

Race, ethnicity, and rurality in public perceptions of therapeutic implanted neural devices

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Background

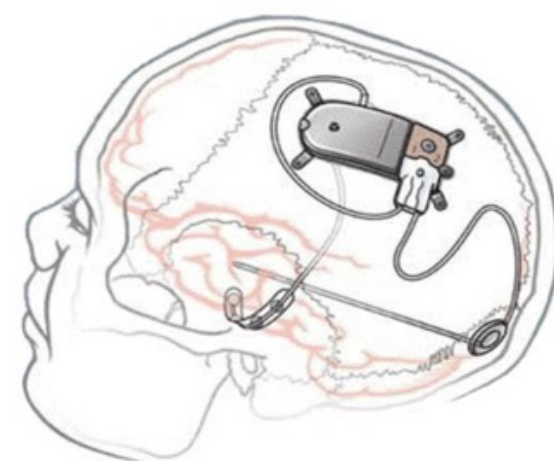
Patient misgivings about novel neurotechnologies may result in difficulties delivering new brain-based treatments to affected people. This study seeks to identify various demographic factors which may affect an American's perception of existing (epilepsy) or developing (mood disorder) neurotechnologies for the treatment of epilepsy and mood disorders.

Data Collection

Nationally representative survey (n=1024), oversampling Black (n=214), Hispanic (n=210), and rural (n=219) Americans

Epilepsy Vignette

Imagine you have epilepsy that cannot be treated with medication. Would you rather have the new implanted device or the traditional surgery to remove part of the brain?

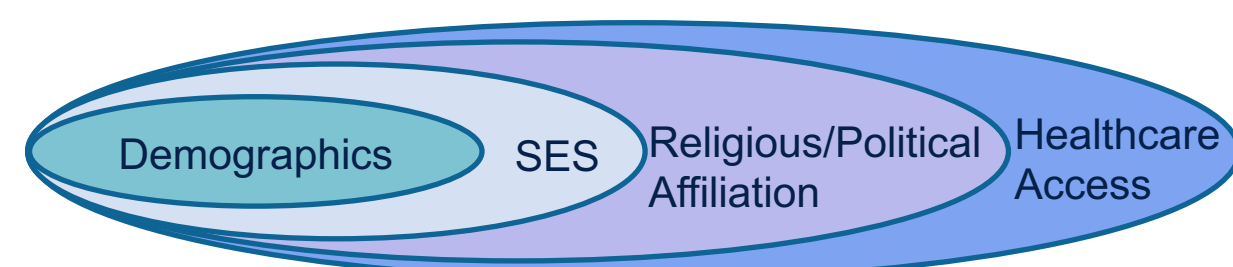


Mood Vignette

Imagine you have depression or anxiety that needs treatment. Would you rather have the new implanted device or the traditional medications to take every day?

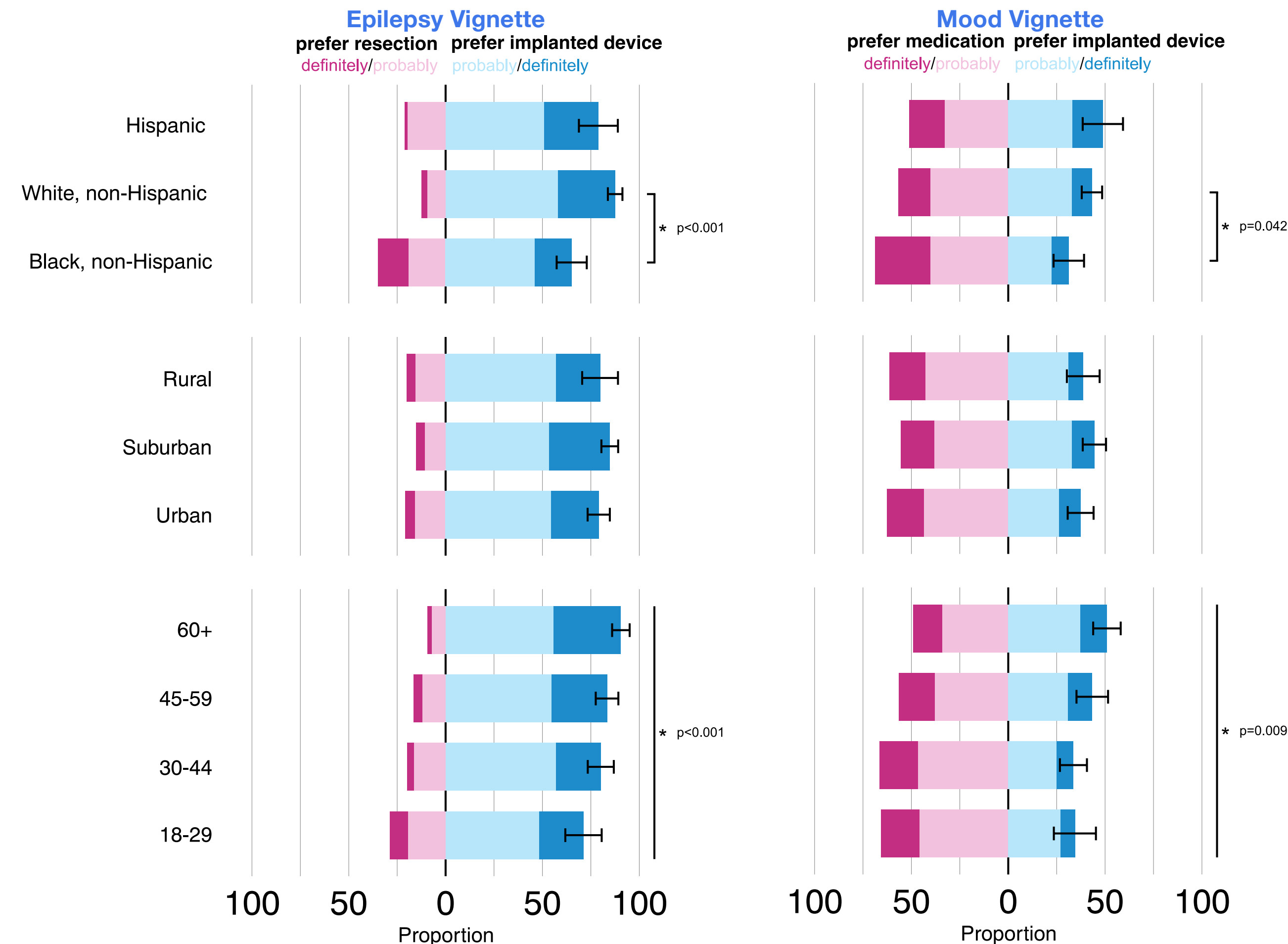
Methods

Nested logistic regression models with group differences were tested for mediation.



Results

Survey-weighted Preferences for Traditional Treatment and Implanted Device by Key Demographic Variable



Demographic Characteristics of Participants				
Characteristic		Black, non-Hispanic, N = 214	White, non-Hispanic, N = 553	Hispanic, N = 210
Rurality	Urban	124 (58%)	133 (24%)	91 (43%)
	Suburban	72 (34%)	254 (46%)	99 (47%)
	Rural	18 (8.4%)	166 (30%)	20 (9.5%)
Age (Mean ± sd)		46 ± 16	51 ± 17	44 ± 17

P-values of the figure correspond to the most basic model including only age, gender, race/ethnicity, and rurality. Certain demographic groups such as non-Hispanic Asian, 2+ races, and others were excluded due to small cell counts. Error bars display standard error of dichotomized variables.

Results cont.

Main Takeaways

- Non-Hispanic, Black Americans are less likely than non-Hispanic, White Americans to prefer an implanted neural device for refractory epilepsy and for mood disorders.
- Older Americans are more likely than younger Americans to prefer an implanted neural device for refractory epilepsy and for mood disorders.
- The fully adjusted model for refractory epilepsy showed Democratic political identification, retirement, and income were associated with a preference for an implanted neural device.
- The fully adjusted model for mood disorders showed unemployment was associated with a preference for an implanted neural device.

Mediation Analysis

Epilepsy Vignette

- Age is partially mediated by income. Age is no longer significant when adjusted for this variable.
- Black race is partially mediated by income and inconsistently mediated by political party affiliation.

Mood Vignette

- Age is inconsistently mediated by unemployment.
- Black race is no longer significant when adjusted for all variables, but specific mediation was not identified.