

Supplemental Material – Corpus

Brian D. Hall¹, Yang Liu², Yvonne Jansen³, Pierre Dragicevic⁴, Fanny Chevalier⁵, Matthew Kay⁶

¹University of Michigan, MI, USA; ²University of Washington, WA, USA; ³Sorbonne Université, France; ⁴Inria, Université Paris-Saclay, France; ⁵University of Toronto, ON, Canada; ⁶Northwestern University, IL, USA

Publication	Corpus	Terminology	Search Keyword	Introduces Archetype
Beugelsdijk <i>et al.</i> , 2004 [BDGVS04]	serendipity	robustness analysis		
Hegre & Sambanis, 2006 [HS06]	serendipity	sensitivity analysis		
Ioannidis, 2008 [Ioa08]	serendipity	vibration of effects		
Carp, 2012 [Car12]	serendipity	variability		yes
Cirillo & Taleb, 2016 [CT16]	serendipity	robustness analysis		
Olkin <i>et al.</i> , 2012 [ODT12]	serendipity	between-study heterogeneity		yes
Harris <i>et al.</i> , 2013 [HCM13]	serendipity	researcher degrees of freedom		
Young & Holsteen, 2017 [YH17]	serendipity	multimodel analysis		yes
Arslan <i>et al.</i> , 2018 [ASGP18]	serendipity	specification curve & robustness analysis		yes
Young, 2018 [You18]	serendipity	multimodel analysis		
Muñoz & Young, 2018 [MY18]	serendipity	robustness analysis		
Poarch <i>et al.</i> , 2019 [PVB19]	serendipity	multiverse analysis		
Bastiaansen <i>et al.</i> , 2019 [BKB*20]	serendipity	crowdsourced analysis		yes
Donnelly <i>et al.</i> , 2019 [DBH19]	serendipity	multiverse meta-analysis		
Kalokerinos <i>et al.</i> , 2019 [KECK19]	serendipity	multiverse analysis		yes
Dejonckheere <i>et al.</i> , 2019 [DKBK19]	serendipity	multiverse analysis		
Rae <i>et al.</i> , 2019 [RGD*19]	serendipity	multiverse analysis		
Voracek <i>et al.</i> , 2019 [VKT19]	serendipity	specification curve & multiverse meta-analysis		
Bryan <i>et al.</i> , 2019 [BYO19]	serendipity	specification curve		
Botvinik-Nezer <i>et al.</i> , 2019 [BNHC*20]	serendipity	crowdsourced analysis		yes
Lonsdorf <i>et al.</i> , 2019 [LKJA*19]	serendipity	garden of forking paths		yes
Dragicevic <i>et al.</i> , 2019 [DJS*19]	serendipity	multiverse analysis		yes
Liu <i>et al.</i> , 2020 [LKAH20]	serendipity	multiverse analysis		yes
Bursztyn <i>et al.</i> , 2020 [BRRYD20]	serendipity	robustness checks		
Silberzahn & Uhlmann, 2015 [SU15]	both	crowdsourced analysis	crowdsourced analysis	
Patel <i>et al.</i> , 2015 [PBI15]	both	vibration of effects	vibration of effects	yes
Steege <i>et al.</i> , 2016 [STGV16]	both	multiverse analysis	multiverse analysis / vibration of effects	yes
Rohrer <i>et al.</i> , 2017 [RES17]	both	specification curve	specification curve	
Cookson, 2018 [Coo18]	both	specification curve & robustness analysis	specification curve	
Silberzahn <i>et al.</i> , 2018 [SUM*18]	both	crowdsourced analysis	crowdsourced analysis / multiverse analysis	yes
Jelveh <i>et al.</i> , 2018 [JKN18]	both	specification curve	specification curve	
Dejonckheere <i>et al.</i> , 2018 [DMH*18]	both	multiverse analysis	specification curve / multiverse analysis	
Orben & Przybylski, 2019a [OP19a]	both	multiverse analysis	multiverse analysis	
Simonsohn <i>et al.</i> , 2019 [SSN19]	both	specification curve	specification curve	yes
Cesario <i>et al.</i> , 2019 [CJT19]	both	specification curve	specification curve	
Border <i>et al.</i> , 2019 [BJE*19]	both	multiverse analysis	multiverse analysis	
Bruns & Ioannidis, 2016 [BI16]	both	multiverse analysis	multiverse analysis	
Hill <i>et al.</i> , 2016 [HHC*16]	systematic	vibration of effects	vibration of effects	
Denny & Spirling, 2018 [DS18]	systematic	crowdsourced analysis	crowdsourced analysis	
Dubois <i>et al.</i> , 2018 [DGH*18]	systematic	multiverse analysis	multiverse analysis	
Saggar <i>et al.</i> , 2018 [SSGC*18]	systematic	vibration of effects	vibration of effects	
Orben <i>et al.</i> , 2019 [ODP19]	systematic	perturbation analysis	perturbation analysis	
Orben & Przybylski, 2019b [OP19b]	systematic	specification curve	specification curve	
Orben & Przybylski, 2019b [OP19b]	systematic	specification curve	specification curve	

Figure 1: All publications in our corpus. The columns indicate how the article was found, the terminology used in the article to describe the multiverse analysis, the search keyword(s) (if applicable) through which the article was discovered, and whether the article introduces a visualization archetype.

References

- [ASGP18] ARSLAN R. C., SCHILLING K. M., GERLACH T. M., PENKE L.: Using 26,000 diary entries to show ovulatory changes in sexual desire and behavior. *Journal of Personality and Social Psychology* (2018). 1
- [BDGVS04] BEUGELSDIJK S., DE GROOT H. L., VAN SCHAIK A. B.: Trust and economic growth: a robustness analysis. *Oxford economic papers* 56, 1 (2004), 118–134. 1
- [BI16] BRUNS S. B., IOANNIDIS J. P.: P-curve and p-hacking in observational research. *PLoS one* 11, 2 (2016), e0149144. 1
- [BJE*19] BORDER R., JOHNSON E. C., EVANS L. M., SMOLEN A., BERLEY N., SULLIVAN P. F., KELLER M. C.: No support for historical candidate gene or candidate gene-by-interaction hypotheses for major depression across multiple large samples. *American Journal of Psychiatry* 176, 5 (2019), 376–387. 1
- [BKB*20] BASTIAANSEN J. A., KUNKELS Y. K., BLAAUW F. J., BOKER S. M., CEULEMANS E., CHEN M., CHOW S.-M., DE JONGE P., EMERENCIA A. C., EPSKAMP S., ET AL.: Time to get personal? the impact of researchers choices on the selection of treatment targets using the experience sampling methodology. *Journal of psychosomatic research* 137 (2020), 110211. 1
- [BNHC*20] BOTVINIK-NEZER R., HOLZMEISTER F., CAMERER C. F., DREBER A., HUBER J., JOHANNESSEN M., KIRCHLER M., IWANIR R., MUMFORD J. A., ADCOCK R. A., ET AL.: Variability in the analysis of a single neuroimaging dataset by many teams. *Nature* 582 (2020), 84–88. 1
- [BRRYD20] BURSZTYN L., RAO A., ROTH C., YANAGIZAWA-DROTT D.: Misinformation during a pandemic. *University of Chicago, Becker Friedman Institute for Economics Working Paper*, 2020-44 (2020), 1–114. 1
- [BYO19] BRYAN C. J., YEAGER D. S., O'BRIEN J. M.: Replicator degrees of freedom allow publication of misleading failures to replicate. *Proceedings of the National Academy of Sciences* 116, 51 (2019), 25535–25545. 1
- [Car12] CARP J.: On the plurality of (methodological) worlds: estimating the analytic flexibility of fmri experiments. *Frontiers in neuroscience* 6 (2012), 149. 1
- [CJT19] CESARIO J., JOHNSON D. J., TERRILL W.: Is there evidence of racial disparity in police use of deadly force? analyses of officer-involved fatal shootings in 2015–2016. *Social psychological and personality science* 10, 5 (2019), 586–595. 1
- [Coo18] COOKSON J. A.: When saving is gambling. *Journal of Financial Economics* 129, 1 (2018), 24–45. 1
- [CT16] CIRILLO P., TALEB N. N.: On the statistical properties and tail risk of violent conflicts. *Physica A: Statistical Mechanics and its Applications* 452 (2016), 29–45. 1
- [DBH19] DONNELLY S., BROOKS P. J., HOMER B. D.: Is there a bilingual advantage on interference-control tasks? a multiverse meta-analysis of global reaction time and interference cost. *Psychonomic bulletin & review* 26, 4 (2019), 1122–1147. 1
- [DGH*18] DUBOIS J., GALDI P., HAN Y., PAUL L. K., ADOLPHS R.: Resting-state functional brain connectivity best predicts the personality dimension of openness to experience. *Personality neuroscience* 1 (2018). 1
- [DJS*19] DRAGICEVIC P., JANSEN Y., SARMA A., KAY M., CHEVALIER F.: Increasing the transparency of research papers with exploratory multiverse analyses. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (New York City, NY, USA, 2019), Association for Computing Machinery, pp. 1–15. 1
- [DKBK19] DEJONCKHEERE E., KALOKERINOS E. K., BASTIAN B., KUPPENS P.: Poor emotion regulation ability mediates the link between depressive symptoms and affective bipolarity. *Cognition and Emotion* 33, 5 (2019), 1076–1083. 1

- [DMH*18] DEJONCKHEERE E., MESTDAGH M., HOUBEN M., ERBAS Y., PE M., KOVAL P., BROSE A., BASTIAN B., KUPPENS P.: The bipolarity of affect and depressive symptoms. *Journal of personality and social psychology* 114, 2 (2018), 323. 1
- [DS18] DENNY M. J., SPIRLING A.: Text preprocessing for unsupervised learning: Why it matters, when it misleads, and what to do about it. *Political Analysis* 26, 2 (2018), 168–189. doi:10.1017/pan.2017.44. 1
- [HCM13] HARRIS C. R., CHABOT A., MICKES L.: Shifts in methodology and theory in menstrual cycle research on attraction. *Sex Roles* 69, 9-10 (2013), 525–535. 1
- [HHC*16] HILL S. M., HEISER L. M., COKELAER T., UNGER M., NESSER N. K., CARLIN D. E., ZHANG Y., SOKOLOV A., PAULL E. O., WONG C. K., ET AL.: Inferring causal molecular networks: empirical assessment through a community-based effort. *Nature methods* 13, 4 (2016), 310–318. 1
- [HS06] HEGRE H., SAMBANIS N.: Sensitivity analysis of empirical results on civil war onset. *Journal of conflict resolution* 50, 4 (2006), 508–535. 1
- [Ioa08] IOANNIDIS J. P.: Why most discovered true associations are inflated. *Epidemiology* 19, 5 (2008), 640–648. 1
- [JKN18] JELVEH Z., KOGUT B., NAIDU S.: Political language in economics. *Columbia Business School Research Paper*, 14-57 (2018), 1–67. 1
- [KECK19] KALOKERINOS E. K., ERBAS Y., CEULEMANS E., KUPPENS P.: Differentiate to regulate: Low negative emotion differentiation is associated with ineffective use but not selection of emotion-regulation strategies. *Psychological Science* 30, 6 (2019), 863–879. 1
- [LKAH20] LIU Y., KALE A., ALTHOFF T., HEER J.: Boba: Authoring and visualizing multiverse analyses, 2020. arXiv:2007.05551. 1
- [LKJA*19] LONSDORF T. B., KLINGELHÖFER-JENS M., ANDREATTA M., BECKERS T., CHALKIA A., GERLICHER A., JENTSCH V. L., DREXLER S. M., MERTENS G., RICHTER J., ET AL.: Navigating the garden of forking paths for data exclusions in fear conditioning research. *Elife* 8 (2019), e52465. 1
- [MY18] MUÑOZ J., YOUNG C.: We ran 9 billion regressions: Eliminating false positives through computational model robustness. *Sociological Methodology* 48, 1 (2018), 1–33. 1
- [ODP19] ORBEN A., DIENLIN T., PRZYBYLSKI A. K.: Social media's enduring effect on adolescent life satisfaction. *Proceedings of the National Academy of Sciences* 116, 21 (2019), 10226–10228. 1
- [ODT12] OLKIN I., DAHABREH I. J., TRIKALINOS T. A.: Gosh—a graphical display of study heterogeneity. *Research Synthesis Methods* 3, 3 (2012), 214–223. 1
- [OP19a] ORBEN A., PRZYBYLSKI A. K.: The association between adolescent well-being and digital technology use. *Nature Human Behaviour* 3, 2 (2019), 173–182. 1
- [OP19b] ORBEN A., PRZYBYLSKI A. K.: Screens, teens, and psychological well-being: evidence from three time-use-diary studies. *Psychological science* 30, 5 (2019), 682–696. 1
- [PBI15] PATEL C. J., BURFORD B., IOANNIDIS J. P.: Assessment of vibration of effects due to model specification can demonstrate the instability of observational associations. *Journal of clinical epidemiology* 68, 9 (2015), 1046–1058. 1
- [PVB19] POARCH G. J., VANHOVE J., BERTHELE R.: The effect of bidialectalism on executive function. *International Journal of Bilingualism* 23, 2 (2019), 612–628. 1
- [RES17] RÖHRER J. M., EGLOFF B., SCHMUKLE S. C.: Probing birth-order effects on narrow traits using specification-curve analysis. *Psychological Science* 28, 12 (2017), 1821–1832. 1
- [RGD*19] RAE J. R., GÜLGÖZ S., DURWOOD L., DEMEULES M., LOWE R., LINDQUIST G., OLSON K. R.: Predicting early-childhood gender transitions. *Psychological science* 30, 5 (2019), 669–681. 1

- [SSGC*18] SAGGAR M., SPORNS O., GONZALEZ-CASTILLO J., BANDETTINI P. A., CARLSSON G., GLOVER G., REISS A. L.: Towards a new approach to reveal dynamical organization of the brain using topological data analysis. *Nature communications* 9, 1 (2018), 1–14. [1](#)
- [SSN19] SIMONSOHN U., SIMMONS J. P., NELSON L. D.: Specification curve: Descriptive and inferential statistics on all reasonable specifications, 2019. [1](#)
- [STGV16] STEEGEN S., TUERLINCKX F., GELMAN A., VANPAEMEL W.: Increasing transparency through a multiverse analysis. *Perspectives on Psychological Science* 11, 5 (2016), 702–712. [1](#)
- [SU15] SILBERZAHN R., UHLMANN E. L.: Crowdsourced research: Many hands make tight work. *Nature News* 526, 7572 (2015), 189. [1](#)
- [SUM*18] SILBERZAHN R., UHLMANN E. L., MARTIN D. P., ANSELMINI P., AUST F., AWTREY E., BAHNÍK Š., BAI F., BANNARD C., BONNIER É., ET AL.: Many analysts, one data set: Making transparent how variations in analytic choices affect results. *Advances in Methods and Practices in Psychological Science* 1, 3 (2018), 337–356. [1](#)
- [VKT19] VORACEK M., KOSSMEIER M., TRAN U. S.: Which data to meta-analyze, and how? *Zeitschrift für Psychologie* 227 (2019), 64–82. [1](#)
- [YH17] YOUNG C., HOLSTEEN K.: Model uncertainty and robustness: A computational framework for multimodel analysis. *Sociological Methods & Research* 46, 1 (2017), 3–40. [1](#)
- [You18] YOUNG C.: Model uncertainty and the crisis in science. *Socius* 4 (2018). [1](#)