Brain development

https://doi.org/10.1038/s44159-025-00485-3

How Pokémon helped to explain brain differences

When I started out in neuroscience, I wanted answers to complex yet straightforward questions, such as how early childhood experiences shape human brains or why some children thrive while others struggle. Early on, I found myself drawn to these social and developmental puzzles, yet I quickly realized that science rarely handed me answers at the speed of my curiosity. But some papers, such as the article published in 2019 by Gomez and colleagues, are reminders of why foundational research matters, how much can be learned from careful design (even with small samples), and why communicating differences in brain science needs care, humility and nuance.

Gomez and colleagues' article takes an elegant approach to a singular question. The authors asked what happens in the brains of adults who spent thousands of childhood hours playing Pokémon. The study recruited 22 adults in two groups: one group that played Pokémon extensively as kids and one that barely touched the game. Then, the authors used functional magnetic resonance imaging to measure brain activity as both groups viewed images of Pokémon and other objects. The group that played Pokémon showed a distinct patch of visual cortex that lit up for Pokémon images — a neural signature that the other group did not have.

The finding that distinct brain regions were activated across the groups was fascinating to me, because it confirmed the idea that everyday activities can leave lasting, measurable traces in the brain. In my research, I often come across studies that showcase brain differences that arise from early childhood adversity — and work to understand these processes through a non-deficit lens. This Pokémon study offered an encouraging framework I seek: a reminder that neural differences can be reflections of different experiences, not deficiencies. This study accomplished the inspiring feat and challenging (and exciting) task of elucidating the meaning of those differences and how experiences shape the brain.

Although the pressure to translate complicated basic science into direct, immediate social impact is real, and this paper, by itself, will not lead to a new therapy or social policy, Gomez and colleagues' work helped to illustrate a little more about how childhood experience sculpts the adult brain. Maybe more importantly, the results of this study open the door to all kinds of natural research involving questions from everyday life. Today, it is Pokémon, but it could also be about chess, music, TikTok, trauma or poverty. The genius of this paper's experimental design inspires me to get clever in my work, too. To me, the beauty of basic science is that sometimes researchers answer a question nobody thought to ask, using a tool nobody expected would matter, and in the process, researchers push the whole field forward.

Another reason I admire this study is that it does not hide from the thorny issue of small sample sizes. As someone who has lost more than one battle justifying sample sizes, I find this study both honest and empowering. What I admire is that Gomez and colleagues do not excuse or overstate the limitations of their small sample size. Instead, they outlined how a thoughtfully designed, well-controlled study can reveal something important even with modest numbers.

Finally, this paper helped me clarify that brain differences are not deficits — a lesson that is easy to forget. A scientist's job is to make sense of these differences across groups — slowly, carefully and, above all, sensitively. In the communities I hope to partner with, such as those experiencing chronic economic hardship, this distinction is vital because it offers a sensitive, principled direction for not just how I ask questions or design studies, but also how I analyse data I am trusted with; to stay attuned to the lived experiences behind the numbers.

> "Neural differences can be reflections of different experiences, not deficiencies"

Maybe that is why I love teaching this paper, particularly for early career students. It is a perfect first foray into the deep end of cognitive neuroscience: a story about methods, why researchers study these topics, and the promise of creativity in science.

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Competing interests
The author declares no competing interests.

Original article: Gomez, J., Barnett, M. & Grill-Spector, K. Extensive childhood experience with Pokémon suggests eccentricity drives organization of visual cortex. *Nat. Hum. Behav.* **3**, 611–624 (2019)