NEWS

Community Newsletter: Polyneuro risk score; rat brain imaging protocol

BY **MICHAEL FERGENSON**

2 APRIL 2023

Researchers raved this week about a new tool called a polyneuro risk score (PNRS) that can characterize brain-behavior relationships. The technique is analogous to a **polygenic risk score**, which is used to describe relationships between genes and traits.

In a **thread** detailing the **work**, which was published 28 March in *Developmental Cognitive Neuroscience*, study investigator **Gracie Grimsrud** of the University of Minnesota explained that the team used data from the Adolescent Brain Cognitive Development study to investigate the relationship between functional connectivity and three cognitive domains: general ability, executive function and learning and memory.

> Using RSFC data from ABCD (N>6500), we investigate the underlying connectivity of three higher-order cognitive domains (general ability, executive function, learning & memory - derived by **@wesstat** et al.) using multivariate techniques and large, independent sample validation. **pic.twitter.com/On8rYPVjoq**
>
> — Gracie Grimsrud (@graciegrimsrud) **March 28, 2023**

Grimsrud tweeted that the tool could address the "**reproducibility crisis**" in brain-wide association studies (BWAS), an issue ***Spectrum* covered** last year.

Study investigator **Damien Fair** called the new work a "**tour de force**" in a tweet urging his followers to check out the study.

> You all have to check this out! **@graciegrimsrud** was my first **@UMN_MIDB** student and started as a freshman!! in **@DCANLabs@NoraByington** Lab Manager who started the lab and took this on with Gracie!
>
> Tour de force...amazing talent.
>
> Coming for you **@smarek0502 @tervoclemmensb** ! **https://t.co/PgisECCycQ**
>
> — Damien Fair (@DrDamienFair) **March 28, 2023**

Two fellow scientists from the University of Minnesota, who were not involved in the study, also chimed in. “I've been playing around with the BWAS/PNRS tool myself as well and definitely see the **utility it can have for the field**,” tweeted **Ekom Eyoh**.

> So happy to see that this work from **@NoraByington** and **@graciegrimsrud** is finally out! I've been playing around with the BWAS/PNRS tool myself as well and definitely see the utility it can have for the field. Check it out! **https://t.co/DpEVWaA0o0**
>
> — Ekom Eyoh (@EkomOnPsych) **March 28, 2023**

“This technique allows scientists to get a single measure of cognitive function **using only fMRI data**. That’s pretty cool!” tweeted **Robert Hermosillo**.

> This technique allows scientists to get a single measure of cognitive function using only fMRI data. That's pretty cool! Great work from **@graciegrimsrud** and **@NoraByington @BionicMicki @oscar_m_d_mex @EricFeczko @DrDamienFair @PerroneAnders https://t.co/BX2k2zultZ**
>
> — Robert Hermosillo (@DrScienceMan1) **March 28, 2023**

Continuing the fMRI theme, another study that garnered attention this week debuted StandardRat, a standard protocol for imaging rat brains in controlled conditions.

> Freshly out of the embargo
>
> A big thank you to everyone who contributed!!! Together you make such a nice community, I feel proud to have my name listed along with yours ????**https://t.co/YobJq8iVN4 https://t.co/FwCSo6MGhP**
>
> — Joanes Grandjean wants you to share your data (@grandjeanlab) **March 27, 2023**

More than 200 researchers examined data from 46 research centers to create the **protocol**, explained **Joanes Grandjean** of the Donders Institute for Brain, Cognition and Behaviour in an April 2022 **thread** describing the work.

The researchers published the protocol 27 March in *Nature Neuroscience* and made the **code** for it available on github.

> With the new StandardRat protocol, we improved the specificity outcome in our datasets by 50%
>
> This has major implications. It means by using this protocol, you greatly enhance your chances to detect biologically-plausible signal.
>
> 10/ **pic.twitter.com/gRfeInyH5m**
>
> — Joanes Grandjean wants you to share your data (@grandjeanlab) **April 28, 2022**

Study investigator **Noam Shemesh** of the Champalimaud Centre for the Unknown called the work a "**landmark in the field**."

> Congrats **@grandjeanlab** for the herculean effort!!!! A landmark in the field.

> **https://t.co/yMxem1YgW7**
>
> — Shemesh Lab (@ShemeshL) **March 27, 2023**

“This is what happens when a **whole community takes action** to improve itself,” tweeted study investigator **Valerio Zerbi** of EPFL, the Swiss Federal Institute of Technology in Lausanne.

> This is what happens when a whole community takes action to improve itself - and when **@grandjeanlab** pushes it to do so! **@NatureNeuro https://t.co/mgv3NtSidN**
>
> — Valerio Zerbi (@Valerio_Zerbi) **March 28, 2023**

“Never underestimate the power of **@grandjeanlab**’s judgement to bring a field together,” tweeted study investigator **Eilidh MacNicol** of King’s College London.

> Never understimate the power of **@grandjeanlab**’s judgement to bring a field together ???? **https://t.co/ablDORBtcQ**
>
> — Eilidh MacNicol (@eilidhmacnicol@mstdn.science) (@eilidhmacnicol) **March 28, 2023**

Maximilian Friedrich of the University of Würzburg called the work a “**crucial step**” toward translational frameworks for brain-behavior studies. “Imagine the degrees of freedom of rodent connectomic imaging when in fact the lesions/stim sites can be introduced in a controlled way.”

> A crucial step towards genuinely translational frameworks for beain behavior studies. Imagine the degrees of freedom of rodent connectomic imaging when in fact the lesions/stim sites can be introduced in a controlled way. **https://t.co/LU3AZXU7nN**
>
> — Dr. Maximilian U. Friedrich (@vertigologist) **March 28, 2023**

That’s it for this week’s Community Newsletter! If you have any suggestions for interesting social posts you saw in the autism research sphere, feel free to send an email to **michael@spectrumnews.org**.

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