Validate Power: d2.1

December 26, 2021

d_m: Blocked RCT, with 2 levels, and randomization done at level 1 (individual level).

Models: Constant treatment effects, fixed treatment effects, and random treatment effects.

Default parameters:

- M = 3
- J = 20
- rho: $\rho = 0.5$
- MDES = 0.125, 0.125, 0.125
- R2.1: $R_1^2 = 0.1, 0.1, 0.1$
- ICC: $\text{ICC}_2 = 0.2, 0.2, 0.2$

Parameters by model type:

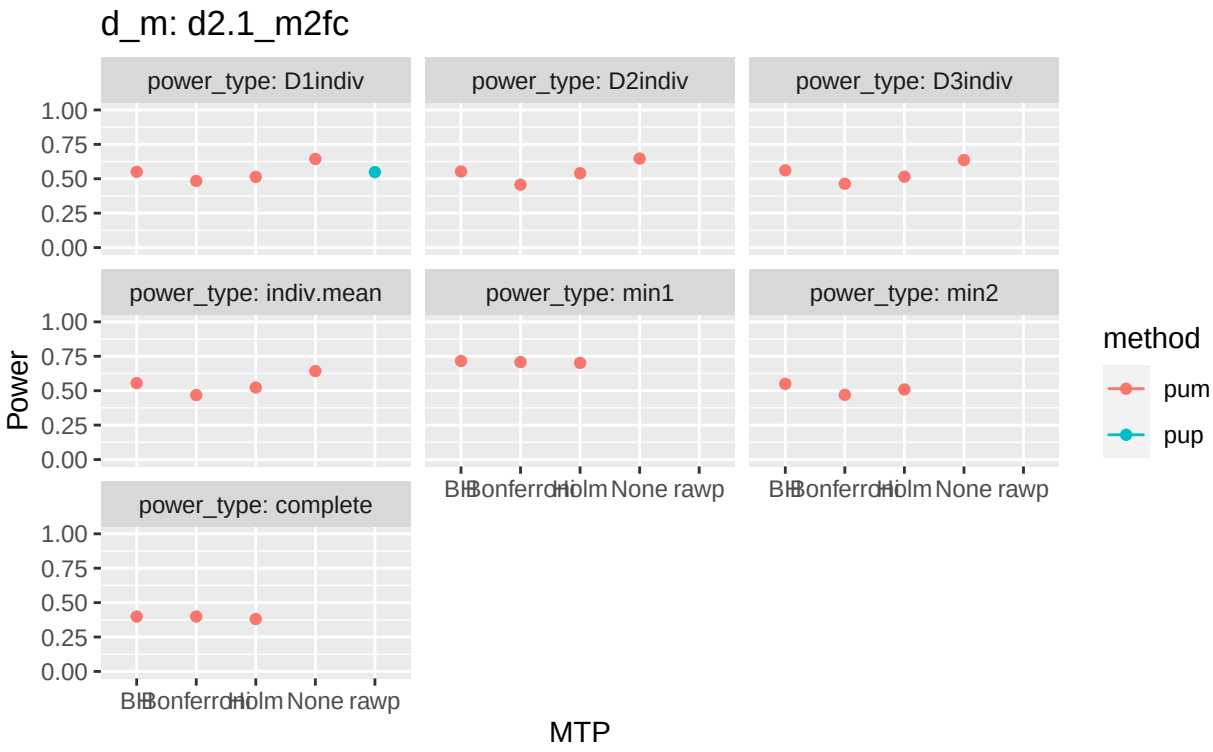
- Omega: $\omega_2 = 0$ for constant effects, $\omega_2 = 0.1, 0.1, 0.1$ for fixed and random

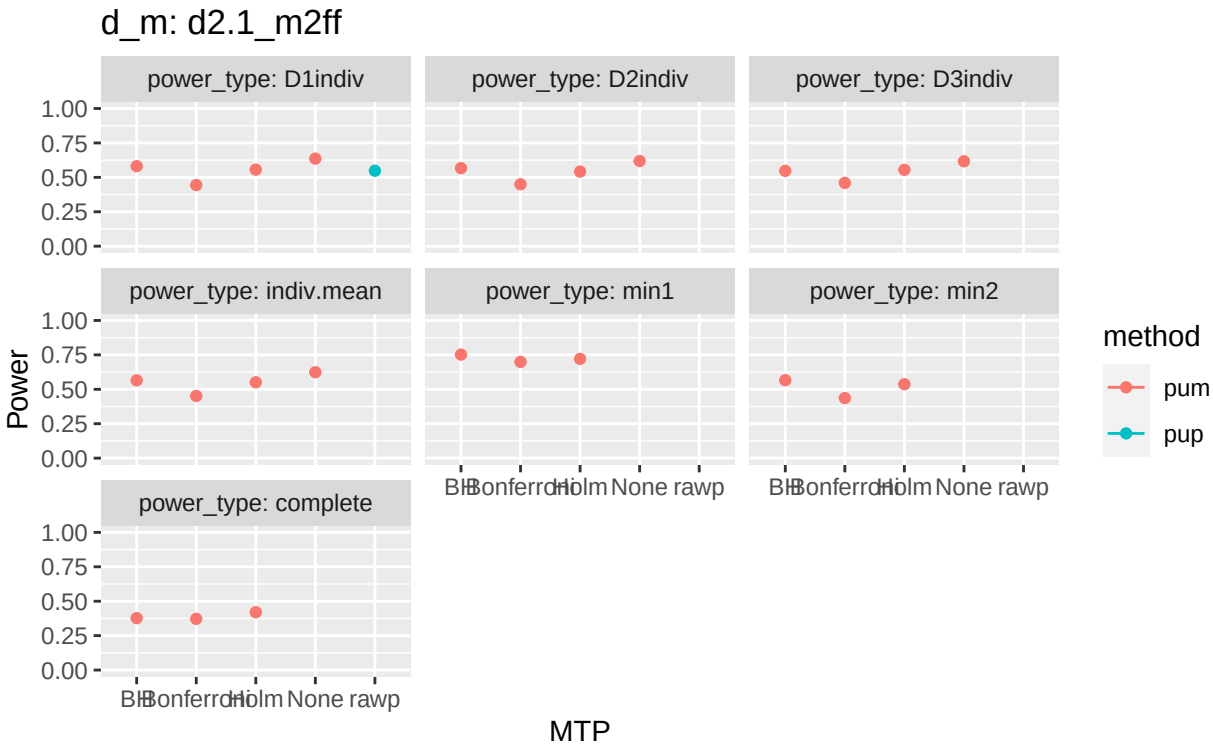
Assumptions:

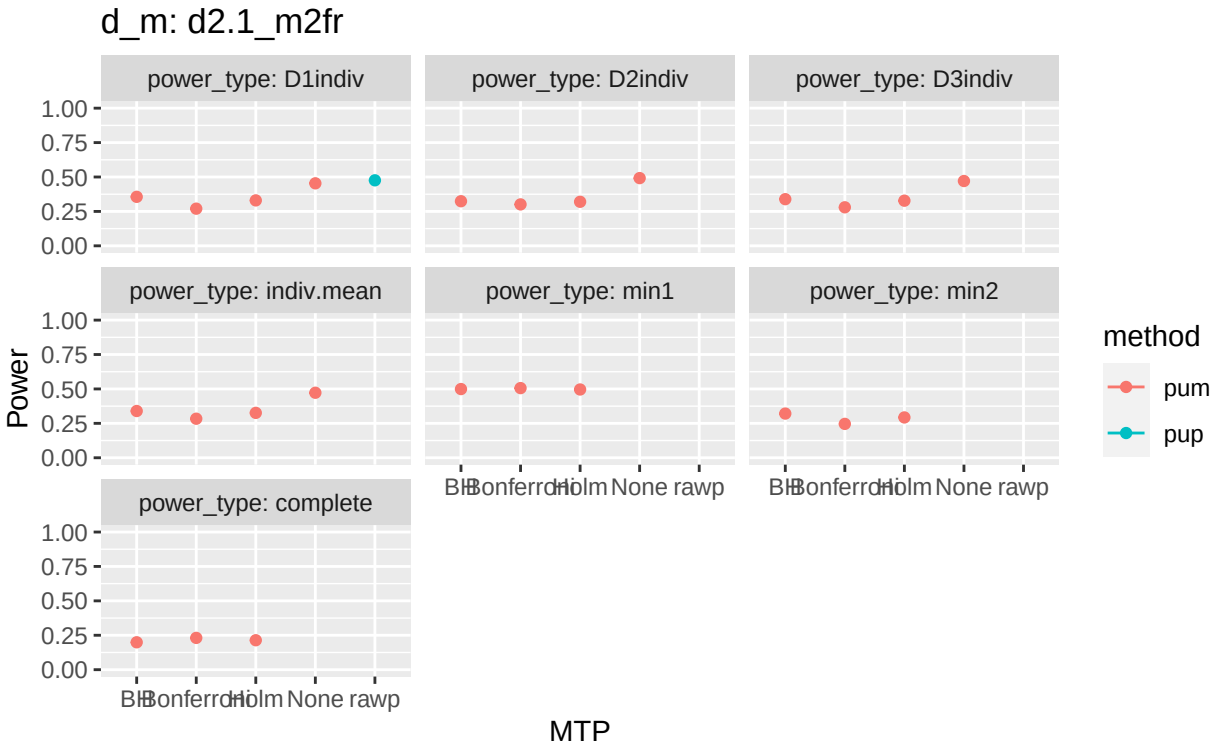
- Two-level design: $\text{ICC}_3 = 0$, $\omega_3 = 0$, $K = 1$

Power Validation

Base case

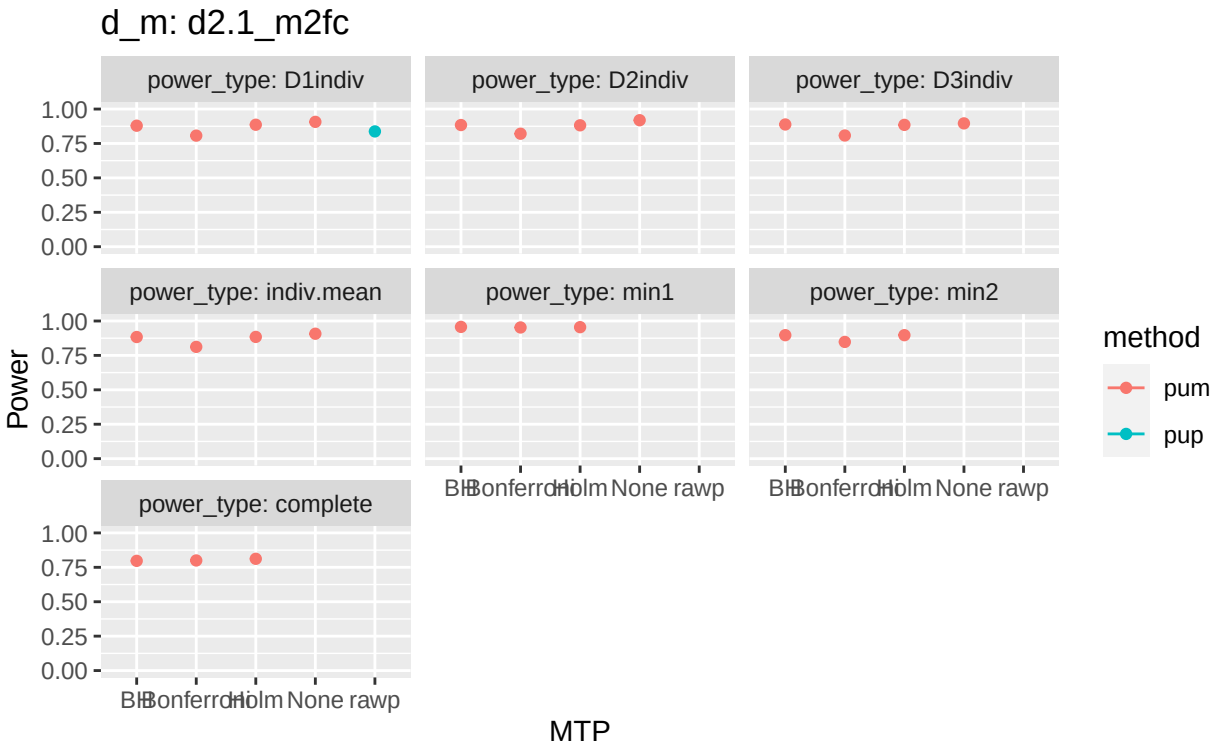


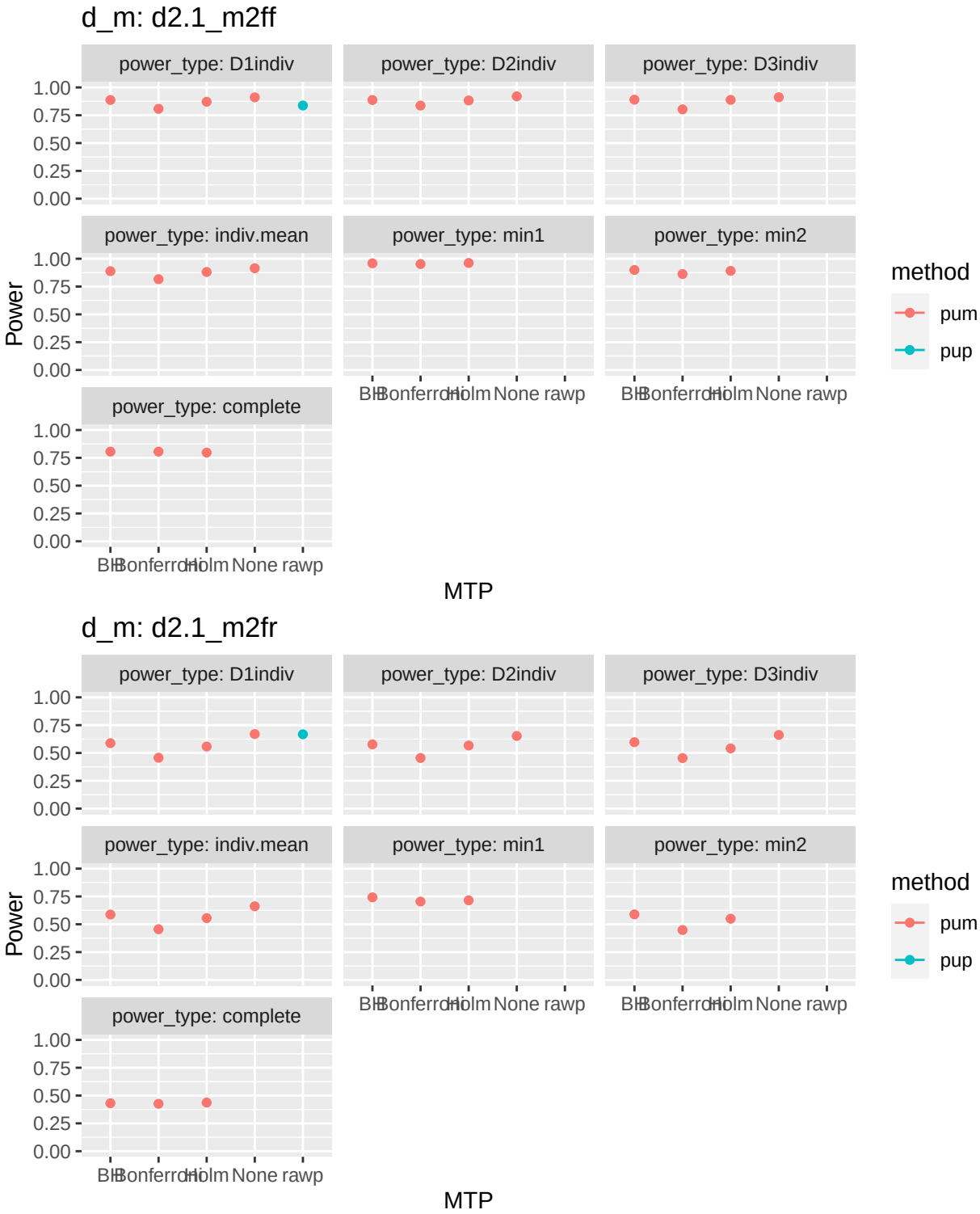




Varying school size

$\bar{n} = 100$

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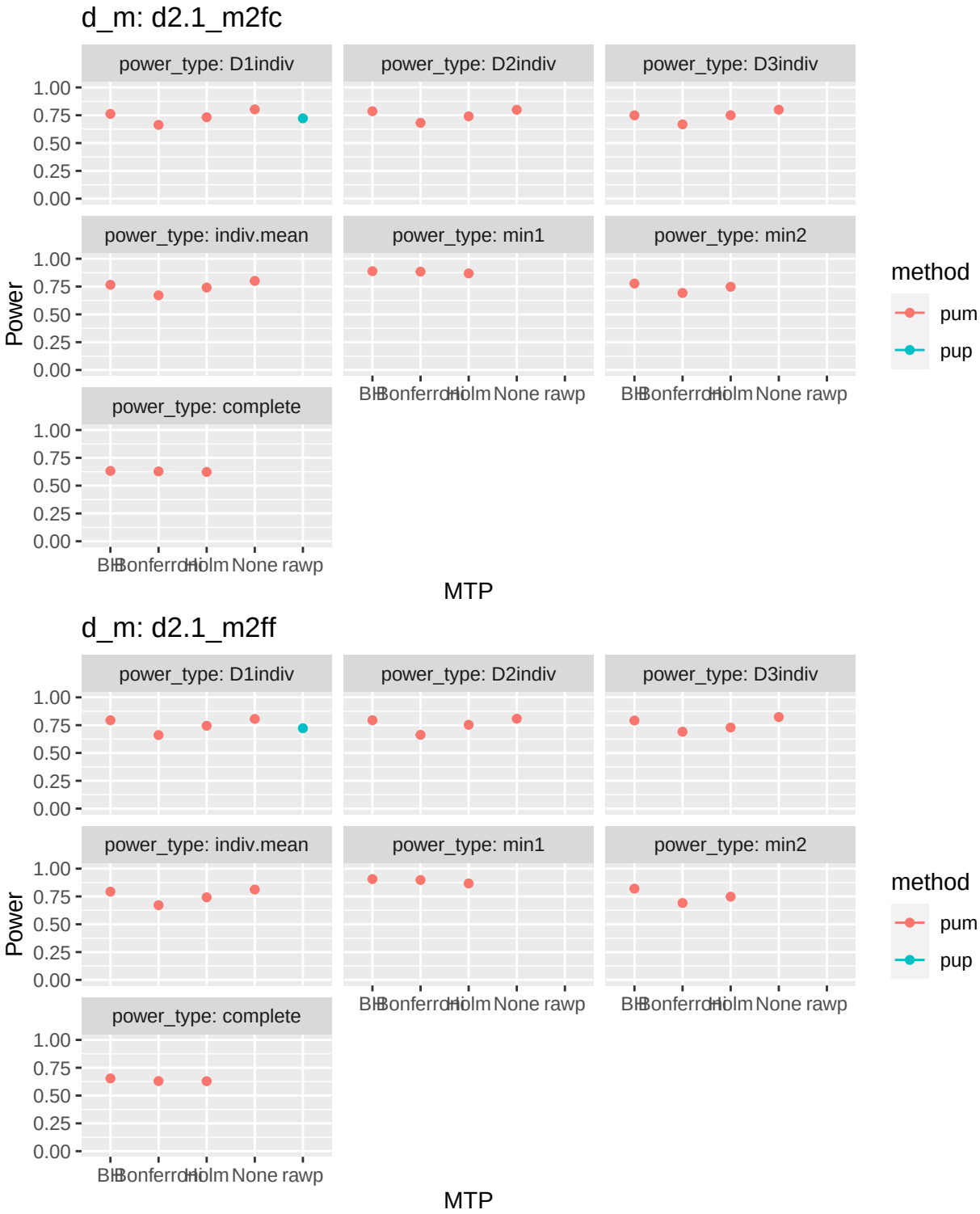
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup
d_m: d2.1_m2fr
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup

$\bar{n} = 75$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power_type: D2indiv
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power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup
d_m: d2.1_m2ff
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
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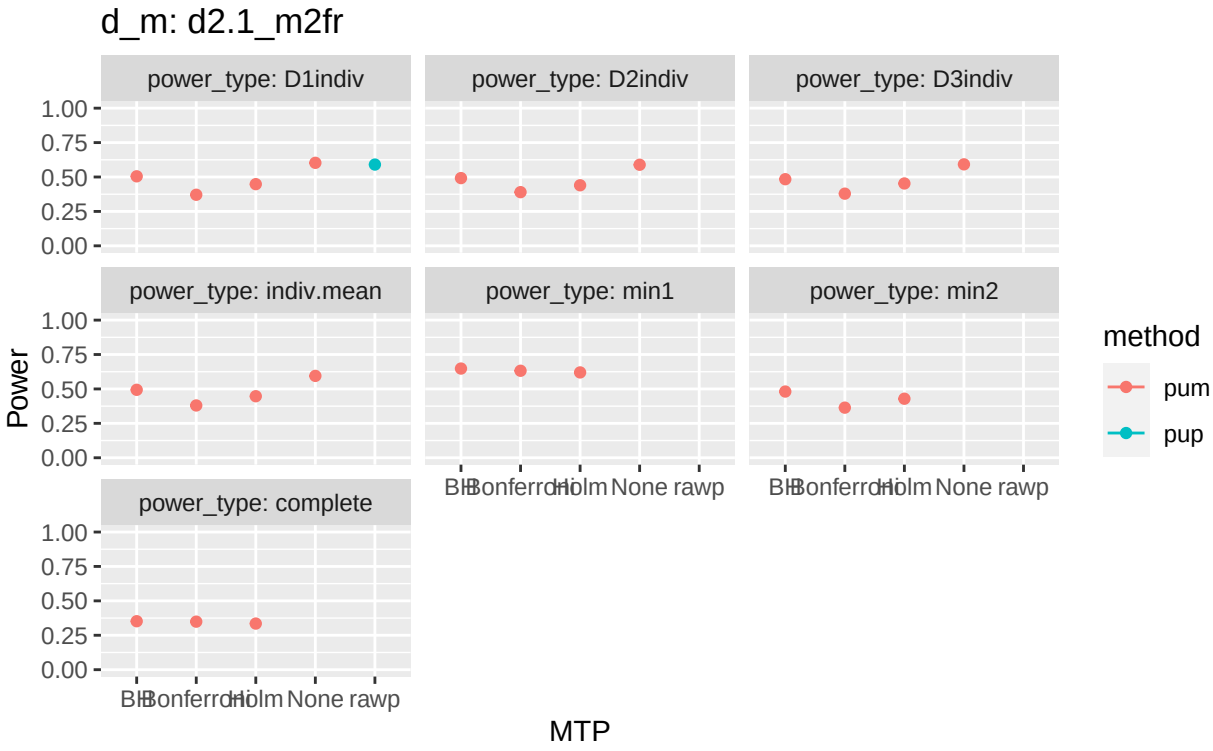
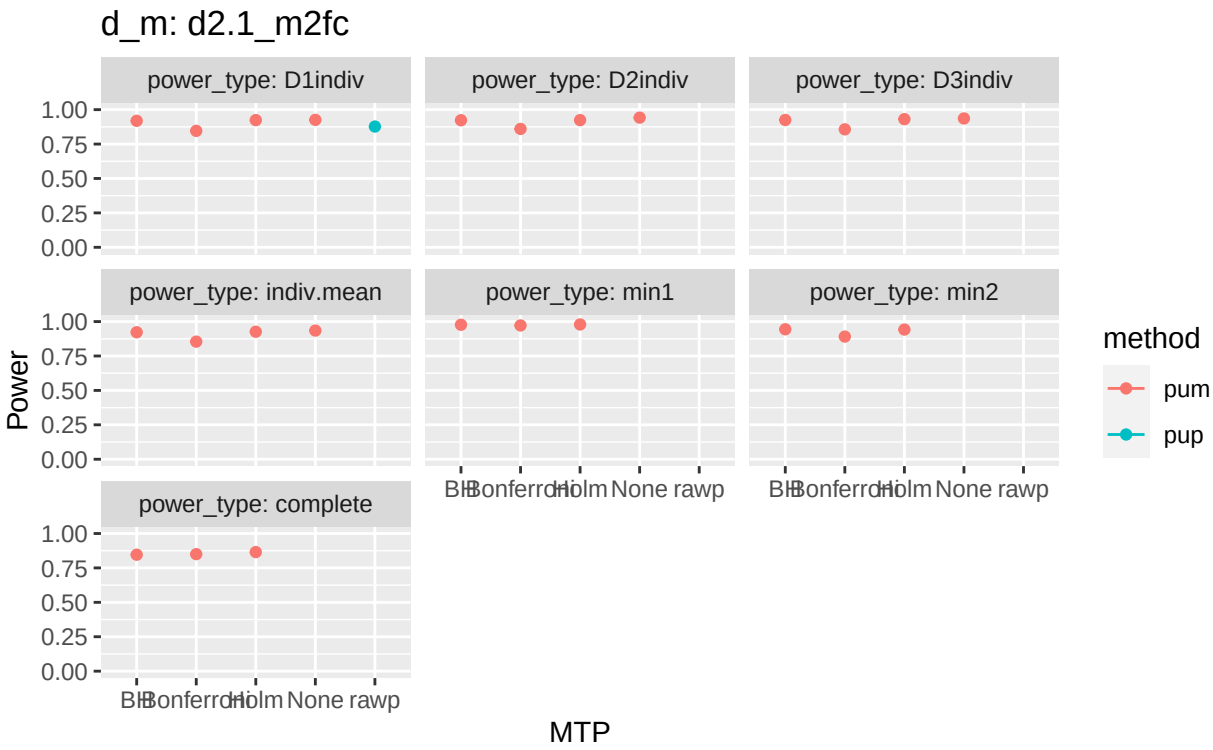
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup

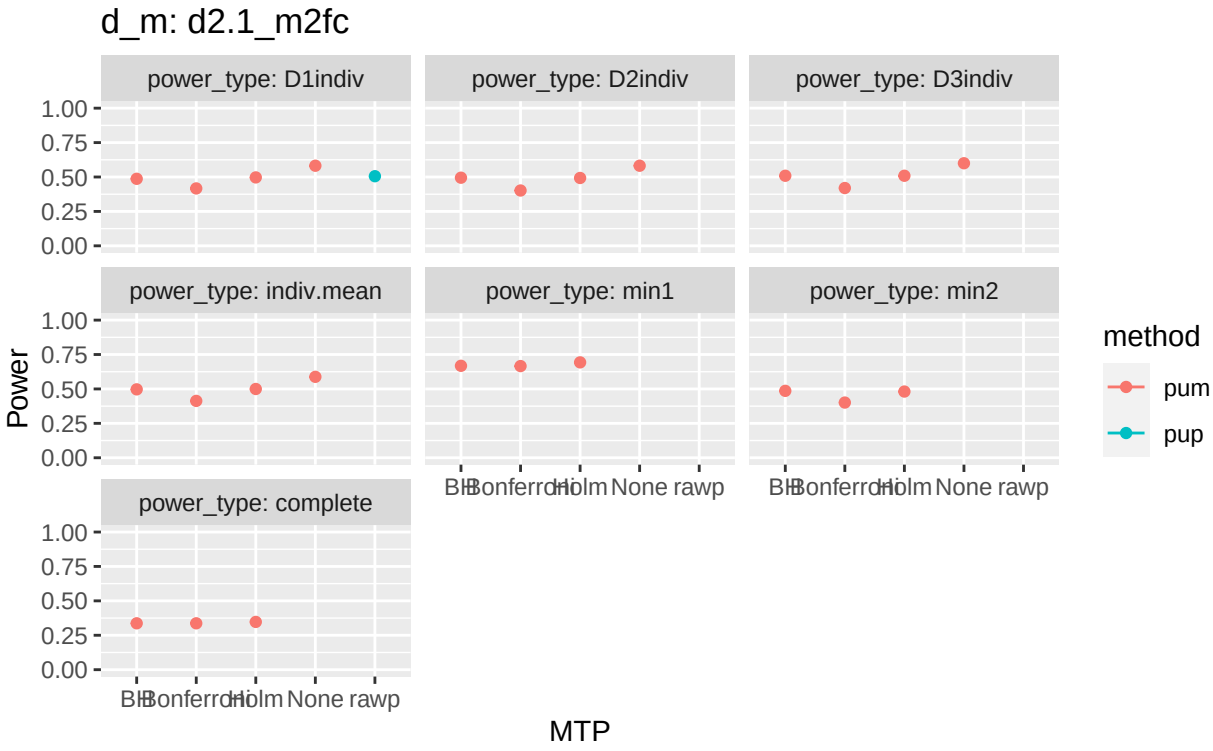


Varying R2

$R_1^2 = 0.6, 0.6, 0.6$

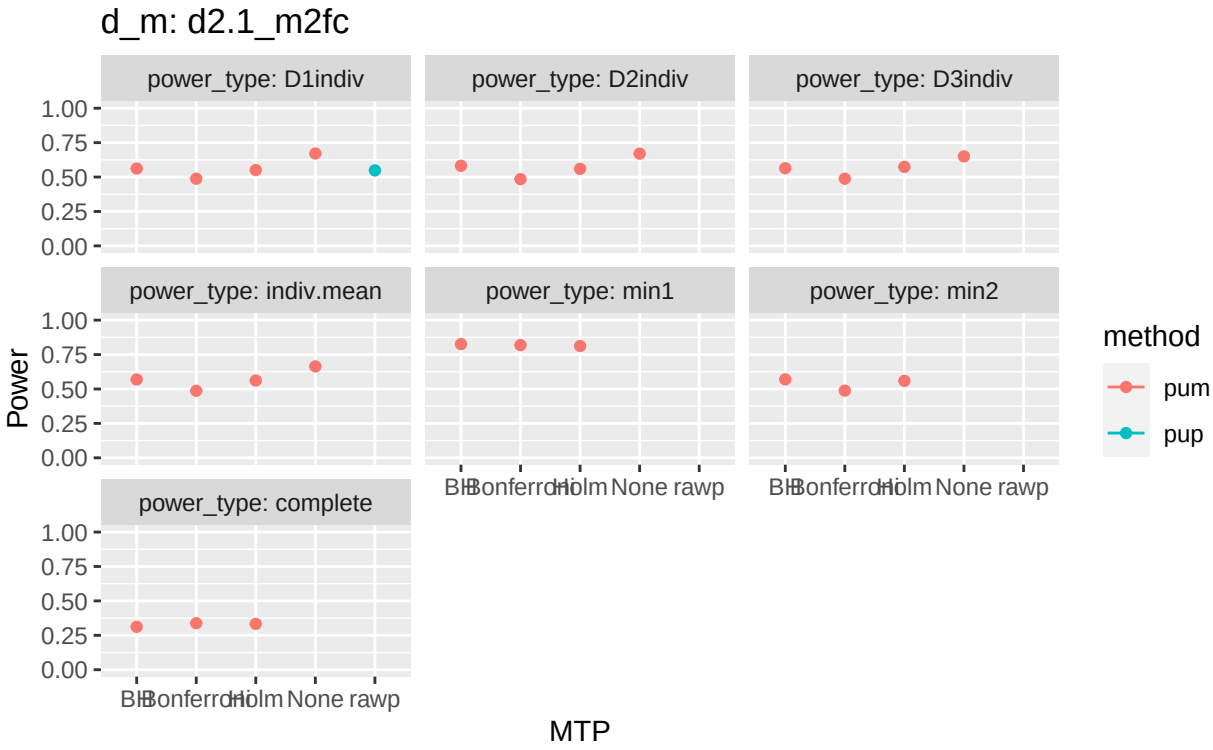


$R_1^2 = 0, 0, 0$

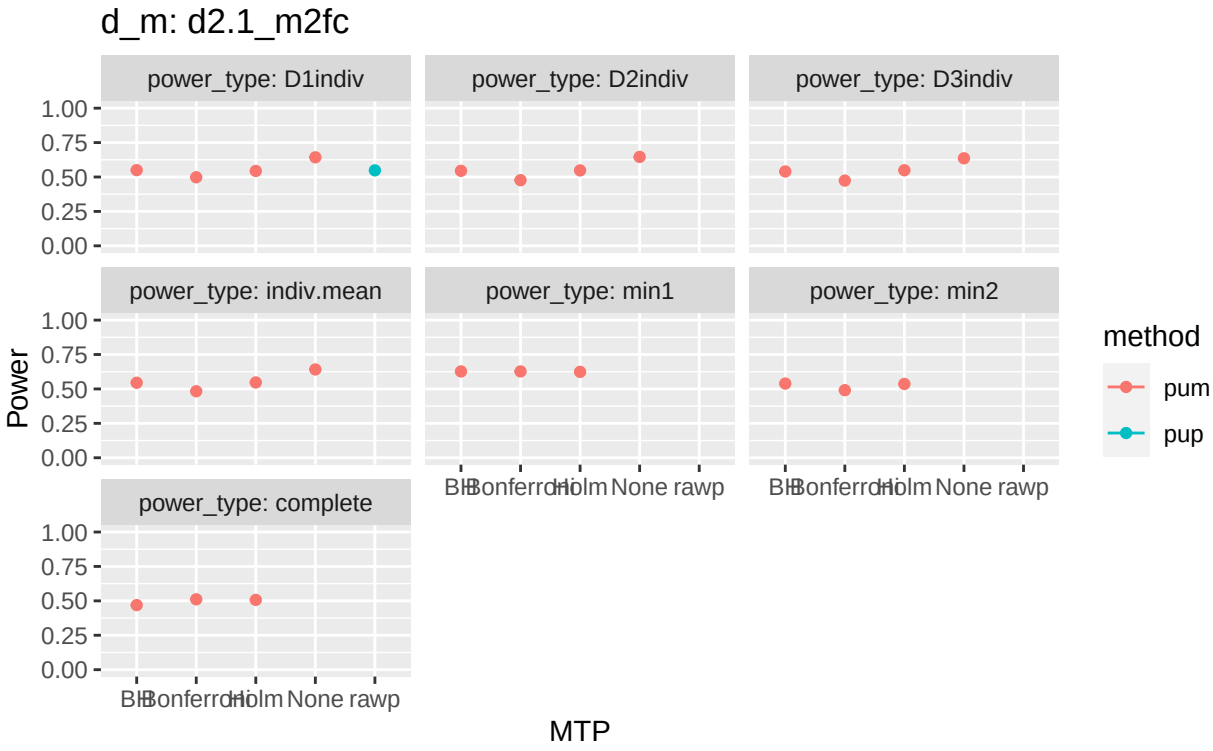


Varying rho

$\rho = 0.2$

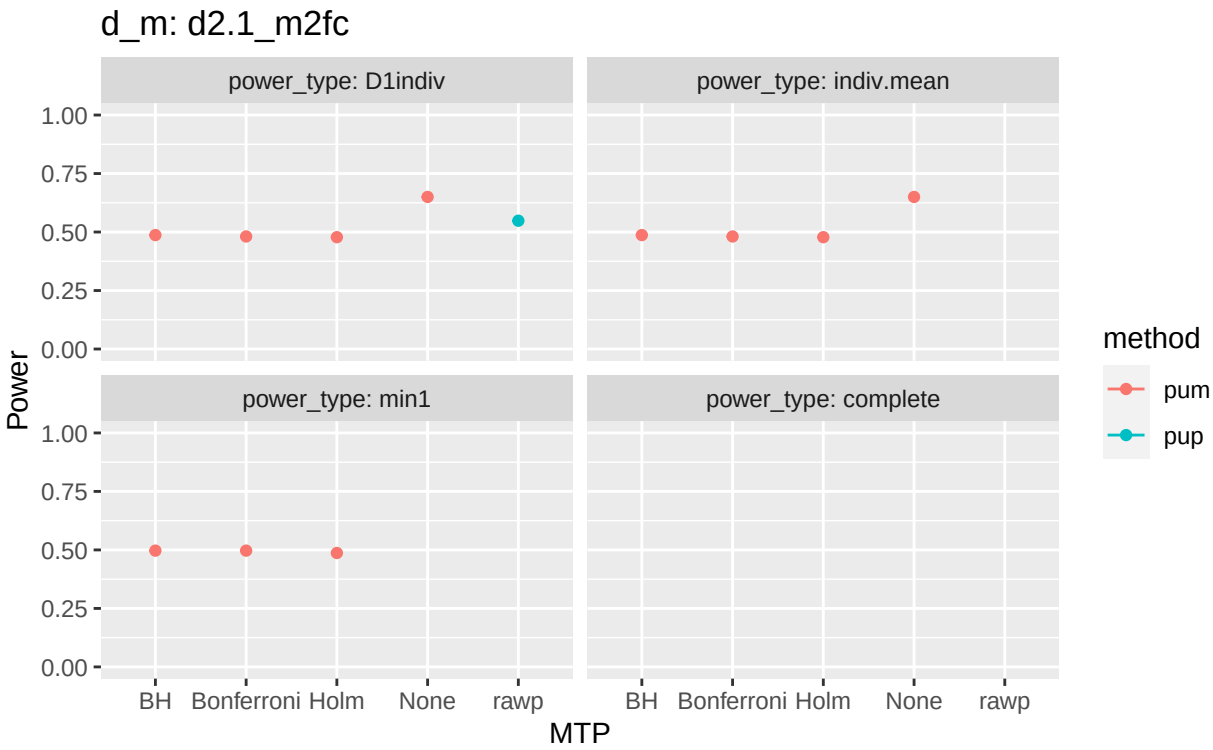


$\rho = 0.8$



Varying true positives

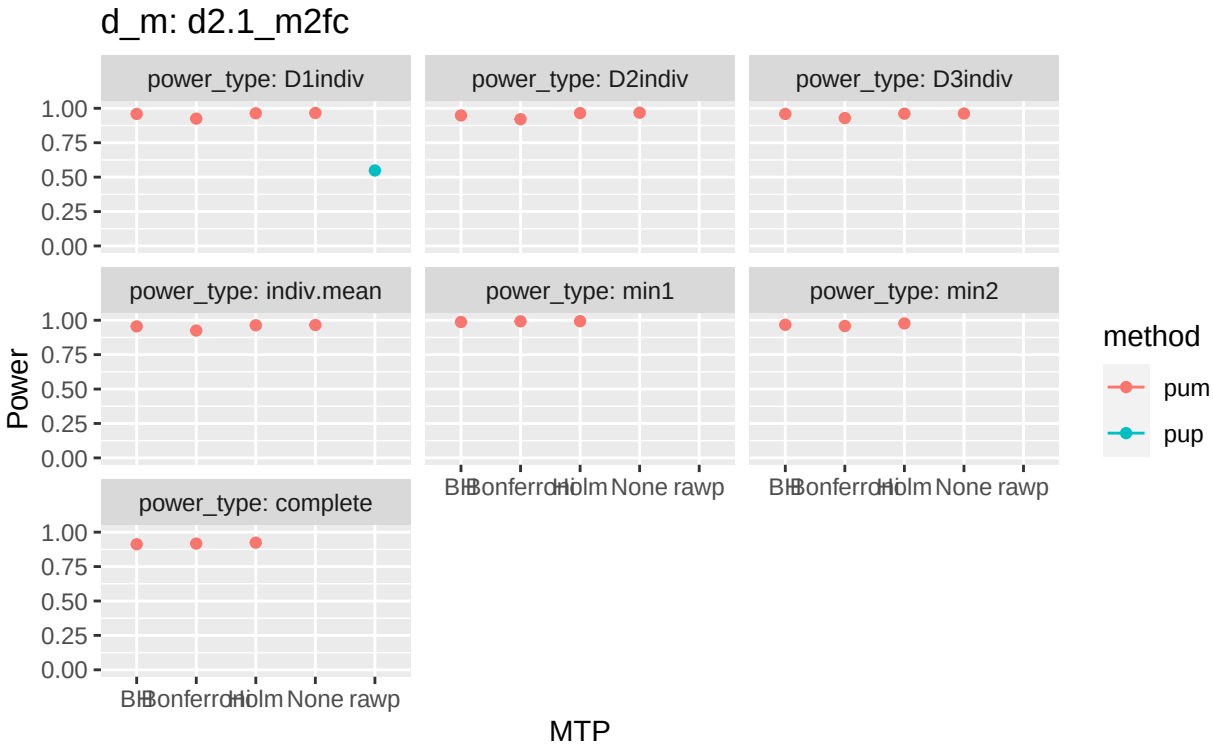
MDES = 0.125, 0, 0

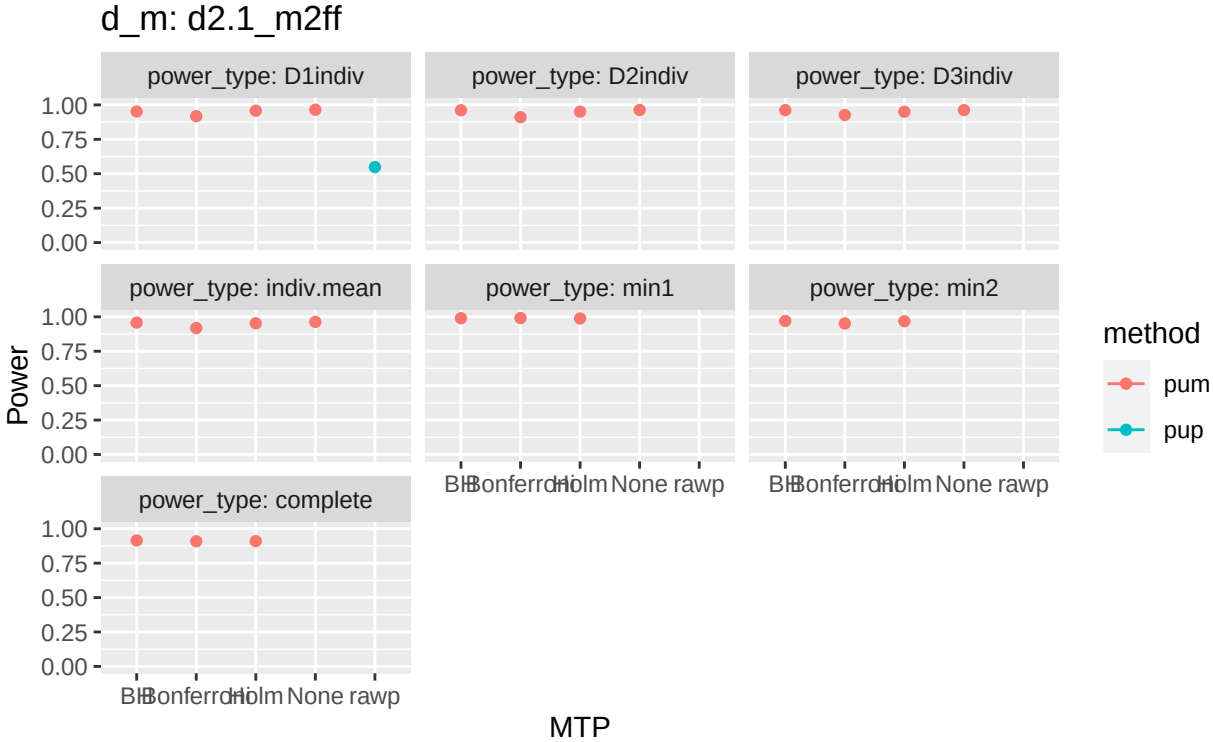


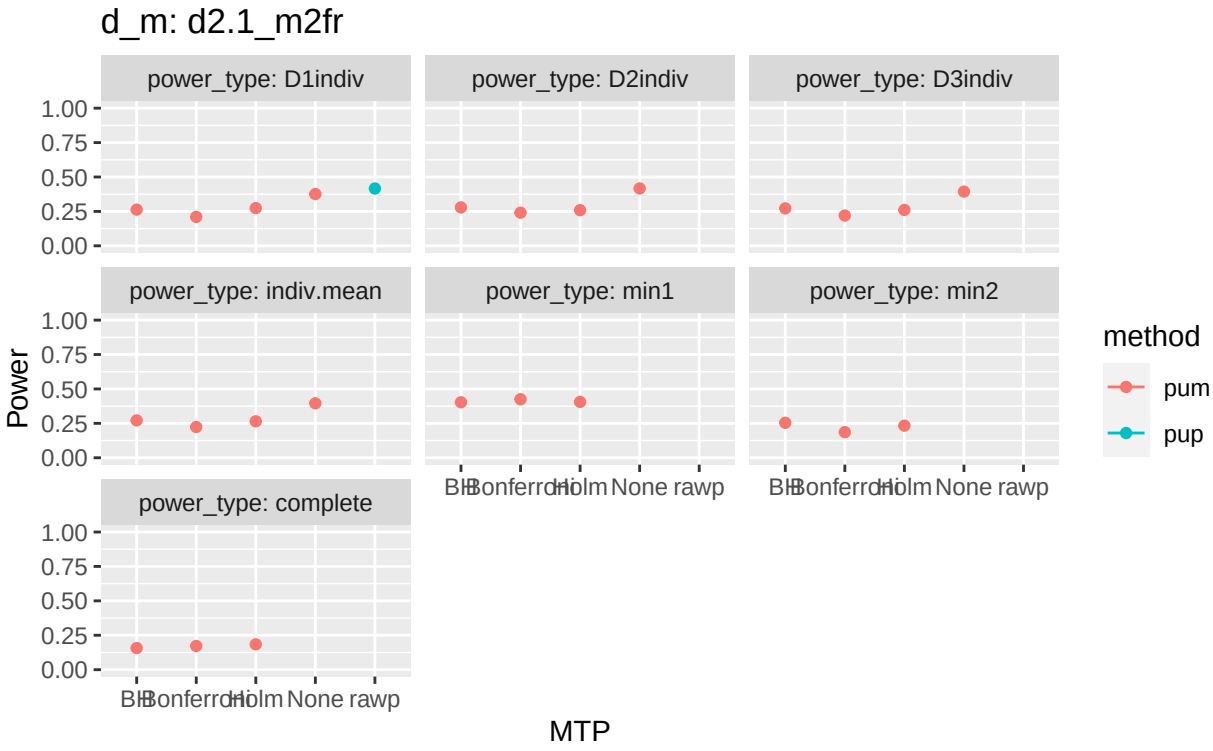
Varying ICC

Note: we expect a discrepancy when ICC is not zero between powerup and pump.

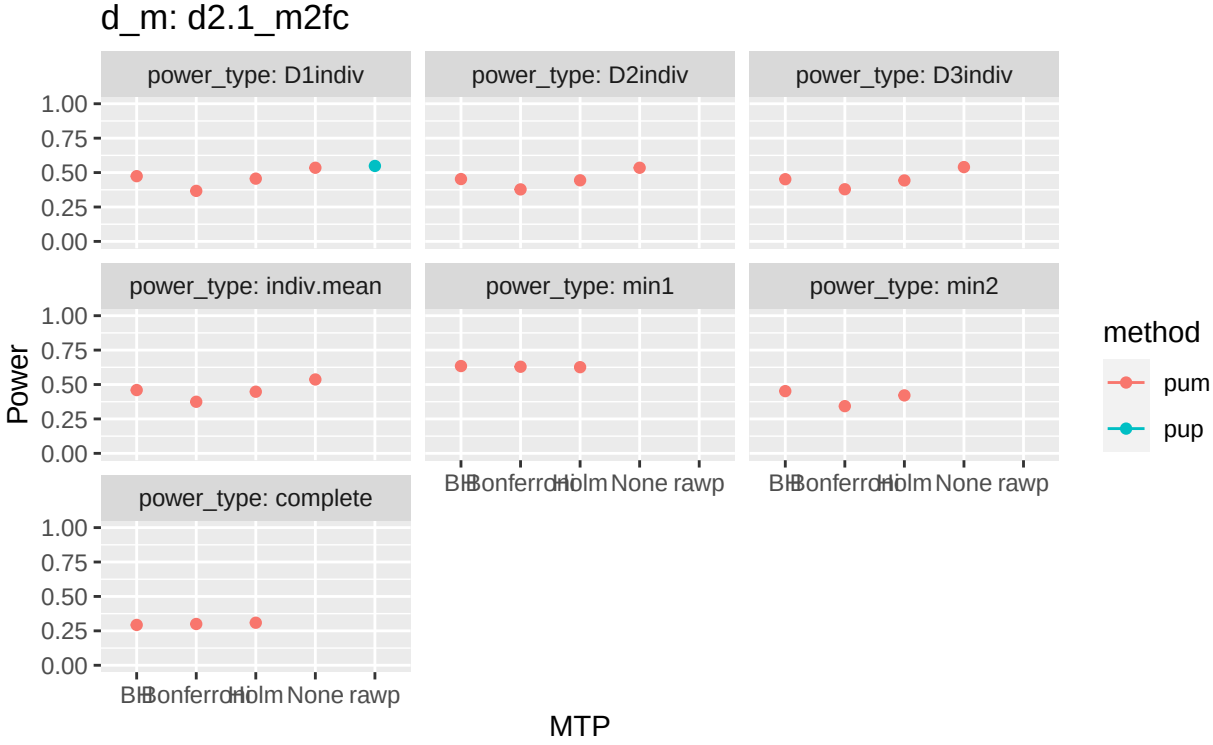
$ICC_2 = 0.7, 0.7, 0.7$

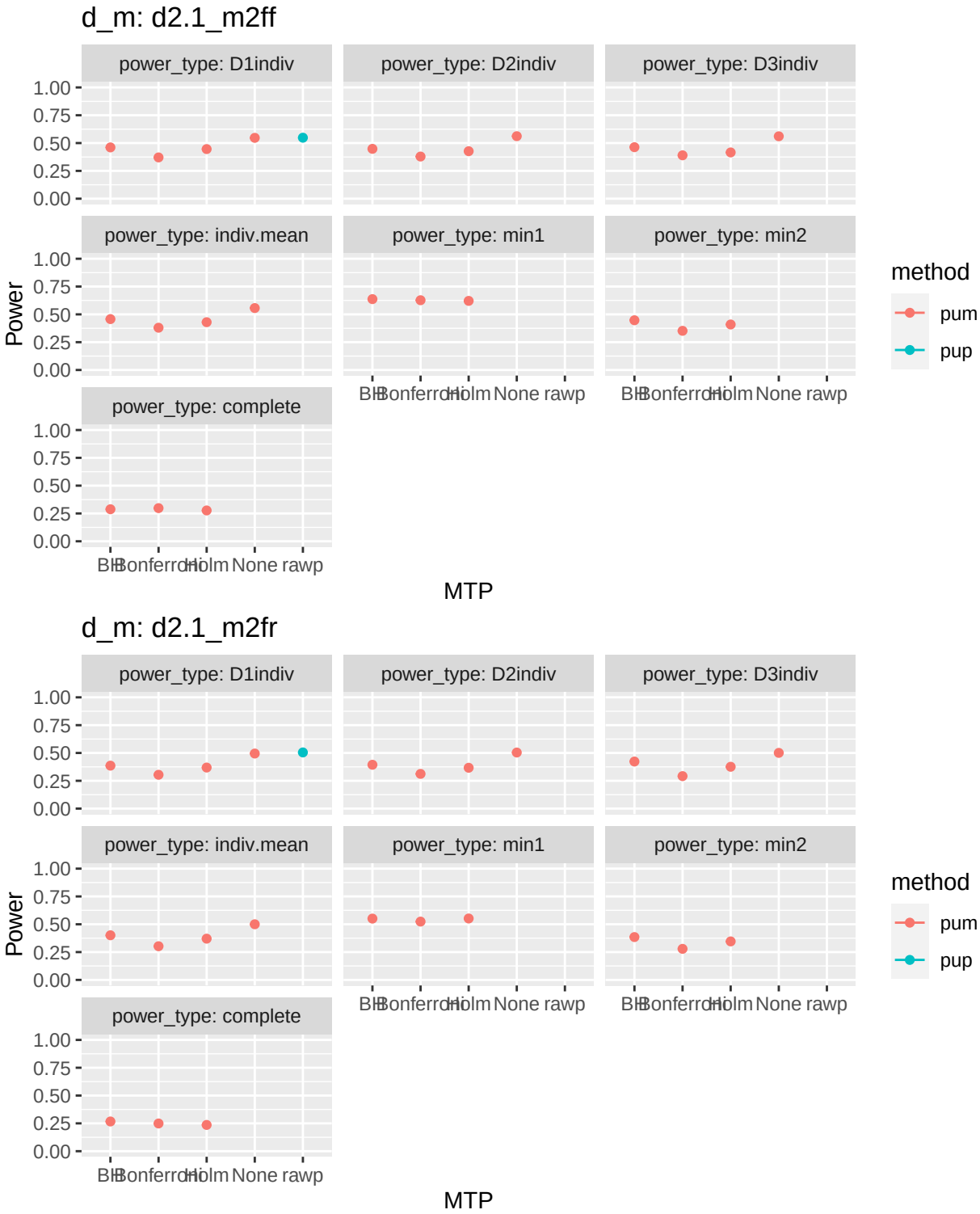






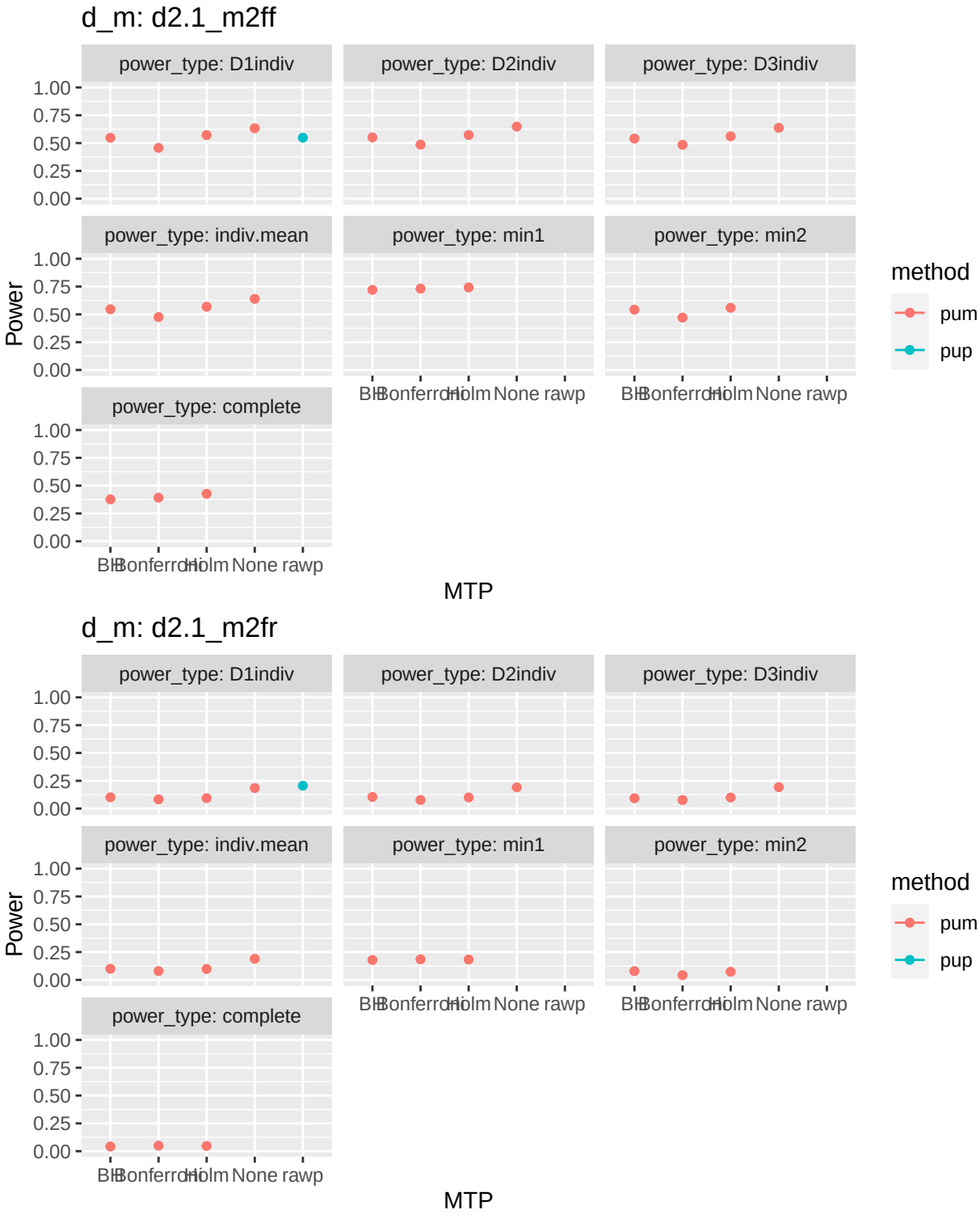
$\mathrm{ICC}_2 = 0, 0, 0$





Varying Omega

$\omega_2 = 0.8, 0.8, 0.8$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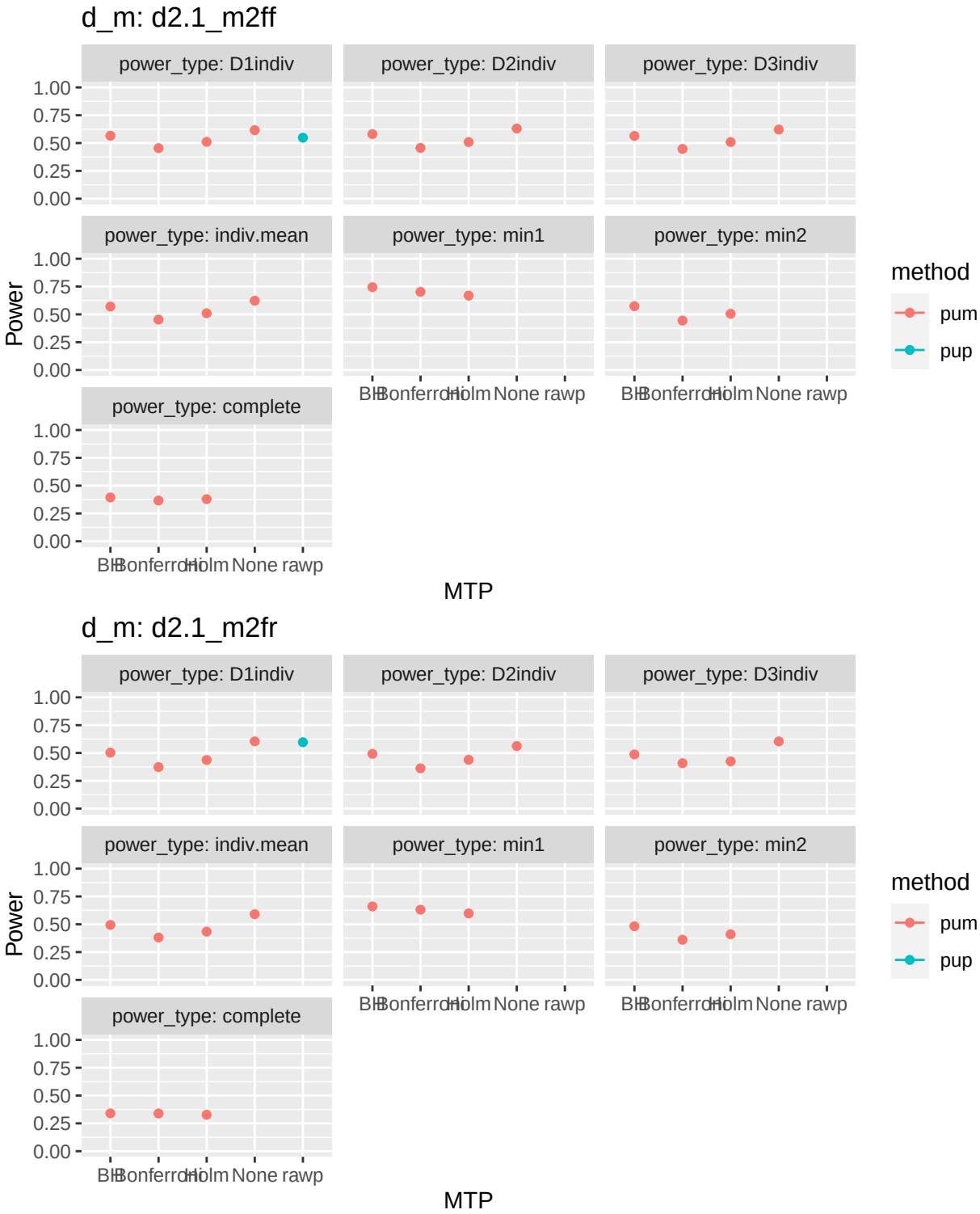
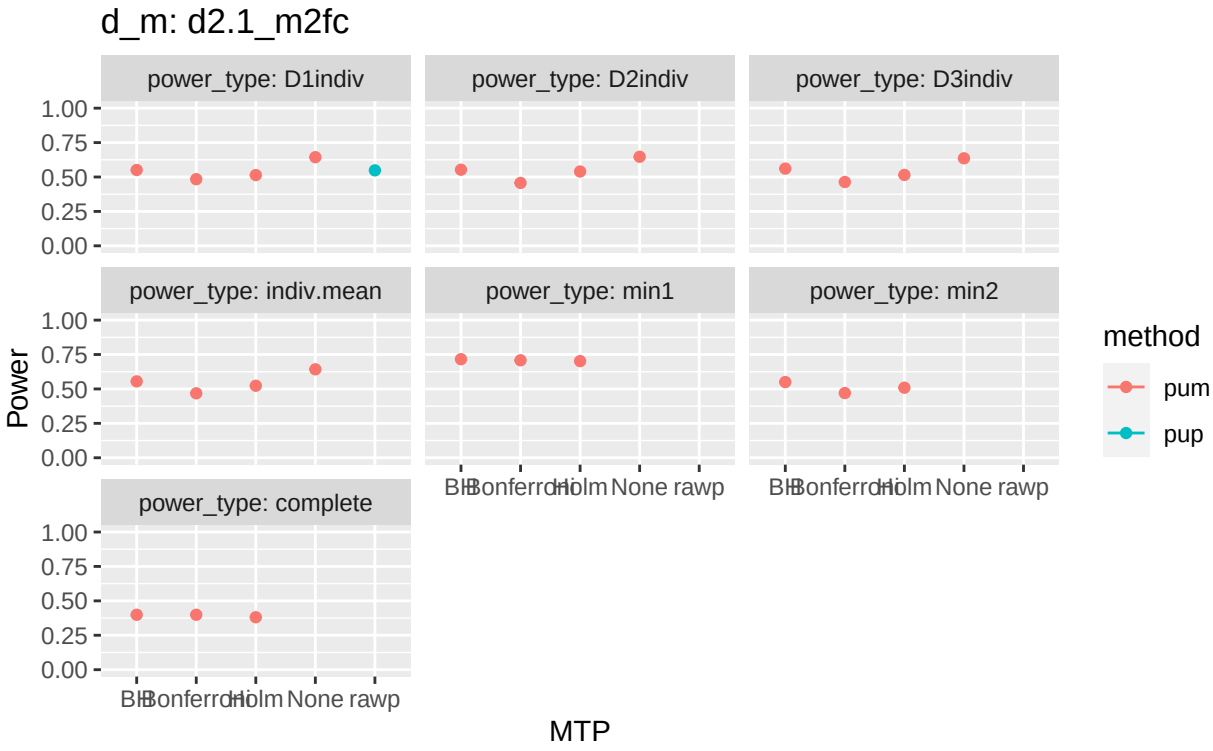
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup
d_m: d2.1_m2fr
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup

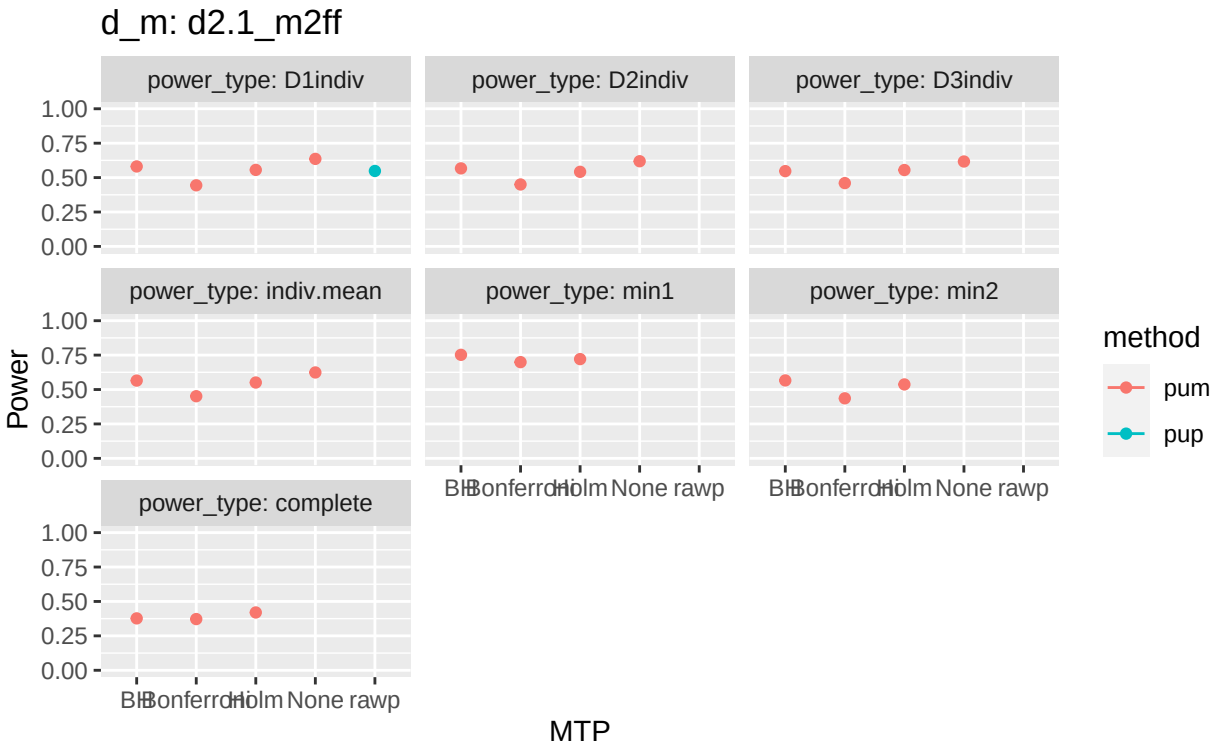
$\omega_2 = 0, 0, 0$

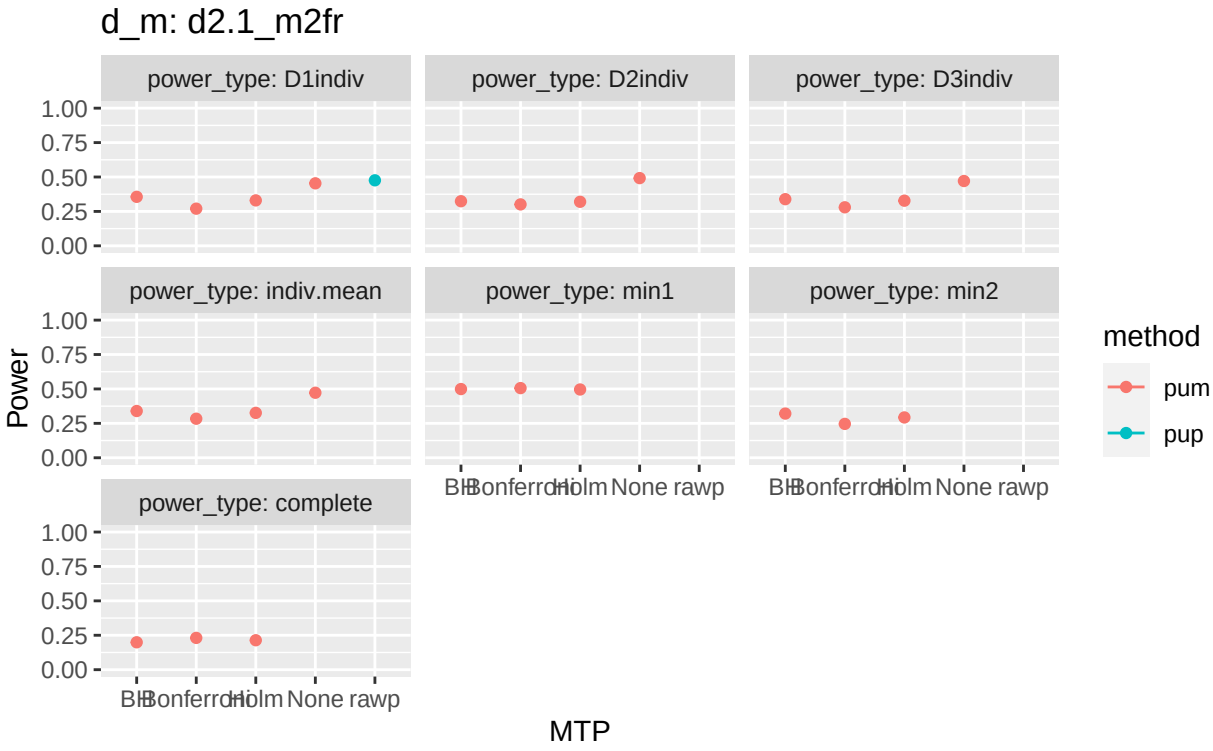


Kappa

$\kappa = 0.4$


d_m: d2.1_m2fc
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup


d_m: d2.1_m2ff
power_type: D1indiv
power_type: D2indiv
power_type: D3indiv
power_type: indiv.mean
power_type: min1
power_type: min2
power_type: complete
Power
1.00
0.75
0.50
0.25
0.00
BH
Bonferroni
Holm
None
rawp
MTP
method
pum
pup



MDES validation

Sample size validation