

**“WE CONTROLLED FOR RACE AND  
ETHNICITY...”**

**CONSIDERATIONS FOR THE USE AND COMMUNICATION OF RACE  
AND ETHNICITY IN NEUROIMAGING RESEARCH**

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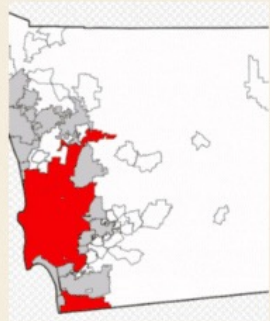


*My life*

**Carlos Cardenas-Iniguez**



**Birth!**



**BS**



Cambridge, MA



San Diego

**K-12**



**YOLO\***  
\*YOU ONLY LIVE ONCE

**PhD**

Chicago, IL

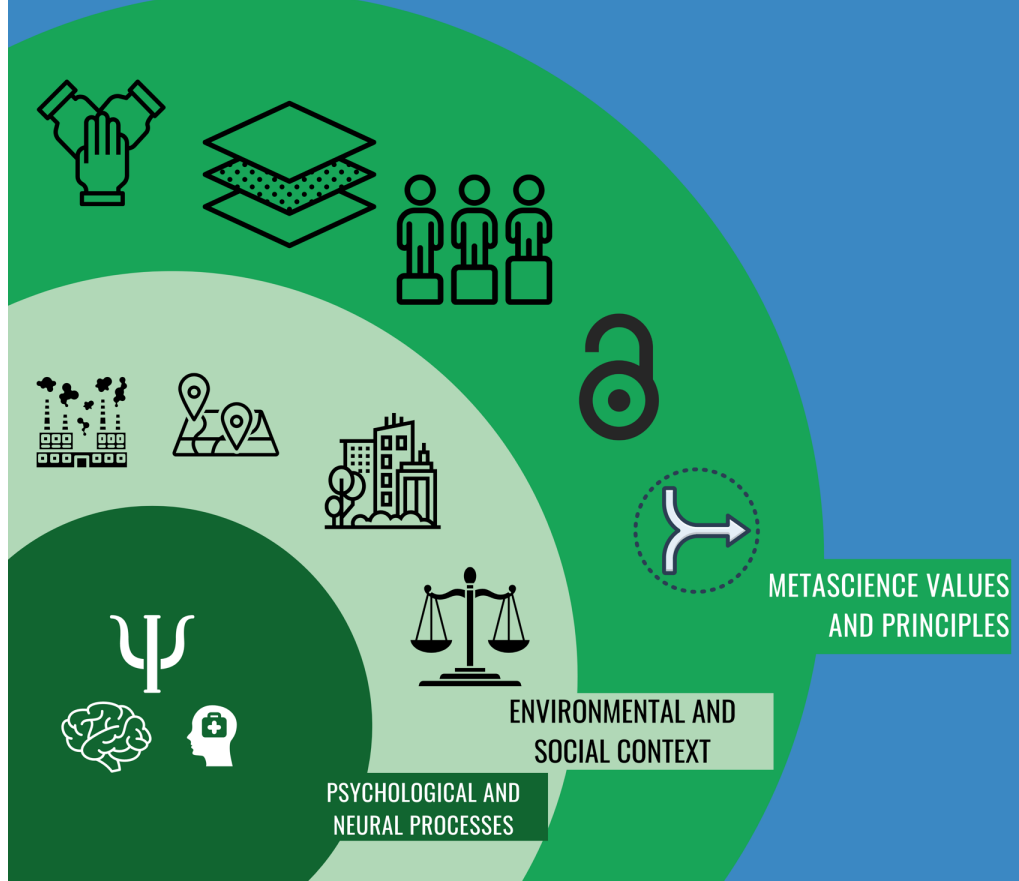
**Postdoc**

Los Angeles, CA



THE DEPARTMENT OF  
**PSYCHOLOGY**  
THE UNIVERSITY OF CHICAGO

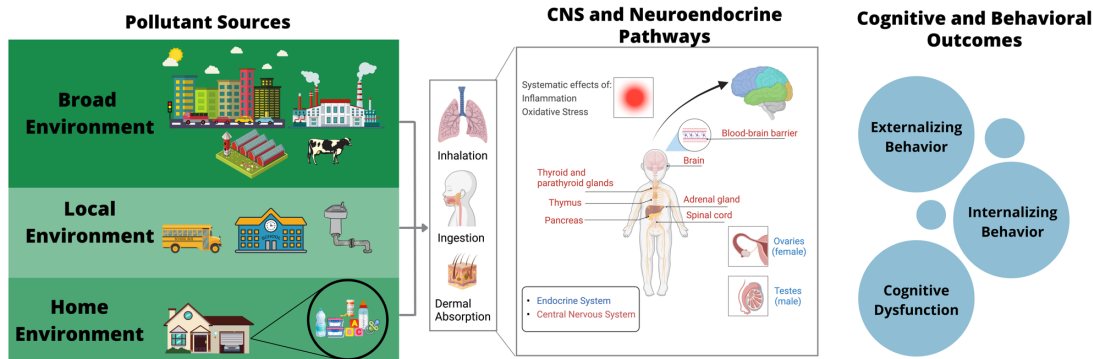
# A MULTILEVEL FRAMEWORK FOR ENVIRONMENTAL FACTORS IN PSYCH AND NEURO



# THE MANY LEVELS OF ENVIRONMENTAL NEUROSCIENCE

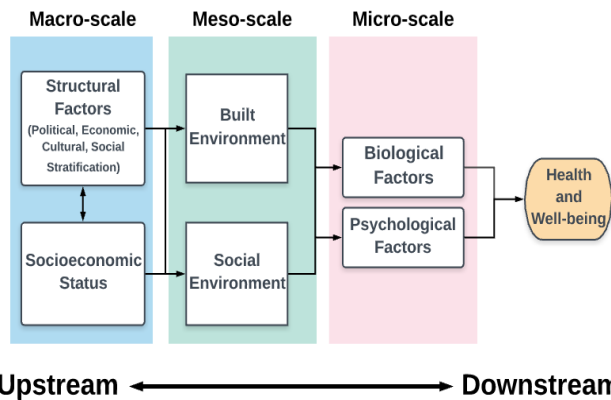


# ENVIRONMENTAL NEUROSCIENCE APPROACH TO INVESTIGATE THE ROLE OF URBAN CONTEXT

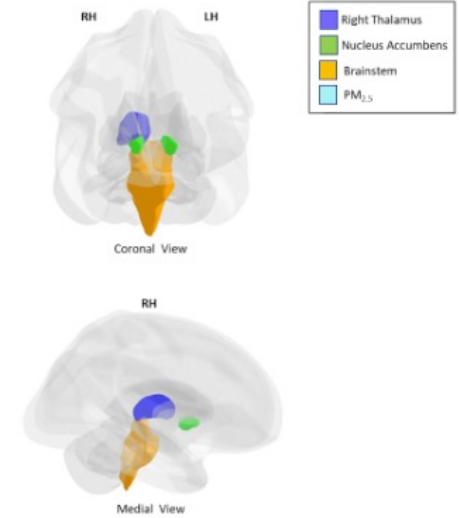
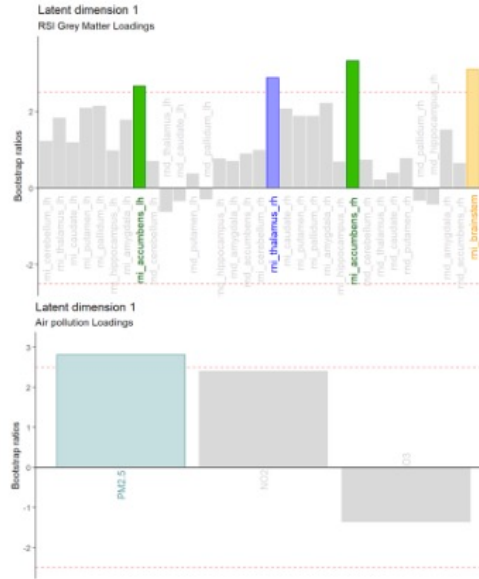
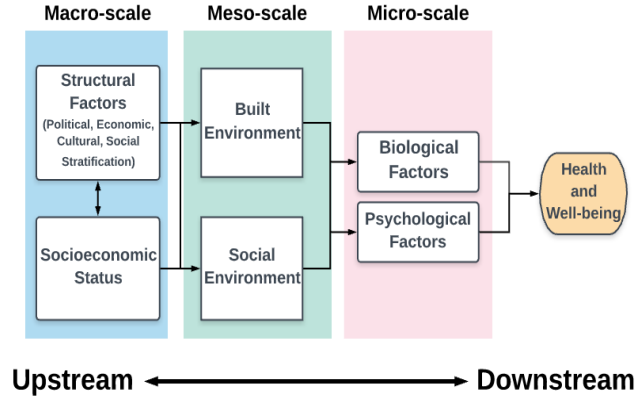


Cardenas-Iniguez, C., Burnor, E., Herting, M.M. Neurotoxicants, the developmental brain, and mental health. *Biological Psychiatry: Global Open Science*. (In Press)

From Berman, Cardenas-Iniguez, & Meidenbaier, 2019.

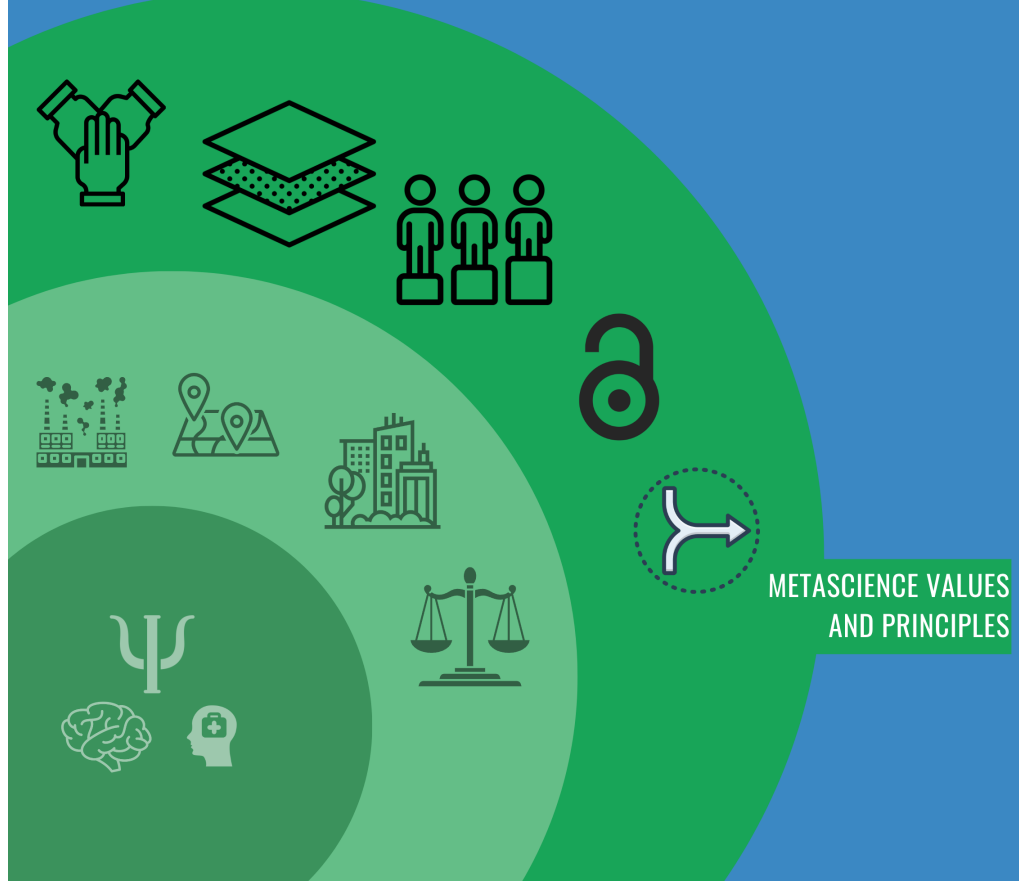


# AIR POLLUTION EFFECTS ON SUBCORTICAL STRUCTURES



Sukumaran, K., Cardenas-Iniguez, C., Burnor, E., Bottenhorn, K. L., Hackman, D. A., McConnell, R., Berhane, K., Schwartz, J., Chen, J.-C., & Herting, M. M. (2023). Ambient fine particulate exposure and subcortical gray matter microarchitecture in 9- and 10-year-old children across the United States. *iScience*, 26(3), 106087. <https://doi.org/10.1016/j.isci.2023.106087>

# A MULTILEVEL FRAMEWORK FOR ENVIRONMENTAL FACTORS IN PSYCH AND NEURO



Recommendations for addressing socioeconomic inequities in human neuroscience

## Radically Reframing Studies on Neurobiology and Socioeconomic Circumstances: A Call for Social Justice-Oriented Neuroscience

Kate Webb (@\_brainstorm\_12)  
Carlos Cardenas-Iniguez (@kharloews)  
& Robyn Douglas (@robyndd\_)

Front. Integr. Neurosci. (2022)  
doi: 10.3389/fnint.2022.958545

Fund Neuroscience Work on Sociopolitical Factors/Fund Scientists from Affected Communities

Engage in Community-Based Participatory and Community-Engaged Research

Explore Resilience Modeling in Studies on Socioeconomic Circumstances and Neurobiology.

Report Inequities and Acknowledge Diversity in Research Samples

"Radical simply means grasping things at the root"  
- Angela Davis

What we see and study

Poverty

Education Disparities

Neighborhood Disadvantage

Root cause of understudied socioeconomic inequities

# Structural Racism



SCAN ME

# Radically reframing studies on neurobiology and socioeconomic circumstances: A call for social justice-oriented neuroscience



E. Kate Webb<sup>1,2,3\*</sup>



Carlos Cardenas-Iniguez<sup>4††</sup> and



Robyn Douglas<sup>5††</sup>



**Kate Webb, PhD**  
McLean/Harvard Med  
T/X: @\_brainstorm\_12



**Robyn Douglas, MA**  
Texas A&M  
T/X: @RobynDD\_

# RECOMMENDATIONS FOR THE RESPONSIBLE USE AND COMMUNICATION OF RACE AND ETHNICITY IN NEUROIMAGING RESEARCH

## STUDY DESIGN AND CONCEPTUALIZATION

- 1 Race is socially constructed, with no biological basis.
- 2 Provide operationalization of race and ethnicity.
- 3 Avoid race and ethnicity as proxies, measure variables directly.

## ANALYSIS AND IMPLEMENTATION

- 4 Report race and ethnicity of study population. Also ask: Why are you including race and ethnicity in models?
- 5 Race is not genetic ancestry.

## APPLICATION AND INTERPRETATION

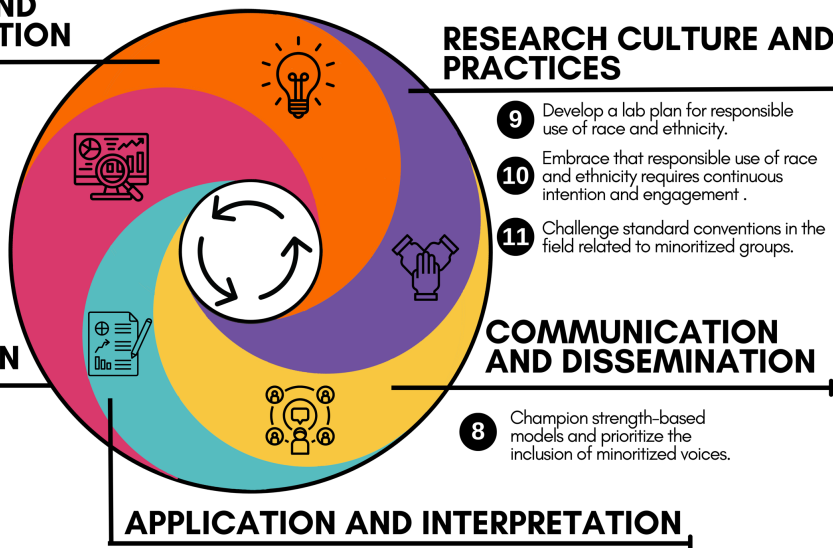
- 6 Evaluate biases in representation and participation, measurements, and generalizability.
- 7 Interrogate upstream causes instead of "race and ethnicity effects".

## RESEARCH CULTURE AND PRACTICES

- 9 Develop a lab plan for responsible use of race and ethnicity.
- 10 Embrace that responsible use of race and ethnicity requires continuous intention and engagement.
- 11 Challenge standard conventions in the field related to minoritized groups.

## COMMUNICATION AND DISSEMINATION

- 8 Champion strength-based models and prioritize the inclusion of minoritized voices.



Marybel Robledo Gonzalez, PhD  
Assistant Professor  
The Ohio State University  
College of Medicine







## Adolescent Brain Cognitive Development®

*Teen Brains. Today's Science. Brighter Future.*

***A longitudinal study of about 10,000 children from ages 9-10 through early adulthood to assess factors that influence individual brain development trajectories and functional outcomes***

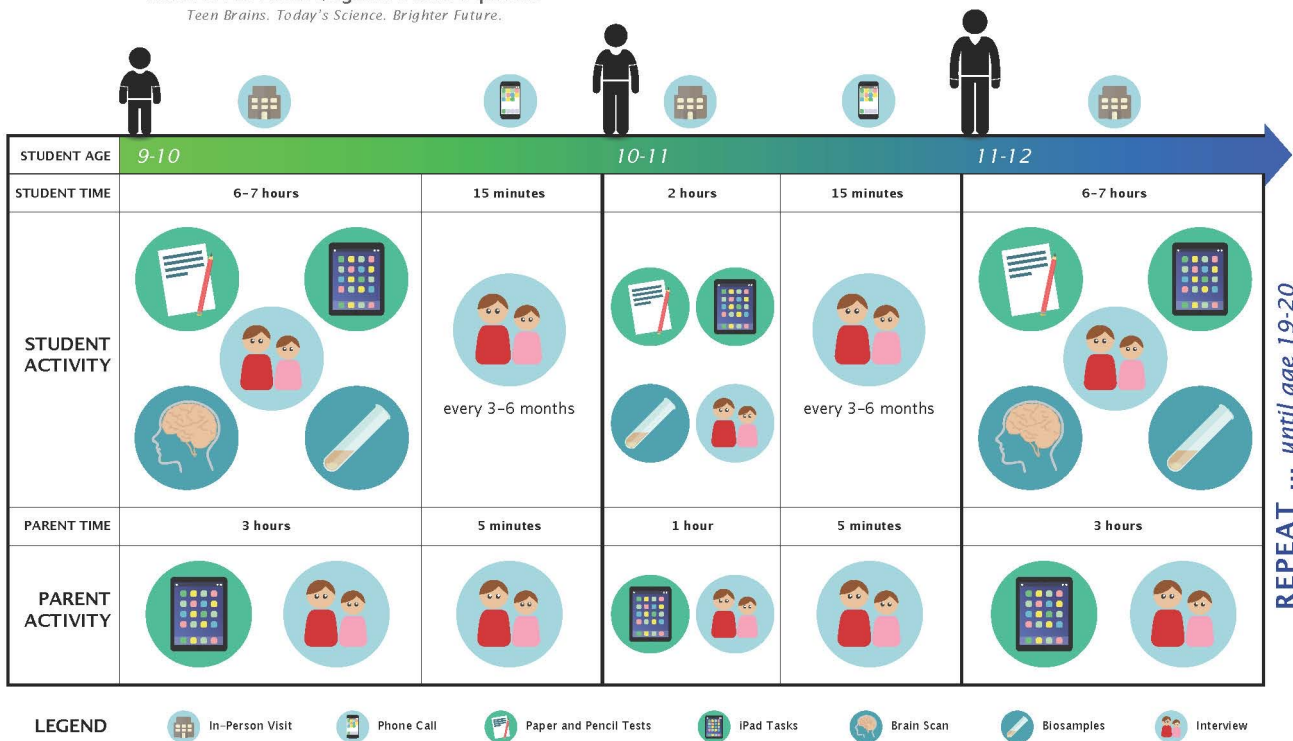


**Adolescent Brain Cognitive Development®**

*Teen Brains. Today's Science. Brighter Future.*

# ABCD Study

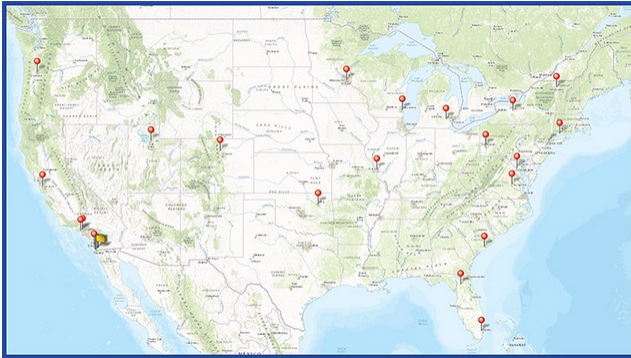
## TIMELINE OF EVENTS





## Adolescent Brain Cognitive Development®

*Teen Brains. Today's Science. Brighter Future.*



- 21 collection sites
- Data made available through Annual Curated Release available through NIMH Data Archive
- All data are released
- So.... RESPONSIBLE USE OF DATA IS IMPORTANT

## **ABCD JEDI RESPONSIBLE USE OF DATA WORKGROUP (WG3)**

- **This JEDI workgroup promotes principles of ethical conduct in research to prevent further stigmatization, marginalization, and injustice toward individuals because of racial, ethnic, and/or gender minority status.**
- **The workgroup strives to ensure that researchers analyze and interpret ABCD Study data responsibly, considering psychological, social, economic, and any other potentially harmful impacts their research could have on individuals, communities, and society.**

# RACE AND ETHNICITY

- **Very popular to include race and ethnicity as covariates**
- **Very limited conversation about their operationalization and measurement**
  
- **When you include race and ethnicity in your models, especially as covariates of non-interest/nuisance variables, what are you accounting for?**

- **Turns out, there is wide variability in these responses. Examples:**
  - **There are different biologically different responses between races and ethnicities**
  - **Subject to different experiences in society as an account of systemic racism and interpersonal racism**
  - **Because everybody does it**
- **Furthermore, race and ethnicity are often used as proxy variables, often without justification, which leaves the door open to many interpretations and generalizations (i.e., individual-level interpretations for social or structural determinants)**

**Decisions that researchers make at multiple stages of the research process have wide implications for how we consider these constructs in larger society**

# **GOALS OF PAPER**

**To communicate challenges and methodological considerations for members of the neuroscience scientific community, including users of ABCD Study data regarding race and ethnicity**

- 1. To reflect on choices in study design, model specification, statistical analysis, and communication of results,**
- 2. To implement practices to avoid the further stigmatization of historically minoritized groups, and**
- 3. To engage in research practices that counteract existing hurtful biases related to race and ethnicity.**



# RECOMMENDATIONS FOR THE RESPONSIBLE USE AND COMMUNICATION OF RACE AND ETHNICITY IN NEUROIMAGING RESEARCH

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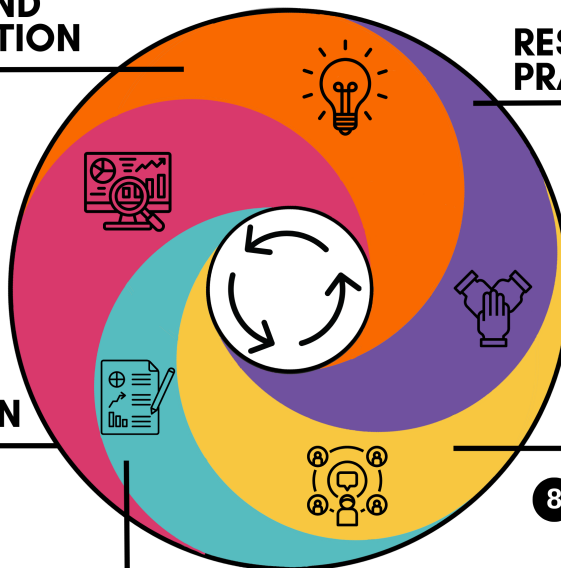
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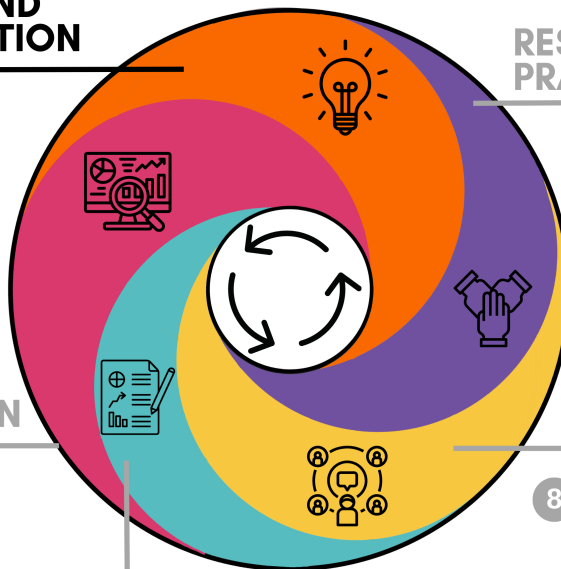
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# DOMAIN 1: STUDY DESIGN AND CONCEPTUALIZATION

Recommendation #1: Acknowledge race and ethnicity as socially constructed concepts whose meaning originates and is dependent on social, political, and historical forces.

Here, we define race as a socially constructed classification used to divide humans into groups based on biased judgments of physical characteristics and appearance, and which have been historically politically driven and used to establish social hierarchies.

Ethnicity, often tied to race, is also a social construct used to categorize diverse populations and establish personal and group identity.

Bryant, B. E., Jordan, A. & Clark, U. S. Race as a Social Construct in Psychiatry Research and Practice. *JAMA Psychiatry* 79, 93–94 (2022).

Graves Jr, J. L. & Goodman, A. H. *Racism, Not Race: Answers to Frequently Asked Questions*. (Columbia University Press, 2021).

Roth, W. D. The multiple dimensions of race. *Ethn. Racial Stud.* 39, 1310–1338 (2016).

Ford, C. L. & Harawa, N. T. A new conceptualization of ethnicity for social epidemiologic and health equity research. *Soc. Sci. Med.* 71, 251–258 (2010)

Table Adapted from Roth (2016).

Dimension of Race	Definition	Measurement
Racial Identity	Subjective self-identification, not limited to pre-set options	Open-ended self-identification questions
Racial Self-Classification	The race you check on an official form or survey with constrained options (eg. the Census)	Close-ended survey question
Observed Race	The race that others believe you to be	Interviewer classification
Appearance-based	Observed race based on readily observable characteristics	Interview classification with instructions to classify on first observation
Interaction-based	Observed race based on characteristics revealed through interactions (e.g. language, accent, surname)	Interviewer classification with instructions to classify after interaction or survey
Reflected Race	The race you believe others assume you to be	"What race do most people think you are?"
Phenotype	Racial appearance	Usually interviewer classification
Color	Skin color	Usually interviewer classification on a Likert scale or color palette
Other features	Hair texture or color, nose shape, lip shape, eye color	Usually interviewer classification on a series of categorical variables

Martinez RAM, Andrabi N, Goodwin AN, Wilbur RE, Zivich PN. Thoughtfully Measuring and Interpreting Race In Population Health Research. *IAPHS Blog* blog. 2021. <https://doi.org/10.17615/bs67-ij32>

Martinez, RAM, Andrabi, N., Goodwin, A., Wilbur, R., Smith, N., & Zivich, P. Resource Packet for "Clear communication of race and ethnicity for public health: best practices & common failings". *IAPHS Pre-conference workshop*. 2021. <https://doi.org/10.17615/dcfi-9g46>

People may report race and ethnicity, but those terms matter because of *racialization* (how it is that people are “raced”).

Omi, M. & Winant, H. *Racial Formation in the United States: From the 1960s to the 1980s*. (Routledge & Kegan Paul, 1986).  
Bonilla-Silva, E. Rethinking Racism: Toward a Structural Interpretation. *Am. Sociol. Rev.* 62, 465–480 (1997).

Year	American Indian / Alaska Native <sup>b</sup>	White <sup>b,c</sup>	African American / Black	Hispanic / Latinx <sup>d</sup>	Asian <sup>d</sup>	Native Hawaiian / Pacific Islander <sup>d</sup>
1500						
1600	<b>Tribal Independence (1492-1787)</b> C, L, H, R	<b>European Rule (1500-1776)</b> C, L, M, W, R		<b>Colonization of Latin America (1500-1800)</b> C, L, E, W, R		<b>Local Polynesian Independence (1500-1778)</b> L, W, H, M
1700					<b>Asians in Early Americas (1600-1840)</b> C, L, W, H, M, R	
	<b>Treaty (1787-1828)</b> C, L, H	<b>Early Independence (1776-1865)</b> C, L, E, W, J, M, R				
1800	<b>Relocation / Removal (1828-1887)</b> C, L, E, W, J, M, R		<b>Reconstruction (1863-1877)</b> C, E, W, J, H, R	<b>The "Wild West" &amp; Re-Colonization (1800-1900)</b> C, L, E, W, M, R		<b>European-American Colonization (1778-1898)</b> C, L, E, W, H, M
	<b>Allotment &amp; Assimilation (1887-1934)</b> C, L, W, M, R				<b>Asian Migration &amp; Exclusion (1840-1939)</b> C, E, L, W, H, M, R	
		<b>WWI – WWII (1918-1945)</b> C, L, E, W, M, R		<b>The Great Migration (1900-1930)</b> C, E, M, R		<b>Wars in the Pacific (1898-1945)</b> C, L, W, H, M
1900	<b>Reorganization &amp; Termination (1934-1968)</b> C, L, E, J, H		<b>Jim Crow (1876-1965) &amp; Civil Rights Movement (1954-1968)</b> C, L, E, M, W, J, H, R	<b>Repatriation &amp; Revival (1930-1960)</b> C, E, W, H, M, R	<b>WWII &amp; Post-War Era (1939-1965)</b> C, E, L, W, J, H, M, R	
		<b>Cold War (1946-1980)</b> C, L, E, H, W		<b>Chicano Civil Rights Movement (1960-1975)</b> C, L, E, M, R	<b>Immigration Reform &amp; Cold War Politics (1965-1980)</b> C, E, L, W, H, M, R	<b>Cold War (1945-1991)</b> C, L, E, H, M
	<b>Self-Determination (1968-)</b> C, L, E, J, H, M		<b>Colorblindness (1970-)</b> C, L, E, W, H, J, R	<b>Racialization &amp; Illegality (1975-)</b> C, L, E, W, J, M, R		
2000		<b>Reagan Era (1980-)</b> L, W, J, H			<b>Transnationalism (1980-)</b> C, E, L, W, J, H, M, R	<b>Towards a New Independence (1991-)</b> C, L, E

**Figure 1. Framework for operationalizing structural racism for health research in the United States**

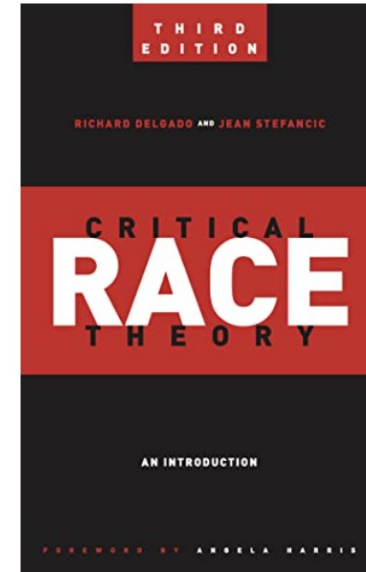
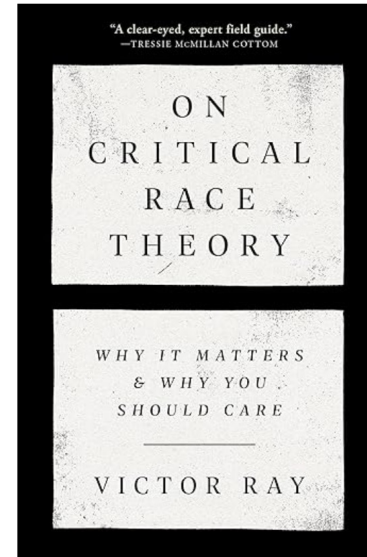
a. Enactment or enforcement of racist policy, laws, events, or norms regarding: C, Civil / Political Rights; L, Land / Housing / Neighborhoods; E, Education; W, Jobs / Benefits / Wealth; J, Justice System; H, Health; M, Migration and Movement; and R, Racial Climate.  
b. See Figure 2 for additional details for American Indians / Alaskan Natives and Whites.  
c. Importantly, the domains listed for Whites primarily represent a structural advantage. Although several European ethnic immigrant groups (eg, Irish, Polish, Jewish, German, etc.) experienced discrimination and unfair treatment upon arrival to the United States, their eventual racialization into the White racial group enabled them to access benefit associated with whiteness earlier than non-White groups.  
d. Domains of structural racism differentially affected various ethnic subgroups within and across these eras.

Dennis, A. C., Chung, E. O., Lodge, E. K., Martinez, R. A., & Wilbur, R. E. (2021). Looking Back to Leap Forward: A Framework for Operationalizing the Structural Racism Construct in Minority and Immigrant Health Research. *Ethnicity & Disease*, 31(Suppl), 301–310. <https://doi.org/10.18865/ed.31.S1.301>

# CRITICAL RACE THEORY

**Critical Race Theory (CRT):** a framework of legal analysis engaged in studying and transforming the relationship between race, racism, and power across dominant cultural modes of expression

- Race is *socially constructed*, not biologically innate.
- Racism in the United States is embedded within the structure of society and normal, not aberrational (*ordinariness*). This *ordinariness* makes it difficult to acknowledge, although it plays an integral role in how people are racialized.
- Because racism advances the interests of all white people, both affluent and working-class whites, there is little incentive to eradicate racism in a large segment of society. Also referred to as *interest convergence* or *material determinism*, advances for people of color only occur when they tend to serve the interests of dominant white groups.
- Members of minority groups periodically undergo *differential racialization* depending on the needs or interests of whites.
- No individual can be adequately identified by membership in a single group (*intersectionality, antiessentialism*).
- People of color are uniquely qualified to speak on behalf of their own group(s) regarding the forms and effects of racism (*voice of color*).

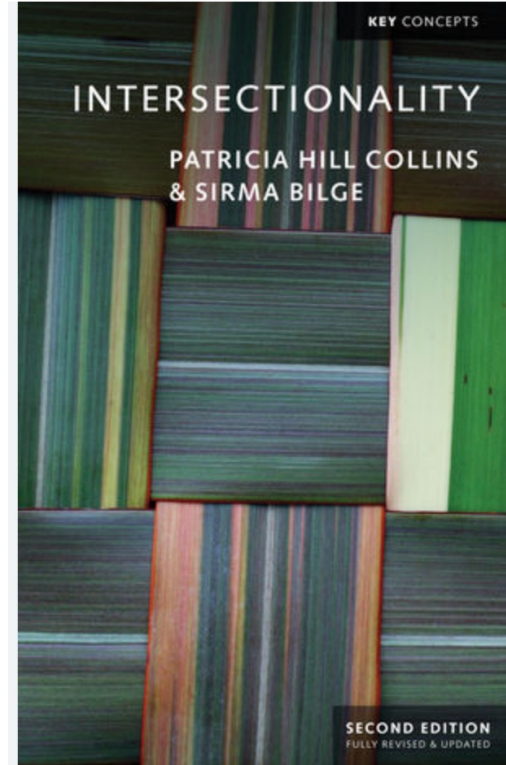




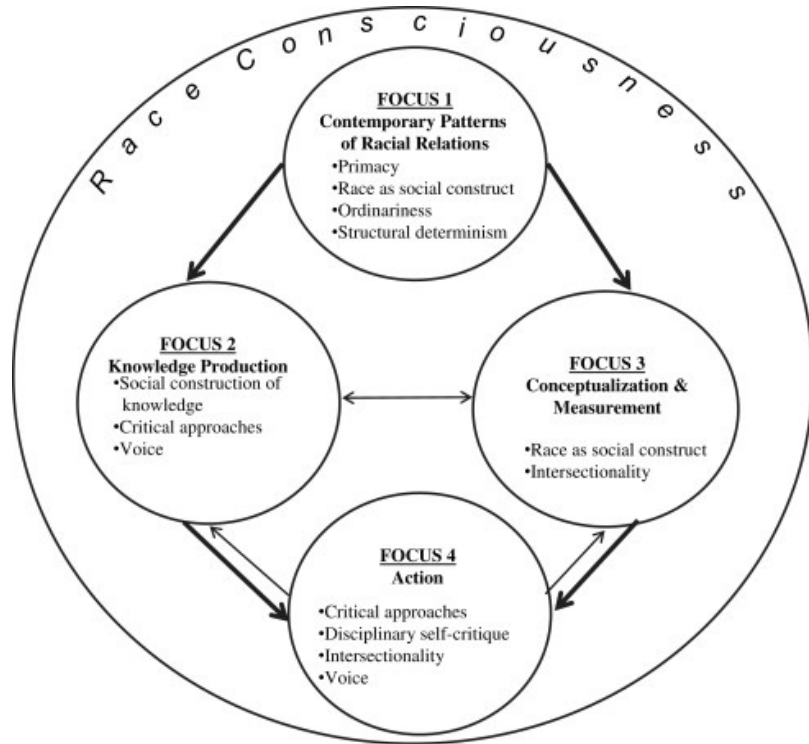
# INTERSECTIONALITY

**Intersectionality Theory**—Kimberlé Crenshaw (1989), addressing unique position of Black woman in US legal system

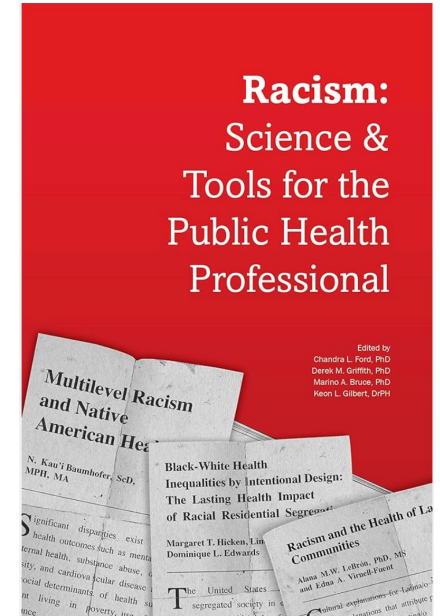
- “how multiple forms of inequality and identity inter-relate in different contexts and over time, for example, the inter-connectedness of race, class, gender, disability, [etc.]”
- Often interpreted as considering overlap of multiple identities
- Importantly, also highlights “interlocking systems of oppression” underscoring the importance of focusing on upstream social/structural determinants that may impact many/all marginalized groups.



# PUBLIC HEALTH CRITICAL RACE PRAXIS



Provides applications of CRT to empirical research.  
Can be a useful text to reference.



Ford, C. L., & Airhihenbuwa, C. O. (2010a). Critical Race Theory, Race Equity, and Public Health: Toward Antiracism Praxis. *American Journal of Public Health*, 100(Suppl 1), S30–S35. <https://doi.org/10.2105/AJPH.2009.171058>

Ford, C. L., & Airhihenbuwa, C. O. (2010b). The public health critical race methodology: Praxis for antiracism research. *Social Science & Medicine*, 71(8), 1390–1398. <https://doi.org/10.1016/j.socscimed.2010.07.030>

**Recommendation #2: Researchers should provide clear categorization and coding rationale for race and ethnicity variables and include race and ethnicity information about study populations.**

Studies published in NeuroImage and Cerebral Cortex showed only about 20% of studies reported race and ethnicity information (Goldfarb & Brown, 2022; Sterling et al., 2022)

This is critical for generalizability, reproducibility, and the development of appropriate interventions.

***But...since race and ethnicity are socially constructed, there are many categorization methods, and none are perfect.***

Goldfarb, M. G., & Brown, D. R. (2022). Diversifying participation: The rarity of reporting racial demographics in neuroimaging research. *NeuroImage*, 254, 119122. <https://doi.org/10.1016/j.neuroimage.2022.119122>

Sterling, E., Pearl, H., Liu, Z., Allen, J. W., & Fleischer, C. C. (2022). Demographic reporting across a decade of neuroimaging: A systematic review. *Brain Imaging and Behavior*, 16(6), 2785–2796. <https://doi.org/10.1007/s11682-022-00724-8>

# A POPULAR CODING APPROACH TO RACE/ETHNICITY:

Asked two questions:

What is your race?

What is your ethnicity?

Responses are then coded into the following categories:

- White
- Black/African American
- Asian
- Multi-racial/Other
- Hispanic/ Latinx/e

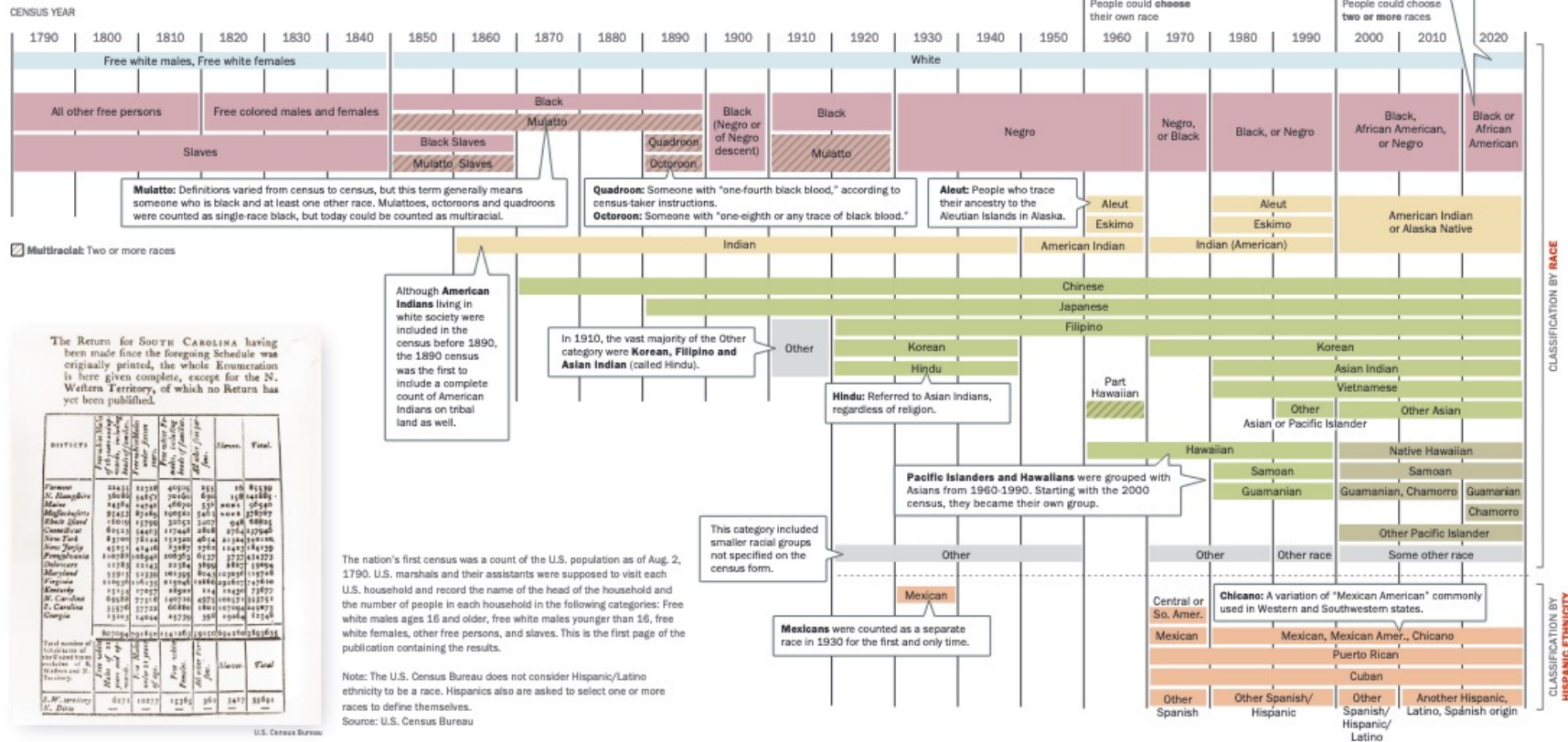
- Combined ethnoracial construct, consistent with Census categories
  - Hispanic/Latinx category supersedes all others
  - If not, assigned “Other” category
- Limitations
  - What is other?!
  - Native Hawaiian or Other Pacific Islander American Indian or Alaska Native not often included
  - Census categories subject to sociopolitical and historical context

# What Census Calls Us

## A Historical Timeline

This graphic displays the different race, ethnicity and origin categories used in the U.S. decennial census, from the first one in 1790 to the latest count in 2020. The category names often changed from one decade to the next, in a reflection of current politics, science and public attitudes. For example, “colored” became “black,” with “Negro” and “African American” added later. The term “Negro” was dropped for the 2020 census. Through 1950, census-takers commonly determined the race of the people they counted. From 1960 on, Americans could choose their own race. Starting in 2000, Americans could include themselves in more than one racial category. Before that, many multiracial people were counted in only one racial category.

For the first time, people who check one or both of these boxes are asked to write more about their origins, for example German, African American, Jamaican, etc.



The Return for SOUTH CAROLINA having been made since the foregoing Schedule was originally printed, the whole Enumeration is here given complete, except for the N. Western Territory, of which no Return has yet been published.

DISTRICTS	Free white males, 16 years and upwards, including those who were born abroad, but who have become citizens of the United States	Free white females, 16 years and upwards	Free colored males, 16 years and upwards	Free colored females, 16 years and upwards	Slaves	Total
Province of South Carolina	22413	22328	40926	251	10	85168
North Carolina	10836	10873	19266	650	1	41537
Virginia	18374	18420	48070	571	1001	77436
Georgia	11442	11485	40936	543	1	54407
Florida	1013	1198	2573	10	0	5794
Alabama	8523	8447	17443	208	0	36621
Mississippi	8126	8144	18240	40	0	34510
Louisiana	4573	4540	13877	270	0	19460
Arkansas	1407	1403	3673	61	0	6544
Missouri	1578	1542	2384	105	0	4509
Illinois	1197	1236	3030	84	0	5527
Indiana	1102	1051	2803	61	0	4017
Ohio	1518	1507	4891	144	0	7060
Kentucky	890	925	2286	54	0	3155
Tennessee	1524	1524	3668	100	0	5216
West Virginia	1381	1404	3776	59	0	5620
Dist. of Columbia	1	1	1	0	0	3
<b>Total</b>	<b>110,323</b>	<b>110,323</b>	<b>300,714</b>	<b>1,393</b>	<b>10</b>	<b>722,767</b>

Note: The U.S. Census Bureau does not consider Hispanic/Latino ethnicity to be a race. Hispanics also are asked to select one or more races to define themselves. Source: U.S. Census Bureau

# WHY MIGHT THIS CODING SCHEME BE USEFUL?

- 1) Comparing estimates to other census-derived effects and describing population-level trends
- 2) Examining small subsamples that risk the identifiability of participants
- 3) Can be helpful in accounting for Hispanic/Latinx individuals that do not feel represented when asked to report their race

That being said, the limitations of this combined ethnoracial construct persist, and must be acknowledged.

# SO... WHAT DO WE DO?

## **Selecting a coding schema:**

1. How are variables being combined?
2. Why are they being combined?
3. Does the resulting code match the research question?
4. Are the findings still representative of the original data?

## **Guiding questions on the “Other” category:**

In your own research:

1. What purpose does the “other” category serve in my research?
  - a. Does it provide meaningful information about/for the populations included in the category?
  - b. Does it provide a valuable comparison to the groups outside of the “other” category?

As you review others’ research:

1. Do they use an “other” category? If so, do they say who is in it? Do they justify its use?
  - a. What are the benefits and limitations of using this category *for the researchers?*
  - b. What are the benefits and limitations of using this category *for the participants?*

## **Solutions to Common Coding Problems:**

1. Resist the temptation to collapse categories unnecessarily
2. If you must use an “Other” category, ensure that it serves a specific analytic purpose
3. Be transparent about your coding decisions in both analysis and publication

## **One Thing You Need to Do for Coding:**

Ask yourself, “Could someone reviewing this article reproduce my coding scheme from the original data?”

# DOMAIN 1: STUDY DESIGN AND CONCEPTUALIZATION

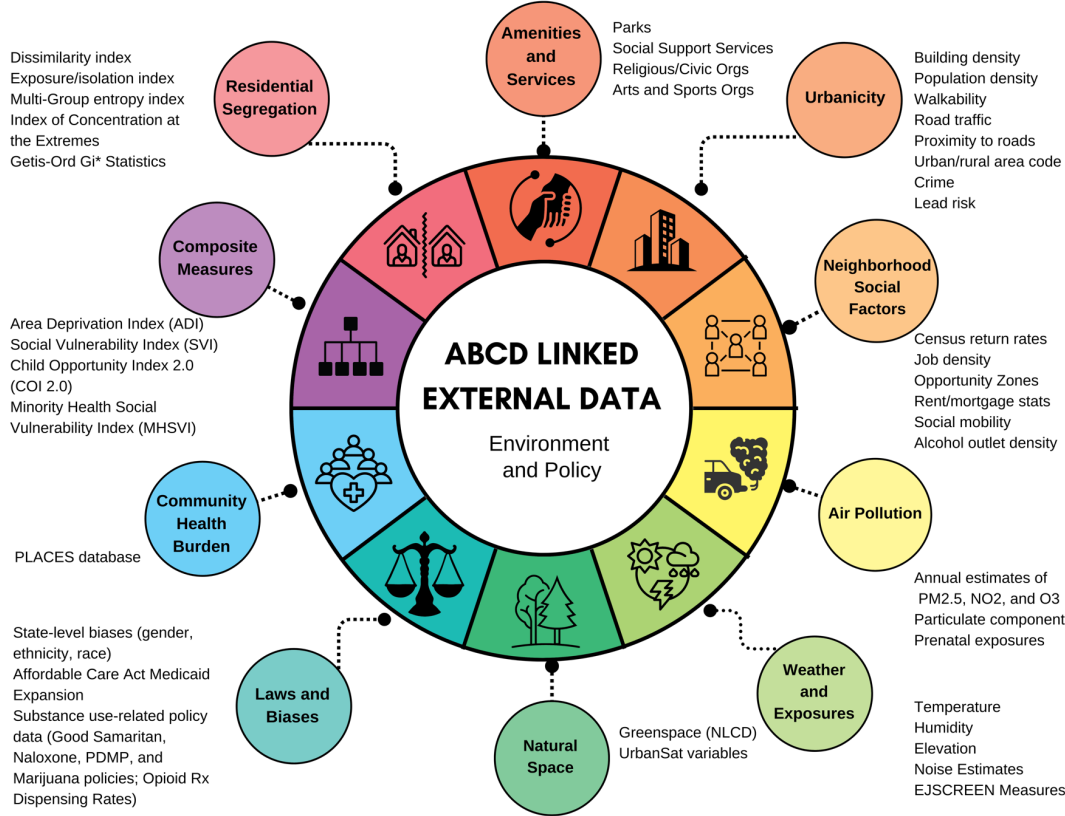
**Recommendation #3: Avoid using race and ethnicity as proxies for social and environmental forces and directly measure those variables instead.**

Even though these terms are needed to characterize health disparities, all mentions of race and ethnicity pose a risk for harm to historically minoritized groups, as they may be interpreted as “innate properties” of the group instead of a result of structural racism and the process of racialization----Nancy Krieger, the “two-edged sword of data” (Krieger, 2021).

Many constructs that can describe social and environmental forces

Note: Race and ethnicity as a construct is not independent of SES.





**Link to Paper**

Cardenas-Iniguez, C., Schachner, J. N., Ip, K. I., Schertz, K. E., Gonzalez, M. R., Abad, S., & Herting, M. M. (2024). Building Towards an Adolescent Neural Urbanome: Expanding Environmental Measures using Linked External Data (LED) in the ABCD Study. *Developmental Cognitive Neuroscience*, 101338. <https://doi.org/10.1016/j.dcn.2023.101338>

# RECOMMENDATIONS FOR THE RESPONSIBLE USE AND COMMUNICATION OF RACE AND ETHNICITY IN NEUROIMAGING RESEARCH

## STUDY DESIGN AND CONCEPTUALIZATION

- 1 Race is socially constructed, with no biological basis.
- 2 Provide operationalization of race and ethnicity.
- 3 Avoid race and ethnicity as proxies, measure variables directly.

## ANALYSIS AND IMPLEMENTATION

- 4 Report race and ethnicity of study population. Also ask: Why are you including race and ethnicity in models?
- 5 Race is not genetic ancestry.

## RESEARCH CULTURE AND PRACTICES

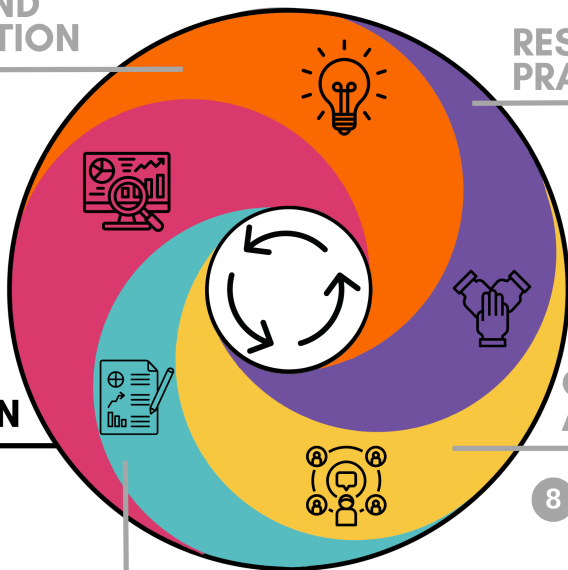
- 9 Develop a lab plan for responsible use of race and ethnicity.
- 10 Embrace that responsible use of race and ethnicity requires continuous intention and engagement.
- 11 Challenge standard conventions in the field related to minoritized groups.

## COMMUNICATION AND DISSEMINATION

- 8 Champion strength-based models and prioritize the inclusion of minoritized voices.

## APPLICATION AND INTERPRETATION

- 6 Evaluate biases in representation and participation, measurements, and generalizability.
- 7 Interrogate upstream causes instead of "race and ethnicity effects".



# DOMAIN 2: ANALYSIS AND IMPLEMENTATION

**Recommendation #4: Researchers should justify their inclusion of race and/or ethnicity in statistical models, avoiding default inclusion.**

Common to control for race and ethnicity as a “covariate of no interest” or “control variables” without providing an appropriate rationale. But, what is it that is being “accounted for” when doing so?

Using race and ethnicity as a proxy can lead the door open for many interpretations.

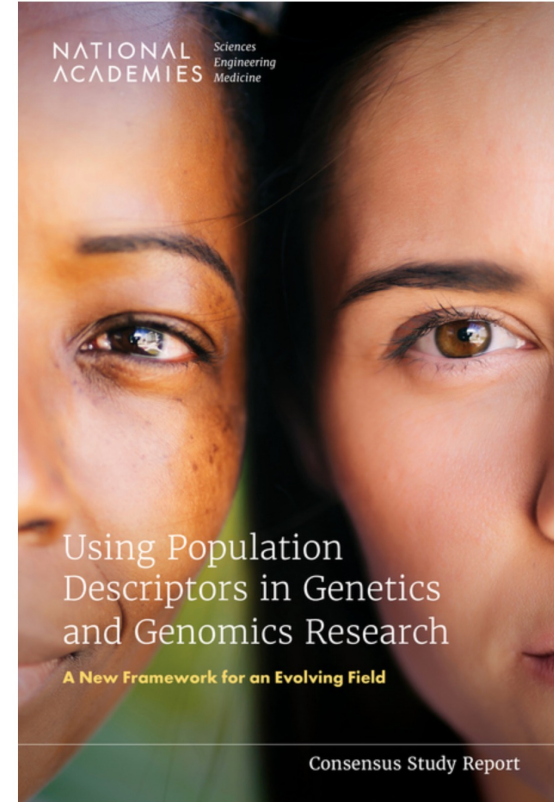
Important to explore the implications of assuming “white = neutral.” Can use QuantCrit framework to examine these assumptions.

- What does it mean to use white as the “default category”?
- Although race derives meaning from many factors, it alone does not encapsulate all of those factors.

# DOMAIN 2: ANALYSIS AND IMPLEMENTATION

**Recommendation #5: Race and ethnicity should not be equated with genetic ancestry.**

NASEM report on population descriptors in genomics research asserts that race is neither useful nor scientifically valid as a measure of the structure of human genetic variation.

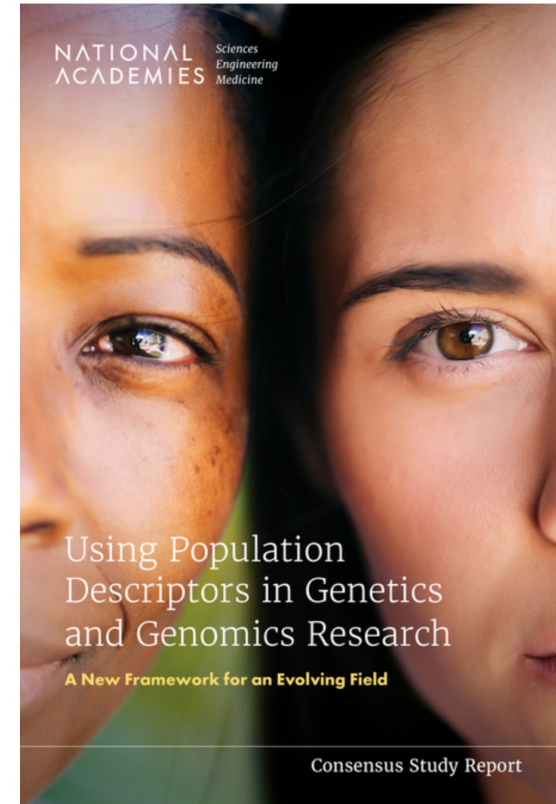


Specifically, the report suggests strong skepticism regarding claims of genetic causation of disease differentials (that avoid discussion of gene-environment interactions) among socially defined groups in the US.

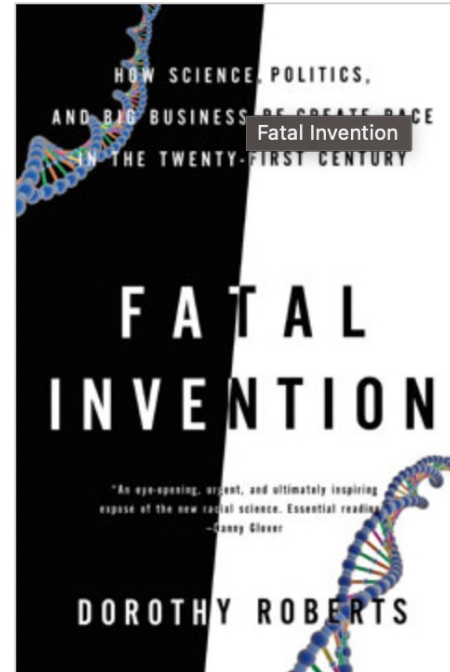
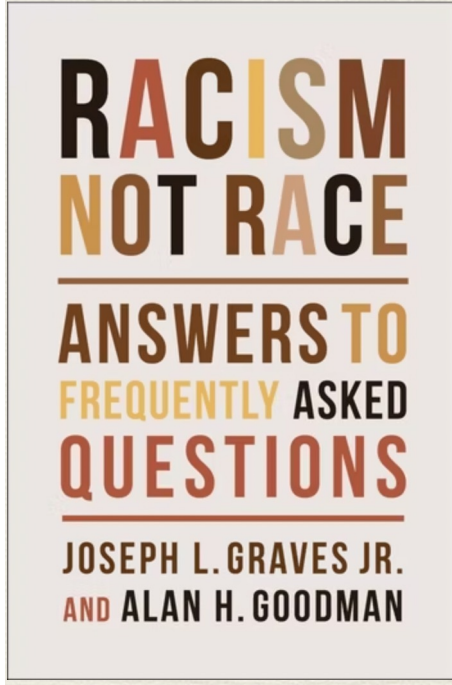
Avoiding the use of continental geographic labels for ancestry (i.e., European, African, American, Asian), as they reify typological thinking.

Alternative: Use “-like” as a modified in your label, or be as specific as possible about the training or source data.

To quote Joseph Graves Jr., “Racially subordinated populations (such as Amerindians, Latinx, and African Americans) have never lived in environments that are equivalent to the socially dominant European population”.



# MORE ON THIS TOPIC



# RECOMMENDATIONS FOR THE RESPONSIBLE USE AND COMMUNICATION OF RACE AND ETHNICITY IN NEUROIMAGING RESEARCH

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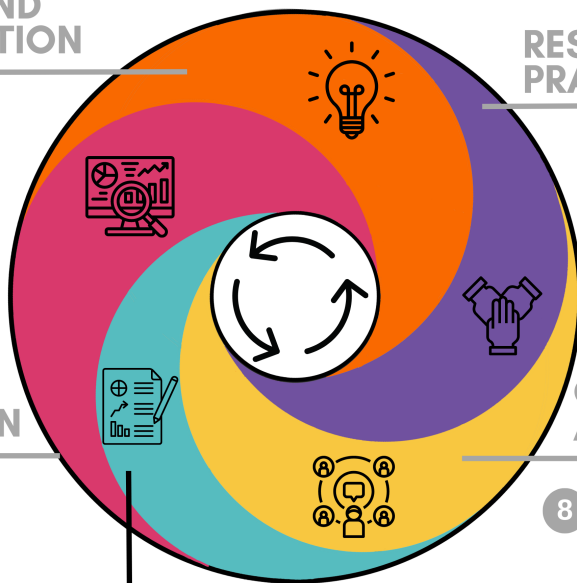
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# DOMAIN 3: APPLICATION AND INTERPRETATION

**Recommendation # 6: Evaluate biases in population representation and participation, measurements, patterns of missingness, and generalizability.**

- Underrepresentation of historically minoritized populations in research,
- Anatomical templates were not derived from diverse populations,
- Limited genetics research to those not of European ancestry,
- Many measures may not have been normed with diverse samples
- Overly strict exclusion criteria may disproportionately impact minoritized groups

Cosgrove, K. T., McDermott, T. J., White, E. J., Mosconi, M. W., Thompson, W. K., Paulus, M. P., Cardenas-Iniguez, C., & Aupperle, R. L. (2022). Limits to the generalizability of resting-state functional magnetic resonance imaging studies of youth: An examination of ABCD Study® baseline data. *Brain Imaging and Behavior*. <https://doi.org/10.1007/s11682-022-00665-2>



# DOMAIN 3: APPLICATION AND INTERPRETATION

Recommendation #7: Avoid “health equity tourism” and interrogate upstream causes instead of simply exploring “race and ethnicity effects”.

Health equity tourists: those motivated to explore “race effects” or “ethnicity effects” without particular attention to what these variables may represent, or previous efforts that have brought attention to racial and ethnic health disparities in their fields and the forces that give rise to them (Lett et al., 2022)

Exploring a “race effect” or an “ethnicity effect” alone does not constitute “health disparities research.” HD research requires interrogating upstream causes and investment in minoritized populations.

Focus on beneficence: not just “doing no harm”, but “doing good”

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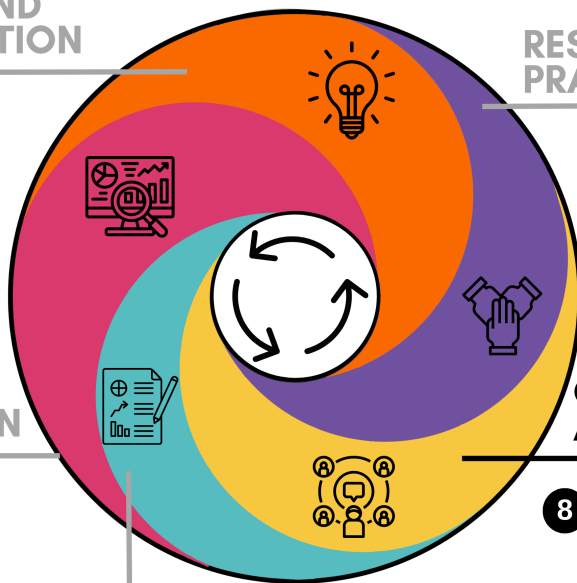
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# DOMAIN 4: COMMUNICATION AND DISSEMINATION

**Recommendation #8: Champion strength-based models when reporting on minoritized groups and prioritize the inclusion of minoritized voices.**

Too much of a focus on deficits when talking about minoritized groups. Over-association with negative stereotypes.

Use of deficit-based language such as “vulnerable”, “at risk”, “distressed”, or other qualifiers suggest that populations experiencing disparities or structural oppression are helpless and devoid of agency, while at the same time placing the source of the disparities as the individuals themselves.

Actively involving members of minoritized groups at all stages of research is critical for mitigating many of these negative effects.

# DOMAIN 4: COMMUNICATION AND DISSEMINATION

The cultural (mis)attribution bias in developmental psychology in the United States  
(Causadias, Vitriol, & Atkin, 2018)

Bias relies on exaggerating the role of culture in the development of minoritized youth, while overemphasizing the role of psychological processes in the development of white individuals.

Causadias, J. M., Vitriol, J. A., & Atkin, A. L. (2018). Do we overemphasize the role of culture in the behavior of racial/ethnic minorities? Evidence of a cultural (mis)attribution bias in American psychology. *American Psychologist*, 73(3), 243–255. <https://doi.org/10.1037/amp0000099>

# DOMAIN 4: COMMUNICATION AND DISSEMINATION

Considering group membership and particular populations can be incredibly useful, but it is important to avoid structural determinism– assuming that structural/social determinants explain everything about an individual

# DOMAIN 4: COMMUNICATION AND DISSEMINATION

What can you do?

Actively involving members of minoritized groups at all stages of research is critical for mitigating many of these negative effects.

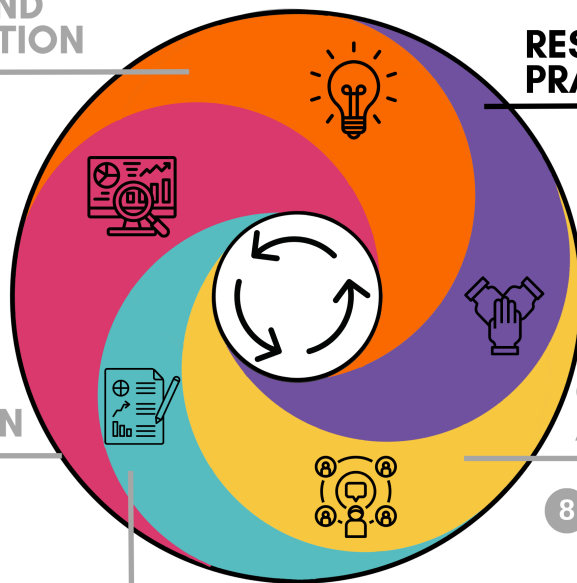
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# DOMAIN 5: RESEARCH CULTURE AND PRACTICES

## Recommendation #9: Develop a Plan for Responsible Use and Communication of Race and Ethnicity in your Research Process

- Explore and implement a research framework or epistemological theory to ground your operationalizations on race and ethnicity.
- This takes intention and commitment. Also read up on how many of the perspectives in diversity science have been excluded from the academic conversation

Buchanan, N. T. & Wiklund, L. O. Why Clinical Science Must Change or Die: Integrating Intersectionality and Social Justice. *Women Ther.* 43, 309–329 (2020). Settles, I. H., Warner, L. R., Buchanan, N. T. & Jones, M. K.

Understanding psychology's resistance to intersectionality theory using a framework of epistemic exclusion and invisibility. *J. Soc. Issues* 76, 796–813 (2020).



Source: Bodison, S. C., Nagel, B., Lopez, D. A., Huber, R., & Members of ABCD JEDI WG3. (2023). *Equity-Focused Questions for Researchers using the ABCD Study*. <https://osf.io/pm7sy/>

**Equity in the Scientific Process: Questions for Authors to Consider Prior to Hypotheses Testing with Diverse Samples**

- What is your reason for analyzing these data stratified by race/ethnicity, sex/gender, and/or SES and have you sufficiently justified your reasoning in the paper?
- Have you acknowledged any potential bias in measures/constructs (known or suspected)? If yes, how?
- Have you been careful to contextualize variables, such as race/ethnicity, sex/gender, and/or SES? If yes, how?
- Have you limited the use of deterministic language?
  - The implication that specific observations (behavior, cognition, etc) are *caused* by certain factors (race/ethnicity, gender, etc.) with little to no capability of change and thus, does not take into consideration other important factors such as adolescent developmental stages, environmental factors, exposure to social experiences, etc.
  - *Example (Biological determinism) - race/ethnicity, gender, sexual orientation, etc., are determined by biology and does not take into account the environmental, social, and cultural factors that play a role throughout development.*
- If variables, such as race/ethnicity, sex/gender, and/or SES were used as covariates or for sample characteristic reporting, were they appropriately reported and are limitations of such reporting addressed?
- If you are showing differences between social groups in your analysis, have you provided enough theoretical justification for why this comparison is needed to address disparities in health research?

- Have you considered including a positionality statement to describe your proximity (or lack thereof) to the groups you are describing? Another option would be to include a statement that, in writing the paper, all authors have considered their positionality and proximity to the data you're describing in the acknowledgments section.
- When writing your manuscript, have you made sure to include person-first language when describing the sample?
  - Places the focus on the person, and not the disability/disorder/disease/condition. A description of what a person has, not who a person is.
  - Example(s):
    - "Person with a disability" instead of "handicapped/the disabled"
    - "Person with substance use disorder" instead of "addict"
    - "Person living with schizophrenia" instead of "schizophrenic"
- If you have co-varied for race/ethnicity, sex/gender, sexual orientation, and other variables such as education, SES, income, etc., have you considered the exact effects being ascribed to each variable?

# A Developmental Approach to Diversifying Neuroscience Through Effective Mentorship Practices: Perspectives on Cross-Identity Mentorship and a Critical Call to Action

Tanisha G. Hill-Jarrett<sup>1\*</sup>, Rowena Ng<sup>2, 3\*</sup>, Carlos Cardenas-Iniguez<sup>4</sup>,  
 Jemima Akinsanya<sup>5</sup>, Ismary Blanco<sup>6</sup>, Johnathan Borland<sup>7</sup>, James S. Brown<sup>8</sup>,  
 Tameka Clemons<sup>9</sup>, Adriana K. Cushnie<sup>7</sup>, Jacqueline Garcia<sup>10</sup>, Brianna George<sup>11</sup>,  
 Cera W. Hassinan<sup>12, 13</sup>, Timothy J. Hines<sup>14</sup>, Dan Landayan<sup>15</sup>, Taylor A. McCorkle<sup>16</sup>,  
Katherine R. Meckel<sup>17, 18</sup>, Mariajose Metcalfe<sup>19</sup>, Samantha A. Montoya<sup>7</sup>, Deborah K. Rose<sup>20</sup> and  
Desmond R. Warren<sup>21</sup>

## C) Recommendations for Cross-Identity Mentorship Relationships

### Mentors

Do not just be a manager, be an ally and sponsor. Acknowledge power imbalances in relationship.

Make expectations known, consider mentee's interests, listen to understand.

Connect on shared or similar lived experiences. Embrace differences, focus on strengths, and encourage authenticity.

Acknowledge and respect mentee's personhood outside of academia. Create and maintain a culture of communication and respect.



### Mentees

Remember your identities and experiences are valid.

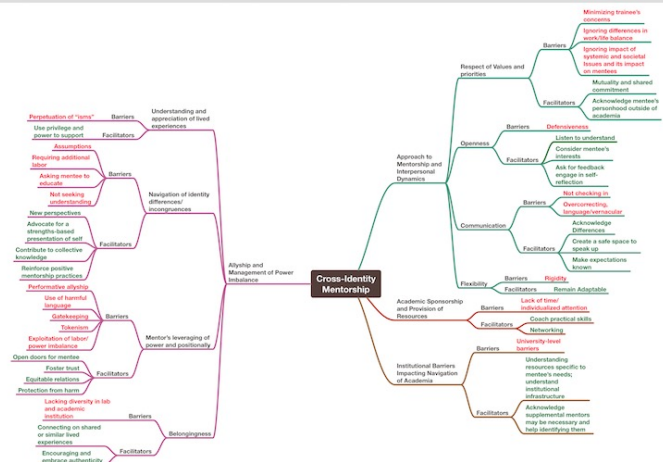
Communicating your needs is important.

Remember intra- and inter-personal factors when communicating with your mentor(s).

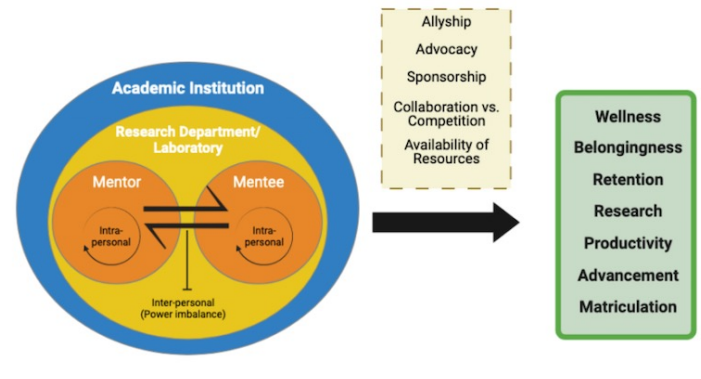
Ask for feedback and clarification of expectations.

Embrace a diverse multi-mentor network of support.

A)



B)



# DOMAIN 5: RESEARCH CULTURE AND PRACTICES

**Recommendation #10:** Embrace that responsible use and communication of race and ethnicity requires continuous intention and engagement.

Buchanan, N. T., Perez, M., Prinstein, M. J. & Thurston, I. B. Upending racism in psychological science: Strategies to change how science is conducted, reported, reviewed, and disseminated. *Am. Psychol.* **76**, 1097–1112 (2021).

Garcini, L. M. *et al.* Increasing diversity in developmental cognitive neuroscience: A roadmap for increasing representation in pediatric neuroimaging research. *Dev. Cogn. Neurosci.* **58**, 101167 (2022).

Roberts, S. O., Bareket-Shavit, C., Dollins, F. A., Goldie, P. D. & Mortenson, E. Racial Inequality in Psychological Research: Trends of the Past and Recommendations for the Future. *Perspect. Psychol. Sci.* **15**, 1295–1309 (2020).

# DOMAIN 5: RESEARCH CULTURE AND PRACTICES

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A simple checklist or flowchart cannot replace a thoughtful and developed plan specific to each research project.

There is no one-size-fits-all recipe for addressing racial/ethnic structural inequity in research.

# DOMAIN 5: RESEARCH CULTURE AND PRACTICES

**Recommendation #11:** Challenge standard conventions in the scientific process that are harmful to minoritized groups.

Push back on “what has been done before”.

Step outside the ivory tower, include communities and voices of color.

La Scala, S., Mullins, J. L., Firat, R. B., Emotional Learning Research Community Advisory Board & Michalska, K. J. Equity, diversity, and inclusion in developmental neuroscience: Practical lessons from community-based participatory research. *Front. Integr. Neurosci.* **16**, (2023).

Randolph, A. C. *et al.* Creating a sustainable action-oriented engagement infrastructure—a UMN-MIDB perspective. *Front. Integr. Neurosci.* **16**, (2022).

# EXTRAS AND NEXT STEPS

Paper also includes a checklist in the supplement and additional research for a deeper dive.

Hoping to flesh this paper out into a course/workshops to further engage members of the field (especially ECRs and trainees).



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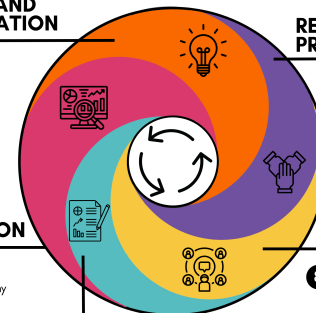
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# ACKNOWLEDGMENTS

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Department of Population and Public Health  
Sciences

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ABCD LED WG and JEDI WGs

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their support.



National Institute  
on Drug Abuse



National Institute  
on Minority Health  
and Health Disparities



Diversifying CNS



National Institute of  
Neurological Disorders  
and Stroke



Keck School of  
Medicine of USC