

**Editors' Note:** WriteClick contributors this week address the issues of certainty and error in scientific publications. In reference to "Pattern of brain tissue loss associated with freezing of gait in PD" by Filippi et al., Dr. Montgomery reiterates the importance of setting forth alternatives when discussing a hypothesis in order to avoid inadvertently providing a false sense of validity. Dr. Walker calls attention to a genetic sequencing error made in a report published by Saiki et al. in 2003 which significantly alters the emphasis of the original publication. The authors acknowledge the error in a letter that will be linked to their original article.

*Megan Alcauskas, MD, and Robert C. Griggs, MD*

#### COMMENT: FRONTAL LOBES, EXECUTIVE DYSFUNCTION, GAIT, AND THE FALLACY OF PSEUDO-TRANSITIVITY

**Massimo Filippi, Federica Agosta, Milan, Italy; Vladimir Kostić, Belgrade, Serbia; on behalf of all authors of "Pattern of brain tissue loss associated with freezing of gait in Parkinson disease":** We thank Dr. Montgomery<sup>1</sup> for his stimulating comments on our article. Our study showed that a specific pattern of brain network damage involving frontal and parietal cortices occurs in patients with Parkinson disease (PD) and freezing of gait (FOG).<sup>2</sup> Although voxel-based morphometry may not be sensitive enough to depict damage to subcortical and brainstem nuclei, this finding suggests that impairment of the frontoparietal network may play a role in the development of FOG in PD. Furthermore, we suggested that the occurrence of FOG in patients with PD may be related to cognitive frontal dysfunction. This is based not only on the commonality of frontal lobe pathology between the 2 clinical manifestations but also on the evidence that patients with PD with FOG have frontal executive deficits compared with patients with PD without FOG. In addition, FOG severity correlated with the degree of frontal executive dysfunction. Gait is a complex movement with multiple contributions from many brain regions. Although the mechanisms responsible for FOG are unclear,<sup>3</sup> our findings suggest a role for frontoparietal damage and executive dysfunction, yet

still unobserved pathologies may be directly responsible for FOG.

**Author Response: Erwin B. Montgomery, Jr., Birmingham, AL:** The response of Filippi et al. to my Comment accompanying their article<sup>2</sup> reiterates the original arguments. Their inferences are appropriate as a hypothesis and may be proven correct, as I previously stated.<sup>1</sup> However, their hypothesis has no greater epistemic standing than any number of alternatives which they fail to consider. Failure to genuinely discuss alternatives may further a false sense of validity which is not offset by use of qualifiers such as "may" or "suggests" in their own inferences. They fail to differentiate correlation from cause and effect. Their reasoning is insufficient validation as it relies on the logical fallacy of pseudotransitivity which is of the form: if a implies c and b implies c, then a implies b. This fallacy is repeated throughout their attempted causal explanation from executive dysfunction (a) implying attention or perceptual problems (c) and PD (b) being associated with attention or perceptual problems (c). The fallacy is very seductive because it is such a powerful—and some would argue—necessary route to hypothesis generation but it is not a method of validation. Great confusions are created when the fallacy is taken as validation, as they seemed to have done.

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1. Montgomery EB Jr. Comment: frontal lobes, executive dysfunction, gait and the fallacy of pseudo-transitivity. *Neurology* 2012;78:415.
2. Kostić VS, Agosta F, Pievani M, et al. Pattern of brain tissue loss associated with freezing of gait in Parkinson disease. *Neurology* 2012;78:409–416.
3. Nutt JG, Bloem BR, Giladi N, Hallett M, Horak FB, Nieuwboer A. Freezing of gait: moving forward on a mysterious clinical phenomenon. *Lancet Neurol* 2012;10:734–744.

#### MUTATION IN THE CHAC GENE IN A FAMILY OF AUTOSOMAL DOMINANT CHOREA-ACANTHOCYTOSIS

**Ruth H. Walker, Bronx, NY; Antonio Velayos-Baeza, Oxford, UK; Benedikt Bader, Adrian Danek, Munich, Germany:** In 2003, Saiki et al.<sup>1</sup> reported an autosomal dominant transmission of

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**Comment: Frontal lobes, executive dysfunction, gait, and the fallacy of pseudo-transitivity**

Massimo Filippi, Erwin B. Montgomery, Jr., Federica Agosta, et al.

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