

Exer 5.6

In the `swim100m.csv` data, the variables are

- `time`: World record time (in seconds)
- `year`: The year in which the record was set
- `sex`: Whether the record is for men or women.

Here are the coefficients from several different fitted models.

```
> lm( time ~ year, data=swim)
```

Coefficients:

```
(Intercept)      year
    567.2420    -0.2599
```

```
> lm( time ~ year+sex, data=swim)
```

Coefficients:

```
(Intercept)      year      sexM
    555.7168    -0.2515    -9.7980
```

```
> lm( time ~ year*sex, data=swim)
```

Coefficients:

```
(Intercept)      year      sexM year:sexM
    697.3012    -0.3240  -302.4638     0.1499
```

```
> lm( time ~ sex, data=swim)
```

Coefficients:

```
(Intercept)      sexM
     65.19      -10.54
```

For each of the following, pick the appropriate model from the set above and use its coefficients to answer the question.

- How does the world record time typically change from one year to the next for both men and women taken together?

-302.4 -10.54 -9.79 -0.2599 -0.2515 -0.324 -0.174 [Exer 5.6-1](#)

- How does the world record time change from one year to the next for women only?

-302.4 -10.54 -9.79 -0.2599 -0.2515 -0.324 -0.174 [Exer 5.6-2](#)

- How does the world record time change from one year to the next for men only?

-302.4 -10.54 -9.79 -0.2599 -0.2515 -0.324 -0.174 [Exer 5.6-3](#)