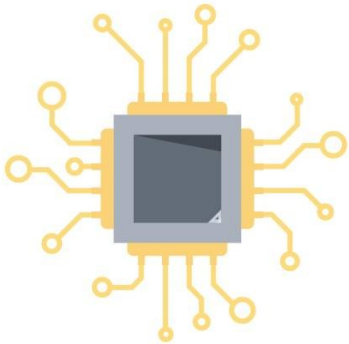
Simulation study

Gorica Evidence Synthesis

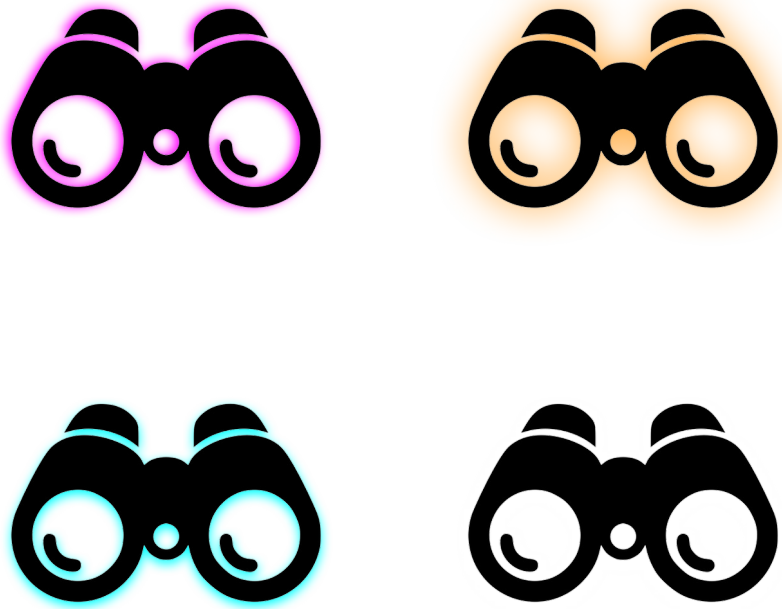


Setup

$H_0: \beta_3 = 0$

$H_1: \beta_3 > 0$

$H_2: \beta_3 < 0$



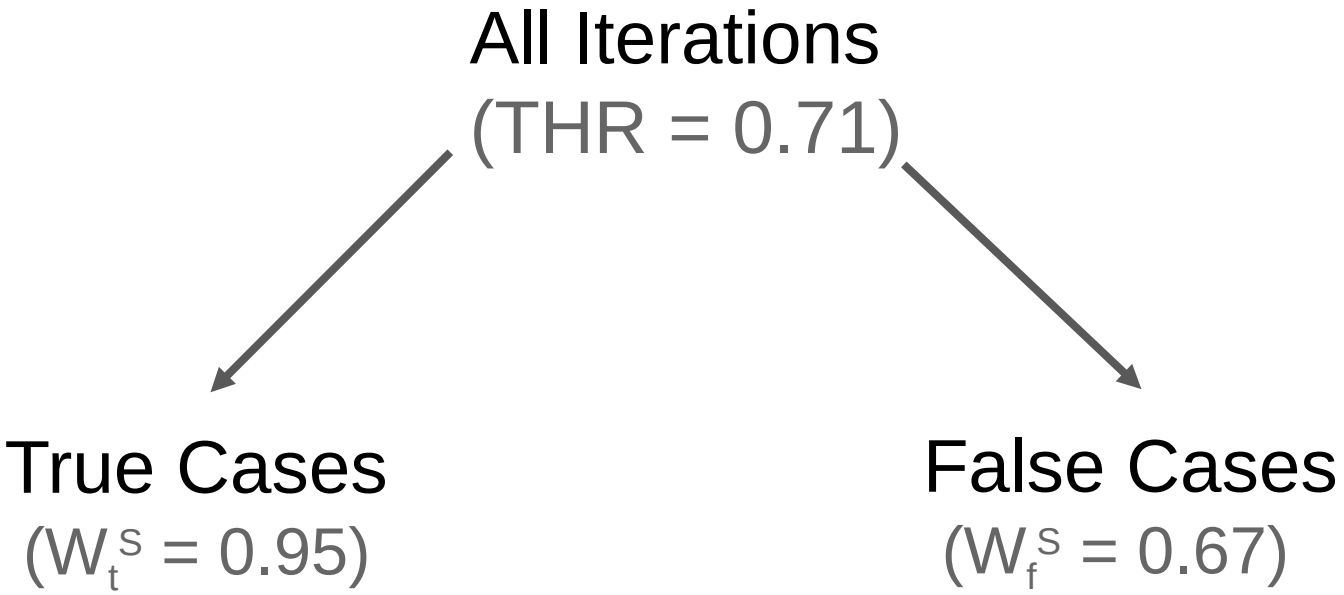
Performance Indicators

1. Gorica weights
2. True hypothesis rate
3. Relative support

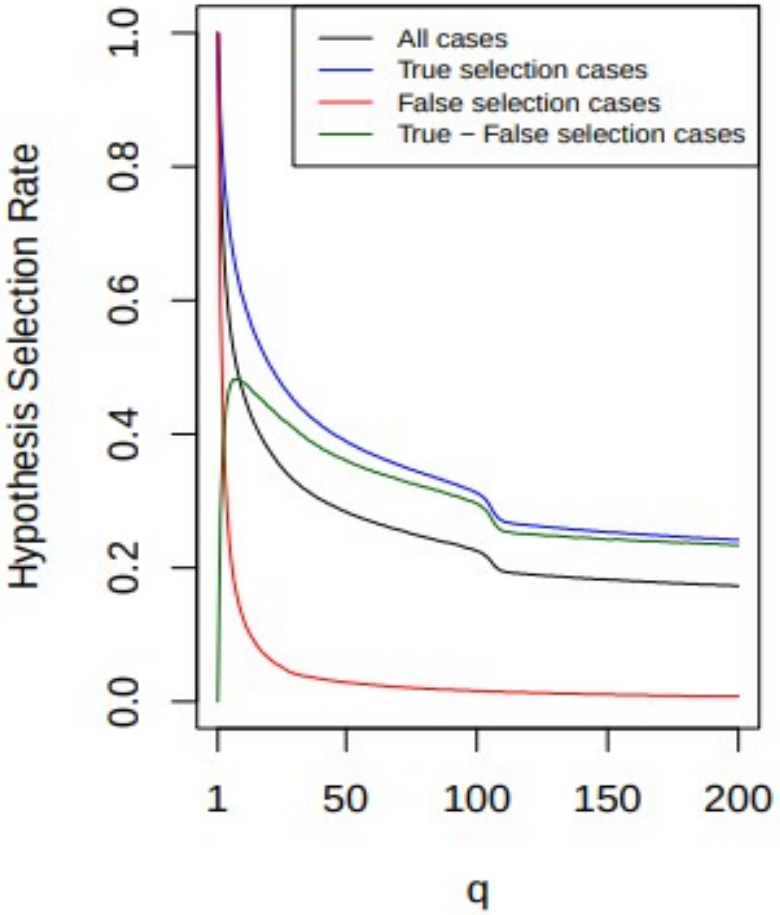
Design Factors

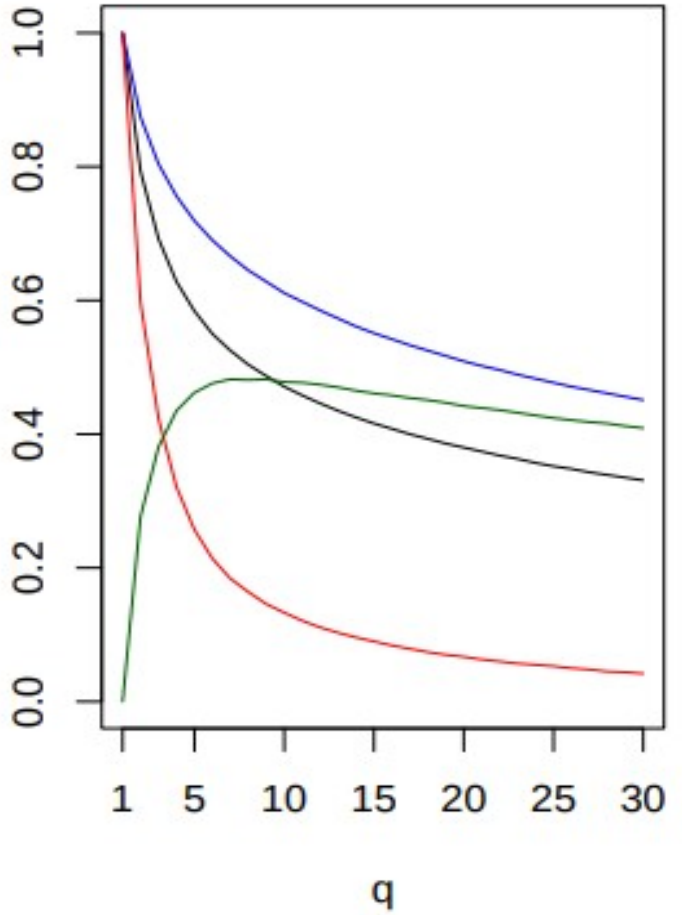
1. Sample size
2. Hypothesis set
3. Study heterogeneity
4. Population effect size
5. Multicollinearity
6. Relative predictor importance

Main results



Main results

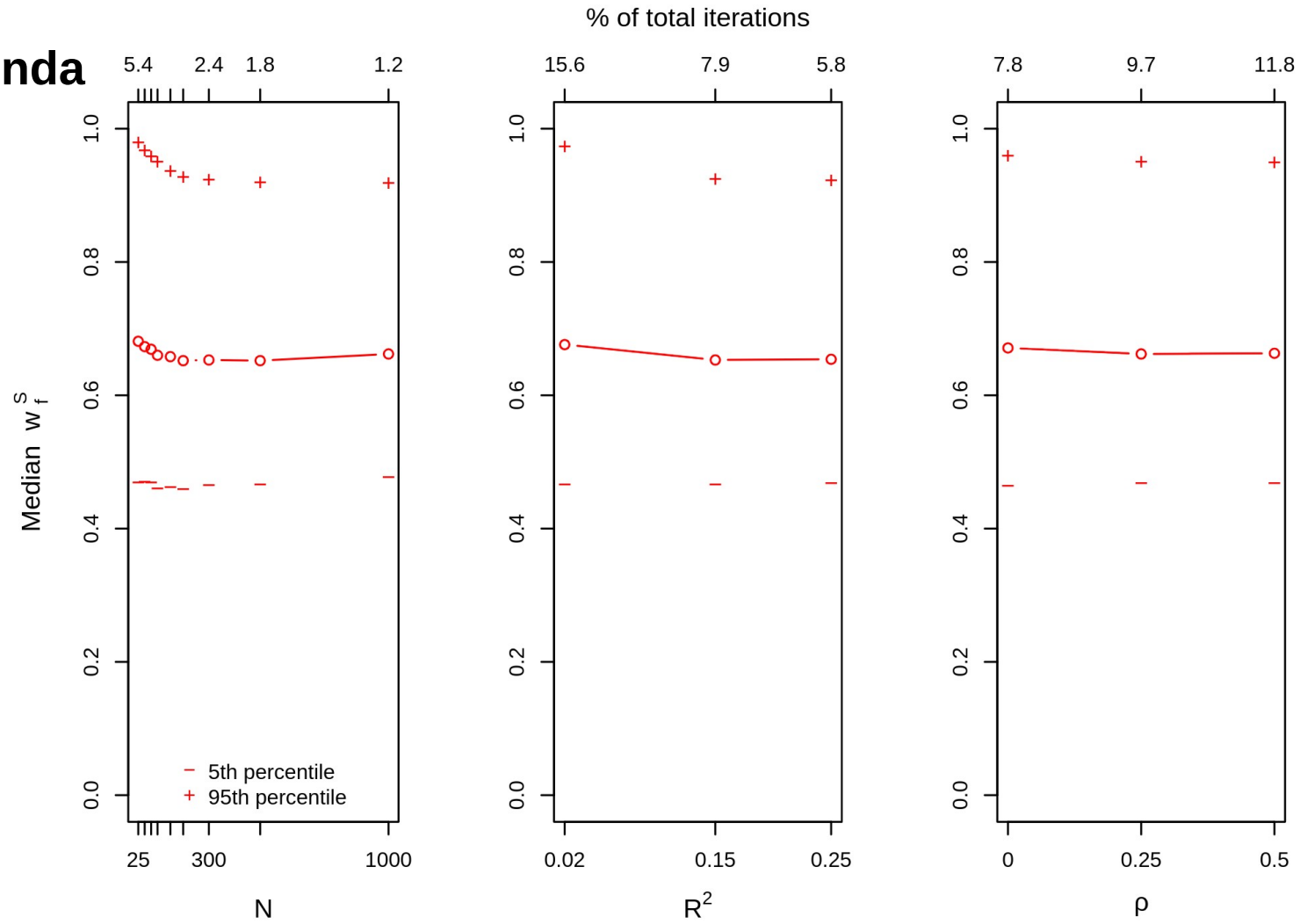


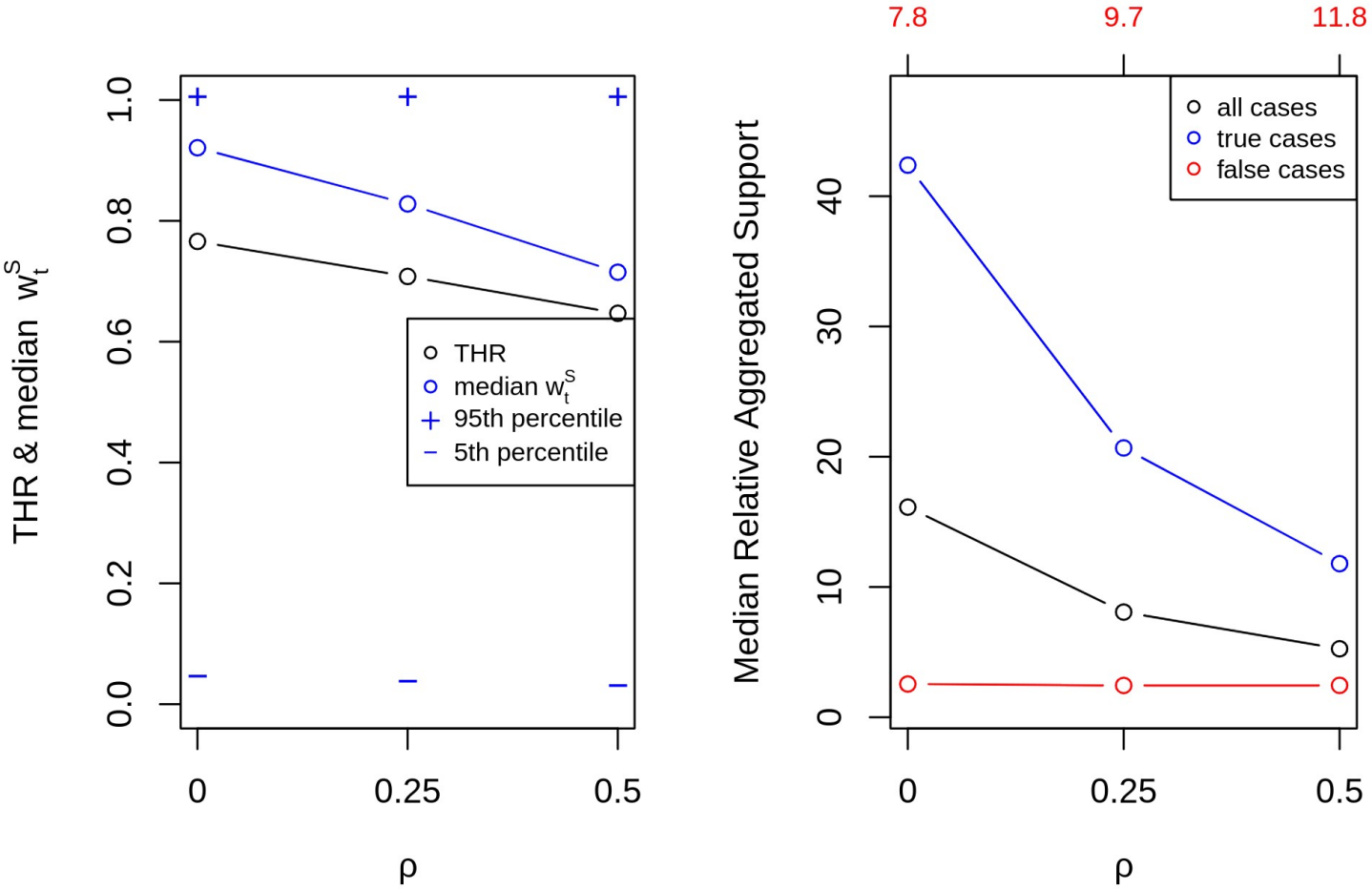


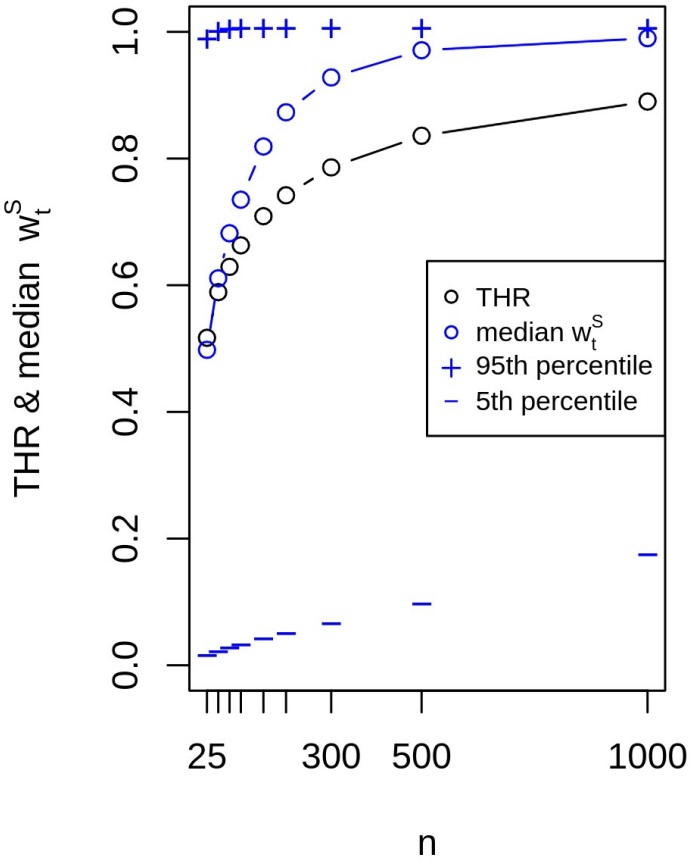
Conclusion

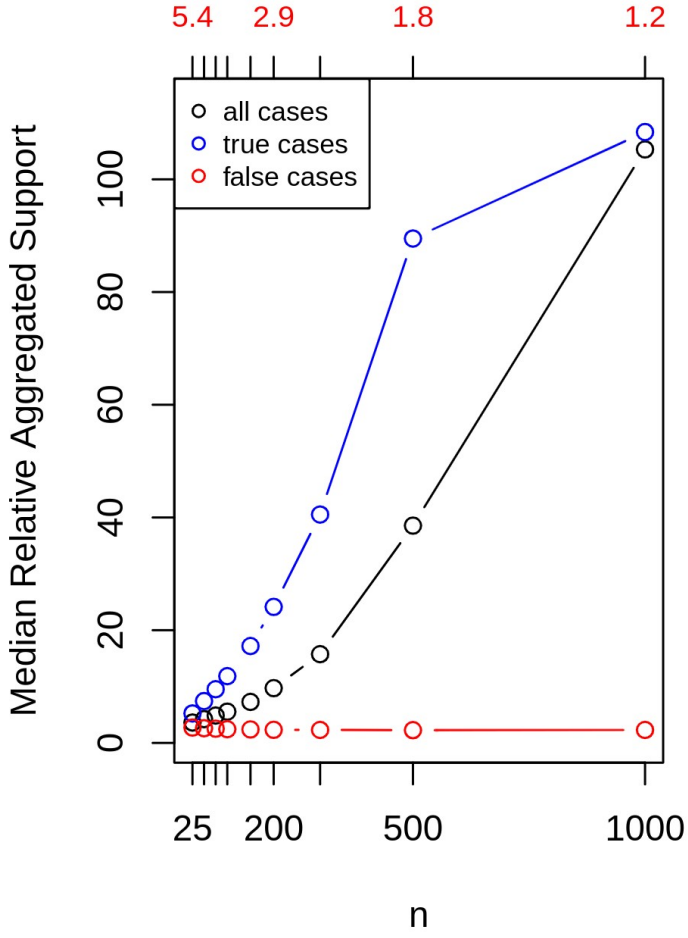
- Viable confirmatory method
- A priori threshold

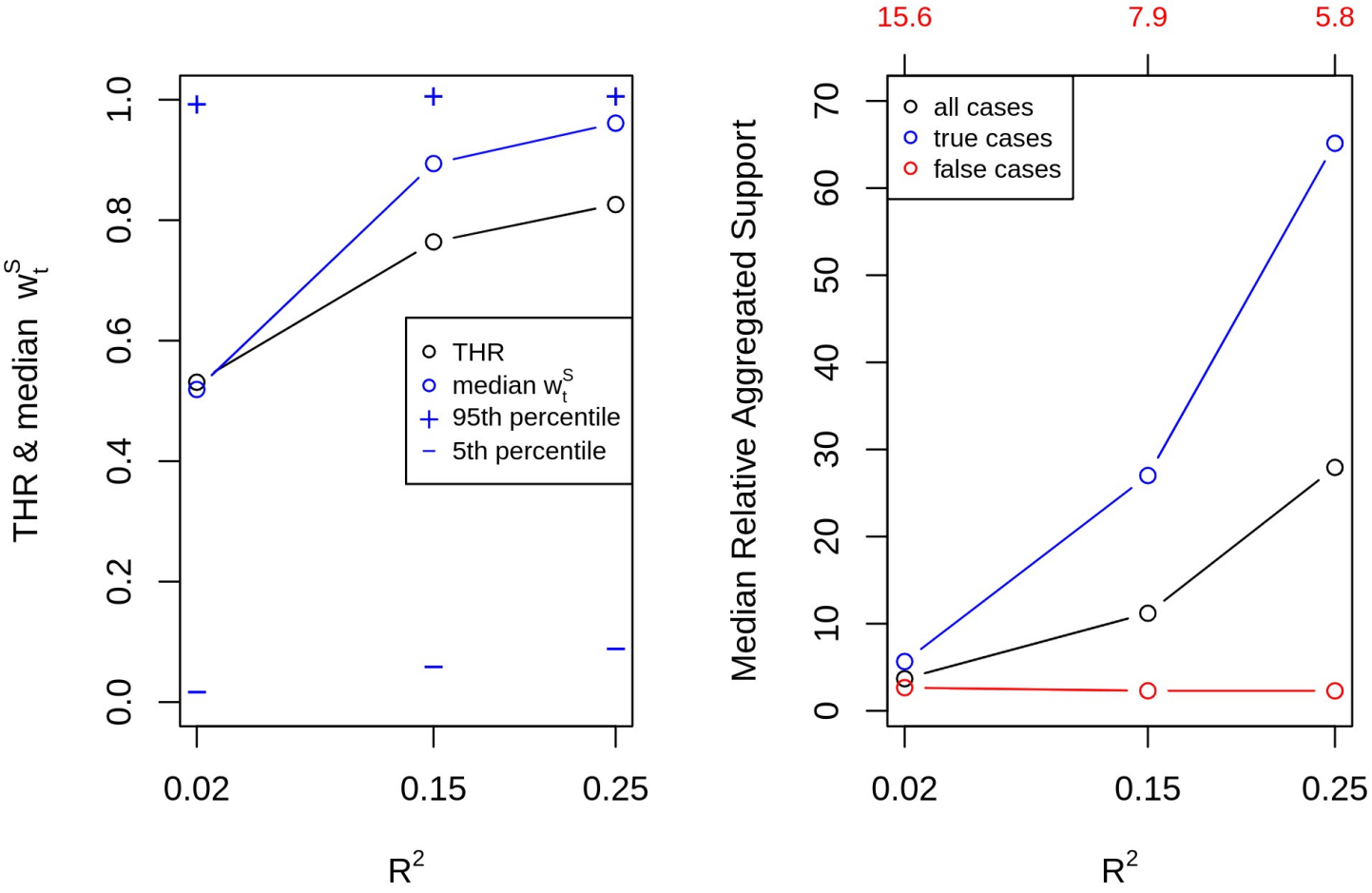
Addenda


% of total iterations
5.4
2.4
1.8
1.2
15.6
7.9
5.8
7.8
9.7
11.8
Median w_f^s
1.0
0.8
0.6
0.4
0.2
0.0
5th percentile
95th percentile
25
300
1000
0.02
0.15
0.25
0
0.25
0.5
N
R^2
ρ


THR & median w_t^s
1.0
0.8
0.6
0.4
0.2
0.0
0
0.25
0.5
ρ
THR
median w_t^s
95th percentile
5th percentile
Median Relative Aggregated Support
7.8
9.7
11.8
40
30
20
10
0
all cases
true cases
false cases


THR & median w_t^s
0.0
0.2
0.4
0.6
0.8
1.0
25
300
500
1000
n
THR
median w_t^s
95th percentile
5th percentile


Median Relative Aggregated Support
5.4
2.9
1.8
1.2
0
20
40
60
80
100
25
200
500
1000
n
all cases
true cases
false cases


THR & median w_t^S
1.0
0.8
0.6
0.4
0.2
0.0
THR
median w_t^S
95th percentile
5th percentile
0.02
0.15
0.25
R^2
15.6
7.9
5.8
Median Relative Aggregated Support
70
60
50
40
30
20
10
0
all cases
true cases
false cases
0.02
0.15
0.25
R^2

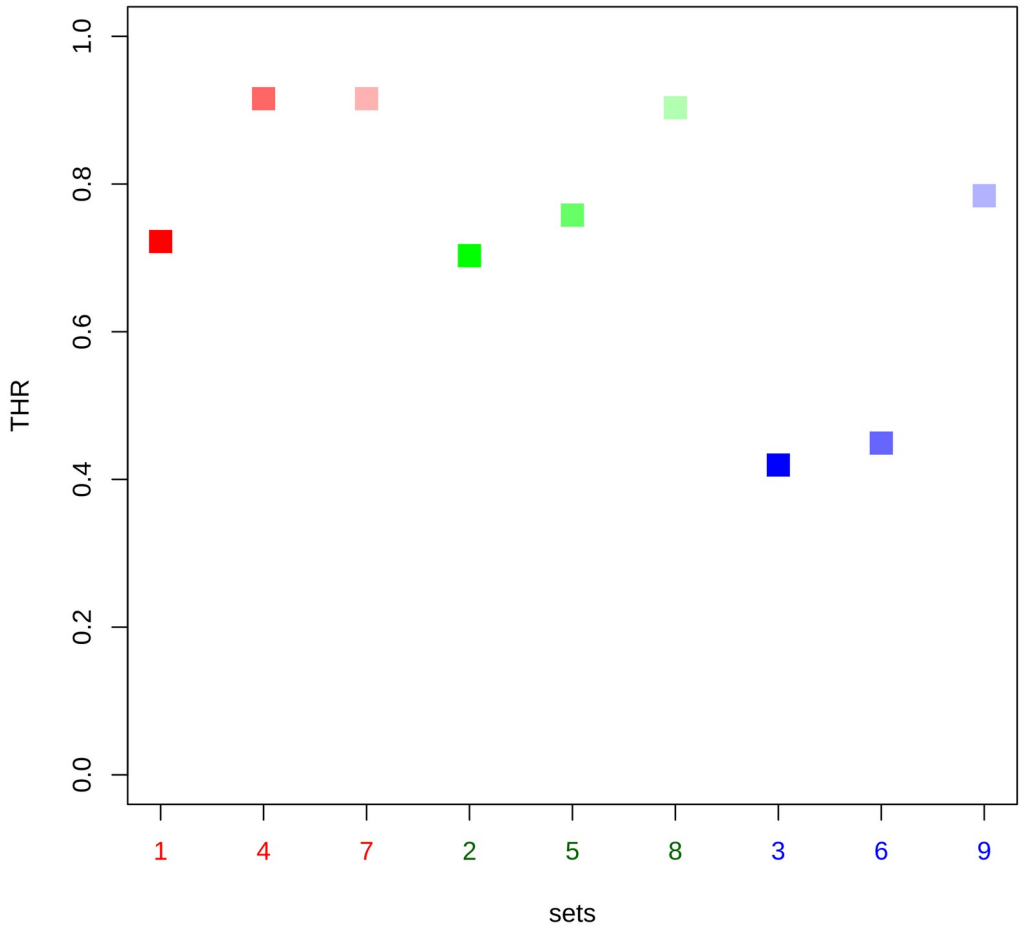

THR
1.0
0.8
0.6
0.4
0.2
0.0
1
4
7
2
5
8
3
6
9
sets

TABLE 3 Performance of GORICA evidence aggregation for different hypothesis sets.

Set	THR	median w_t^S	percentiles w_t^S		MRAS		
			5th	95th	all	true	false
Set 1	.72	.91	.12	1.00	11.5	157	2.38
Set 2	.70	.74	.02	.99	6.59	11.5	2.60
Set 3	.42	.26	.00	1.00	5.22	18.0	3.36
Set 4	.92	.99	.38	1.00	77.0	149	1.90
Set 5	.76	.77	.06	.99	4.83	9.67	1.71
Set 6	.45	.33	.02	1.00	4.25	14.6	2.74
Set 7	.92	.99	.38	1.00	77.0	149	1.90
Set 8	.90	.95	.26	1.00	18.7	21.7	2.96
Set 9	.78	.83	.25	1.00	5.70	11.3	1.82

Abbreviations. True Hypothesis Rate (THR), median aggregated GORIC(A) weight for the true hypothesis (median w_t^S), Median Relative Aggregated Support (MRAS) for the true hypothesis over all cases (all), for the true hypothesis over only the true selection cases (true), and for a false hypothesis over only the false selection cases (false).

TABLE 4 Performance of GORICA evidence aggregation for statistical model diversity.

Diversity condition	THR	median w_t^S	percentiles w_t^S		MRAS		
			5th	95th	all	true	false
Homogeneous-equal	.71	.84	.04	1.00	8.61	22.2	2.50
Homogeneous-unequal	.70	.82	.03	1.00	8.18	22.1	2.46
Heterogeneous	.71	.83	.04	1.00	7.90	19.9	2.45

Abbreviations. True Hypothesis Rate (THR), median aggregated GORIC(A) weight for the true hypothesis (median w_t^S), Median Relative Aggregated Support (MRAS) for the true hypothesis over all cases (all), for the true hypothesis over only the true selection cases (true), and for a false hypothesis over only the false selection cases (false).

TABLE 2 Performance of GORICA evidence aggregation for different ratios of relative predictor importance.

Ratio of βs	THR	median w_t^S	percentiles w_t^S		MRAS		
			5th	95th	all	true	false
4:2:1	.76	.91	.05	1.00	13.3	32.1	2.51
1.77:1.33:1	.66	.74	.03	1.00	5.76	13.5	2.45
4:3:2:1:0	.66	.74	.03	1.00	5.88	13.6	2.60
1:2:3:4:0	.74	.89	.02	1.00	12.7	42.9	2.28

Abbreviations. True Hypothesis Rate (THR), median aggregated GORIC(A) weight for the true hypothesis (median w_t^S), Median Relative Aggregated Support (MRAS) for the true hypothesis over all cases (all), for the true hypothesis over only the true selection cases (true), and for a false hypothesis over only the false selection cases (false).