

## **OPEN ACCESS**

EDITED AND REVIEWED BY Martin Reuter, University of Bonn, Germany

\*CORRESPONDENCE

Joshua A. Wilt

☑ ioshua.wilt@case.edu

RECEIVED 05 June 2023 ACCEPTED 29 June 2023 PUBLISHED 12 July 2023

### CITATION

Wilt JA, Merner AR, Zeigler J, Montpetite M and Kubu CS (2023) Corrigendum: Does personality change follow deep brain stimulation in Parkinson's disease patients? *Front. Psychol.* 14:1235029. doi: 10.3389/fpsyg.2023.1235029

### COPYRIGHT

© 2023 Wilt, Merner, Zeigler, Montpetite and Kubu. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

# Corrigendum: Does personality change follow deep brain stimulation in Parkinson's disease patients?

Joshua A. Wilt<sup>1\*</sup>, Amanda R. Merner<sup>1,2</sup>, Jaclyn Zeigler<sup>2</sup>, Michelle Montpetite<sup>2</sup> and Cynthia S. Kubu<sup>2,3</sup>

<sup>1</sup>Department of Psychological Sciences, Case Western Reserve University, Cleveland, OH, United States, <sup>2</sup>Department of Neurology, Cleveland Clinic, Cleveland, OH, United States, <sup>3</sup>Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, Cleveland, OH, United States

### KEYWORDS

personality, deep brain stimulation, personality change, Parkinson's disease, personality pathology

# A corrigendum on

Does personality change follow deep brain stimulation in Parkinson's disease patients?

by Wilt, J. A., Merner, A. R., Zeigler, J., Montpetite, M., and Kubu, C. S. (2021). *Front. Psychol.* 12:643277. doi: 10.3389/fpsyg.2021.643277

In the published article, there was an error in Table 1, "Summary of findings organized by layers of personality and variables." as published. The table was missing the material on Characteristic adaptations and Narrative identity. The corrected Table 1 and its caption are shown below.

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

# Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Wilt et al. 10.3389/fpsyg.2023.1235029

# References

Appleby, B. S., Duggan, P. S., Regenberg, A., and Rabins, P. V. (2007). Psychiatric and neuropsychiatric adverse events associated with deep brain stimulation: a metanalysis of ten years' experience. *Mov. Disord. Off. J. Mov. Disord. Soc.* 22, 1722–1728. doi: 10.1002/mds.21551

Baumann-Vogel, H., Bodenmann, G., Schmid, J., Waldvogel, D., Ineichen, C., and Baumann, C. R. (2020). Partners' view after subthalamic deep brain stimulation: better relationships despite patients being less active. *Clin. Parkinson. Relat. Disord.* 3:100052. doi: 10.1016/j.prdoa.2020.100052

Boel, J. A., Odekerken, V. J., Geurtsen, G. J., Schmand, B. A., Cath, D. C., Figee, M., et al. (2016). Psychiatric and social outcome after deep brain stimulation for advanced Parkinson's disease. *Mov. Disord.* 31, 409–413. doi: 10.1002/mds. 26468

Castelli, L., Perozzo, P., Zibetti, M., Crivelli, B., Morabito, U., Lanotte, M., et al. (2006). Chronic deep brain stimulation of the subthalamic nucleus for Parkinson's disease: effects on cognition, mood, anxiety and personality traits. *Eur. Neurol.* 55, 136–144. doi: 10.1159/000093213

Denheyer, M., Kiss, Z. H., and Haffenden, A. M. (2009). Behavioral effects of subthalamic deep brain stimulation in Parkinson's disease. *Neuropsychologia* 47, 3203–3209. doi: 10.1016/j.neuropsychologia.2009.07.022

Fassino, S., Daga, G. A., Gramaglia, C., Piero, A., Zibetti, M., Castelli, L., et al. (2010). Novelty-Seeking in Parkinson's Disease after deep brain stimulation of the subthalamic nucleus: a case-control study. *Psychosomatics* 51, 62–67. doi: 10.1016/S0033-3182(10)70660-5

Gilbert, F. (2012). The burden of normality: from "chronically ill" to "symptom free." New ethical challenges for deep brain stimulation postoperative treatment. *J. Med. Ethics* 38, 408–412. doi: 10.1136/medethics-2011-100044

Gilbert, F. (2018). Deep brain stimulation: inducing self-estrangement. Neuroethics 11, 157–165. doi: 10.1007/s12152-017-9334-7

Gilbert, F., Goddard, E., Viaña, J. N. M., Carter, A., and Horne, M. (2017). I miss being me: phenomenological effects of deep brain stimulation. *AJOB Neurosci.* 8, 96–109. doi: 10.1080/21507740.2017.1320319

Hälbig, T. D., Tse, W., Frisina, P. G., Baker, B. R., Hollander, E., Shapiro, H., et al. (2009). Subthalamic deep brain stimulation and impulse control in Parkinson's disease. *Eur. J. Neurol.* 16, 493–497. doi: 10.1111/j.1468-1331.2008.02509.x

Houeto, J.-L., Mallet, L., Mesnage, V., Tezenas du Montcel, S., Béhar, C., Gargiulo, M., et al. (2006). Subthalamic stimulation in Parkinson Disease: behavior and social adaptation. *JAMA Neurol.* 63, 1090–1095. doi: 10.1001/archneur.63.8.1090

Houeto, J. L., Mesnage, V., Mallet, L., Pillon, B., Gargiulo, M., du Moncel, S. T., et al. (2002). Behavioural disorders, Parkinson's disease and subthalamic stimulation. J. Neurol. Neurosurg. Psychiatry 72:701. doi: 10.1136/jnnp.72.6.701

Kubu, C. S., Cooper, S. E., Machado, A., Frazier, T., Vitek, J., and Ford, P. J. (2017a). Insights gleaned by measuring patients' stated goals for DBS: more than tremor. *Neurology* 88, 124–130. doi: 10.1212/WNL.0000000000003485

Kubu, C. S., Ford, P. J., and Lapin, B. (2017b). *Patients' Perceptions of Personality Change in Parkinson's Disease and Following Deep Brain Stimulation*. Washington, DC: International Neuroethics Society meeting.

Kubu, C. S., Frazier, T., Cooper, S. E., Machado, A., Vitek, J., and Ford, P. J. (2018). Patients' shifting goals for deep brain stimulation and informed consent. Neurology 91, e472–e478. doi: 10.1212/WNL.0000000000005917

Lewis, C. J., Maier, F., Horstkötter, N., Zywczok, A., Witt, K., Eggers, C., et al. (2015). Subjectively perceived personality and mood changes associated with subthalamic stimulation in patients with Parkinson's disease. *Psychol. Med.* 45, 73–85. doi: 10.1017/S0033291714001081

Lhommée, E., Boyer, F., Wack, M., Pélissier, P., Klinger, H., Schmitt, E., et al. (2017). Personality, dopamine, and Parkinson's disease: insights from subthalamic stimulation. *Mov. Disord.* 32, 1191–1200. doi: 10.1002/mds.27065

Pham, U., Solbakk, A.-K., Skogseid, I.-M., Toft, M., Pripp, A. H., Konglund, A. E., et al. (2015). Personality changes after deep brain stimulation in Parkinson's Disease. *Parkinson's Dis.* 7:490507. doi: 10.1155/2015/490507

Temel, Y., Kessels, A., Tan, S., Topdag, A., Boon, P., and Visser-Vandewalle, V. (2006). Behavioural changes after bilateral subthalamic stimulation in advanced Parkinson disease: a systematic review. *Parkinson. Relat. Disord.* 12, 265–272. doi: 10.1016/j.parkreldis.2006.01.004

Thomson, C. J., Segrave, R. A., and Carter, A. (2019). Changes in personality associated with deep brain stimulation: a qualitative evaluation of clinician perspectives. *Neuroethics* 2, 1–16. doi: 10.1007/s12152-019-09419-2

Thomson, C. J., Segrave, R. A., Racine, E., Warren, N., Thyagarajan, D., and Carter, A. (2020). "He's back so I'm not alone": the impact of deep brain stimulation on personality, self, and relationships in Parkinson's Disease. *Qualitat. Health Res.* 2020:1049732320951144. doi: 10.1177/1049732320951144

Törnqvist, A., Ahlström, G., Widner, H., and Rehncrona, S. (2007). Fulfilment of patients' goals after thalamic deep brain stimulation: a follow-up study. *Parkinson. Relat. Disord.* 13, 29–34. doi: 10.1016/j.parkreldis.2006.06.005

Wilt et al. 10.3389/fpsyg.2023.1235029

TABLE 1 Summary of findings organized by layers of personality and variables.

Layer of personality	Variables	Associations between DBS and variables
Dispositional traits		
	Cloninger's personality theory traits	
	Novelty-seeking	-/0: Lhommée et al. (2017)—Quant/P  0: Houeto et al. (2006)—Quant/P; Pham et al. (2015)—Quant/P  0/+: Fassino et al. (2010)—Quant/P
	Harm avoidance	0: Houeto et al. (2006)—Quant/P; Fassino et al. (2010)—Quant/P; Pham et al. (2015)—Quant/P+: Lewis et al. (2015)—Quant/P
	Reward dependance	-/0: Lewis et al. (2015)—Quant/P 0: Houeto et al. (2006)—Quant/P; Fassino et al. (2010)—Quant/P; Pham et al. (2015)—Quant/P
	Persistence	-: Pham et al. (2015)—Quant/P 0: Houeto et al. (2006)—Quant/P; Fassino et al. (2010)—Quant/P
	Self-directedness	0: Houeto et al. (2006)—Quant/P; Fassino et al. (2010)—Quant/P; Pham et al. (2015)—Quant/P
	Cooperativeness	0: Houeto et al. (2006)—Quant/P; Fassino et al. (2010)—Quant/P; Pham et al. (2015)—Quant/P
	Self-transcendence	-: Pham et al. (2015)—Quant/P 0: Houeto et al. (2006)—Quant/P 0/+: Fassino et al. (2010)—Quant/P
	Big five traits	
	Extraversion	-/0: Boel et al. (2016)—Quant/RCT
	Agreeableness	-/0: Boel et al. (2016)—Quant/RCT
	Conscientiousness	0: Boel et al. (2016)—Quant/RCT
	Neuroticism	0: Pham et al. (2015)—Quant/P; Boel et al. (2016)—Quant/RCT
	Openness	-/0: Boel et al. (2016)—Quant/RCT
	Affective/behavioral traits	
	Negative affective traits	-/+: Gilbert (2018)—Qual; Thomson et al. (2019)—Qual 0/+: Thomson et al. (2019)—Qual
	Positive affective traits	-/+: Gilbert (2018)—Qual; Thomson et al. (2020)—Qual
	Aggressiveness	0: Temel et al. (2006)—Quant/MA
	Anxiety	0: Castelli et al. (2006)—Quant/P
	Apathy	0: Temel et al. (2006)—Quant/MA; Appleby et al. (2007)—Quant/MA +: Denheyer et al. (2009)—Quant/Ret; Gilbert (2012)—Qual
	Hypersexuality	0: Temel et al. (2006)—Quant/MA; Appleby et al. (2007)—Quant/MA
	Hypomania	+: Lewis et al. (2015)—Quant/P
	Impulsivity	0: Lewis et al. (2015)—Quant/P 0/+: Pham et al. (2015)—Quant/P +: Hälbig et al. (2009)—Quant/CS
	Personality pathology	
	General personality pathology	0: Temel et al. (2006)—Quant/MA; Appleby et al. (2007)—Quant/MA; -/+: Houeto et al. (2002)—Quant/Ret
	Personality disorders: obsessive-compulsive, paranoid	-: Castelli et al. (2006)—Quant/P
	Personality disorders: avoidant, dependent, passive-aggressive, self-frustrating, schizotypal, schizoid, histrionic, narcissistic, borderline, antisocial	0: Castelli et al. (2006)—Quant/P

(Continued)

Wilt et al. 10.3389/fpsyg.2023.1235029

TABLE 1 (Continued)

Layer of personality	Variables	Associations between DBS and variables
Characteristic adaptations	Ability to pursue leisure activities	+: Törnqvist et al. (2007)—PVC/P; Kubu et al. (2017a,b)—PVC/P
	Ability to pursue social activities	+: Törnqvist et al. (2007)—PVC/P; Kubu et al. (2017a,b)—PVC/P
	Ability to pursue work activities	+: Törnqvist et al. (2007)—PVC/P; Kubu et al. (2017a,b)—PVC/P
	Difficulties with relationships	-/+: Gilbert (2018)—Qual +: Gilbert (2012)—Qual
	Difficulties with routine behaviors	-/+: Gilbert (2018)—Qual +: Gilbert (2012)—Qual
	Leisure/social/work goal importance	+/-: Kubu et al. (2018)—PVC/P
	Positive relationship-specific coping strategies	+: Baumann-Vogel et al. (2020)—Quant/CS
Narrative identity	Difficulties with self-image/self-estrangement	-/+: Gilbert et al. (2017)—Qual; Gilbert (2018)—Qual +: Gilbert (2012)—Qual

<sup>&</sup>quot;-"evidence for negative association; "0": no evidence for directional association; "+": evidence for positive association; when -, 0, or + are separated by "/", the study provided mixed evidence for associations [e.g., Lewis et al. (2015) provided evidence for negative and null associations between DBS and novelty-seeking]; References are followed by "-Method/Design"; "Quant" = quantitative methods; "Qual" = qualitative methods; "PVC" = patient valued characteristics (mixed methods); "MA" = meta-analysis; "Ret" = retrospective design; "CS" = Cross-sectional design; "P" = prospective design; "RCT" = randomized clinical trial.