Meta-Analytic QuantCrit: Exploring the Possibilities

Jamaal Young, Ph.D.

Texas A&M University

Overview

- My Positionality
- Background CRT and QuantCrit
- Unpack QuantCrit Tenets
- Critical Inquiry and QuantCrit
- Meta-Analytic QuantCrit

My Positionality

Critical Race Theory (CRT)

- (1) unequivocally claims that race and racism are central, endemic, permanent and fundamental in defining and explaining how U.S. society functions;
- (2) challenges dominant ideologies and claims of race neutrality, objectivity, meritocracy, color-blindness and equal opportunity;
- (3) the principles of CRT are activist in nature and propagates a commitment to social justice;
- (4) it centers the experiences and voices of the marginalized and oppressed, and
- (5) is necessarily interdisciplinary in scope and function (Delgado Bernal 2002; Solorzano & Yosso 2000).
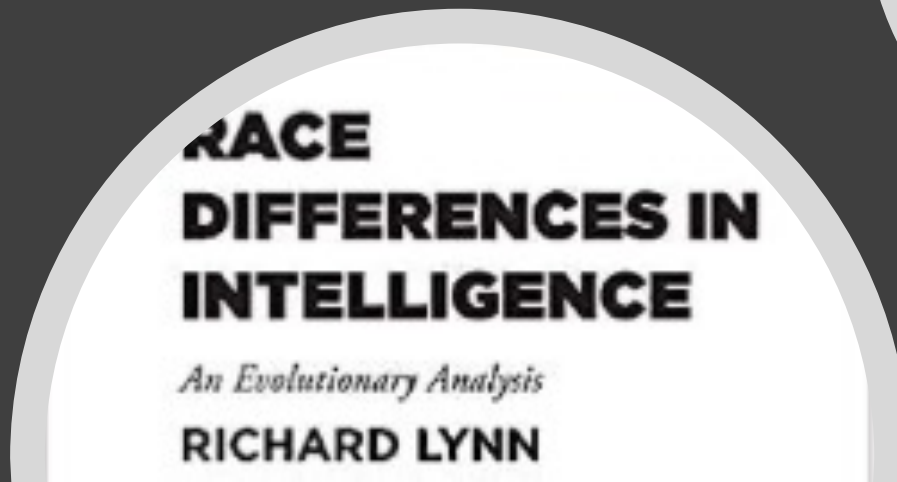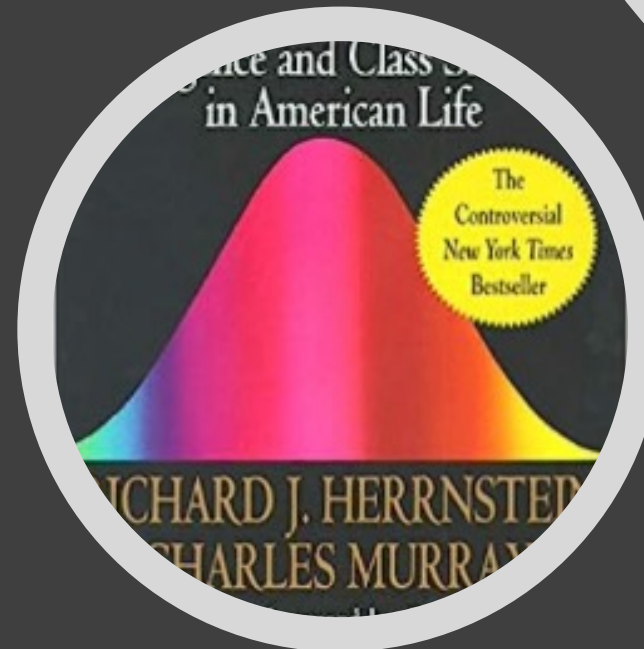
Five Tenets of QuantCrit

- 1) the centrality of racism;

- 2) numbers are not neutral;

- 3) categories are neither 'natural' nor given, and models that treat categories as causal often conceal the operation of power and ideology;

- 4) voice and insight (data cannot speak for itself); and

- 5) a social justice/equity orientation (Gillborn et al., 2018)

Tenet 1: Centrality of Racism

- Centrality defined
  - the quality or fact of being in the middle of somewhere or something.
  - the quality of being essential or of the greatest importance
- Racism defined
  - the belief that different races possess distinct characteristics, abilities, or qualities, especially so as to distinguish them as inferior or superior to one another.
- There is a permanent component of racism in American society and "statistics"
- During the eugenic movement, statistics were sometimes used to explain the inferiority of other races and to reinforce white supremist ideologies (Zuberi, 2001).

Tenet 2: Numbers are not Neutral

- Quantitative data are often viewed as objective or neutral. However, the data produced by human hands carry the ideologies, political entanglements, and sociohistorical baggage of those who created them.

Male–Female, White–Black, and White–Hispanic score gaps in fourth-grade mathematics increase compared to 2019

In 2022, the average mathematics score for male fourth-graders was 6 points higher than their female peers (compared to 3 points in 2019). Among racial/ethnic groups, the average mathematics score for White fourth-grade students was 29 points higher than their Black peers (compared to 25 points in 2019) and 21 points higher than their Hispanic peers (compared to 18 points in 2019).

Male–Female, White–Black, and White–Hispanic score gaps in fourth-grade mathematics increase compared to 2019

In 2022, the average mathematics score for male fourth-graders was 6 points higher than their female peers (compared to 3 points in 2019). Among racial/ethnic groups, the average mathematics score for White fourth-grade students was 29 points higher than their Black peers (compared to 25 points in 2019) and 21 points higher than their Hispanic peers (compared to 18 points in 2019).
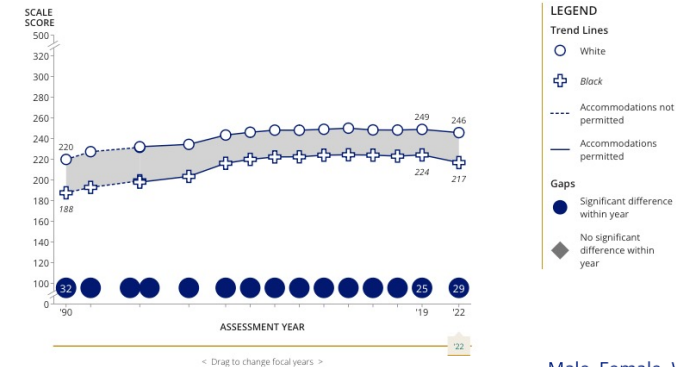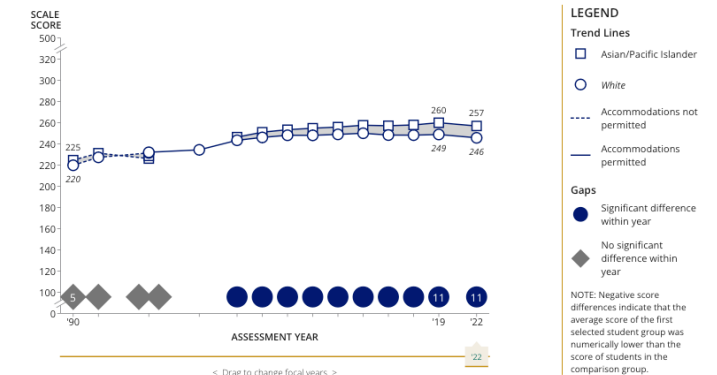
Tenet 3: Categories are neither 'natural' nor given

- A well-known feature of QuantCrit, along with many other approaches to understanding society, is that it recognizes that the categories humans call 'races' do not exist as meaningful or objective categories that can be used to divide participants into separate subgroups.

Figure 4: Educational Attainment, Bachelor's Degree or Higher

Group	
Asian Indian	56.3% / 57.1%
Cambodian	9.1% / 11.3%
Chinese	42.4% / 41.5%
Filipino	30.8% / 29.5%
Chamorro	4.7% / 8.3%
Hmong	9.2% / 23.7%
Japanese	43.0% / 42.2%
Korean	29.5% / 32.7%
Laotian	7.6% / 9.8%
Native Hawaiian	14.1% / 15.6%
Samoan	2.6% / 7.2%
Vietnamese	17.4% / 16.9%

WA State BA or Higher 32.1%

Source: U.S. Census Bureau, American Community Survey, 3-Year Estimates, 2006–2008 & 2011–

Tenet 4: Voice and Insight

- All data are socially constructed.

- Social research is shaped by researchers (and usually funders) who decide what to investigate, data collection methods, which participants to include, how to analyze the data, and what/how to report the results.

- Your "Voice and Insight" i.e., positionality and experiential knowledge matter!

KEY STEPS TO PERFORM A META-ANALYSIS

PLANNING
- Discuss the rationale and suitability of the research question
- FINER: Feasibility, Interesting, Novel, Ethical, and Relevant
- PICO(T): Population, Intervention, Comparator(s), Outcome(s) +/- Time
- Define protocol and register on PROSPERO

SEARCH STRATEGY
- It should be performed by an experienced medical librarian
- Combine controlled vocabulary/subject headings (e.g., MeSH for MEDLINE, EMTREE for Embase) and a comprehensive list of keywords/textwords
- Include multidisciplinary databases (e.g. MEDLINE, EMBASE, The Cochrane Library), as well as subject specific resources
- Search strategy must be published with the manuscript
- Use of tools such as PRESS checklist and the PRISMA-S increase search robustness

STUDY SELECTION AND QUALITY ASSESSMENT
- Inclusion criteria must be clearly stated and study selection should be reproducible
- Carefully choose the most appropriate tools for quality assessment of risks of bias

DATA EXTRACTION AND ANALYSES
- At least 2 authors should extract data independently
- The protocol should describe which data will to be extracted and how disagreements will be resolved
- Reasonability of pooling and choice of pooling model (fixed versus random effects) should be based on clinical and methodological homogeneity among studies

STATISTICAL HETEROGENEITY
- Statistical heterogeneity should be measured with established tools (I^2, Cochran's Q [χ^2]) and reported in addition to performing visual inspection with forest plots
- Significant degrees of statistical heterogeneity should be explored with subgroup analysis, sensitivity analysis, or meta-regression

PUBLICATION BIAS
- Perform a systematic search for all published and unpublished articles to reduce (or ideally eliminate) publication bias
- Funnel plots and associated statistical tests for publication bias may be included
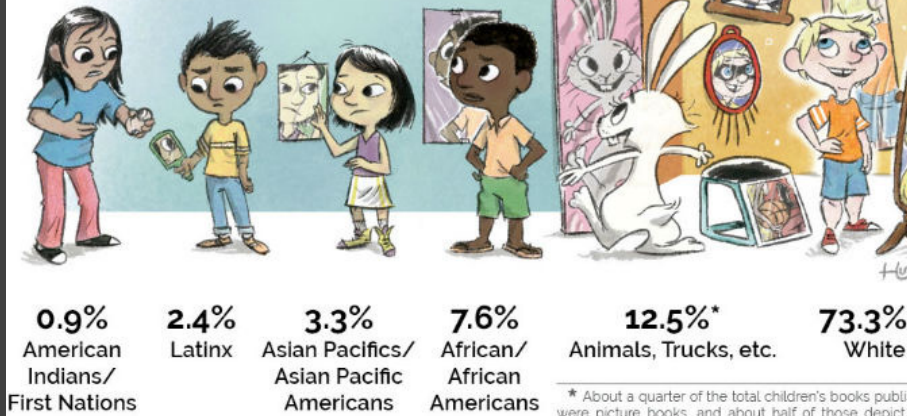
ALTERNATIVE STATISTICAL FRAMEWOKS/METHODS
- Alternative statistical frameworks (e.g. Bayesian) or more complex methods (e.g. Network meta-analyses, individual patient data meta-analyses) should be undertaken only with expert guidance

Diversity in Children's Books 2015

Percentages of books depicting characters from diverse backgrounds. Based on the 2015 publishing statistics compiled by the Cooperative Children's Book Center, School of Education, University of Wisconsin-Madison: ccbc.education.wisc.edu/books/pcstats.asp

0.9%	2.4%	3.3%	7.6%	12.5%*	73.3%
American Indians/ First Nations	Latinx	Asian Pacifics/ Asian Pacific Americans	African/ African Americans	Animals, Trucks, etc.	White

* About a quarter of the total children's books publis were picture books, and about half of those depict characters, like animals & trucks.
** The remainder depict white characters

Illustration by David Huyck, in consultation with Sarah Park Dahlen & Molly Beth Griffin
Released under a Creative Commons BY-NC-SA license: https://creativecommons.org/licenses/by-nc-sa/4.0/

DIVERSITY IN CHILDREN'S BOOKS 2018

Percentage of books depicting characters from diverse backgrounds based on the 2018 publishing statistics compiled by the Cooperative Children's Book Center, School of Education, University of Wisconsin-Madison: ccbc.education.wisc.edu/books/pcstats.asp

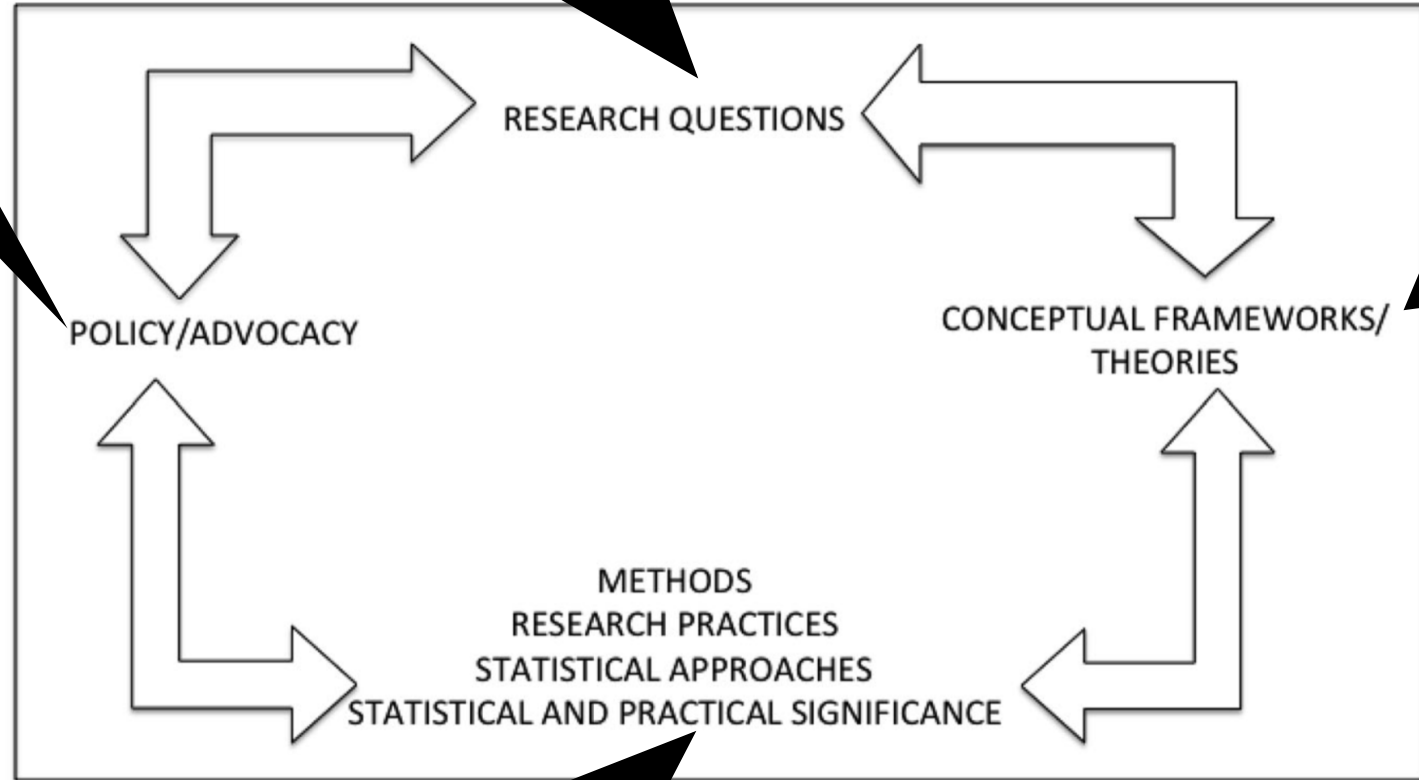| 23 BOOKS 1%	170 BOOKS 5%	218 BOOKS 7%	301 BOOKS 10%	864 BOOKS 27%	1,558 BOOKS 50%
American Indians/	Latinx	Asian Pacific Islander/Asian	African/ African	Animals/Other	White

Tenet 5: Using Numbers for Social Justice

- Social Justice defined
    - the equitable distribution of resources among members of a community and the respect of rights minoritized populations.
- The use of numbers for social justice should take a structural perspective, which views social, political, and economic structures as underlying the problems people face.

Critical Inquiry Framework

Tenet 5: Using Numbers for Social Justice

Tenet 1: Centrality of Racism

Tenet 2: Numbers are Not Neutral

RESEARCH QUESTIONS

POLICY/ADVOCACY

CONCEPTUAL FRAMEWORKS/ THEORIES

METHODS
RESEARCH PRACTICES
STATISTICAL APPROACHES
STATISTICAL AND PRACTICAL SIGNIFICANCE
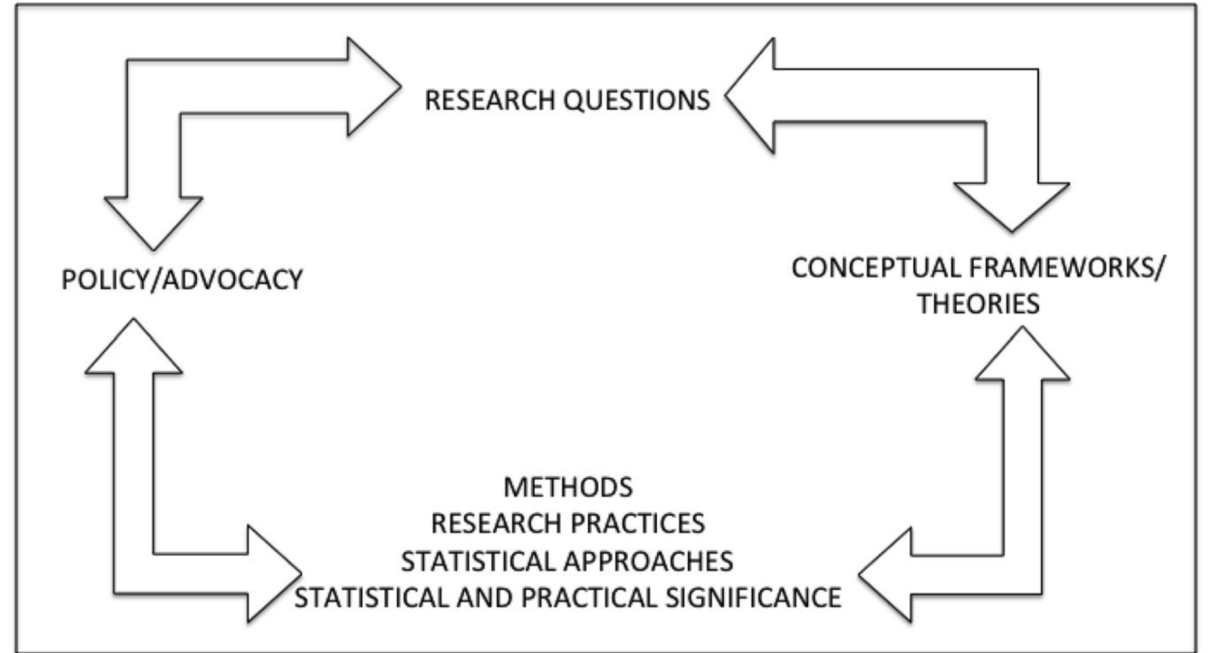
Tenets 3: Categories are neither 'natural' nor given
Tenet 4: Voice and Insight

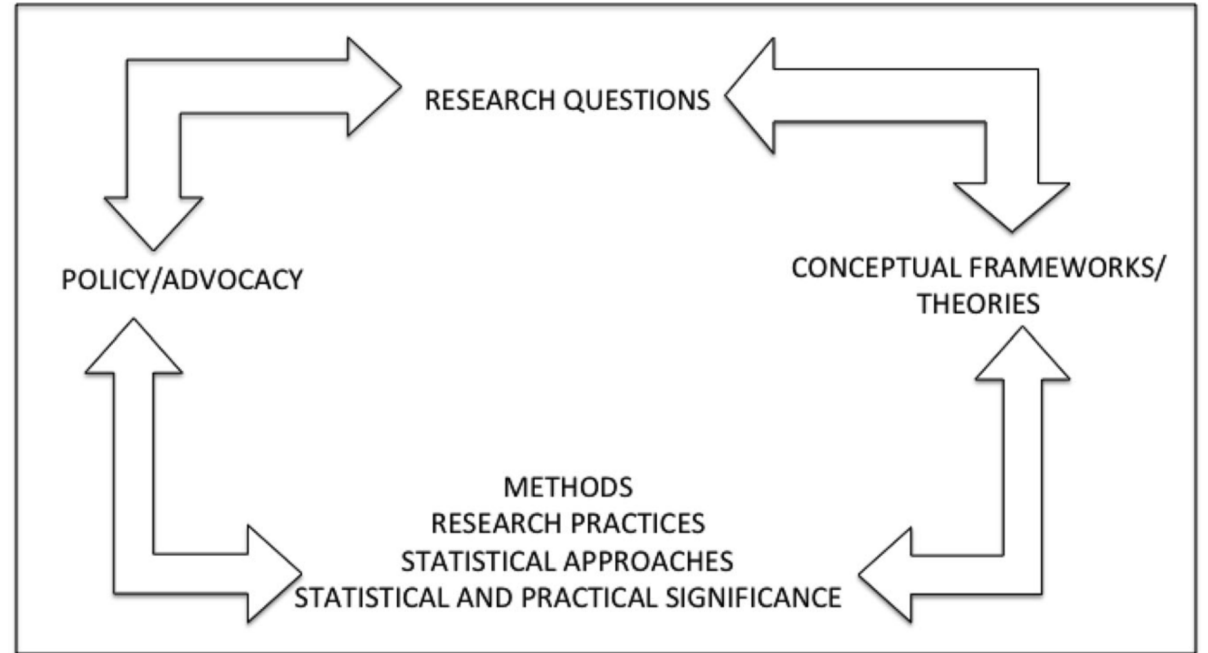# Tenet 1: The Centrality of Racism

- The *centrality of racism* must be considered when developing quantitative research questions.

- **Application** – Use Critical Race Theory (CRT) to critique you research question(s) in order to decenter racism.

RESEARCH QUESTIONS

CONCEPTUAL FRAMEWORKS/ THEORIES

METHODS
RESEARCH PRACTICES
STATISTICAL APPROACHES
STATISTICAL AND PRACTICAL SIGNIFICANCE

POLICY/ADVOCACY

Tenet 2: Numbers are Not Neutral

- The *underlying meaning* of numbers and data must be considered in conjunction with your positionality designing a research study.

- **Application -** During the problem development process, reflect on your positionality as it relates to problem under investigation and CRT.

RESEARCH QUESTIONS

CONCEPTUAL FRAMEWORKS/ THEORIES

POLICY/ADVOCACY

METHODS
RESEARCH PRACTICES
STATISTICAL APPROACHES
STATISTICAL AND PRACTICAL SIGNIFICANCE

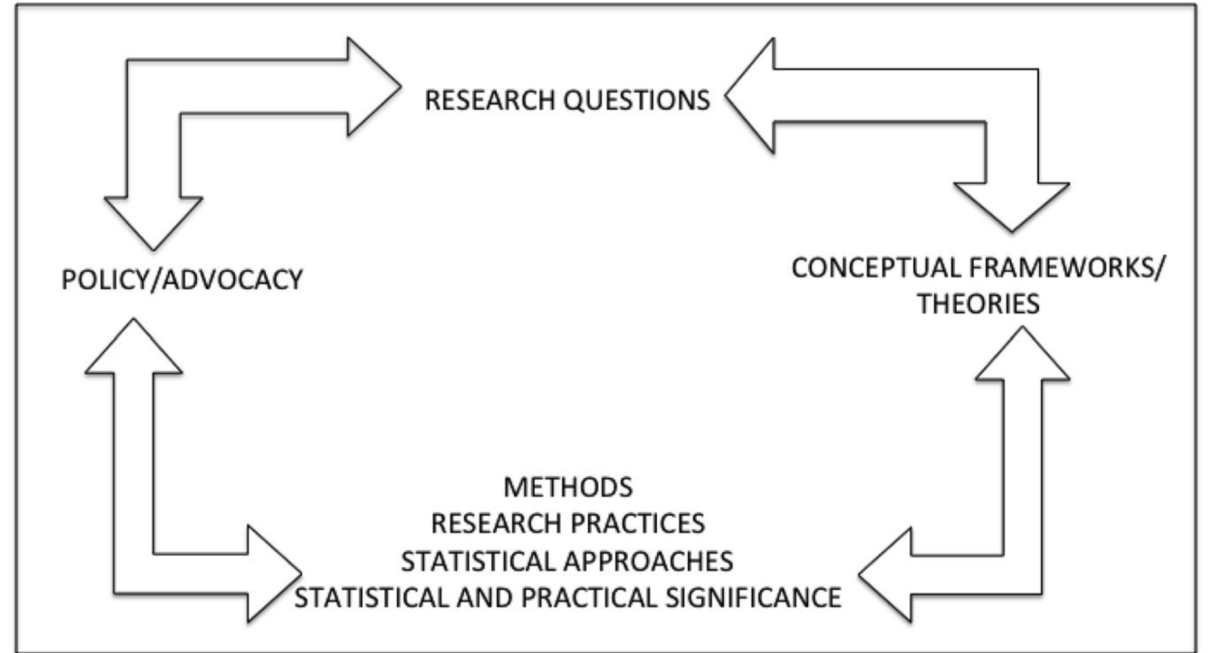# Tenet 3: Categories are neither natural nor given

- Because *categories are neither natural nor given* the operationalization and characterization of groups of participants should seek to highlight the diversity within the group.

- **Application** - Use the conceptual/theoretical definitions to identify conceptually relevant factors to investigate related to race, gender, and other diversity/equity related data

Tenet 4: Voice and Insight

- Because all data is social constructed research provide *voice and insight* as they decide how to analyze the data, report the results, and provide context through discussion

- **Application**– Be aware of your positionality as your experiences, beliefs, and circumstance will inherently determine how you handle your data.

RESEARCH QUESTIONS

CONCEPTUAL FRAMEWORKS/ THEORIES

POLICY/ADVOCACY

METHODS
RESEARCH PRACTICES
STATISTICAL APPROACHES
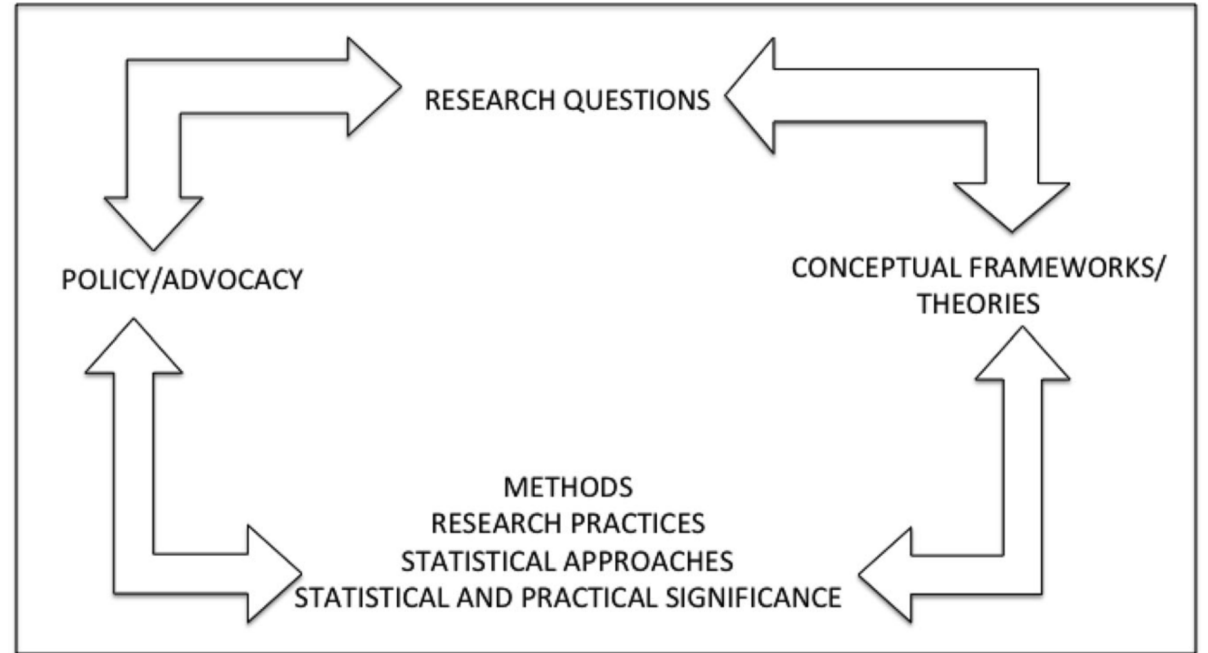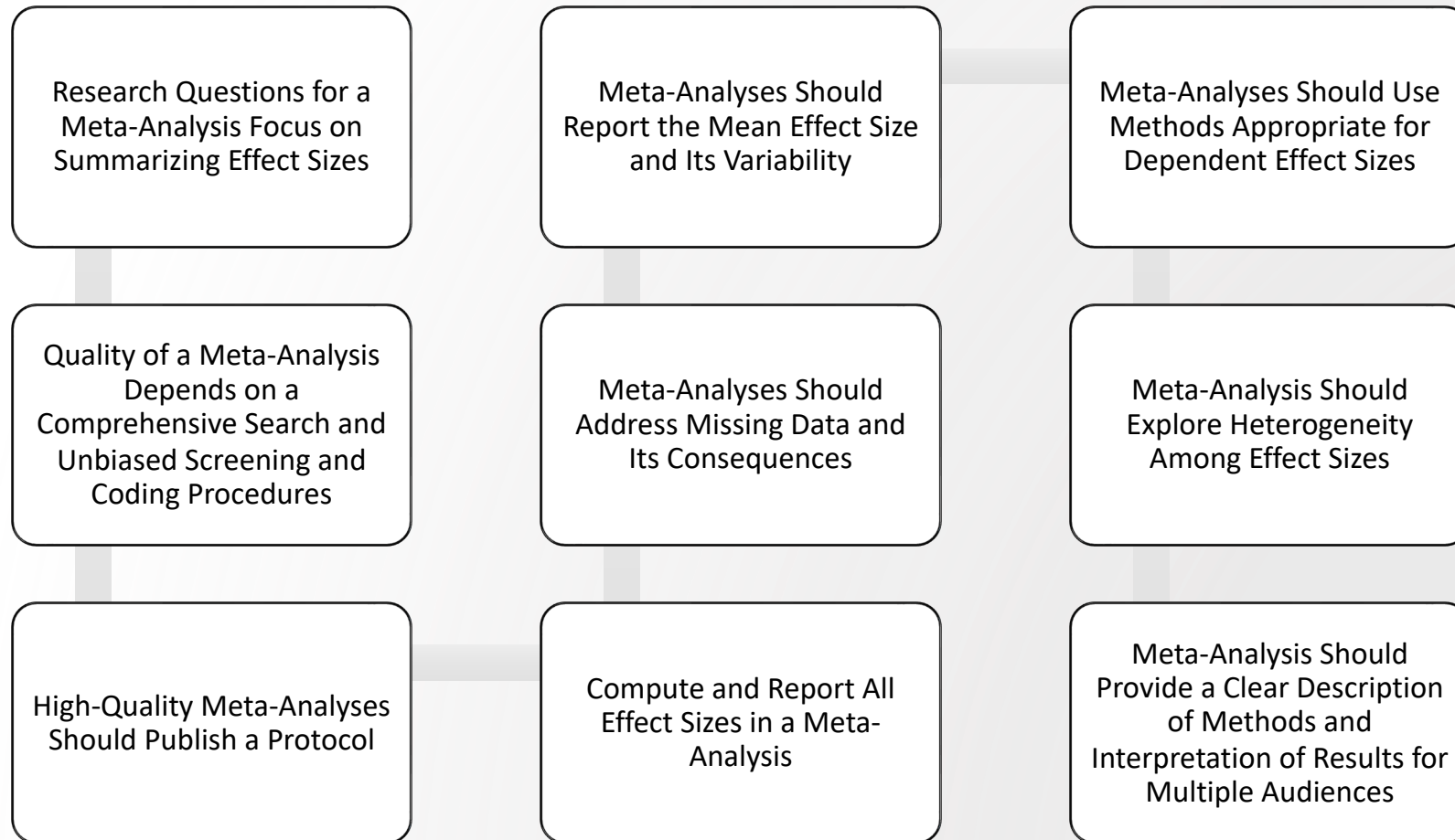STATISTICAL AND PRACTICAL SIGNIFICANCE

Tenet 5: Using Numbers for Social Justice

- Because all data is social constructed researchers should provide *voice and insight* as they decide how to analyze the data, report the results, and provide context through discussion.

- **Application** – The use of numbers for social justice should promote policy and advocacy that creates structural change.

Pro Tips for High-Quality Meta-Analysis in a Systematic Review (Piggott & Polanin, 2019)

Research Questions for a Meta-Analysis Focus on Summarizing Effect Sizes

Meta-Analyses Should Report the Mean Effect Size and Its Variability

Meta-Analyses Should Use Methods Appropriate for Dependent Effect Sizes

Quality of a Meta-Analysis Depends on a Comprehensive Search and Unbiased Screening and Coding Procedures

Meta-Analyses Should Address Missing Data and Its Consequences

Meta-Analysis Should Explore Heterogeneity Among Effect Sizes

High-Quality Meta-Analyses Should Publish a Protocol

Compute and Report All Effect Sizes in a Meta-Analysis

Meta-Analysis Should Provide a Clear Description of Methods and Interpretation of Results for Multiple Audiences

Tenet 1: The Centrality of Racism and Meta-analytic Studies

Research Questions for a Meta-Analysis Focus on Summarizing Effect Sizes

- Common Effect Size Summaries
  - Treatment effects
  - Differences Between groups
  - Associations
  - Prevalence of Phenomenon

What effect sizes are you summarizing?

- The *centrality of racism* must be considered in the problem formulation phase of your study.
- Decenter Racism when designing research questions.
- **Think "within" rather than "between"**

Tenets 2 & 3: Numbers and Categories are Not Neutral

Coding Important Moderators of Effect Size Variability

- Provide Rational for Coding Schema
- "Clearly state a priori hypotheses about why effect sizes vary across studies and provide a clear analysis plan that includes these moderators" (Piggott & Polanin, 2019, p. 29)

What is the rationale for your Coding Schema?

- The *underlying meaning* of numbers and data must be considered when defining concepts and inclusion criteria for a Meta-analysis – Think whose numbers are these
- Because *categories are neither natural nor given* the operationalization and characterization of concepts needs to considered in the data extraction/coding process
- Use the conceptual/theoretical definitions to identify conceptually relevant data for extraction and coding related to race, gender, and other diversity/equity related data
- **Use CRT and other Equity-focused theories to develop a rational for your coding schema**

Tenet 4: Voice and Insight

Meta-analytic Data Analysis Best Practices

- Compute and Report All Effect Sizes in a Meta-Analysis
- Meta-Analyses Should Address Missing Data and Its Consequences
- Meta-Analyses Should Report the Mean Effect Size and Its Variability
- Meta-Analyses Should Use Methods Appropriate for Dependent Effect Sizes
- Meta-Analysis Should Explore Heterogeneity Among Effect Sizes

Considerations for Meta-analytic data analysis and Reporting

- Computing effect sizes for data for traditionally minoritize people of color will likely come from larger non-equity focused projects so these data are likely dependent effect sizes (treat them accordingly)!
- Many of the important moderators derived from your "voice and insight" will not be provided in primary studies
- **Be aware of the affordances and constraints of your positionally as you provide "Voice and Insight"**
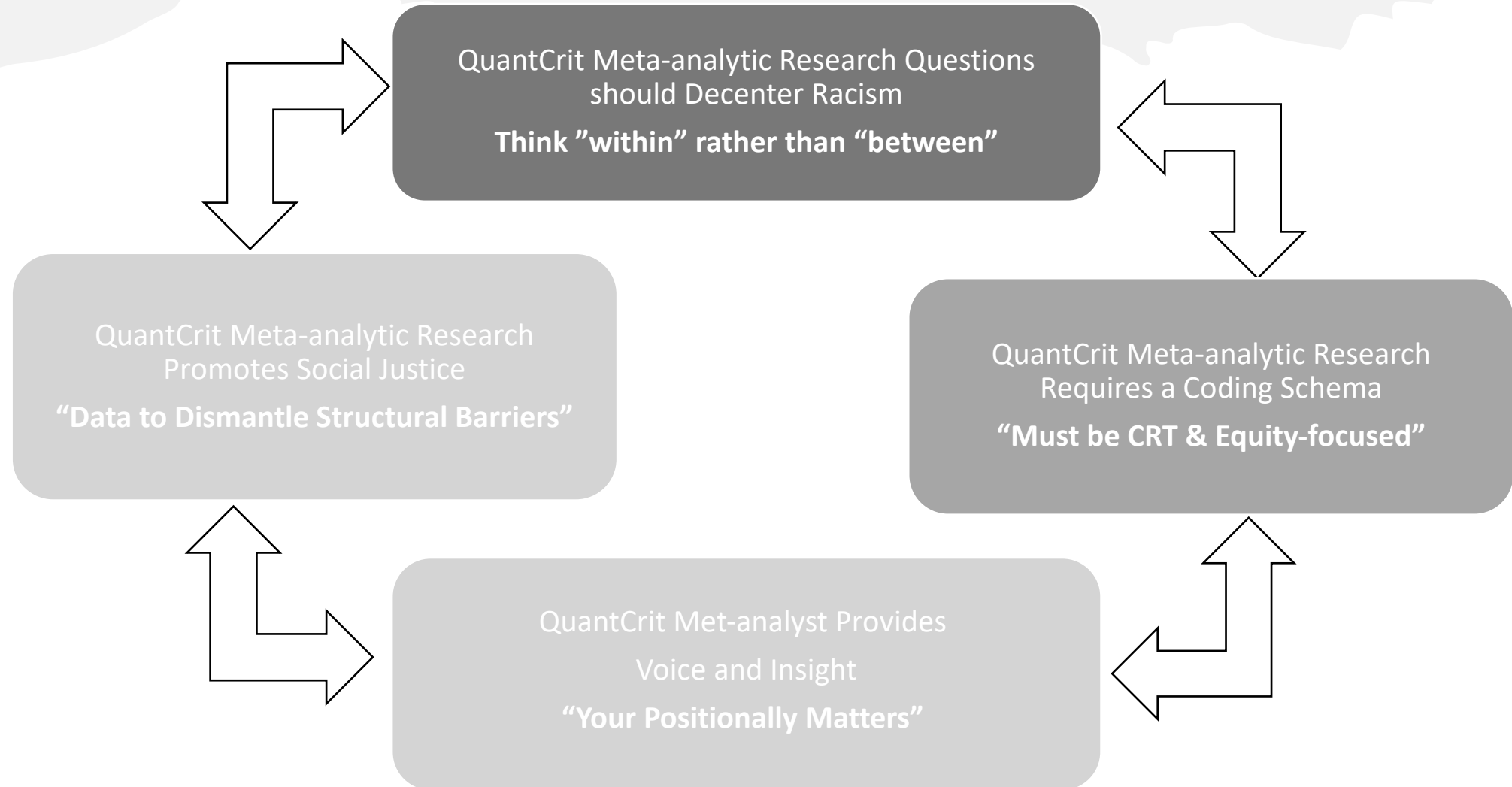
Tenet 5: Using Numbers for Social Justice

Meta-Analysis Should Provide a Clear Description of Methods and Interpretation of Results for Multiple Audiences

- Publish a protocol/Meta-Analysis Data and Analysis Code
- Interpreting the Meta-Analysis Results and Their Limitations
  - (a) effect size transformation,
  - (b) moderator or covariate description, and
  - (c) audience translation.

Using Meta-analytic Data for Social Justice

- Each one, Reach one, Teach one
- Transforming effect sizes back to natural metrics is essentially cracking the code for non-research professionals
- **Translating the results of meta-analysis for multiple audiences is the key to using meta-analytic data for social justice**

Summary: A Framework for Meta-analytic QuantCrit

Questions