I believe the additional constant that we're adding (k) to the range normalized aDDM makes it so that the aDDM is simultaneously multiplicative and additive, like how we were discussing during out last meeting. Explanation:

Suppose DM is looking left:

Where

If we write it out like this, then drift looks like a combination of a multiplicative and an additive form of attentional bias.

And similarly, if the DM is looking right, then

Notice that

Let . Then,

So range normalization is its own thing, but if we include an additional parameter that shifts the starting point for range normalization, it’s as if we are combining a range normalized multiplicative model with an additive model of attention.