

SAR results for FCTC implementation Articles 5, 6, 8, 11, and 13

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This document presents the results from implementing an adjusted version of Aral et al. (2012) propensity score matching estimator for evaluating contagion effects in the context of the implementation of the FCTC.

Roughly, the method can be described as follows:

1. Define a treatment variable Z_i which will be equal to 1 if and only if individual i is exposed to at least some percentage or number of neighbors in the network that implemented at least one item of a particular article,
2. With Z defined, via the MatchIt R package, we use the Coarsened Exact Matching method (which maximizes balance). This returns a vector of weights W that indicate whether an individual j was matched, hence $w_j > 0$, or not, in which case $w_j = 0$ and compute an Average Treatment Effect on the Treated (ATT).
3. Finally, we estimated distributions for the ATT using bootstrapping as described in Snijders and Borgatti (1999).

1 INB Co-participation network

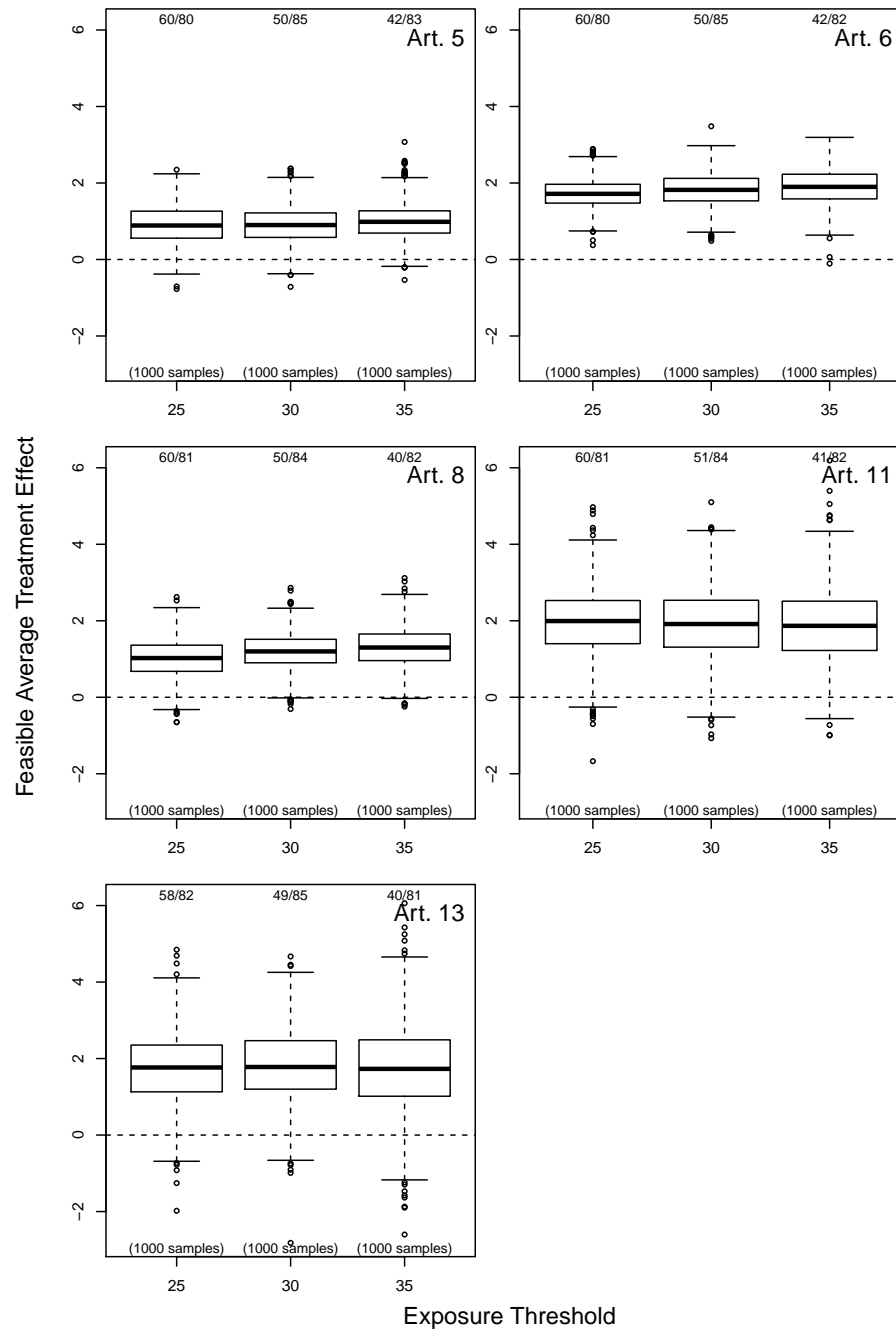


Figure 1: Distribution of Feasible Average Treatment Effect on the Treated using the INB co/participation network. Each box represents 3,000 bootstrap versions of the estimator.

2 COP Co-participation network

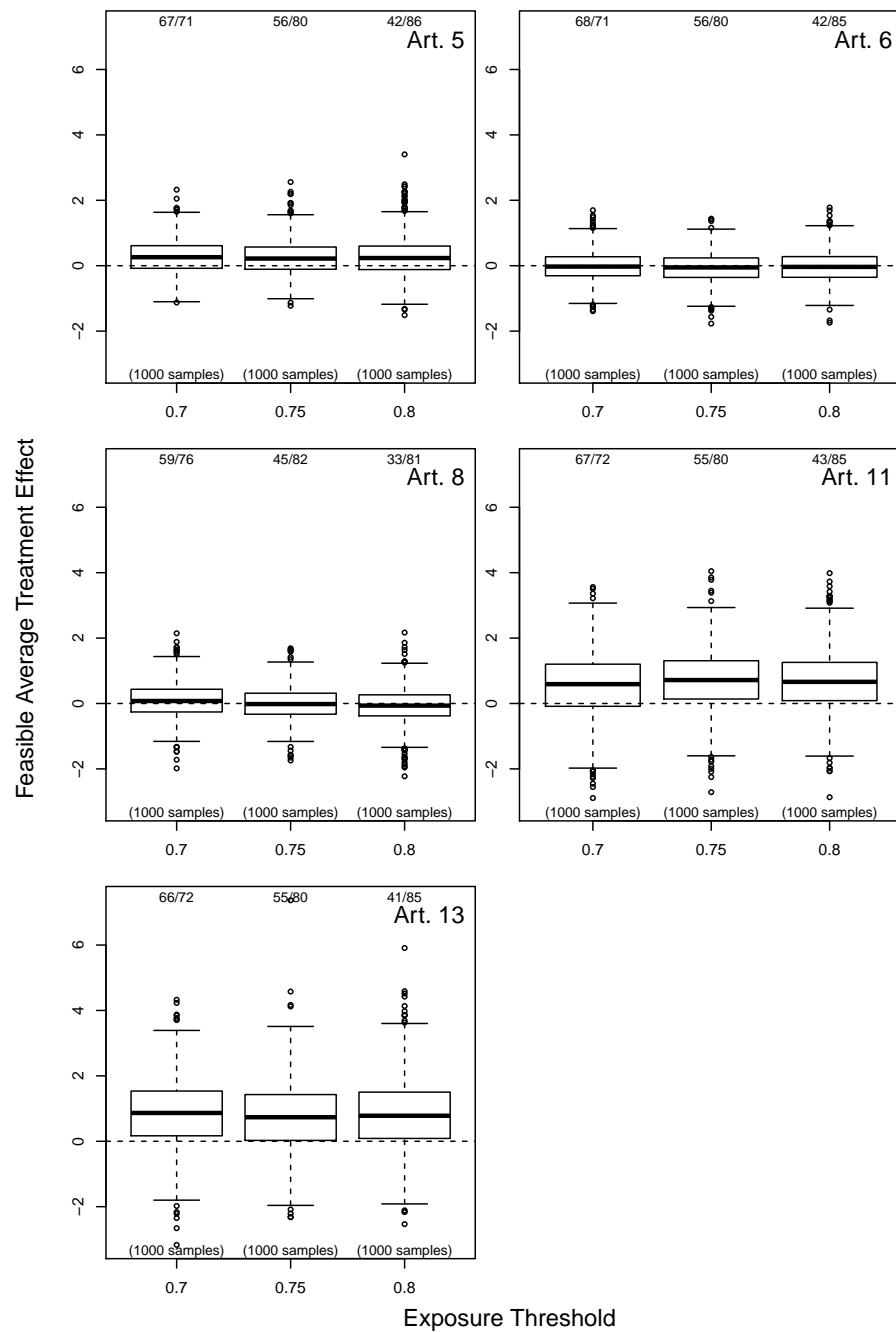


Figure 2: Distribution of Feasible Average Treatment Effect on the Treated using the COP co/participation network. Each box represents 3,000 bootstrap versions of the estimator.

3 GL Co-subscription network

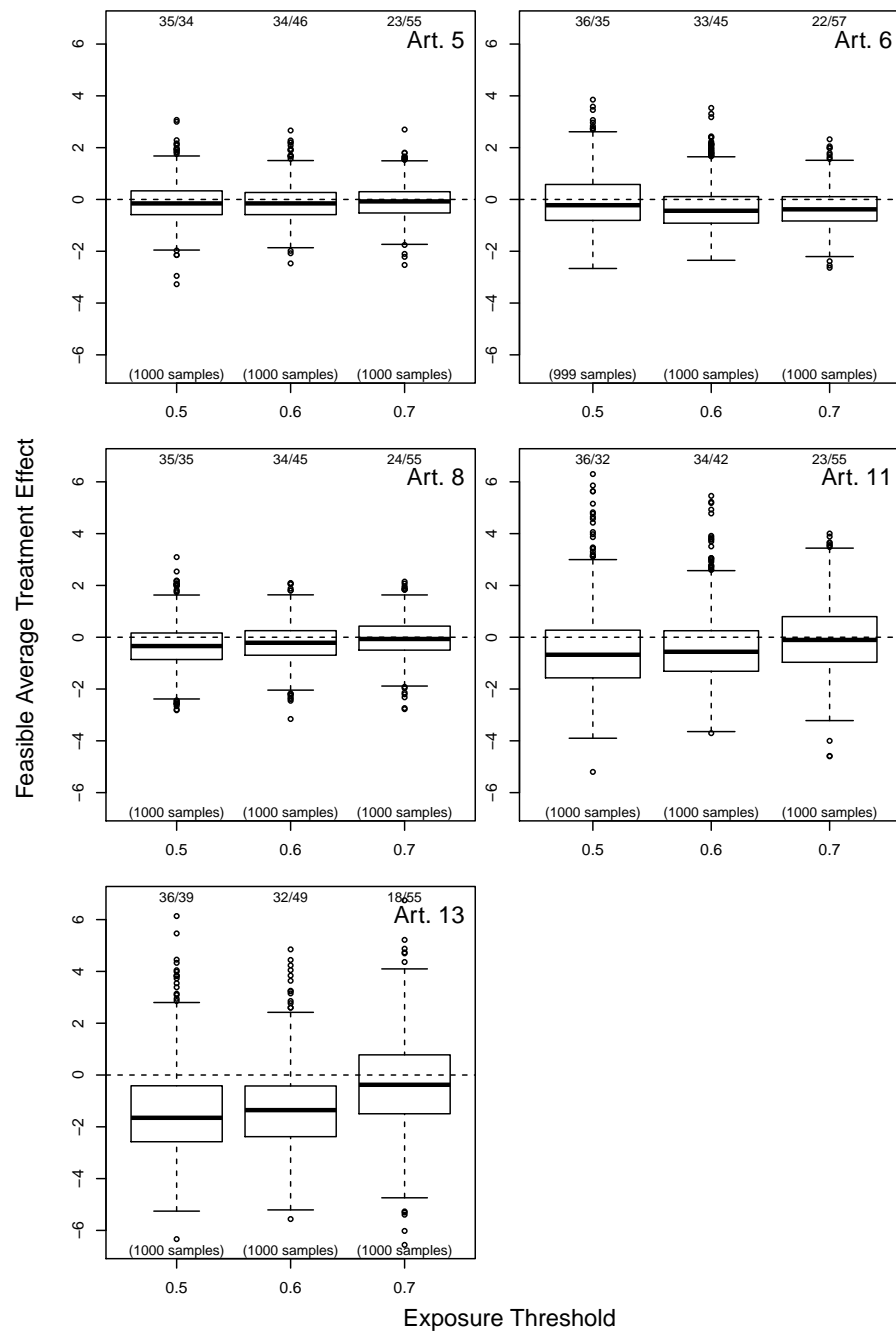


Figure 3: Distribution of Feasible Average Treatment Effect on the Treated using the GlobalLink posts network. Each box represents 2,000 bootstrap versions of the estimator.

4 GL Referrals network

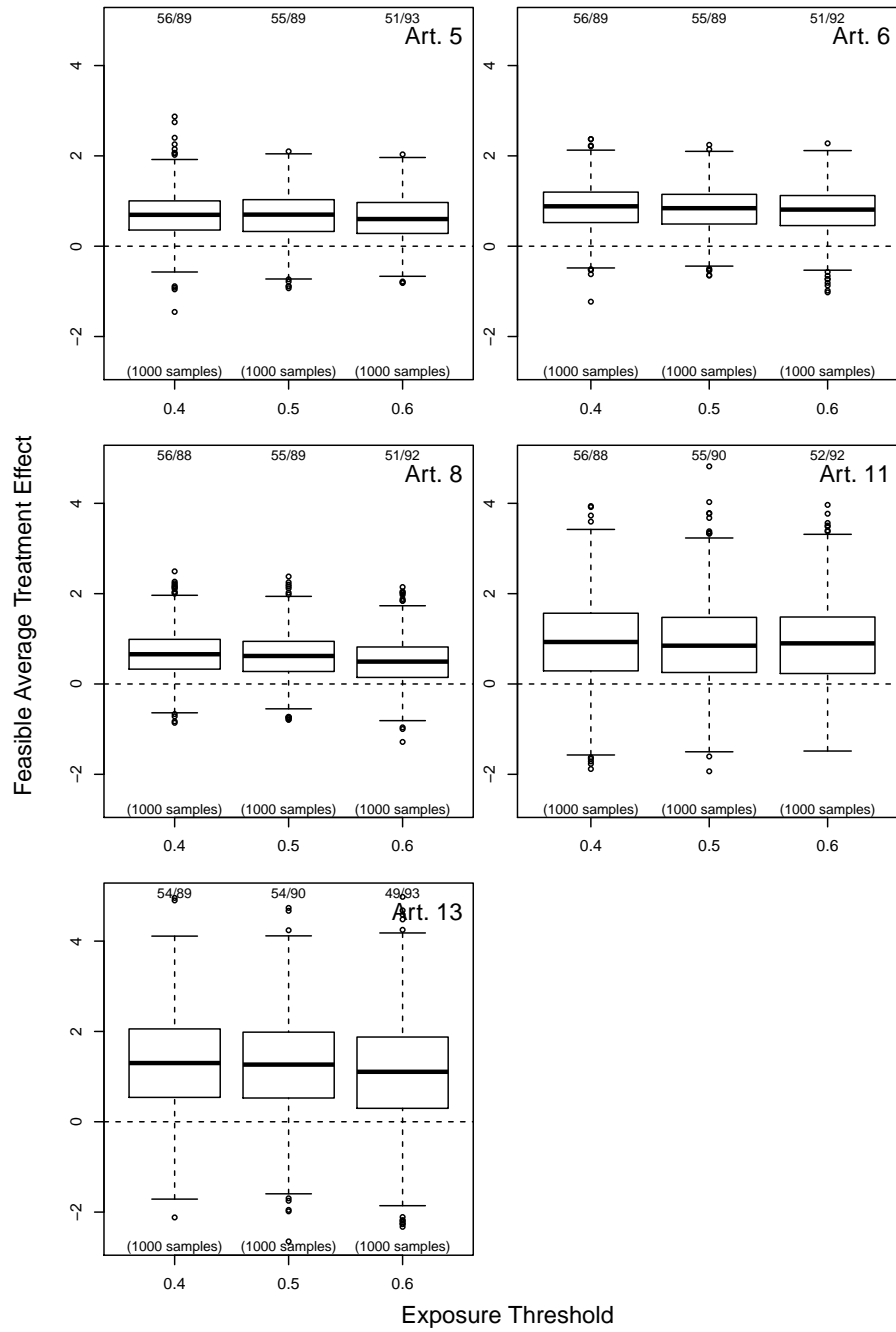


Figure 4: Distribution of Feasible Average Treatment Effect on the Treated using the GlobalLink posts network. Each box represents 2,000 bootstrap versions of the estimator.

5 Robustness check

In order to evaluate if the method reaches coherent results, we use it on a network that, according to the SAR model, does show contagion effects, the centroid distance network. Furthermore, we also performed the test on 2,000 permuted versions of this network expecting to find no contagion effect.

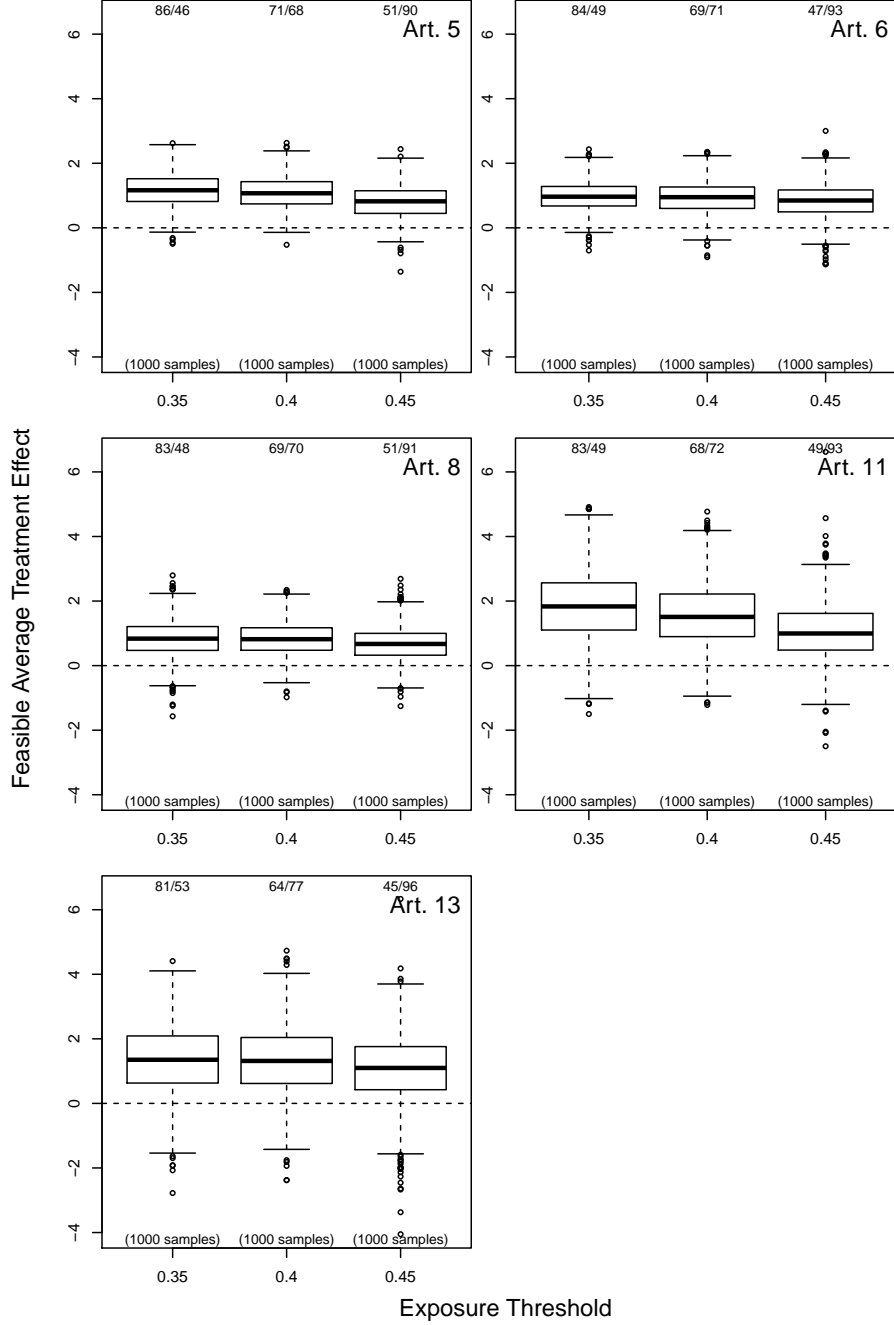


Figure 5: Distribution of Sample Average Treatment Effect on the Treated using the Centroid Network. Each box represents 2,000 bootstrap versions of the estimator.

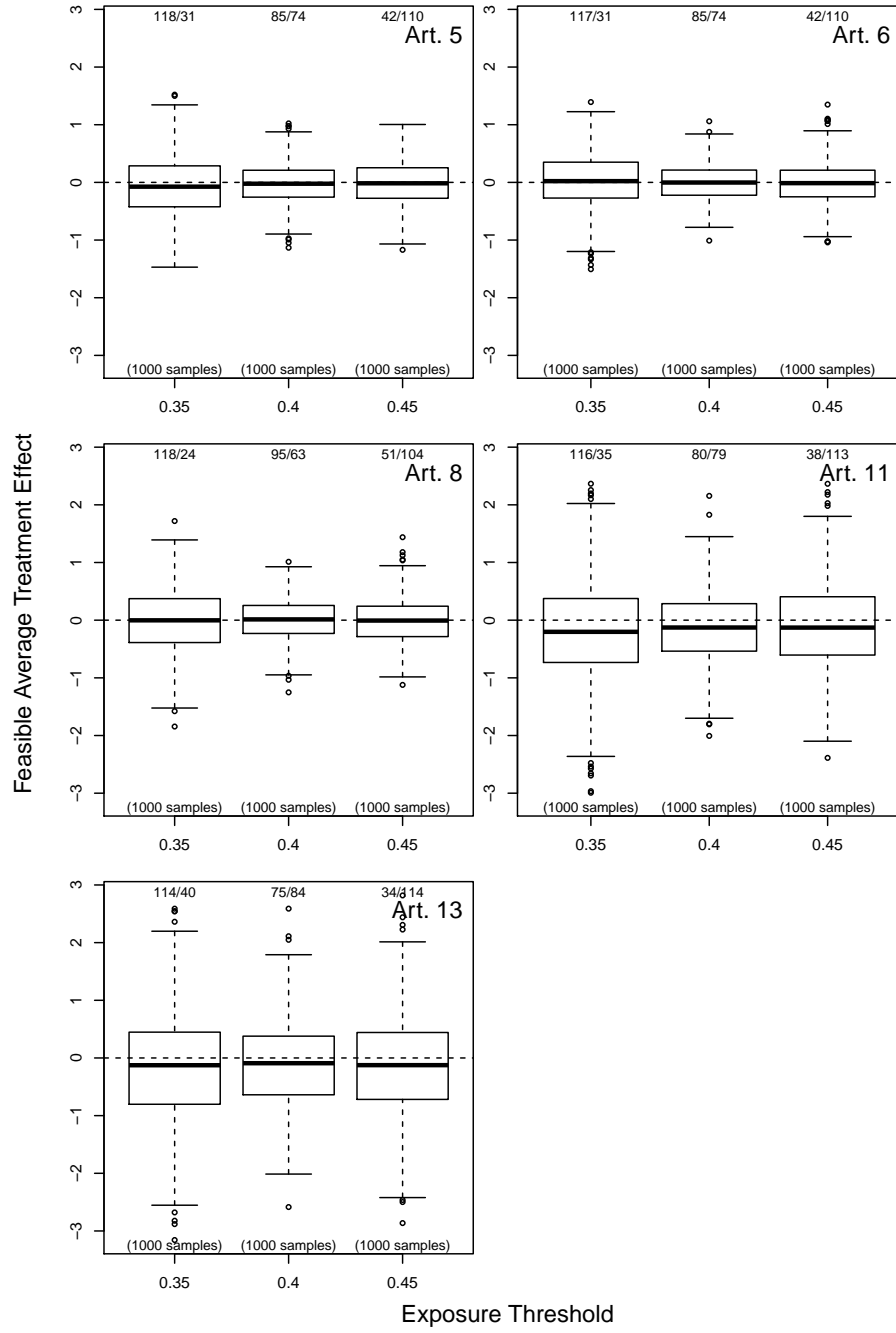


Figure 6: Distribution of Feasible Average Treatment Effect on the Treated using a permuted version of the centroid network. Each box represents 2,000 bootstrap versions of the estimator.

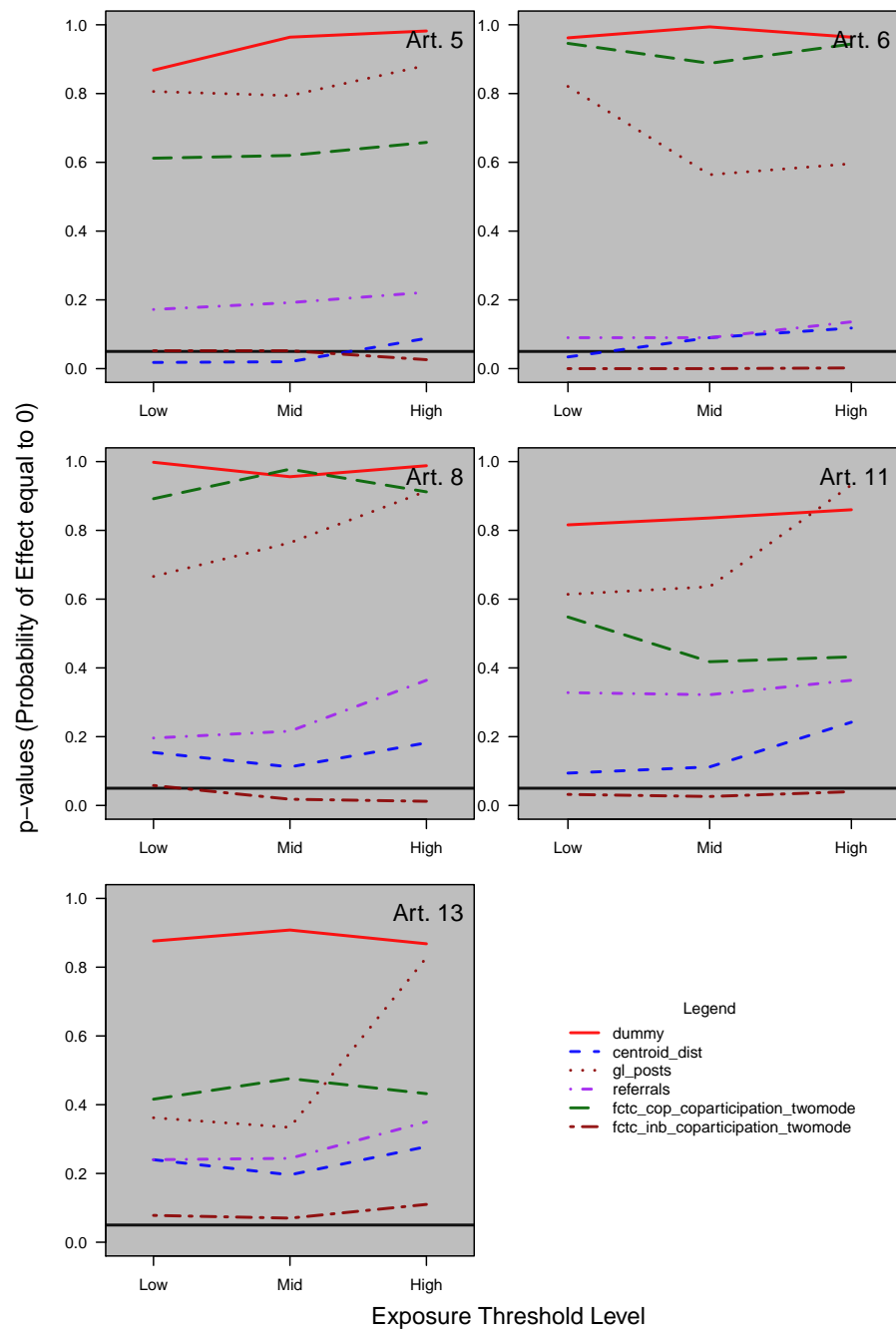


Figure 7: P-values testing treatment effect equal to zero.

Table 1: p-values of NetMatching

Network	Art.	Low Thr.	Mid. Thr.	High Thr.
dummy	5	0.8680000	0.964	0.982
dummy	6	0.9620000	0.994	0.964
dummy	8	0.9980000	0.956	0.988
dummy	11	0.8160000	0.836	0.860
dummy	13	0.8760000	0.908	0.868
adjmat_centroid_dist	5	0.0180000	0.020	0.088
adjmat_centroid_dist	6	0.0340000	0.090	0.118
adjmat_centroid_dist	8	0.1540000	0.112	0.182
adjmat_centroid_dist	11	0.0940000	0.112	0.242
adjmat_centroid_dist	13	0.2400000	0.196	0.278
adjmat_gl_posts	5	0.8060000	0.794	0.882
adjmat_gl_posts	6	0.8208208	0.564	0.596
adjmat_gl_posts	8	0.6660000	0.764	0.914
adjmat_gl_posts	11	0.6140000	0.636	0.932
adjmat_gl_posts	13	0.3620000	0.334	0.828
adjmat_referrals	5	0.1720000	0.192	0.222
adjmat_referrals	6	0.0900000	0.090	0.136
adjmat_referrals	8	0.1960000	0.216	0.364
adjmat_referrals	11	0.3280000	0.322	0.364
adjmat_referrals	13	0.2400000	0.244	0.350
adjmat_ftc_cop_coparticipation_twomode	5	0.6120000	0.620	0.658
adjmat_ftc_cop_coparticipation_twomode	6	0.9460000	0.888	0.944
adjmat_ftc_cop_coparticipation_twomode	8	0.8920000	0.978	0.912
adjmat_ftc_cop_coparticipation_twomode	11	0.5480000	0.418	0.432
adjmat_ftc_cop_coparticipation_twomode	13	0.4160000	0.476	0.432
adjmat_ftc_inb_coparticipation_twomode	5	0.0520000	0.052	0.026
adjmat_ftc_inb_coparticipation_twomode	6	0.0000000	0.000	0.002
adjmat_ftc_inb_coparticipation_twomode	8	0.0580000	0.018	0.012
adjmat_ftc_inb_coparticipation_twomode	11	0.0320000	0.026	0.040
adjmat_ftc_inb_coparticipation_twomode	13	0.0780000	0.070	0.110