Data exploration given PL&PP correlations

13 Nov 2015

Headline/Conclusions/Next steps ***

- Yes, there is a good PP effect on choice that we can go look for
  - Do NOT just use residuals in place of the PP scores – because, this induces anticorrelation between PL and PP on IC trials

- **Approach**: Use PP scores as is, but always check that you get the same qualitative pattern using the PP-residuals ***

- Practically, we may struggle to demonstrate an effect of PP
  - even if PL-exclusive strategies are only deployed on IC trials, I worry that a PL-exclusive strategy will explain CC trial data sufficiently well (even approximately, if not accurately/actually) that non-PL-exclusive strategies will be overwhelmed in the model comparison (since they will require a doubling of free parameters)

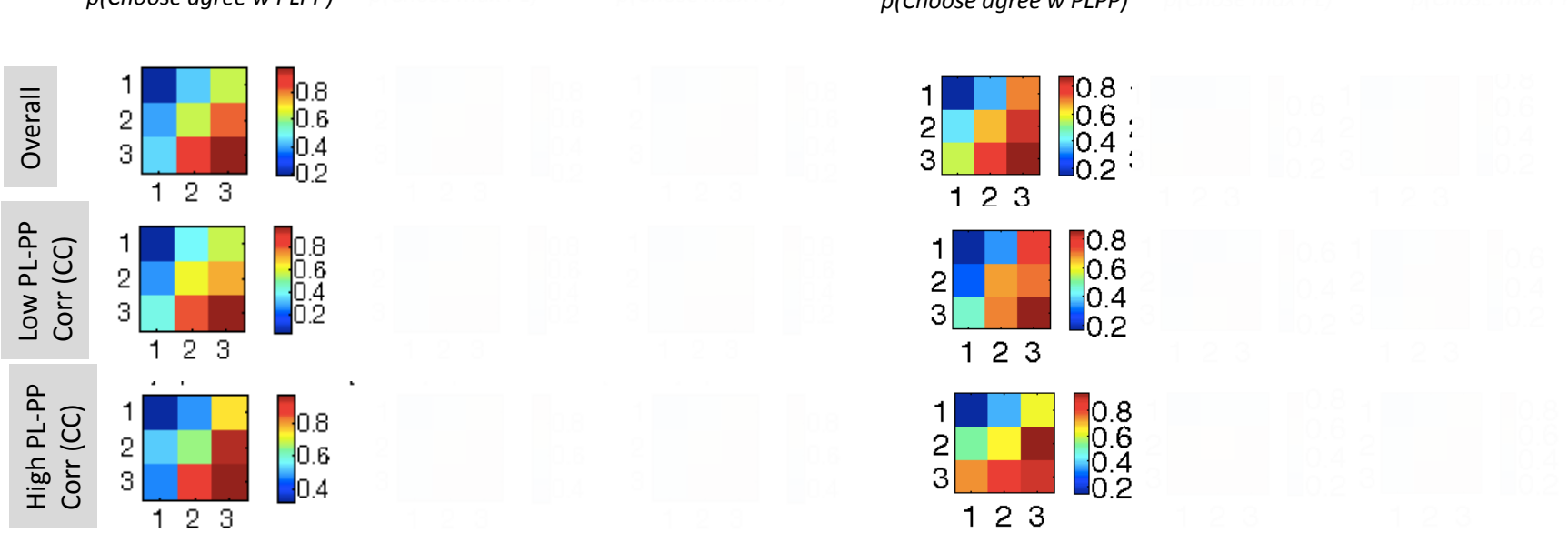
PL & PP scores are inherently correlated, and some of the observed pattern emerges from a PL-exclusive strategy

[CC] Binned according to VChosen

Choose-PL (stochastic) simulations

Here, stochastic sims have draws deleted

Observed choice



- CC trials: PL & PP are correlated within subject (mean r=.62, SD=0.05)
- Simulating a PL-exclusive strategy produces **Apparent Variance as a Function of** (AVFo) PP
- But, the o*bserved* AVFo-PP is greater than what one would see with a PL-exclusive strategy

→ There is an effect of PP to look for, but we may be slightly hamstrung (possibly as a fxn of PL-PP correlation)

PP artificially decorr from PL

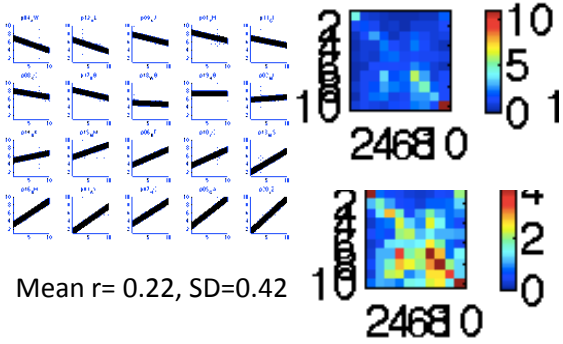
PL & PP de-correlation is performed on all trials (not just CC vs IC). PL are the residuals after regressing out PL.

All trials

Compatible Choice trials

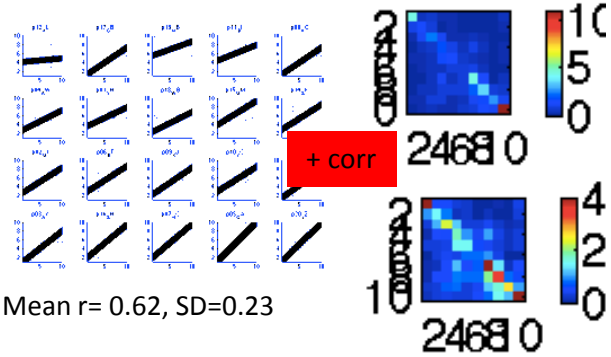
Incompatible Choice trials

Original

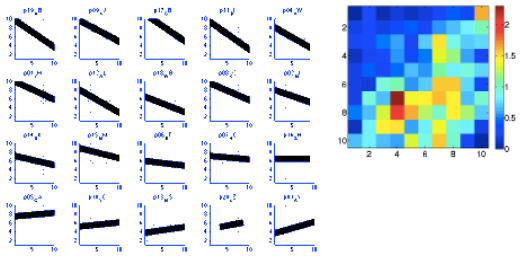


Mean r= 0.22, SD=0.42

+ corr

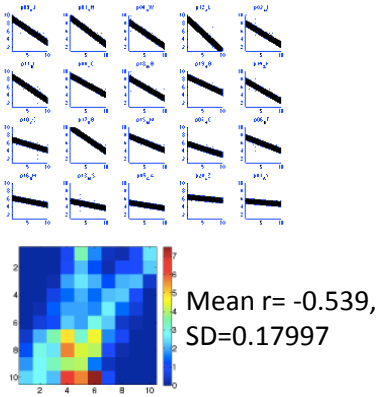


Mean r= 0.62, SD=0.23

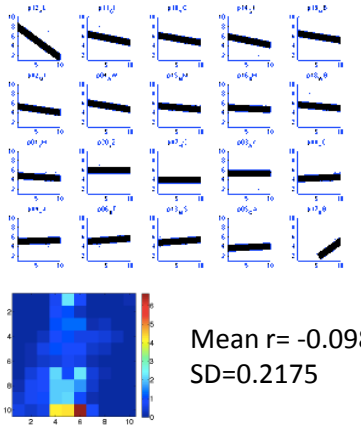


Mean r= -0.2603, SD=0.31046

After decorrelation

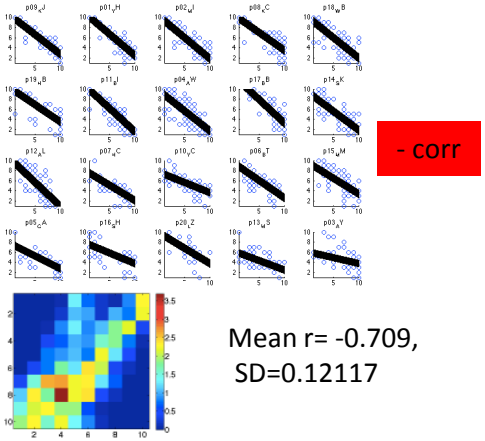


Mean r= -0.539, SD=0.17997



Mean r= -0.098, SD=0.2175

- corr



Mean r= -0.709, SD=0.12117

- Can't just stick with the residuals of PP (after PL regressed out) – because this effectively induces anticorrelation between PL & PP in the IC trials
- Suggested approach: conduct analysis on raw scores (i.e. not PP residuals), but check for the qualitatively same pattern using the residuals
- Note: on CC trials, a PL strategy may do fairly well on CC trials *because* PL is also predictive of PP.

PP = residuals after PL is regressed out

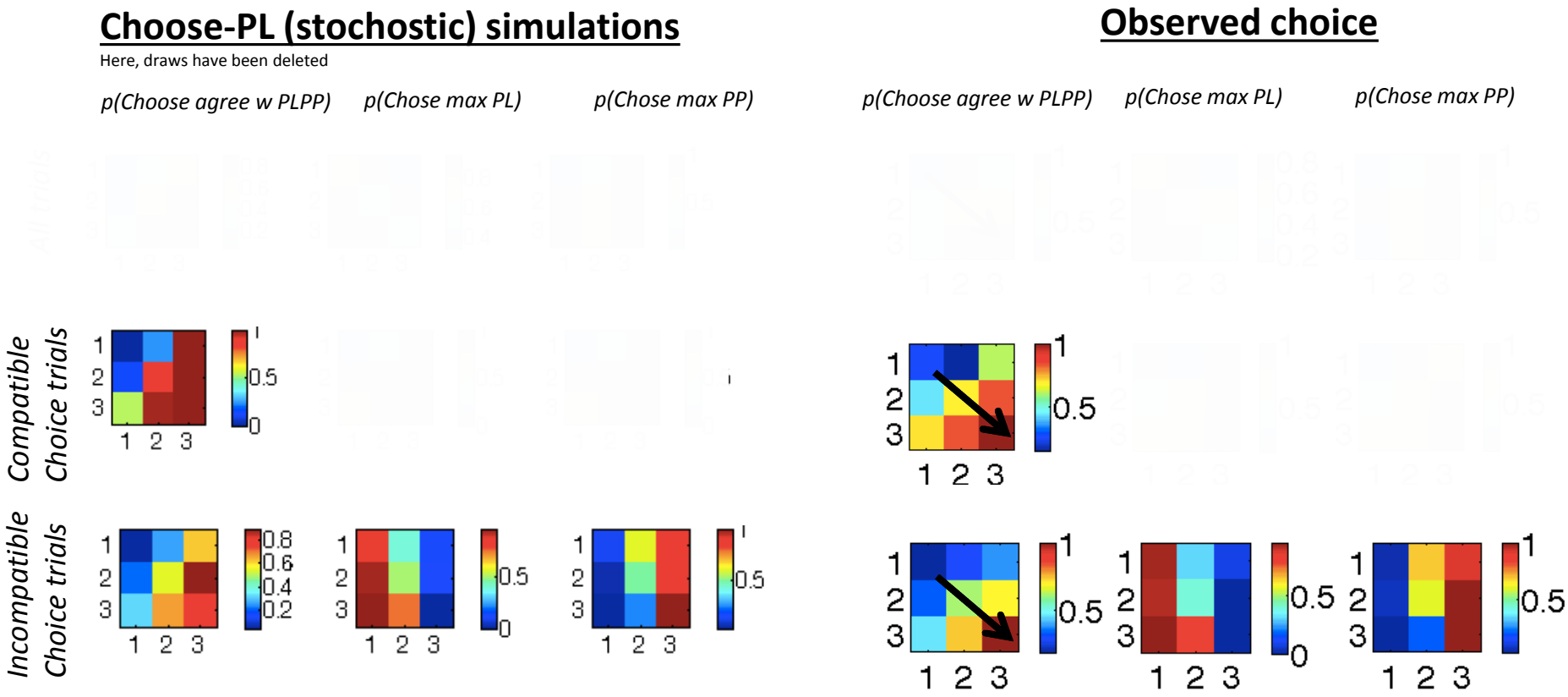
(rescaled from 1-10 & rounded)

[All trials] Binned according to VChosen

Choose-PL (stochostic) simulations

Here, draws have been deleted

Observed choice



- If PL is regressed out of PP, there is still AVFo-PP (where PP=residuals after PL regressed out). i.e. Yes, PP is having a real effect
- But, with a stochastic simulation, a PL-exclusive strategy still somewhat produces AVFo-PP (residual PL-PP corr?)
  - Note that a deterministic simulation doesn't produce this effect. May be residual PL-PP correlation driving the AVFo-PP

PP = residuals after PL is regressed out

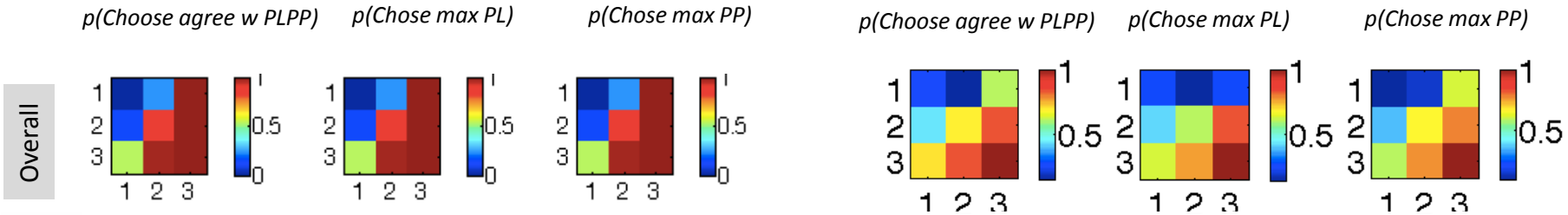
(rescaled from 1-10 & rounded)

[CC] Binned according to VChosen

Choose-PL (stochastic) simulations

Here, stochastic sims have draws deleted

Observed choice



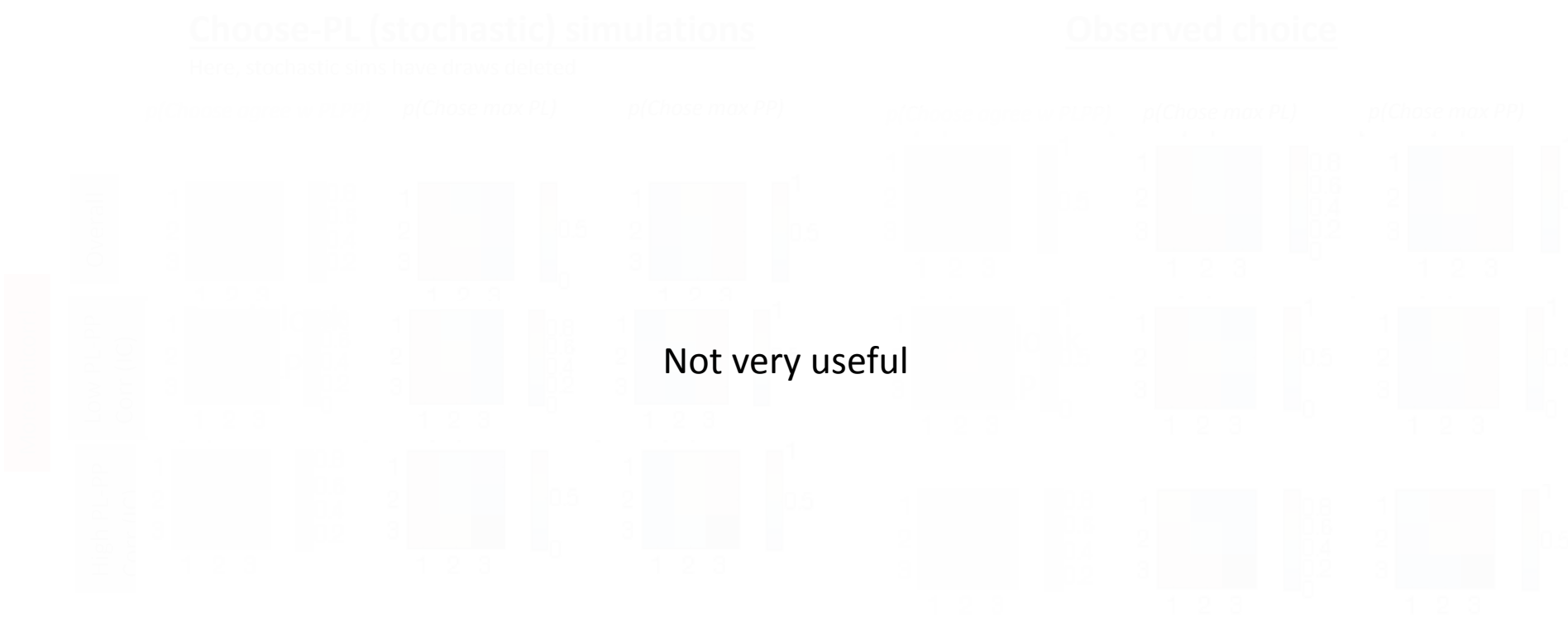
Overall, PL & PP are not very correlated (after PL is regressed out of PP).
So, no need to look at the median split according to PL-PP correlation

- Is there a greater AVFo-PP in behaviour, compared to the AVFo-PP from choosing PL?
  - Pattern here is hard to discern.
- Median split PL-PP correlation is now determined on PL-PP corrs after PP has had PL decorr from it. Low corr: mean r=-0.06, High corr, mean r=0.39

PP = residuals after PL is regressed out

(rescaled from 1-10 & rounded)

[IC] Binned according to VChosen



Not very useful

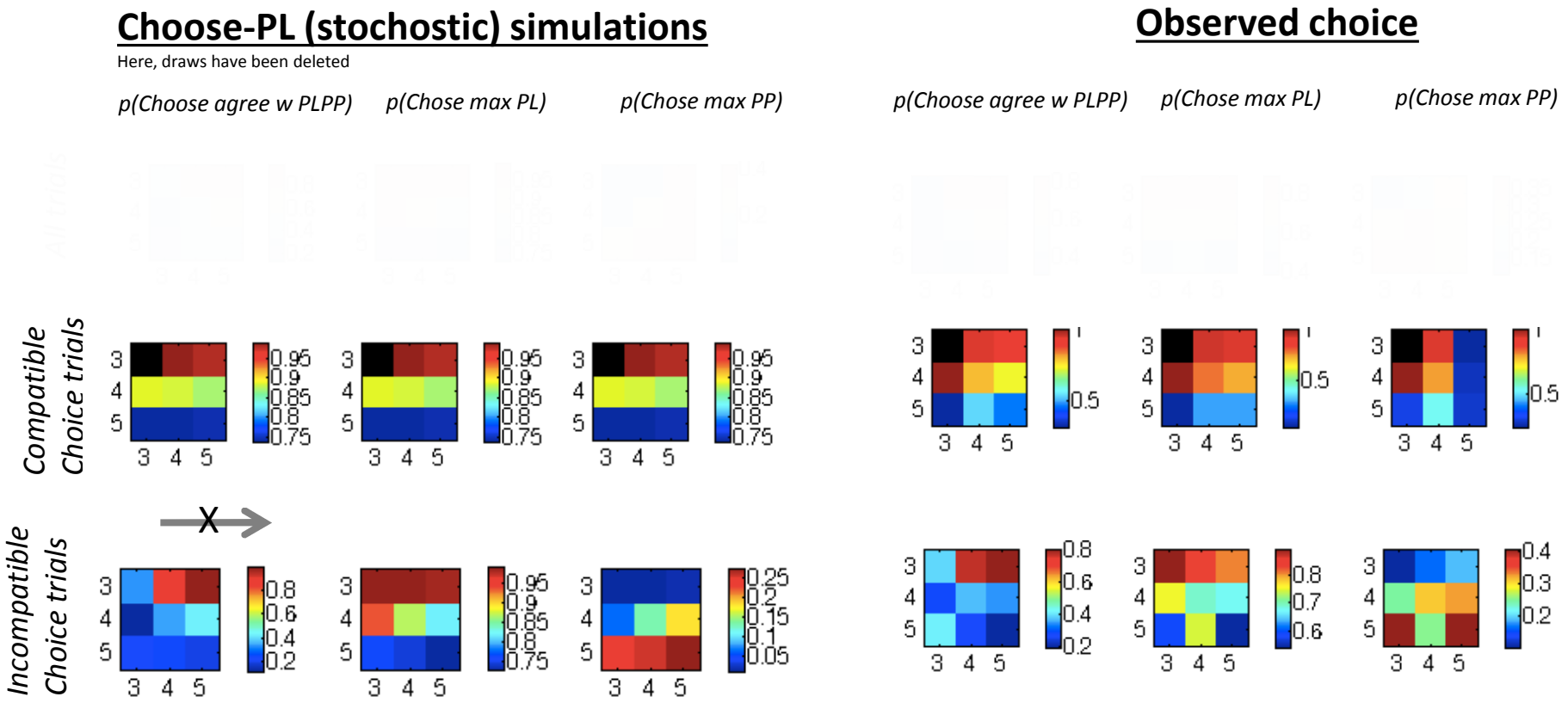
- PL & PP are anticorrelated here.
- Median split PL-PP correlation is now determined on PL-PP corrs after PP has had PL decorr from it.

Binned according to cf

PP = residuals after PL is regressed out

(rescaled from 1-10 & rounded)

[Binned according to cf]

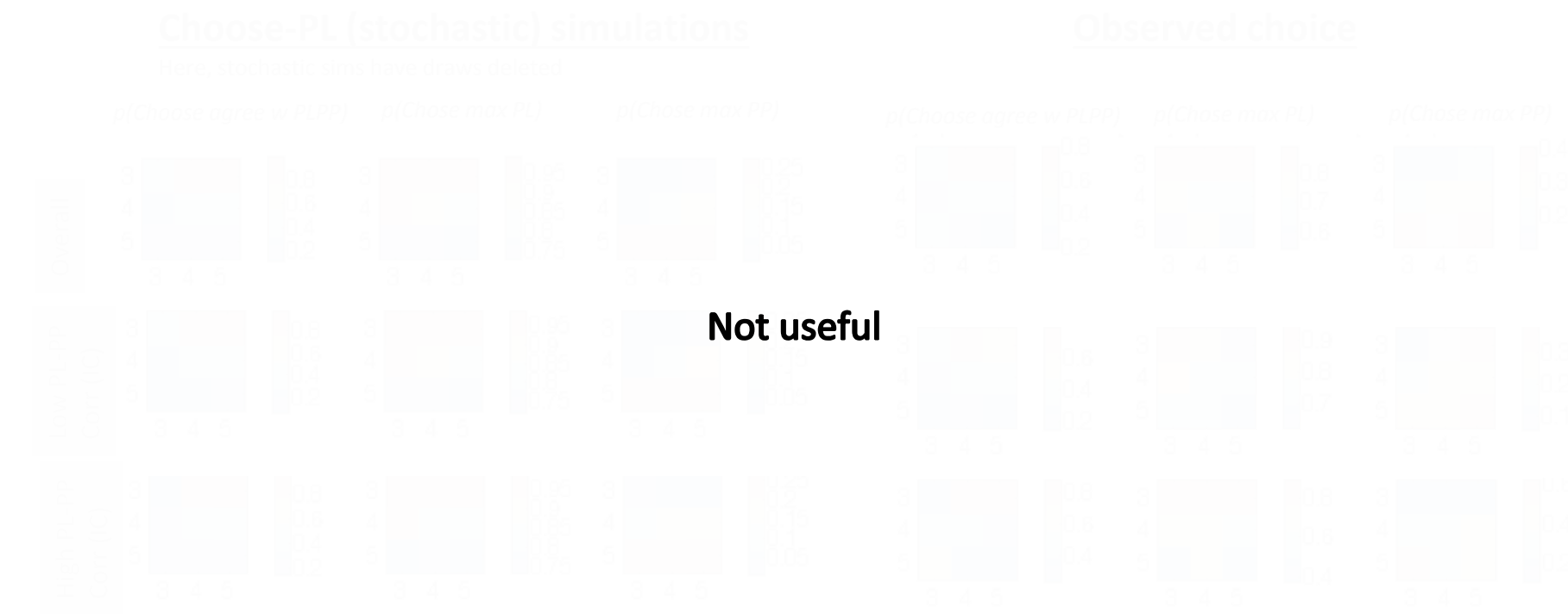


- The CC pattern that is seen (with cf binning) is not generated using a choose-PL strategy **== good!** ☺

PP = residuals after PL is regressed out

(rescaled from 1-10 & rounded)

[IC] *Binned according to cf*



Not useful

- Note that these figures max out pretty low!
- Median split PL-PP correlation is now determined on PL-PP corrs after PP has had PL decorr from it.