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*The authors' disclosures accompany the original article.*

*This letter (doi: 10.1176/appi.ajp.2009.09081220r) was accepted for publication in September 2009.*

## Improving Verbal Memory Performance in Schizophrenia

TO THE EDITOR: It is with great interest that we read the article by Melissa Fisher, Ph.D., et al. (1), published in the July 2009 issue of the *Journal*, on a neuroplasticity-based auditory training to improve verbal memory in schizophrenia. Dr. Fisher et al. rightly stated that a new approach to the treatment of cognitive dysfunction in schizophrenia is needed. The authors used conventional psychological tests in several cognitive domains to examine whether their approach was successful and found a significant improvement from baseline to post-computerized auditory training in verbal working memory, verbal learning, verbal memory, and global cognition among those subjects who received the training.

These interim results are indeed fascinating. However, two critical notes are important. First, there was a difference in the number of female subjects between the treatment and comparison groups (nine versus six), which could have influenced the results substantially, especially since the groups were rather small. There is extensive literature showing that women outperform men in the language (verbal) domains and that these sex differences can also be seen in patients with schizophrenia (2). Consequently, we cannot be sure whether significant improvements on tasks with a clear verbal element would also be observed when the number of female subjects in the treatment and comparison groups remains constant. In particular, when we keep in mind that this training focused specifically on speech, then it might be expected (given the data presented in the available literature) that women improved more than men.

In addition, there appears to have been a substantial difference between the two groups regarding the dose of antipsychotic medication, with the comparison group receiving higher doses. This too could have influenced the results (3), and, therefore, these results should be interpreted cautiously. Finally, we completely agree with the authors that neuroplasticity-based auditory training is an important direction in the treatment of patients with schizophrenia, and we look forward to seeing future results on their training program.

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*The authors report no financial relationships with commercial interests.*

*This letter (doi: 10.1176/appi.ajp.2009.09081092) was accepted for publication in September 2009.*

## Drs. Fisher and Vinogradov Reply

TO THE EDITOR: We thank Dr. Van den Noort et al. for their interest in our article. They note that “there was a difference in the number of female subjects between the treatment and comparison groups,” possibly influencing our results, and there seems to “have been a substantial difference between the two groups regarding the dose of antipsychotic medication, with the comparison group receiving higher doses.”

To determine whether gender and chlorpromazine levels significantly influenced these results, we analyzed the data using repeated-measures analysis of variance with the addition of these variables as covariates. Relative to the comparison group, the treatment group showed significant gains from baseline to post-training in global cognition ( $F=14.05$ ,  $df=1, 51$ ,  $p<0.001$ ), verbal working memory ( $F=5.08$ ,  $df=1, 51$ ,  $p=0.03$ ), verbal learning ( $F=9.47$ ,  $df=1, 51$ ,  $p=0.003$ ), and verbal memory ( $F=8.26$ ,  $df=1, 51$ ,  $p=0.006$ ). Thus, our results remained the same.

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*The authors' disclosures accompany the original article.*

*This letter (doi: 10.1176/appi.ajp.2009.09081092r) was accepted for publication in September 2009.*

## Vocal Cord Dysfunction Arising From Vagal Nerve Stimulator Removal

TO THE EDITOR: In 2005, vagal nerve stimulation received approval for treatment of adult patients with refractory major depressive disorder. Adverse effects associated with vagal nerve stimulation implantation are cough, hoarseness, and dysesthesias of the throat related to electrical stimulation, along with rare cases of localized deep-tissue infection (1–3). Seldom is removal of the device required, although it is recommended in cases of infection refractory to treatment (such as aspiration and antibiotics) or potential systemic infection (4). We report the unique case of a patient requiring vagal nerve stimulator removal, which resulted in vocal cord hoarseness.