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### Editorial

Oldehinkel, A. J. (Tineke)

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## Editorial: Sweet nothings – the value of negative findings for scientific progress

Since John Ioannidis wrote his landmark paper *Why most published research findings are false* in 2005, most researchers have become well aware of the catastrophic scientific consequences of selective outcome reporting and selective publication. Both these processes distort the information that is made publicly available, with implausible meta-analytic effect estimates as a likely consequence. Funnel plots and tests for funnel plot asymmetry may provide some insight into the extent to which publication bias is likely, but are not without problems (Sterne et al., 2011). Hence, selective reporting and publishing undermine the reliability of what we consider evidence-based knowledge and therefore remain issues of utmost concern, which deserve unremitting attention and deliberation (Asarnow et al., 2018).

The scientific world would be in much better shape if all associations that were tested were reported, and if the likelihood of publication were solely based on methodological quality, not on the outcomes. But even in this imaginary world, perceptions of the base of evidence might still be false because the risk of bias extends beyond the processes of reporting and publishing results. Two sources of bias that have received less attention so far, but are not necessarily less detrimental, are *spin* and *selective citation*. Spin relates to selective interpretation, meant to transform an essentially negative conclusion into a more positively toned one by a disproportionate focus on effects that were actually found, rather than those that were expected but not delivered. Instead of, or in addition to, stating that an intervention was not significantly more effective than a placebo, spinning researchers pay extensive attention to, for instance, results suggesting efficacy in a subpopulation of patients. Spin is very common in the medical literature: over half of the conclusion sections of articles describing trials with negative findings with regard to the primary outcome are estimated to contain spin (Boutron, Dutton, Ravoud, & Altman, 2010). Bias due to selective citation is the phenomenon that findings supporting specific claims (positive findings) tend to be cited more than findings disputing these claims (negative findings). As opposed to outcome reporting and publication bias, which influence the information that finds its way to the scientific literature and general public sphere initially, spin and citation bias act in more subtle ways, that is, by influencing the focus of the public's attention to specific elements of what is already published and therefore belief systems (Greenberg, 2009). The effects of these and other sources of imbalance accumulate, and the consequences can be huge. A review of 105 trials on the efficacy of antidepressants for depressive disorders, of which half yielded nonsignificant results on the primary outcomes in the original FDA database, revealed that authors rarely clearly reported that the antidepressant was not effective in their study; in only four papers did they do so (De Vries, 2018). In other words, the negative findings had virtually disappeared out of sight.

Biased knowledge is bad news for science, and perhaps even more so for clinical practice. Biased notions about the potential of particular interventions are likely to generate undue efforts and expenses, and to impede more realistic conceptions. Hence, it is a damaging obstacle blocking the way to providing the best possible care to those who need it the most. Obviously, it is a shared responsibility of everyone involved in the scientific process to prevent imbalanced knowledge dissemination by all possible means. All researchers should be aware of the extent to which the various sources of bias may distort their perception of the base of evidence, and keep this awareness in the forefront of their brains. This awareness will help to ensure that the literature is reviewed critically and that new findings are interpreted correctly. A crucial opportunity to prevent bias is the description and interpretation of research findings when preparing a manuscript for submission to a scientific journal, particularly when all or part of the main findings of the study are negative. Because not reporting such outcomes is generally considered scientific misconduct, there is no need to waste more words over that. Spin, a selective focus on positive findings, seems to have a more innocent face than selective reporting, and is often regarded a relatively harmless consequence of the fact that it is generally easier to discuss the presence of an association than its absence. Spin is tempting; it is well-known that bringers of good news are likely to be cited more than those with a primarily negative message. Moreover, they are also likely to receive less criticism of their work. Whereas negative findings often evoke critical comments about putative design flaws such as low power, positive findings are usually accepted with considerably fewer concerns about methodological limitations, even though such limitations undermine the strength of any conclusion, positive and negative ones alike. Considering all this, it is quite a challenge to present negative findings without attempting to end on a positive note to increase the probability of positive feedback and the probability that the paper will be cited. Researchers who have the courage to report negative results frankly should be praised for their resistance to the temptation to give their work a positive gloss.

Not only the readers and authors of scientific reports but also journals, editors and reviewers have a moral obligation to prevent bias. They need courage to do so too, because citation bias creates a potentially detrimental cycle linking the publication of positive findings to the journal's status and impact. Like all editors at the *Journal of Child Psychology and Psychiatry*, I feel that everyone involved in the review and publication process should strive to full transparency and a balanced discussion of the findings, and work hard to ensure that negative findings are not ignored in the results, discussion, conclusions, and reference list – although it is not always self-evident what is the best way to move forward on this

(Asarnow et al., 2018). Yet, it does not do the JCPP harm to pay additional attention to negative evidence from time to time in an editorial like this, as a means to encourage all researchers with nonsignificant findings to communicate their message to the scientific community.

This issue of JCPP contains several articles with wholly or partly negative findings. Here I highlight three. Dunn et al. (2018) investigated the association between exposure to childhood adversities and the later ability to recognize facial emotions in the Avon Longitudinal Study of Parents and Children. Several clinical and high-risk studies have suggested emotion recognition deficits in children exposed to adversities, but this association has rarely been investigated in population-based samples. Even though their sample size was sufficient to detect small effects and regardless of the severity and timing of the adversity, Dunn et al. did not find any evidence in favor of an association between emotion recognition skills and exposure to childhood adversity whatsoever. This is highly relevant for multiple reasons. It indicates once again that findings from clinical samples cannot be generalized to the general population in a straightforward way. Furthermore, Dunn's findings suggest that emotion recognition skills are not modulated by stressful experiences in the vast majority of children, and hence unlikely to be a mediating mechanism linking childhood adversities to the development of common mental health problems.

A second negative finding in this issue that deserves special notice was reported by Conway, Raposa, Hammen, and Brennan (2018). They investigated whether and how early family stress predicted a range of mental disorders assessed at age 20, and found that these stressors predicted higher-order internalizing and externalizing dimensions but no specific disorders. These findings add to the accumulating evidence that adversities affect broad psychopathological spectra rather than specific disorders. This not only clearly supports a focus on transdiagnostic outcomes in stress research, but may also inspire and refine the search for truly disorder-specific risk factors. Possibly, these factors operate later in the pathological process, where they bend broad vulnerabilities in the direction of specific expressions.

The third finding that I would like to draw particular attention to here is described in the article written by Rydell, Lundström, Gillberg, Lichtenstein, and Larsson (2018), who aimed to find out whether the reported rise in clinically diagnosed and treated ADHD reflects an increase in ADHD-like traits in the population. Using both register-based clinical ADHD diagnoses and parent-reported ADHD symptoms of a large population-based sample of 9-year-old twins, collected during a period of eleven years (2004–2014), Rydell et al. confirmed previous reports of a strong increase in clinically diagnosed ADHD, but found no significant increase in parent-reported diagnostic-level ADHD. As the authors note, this might indicate that the increased rates of clinically diagnosed ADHD reflect altered diagnostic and treatment practices or administrative changes rather than an actual increase in the ADHD phenotype. Food for thought.

All findings reported in this issue of JCPP are highly interesting and worthy of finding their way into people's minds and scientific theories. Yet, I would like to inspire you to read the negative findings extra carefully and cite them as much as you can. Publications regarding negative findings comprise an underrepresented and often undervalued minority, and therefore deserve all support they can get.

**Publications regarding negative findings comprise an underrepresented and undervalued minority.**

A.J. (Tineke) Oldehinkel<sup>1,2</sup>

<sup>1</sup>Interdisciplinary Center Psychopathology and Emotion Regulation, University Medical Center Groningen, Groningen, <sup>2</sup>University of Groningen, Groningen, The Netherlands

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