# ESTIMATING THE HETEROGENEITY VARIANCE IN A RANDOM-EFFECTS META-ANALYSIS

 $Two \ volumes$ 

VOLUME II OF II

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OR meta- analyses with event probability:	0.5	p. 317	p. 318	p. 319	p. 320	p. 321
	0.1-0.5	p. 322	p. 323	p. 324	p. 325	p. 326
	0.05	p. 327	p. 328	p. 329	p. 330	p. 331
	0.01	p. 332	p. 333	p. 334	p. 335	p. 336

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		Study sizes				
		Small	Small-to- medium	Medium	Small and Large	Large
SMD meta-analyses		p. 337	p. 338	p. 339	p. 340	p. 341
OR meta- analyses with event probability:	0.5	p. 342	p. 343	p. 344	p. 345	p. 346
	0.1 - 0.5	p. 347	p. 348	p. 349	p. 350	p. 351
	0.05	p. 352	p. 353	p. 354	p. 355	p. 356
	0.01	p. 357	p. 358	p. 359	p. 360	p. 361

		Study sizes				
		Small	Small-to- medium	Medium	Small and Large	Large
SMD meta-analyses		p. 362	p. 363	p. 364	p. 365	p. 366
OR meta- analyses with event probability:	0.5	p. 367	p. 368	p. 369	p. 370	p. 371
	0.1 - 0.5	p. 372	p. 373	p. 374	p. 375	p. 376
	0.05	p. 377	p. 378	p. 379	p. 380	p. 381
	0.01	p. 382	p. 383	p. 384	p. 385	p. 386

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		Study sizes				
		Small	Small-to- medium	Medium	Small and Large	Large
SMD meta-analyses		p. 387	p. 388	p. 389	p. 390	p. 391
OR meta- analyses with event probability:	0.5	p. 392	p. 393	p. 394	p. 395	p. 396
	0.1 - 0.5	p. 397	p. 398	p. 399	p. 400	p. 401
	0.05	p. 402	p. 403	p. 404	p. 405	p. 406
	0.01	p. 407	p. 408	p. 409	p. 410	p. 411

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		Study sizes				
		Small	Small-to- medium	Medium	Small and Large	Large
SMD meta-analyses		p. 412	p. 413	p. 414	p. 415	p. 416
OR meta- analyses with event probability:	0.5	p. 417	p. 418	p. 419	p. 420	p. 421
	0.1-0.5	p. 422	p. 423	p. 424	p. 425	p. 426
	0.05	p. 427	p. 428	p. 429	p. 430	p. 431
	0.01	p. 432	p. 433	p. 434	p. 435	p. 436

		Study sizes				
		Small	Small-to- medium	Medium	Small and Large	Large
SMD meta-analyses		p. 437	p. 438	p. 439	p. 440	p. 441
OR meta- analyses with event probability:	0.5	p. 442	p. 443	p. 444	p. 445	p. 446
	0.1-0.5	p. 447	p. 448	p. 449	p. 450	p. 451
	0.05	p. 452	p. 453	p. 454	p. 455	p. 456
	0.01	p. 457	p. 458	p. 459	p. 460	p. 461

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## 1. Bias of heterogeneity variance estimates



Figure 1.1: Mean bias of heterogeneity variance estimates in SMD outcome meta-analyses. Containing small sized studies



Figure 1.2: Mean bias of heterogeneity variance estimates in SMD outcome meta-analyses. Containing small-to-medium sized studies Bias is presented on the proportional scale when  $\tau^2 > 0$ 



Figure 1.3: Mean bias of heterogeneity variance estimates in SMD outcome meta-analyses. Containing medium sized studies Bias is presented on the proportional scale when  $\tau^2 > 0$ 



Figure 1.4: Mean bias of heterogeneity variance estimates in SMD outcome meta-analyses. Containing small and large sized studies Bias is presented on the proportional scale when  $\tau^2 > 0$ 



Figure 1.5: Mean bias of heterogeneity variance estimates in SMD outcome meta-analyses. Containing large sized studies Bias is presented on the proportional scale when  $\tau^2 > 0$ 





Bias is presented on the proportional scale when  $\tau^2 > 0$ 







Figure 1.8: Mean bias of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing medium sized studies with 0.5 underlying event probability



















Figure 1.12: Mean bias of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small-to-medium sized studies with 0.1 to 0.5 underlying event probability Bias is presented on the proportional scale when  $\tau^2 > 0$ 









Bias is presented on the proportional scale when  $\tau^2 > 0$ 







Figure 1.16: Mean bias of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small sized studies with 0.05 underlying event probability



### Figure 1.17: Mean bias of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small-to-medium sized studies with 0.05 underlying event probability

















Figure 1.21: Mean bias of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small sized studies with 0.01 underlying event probability



Figure 1.22: Mean bias of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small-to-medium sized studies with 0.01 underlying event probability











![](_page_28_Figure_1.jpeg)

![](_page_28_Figure_2.jpeg)

![](_page_29_Figure_0.jpeg)

2. Mean squared error of heterogeneity variance estimates

Figure 2.1: Mean squared error of heterogeneity variance estimates in SMD outcome meta-analyses. Containing small sized studies

![](_page_30_Figure_0.jpeg)

Figure 2.2: Mean squared error of heterogeneity variance estimates in SMD outcome meta-analyses. Containing small-to-medium sized studies MSE is presented on the proportional scale when  $\tau^2 > 0$ 

![](_page_31_Figure_0.jpeg)

Figure 2.3: Mean squared error of heterogeneity variance estimates in SMD outcome meta-analyses. Containing medium sized studies MSE is presented on the proportional scale when  $\tau^2 > 0$ 

![](_page_32_Figure_0.jpeg)

Figure 2.4: Mean squared error of heterogeneity variance estimates in SMD outcome meta-analyses. Containing small and large sized studies MSE is presented on the proportional scale when  $\tau^2 > 0$ 

![](_page_33_Figure_0.jpeg)

Figure 2.5: Mean squared error of heterogeneity variance estimates in SMD outcome meta-analyses. Containing large sized studies MSE is presented on the proportional scale when  $\tau^2 > 0$ 

![](_page_34_Figure_0.jpeg)

Figure 2.6: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small sized studies with 0.5 underlying event probability MSE is presented on the proportional scale when  $\tau^2 > 0$ 

![](_page_35_Figure_0.jpeg)

Figure 2.7: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small-to-medium sized studies with 0.5 underlying event probability

![](_page_35_Figure_2.jpeg)


Figure 2.8: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing medium sized studies with 0.5 underlying event probability



Figure 2.9: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small and large sized studies with 0.5 underlying event probability





Figure 2.10: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing large sized studies with 0.5 underlying event probability MSE is presented on the prepartice of each when  $\tau^2 > 0$ 

MSE is presented on the proportional scale when  $\tau^2 > 0$ 



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Figure 2.12: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small-to-medium sized studies with 0.1 to 0.5 underlying event probability MSE is presented on the proportional scale when  $\tau^2 > 0$ 



Figure 2.13: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing medium sized studies with 0.1 to 0.5 underlying event probability MSE is presented on the prepartienal code when -2 > 0

MSE is presented on the proportional scale when  $\tau^2 > 0$ 



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Figure 2.22: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing small-to-medium sized studies with 0.01 underlying event probability











Figure 2.25: Mean squared error of heterogeneity variance estimates in odds ratio outcome meta-analyses. Containing large sized studies with 0.01 underlying event probability



3. Proportion of zero heterogeneity variance estim-

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Figure 3.2: Proportion of zero heterogeneity variance estimates in SMD outcome meta-analyses. Containing small-to-medium sized studies



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7. Coverage of 95% Knapp-Hartung confidence intervals

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Figure 7.2: Coverage of 95% Knapp-Hartung confidence intervals in SMD outcome meta-analyses. Containing small-to-medium sized studies



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