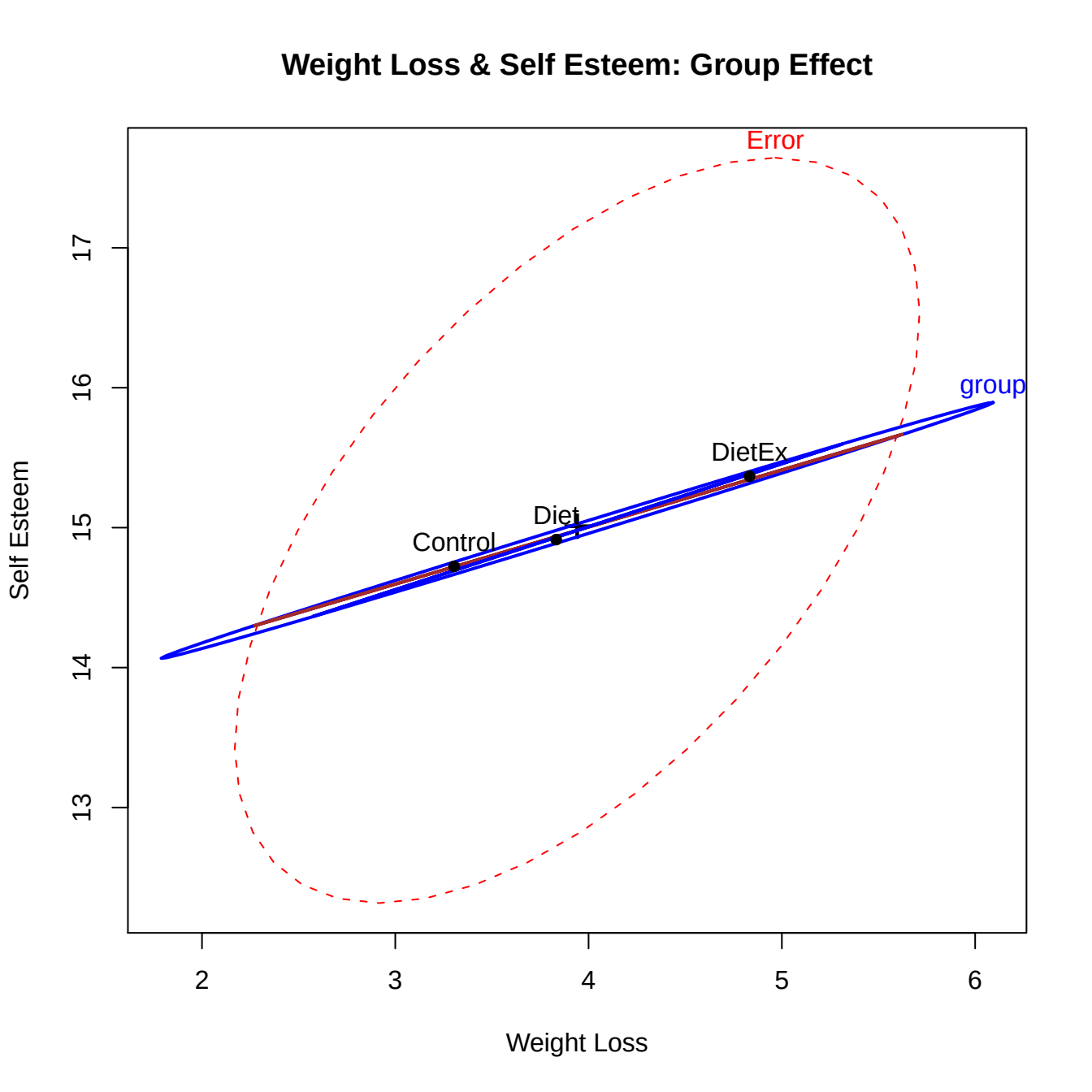

16
:lin
−15
Error
control
hour
F
A
M
−19
:quad
−43
4
:cubic
−12
35
:4th
−20

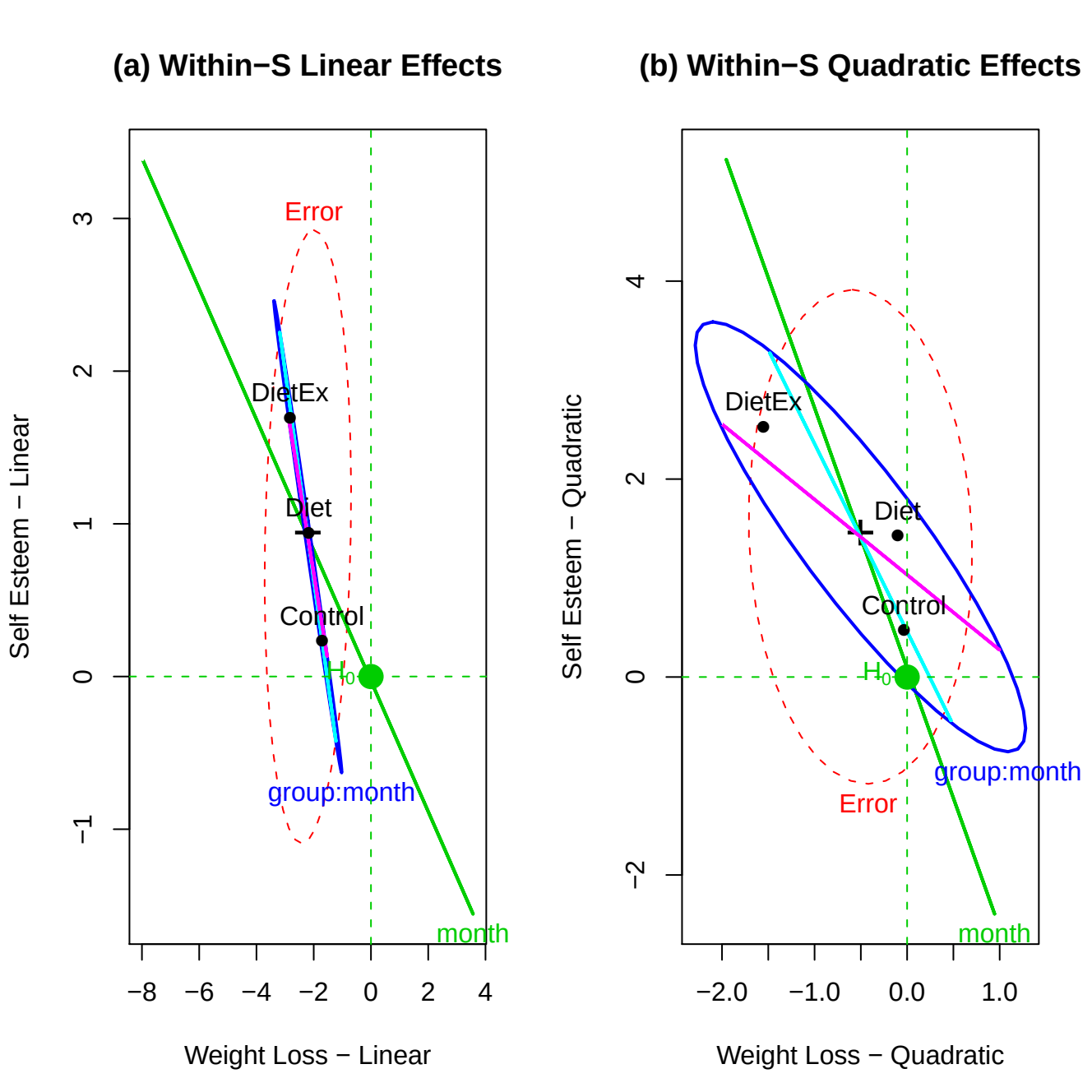

Weight Loss: Group x Month
Weight Loss
2
3
4
5
6
7
1
3
1
3
1
3
Month / Group

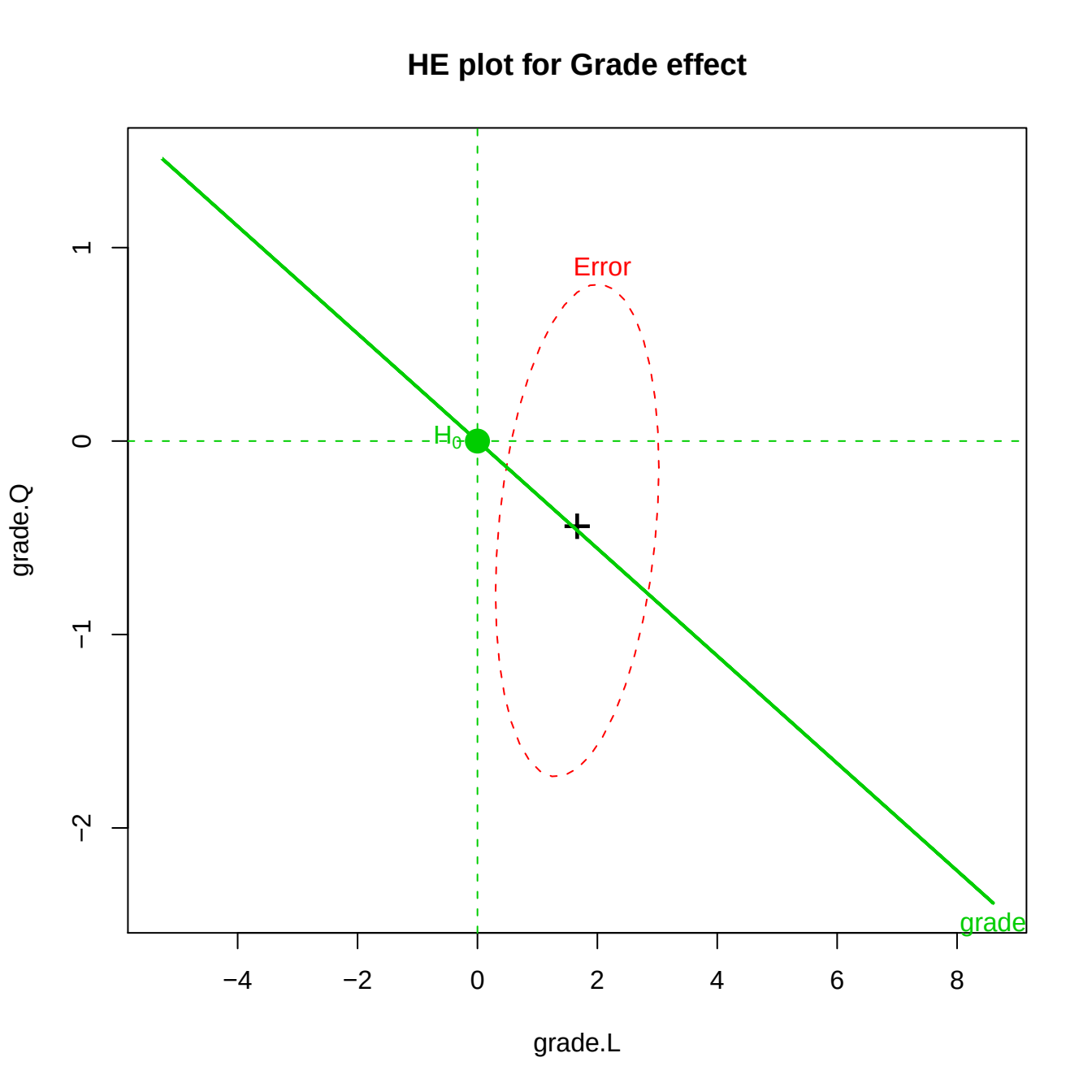

Self Esteem: Group x Month
Self Esteem
13
14
15
16
17
18
1
3
1
3
1
3
Month / Group

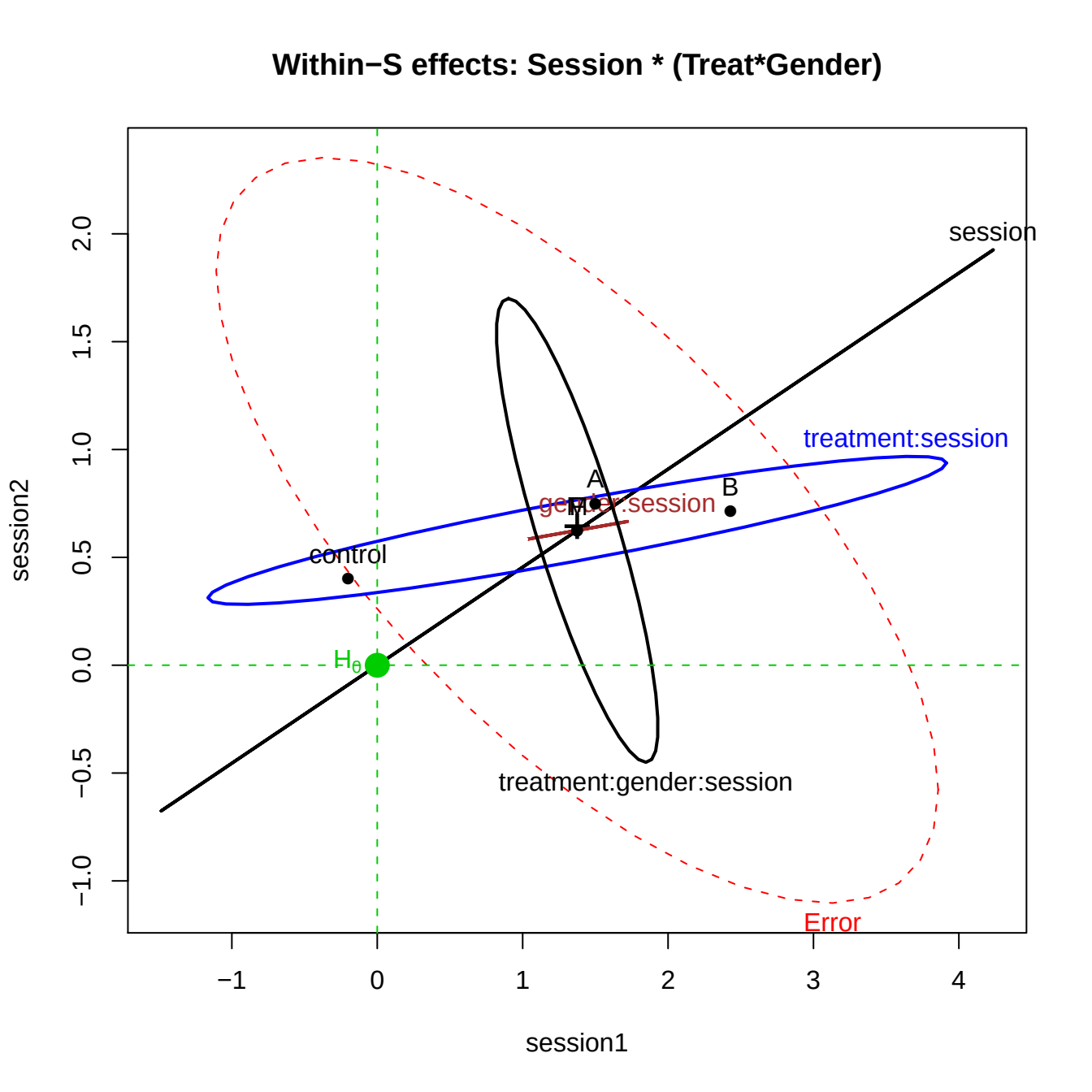

group
Error
DietEx
Diet
Control
Weight Loss, month 2
Weight Loss, month 1
2
3
4
5
6
7
3
4
5
6
7

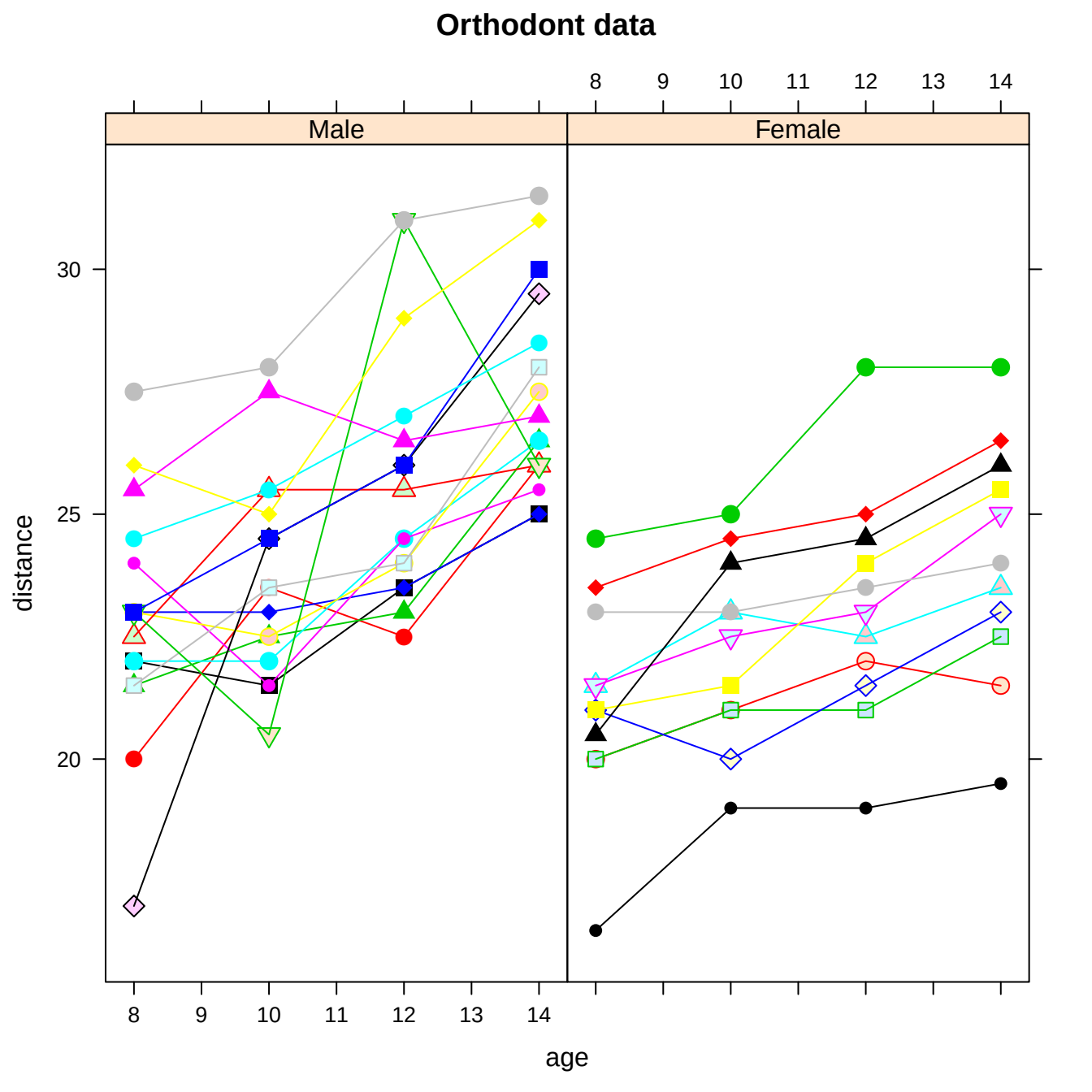

Error
Control
Diet
DietEx
group
Self Esteem, month 2
Self Esteem, month 1
11
12
13
14
15
16
17
12
13
14
15
16
17
18

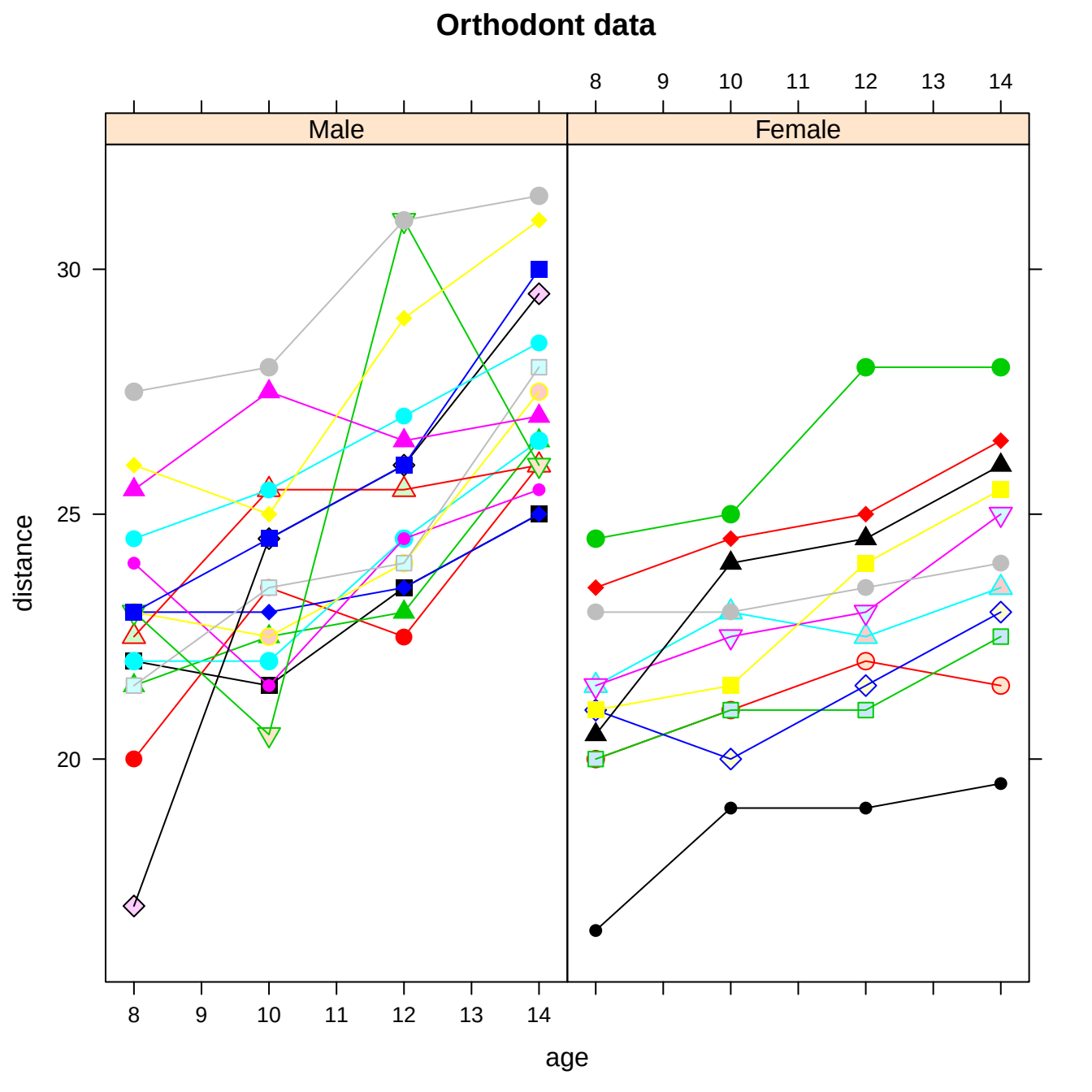

Weight Loss & Self Esteem: Group Effect
Error
group
DietEx
Diet
Control
Self Esteem
Weight Loss
13
14
15
16
17
2
3
4
5
6

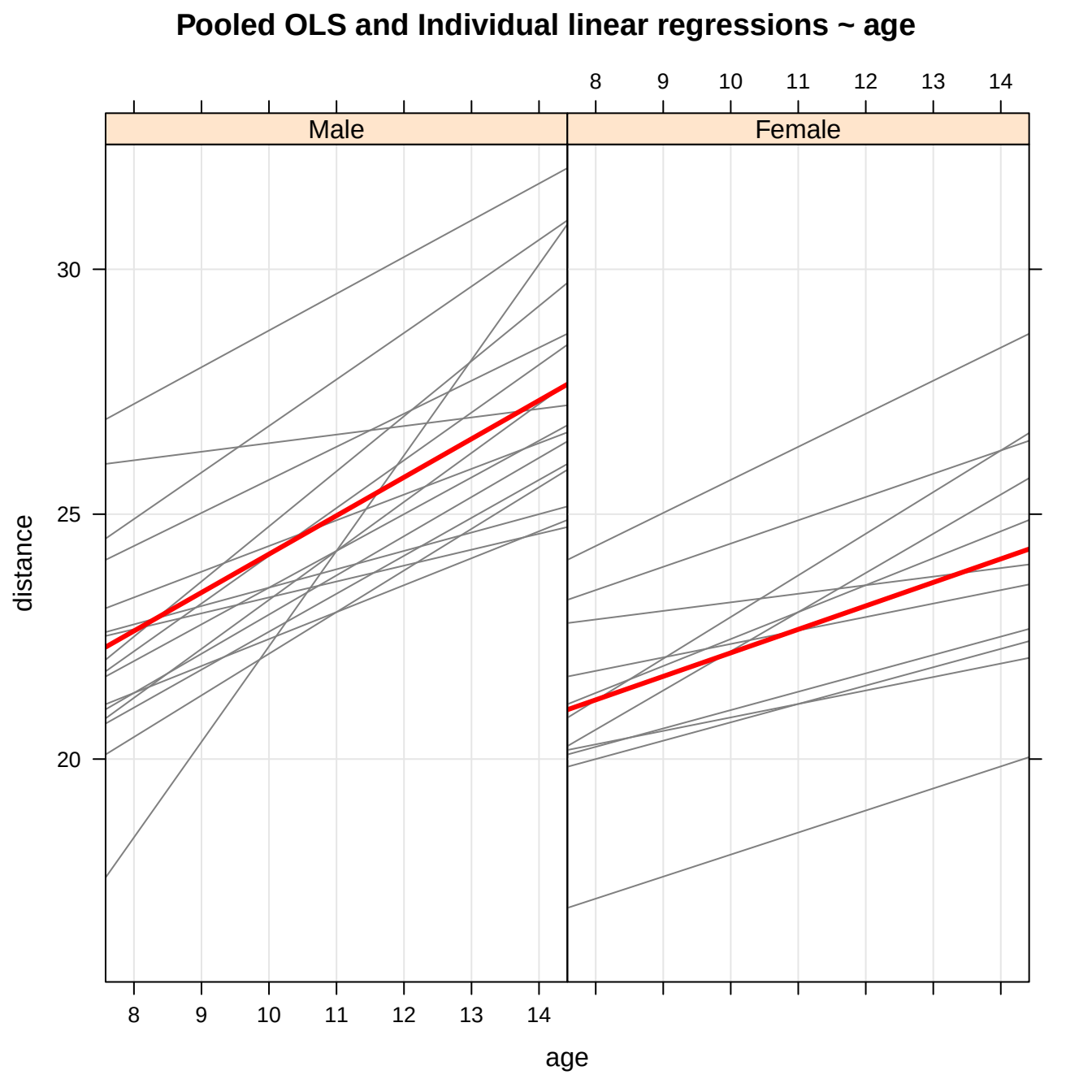

(a) Within−S Linear Effects
(b) Within−S Quadratic Effects
Error
DietEx
Diet
Control
H0
group:month
month
Self Esteem − Linear
Weight Loss − Linear
Self Esteem − Quadratic
Weight Loss − Quadratic
−8
−6
−4
−2
0
2
4
−1
0
1
2
3
−2.0
−1.0
0.0
1.0
−2
0
2
4

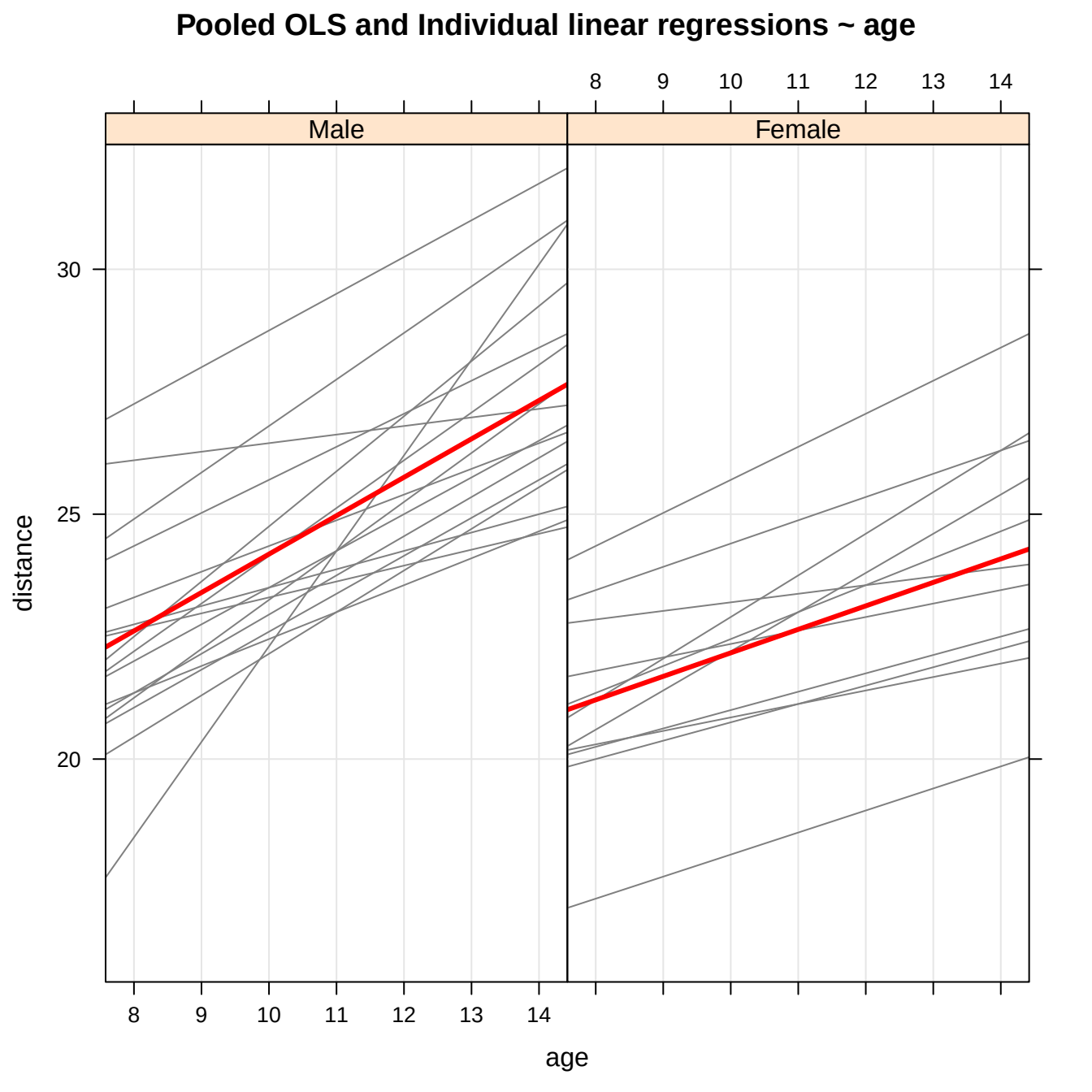

HE plot for Grade effect
Error
H0
grade
grade.Q
grade.L
1
0
−1
−2
−4
−2
0
2
4
6
8

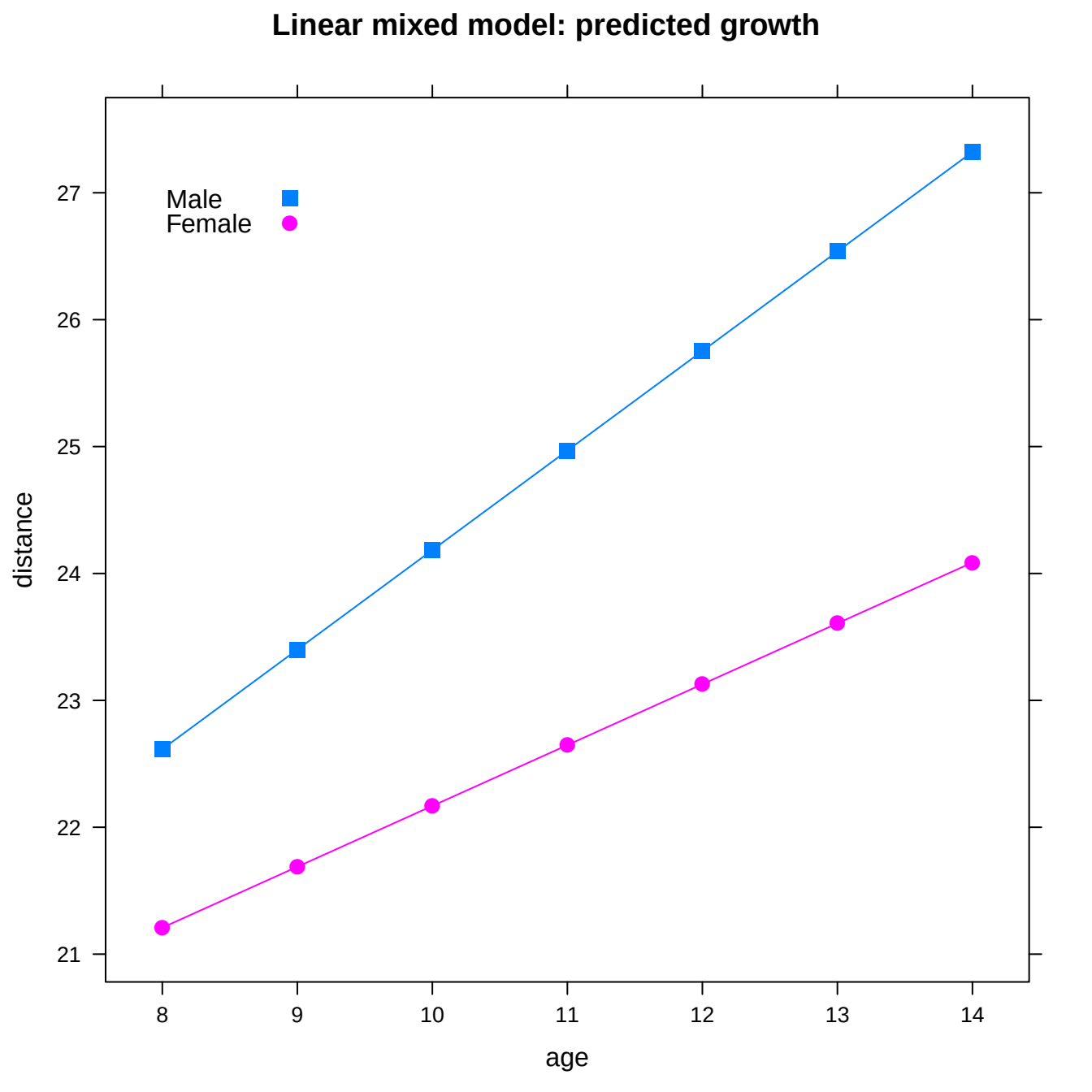

Within−S effects: Session * (Treat*Gender)
session
treatment:session
gender:session
A
B
M
control
H_0
treatment:gender:session
Error
session2
session1
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1
0
1
2
3
4

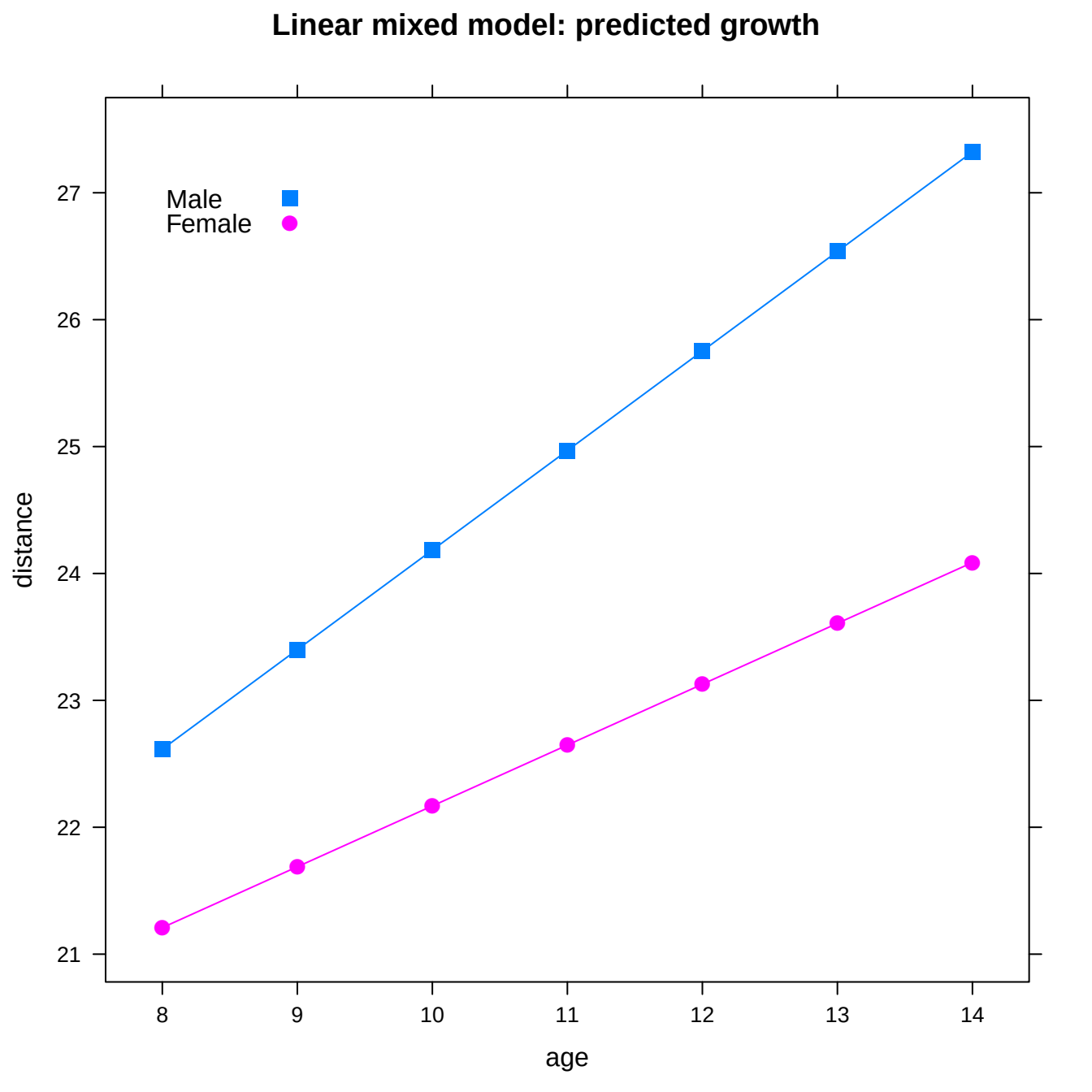

Orthodont data
Male
Female
distance
age
20
25
30
8
9
10
11
12
13
14

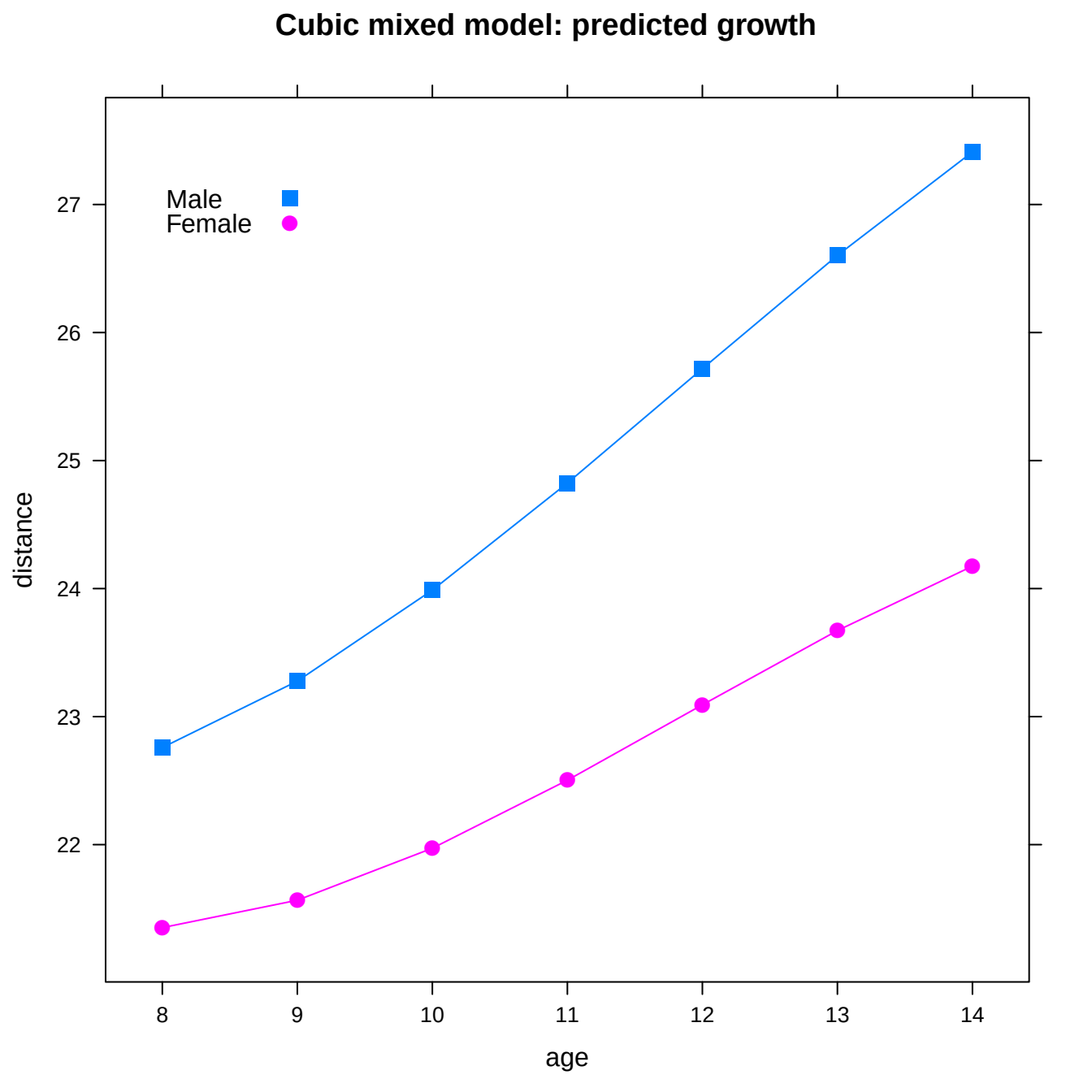

Orthodont data
Male
Female
distance
age
20
25
30
8
9
10
11
12
13
14

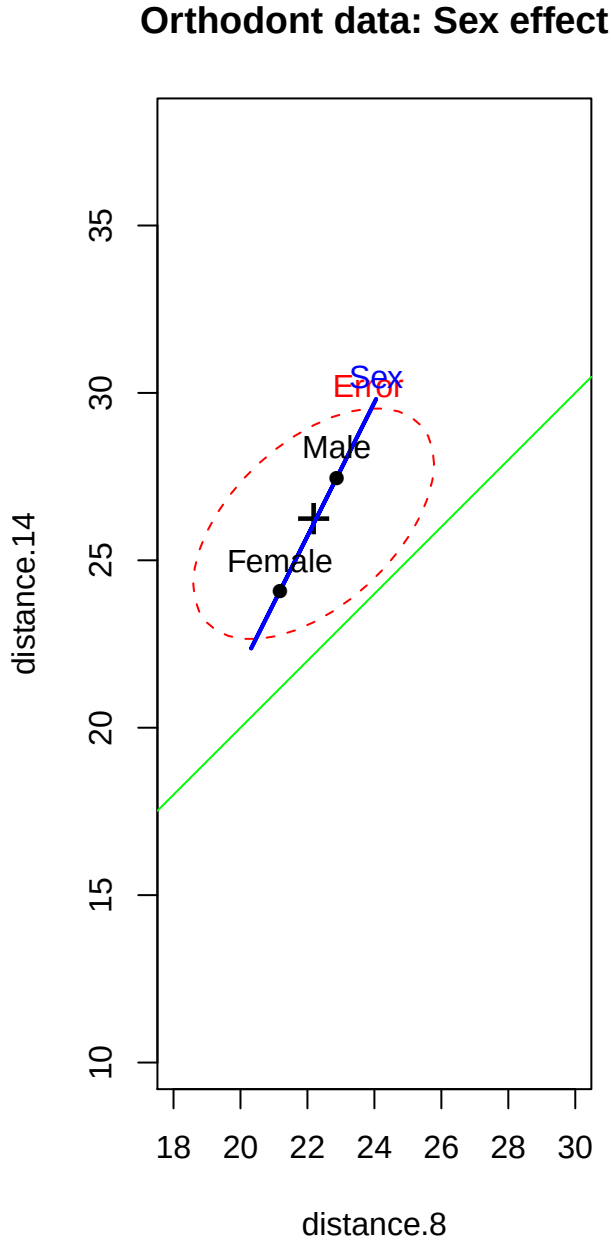

Pooled OLS and Individual linear regressions ~ age
Male
Female
distance
age
8
9
10
11
12
13
14
20
25
30

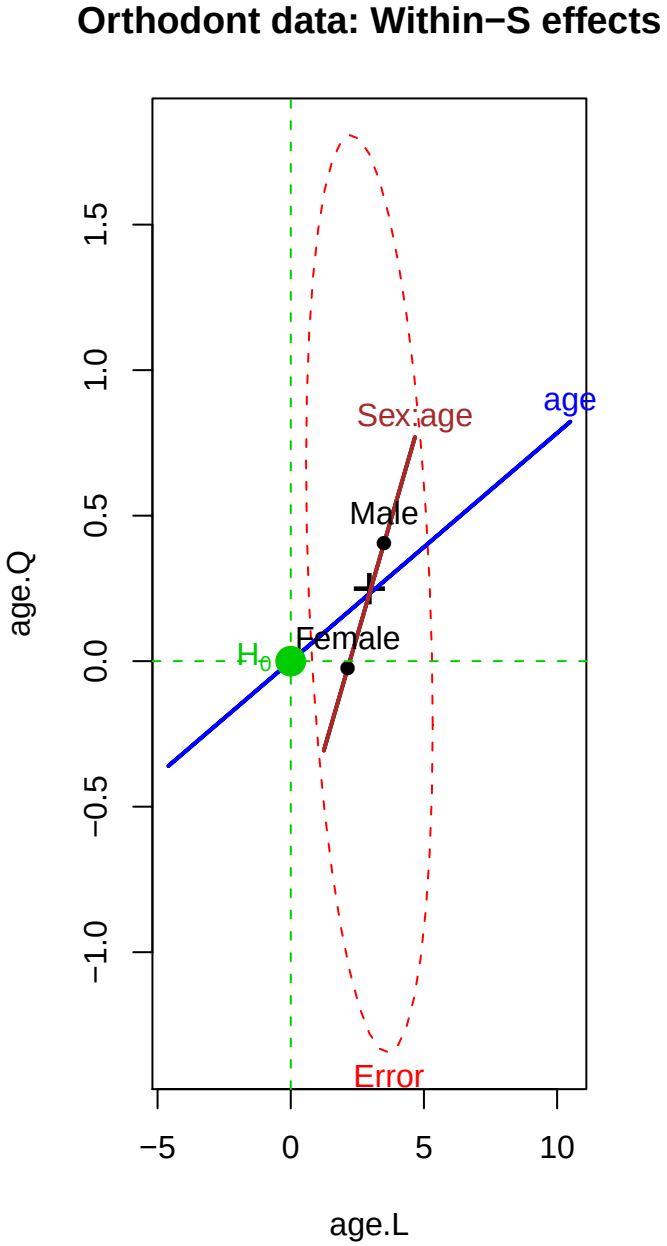

Pooled OLS and Individual linear regressions ~ age
Male
Female
distance
age
8
9
10
11
12
13
14
20
25
30

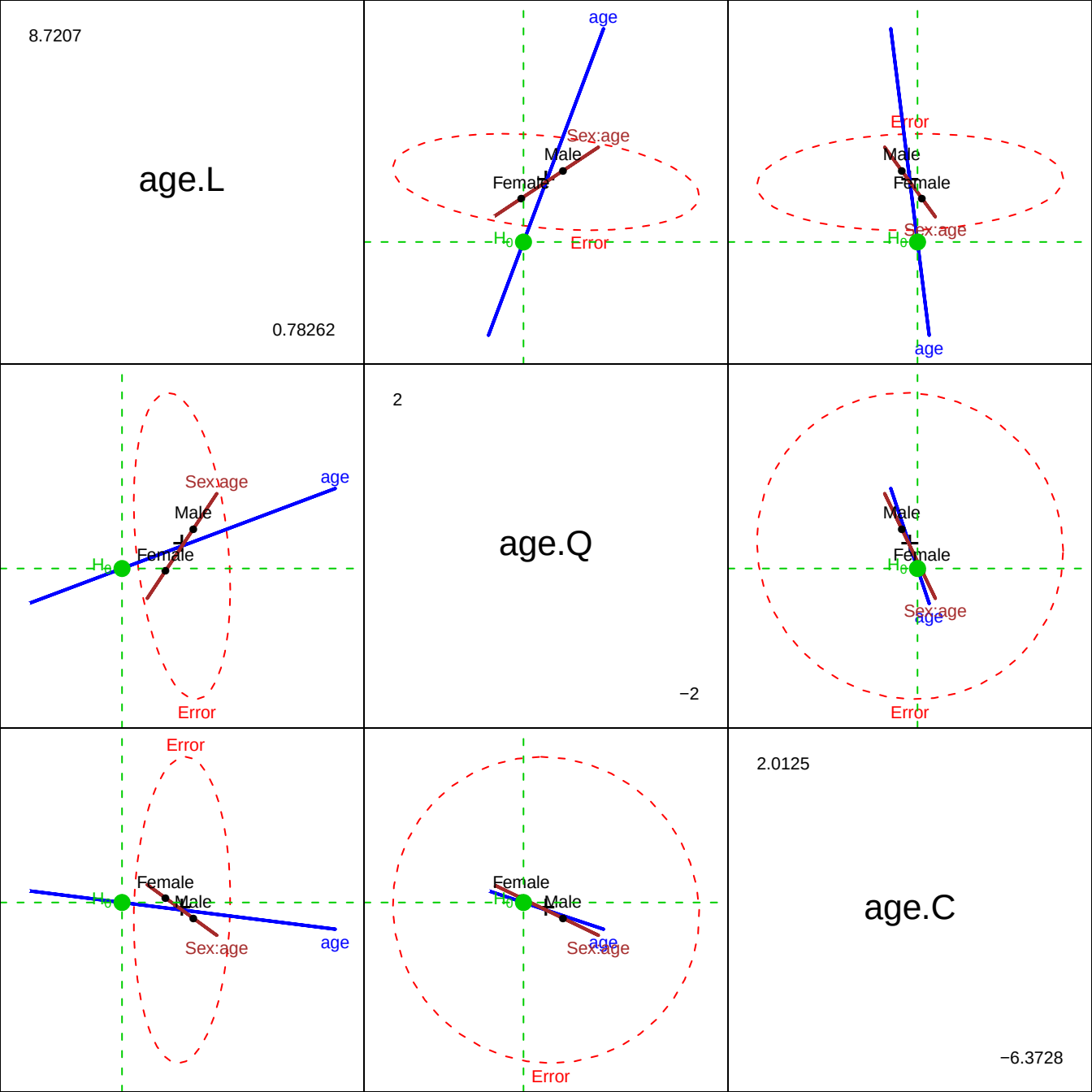

Linear mixed model: predicted growth
Male
Female
distance
27
26
25
24
23
22
21
8
9
10
11
12
13
14
age

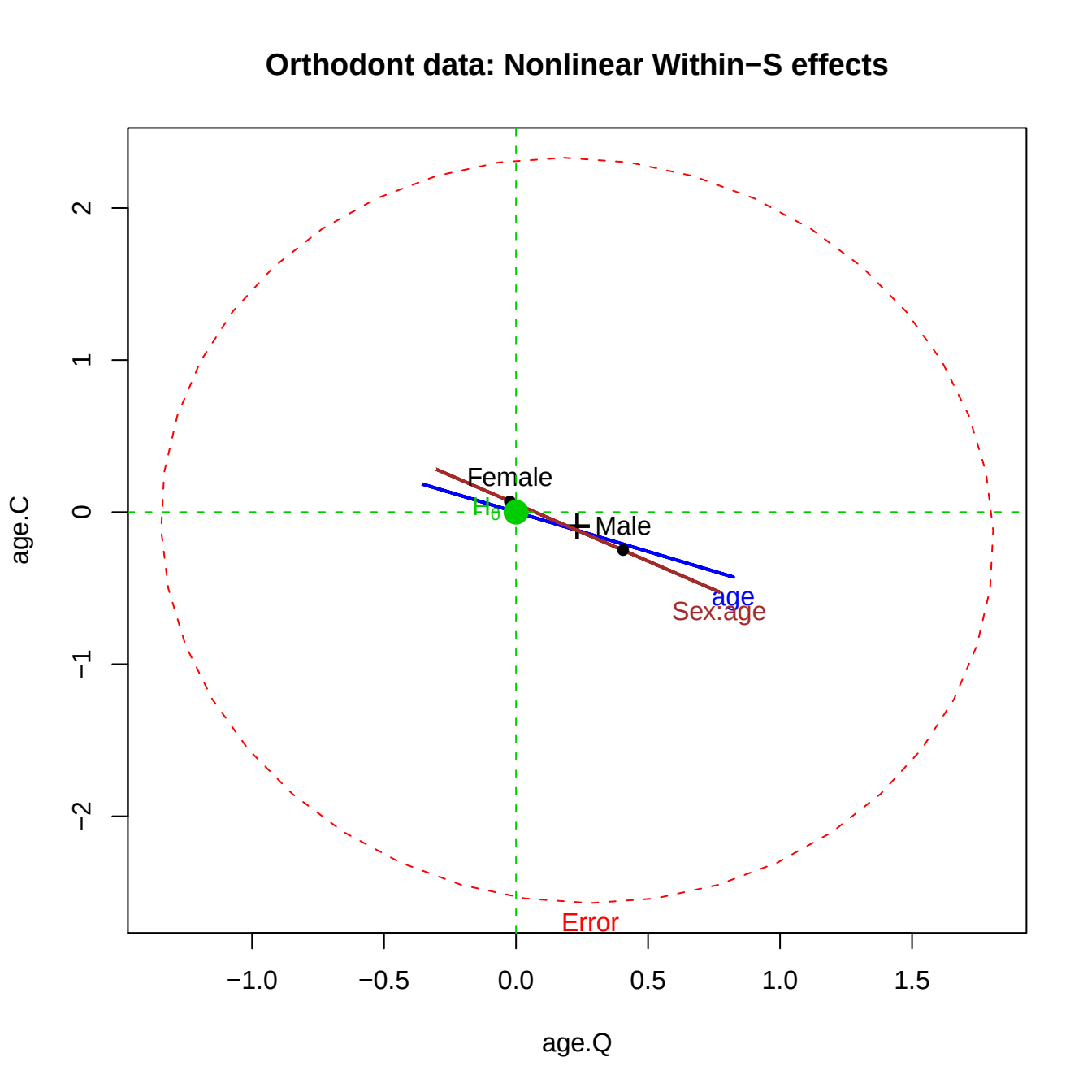

Linear mixed model: predicted growth
Male
Female
distance
27
26
25
24
23
22
21
8
9
10
11
12
13
14
age


Cubic mixed model: predicted growth
Male
Female
distance
27
26
25
24
23
22
8
9
10
11
12
13
14
age


Orthodont data: Sex effect
Sex
Error
Male
Female
distance.14
distance.8
10
15
20
25
30
35
18
20
22
24
26
28
30


Orthodont data: Within−S effects
age
Sex:age
Male
Female
H0
Error
age.Q
age.L
−1.0
−0.5
0.0
0.5
1.0
1.5
−5
0
5
10


8.7207
age.L
0.78262
age
Sex:age
Male
Female
H0
Error
Error
Male
Female
Sex:age
H0
age
Sex:age
age
Male
Female
H0
Error
2
age.Q
−2
Male
Female
H0
Sex:age
age
Error
Error
Female
Male
H0
Sex:age
age
Female
Male
H0
age
Sex:age
Error
2.0125
age.C
−6.3728


Orthodont data: Nonlinear Within−S effects
Female
H0
Male
age
Sex:age
Error
age.C
age.Q
2
1
0
−1
−2
−1.0
−0.5
0.0
0.5
1.0
1.5