

Extending material

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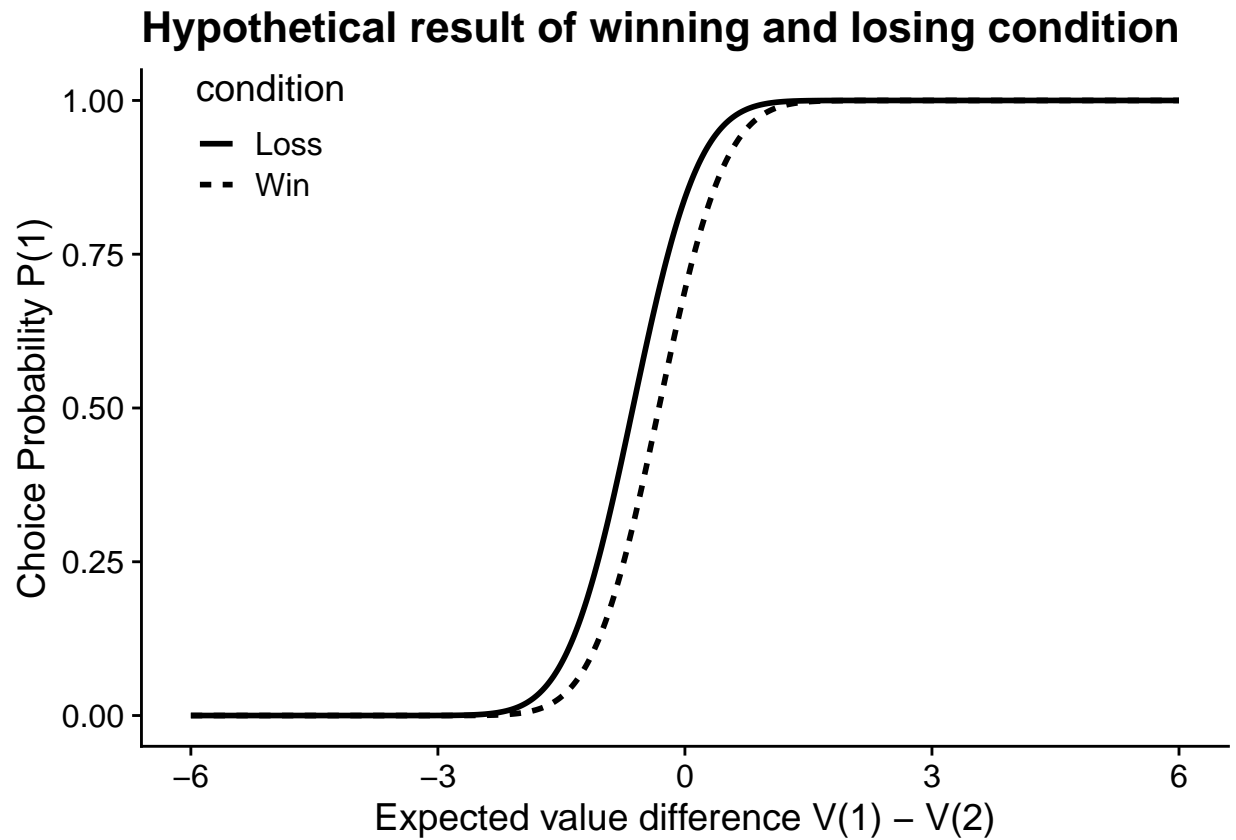
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Expected results

Conditions

I supposed that losing condition will lead to more direct exploration. That will yield a result that higher w_2 in losing condition than in winning condition.

However, I am not really sure about whether we should suppose it, especially, when we control the risk aversion. It has a fair chance that the framing effect (winning/losing condition) have nothing to do with exploration.



As previous study found that the relative risk in RR condition will be close to 0, I supposed there will be a different intercept between SR and RR condition. The TU is set to the real value of variance in the population. Based on the definition of TU: $TU = \sqrt{(\sigma_1^2 + \sigma_2^2)}$, in our experiment, the TU in RR is actually smaller than in SR condition. The TU is SR is

```
rr <- c(-1,-1,-1,0,0,0,0,0,0,1,1,1)
sr <- c(1,2,3,3,4,4,4,4,5,5,6,7)
V_rr <- var(rr) * 12/11 # using the variance of the population instead of the unbiased estimator
V_sr <- var(sr) * 12/11
sqrt(V_sr + 0)
```

```
## [1] 1.724879
```

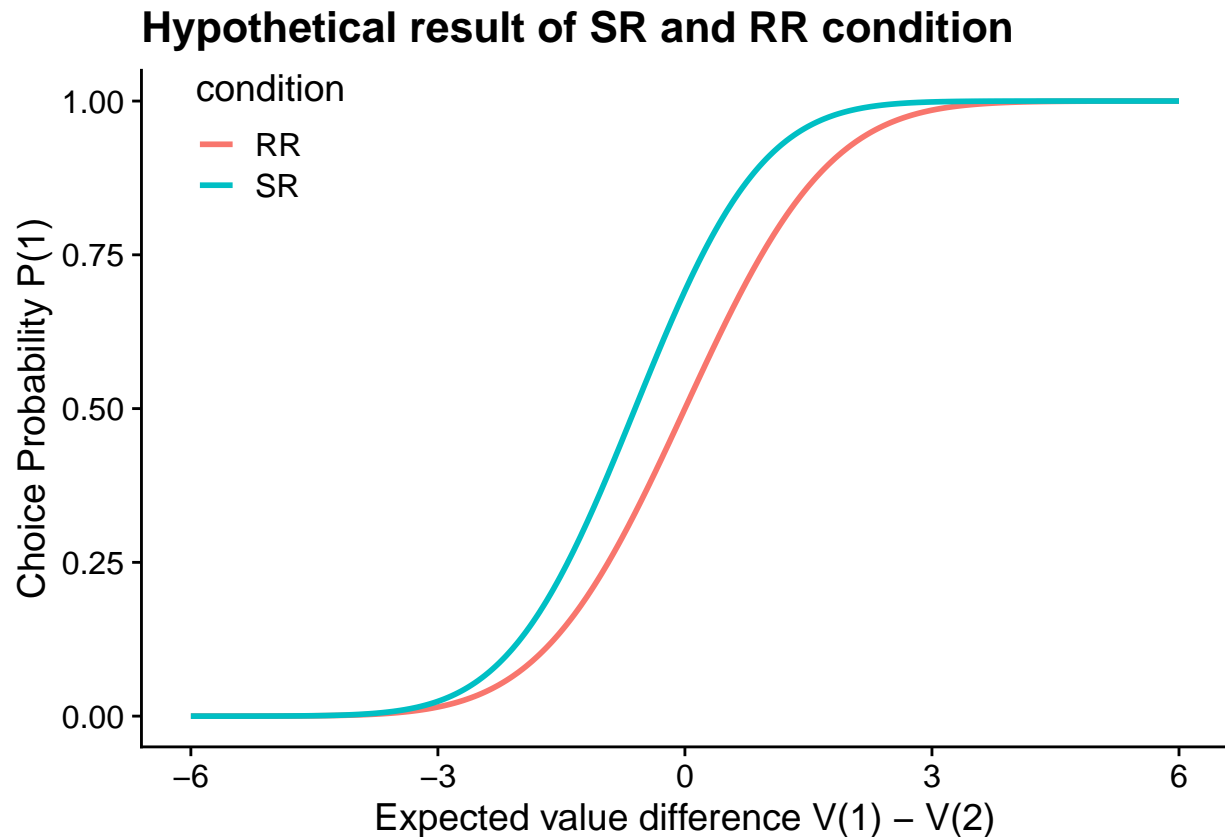
Whereas the TU in RR is

```
sqrt(2 * V_rr)
```

```
## [1] 1.090909
```

Those are not real TU, as the TU should be estimated during subjects' decision making. However, it is a little bit tricky to explain the setting. We may need to discuss it later. For now, I will use the real value of variance in the population in the following simulation.

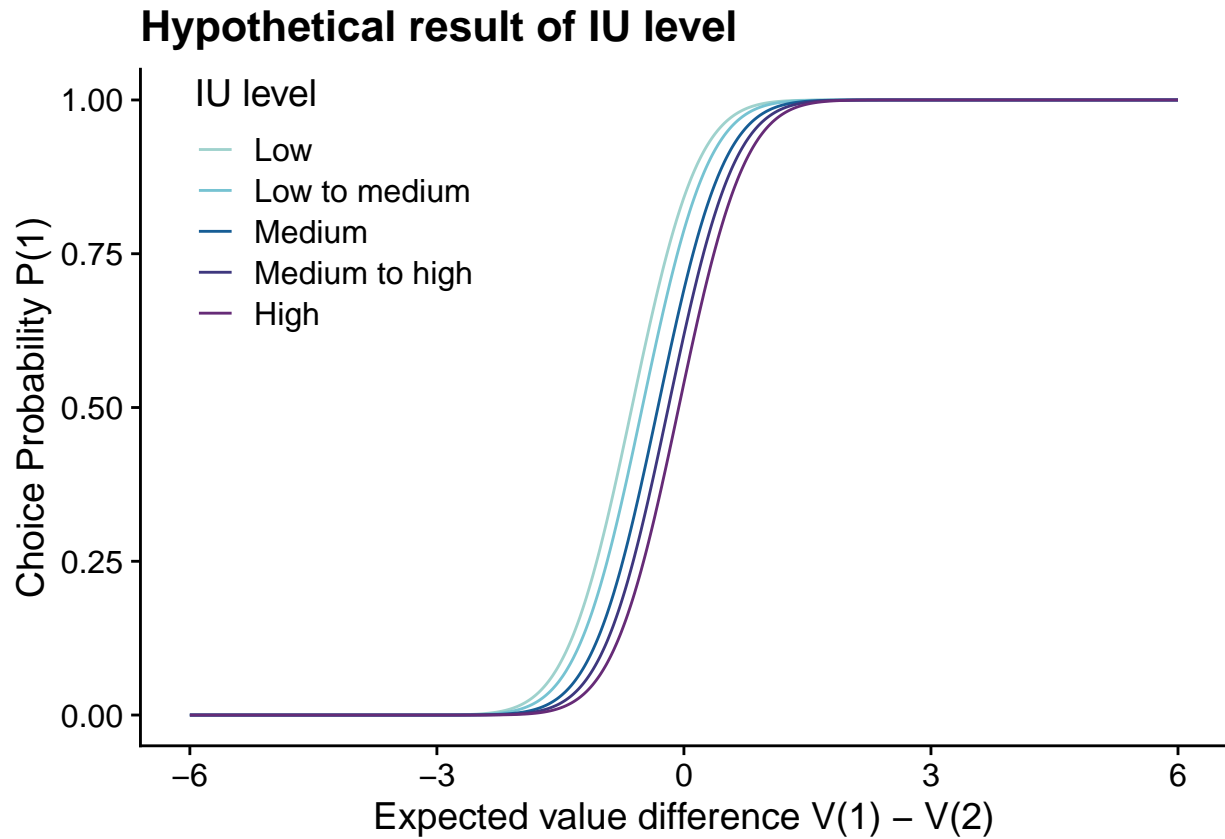
I setted same w_3 for RR and SR. However, the slop is different due to the different TU.



Individual difference

Intolerance of Uncertainty (IU)

H1: High IU lead to less direct exploration



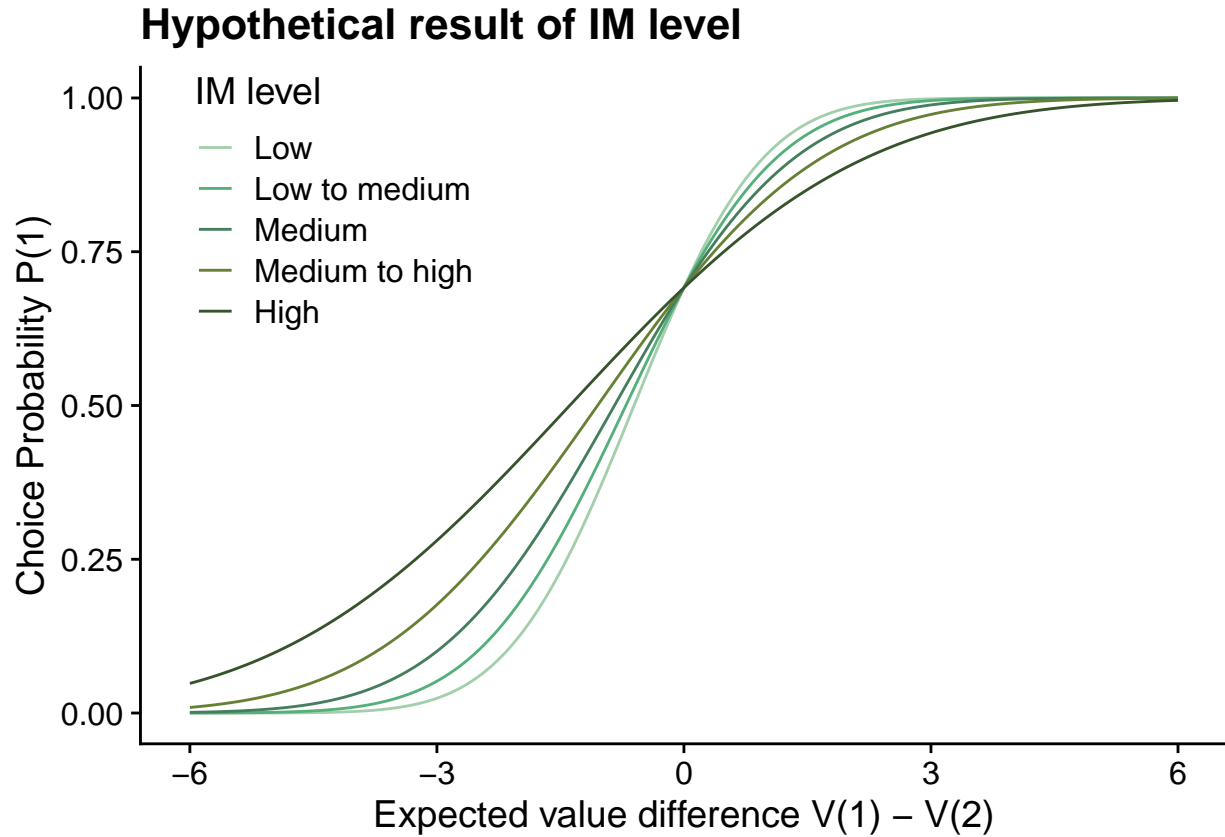
Impulsiveness (IM)

H2: High IM will lead to more random exploration

Notice: the sign of w_3 is changed to negative.

The hybride model is a function with 3 variables, the w_3 is actually a slop of the totel uncertainty (TU). By fixed the TU, the comparison of w_3 will be anti-intuitive. A higher w_3 will lead to a steep slop of value. Therefore, for convenience, I changed the sign of w_3 .

Please let me know if you have any suggestions.

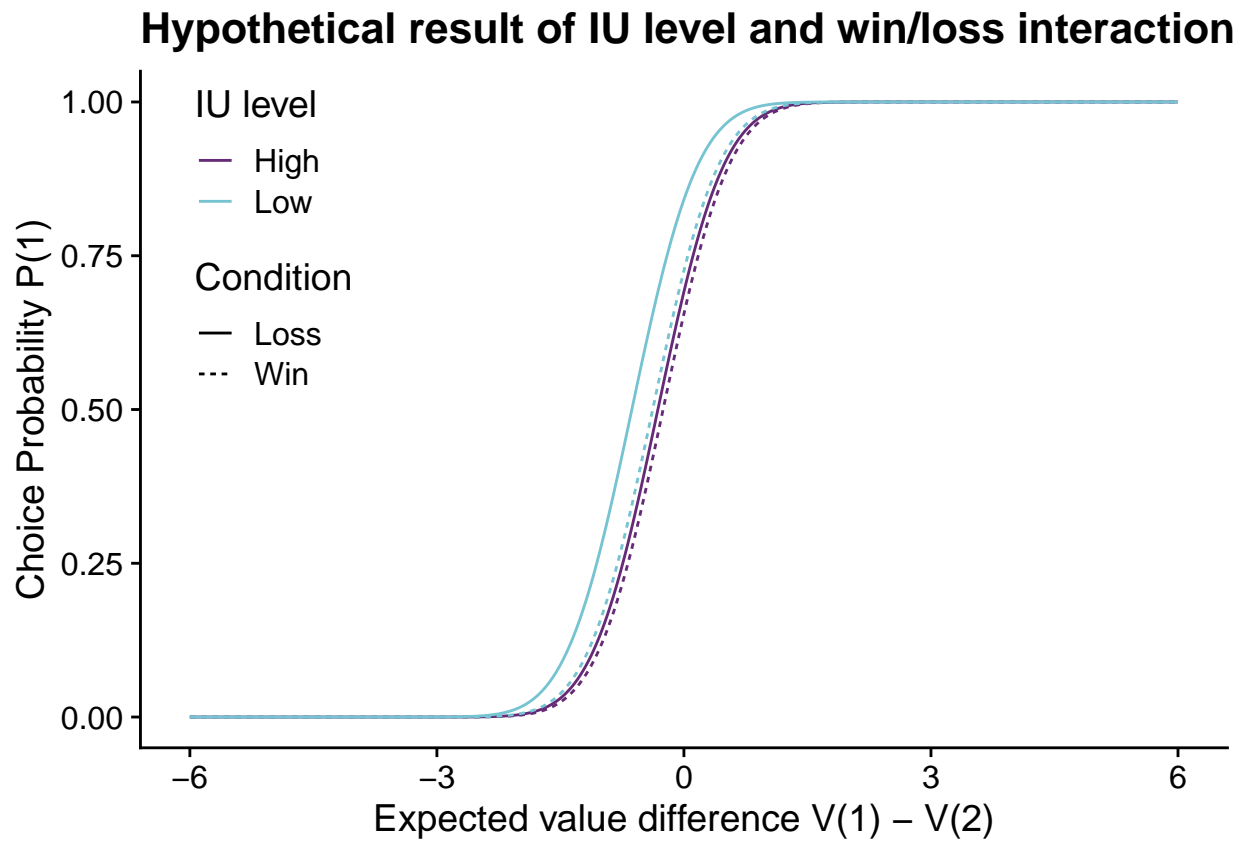


Interactions

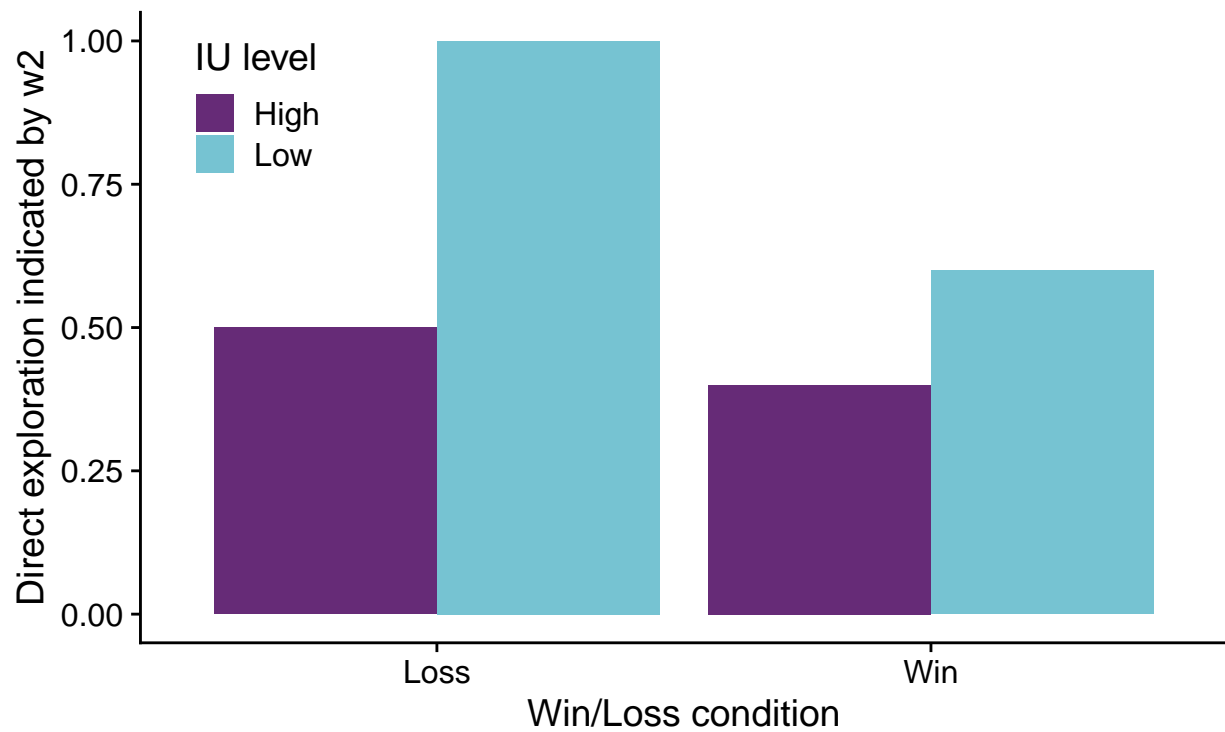
IU x Win/Loss

H3: In loss condition, participants with lower IU will show a similar level of direct exploration compared to participants with higher IU. In win condition, participants with lower IU will show a greater increase in direct exploration compared to participants with higher IU.

Although I lack of the evidence to support the hypothesis of framing effect, there are some evidence support the interaction between IU and win/loss condition. As the IU is supposed to show overestimation of the probability of negative events, the losing condition will lead to more direct exploration.

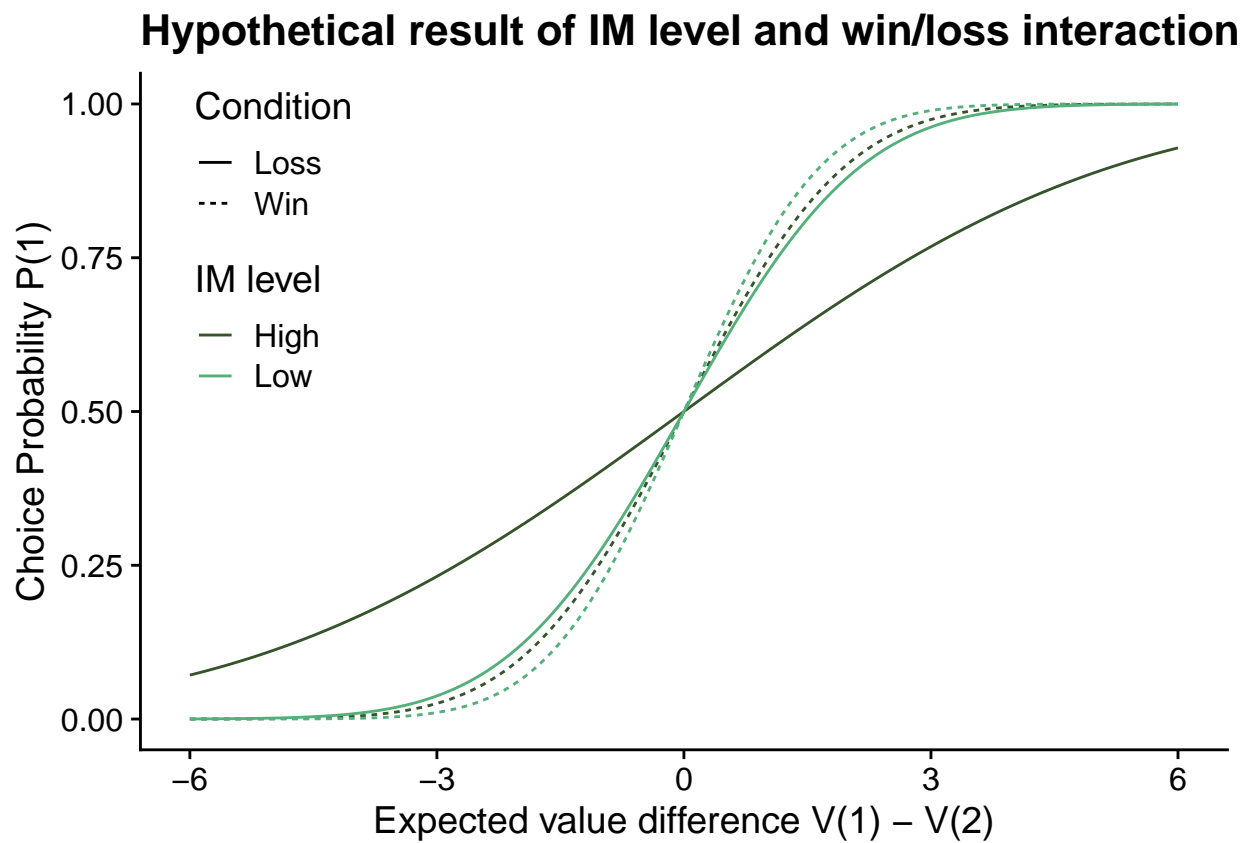


Hypothetical result of IU level and win/loss interaction indicated by parameter



IM x Win/Loss

H4: In win condition, participants with higher IM will show a small higher random exploration compared to participants with lower IM. In loss condition, participants with higher IM will show a greater increase in random exploration compared to participants with lower IM.



Hypothetical result of IM level and win/loss interaction indicated by parameter

