Residential Greenspace is Associated with Psychological and Neural Signatures in Trauma-Exposed Adults

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Background
- Neighborhood characteristics can impact post-trauma trajectories.1
- Risk factors are associated with neural vulnerabilities to PTSD.2
- However, less is known about how resilience factors impact neurobiology.
- Greenspaces are associated with better mental and physical health and lower mortality rates.3

Current Study
1. Does greenspace predict PTSD symptom trajectories?
2. Does internal resilience (CD-RISC scores) moderate how well external resilience (greenspace) buffers against symptomatic trajectories?
3. Does greenspace impact neural reactivity to reward?

Geocoding Methods
1. X Y coordinates of participants’ home addresses were derived.
2. High-resolution (30m) multiband satellite imagery from the Landsat 8 archive was extracted from Google Earth Engine (GEE).
3. NDVI = (NIR - Red)/(NIR + Red)
   - Computation of the normalized difference vegetation index (NDVI) was performed in GEE.
4. NDVI rasters and the coordinates of the participants’ home addresses were entered into ArcGIS Pro.
5. Euclidean buffers were created around each address with increasing radiuses.

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Results
- N = 2,223; 63% women, M age = 36 years old, SD = 13; majority (74%) motor vehicle crash; 50% non-Hispanic Black; 35% non-Hispanic White.

Conclusions
- Greenspace works in conjunction with individual factors to protect against posttraumatic dysfunction and modulates neural responses to reward.
- The effectiveness of greenspace depends on an individual’s internal resilience.

Strengths
- Geographical variability
- NDVI derived pre-trauma

Limitations
- Residential stability
- MRI sample is significantly different from the full sample (5 out of 22 study sites completed neuroimaging)
- Evaluating environmental factors which promote psychological recovery has important implications for clinical care and public policy.

References