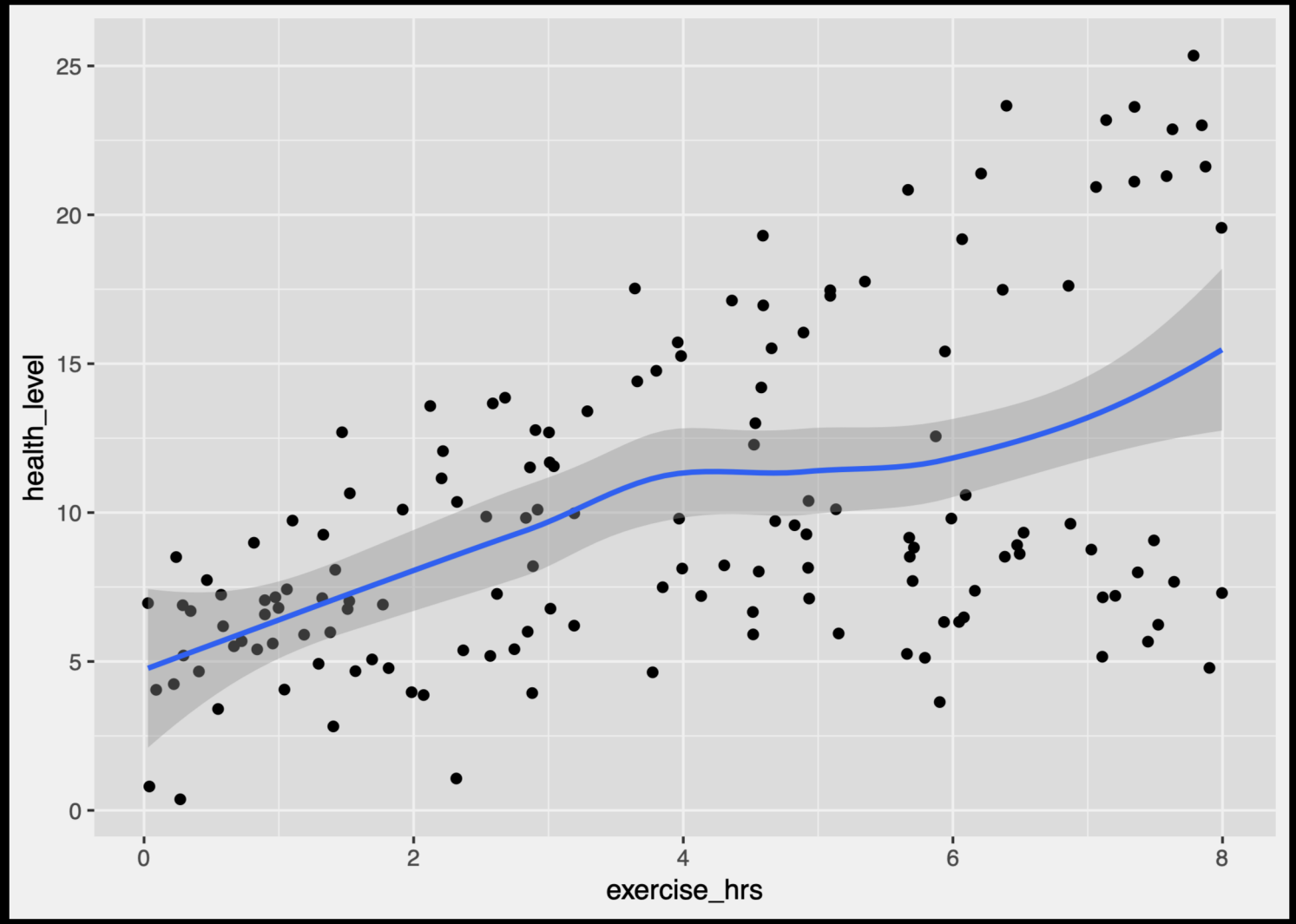
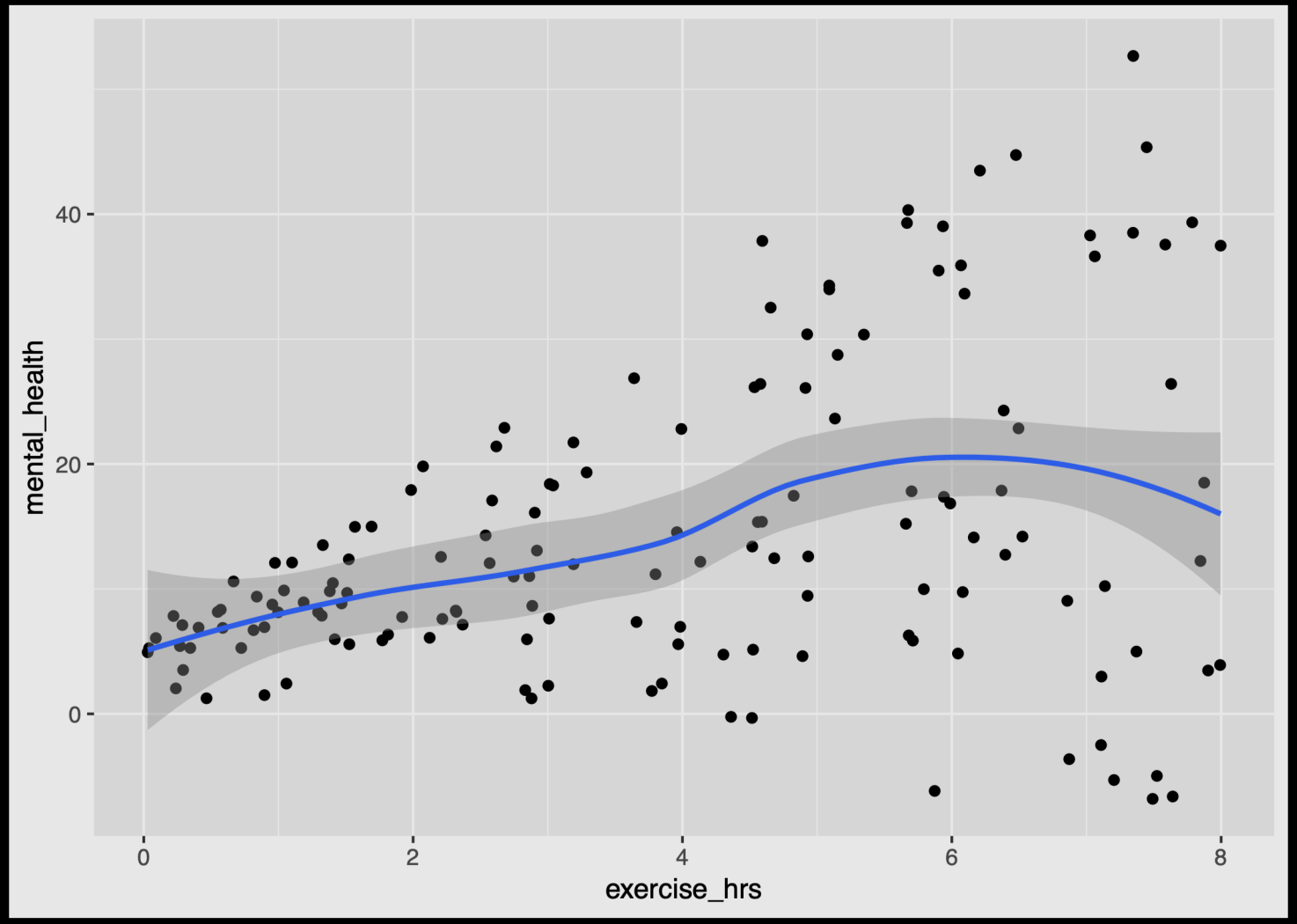
```r
health_data %>%
  ggplot(aes(x = exercise_hrs, y = health_level)) +
    geom_point() +
    geom_smooth()
```

What might be happening here?



```r
health_data %>%
  ggplot(aes(x = exercise_hrs, y = mental_health)) +
  geom_point() +
  geom_smooth()
```

What about here?



Let's try an interaction (continuous with binary)

```
## Physical Health
lm(health_level ~ exercise_hrs * sex + location + sleep, data = health_data) %>%
  jtools::summ(confint = TRUE,
               part.corr = TRUE)
lm(health_level ~ exercise_hrs * sex + location + sleep, data = health_data) %>%
  jtools::summ(confint = TRUE,
               part.corr = TRUE,
               scale = TRUE)
```

New package and function that prints out results nicely

Let's try an interaction

MODEL INFO:
Observations: 150
Dependent Variable: health_level
Type: OLS linear regression

MODEL FIT:
$F(7,142) = 140.16$, $p = 0.00$
$R^2 = 0.87$
Adj. $R^2 = 0.87$

Standard errors: OLS

Model information and fit

Coefficients

p-value

	Est.	2.5%	97.5%	t val.	p	partial.r	part.r
(Intercept)	7.20	6.49	7.92	19.98	0.00	NA	NA
exercise_hrs	1.13	0.70	1.56	5.24	0.00	0.40	0.16
sex	7.47	6.81	8.14	22.27	0.00	0.88	0.66
locationnowhere	-0.00	-0.97	0.97	-0.00	1.00	-0.00	-0.00
locationrural	-0.91	-1.84	0.02	-1.94	0.05	-0.16	-0.06
locationurban	-0.62	-1.56	0.32	-1.31	0.19	-0.11	-0.04
sleep	0.10	-0.23	0.43	0.60	0.55	0.05	0.02
exercise_hrs:sex	4.00	3.34	4.67	11.90	0.00	0.71	0.36

Continuous predictors are mean-centered &

partial correlation

Confidence intervals

Let’s try another interaction
(continuous with continuous)

```
## Mental Health
lm(mental_health ~ exercise_hrs * sleep + sex + location, data = health_data) %>%
  jtools::summ(confint = TRUE,
               part.corr = TRUE)
```

Let’s try another interaction
(continuous with continuous)

MODEL INFO:
Observations: 150
Dependent Variable: mental_health
Type: OLS linear regression

MODEL FIT:
$F(7,142) = 825.45$, $p = 0.00$
$R^2 = 0.98$
Adj. $R^2 = 0.97$

Standard errors: OLS

	Est.	2.5%	97.5%	t val.	p	partial.r	part.r
(Intercept)	7.57	5.27	9.87	6.50	0.00	NA	NA
exercise_hrs	-6.21	-6.67	-5.75	-26.66	0.00	-0.91	-0.35
sleep	-0.18	-0.43	0.08	-1.37	0.17	-0.11	-0.02
sex1	-0.23	-0.89	0.43	-0.70	0.49	-0.06	-0.01
locationnowhere	0.37	-0.58	1.32	0.77	0.44	0.06	0.01
locationrural	-0.01	-0.93	0.90	-0.03	0.98	-0.00	-0.00
locationurban	-0.70	-1.63	0.23	-1.49	0.14	-0.12	-0.02
exercise_hrs:sleep	1.05	1.00	1.11	37.74	0.00	0.95	0.49

We can assess this interaction using the following code

```
fit2 ← lm(mental_health ~ exercise_hrs * sleep + sex + location, data = health_data)
interactions::probe_interaction(fit2, pred = exercise_hrs, modx = sleep)
```

We can assess this interaction using the following code

JOHNSON-NEYMAN INTERVAL

When sleep is OUTSIDE the interval [5.71, 6.05], the slope of exercise_hrs is p < .05.

Note: The range of observed values of sleep is [4.03, 11.99]

SIMPLE SLOPES ANALYSIS

Slope of exercise_hrs when sleep = 10.36 (+ 1 SD):

Est.	S.E.	t val.	p
4.72	0.09	49.82	0.00

Slope of exercise_hrs when sleep = 7.98 (Mean):

Est.	S.E.	t val.	p
2.21	0.07	32.82	0.00

Slope of exercise_hrs when sleep = 5.60 (- 1 SD):

Est.	S.E.	t val.	p
-0.30	0.09	-3.18	0.00