**Affect-as-Information (AI) Decision-Diffusion Model**

Emotion will primarily affect the rate of evidence accumulation (drift rate) for either an EMOTIONAL or NON-EMOTIONAL decision.

The intensities of each face stimulus in an array will be converted from intensity to evidence for a decision. We are defining emotional intensity as the evidence that is being accumulated in this model. In the case that the subject decides that an array is EMOTIONAL, low intensities will count as less evidence than high intensities. Likewise, if the subject decides that an array is NON-EMOTIONAL, low intensities will count as more evidence than high intensities. This conversion will be as follows\*:

( 1 )

Where the evidence provided by a stimulus with intensity , , is equal to when an EMOTIONAL decision is made, and when a NON-EMOTIONAL decision is made. is a monotonically **increasing** function, such that the informativeness of increases exponentially with intensity. A larger indicates **more** evidence per unit of intensity. Likewise, is a monotonically **decreasing** function, such that the informativeness of decreases exponentially with intensity. A larger indicates **less** evidence per unit of intensity. Last, is a salience weight, such that stimuli with smaller absolute are considered less as evidence.

After converting intensities to evidence, all evidences will be summated. Note that the decision type D will determine whether this sum is positive or negative. Consequentially, there will be either a positive drift toward EMOTIONAL, or a negative drift toward NON-EMOTIONAL:

( 2 )

Where is a stochasticity weight, such that people with smaller absolute are more stochastic in their choices. The parameters and will be free to vary between face identity (black vs. white) and face valance (happy vs. angry). Other standard DDM parameters (threshold), (initial bias), and (non-decision time), as well as (stochasticity weight) will be free to vary between valance.

**Some questions that can be answered with this model:**

1. Are black faces considered more emotional than white face?
   1. If we see that is greater for black faces than white faces, yes, black faces contributed more evidence for EMOTIONAL per unit of intensity than white faces.
   2. If we see that is greater for black faces than white faces, yes, black faces contributed less evidence for NON-EMOTIONAL per unit of intensity than white faces.
   3. Follow this logic, we can similarly test whether black faces are more emotional in high vs. low ratios.
2. Are angry arrays considered more emotional than happy arrays?
   1. If we see that β is greater for angry arrays than happy arrays, yes, angry faces contributed more evidence for EMOTIONAL per unit of intensity than happy faces.
   2. If we see that is greater for angry arrays than happy arrays, yes, angry faces contributed less evidence for NON-EMOTIONAL per unit of intensity than happy faces.

\* Note: I’m naming this model after affect-as-information theory, since I think it has the most insight into the conversion of emotion to evidence for decision-making, but I’ve drawn inspiration from Prospect Theory’s value function for formulating the conversion.

**Variation 1 – Dynamic Thresholds:**

In this variation, we will also allow the threshold parameter to be modulated by the total amount of evidence available in an array. Since can be thought of as the relative emphasis on speed vs. accuracy, we can imagine that arrays with more information that could be taken as strong evidence for either decision (EMOTIONAL or NON-EMOTIONAL) would require more evidence before reaching either decision. As such, subjects will consider the difference in evidence under both models:

( 3 )

On each trial, will be adjusted according to this difference:

( 4 )

Where is some fixed threshold value that is baseline fore each subject, and is a modulator reflecting subject-specific sensitivity to the difference in evidence. Larger will mean that subjects will more greatly increase their thresholds with more equivocal evidence.