

Chapman University Chapman University Digital Commons

Psychology Faculty Articles and Research

Psychology

5-2-2018

Treating ADHD with Suggestion: Neurofeedback and Placebo Therapeutics


Robert T. Thibault
McGill University

Samuel Vassière
McGill University

Jay A. Olson
McGill University

Amir Raz
Chapman University, raz@chapman.edu

Follow this and additional works at: https://digitalcommons.chapman.edu/psychology_articles

 Part of the [Behavioral Disciplines and Activities Commons](#), [Behavior and Behavior Mechanisms Commons](#), [Biological Psychology Commons](#), [Experimental Analysis of Behavior Commons](#), [Health Psychology Commons](#), [Medical Neurobiology Commons](#), [Mental Disorders Commons](#), [Neurology Commons](#), [Neurosciences Commons](#), [Other Psychiatry and Psychology Commons](#), [Other Psychology Commons](#), and the [Psychological Phenomena and Processes Commons](#)

Recommended Citation

Thibault, R. T., Vassière, S., Olson, J. A., & Raz, A. (2018). Treating ADHD with suggestion: Neurofeedback and placebo therapeutics. *Journal of Attention Disorders*. doi: 10.1177/1087054718770012

This Article is brought to you for free and open access by the Psychology at Chapman University Digital Commons. It has been accepted for inclusion in Psychology Faculty Articles and Research by an authorized administrator of Chapman University Digital Commons. For more information, please contact laughtin@chapman.edu.

Treating ADHD with Suggestion: Neurofeedback and Placebo Therapeutics

Comments

This is a pre-copy-editing, author-produced PDF of an article accepted for publication in *Journal of Attention Disorders* in 2018 following peer review. The definitive publisher-authenticated version is available online at DOI: [10.1177/1087054718770012](https://doi.org/10.1177/1087054718770012).

Copyright

The authors

Treating ADHD with Suggestion: Neurofeedback and Placebo Therapeutics

Robert T. Thibault*^{a,b}, Samuel Veissière*^a, Jay A. Olson^a, Amir Raz^{a,b}[†]

**Authors contributed equally, listed alphabetically*

*Uncorrected proofs of article accepted for publication in the **Journal of Attention Disorders***

^a McGill University, 3775 University Street, Montreal, QC, H3A 2B4, Canada

^b Institute for Interdisciplinary Brain and Behavioral Sciences, Chapman University, Irvine, CA,
92618, USA

Keywords: placebo, nocebo, neuroenchantment, neurosuggestion, neurofeedback, ADHD, EEG.

[†] Please address physical correspondence to:

Professor Amir Raz, Brain Institute, Chapman University, Irvine, CA, 92618, USA

Email correspondence to: Robert.Thibault@mail.mcgill.ca or Raz@Chapman.edu

Recent critical publications on neurofeedback raise a conundrum: Does EEG-neurofeedback (EEG-nf) work, and if so, how? In a series of papers, we reported that EEG-nf seems to help the symptoms of ADHD, but for different reasons than most advocates would expect—i.e., due to a placebo response (Thibault, Lifshitz, Birbaumer, & Raz, 2015; Thibault & Raz, 2017). In this Guest Editorial, we address ethical considerations concerning prescribing placebos and highlight how we can leverage prevailing brain-based beliefs about behavioral disorders to better treat patients. We conclude that clinicians can apply EEG-nf to ADHD as a form of clinical suggestion for patients with the time, finances, and inclination to pursue such a treatment.

In a therapeutic context, suggestion refers to communicable ideas, contextual cues, and cultural rituals that can help modulate both voluntary actions and autonomic functions that typically lie outside of our volitional control. Suggestions come in many flavors (e.g., hypnotic, parental, or commercial). In this paper we focus on the kind of suggestion that uses ideas, cues, and rituals drawn from neuro-technology and our culturally widespread trust in brain-based explanatory models of human behavior—i.e., *neurosuggestion*. To enhance the involvement of the patient and to make suggestion more effective, we can leverage culturally salient props, such as a brain scanner, in a process we broadly term *accessory-assisted healing*.

Why EEG-neurofeedback is neurosuggestion therapy

EEG-nf for ADHD shows comparable benefits whether the feedback is genuine (from one's own brain signal of interest) or a sham (from an unrelated signal). To date, every relevant double-blind sham-controlled study has reached this conclusion (Arnold et al., 2013;

Please cite published version.

Lansbergen, van Dongen-Boomsma, Buitelaar, & Slaats-Willemse, 2011; Logemann, Lansbergen, van Os, Bocker, & Kenemans, 2010; Perreau-Linck, Lessard, Lévesque, & Beauregard, 2010; Schönenberg et al., 2017; Thibault & Raz, 2017; Van Dongen-Boomsma, Vollebregt, Slaats-Willemse, & Buitelaar, 2013; Vollebregt, van Dongen-Boomsma, Buitelaar, & Slaats-Willemse, 2014). In all but two of these studies, the treatment benefitted both groups (Logemann et al., 2010; Vollebregt et al., 2014). A recent triple-blind registered randomized controlled trials (RCT) with 118 participants diagnosed with ADHD found large effect sizes for both true ($d=1.0$) and sham ($d=1.5$) neurofeedback groups (Schönenberg et al., 2017). Until research demonstrates additional benefits from true neurofeedback that go above and beyond placebo effects, the science suggests that EEG-nf, at least in its current incarnation, relies exclusively on treatment mechanisms unrelated to watching one's own brain activity (Thibault & Raz, 2016). EEG-nf, in other words, is neurosuggestion.

We already prescribe suggestion

Most clinicians have prescribed suggestion—but many don't know it. The benefits of SSRIs for depression, acupuncture for lower back pain, and knee surgery for osteoarthritis all stem largely from the suggestion that these treatments will improve your health (i.e., from placebo effects). In 2002, the psychologist Irving Kirsch obtained unpublished clinical trial data under the Freedom of Information Act, and found that SSRIs barely outperformed placebos in RCTs (Kirsch, Moore, Scoboria, & Nicholls, 2002). In the case of lower back pain, two RCTs with a total of over 1,700 participants demonstrated comparable benefits between veridical acupuncture and sham acupuncture, yet both outperformed a standard-of-care treatment (Cherkin et al., 2009; Haake, Basler, & Endres, 2007; Harris, Lifshitz, & Raz, 2015). Likewise, a high-

profile RCT showed that, even at a two-year follow-up, sham knee surgery decreased pain and improved movement capacity on par with real surgery (Moseley et al., 2002). An expert panel now strongly recommends against knee surgery for osteoarthritis due to potential complications and the absence of benefits beyond placebo effects (Siemieniuk et al., 2017). In these situation, clinicians often unknowingly prescribe placebos. Following the results from recent double-blind studies, we can now add EEG-nf for ADHD to this list of placebo therapies that masquerade under other biomedical labels.

The case for suggestion in ADHD

In contrast to the abovementioned placebo therapies, psychostimulants typically reduce ADHD symptoms more effectively than placebo, but come at a cost. Potential side-effects include crying, staring, anxiety, sadness, nail biting, euphoria, and shyness (Konrad-Bindl, Gresser, & Richartz, 2016). Due to growing concerns about long-term adverse side-effects, the European Commission recently called for a two-year longitudinal study that is taking place at 27 sites (Inglis et al., 2016). Given the potential for harm, it is advantageous to consider drug-free treatments with minimal side-effects to complement or replace psychostimulants. In this vein, a pair of studies found that when children with ADHD were prescribed an “open-label” placebo, they could cut their psychostimulant intake in half with negligible changes in behavior (Sandler & Bodfish, 2008; Sandler, Glesne, & Bodfish, 2010). In lieu of deception, the researchers briefed children with the following script:

“This little capsule is a placebo. Placebos have been used a lot in treating people. It is called ‘Dose Extender.’ As you can see, it is different from Adderall. Dose Extender is

Please cite published version.

something new. It has no drug in it. I can promise you that it won't hurt you at all. It has no real side effects. But it may help you to help yourself. It may work well with your Adderall, kind of like a booster to the dose of Adderall. That's why it's called a Dose Extender. I won't be surprised when I hear from you and your parents and your teachers that you're able to control your ADHD better.” (Sandler & Bodfish, 2008, p.106)

Full disclosure made little impact on the effectiveness of the placebo condition—i.e., administering placebos openly hardly detracted from the clinical benefit (Sandler et al, 2008). Researchers have reproduced this finding in several conditions, including irritable bowel syndrome, chronic pain, and depression (Kaptchuk et al., 2010; Kelley, Kaptchuk, Cusin, Lipkin, & Fava, 2012; Schafer, Colloca, & Wager, 2015).

Based on staunch faith in brain science, neurosuggestion may perhaps treat patients even better than placebo pills. In particular, with EEG-nf for ADHD, the suggestion that physical movement will contaminate the expensive brain recordings can lead participants to sit still and in turn, this procedure provides an ulterior form of behavioral therapy. The additional psychosocial cues surrounding EEG-nf, compared to those present when ingesting a pill, may help this technique compete with standard pharmacotherapy (e.g., Fuchs, Birbaumer, Lutzenberger, Gruzelier, & Kaiser, 2003). To further support this point scientifically and to the level of clinical recommendation, more studies would need to directly compare EEG-nf with standard of care treatment.

Testing neurosuggestion in the clinic

In our previous work, we explored how strong this type of suggestion could be. We found that many participants believed that a crudely-built “brain scanner”—assembled from discarded hair drying and medical equipment and placed in a cognitive neuroscience laboratory—could read their minds (Ali, Lifshitz, & Raz, 2014). In subsequent iterations of this paradigm, we found that a more realistic looking scanner could similarly alter people’s sense of agency and moral attitudes (Olson, Landry, Appourchaux, & Raz, 2016; Olson, Strandberg, Hall, Johansson, & Raz, 2017). In light of these findings, we decided to test the clinical applications of this technique we term neurosuggestion.

To pilot the idea, we used a real but decommissioned—in other words, sham—Magnetic Resonance Imaging (MRI) scanner at the Montreal Neurological Institute as part of an open-label procedure to treat nine children diagnosed with ADHD (Figure 1; Veissière, Olson, & Raz, 2017). We told the children that the “brain machine” was inactive, and that we would “use it as a suggestion” that would “help their brain heal itself”. While in the defunct scanner, we gave the children positive verbal suggestions to promote relaxation, focus, and confidence. At one-, three-, and six-week follow-ups, parents reported improvements in eight out of the nine participating children. In qualitative interviews, two families reported near complete remission of symptoms, and six reported improvements in areas such as confidence, self-control, and social skills. None reported any side effects. In essence, this study provided neurofeedback-like treatment, but instead of focusing on a specific physiological mechanism, we emphasized suggestion based healing.

Figure 1: Decommissioned Siemens 1.5T MRI used for the neurosuggestion procedure.



Should we prescribe EEG-nf for ADHD?

To answer this question, we need to consider a few issues. First, as a culture, we maintain deep-set beliefs that the origin of behavioral disorders resides in the brain (Moncrieff, 2016; Rose, 2003). Relying on this assumption, children and their families often actively seek a diagnostic label, for example ADHD, in order to ascribe meaning to their behavior (Moncrieff, 2016; Moncrieff, Rapley, & Timimi, 2015). Second, even in our open-label neurosuggestion experiment (Veissière et al., 2017), parents continued to ask what was “wrong” with their child’s brain, despite having been extensively briefed regarding the inert nature of the MRI scanner. And yet, this very belief system—that a brain disorder is the core reason for the symptoms—may unintentionally act as a suggestion to further obfuscate the situation and exacerbate symptoms through nocebo effects (Loftus & Fries, 1979). This type of thinking has been described as a “looping effect”, where our beliefs and social norms affect the framing, course, and outcomes of a disorder (Hacking, 1995). In other words, context and culture strongly modulate how patients

attend to and construe their behavior, which in turn, alters their symptoms (Kirmayer, Gomez-Carrillo, & Veissière, 2017; Seth & Friston, 2016). Third, our experiments show that brain-based folk explanations can lead to both nocebo and placebo effects. It seems that neurofeedback likely summons its strength from this belief system, which offers a promising means to regulate “faulty” brain patterns (Thibault & Raz, 2017). Thus, neurosuggestion, rather than the act of regulating one’s own EEG waves, likely allows patients to break free from harmful looping effects.

In sum, under certain circumstances, clinicians could ethically and non-deceptively prescribe EEG-nf as a form of neurosuggestion therapy. It wouldn’t be the first placebo prescription—in the United States, one study reports that 45% of physicians use placebos in clinical practice and 96% of them believe placebos can have therapeutic effects (Sherman & Hickner, 2008); in Canada, an analysis of placebo use among physicians, and especially psychiatrists, echoes similar sentiments (Raz et al., 2011). Moreover, a recent study describes interviews with 1,000 parents and reports that most deem it acceptable for clinicians to recommend placebo treatment for ADHD (Faria et al., 2017). With these realities in mind, EEG-nf presents a reasonable alternative for patients experiencing adverse side-effects or simply searching for a non-pharmacological treatment. Because EEG-nf requires time, money, and energy, if clinicians decide to promote this technique, they ought to present it as one of several options (e.g., exercise, cognitive training, behavioral therapy, and diet; Sonuga-Barke et al., 2013). Thus, clinicians can certainly prescribe EEG-nf. We recommend they do so transparently and with an eye for amplifying the psychosocial mechanisms of suggestion rather than grasping at the elusive neural signatures many practitioners speciously assign as the cause of ADHD.

REFERENCES

- Ali, S., Lifshitz, M., & Raz, A. (2014). Empirical neuroenchantment: from reading minds to thinking critically. *Frontiers in Human Neuroscience*, 27(8), 357.
<http://doi.org/http://dx.doi.org/10.3389/fnhum.2014.00357>
- Arnold, L. E., Lofthouse, N., Hersch, S., Pan, X., Hurt, E., Bates, B., ... Grantier, C. (2013). EEG neurofeedback for ADHD: double-blind sham-controlled randomized pilot feasibility trial. *Journal of Attention Disorders*, 17(5), 410–419.
<http://doi.org/10.1177/1087054712446173>
- Cherkin, D. C., Sherman, K., Avins, A., Erro, J., Ichickawa, L., & Barlow, W. (2009). A randomized trial comparing acupuncture, simulated acupuncture, and usual care for chronic low back pain. *Archives of Internal Medicine*, 169(9), 858.
<http://doi.org/10.1001/archinternmed.2009.65>
- Faria, V., Kossowsky, J., Petkov, M. P., Kaptchuk, T. J., Kirsch, I., Lebel, A., & Borsook, D. (2017). Parental Attitudes About Placebo Use in Children. *Journal of Pediatrics*, 181, 272–278. <http://doi.org/10.1016/j.jpeds.2016.10.018>
- Fuchs, T., Birbaumer, N., Lutzenberger, W., Gruzelier, J. H., & Kaiser, J. (2003). Neurofeedback Treatment for Attention-Deficit / Hyperactivity Disorder in Children : A Comparison With Methylphenidate. *Applied Psychophysiology and Biofeedback*, 28(1).
- Haake, M., Basler, H. D., & Endres, H. G. (2007). German Acupuncture Trials (GERAC) for Chronic Low Back Pain. *Archives of Internal Medicine*, 167(17), 1892–1898.
<http://doi.org/10.1001/archinte.168.9.1011-a>
- Hacking, I. (1995). The Looping Effect of Human Kinds. In *Causal Cognition: An Interdisciplinary Approach*. (pp. 351–383).

- Harris, C. S., Lifshitz, M., & Raz, A. (2015). Acupuncture for Chronic Pain? Clinical Wisdom Undecided Despite Over 4000 Years of Practice. *The American Journal of Medicine*, *128*(4), 331–333. <http://doi.org/10.1016/j.amjmed.2014.10.042>
- Inglis, S. K., Carucci, S., Garas, P., Häge, A., Banaschewski, T., Buitelaar, J. K., ... Coghill, D. C. (2016). Prospective observational study protocol to investigate long-term adverse effects of methylphenidate in children and adolescents with ADHD: The Attention Deficit Hyperactivity Disorder Drugs Use Chronic Effects (ADDUCE) study. *BMJ Open*, *6*(4), 1–12. <http://doi.org/10.1136/bmjopen-2015-010433>
- Kaptchuk, T. J., Friedlander, E., Kelley, J. M., Sanchez, M. N., Kokkotou, E., Singer, J. P., ... Lembo, A. J. (2010). Placebos without deception: A randomized controlled trial in irritable bowel syndrome. *PLoS ONE*, *5*(12). <http://doi.org/10.1371/journal.pone.0015591>
- Kelley, J. M., Kaptchuk, T. J., Cusin, C., Lipkin, S., & Fava, M. (2012). Open-label placebo for major depressive disorder: A pilot randomized controlled trial. *Psychotherapy and Psychosomatics*, *81*(5), 312–314. <http://doi.org/10.1159/000337053>
- Kirmayer, L. J., Gomez-Carrillo, A., & Veissière, S. (2017). Culture and depression in global mental health: An ecosocial approach to the phenomenology of psychiatric disorders. *Social Science and Medicine*, *183*, 163–168. <http://doi.org/10.1016/j.socscimed.2017.04.034>
- Kirsch, I., Moore, T. J., Scoboria, A., & Nicholls, S. S. (2002). The emperor's new drugs: An analysis of antidepressant medication data submitted to the U.S. Food and Drug Administration. *Prevention & Treatment*, *5*(1), 1–11. <http://doi.org/10.1037//1522-3736.5.1.523a>
- Konrad-Bindl, D. S., Gresser, U., & Richartz, B. M. (2016). Changes in behavior as side effects in methylphenidate treatment: Review of the literature. *Neuropsychiatric Disease and*

Treatment, 12, 2635–2647. <http://doi.org/10.2147/NDT.S114185>

Lansbergen, M. M., van Dongen-Boomsma, M., Buitelaar, J. K., & Slaats-Willemsse, D. (2011). ADHD and EEG-neurofeedback: a double-blind randomized placebo-controlled feasibility study. *Journal of Neural Transmission*, 118(2), 275–84. <http://doi.org/10.1007/s00702-010-0524-2>

Loftus, E. F., & Fries, J. F. (1979). Informed consent may be hazardous to health. *Science (New York, N.Y.)*, 204(4388), 11. <http://doi.org/10.1126/science.373117>

Logemann, H. N. A., Lansbergen, M. M., van Os, T. W. D. P., Bocker, K. B. E., & Kenemans, J. L. (2010). The effectiveness of EEG-feedback on attention, impulsivity and EEG: a sham feedback controlled study. *Neuroscience Letters*, 479, 49–53. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0304394010006014>

Moncrieff, J. (2016). *The myth of the chemical cure: A critique of psychiatric drug treatment*. *The Myth of the Chemical Cure: A Critique of Psychiatric Drug Treatment*. <http://doi.org/10.1007/978-0-230-58944-5>

Moncrieff, J., Rapley, M., & Timimi, S. (2015). The Construction of Psychiatric Diagnoses: The case of adult ADHD*. *The Journal of Critical Psychology, Counseling and Psychotherapy*, 15(1), 42–55.

Moseley, J. B., O'Malley, K., Petersen, N. J., Menke, T. J., Brody, B. A., Kuykendall, D. H., ... Wray, N. P. (2002). A controlled trial of arthroscopic surgery for osteoarthritis of the knee. *The New England Journal of Medicine*, 347(2), 81–88. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12368798>

Olson, J. A., Landry, M., Appourchaux, K., & Raz, A. (2016). Simulated thought insertion: Influencing the sense of agency using deception and magic. *Consciousness and Cognition*,

43, 11–26. <http://doi.org/10.1016/j.concog.2016.04.010>

Olson, J. A., Strandberg, T., Hall, L., Johansson, P., & Raz, A. (2017). Manipulating attitudes using suggestion. In *68th Society for Clinical and Experimental Hypnosis Conference*. Chicago, IL.

Perreau-Linck, E., Lessard, N., Lévesque, J., & Beaugard, M. (2010). Effects of Neurofeedback Training on Inhibitory Capacities in ADHD Children: A Single-Blind, Randomized, Placebo-Controlled Study. *Journal of Neurotherapy*, *14*(3), 229–242. <http://doi.org/10.1080/10874208.2010.501514>

Raz, A., Campbell, N., Guindi, D., Holcroft, C., Déry, C., & Cukier, O. (2011). Placebos in clinical practice: Comparing attitudes, beliefs, and patterns of use between academic psychiatrists and nonpsychiatrists. *Canadian Journal of Psychiatry*, *56*(4), 198–208. <http://doi.org/10.1177/070674371105600403>

Rose, N. (2003). Neurochemical selves. *Society*, *41*(1), 46–59. <http://doi.org/10.1007/BF02688204>

Sandler, A., & Bodfish, J. W. (2008). Open-label use of placebos in the treatment of ADHD: A pilot study. *Child: Care, Health and Development*, *34*(1), 104–110. <http://doi.org/10.1111/j.1365-2214.2007.00797.x>

Sandler, A., Glesne, C. E., & Bodfish, J. W. (2010). Conditioned placebo dose reduction: a new treatment in attention-deficit hyperactivity disorder? *Journal of Developmental and Behavioral Pediatrics : JDBP*, *31*(5), 369–75. <http://doi.org/10.1097/DBP.0b013e3181e121ed>

Schafer, S. M., Colloca, L., & Wager, T. D. (2015). Conditioned placebo analgesia persists when subjects know they are receiving a placebo. *Journal of Pain*, *16*(5), 412–420.

<http://doi.org/10.1016/j.jpain.2014.12.008>

Schönenberg, M., Wiedemann, E., Schneidt, A., Scheeff, J., Logemann, A., & Keune, P. M. (2017). Neurofeedback, sham neurofeedback, and cognitive-behavioural group therapy in adults with attention-deficit hyperactivity disorder: a triple-blind, randomised, controlled trial. *Lancet Psychiatry*, *4*(9), 673–84.

Seth, A. K., & Friston, K. J. (2016). Active interoceptive inference and the emotional brain. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *371*(1708), 20160007. <http://doi.org/10.1098/rstb.2016.0007>

Sherman, R., & Hickner, J. (2008). Academic physicians use placebos in clinical practice and believe in the mind-body connection. *Journal of General Internal Medicine*, *23*(1), 7–10. <http://doi.org/10.1007/s11606-007-0332-z>

Siemieniuk, R. A. C., Harris, I. A., Agoritsas, T., Poolman, R. W., Brignardello-Petersen, R., Van de Velde, S., ... Kristiansen, A. (2017). Arthroscopic surgery for degenerative knee arthritis and meniscal tears: a clinical practice guideline. *BMJ (Clinical Research Ed.)*, *357*, j1982. <http://doi.org/10.1136/BMJ.J1982>

Sonuga-Barke, E. J. S., Brandeis, D., Cortese, S., Daley, D., Ferrin, M., Holtmann, M., ... Sergeant, J. (2013). Nonpharmacological interventions for ADHD: systematic review and meta-analyses of randomized controlled trials of dietary and psychological treatments. *The American Journal of Psychiatry*, *170*(3), 275–89. <http://doi.org/10.1176/appi.ajp.2012.12070991>

Thibault, R. T., Lifshitz, M., Birbaumer, N., & Raz, A. (2015). Neurofeedback, self-regulation, and brain imaging: Clinical science and fad in the service of mental disorders. *Psychotherapy and Psychosomatics*, *84*(4). <http://doi.org/10.1159/000371714>

Thibault, R. T., & Raz, A. (2016). Neurofeedback: The power of psychosocial therapeutics. *The Lancet Psychiatry*, 3(11), e18.

Thibault, R. T., & Raz, A. (2017). The Psychology of Neurofeedback: Clinical Intervention even if Applied Placebo. *American Psychologist*, 72(7), 679–688.

<http://doi.org/10.1037/amp0000118>

Van Dongen-Boomsma, M., Vollebregt, M. A., Slaats-Willemse, D., & Buitelaar, J. K. (2013). A randomized placebo-controlled trial of electroencephalographic (EEG) neurofeedback in children with attention-deficit/hyperactivity disorder. *Journal of Clinical Psychiatry*, 74(August), 821–827. <http://doi.org/10.4088/JCP.12m08321>

Veissière, S., Olson, J. A., & Raz, A. (2017). Neurosuggestion improves self-regulation in neurodevelopmental disorders: a feasibility study. In *68th annual meeting of the Society for Clinical and Experimental Hypnosis*. Chicago, IL.

Vollebregt, M. A., van Dongen-Boomsma, M., Buitelaar, J. K., & Slaats-Willemse, D. (2014). Does EEG-neurofeedback improve neurocognitive functioning in children with attention-deficit/hyperactivity disorder? A systematic review and a double-blind placebo-controlled study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 55(5), 460–72. <http://doi.org/10.1111/jcpp.12143>