

APPENDIX **E**

A TUTORIAL ON R PACKAGE **NetworkComparisonTest**

Adapted from:

<https://cran.r-project.org/web/packages/NetworkComparisonTest/NetworkComparisonTest.pdf>

This tutorial provides an explanation of R package **NetworkComparisonTest** (Van Borkulo, Epskamp, & Milner, 2016). This Network Comparison Test (NCT) is a permutation based hypothesis test, which is suited for Gaussian and binary data. It assesses the difference between two networks based on several invariance measures (network structure invariance, global strength invariance, edge invariance). Currently, NCT is suited for comparison of independent as well as dependent samples. Concerning dependent samples, only comparing one group which is measured twice is implemented (e.g., a group of patients with a pre- and post-treatment).

Network structures are estimated with ℓ_1 -regularized partial correlations (EBICglasso for Gaussian data; Epskamp et al., 2012) or with ℓ_1 -regularized logistic regression (eLasso for binary data Van Borkulo et al., 2014).

E.1 Introduction

Research in which the network approach is used has recently shifted from a descriptive stance to a more comparative stance (Bringmann et al., 2013; Pe et al., 2015; Wigman et al., 2015). The **NetworkComparisonTest** package provides a statistical tool to do so, by allowing direct comparison of two networks. This procedure combines advanced methodology for inferring network structures from large empirical, cross sectional datasets (Epskamp et al., 2012; Van Borkulo et al., 2014) with permutation testing. Currently, NCT evaluates three hypotheses that are typically relevant in network analysis: (1) *invariant network structure*, (2) *invariant edge strength*, and (3) *invariant global strength*. The first hypothesis, concerns the structure of the network as a whole, and states that this structure is completely identical across subpopulations. Differently stated, the distributions of edge weights are compared, similar to a Kolmogorov-Smirnoff test. The second hypothesis zooms in on the difference in strength of a specific edge of interest. The third hypothesis says that, although networks may differ in structure, the overall level of connectivity is equal across groups. See Chapter 5, for an extensive explanation of the test statistics, which accompany these three hypotheses.

E.1.1 Real data to illustrate NCT

In this tutorial, the arguments and output of the function is explained and illustrated with data of the Virginia Adult Twin Study of Psychiatric and Substance Use Disorders (VATSPUD; Kendler & Prescott, 2006; Prescott et al., 2000). For this tutorial, we use the data of presence/absence of the 14 disaggregated symptoms of MDD for at least 5 days during the previous year of 8973 individuals from the population. To illustrate NCT, we divided the data into males ($n = 5091$) and females ($n = 3884$). This Chapter is an extended version of <https://cran.r-project.org/web/packages/NetworkComparisonTest/NetworkComparisonTest.pdf>.

To investigate differences in network structure between males and females, we can first inspect the networks visually. Judging from Figure E.1, there are no clear differences between the two networks. In men, depressed mood is more strongly associated with feeling worthless and it is associated to weight loss, whereas it is not in women.

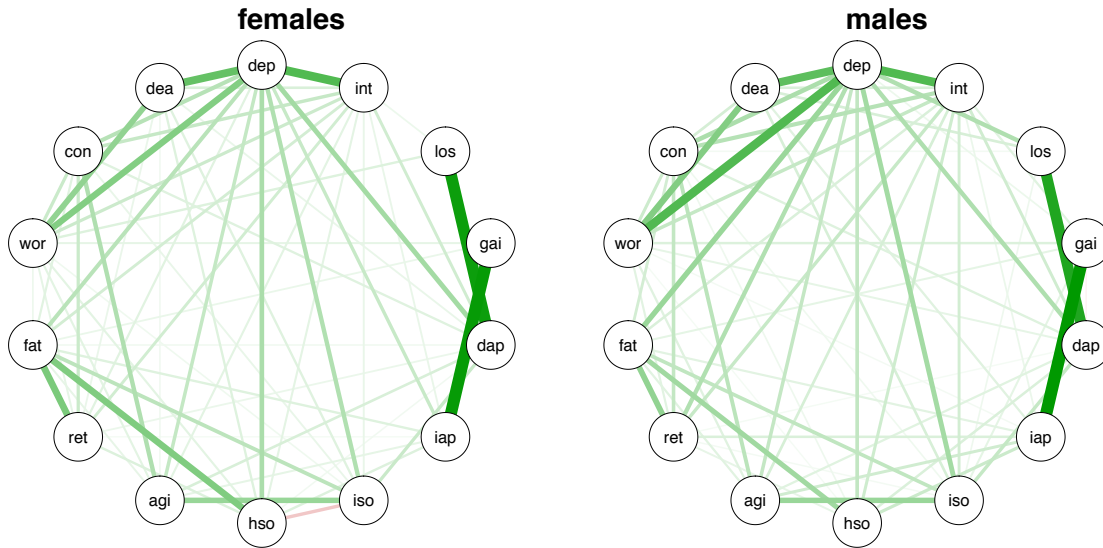


FIGURE E.1. The network structures of females (left panel; $n = 3884$) and males (right panel; $n = 5091$) of the VATSPUD study. Estimation is performed with `IsingFit()` and $\gamma = .25$. dep - depressed mood; int - loss of interest; los - weight loss; gai - weight gain; dap - decreased appetite; iap - increased appetite; iso - insomnia; hso - hypersomnia; ret - psychomotor retardation; agi - psychomotor agitation; fat - fatigue; wor - feelings of worthlessness; con - concentration problems; dea - thoughts of death.

E.2 Arguments

The main function of package `NetworkComparisonTest` is function `NCT()`, which has several arguments:

```
NCT(data1, data2, gamma, it=100, binary.data=FALSE, paired=FALSE, weighted=TRUE,
AND=TRUE, test.edges=FALSE, edges, progressBar=TRUE)
```

In this section, the arguments are explained and the function of some arguments is illustrated with our two groups of individuals (males and females) from the VATSPUD study.

data1/data2

The first two arguments (`data1` and `data2`) are the data of the groups to be compared. Both datasets have to contain cross-sectional data. The dimension of the matrices is $nobs \times nvars$, with $nobs$ (the number of observations) as rows and $nvars$ (the number of variables) as columns.

gamma

A single value between 0 and 1. When not entered, γ is set to .25 for binary data and to .50 for gaussian data. See Appendix D (D.3) for a more elaborate explanation of effect of adjusting this argument.

it

The number of iterations (permutations) to create a reference distribution (see Section 5.2.3 for an explanation of the reference distribution). The default value is 100.

binary.data

Logical. Can be TRUE or FALSE to indicate whether the data is binary or not. The default value is FALSE, which ensures the data is handled as gaussian. The VATSPUD data that we use to illustrate NCT is binary, hence, to compare males and females in this study, the following code should be used.

```
set.seed(1)
res <- NCT(data.females, data.males, binary.data=TRUE)
```

The results of the analysis is assigned to *object* `res`. This object contains the output of NCT. The output is explained in detail in the next section. Note that with this code, a permutation test with 100 iterations (default) is performed, which might be too low considering the large number of observations in our groups ($n = 5091$ and $n = 3884$).

paired

Logical. Can be TRUE or FALSE to indicate whether the samples are dependent or not – the default value is FALSE. If `paired` is TRUE, relabeling is performed within each pair of observations. If `paired` is FALSE, relabeling is not restricted to pairs of observations. Note that, currently, only comparing one group which is measured twice (e.g., a group of patients with a pre- and post-treatment) is implemented. In the nearby future, NCT will be extended to allow for comparing group-level networks of two groups with ESM data.

weighted

Logical. Can be TRUE or FALSE to indicate whether the networks to be compared should be weighted or not. If not, the estimated networks are dichotomized. Defaults to TRUE.

AND

Logical. Can be TRUE or FALSE to indicate whether the AND- or the OR-rule should be used to define the edges in the network. Defaults to TRUE. Only necessary for binary data. See Section D.2 in the Appendix for a more elaborate explanation of effect of adjusting this argument.

test.edges

Logical. Can be TRUE or FALSE to indicate whether or not differences in individual edges should be tested. Defaults to FALSE. When TRUE, you have to specify which edges you want to test with the next argument `edges`.

edges

Character or list. When "all", differences between all individual edges are tested. When provided a list with one or more pairs of indices referring to variables, the provided edges are tested. A Holm-Bonferroni correction is applied to control for multiple testing. To test all edges, the following code can be used.

```
set.seed(1)
res2 <- NCT(data.females, data.males, binary.data=TRUE, test.edges=TRUE, edges="all")
```

Again, see the next Section E.3, for how to retrieve the results in the output of `NCT`.

progressbar

Logical. Should the progressbar be plotted in order to see the progress of the estimation procedure? Especially with binary data, which involves node-wise regressions, it can take a while before all permutations are performed. With the progressbar, you can keep track of the progress of the analysis. Defaults to TRUE.

E.3 Output

`NCT` returns an *NCT* object that contains several items. Using the code above, the output is stored in an object with the name `res` and `res2`. Since `res2` contains the most elaborate output, we will use that to explain the content of the output.

glstrinv.real

The difference in global strength between the networks of the observed (real) data sets. This is the actual test statistic S (see Chapter 5) that should be reported. In our example, the difference in global strength S is 3.72. This can be retrieved with `res2$glstrinv.real`.

glstrinv.perm

The difference in global strength between the networks of the permuted data sets. When the number of iterations `it` is 100, `res2$glstrinv.perm` will contain 100 values.

glstrinv.sep

The separate global strength values of the individual networks. In our example, `res2$glstrinv.sep` reveals that the females' network has a global strength of 41.97 and the males' network 45.69.

glstrinv.pval

The p value resulting from the permutation test concerning difference in global strength. `res2$glstrinv.pval` reveals that, although the males have a higher global strength, this difference is not significant ($S = 3.72$, $p = .26$).

nwinv.real

The value of the maximum difference M in any of the edge weights of the observed networks. In our example, `res2$nwinv.real` shows that $M = .99$.

nwinv.perm

The values of the maximum difference in edge weights of the permuted networks.

nwinv.pval

The p values resulting from the permutation test concerning the maximum difference in edge weights. When `it=100`, there will be 100 p values that form the reference distribution.

edges.tested

The pairs of variables between which the edges are called to be tested. Only if `test.edges = TRUE`.

einv.real

The value of the difference in edge weight of the observed networks (multiple values if more edges are called to test). Only if `test.edges = TRUE`.

einv.pvals

The Holm-Bonferroni corrected p values per edge from the permutation test concerning differences in edges weights. Only if `test.edges = TRUE` and only for the edges provided in argument `edges.tested`. In our example, `res2$einv.pvals` shows that one edge differs significantly in males and females: the edge between depressed mood (dep) and weight loss (los). This edge is absent in the males, but present in females ($p < .01$).

einv.perm

The values of the difference in edge weight of the permuted networks. Only if `test.edges = TRUE`.

E.4 Plotting of NCT results

Results can also be plotted. The permutation test results in a reference distribution of test statistics under the relevant null hypothesis. NCT is accompanied by a plotting function to visualize the results.

In our example of males and females in the VATSPUD study, the results of the network structure and global strength invariance test can be plotted with the following code:

```
plot(res2, what="network")
plot(res2, what="strength")
```

The argument `what` can be used to indicate which statistic to be plotted. Figure E.2 shows the reference distributions — created by permutations of the data — with which the test statistics M (i.e., the maximum difference in edge strength of the two networks) and S (i.e., the difference in global strength) can be evaluated.

The distribution(s) of the edge strength invariance test can be plotted with `plot(res2, what="edge")`. When more than one edge was tested, more than one plots will be returned (i.e., a plot for each edge tested).

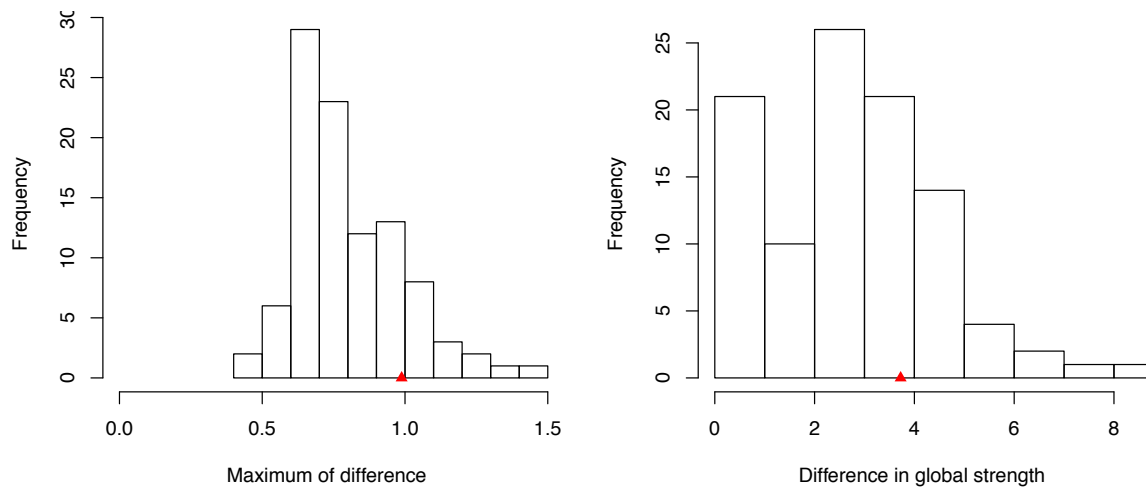


FIGURE E.2. Reference distributions of two of the three test statistics based on the VATSPUD data: the maximum difference in edge strength (left panel) and the difference in global strength (right panel). The red triangle indicates the test statistic based on the observed (real) data.

BIBLIOGRAPHY

- aan het Rot, M., Hogenelst, K., & Schoevers, R. A. (2012). Mood disorders in everyday life: A systematic review of experience sampling and ecological momentary assessment studies. *Clinical psychology review*, 32(6), 510–523.
- Abegaz, F., & Wit, E. (2013). Sparse time series chain graphical models for reconstructing genetic networks. *Biostatistics*, 14(3), 586–599.
- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review*, 96, 358-372.
- Afzali, M. H., Sunderland, M., Teesson, M., Carragher, N., Mills, K., & Slade, T. (2017). A network approach to the comorbidity between posttraumatic stress disorder and major depressive disorder: The role of overlapping symptoms. *Journal of Affective Disorders*, 208, 490–496.
- Agresti, A. (2007). *An Introduction to Categorical Data Analysis*. Wiley.
- Albert, U., Rosso, G., Maina, G., & Bogetto, F. (2008). Impact of anxiety disorder comorbidity on quality of life in euthymic bipolar disorder patients: differences between bipolar I and II subtypes. *Journal of Affective Disorders*, 105(1-3), 297–303.
- Amaral, L. a. N., Scala, A., Barthélemy, M., & Stanley, H. E. (2000). Classes of small-world networks. *Proceedings of the National Academy of Sciences*, 97(21), 11149–11152.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). American Psychiatric Publishing, Inc.
- American Psychiatric Association. (2013). *The Diagnostic and Statistical Manual of Mental Disorders: DSM 5*. bookpointUS.
- Aseltine, R. H., James, A., Schilling, E. A., & Glanovsky, J. (2007). Evaluating the SOSsuicide prevention program: a replication and extension. *BMC Public Health*, 7, 161.
- Baglioni, C., & Riemann, D. (2012). Is Chronic Insomnia a Precursor to Major Depression? Epidemiological and Biological Findings. *Current Psychiatry Reports*, 14(5), 1–8.
- Barabási, A. L. (2011). Network medicine: a network-based approach to human disease. *Nature Reviews Genetics*, 12(1), 56–68.
- Barabási, A. L., & Albert, R. (1999). Emergence of scaling in random networks. *Science*, 286(5439), 509–512.
- Barrat, A., Barthelemy, M., Pastor-Satorras, R., & Vespignani, A. (2004). The architecture of complex weighted networks. *Proceedings of the National Academy of Sciences of the United States of America*, 101(11), 3747–3752.

- Bartz, J. A., & Hollander, E. (2006). Is obsessive-compulsive disorder an anxiety disorder? *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 30(3), 338–352.
- Barzel, B., & Barabási, A.-L. (2013). Universality in network dynamics. *Nature Physics*, 9(10), 673–681.
- Beard, C., Millner, A. J., Forgeard, M. J. C., Fried, E., Hsu, K. J., Treadway, M. T., ... Björgvinsson, T. (2016). Network analysis of depression and anxiety symptom relationships in a psychiatric sample. *Psychological Medicine*, 1–11.
- Bebbington, P. (1987). Misery and beyond: the pursuit of disease theories of depression. *International Journal of Social Psychiatry*, 33, 13–20.
- Beck, A. T. (1987). Cognitive models of depression. *Journal of Cognitive Psychotherapy*, 1, 5–38.
- Bejerot, S. (2007). An autistic dimension A proposed subtype of obsessive-compulsive disorder. *Autism*, 11(2), 101–110.
- Bekhuis, E., Schoevers, R., Claudia Borkulo, V., Rosmalen, J., & Boschloo, L. (2016). The network structure of major depressive disorder, generalized anxiety disorder and somatic symptomatology. *Psychological Medicine*, 1–10.
- Beltz, A. M., Wright, A. G. C., Sprague, B. N., & Molenaar, P. C. M. (2016). Bridging the Nomothetic and Idiographic Approaches to the Analysis of Clinical Data. *Assessment*, 23(4), 447–458.
- Besag, J. (1974). Spatial Interaction and the Statistical Analysis of Lattice Systems. *Journal of the Royal Statistical Society. Series B (Methodological)*, 36(2), 192–236.
- Bickel, P. J., & Doksum, K. A. (2006). *Mathematical Statistics, Basic Ideas and Selected Topics, Vol. 1*, (2edition ed.). Upper Saddle River, N.J: Pearson.
- Bickel, P. J., & Levina, E. (2008). Covariance regularization by thresholding. *Annals of Statistics*, 36(6), 2577–2604.
- Bilodeau, M., & Brenner, D. (2008). *Theory of Multivariate Statistics*. Springer Science & Business Media.
- Boccaletti, S., Latora, V., Moreno, Y., Chavez, M., & Hwang, D. (2006). Complex networks: Structure and dynamics. *Physics Reports*, 424(4), 175–308.
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual review of psychology*, 54(1), 579–616.
- Bonacich, P. (1987). Power and Centrality: A Family of Measures. *American Journal of Sociology*, 92(5), 1170–1182.
- Bonanno, G. A. (2004). Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *American psychologist*, 59(1), 20.
- Bondy, B. (2002). Pathophysiology of depression and mechanisms of treatment. *Dialogues in Clinical Neuroscience*, 4(1), 7–20.
- Borsboom, D. (2008). Psychometric perspectives on diagnostic systems. *Journal of Clinical Psychology*, 64(9), 1089–1108.
- Borsboom, D. (2017). A network theory of mental disorders. *World Psychiatry*, 16(1), 5–13.

- Borsboom, D., & Cramer, A. (2013). Network Analysis: An Integrative Approach to the Structure of Psychopathology. *Annual Review of Clinical Psychology*, 9(1), 91–121.
- Borsboom, D., Cramer, A., Schmittmann, V., Epskamp, S., & Waldorp, L. (2011). The small world of psychopathology. *PLOS ONE*, 6(11), e27407.
- Borsboom, D., Rhemtulla, M., Cramer, A., van der Maas, H. L., Scheffer, M., & Dolan, C. V. (2016). Kinds versus continua: a review of psychometric approaches to uncover the structure of psychiatric constructs. *Psychological medicine*, 46(8), 1567.
- Bos, E. H., & Jonge, P. D. (2014). Critical slowing down in depression is a great idea that still needs empirical proof. *Proceedings of the National Academy of Sciences*, 111(10), E878–E878. doi: 10.1073/pnas.1323672111
- Bos, E. H., & Wanders, R. (2016). Group-Level Symptom Networks in Depression. *JAMA Psychiatry*. doi: 10.1001/jamapsychiatry.2015.3103
- Bos, F. M., Schoevers, R. A., & aan het Rot, M. (2015). Experience sampling and ecological momentary assessment studies in psychopharmacology: A systematic review. *European Neuropsychopharmacology*, 25(11), 1853–1864.
- Boschloo, L., Schoevers, R. A., Beekman, A. T. F., Smit, J. H., van Hemert, A. M., & Penninx, B. W. J. H. (2014). The four-year course of major depressive disorder: the role of staging and risk factor determination. *Psychotherapy and Psychosomatics*, 83(5), 279–288.
- Boschloo, L., Schoevers, R. A., Van Borkulo, C. D., Borsboom, D., & Oldehinkel, A. J. (2016). The Network Structure of Psychopathology in a Community Sample of Preadolescents. [Miscellaneous Article]. *Journal of Abnormal Psychology*, 125(4), 599–606.
- Boschloo, L., Van Borkulo, C. D., Borsboom, D., & Schoevers, R. A. (2016). A Prospective Study on How Symptoms in a Network Predict the Onset of Depression. *Psychotherapy and Psychosomatics*, 85(3), 183–184.
- Boschloo, L., Van Borkulo, C. D., Rhemtulla, M., Keyes, K. M., Borsboom, D., & Schoevers, R. A. (2015). The Network Structure of Symptoms of the Diagnostic and Statistical Manual of Mental Disorders. *PLOS ONE*, 10(9). doi: 10.1371/journal.pone.0137621
- Boschloo, L., Vogelzangs, N., van den Brink, W., Smit, J. H., Veltman, D. J., Beekman, A. T. F., & Penninx, B. W. J. H. (2012). Alcohol use disorders and the course of depressive and anxiety disorders. *The British Journal of Psychiatry: The Journal of Mental Science*, 200(6), 476–484.
- Bouwman, M. E. J., Bos, E. H., Booij, S. H., Faassen, M. v., Oldehinkel, A. J., & Jonge, P. d. (2015, March). Intra- and inter-individual variability of longitudinal daytime melatonin secretion patterns in depressed and non-depressed individuals. *Chronobiology International*, 32(3), 441–446.
- Bower, G. H. (1981). Mood and memory. *American Psychologist*, 36, 129–148.
- Bower, P., Kontopantelis, E., Sutton, A., Kendrick, T., Richards, D. A., Gilbody, S., ... Liu, E. T.-H. (2013). Influence of initial severity of depression on effectiveness of low intensity

- interventions: meta-analysis of individual patient data. *British Medical Journal*, 346. doi: 10.1136/bmj.f540
- Boyd, S., & Vandenberghe, L. (2004). *Convex optimization*. Cambridge university press.
- Brandes, U. (2001). A faster algorithm for betweenness centrality. *The Journal of Mathematical Sociology*, 25(2), 163–177.
- Brewin, C. R. (1985). Depression and causal attributions: What is their relation? *Psychological Bulletin*, 98, 297-309.
- Bringmann, L., & Eronen, M. (2017). *Why use networks: Reconsidering the network approach to psychopathology*.
- Bringmann, L., Hamaker, E. L., Vigo, D. E., Aubert, A., Borsboom, D., & Tuerlinckx, F. (2016). Changing Dynamics: Time-Varying Autoregressive Models Using Generalized Additive Modeling. *Psychological Methods*. doi: 10.1037/met0000085
- Bringmann, L., Lemmens, L. H. J. M., Huibers, M. J. H., Borsboom, D., & Tuerlinckx, F. (2015). Revealing the dynamic network structure of the Beck Depression Inventory-II. *Psychological Medicine*, 45(04), 747–757. doi: e60188
- Bringmann, L., Vissers, N., Wichers, M., Geschwind, N., Kuppens, P., Peeters, F., ... Tuerlinckx, F. (2013). A Network Approach to Psychopathology: New Insights into Clinical Longitudinal Data. *PLOS ONE*, 8(4).
- Bringmann, L. F., Pe, M. L., Vissers, N., Ceulemans, E., Borsboom, D., Vanpaemel, W., ... Kuppens, P. (2016). Assessing Temporal Emotion Dynamics Using Networks. *Assessment*, 23(4), 425–435. doi: 10.1177/1073191116645909
- Brzezniak, Z., & Zastawniak, T. (2000). *Basic stochastic processes: a course through exercises*. Springer.
- Buntrock, C., Ebert, D., Lehr, D., Riper, H., Smit, F., Cuijpers, P., & Berking, M. (2015). Effectiveness of a web-based cognitive behavioural intervention for subthreshold depression: pragmatic randomised controlled trial. *Psychotherapy and Psychosomatics*, 84(6), 348–358.
- Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review*, 26(1), 17–31.
- Caner, M., & Kock, A. B. (2014). Asymptotically Honest Confidence Regions for High Dimensional Parameters by the Desparsified Conservative Lasso. *arXiv preprint arXiv:1410.4208*.
- Cannon, T. D., & Keller, M. C. (2006). Endophenotypes in the genetic analyses of mental disorders. *Annual Review of Clinical Psychology*, 2, 267–290.
- Carpenter, S. R., & Brock, W. A. (2006). Rising variance: a leading indicator of ecological transition. *Ecology Letters*, 9(3), 311–318.
- Caspi, A., Sugden, K., Moffitt, T. E., Taylor, A., Craig, I. W., Harrington, H., ... Poulton, R. (2003). Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science*, 301, 386-389.
- Chen, J., & Chen, Z. (2008). Extended Bayesian information criteria for model selection with

- large model spaces. *Biometrika*, 95(3), 759–771.
- Chen, L., Eaton, W. W., Gallo, J. J., & Nestadt, G. (2000). Understanding the heterogeneity of depression through the triad of symptoms, course and risk factors: a longitudinal, population-based study. *Journal of Affective Disorders*, 59(1), 1–11.
- Chen, L., Liu, R., Liu, Z. P., Li, M., & Aihara, K. (2012). Detecting early-warning signals for sudden deterioration of complex diseases by dynamical network biomarkers. *Scientific Reports*, 2, 342.
- Christensen, H., Batterham, P. J., Gosling, J. A., Ritterband, L. M., Griffiths, K. M., Thorndike, F. P., ... Mackinnon, A. J. (2016). Effectiveness of an online insomnia program (SHUTi) for prevention of depressive episodes (the GoodNight Study): a randomised controlled trial. *The Lancet Psychiatry*, 3(4), 333–341.
- Chwastiak, L. A., & Von Korff, M. (2003). Disability in depression and back pain: evaluation of the World Health Organization Disability Assessment Schedule (WHO DAS II) in a primary care setting. *Journal of Clinical Epidemiology*, 56(6), 507–514.
- Cipra, B. A. (1987). An introduction to the Ising model. *American Mathematical Monthly*, 94(10), 937–959.
- Clark, D. A., & Beck, A. T. (2010). Cognitive theory and therapy of anxiety and depression: Convergence with neurobiological findings. *Trends in Cognitive Sciences*, 14(9), 418–424.
- Clark, M. S., & Isen, A. M. (1982). Toward understanding the relationship between feeling states and social behaviour. In A. H. Hastorf & A. M. Isen (Eds.), *Cognitive social psychology*. Elsevier.
- Cohen, J. (2013). *Statistical Power Analysis for the Behavioral Sciences*. Routledge.
- Cosci, F., & Fava, G. A. (2012). Staging of Mental Disorders: Systematic Review. *Psychotherapy and Psychosomatics*, 82(1), 20–34.
- Costantini, G., Epskamp, S., Borsboom, D., Perugini, M., Möttus, R., Waldorp, L. J., & Cramer, A. (2015). State of the aRt personality research: A tutorial on network analysis of personality data in R. *Journal of Research in Personality*, 54, 13–29.
- Cox, D. R., & Wermuth, N. (1996). *Multivariate Dependencies: Models, Analysis and Interpretation*. CRC Press.
- Cramer, A., & Borsboom, D. (2015). Problems attract problems: A network perspective on mental disorders. *Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource*.
- Cramer, A., Borsboom, D., Aggen, S., & Kendler, K. (2012). The pathoplasticity of dysphoric episodes: differential impact of stressful life events on the pattern of depressive symptom inter-correlations. *Psychological medicine*, 42(05), 957–965.
- Cramer, A., Van Borkulo, C. D., Giltay, E. J., Maas, H. L. J. v. d., Kendler, K. S., Scheffer, M., & Borsboom, D. (2016). Major Depression as a Complex Dynamic System. *PLOS ONE*, 11(12), e0167490. doi: 10.1371/journal.pone.0167490

- Cramer, A., van der Sluis, S., Noordhof, A., Wichers, M., Geschwind, N., Aggen, S. H., ... Borsboom, D. (2012). Dimensions of Normal Personality as Networks in Search of Equilibrium: You Can't Like Parties if You Don't Like People. *European Journal of Personality*, 26(4), 414–431.
- Cramer, A., Waldorp, L., Van Der Maas, H., & Borsboom, D. (2010). Comorbidity: A network perspective. *Behavioral and Brain Sciences*, 33(2-3), 137–150.
- Cramér, H. (1999). *Mathematical methods of statistics* (Vol. 9). Princeton, NJ: Princeton University Press.
- Csardi, G., & Nepusz, T. (2006). The igraph software package for complex network research. *InterJournal, Complex Systems*, 1695(5).
- Csikszentmihalyi, M., & Larson, R. (2014). Validity and Reliability of the Experience-Sampling Method. In *Flow and the Foundations of Positive Psychology* (pp. 35–54). Springer Netherlands.
- Dakos, V., Carpenter, S., Brock, W., Ellison, A., Guttal, V., Ives, A., ... others (2012). Methods for Detecting Early Warnings of Critical Transitions in Time Series Illustrated Using Simulated Ecological Data. *PLOS ONE*, 7(7), e41010.
- Dakos, V., Nes, E. H. v., Donangelo, R., Fort, H., & Scheffer, M. (2010). Spatial correlation as leading indicator of catastrophic shifts. *Theoretical Ecology*, 3(3), 163–174.
- Dakos, V., Scheffer, M., Nes, E. H. v., Brovkin, V., Petoukhov, V., & Held, H. (2008). Slowing down as an early warning signal for abrupt climate change. *Proceedings of the National Academy of Sciences*, 105(38), 14308–14312.
- Dalege, J., Borsboom, D., van Harreveld, F., van den Berg, H., Conner, M., & van der Maas, H. L. J. (2016). Toward a Formalized Account of Attitudes: The Causal Attitude Network (CAN) Model. *Psychological Review*, 123(1), 2–22.
- Demidenko, E. (2013). *Mixed Models: Theory and Applications with R*. John Wiley & Sons.
- Dijkstra, E. W. (1959). A note on two problems in connexion with graphs. *Numerische wiskunde*, 1(1), 269–271.
- Donohue, J. M., & Pincus, H. A. (2007). Reducing the societal burden of depression. *Pharmacoeconomics*, 25(1), 7–24.
- Drton, M., & Perlman, M. (2007). Multiple Testing and Error Control in Gaussian Graphical Model Selection. *Statistical Science*, 22(3), 430–449.
- Efron, B. (2004). Large-Scale Simultaneous Hypothesis Testing: The Choice of a Null Hypothesis. *Journal of the American Statistical Association*, 99(465), 96–104.
- Efron, B., & Tibshirani, R. J. (1994). *An Introduction to the Bootstrap*. CRC Press.
- Ehlers, C. L. (1995). Chaos and complexity. Can it help us to understand mood and behavior? *Archives of General Psychiatry*, 52(11), 960–964.
- Ensel, W. M., & Lin, N. (1996). Distal stressors and the life stress process. *Journal of Community Psychology*, 24, 66-82.

- Epskamp, S. (2013). *IsingSampler: Sampling methods and distribution functions for the Ising model*. Retrieved from github.com/SachaEpskamp/IsingSampler (R package version 0.1)
- Epskamp, S. (2016). Regularized Gaussian Psychological Networks: Brief Report on the Performance of Extended BIC Model Selection. *arXiv:1606.05771*. Retrieved from <http://arxiv.org/abs/1606.05771>
- Epskamp, S., Borsboom, D., & Fried, E. I. (2017). Estimating psychological networks and their accuracy: A tutorial paper. *Behavior Research Methods*, 1–18.
- Epskamp, S., Cramer, A., Waldorp, L. J., Schmittmann, V. D., & Borsboom, D. (2012). qgraph: Network Visualizations of Relationships in Psychometric Data. *Journal of Statistical Software*, 48(4), 1–18.
- Epskamp, S., Deserno, M. K., & Bringmann, L. (2015). *mIVAR: Multi-Level vector autoregression*. Retrieved from <http://CRAN.R-project.org/package=mIVAR> (R package version 0.1.0)
- Epskamp, S., & Fried, E. (2016). A Tutorial on Regularized Partial Correlation Networks. *arXiv:1607.01367*.
- Epskamp, S., Kruis, J., & Marsman, M. (2016). Estimating psychopathological networks: be careful what you wish for. *arXiv:1604.08045*.
- Epskamp, S., Maris, G. K. J., Waldorp, L. J., & Borsboom, D. (2016). Network Psychometrics. In *Handbook of Psychometrics*. New York: Wiley. Retrieved 2017-01-04, from <http://arxiv.org/abs/1609.02818> (arXiv: 1609.02818)
- Epskamp, S., Rhemtulla, M., & Borsboom, D. (2016). Generalized Network Psychometrics: Combining Network and Latent Variable Models. doi: arXiv:1605.09288
- Epskamp, S., Waldorp, L. J., Möttus, R., & Borsboom, D. (2016). Discovering Psychological Dynamics: The Gaussian Graphical Model in Cross-sectional and Time-series Data. doi: arXiv:1609.04156
- Erdos, P., & Renyi, A. (1959). On random graphs. *Publicationes Mathematicae Debrecen*, 6, 290–297.
- Fava, G. A., & Tossani, E. (2007). Prodromal stage of major depression. *Early Intervention in Psychiatry*, 1(1), 9–18.
- Ferguson, T. S. (1996). *A Course in Large Sample Theory*. Taylor & Francis.
- Fiocco, M., & van Zwet, W. (2004). Maximum likelihood estimation for the contact process. *Lecture Notes-Monograph Series*, 309–318.
- Fiocco, M., & van Zwet, W. R. (2003). Parameter Estimation for the Supercritical Contact Process. *Bernoulli*, 9(6), 1071–1092.
- Fiocco, M., & van Zwet, W. R. (2006). Maximum likelihood for the fully observed contact process. *Journal of Computational and Applied Mathematics*, 186(1), 117–129.
- Flay, B. R. (1978). Catastrophe theory in social psychology: Some applications to attitudes and

- social behavior. *Behavioral Science*, 23(4), 335–350.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin*, 99, 20–35.
- Fort, H., Mazzeo, N., Scheffer, M., & Nes, E. v. (2010). Catastrophic shifts in ecosystems: spatial early warnings and management procedures (Inspired in the physics of phase transitions). *Journal of Physics: Conference Series*, 246(1), 012035. doi: 10.1088/1742-6596/246/1/012035
- Foygel, R., & Drton, M. (2010). Extended Bayesian Information Criteria for Gaussian Graphical Models. *Adv. Neural Inf. Process. Syst.*, 23, 2020–2028.
- Foygel, R., & Drton, M. (2011). Bayesian model choice and information criteria in sparse generalized linear models. *arXiv preprint arXiv:1112.5635*.
- Foygel, R., & Drton, M. (2014). High-dimensional Ising model selection with Bayesian information criteria. *arXiv preprint arXiv:1403.3374*.
- Freeman, L. C. (1979). Centrality in Social Networks Conceptual Clarification. *Social Networks*, 1, 215–239.
- Frewen, P. A., Allen, S. L., Lanius, R. A., & Neufeld, R. W. J. (2012). Perceived causal relations: novel methodology for assessing client attributions about causal associations between variables including symptoms and functional impairment. *Assessment*, 19(4), 480–493.
- Frewen, P. A., Schmittmann, V. D., Bringmann, L., & Borsboom, D. (2013). Perceived causal relations between anxiety, posttraumatic stress and depression: extension to moderation, mediation, and network analysis. *European Journal of Psychotraumatology*, 4. doi: 10.3402/ejpt.v4i0.20656
- Fried, E. (2015). Problematic assumptions have slowed down depression research: why symptoms, not syndromes are the way forward. *Frontiers in psychology*, 6.
- Fried, E., Bockting, C., Arjadi, R., Borsboom, D., Amshoff, M., Cramer, A., ... Stroebe, M. (2015). From loss to loneliness: The relationship between bereavement and depressive symptoms. *Journal of Abnormal Psychology*, 124(2), 256–265.
- Fried, E., Boschloo, L., Van Borkulo, C. D., Schoevers, R. A., Romeijn, J.-W., Wichers, M., ... Borsboom, D. (2015). Commentary: “Consistent superiority of selective serotonin reuptake inhibitors over placebo in reducing depressed mood in patients with major depression”. *Frontiers in Psychiatry*, 6(117). doi: 10.3389/fpsy.2015.00117
- Fried, E., & Cramer, A. (in press). Moving forward: challenges and directions for psychopathological network theory and methodology. *Behavioral and Brain Sciences*.
- Fried, E., Epskamp, S., Nesse, R. M., Tuerlinckx, F., & Borsboom, D. (2016). What are ‘good’ depression symptoms? Comparing the centrality of DSM and non-DSM symptoms of depression in a network analysis. *Journal of Affective Disorders*, 189, 314–320.
- Fried, E., Nesse, R., Zivin, K., Guille, C., & Sen, S. (2014). Depression is more than the sum score of its parts: individual DSM symptoms have different risk factors. *Psychological medicine*,

- 44(10), 2067–2076.
- Fried, E., & Nesse, R. M. (2014). The Impact of Individual Depressive Symptoms on Impairment of Psychosocial Functioning. *PLOS ONE*, 9(2). doi: 10.1371/journal.pone.0090311
- Fried, E., & Nesse, R. M. (2015a). Depression is not a consistent syndrome: An investigation of unique symptom patterns in the STAR*D study. *Journal of Affective Disorders*, 172, 96–102.
- Fried, E., & Nesse, R. M. (2015b). Depression sum-scores don't add up: why analyzing specific depression symptoms is essential. *BMC medicine*, 13(1), 72.
- Fried, E., Tuerlinckx, F., & Borsboom, D. (2014). Mental health: More than neurobiology. *Nature*, 508(7497), 458–458.
- Fried, E., Van Borkulo, C. D., Cramer, A., Boschloo, L., Schoevers, R. A., & Borsboom, D. (2016). Mental disorders as networks of problems: a review of recent insights. *Social Psychiatry and Psychiatric Epidemiology*, 52(1), 1–10.
- Friedman, J., Hastie, T., & Tibshirani, R. (2008). Sparse inverse covariance estimation with the graphical lasso. *Biostatistics*, 9(3), 432–441.
- Friedman, J., Hastie, T., & Tibshirani, R. (2010). Regularization paths for generalized linear models via coordinate descent. *Journal of Statistical Software*, 33(1), 1.
- Fruchterman, T. M., & Reingold, E. M. (1991). Graph drawing by force-directed placement. *Software: Practice and Experience*, 21(11), 1129–1164.
- Garnezy, N. (1987). Stress, competence, and development: Continuities in the study of schizophrenic adults, children vulnerable to psychopathology, and the search for stress-resistant children. *Journal of Orthopsychiatry*, 57(2), 159–174.
- Gates, K. M., & Molenaar, P. C. M. (2012). Group search algorithm recovers effective connectivity maps for individuals in homogeneous and heterogeneous samples. *NeuroImage*, 63(1), 310–319.
- Geraghty, A. W., Muñoz, R. F., Yardley, L., Mc Sharry, J., Little, P., & Moore, M. (2016). Developing an Unguided Internet-Delivered Intervention for Emotional Distress in Primary Care Patients: Applying Common Factor and Person-Based Approaches. *JMIR Mental Health*, 3(4). doi: 10.2196/mental.5845
- Gilmore, R. (1993). *Catastrophe Theory for Scientists and Engineers*. Courier Corporation.
- Goekoop, R., & Goekoop, J. G. (2014). A Network View on Psychiatric Disorders: Network Clusters of Symptoms as Elementary Syndromes of Psychopathology. *PLOS ONE*, 9(11). doi: 10.1371/journal.pone.0112734
- Goldberg, D., & Fawcett, J. (2012). The importance of anxiety in both major depression and bipolar disorder. *Depression and anxiety*, 29(6), 471–478.
- Goldbeter, A. (2011). A model for the dynamics of bipolar disorders. *Progress in Biophysics and Molecular Biology*, 105(1), 119–127.
- Good, P. I. (2006). *Permutation, parametric, and bootstrap tests of hypotheses*. Springer Science

- & Business Media.
- Gorban, A. N., Smirnova, E. V., & Tyukina, T. A. (2010). Correlations, Risk and Crisis: From Physiology to Finance. *Physica A: Statistical Mechanics and its Applications*, 389(16), 3193–3217.
- Gorban, A. N., Tyukina, T. A., Smirnova, E. V., & Pokidysheva, L. I. (2016). Evolution of adaptation mechanisms: Adaptation energy, stress, and oscillating death. *Journal of Theoretical Biology*, 405, 127–139.
- Grasman, R. P. P. P., van der Maas, H. L. J., & Wagenmakers, E. M. (2009). Fitting the cusp catastrophe in R: a cusp-package primer. *Journal of Statistical Software*, 32(8), 1–28.
- Greden, J. F. (2001). The burden of recurrent depression: Causes, consequences, and future prospects. *Journal of Clinical Psychiatry*, 62, 5-9.
- Grimmett, G. (2010). *Probability on graphs: random processes on graphs and lattices* (Vol. 1). Cambridge University Press.
- Haig, B. D., Palij, M., Palij, M., & Haig, D. (2014). *Investigating the psychological world*. Cambridge, MA: MIT Press.
- Hamaker, E. L. (2012). Why researchers should think “within-person”: A paradigmatic rationale. In *Handbook of Research Methods for Studying Daily Life* (pp. 43–61). New York, NY: Guilford.
- Hammen, C. L., & Peters, S. D. (1978). Interpersonal consequences of depression: Responses to men and women enacting a depressed role. *Journal of Abnormal Psychology*, 87, 322-332.
- Harris, T. E. (1974). Contact interactions on a lattice. *The Annals of Probability*, 969–988.
- Harris, T. O., Borsanyi, S., Messari, S., Stanford, K., Brown, G. W., Cleary, S. E., ... Herbert, J. (2000). Morning cortisol as a risk factor for subsequent major depressive disorder in adult women. *British Journal of Psychiatry*, 177, 505-510.
- Hartmann, J. A., Wichers, M., Menne-Lothmann, C., Kramer, I., Viechtbauer, W., Peeters, F., ... Simons, C. J. P. (2015). Experience Sampling-Based Personalized Feedback and Positive Affect: A Randomized Controlled Trial in Depressed Patients. *PLOS ONE*, 10(6), e0128095.
- Haslbeck, J. M. B., & Waldorp, L. J. (2015). MGM: Structure Estimation for Time-Varying Mixed Graphical Models in high-dimensional Data. *arXiv:1510.06871*.
- Hastings, W. K. (1970). Monte Carlo sampling methods using Markov chains and their applications. *Biometrika*, 57(1), 97–109.
- Hawton, K., Casañas i Comabella, C., Haw, C., & Saunders, K. (2013). Risk factors for suicide in individuals with depression: A systematic review. *Journal of Affective Disorders*, 147(1), 17–28.
- Hayes, A. M., Yasinski, C., Ben Barnes, J., & Bockting, C. L. H. (2015). Network destabilization and transition in depression: New methods for studying the dynamics of therapeutic change. *Clinical Psychology Review*, 41, 27–39.
- Hazen, E. P., Reichert, E. L., Piacentini, J. C., Miguel, E. C., do Rosario, M. C. a., Pauls, D., & Geller, D. A. (2008). Case series: Sensory intolerance as a primary symptom of pediatric OCD. *Annals of Clinical Psychiatry: Official Journal of the American Academy of Clinical Psychia-*

- trists*, 20(4), 199–203.
- Heeren, A., & McNally, R. J. (2016). An integrative network approach to social anxiety disorder: The complex dynamic interplay among attentional bias for threat, attentional control, and symptoms. *Journal of Anxiety Disorders*, 42, 95–104.
- Hemmeter, U.-M., Hemmeter-Spernal, J., & Krieg, J.-C. (2010). Sleep deprivation in depression. *Expert Review of Neurotherapeutics*, 10(7), 1101–1115.
- Hetrick, S. E., Parker, A. G., Hickie, I. B., Purcell, R., Yung, A. R., & McGorry, P. D. (2008). Early Identification and Intervention in Depressive Disorders: Towards a Clinical Staging Model. *Psychotherapy and Psychosomatics*, 77(5), 263–270.
- Hintze, J. L., & Nelson, R. D. (1998). Violin plots: a box plot-density trace synergism. *The American Statistician*, 52(2), 181–184.
- Hollon, S. D., Jarrett, R. B., Nierenberg, A. A., Thase, M. E., Trivedi, M., & John, A. (2005). Psychotherapy and Medication in the Treatment of Adult and Geriatric Depression: Which Monotherapy or Combined Treatment? *The Journal of Clinical Psychiatry*, 66(4), 455–468.
- Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, 6(2), 65–70.
- Holtzheimer, P. E., & Mayberg, H. S. (2011). Stuck in a rut: rethinking depression and its treatment. *Trends in Neurosciences*, 34(1), 1–9.
- Hoorelbeke, K., Marchetti, I., De Schryver, M., & Koster, E. H. W. (2016). The interplay between cognitive risk and resilience factors in remitted depression: A network analysis. *Journal of Affective Disorders*, 195, 96–104.
- Huber, M. T., Braun, H. A., & Krieg, J. C. (1999). Consequences of deterministic and random dynamics for the course of affective disorders. *Biological Psychiatry*, 46(2), 256–262.
- Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D. S., Quinn, K., . . . Wang, P. (2010). Research domain criteria (RDoC): toward a new classification framework for research on mental disorders. *American Journal of Psychiatry*, 167(7), 748–751.
- Insel, T., & Cuthbert, B. N. (2015). Brain disorders? Precisely. *Science*, 348(6234), 499–500.
- Ising, E. (1925). Beitrag zur theorie des ferromagnetismus. *Zeitschrift für Physik A Hadrons and Nuclei*, 31(1), 253–258.
- Isvoranu, A.-M., Borsboom, D., Os, J. v., & Guloksuz, S. (2016). A Network Approach to Environmental Impact in Psychotic Disorder: Brief Theoretical Framework. *Schizophrenia Bulletin*, 42(4), 870–873.
- Isvoranu, A.-M., Van Borkulo, C. D., Boyette, L.-L., Wigman, J. T. W., Vinkers, C. H., Borsboom, D., & Group Investigators. (2016). A Network Approach to Psychosis: Pathways Between Childhood Trauma and Psychotic Symptoms. *Schizophrenia Bulletin*, 43(1), 187–196.
- Ivarsson, T., & Melin, K. (2008). Autism spectrum traits in children and adolescents with obsessive-compulsive disorder (OCD). *Journal of Anxiety Disorders*, 22(6), 969–978. doi: 10.1016/j.janxdis.2007.10.003

- Jacobs, N., Kenis, G., Peeters, F., Derom, C., Vlietinck, R., & Os, J. v. (2006). Stress-Related Negative Affectivity and Genetically Altered Serotonin Transporter Function: Evidence of Synergism in Shaping Risk of Depression. *Archives of General Psychiatry*, 63(9), 989–996.
- Jardine, N., & van Rijsbergen, C. J. (1971). The use of hierarchic clustering in information retrieval. *Information Storage and Retrieval*, 7(5), 217–240.
- Javanmard, A., & Montanari, A. (2014). *Confidence intervals and hypothesis testing for high-dimensional regression* (Tech. Rep.). arXiv:1306.317.
- Kalisch, M., & Bühlmann, P. (2007). Estimating High-Dimensional Directed Acyclic Graphs with the PC-Algorithm. *Journal of Machine Learning Research*, 8, 613–636.
- Kalisch, M., & Bühlmann, P. (2008). Robustification of the PC-Algorithm for Directed Acyclic Graphs. *Journal of Computational and Graphical Statistics*, 17(4), 773–789.
- Kalisch, M., Mächler, M., Colombo, D., Maathuis, M. H., & Bühlmann, P. (2012). Causal inference using graphical models with the R package pcalg. *Journal of Statistical Software*, 47(11), 1–26.
- Kamphuis, J. H., & Telch, M. J. (2000). Effects of distraction and guided threat reappraisal on fear reduction during exposure-based treatments for specific fears. *Behaviour Research and Therapy*, 38(12), 1163–1181.
- Keeling, M., & Eames, K. T. (2005). Networks and epidemic models. *Journal of The Royal Society Interface*, 2(4), 295–307.
- Keeling, M., & Rohani, P. (2011). *Modeling infectious diseases in humans and animals*. Princeton University Press.
- Keller, M. B. (2003). Past, present, and future directions for defining optimal treatment outcome in depression: Remission and beyond. *JAMA*, 289(23), 3152–3160.
- Keller, M. C., Neale, M. C., & Kendler, K. S. (2007). Association of different adverse life events with distinct patterns of depressive symptoms. *The American Journal of Psychiatry*, 164(10), 1521–1529.
- Keller, M. C., & Nesse, R. M. (2005). Is low mood an adaptation? Evidence for subtypes with symptoms that match precipitants. *Journal of Affective Disorders*, 86(1), 27–35.
- Keller, M. C., & Nesse, R. M. (2006). The evolutionary significance of depressive symptoms. *Journal of Personality and Social Psychology*, 91(2), 316–330.
- Kelso, J. A. S. (2012). Multistability and metastability: understanding dynamic coordination in the brain. *Philosophical Transactions of the Royal Society B*, 367(1591), 906–918.
- Kendler, K. S., Karkowski, L. M., & Prescott, C. A. (1999). Causal Relationship Between Stressful Life Events and the Onset of Major Depression. *American Journal of Psychiatry*, 156(6), 837–841.
- Kendler, K. S., & Prescott, C. A. (2006). *Genes, environment, and psychopathology: Understanding the causes of psychiatric and substance use disorders*. Guilford Press.
- Kendler, K. S., Zachar, P., & Craver, C. (2011). What kinds of things are psychiatric disorders?

- Psychological medicine*, 41(6), 1143–1150.
- Kessler, R. C. (1994). The National Comorbidity Survey of the United States. *International Review of Psychiatry*, 6(4), 365–376.
- Kessler, R. C. (2003). Epidemiology of women and depression. *Journal of Affective Disorders*, 74(1), 5–13.
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., ... Wang, P. S. (2009). The global burden of mental disorders: An update from the WHO World Mental Health (WMH) Surveys. *Epidemiologia e Psichiatria Sociale*, 18(01), 23–33.
- Kessler, R. C., Berglund, P., Chiu, W. T., Demler, O., Heeringa, S., Hiripi, E., ... Zheng, H. (2004). The US National Comorbidity Survey Replication (NCS-R): design and field procedures. *International Journal of Methods in Psychiatric Research*, 13(2), 69–92.
- Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of general psychiatry*, 62(6), 617–627.
- Kessler, R. C., & Magee, W. J. (1993). Childhood adversities and adult depression: basic patterns of associations in a us national survey. *Psychological Medicine*, 23, 679–690.
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., ... Kendler, K. S. (1994). Lifetime and 12-month prevalence of dsm-iii-r psychiatric disorders in the united states: Results from the national comorbidity survey. *Archives of General Psychiatry*, 51, 8–19.
- Kessler, R. C., Nelson, C. B., McGonagle, K. A., Liu, J., & others. (1996). Comorbidity of DSM-III-R major depressive disorder in the general population: Results from the US National Comorbidity Survey. *The British Journal of Psychiatry*, 30, 17–30.
- Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., ... Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, 33(6), 763–771.
- Kievit, R. A., Davis, S. W., Griffiths, J. D., Correia, M. M., Cam-CAN, & Henson, R. N. A. (2016). A watershed model of individual differences in fluid intelligence. *bioRxiv*, 041368. doi: 10.1101/041368
- Kievit, R. A., Frankenhuys, W. E., Waldorp, L. J., & Borsboom, D. (2013). Simpson's paradox in psychological science: a practical guide. *Frontiers in Psychology*, 4. doi: 10.3389/fpsyg.2013.00513
- Kim, N. S., & Ahn, W.-k. (2002). Clinical psychologists' theory-based representations of mental disorders predict their diagnostic reasoning and memory. *Journal of Experimental Psychology: General*, 131(4), 451–476.
- Kindermann, R., & Snell, J. L. (1980). *Markov random fields and their applications* (Vol. 1). American Mathematical Society Providence, RI.
- Kitsak, M., Gallos, L. K., Havlin, S., Liljeros, F., Muchnik, L., Stanley, H. E., & Makse, H. A. (2010).

- Identification of influential spreaders in complex networks. *Nature Physics*, 6(11), 888–893.
- Klainin-Yobas, P., Cho, M. A. A., & Creedy, D. (2012). Efficacy of mindfulness-based interventions on depressive symptoms among people with mental disorders: A meta-analysis. *International Journal of Nursing Studies*, 49(1), 109–121.
- Klippel, A., Viechtbauer, W., Reininghaus, U., Wigman, J., van Borkulo, C., Myin-Germeys, I., & Wichers, M. (2017). The cascade of stress: A network approach to explore differential dynamics in populations varying in risk for psychosis. *Schizophrenia Bulletin*. doi: 10.1093/schbul/sbx037
- Koenders, M. A., Kleijn, R. d., Giltay, E. J., Elzinga, B. M., Spinhoven, P., & Spijker, A. T. (2015). A Network Approach to Bipolar Symptomatology in Patients with Different Course Types. *PLOS ONE*, 10(10), e0141420.
- Kolaczyk, E. (2009). *Statistical analysis of network data: methods and models*. Springer.
- Koller, D., & Friedman, N. (2009). *Probabilistic graphical models: principles and techniques*. MIT press.
- Kossakowski, J. J., Epskamp, S., Kieffer, J. M., Van Borkulo, C. D., Rhemtulla, M., & Borsboom, D. (2016). The application of a network approach to Health-Related Quality of Life (HRQoL): introducing a new method for assessing HRQoL in healthy adults and cancer patients. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, 25(4), 781–792.
- Kramer, I., Simons, C. J., Hartmann, J. A., Menne-Lothmann, C., Viechtbauer, W., Peeters, F., ... Wichers, M. (2014). A therapeutic application of the experience sampling method in the treatment of depression: a randomized controlled trial. *World Psychiatry*, 13(1), 68–77.
- Krieke, L. V. D., Jeronimus, B. F., Blaauw, F. J., Wanders, R. B., Emerencia, A. C., Schenk, H. M., ... Jonge, P. D. (2016). HowNutsAreTheDutch (HoeGekIsNL): A crowdsourcing study of mental symptoms and strengths. *International Journal of Methods in Psychiatric Research*, 25(2), 123–144.
- Kroeze, R., Van Veen, D., Servaas, M., Bastiaansen, J., Oude Voshaar, R., Borsboom, D., & Riese, H. (2016). Personalized feedback on symptom dynamics of psychopathology: a proof-of-principle study.
(Manuscript submitted for publication)
- Kuppens, P., Allen, N. B., & Sheeber, L. (2010). Emotional inertia and psychological maladjustment. *Psychological science*, 21(7), 984–991.
- Kuppens, P., Sheeber, L. B., Yap, M. B. H., Whittle, S., Simmons, J. G., & Allen, N. B. (2012). Emotional inertia prospectively predicts the onset of depressive disorder in adolescence. *Emotion (Washington, D.C.)*, 12(2), 283–289.
- Lamers, F., Vogelzangs, N., Merikangas, K. R., de Jonge, P., Beekman, A. T. F., & Penninx, B. W. J. H. (2013). Evidence for a differential role of HPA-axis function, inflammation and metabolic

- syndrome in melancholic versus atypical depression. *Molecular Psychiatry*, 18(6), 692–699.
- Larson, R., & Csikszentmihalyi, M. (1983). The experience sampling method. *New Directions for Methodology of Social & Behavioral Science*.
- Lauritzen, S. L. (1996). *Graphical Models*. Clarendon Press.
- Leemput, I. A. v. d., Wichers, M., Cramer, A., Borsboom, D., Tuerlinckx, F., Kuppens, P., ... Schaffer, M. (2014). Critical slowing down as early warning for the onset and termination of depression. *Proceedings of the National Academy of Sciences*, 111(1), 87–92.
- Leskelä, U. S., Melartin, T. K., Lestelä-Mielonen, P. S., Rytsälä, H. J., Petteri, T., Heikkinen, M. E., & Isometsä, E. T. (2004). Life Events, Social Support, and Onset of Major Depressive Episode in Finnish Patients. *Journal of Nervous and Mental Disease*, 192(5), 373–381.
- Liggett, T. (2004). *Interacting particle systems* (Vol. 276). Springer.
- Liu, Y. Y., Slotine, J. J., & Barabási, A.-L. (2011). Controllability of complex networks. *Nature*, 473(7346), 167–173.
- Loh, P. L., & Wainwright, M. J. (2013). Structure estimation for discrete graphical models: Generalized covariance matrices and their inverses. *The Annals of Statistics*, 41(6), 3022–3049.
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. L. (2006). Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *The Lancet*, 367, 1747-1757.
- Lord, F., Novick, M., & Birnbaum, A. (1968). *Statistical theories of mental test scores*. Oxford, England: Addison-Wesley.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work. *Child Development*, 71(3), 543–562.
- Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*. Springer Science & Business Media.
- Lux, V., & Kendler, K. (2010). Deconstructing major depression: a validation study of the DSM-IV symptomatic criteria. *Psychological medicine*, 40(10), 1679–1690.
- Maathuis, M., & Nandy, P. (2016). A review of some recent advances in causal inference. In P. Bühlmann, P. Drineas, M. Kane, & M. van der Laan (Eds.), *Handbook of big data* (p. 387-407). Boca Raton, FL: Chapman and Hall/CRC.
- Malki, K., Keers, R., Tosto, M. G., Lourdusamy, A., Carboni, L., Domenici, E., ... Schalkwyk, L. C. (2014). The endogenous and reactive depression subtypes revisited: integrative animal and human studies implicate multiple distinct molecular mechanisms underlying major depressive disorder. *BMC Medicine*, 12, 73.
- Marsman, M., Maris, G., Bechger, T., & Glas, C. (2015). Bayesian inference for low-rank Ising networks. *Scientific Reports*, 5, 9050. doi: 10.1038/srep09050
- Mathers, C., Fat, D. M., & Boerma, J. T. (2008). *The global burden of disease: 2004 update*. World Health Organization.

- Mathers, C. D., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLOS Medicine*, 3(11), e442.
- McCulloch, C. E., & Neuhaus, J. M. (2005). Generalized Linear Mixed Models. In *Encyclopedia of Biostatistics*. John Wiley & Sons, Ltd.
- McGorry, P. D. (2007). Issues for DSM-V: Clinical Staging: A Heuristic Pathway to Valid Nosology and Safer, More Effective Treatment in Psychiatry. *American Journal of Psychiatry*, 164(6), 859–860.
- McGorry, P. D., Hickie, I. B., Yung, A. R., Pantelis, C., & Jackson, H. J. (2006). Clinical Staging of Psychiatric Disorders: A Heuristic Framework for Choosing Earlier, Safer and more Effective Interventions. *Australian & New Zealand Journal of Psychiatry*, 40(8), 616–622.
- McGuffin, P., Katz, R., & Bebbington, P. (1988). The camberwell collaborative depression study iii. depression and adversity in the relatives of probands. *British Journal of Psychiatry*, 153, 775–782.
- McNally, R. J., Robinaugh, D. J., Wu, G. W. Y., Wang, L., Deserno, M. K., & Borsboom, D. (2015). Mental Disorders as Causal Systems A Network Approach to Posttraumatic Stress Disorder. *Clinical Psychological Science*, 3(6), 836–849.
- Meehl, P. E. (1992). Factors and Taxa, Traits and Types, Differences of Degree and Differences in Kind. *Journal of Personality*, 60(1), 117–174.
- Meek, C. (1995). Strong Completeness and Faithfulness in Bayesian Networks. In *Proceedings of the Eleventh Conference on Uncertainty in Artificial Intelligence* (pp. 411–418). San Francisco, CA, USA: Morgan Kaufmann Publishers Inc.
- Meinshausen, N., & Bühlmann, P. (2006). High-dimensional graphs and variable selection with the lasso. *The Annals of Statistics*, 34(3), 1436–1462.
- Mello, M. F. d., Mari, J. d. J., Bacaltchuk, J., Verdelli, H., & Neugebauer, R. (2005). A systematic review of research findings on the efficacy of interpersonal therapy for depressive disorders. *European Archives of Psychiatry and Clinical Neuroscience*, 255(2), 75–82.
- Middeldorp, C. M., Cath, D. C., Beem, A. L., Willemsen, G., & Boomsma, D. I. (2008). Life events, anxious depression and personality: a prospective and genetic study. *Psychological Medicine*, 38(11), 1557–1565.
- Molenaar, P. C. M. (2004). A Manifesto on Psychology as Idiographic Science: Bringing the Person Back Into Scientific Psychology, This Time Forever. *Measurement: Interdisciplinary Research and Perspectives*, 2(4), 201–218.
- Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: implications for the depressive disorders. *Psychological Bulletin*, 110, 406–425.
- Munafò, M. R., Durrant, C., Lewis, G., & Flint, J. (2009). Gene × Environment Interactions at the Serotonin Transporter Locus. *Biological Psychiatry*, 65(3), 211–219.
- Murray, I. (2007). *Advances in Markov chain Monte Carlo methods* (PhD thesis). Gatsby Computational Neuroscience Unit, University College London.

- Musmeci, N., Aste, T., & Di Matteo, T. (2014). Risk diversification: a study of persistence with a filtered correlation-network approach. *arXiv:1410.5621 [q-fin]*. (arXiv: 1410.5621)
- Myin-Germeys, I., Oorschot, M., Collip, D., Lataster, J., Delespaul, P., & van Os, J. (2009). Experience sampling research in psychopathology: opening the black box of daily life. *Psychological Medicine*, 39(09), 1533–1547.
- Nagel, E. (1979). *The Structure of Science: Problems in the Logic of Scientific Explanation*. Hackett Publishing Company.
- Nelder, J. A., & Baker, R. J. (2004). Generalized Linear Models. In *Encyclopedia of Statistical Sciences*. John Wiley & Sons, Inc. Retrieved 2017-01-03, from <http://onlinelibrary.wiley.com/doi/10.1002/0471667196.ess0866.pub2/abstract>
- Newman, M. (2001). Scientific collaboration networks. II. Shortest paths, weighted networks, and centrality. *Physical Review E*, 64(1), 016132.
- Newman, M. (2002). Spread of epidemic disease on networks. *Physical Review E*, 66(1), 016128.
- Newman, M. (2010). *Networks: an introduction*. Oxford University Press, Inc.
- Nock, M. K., Hwang, I., Sampson, N. A., & Kessler, R. C. (2010). Mental disorders, comorbidity and suicidal behavior: Results from the National Comorbidity Survey Replication. *Molecular Psychiatry*, 15(8), 868–876.
- Nolen-Hoeksema, S. (1987). Sex differences in unipolar depression: evidence and theory. *Psychological bulletin*, 101(2), 259.
- Norris, J. R. (1997). *Markov Chains*. Cambridge University Press.
- Oorschot, M., Lataster, T., Thewissen, V., Wichers, M., & Myin-Germeys, I. (2012). Mobile Assessment in Schizophrenia: A Data-Driven Momentary Approach. *Schizophrenia Bulletin*, 38(3), 405–413.
- Oppenheim, P., & Putnam, H. (1991). Unity of science as a working hypothesis. In *The philosophy of science* (pp. 405–428). Cambridge, MA: MIT Press.
- Opsahl, T. (2013). Triadic closure in two-mode networks: Redefining the global and local clustering coefficients. *Social Networks*, 35(2), 159–167.
- Opsahl, T., Agneessens, F., & Skvoretz, J. (2010). Node centrality in weighted networks: Generalizing degree and shortest paths. *Social Networks*, 32(3), 245–251.
- Orman, G. K., & Labatut, V. (2009). A comparison of community detection algorithms on artificial networks. In *Discovery Science* (pp. 242–256). Springer.
- Østergaard, S. D., Jensen, S. O. W., & Bech, P. (2011). The heterogeneity of the depressive syndrome: when numbers get serious. *Acta Psychiatrica Scandinavica*, 124(6), 495–496.
- Parker, G., Paterson, A., & Hadzi-Pavlovic, D. (2015). Cleaving depressive diseases from depressive disorders and non-clinical states. *Acta Psychiatrica Scandinavica*, 131(6), 426–433.
- Patel, M. J., Andreescu, C., Price, J. C., Edelman, K. L., Reynolds, C. F., & Aizenstein, H. J. (2015). Machine learning approaches for integrating clinical and imaging features in late-life depression classification and response prediction. *International Journal of Geriatric Psychiatry*

- etry, 30(10), 1056–1067.
- Pe, M. L., Kircanski, K., Thompson, R. J., Bringmann, L., Tuerlinckx, F., Mestdagh, M., ... Gotlib, I. H. (2015). Emotion-Network Density in Major Depressive Disorder. *Clinical Psychological Science*, 3(2), 292–300.
- Pearl, J. (2000). *Causality: Models, Reasoning, and Inference*. New York, NY, USA: Cambridge University Press.
- Pearl, J. (2009). Causal inference in statistics: An overview. *Statistics Surveys*, 3, 96–146.
- Pearl, J., & Verma, T. (1991). *A theory of inferred causation*. Morgan Kaufmann San Mateo, CA.
- Penninx, B. W., Beekman, A. T., Smit, J. H., Zitman, F. G., Nolen, W. A., Spinhoven, P., ... Assendelft, W. J. (2008). The netherlands study of depression and anxiety (NESDA): Rationale, objectives and methods. *International Journal of Methods in Psychiatric Research*, 17(3), 121–140.
- Penninx, B. W., Nolen, W. A., Lamers, F., Zitman, F. G., Smit, J. H., Spinhoven, P., ... others (2011). Two-year course of depressive and anxiety disorders: Results from the Netherlands Study of Depression and Anxiety (NESDA). *Journal of affective disorders*, 133(1), 76–85.
- Persons, J. B. (1986). The advantages of studying psychological phenomena rather than psychiatric diagnoses. *The American Psychologist*, 41(11), 1252–1260.
- Pons, P., & Latapy, M. (2006). Computing communities in large networks using random walks. *Journal of Graph Algorithms and Applications*, 10(2), 191–218.
- Pötscher, B. M., & Leeb, H. (2009). On the distribution of penalized maximum likelihood estimators: The LASSO, SCAD, and thresholding. *Journal of Multivariate Analysis*, 100(9), 2065–2082.
- Prescott, C. A., Aggen, S. H., & Kendler, K. S. (2000). Sex-specific genetic influences on the comorbidity of alcoholism and major depression in a population-based sample of US twins. *Archives of General Psychiatry*, 57(8), 803.
- R Development Core Team. (2011). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <http://www.R-project.org/> (ISBN 3-900051-07-0)
- Raskutti, G., Wainwright, M. J., & Yu, B. (2010). Restricted Eigenvalue Properties for Correlated Gaussian Designs. *J. Mach. Learn. Res.*, 11, 2241–2259.
- Ravikumar, P., Wainwright, M. J., & Lafferty, J. D. (2010). High-dimensional Ising model selection using l1-regularized logistic regression. *The Annals of Statistics*, 38(3), 1287–1319.
- Ravikumar, P., Wainwright, M. J., Raskutti, G., Yu, B., & others. (2011). High-dimensional covariance estimation by minimizing l1-penalized log-determinant divergence. *Electronic Journal of Statistics*, 5, 935–980.
- Rhemtulla, M., Fried, E., Aggen, S. H., Tuerlinckx, F., Kendler, K. S., & Borsboom, D. (2016). Network analysis of substance abuse and dependence symptoms. *Drug and Alcohol Dependence*, 161, 230–237.

- Richardson, T., & Spirtes, P. (2002). Ancestral Graph Markov Models. *The Annals of Statistics*, 30(4), 962–1030.
- Robinaugh, D. J., LeBlanc, N. J., Vuletich, H. A., & McNally, R. J. (2014). Network analysis of persistent complex bereavement disorder in conjugally bereaved adults. *Journal of Abnormal Psychology*, 123(3), 510–522.
- Robinaugh, D. J., & McNally, R. J. (2011). Trauma centrality and PTSD symptom severity in adult survivors of childhood sexual abuse. *Journal of Traumatic Stress*, 24(4), 483–486.
- Robins, C. J., & Block, P. (1988). Personal vulnerability, life events, and depressive symptoms: a test of a specific interactional model. *Journal of Personality and Social Psychology*, 54, 847–852.
- Robinson, W. S. (1950). Ecological Correlations and the Behavior of Individuals. *American Sociological Review*, 15(3), 351–357.
- Rohde, P., Seeley, J. R., Kaufman, N. K., Clarke, G. N., & Stice, E. (2006). Predicting Time to Recovery Among Depressed Adolescents Treated in Two Psychosocial Group Interventions. *Journal of consulting and clinical psychology*, 74(1), 80–88.
- Rosmalen, J. G., Wenting, A. M., Roest, A. M., de Jonge, P., & Bos, E. H. (2012). Revealing Causal Heterogeneity Using Time Series Analysis of Ambulatory Assessments: Application to the Association Between Depression and Physical Activity After Myocardial Infarction. *Psychosomatic Medicine*, 74(4), 377–386.
- Rothbaum, B. O., & Schwartz, A. C. (2002). Exposure therapy for posttraumatic stress disorder. *American Journal of Psychotherapy*, 56(1), 59–75.
- Rothman, A. J., Levina, E., & Zhu, J. (2010). Sparse multivariate regression with covariance estimation. *Journal of Computational and Graphical Statistics*, 19(4), 947–962.
- Rue, H., & Held, L. (2005). *Gaussian Markov random fields: theory and applications*. CRC Press.
- Rush, A., Gullion, C. M., Basco, M. R., Jarrett, R. B., Trivedi, M. H., & others. (1996). The inventory of depressive symptomatology (IDS): Psychometric properties. *Psychological Medicine*, 26(3), 477–486.
- Ruzzano, L., Borsboom, D., & Geurts, H. M. (2014). Repetitive behaviors in autism and obsessive-compulsive disorder: New perspectives from a network analysis. *Journal of Autism and Developmental Disorders*, 45(1), 192–202. doi: 10.1007/s10803-014-2204-9
- Sani, G., Napoletano, F., Vöhringer, P. A., Sullivan, M., Simonetti, A., Koukopoulos, A., . . . Ghaemi, N. (2014). Mixed depression: clinical features and predictors of its onset associated with antidepressant use. *Psychotherapy and Psychosomatics*, 83(4), 213–221.
- Santos, H., Fried, E., Asafu-Adjei, J., & Ruiz, R. J. (2017). Network Structure of Perinatal Depressive Symptoms in Latinas: Relationship to Stress and Reproductive Biomarkers. *Research in Nursing & Health*. doi: 10.1002/nur.21784
- Schadt, E. E., & Björkegren, J. L. M. (2012). NEW: Network-Enabled Wisdom in Biology, Medicine, and Health Care. *Science Translational Medicine*, 4(115), 115rv1–115rv1.

- Schäfer, J., & Strimmer, K. (2005). A Shrinkage Approach to Large-Scale Covariance Matrix Estimation and Implications for Functional Genomics. *Statistical Applications in Genetics and Molecular Biology*, 4(1), 32.
- Scheffer, M., Bascompte, J., Brock, W. A., Brovkin, V., Carpenter, S. R., Dakos, V., ... Sugihara, G. (2009). Early-warning signals for critical transitions. *Nature*, 461(7260), 53–59.
- Schmittmann, V. D., Cramer, A., Waldorp, L. J., Epskamp, S., Kievit, R. A., & Borsboom, D. (2011). Deconstructing the construct: A network perspective on psychological phenomena. *New Ideas in Psychology*, 31(1), 43–53.
- Schmittmann, V. D., Cramer, A. O. J., Waldorp, L. J., Epskamp, S., Kievit, R. A., & Borsboom, D. (2013). Deconstructing the construct: A network perspective on psychological phenomena. *New Ideas in Psychology*, 31(1), 43–53.
- Schoevers, R. A., Beekman, A. T. F., Deeg, D. J. H., Jonker, C., & Van Tilburg, W. (2003). Comorbidity and risk-patterns of depression, generalised anxiety disorder and mixed anxiety-depression in later life: results from the AMS study. *International Journal of Geriatric Psychiatry*, 18(11), 994–1001.
- Schoevers, R. A., Deeg, D., Van Tilburg, W., & Beekman, A. (2005). Depression and generalized anxiety disorder: co-occurrence and longitudinal patterns in elderly patients. *The American Journal of Geriatric Psychiatry*, 13(1), 31–39.
- Schuch, J. J. J., Roest, A. M., Nolen, W. A., Penninx, B. W. J. H., & de Jonge, P. (2014). Gender differences in major depressive disorder: Results from the Netherlands study of depression and anxiety. *Journal of Affective Disorders*, 156, 156–163.
- Schuurman, N. K., Ferrer, E., de Boer-Sonnenschein, M., & Hamaker, E. L. (2016). How to compare cross-lagged associations in a multilevel autoregressive model. *Psychological Methods*, 21(2), 206–221.
- Shumway, R. H., & Stoffer, D. S. (2010). *Time Series Analysis and Its Applications: With R Examples*. Springer Science & Business Media.
- Singer, B. (1981). Estimation of Nonstationary Markov Chains from Panel Data. *Sociological Methodology*, 12, 319–337.
- Speed, T., & Kiiveri, H. (1986). Gaussian Markov distributions over finite graphs. *The Annals of Statistics*, 14, 138–150.
- Spirtes, P., Glymour, C., & Scheines, R. (2001). *Causation, prediction, and search*. Cambridge, Massachusetts: MIT press.
- Startz, R. (2008). Binomial autoregressive moving average models with an application to US recessions. *Journal of business & economic statistics*, 26(1).
- Stone, A. A., & Shiffman, S. (1994). Ecological momentary assessment (EMA) in behavioral medicine. *Annals of Behavioral Medicine*, 16(3), 199–202.
- Strimmer, K. (2008). fdrtool: a versatile R package for estimating local and tail area-based false discovery rates. *Bioinformatics*, 24(12), 1461–1462.

- Strogatz, S. H. (2014). *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry, and Engineering*. Westview Press.
- Teasdale, J. D. (1983). Negative thinking in depression: Cause, effect, or reciprocal relationship? *Advances in Behaviour, Research and Therapy*, 5, 3-25.
- Thom, R. (1989). *Structural Stability and Morphogenesis*. Addison-Wesley.
- Tibshirani, R. (1996). Regression shrinkage and selection via the lasso. *Journal of the Royal Statistical Society. Series B (Methodological)*, 58, 267–288.
- Tweed, D. L. (1993). Depression-related impairment: estimating concurrent and lingering effects. *Psychological Medicine*, 23(02), 373–386.
- Van Bork, R., Van Borkulo, C. D., Waldorp, L. J., Cramer, A., & Borsboom, D. (n.d.). Network models for clinical psychology. In *The Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience* (Fourth Edition ed.).
- Van Borkulo, C. D., Borsboom, D., Epskamp, S., Blanken, T. F., Boschloo, L., Schoevers, R. A., & Waldorp, L. J. (2014). A new method for constructing networks from binary data. *Scientific Reports*, 4. doi: doi:10.1038/srep05918
- Van Borkulo, C. D., Borsboom, D., Nivard, M., & Cramer, A. O. J. (2011). *Symptom spread model*. Retrieved from http://ccl.northwestern.edu/netlogo/models/community/Vulnerability_to_Depression
- Van Borkulo, C. D., Borsboom, D., & Schoevers, R. A. (2016). Group-level symptom networks in depression - reply. *JAMA Psychiatry*, 73(4), 411–412.
- Van Borkulo, C. D., Boschloo, L., Borsboom, D., Penninx, B. W. J. H., Waldorp, L. J., & Schoevers, R. A. (2015). Association of Symptom Network Structure With the Course of Depression. *JAMA Psychiatry*, 72(12), 1219–1226.
- Van Borkulo, C. D., Boschloo, L., Kossakowski, J., Tio, P., Schoevers, R. A., Borsboom, D., & Waldorp, L. J. (2016). Comparing network structures on three aspects: A permutation test. (Submitted for publication) doi: 10.13140/RG.2.2.29455.38569
- Van Borkulo, C. D., Epskamp, S., & Milner, A. (2016). *NetworkComparisonTest*. Retrieved from <https://cran.r-project.org/web/packages/NetworkComparisonTest/NetworkComparisonTest.pdf> (Version 2.0.0)
- Van Borkulo, C. D., Epskamp, S., & Robitzsch. (2016). *IsingFit: Fitting Ising Models Using the ELasso Method*. Retrieved 2016-11-01, from <https://cran.r-project.org/web/packages/IsingFit/index.html>
- Van Borkulo, C. D., Van Der Maas, H. L. J., Borsboom, D., & Cramer, A. (2013). *Vulnerability to depression*. Retrieved from http://ccl.northwestern.edu/netlogo/models/community/Vulnerability_to_Depression
- Van Borkulo, C. D., Wichers, M., Boschloo, L., Epskamp, S., Schoevers, R. A., Kamphuis, J. H., ... Waldorp, L. J. (2017). Supplement to “the contact process as a model for predicting network dynamics of psychopathology”.

- (Manuscript submitted for publication)
- Van Borkulo, C. D., Wichers, M., Boschloo, L., Schoevers, R. A., Kamphuis, J. H., Borsboom, D., & Waldorp, L. J. (n.d.). *The contact process as a model for predicting network dynamics of psychopathology*. (Manuscript submitted for publication)
- Van de Geer, S., Bühlmann, P., Ritov, Y. A., & Dezeure, R. (2014). On asymptotically optimal confidence regions and tests for high-dimensional models. *The Annals of Statistics*, 42(3), 1166–1202.
- Van Der Maas, H. L. J., Dolan, C. V., Grasman, R. P. P. P., Wicherts, J. M., Huizenga, H. M., & Raijmakers, M. E. J. (2006). A dynamical model of general intelligence: The positive manifold of intelligence by mutualism. *Psychological Review*, 113(4), 842.
- Van der Vaart, A. (1998). *Asymptotic Statistics*. New York: Cambridge University Press.
- Van Loo, H. M., De Jonge, P., Romeijn, J.-W., Kessler, R. C., & Schoevers, R. A. (2012). Data-driven subtypes of major depressive disorder: a systematic review. *BMC medicine*, 10(1), 156.
- Van Nes, E. H., & Scheffer, M. (2005). Implications of Spatial Heterogeneity for Catastrophic Regime Shifts in Ecosystems. *Ecology*, 86(7), 1797–1807.
- van Nes, E. H., & Scheffer, M. (2007). Slow recovery from perturbations as a generic indicator of a nearby catastrophic shift. *The American Naturalist*, 169(6), 738–747.
- Vega-Dienstmaier, J. M. (2015). Estructura de la sintomatología depresiva en una muestra de mujeres con menos de un año postparto: Structure of the depressive symptomatology in a sample of women with less than 1 year postpartum. *Revista de Neuro-Psiquiatría*, 78(4), 221–231.
- Vespignani, A. (2012). Modelling dynamical processes in complex socio-technical systems. *Nature Physics*, 8(1), 32–39.
- Vogelzangs, N., Duivis, H. E., Beekman, A. T. F., Kluft, C., Neuteboom, J., Hoogendijk, W., ... Penninx, B. W. J. H. (2012). Association of depressive disorders, depression characteristics and antidepressant medication with inflammation. *Translational Psychiatry*, 2(2), e79. doi: 10.1038/tp.2012.8
- Wainwright, M. J., & Jordan, M. I. (2008). Graphical models, exponential families, and variational inference. *Foundations and Trends in Machine Learning*, 1(1-2), 1–305.
- Wakefield, J. C., & Schmitz, M. F. (2014). Predictive validation of single-episode uncomplicated depression as a benign subtype of unipolar major depression. *Acta Psychiatrica Scandinavica*, 129(6), 445–457.
- Waldorp, L. (2015). Testing for graph differences using the desparsified lasso in high-dimensional data.
(Manuscript submitted for publication)
- Wang, J., Fick, G., Adair, C., & Lai, D. (2007). Gender specific correlates of stigma toward depression in a Canadian general population sample. *Journal of Affective Disorders*, 103(1–3), 91–97.

- Wasserman, S., & Faust, K. (1994). *Social Network Analysis: Methods and Applications*. Cambridge University Press.
- Watts, D. J., & Strogatz, S. H. (1998). Collective dynamics of small-world networks. *Nature*, 393, 440–442.
- Weisstein, W. (n.d.). *Graph Diameter*. From MathWorld—A Wolfram Web Resource. Retrieved from <http://mathworld.wolfram.com/GraphDiameter.html>
- Whiteford, H. A., Degenhardt, L., Rehm, J., Baxter, A. J., Ferrari, A. J., Erskine, H. E., ... Vos, T. (2013). Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *The Lancet*, 382(9904), 1575–1586.
- Wichers, M. (2014). The dynamic nature of depression: a new micro-level perspective of mental disorder that meets current challenges. *Psychological Medicine*, 44(07), 1349–1360.
- Wichers, M., Geschwind, N., Jacobs, N., Kenis, G., Peeters, F., Derom, C., ... Os, J. v. (2009). Transition from stress sensitivity to a depressive state: longitudinal twin study. *The British Journal of Psychiatry*, 195(6), 498–503.
- Wichers, M., Groot, P. C., & Psychosystems, ESM Group, EWS Group. (2016). Critical Slowing Down as a Personalized Early Warning Signal for Depression. *Psychotherapy and Psychosomatics*, 85(2), 114–116.
- Wichers, M., Wigman, J. T. W., Bringmann, L., & De Jonge, P. (2017). Mental disorders as networks: some cautionary reflections on a promising approach. *Social Psychiatry and Psychiatric Epidemiology*, 52(2), 143–145.
- Wichers, M., Wigman, J. T. W., & Myin-Germeys, I. (2015). Micro-Level Affect Dynamics in Psychopathology Viewed From Complex Dynamical System Theory. *Emotion Review*, 7(4), 362–367.
- Wigman, J. T. W., Os, J. v., Thiery, E., Derom, C., Collip, D., Jacobs, N., & Wichers, M. (2013). Psychiatric Diagnosis Revisited: Towards a System of Staging and Profiling Combining Nomothetic and Idiographic Parameters of Momentary Mental States. *PLOS ONE*, 8(3), e59559.
- Wigman, J. T. W., van Os, J., Borsboom, D., Wardenaar, K. J., Epskamp, S., Klippel, A., ... Wichers, M. (2015). Exploring the underlying structure of mental disorders: cross-diagnostic differences and similarities from a network perspective using both a top-down and a bottom-up approach. *Psychological Medicine*, 45(11), 2375–2387.
- Wigman, J. T. W., Vos, S. d., Wichers, M., Os, J. v., & Bartels-Velthuis, A. A. (2016). A Transdiagnostic Network Approach to Psychosis. *Schizophrenia Bulletin*, sbw095. doi: 10.1093/schbul/sbw095
- Wild, B., Eichler, M., Friederich, H.-C., Hartmann, M., Zipfel, S., & Herzog, W. (2010). A graphical vector autoregressive modelling approach to the analysis of electronic diary data. *BMC medical research methodology*, 10(1), 28.
- Wilensky, U. (1999). *NetLogo*. Northwestern University, Evanston, IL: Center for Connected Learn-

- ing and Computer-Based Modeling. Retrieved from <http://ccl.northwestern.edu/netlogo/>
- Wittchen, H. U. (1994). Reliability and validity studies of the WHO–Composite International Diagnostic Interview (CIDI): a critical review. *Journal of Psychiatric Research*, 28(1), 57–84.
- World Health organization. (2009). *Global Health Risks - Mortality and burden of disease attributable to selected major risks*.
- Wu, F.-Y. (1982). The potts model. *Reviews of modern physics*, 54(1), 235.
- Yin, J., & Li, H. (2011). A sparse conditional gaussian graphical model for analysis of genetical genomics data. *The annals of applied statistics*, 5(4), 2630–2650.
- Zeeman, E. C. (1977). *Catastrophe theory: Selected papers*. Addison-Wesley.