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# A Case of Reverse Word Synesthesia in a Young Woman

**To the Editor:** Synesthesia is a phenomenon in which a presentation of a stimulus causes extra phenomenal experiences for which no physical sensory input exists. We report a case of reverse word synesthesia in a young woman.

**Case report.** Ms A, a 21-year-old white female undergraduate student with recurrent major depressive disorder, generalized anxiety disorder, and excoriation disorder, endorsed regular experience of synesthesia. The patient was seen when she came to establish service with our outpatient clinic for the management of her depression, excoriation disorder, and generalized anxiety symptoms due to what she described as “a lot of changes going on in my life.” She was dealing with the rigors associated with her academic work at school and significant relationship issues with her boyfriend, as she questioned his fidelity. She reported excessive anxiety occurring on most days for over 6 months such that she had difficulty controlling it. Her anxiety was associated with stomachaches and “feelings of being overwhelmed.” She stated that her anxiety was worse at the clinic, and she was observed folding her legs under her seat, huddled up in an anxious position, putting her hand to her mouth, and making poor eye contact.

Ms A also had recurrent skin picking leading to skin lesions, and despite repeated attempts to decrease it, the skin picking caused significant distress with impairment in social functioning.<sup>1</sup> She was on treatment with fluoxetine 40 mg/d for depression and generalized anxiety, with modest improvement in her symptoms.

The patient stated that since childhood, she had noticed that she experiences “mixing of senses.” On numerous occasions, she had experienced a “unique phenomenon” that encompassed the ability to juggle words that were verbalized to her, thus creating what she termed as being able to “flip words and hear visually internally.” Ms A described this as “being able to see words in her mind’s eye and read them back in reverse.” She was able to say the words back to people in reverse order since the words were picture-like, but since the time that she could read and spell, the words came to her visually in script. Then they “flipped” and she could essentially just read them back, not memorize them. She stated that when she was a child, “it was sometimes a neat party trick, and people marveled” at it. She mostly learned to ignore it when she could, but that it was gradually becoming more noticeable and annoying to her such that she was being made anxious by it and wanted it to stop. She had told her counselor about it and reported that the counselor told her that she “knew nothing about that” and that Ms A “essentially was told to ignore it.” The patient had no psychotic symptoms, seizure disorder, or use of hallucinogens.

The patient report of verbal impulses affecting one sense modality and causing a sensation normally experienced by stimulation of another sense modality, which she described as “flips words and hears visually internally,” appears to describe a form of synesthesia.<sup>2</sup> We are not aware of any previous report of synesthesia with excoriation disorder or of synesthetes reporting increased anxiety symptoms due to synesthesia or a reverse word synesthesia as our patient endorses. The neurophysiological

mechanisms underlying synesthesia are still largely unknown, but there is speculation that the phenomenon might be associated with cross-activation or cross-wiring of different perceptual areas in the brain. Other hypotheses suggest that synesthesia might be due to cross-wirings that were not disconnected after birth or to altered processing in perceptual association areas.<sup>3</sup> Some reports have suggested that synesthesia might have familial traits with female preponderance as was noted in our female patient; however, she did not report synesthesia in other family members.<sup>4</sup> Similar to previous reports indicating that perceptual association of synesthetes is stable and consistent across time, our patient has had the same perceptual association since childhood.<sup>4</sup> Although some psychiatric diagnoses have been associated with synesthesia,<sup>2</sup> we are not aware of any synesthetes who endorsed increased anxiety as they advanced in age. Seizure disorder, migraine, or hallucinogen use might lead to altered perceptual phenomena, but our patient did not endorse a history of any of these.<sup>5</sup> The patient’s synesthesia symptoms have been present all of her life, suggesting that they are not due to any cause other than synesthesia.

The relationship between the patient’s psychiatric symptoms and her synesthesia might just be a coincidental finding or be associated with altered wiring of different perceptual areas of the brain, and a limitation of this assertion is that we were unable to conduct any functional imaging modality to authenticate this. Fluoxetine alleviated the patient’s symptoms of generalized anxiety, depression, and excoriation disorder somewhat, but it did not eliminate her abnormal synesthetic perceptions, suggesting that the perceptual associations of synesthesia endure throughout a patient’s lifetime.

This case report presents a unique case of a patient with “reverse word synesthesia” that involves flipping words into reverse after hearing them. We recommend further research to elaborate on this condition.

## REFERENCES

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Ferdinand C. Osuagwu, MD<sup>a</sup>

osuag1fc@cmich.edu

Dianne Plath, MD<sup>a</sup>

<sup>a</sup>Department of Psychiatry, Central Michigan University College of Medicine, Saginaw

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