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Interactions

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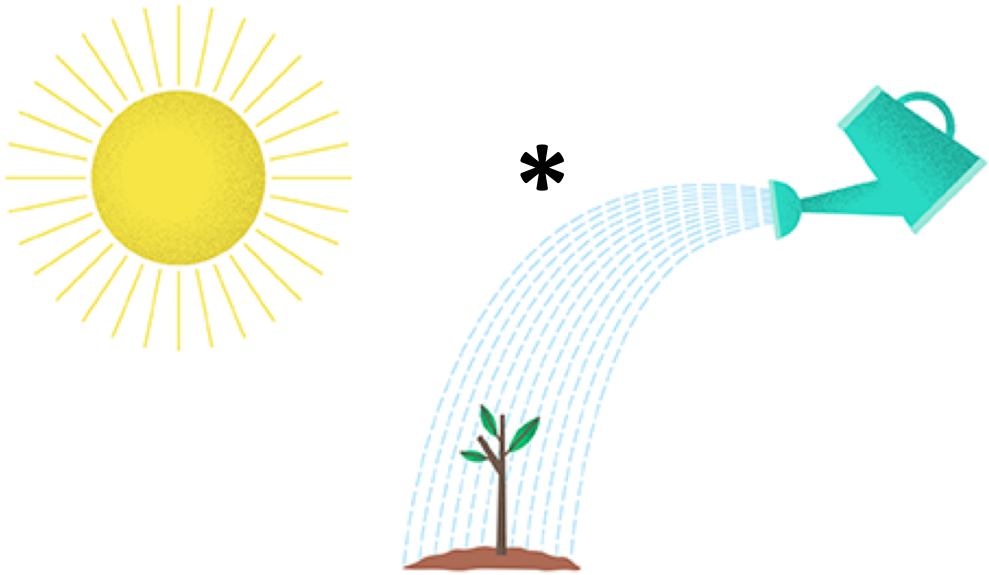
The concept of interaction



$$y = b_0 + b_1 x_1 + b_2 x_2$$

$$y = b_0 + b_1 x_1 + b_2 x_2 + b_3 (x_1 * x_2)$$

An example: Iconicity (again)

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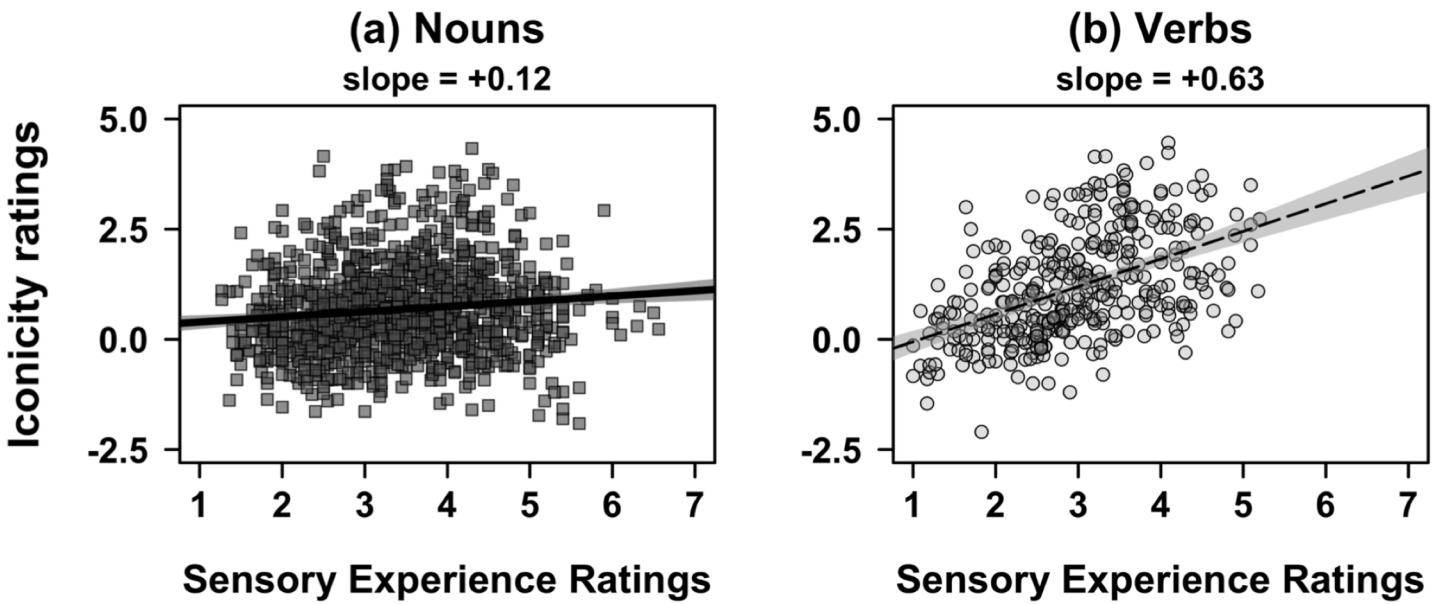
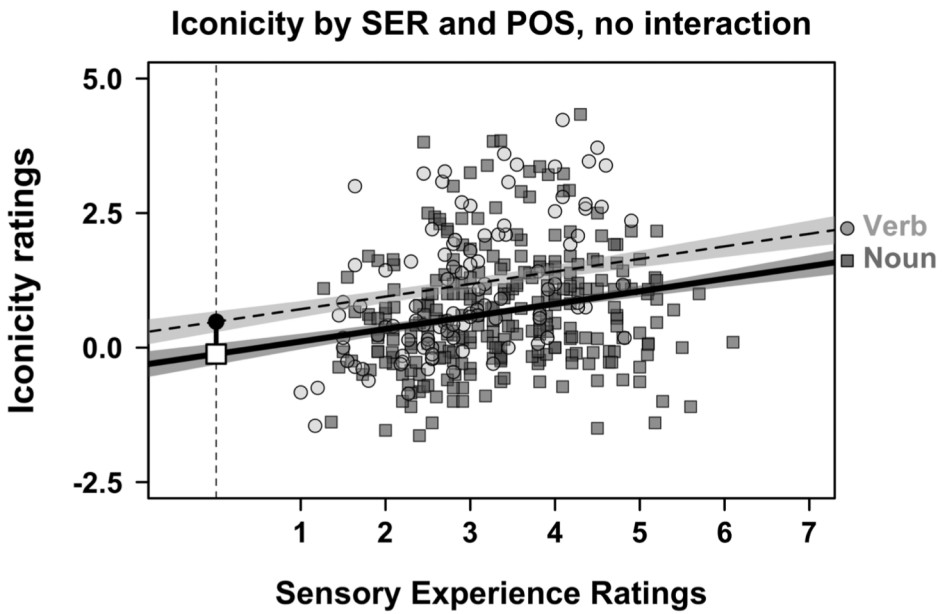


Model without interaction term

```
NV_mdl <- lm(Iconicity ~ SER + POS, data = NV)
```

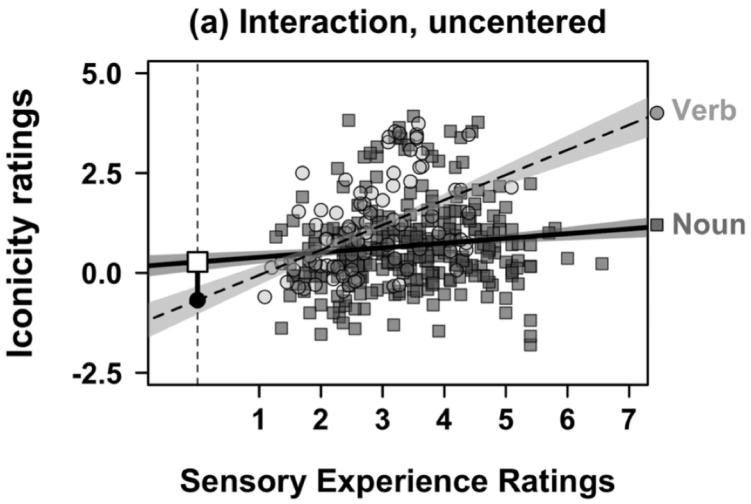


	term	estimate
1	(Intercept)	-0.1193515
2	SER	0.2331949
3	POSVerb	0.6015939

Model with interaction term

```
NV_int_mdl <- lm(Iconicity ~ SER * POS, data = NV)
```

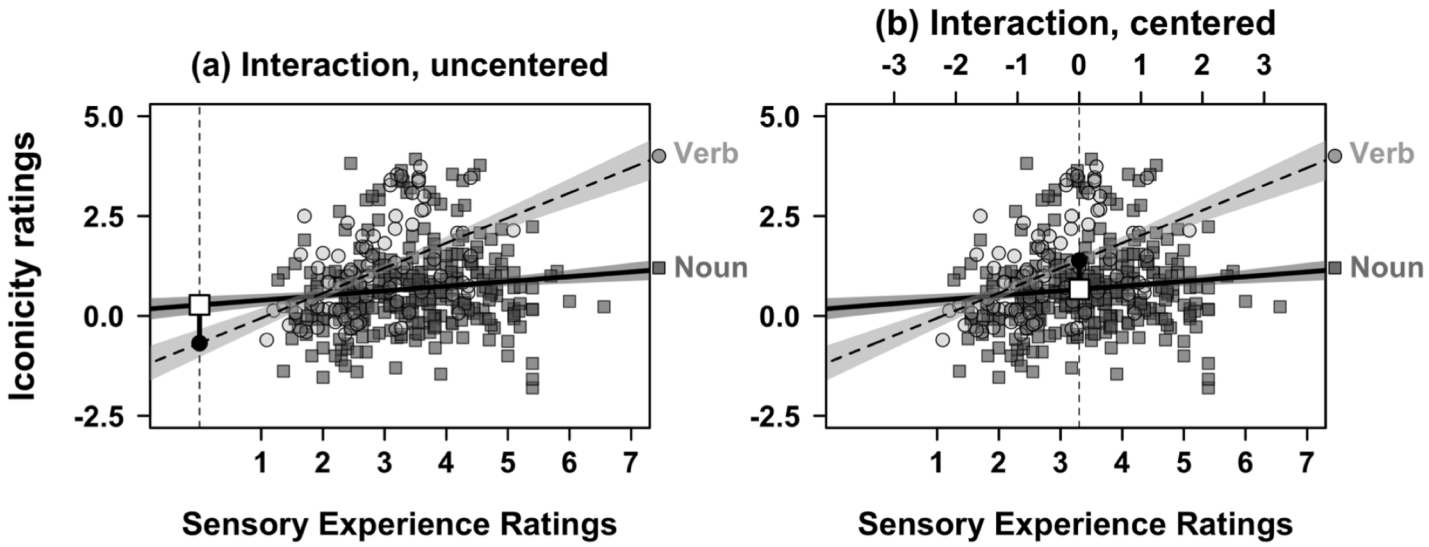
```
          term    estimate
1  (Intercept)   0.2739423
2          SER   0.1181651
3      POSVerb  -0.9554158
^ SER:POSVerb   0.5083802
```



Model with interaction term (centered)

```
          term    estimate
1  (Intercept)   0.2739423
2          SER   0.1181651
3      POSVerb  -0.9554158
4  SER:POSVerb   0.5083802
```

```
          term    estimate
1  (Intercept)   0.6642298
2        SER_c   0.1181651
3      POSVerb   0.7237133
4  SER_c:POSVerb   0.5083802
```



Alternative ways of specifying interactions

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```
lm(iconicity ~ SER * POS, data = NV)
# Same as:
lm(iconicity ~ SER + POS + SER:POS, data = NV)
```

Summary

- Interaction: describes a situation where the influence of a predictor on the response depends on another predictor.

$$y = b_0 + b_1 x_1 + b_2 x_2 + b_3 (x_1 * x_2)$$

```
lm (y ~ x1*x2, data)
lm (y ~ x1 + x2 + x1:x2, data)
```

- If in doubt, center.
- If interaction significant, can't interpret predictors in isolation anymore.
- Slope for interaction can be seen as a 'slope adjustment term' when you move from one category to the next