The Affordances Model for Understanding Population Disparities in Physical and Mental Health



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The Extraordinary Science of Addictive Junk Food NY Times, February 24, 2013

"Food companies and the public have known for decades that sugary, salty, fatty foods are not good for us in the quantities that we consume them. Why, then, are the epidemics of diabetes and obesity still out of control?"

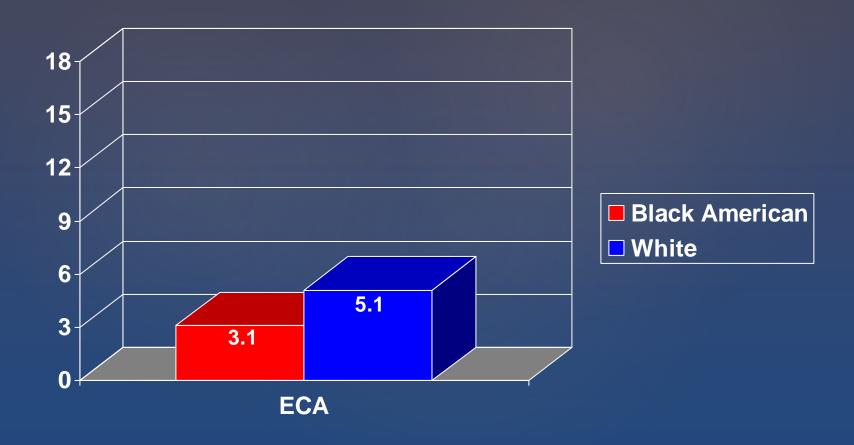
Broad Dimensions of This Talk

- Ubiquitous Effects of Chronic Stressors and Stress
- Disparate Racial Group Differences in Material Well-Being
- Racial Group Disparities in Physical and Psychiatric Health Statuses
- The Role of Motivation, Self-Regulation and Other Psychological Processes in Health
- The Masquerade of Racial Group Differences

Admissions per 100,000 by Race, Ethnicity & Type of Facility

Population	Total	State Hospital	Private Hospital	General Hospital	Veterans Hospital
All Groups	593.0	163.6	62.6	295.3	70.4
African- American	931.0	364.2	62.9	386.6	118.2
American Indian	818.7	306.4	41.2	371.6	99.2
Asian	268.1	75.4	25.0	161.0	6.6
Hispanic	452.3	146.0	34.4	227.0	44.1
White	550.0	136.8	63.4	284.9	67.9
					1/1/2007

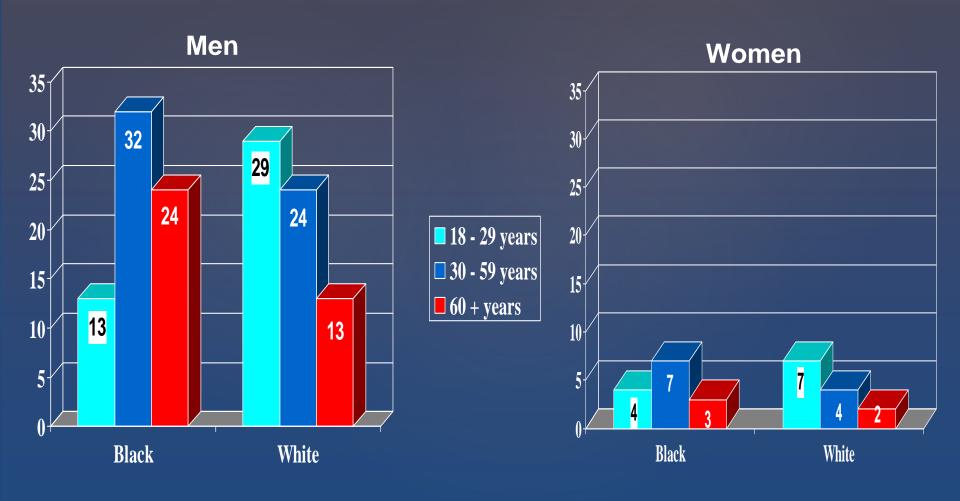
Lifetime Prevalence Rates: Major Depression by Race (in percentages)



Source: ECA, Epidemiologic Catchment Area Study, *Psychiatric Disorders in America*, 1991. *ECA does not distinguish between African American respondents and Caribbean respondents.

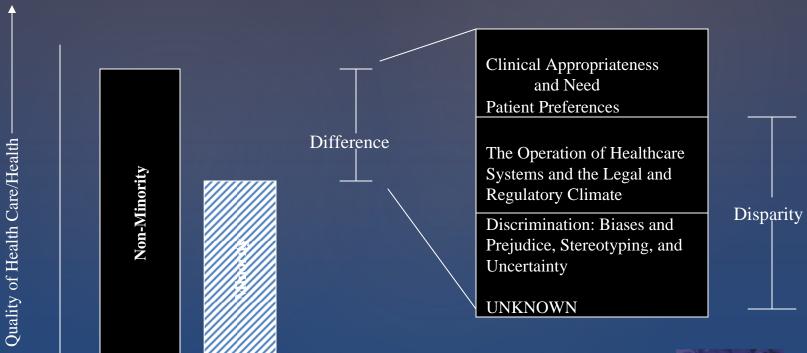
Rates of Lifetime Alcohol Disorders for All Epidemiologic Catchment Areas Combined

(in percentages)



Source: Robins, 1989. Jackson, Williams & Williams, 1998

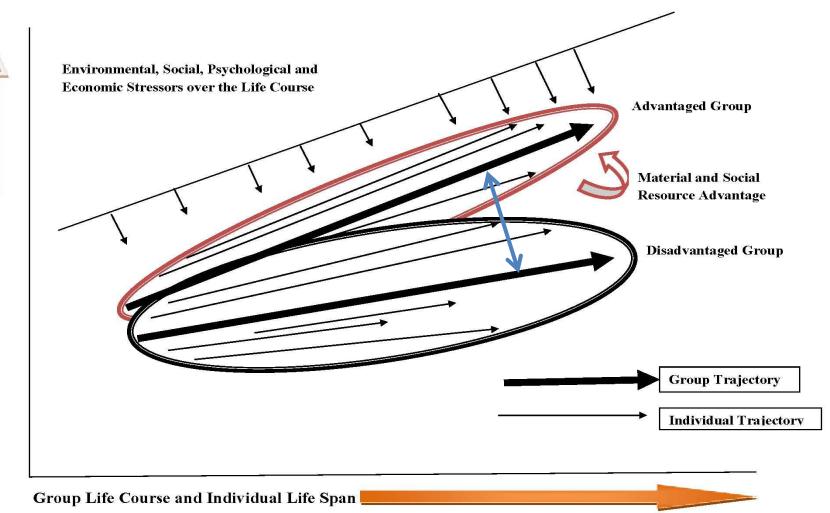
Figure 1: Differences, Disparities, and Discrimination



Populations with Equal Access to Health Care



Figure 1: Group Life Course and Individual Life Spans of Members of Advantaged and Disadvantaged Groups

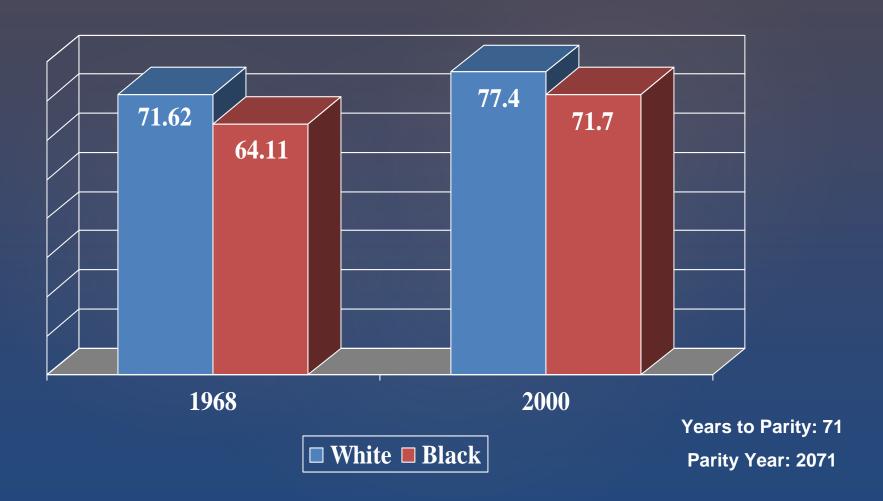


Social Inequalities and Health

Race Matters

Even if we don't know what "IT" is

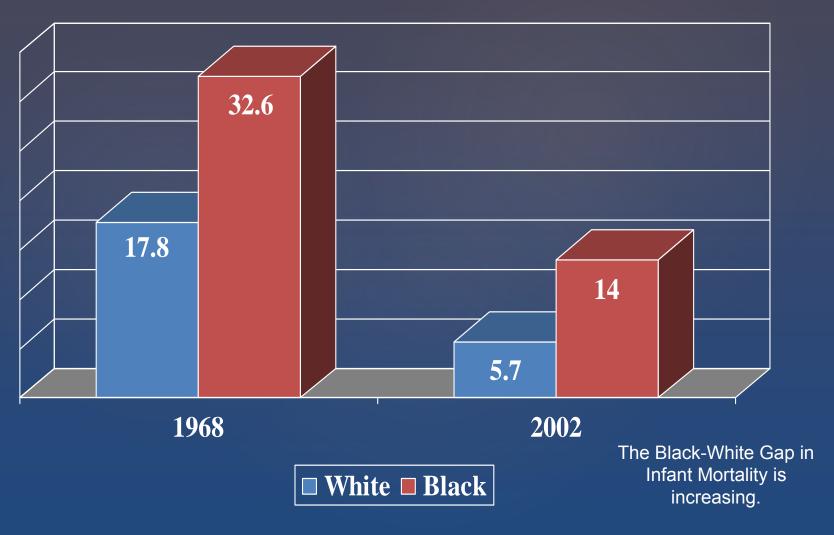
Life Expectancy at Birth, 1970 and 2000



Source: National Center for Health Statistics, National Vital Statistics Reports, Dec. 19, 2002, Table 11. State of the Dream 2004 Report

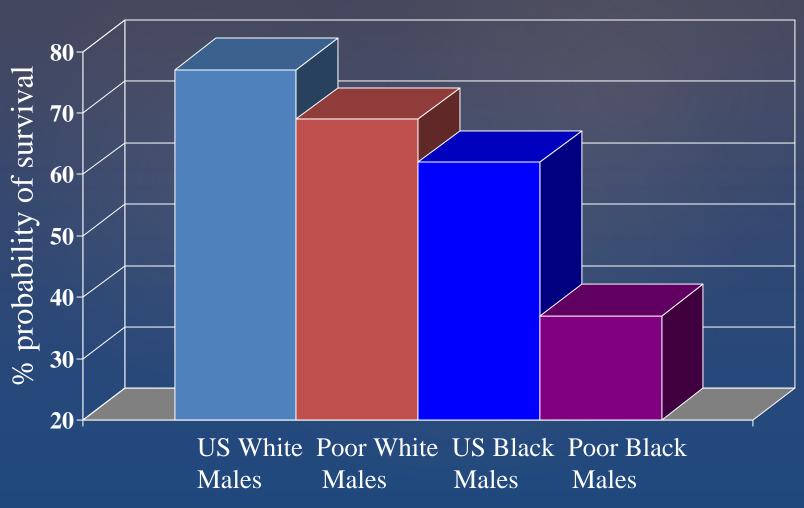
Infant Mortality Rate, 1970 and 2001

(Deaths per 1,000 live births)



Source: National Center for Health Statistics, National Vital Statistics Reports, Sept. 18, 2003, Table 31. State of the Dream 2004 Report

Probability of Survival From Age 15 to 65 Years Among US Blacks & Whites



Geronimus et al, NEJM 1996

Chronic Stress Process: One Possible
Pathway for Physical and Mental Health
Disparities Among Racial and Ethnic
Minorities

Law of Small Effects in Race Related Outcomes (Jackson, 2004)

There is no one single factor that produces observed physical and mental health disparities in process and outcomes among racial and ethnic groups in U.S.

Group of small differences that accumulate over the life-course to produce observed differences in adulthood and older ages among different race and ethnic groups

Some Candidates

- Gene/gene and gene/environment interactions
- Discrimination and perceived racism (stress process)
- Cultural factors
- Behavioral differences
- SES and institutional arrangement
- Social & Psychological Factors (e.g. John Henyrism, Self-efficacy, mastery, etc).

- Life-Course Selection
- Accumulated Treatment Differences (e.g. Weathering Geronimous, Allostatic Load McEwen, etc.)
- Culturally & Environmentally Mediated Behavioral Coping Strategies

We cannot easily parse these potential effects into their constituent parts and assign individual contributions There are Large Disparities in Living Arrangements favoring non-Hispanic Whites

Negative Neighborhood Characteristics

Neighborhood Segregation & Health (LaVeist & Wallace, 2000; Roux, et al, 2002; Roux & Mair, 2010)

Differentially Stressful (e.g. Do, 2009; Roux et al, 2001; 2002; Geronimous & Thompson, 2004; Massey, 2004)

Neighborhood Affordances*

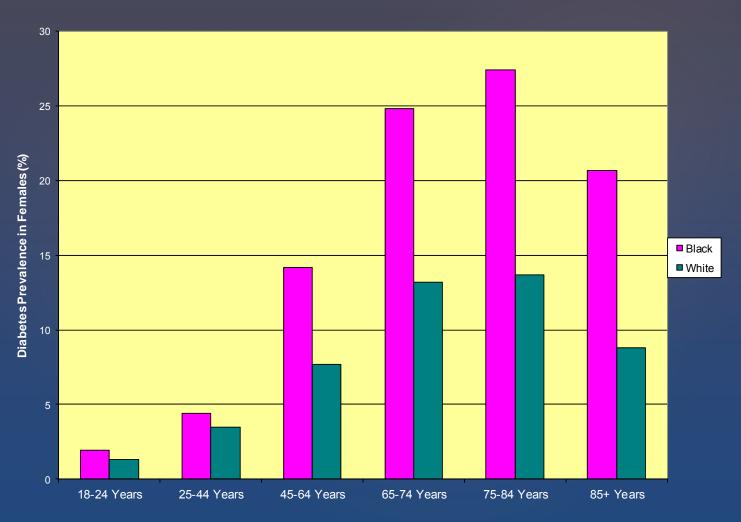
- Afford Differential Opportunities, e.g. food, services, jobs (e.g. Dave & Kelly, 2010; Morland, et al, 2001; 2002; Wing et al, 2002)
- Afford Differential Coping Resources (e.g. Fast Food Outlets, Liquor Stores, Illegal Drug Distributors, etc. Cutler & Glaeser, 2005; Roux, 2002)

Starting Epidemiological Paradox

 Disparities in physical health favor whites (vs. blacks) (Jackson & Knight 2006; Massy 2004);

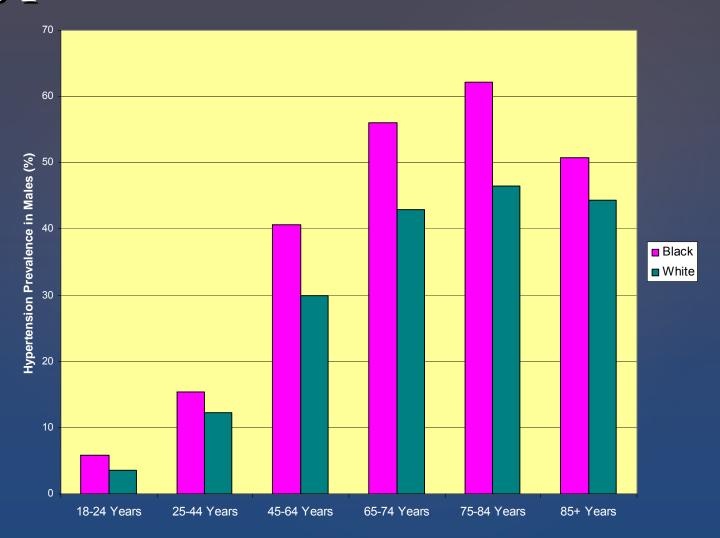
Disparities in mental health, generally, favor blacks (vs. whites) (Jackson 2009; Williams et al. 2007; Breslau et al. 2005)

Diabetes – Females 2004-2005



Prevalence of Selected Chronic Conditions by Age, Sex, and Race/Ethnicity: United States, 1997-2005. National Health Interview Survey (NHICO5)

Hypertension – Males 2004-2005



Prevalence of Selected Chronic Conditions by Age, Sex, and Race/Ethnicity: United States, 1997-2005. National Health Interview Survey (NHICO5)

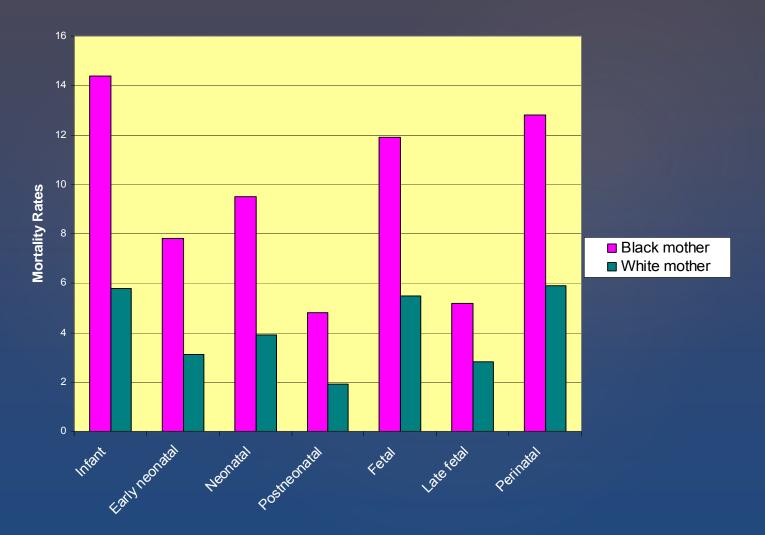
Health Disparities by Age, Aging and the Life-Course

- There are links from childhood (infancy, neonatal, pregnancy, etc.) social conditions to race/ethnic disparities in adulthood and older age (e.g. Umberson, et al, 2006; Warner & Hayward, 2003)
- Over the life course blacks more than any other group live the fewest years and a high proportion of these years is in poor health (e.g. Hayward & Heron, 2002)
- Health, race, ethnicity and mobility (SES) are linked in complex ways across childhood, adolescence, adulthood, and old age (e.g. Hayward et al, 2003; Whitfield & Hayward, 2003; Crimmins et al, 2000; Crimmins & Saito, 2001)

Pregnancy to Death

Blacks May be More Highly Selected for Positive Health Than Whites Early in Life and Late in Life (Barker, 2007; Jackson et al, 2011; McMillen et al, 2007)

Infant, Fetal, & Perinatal Mortality Rates - 2002



Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System: Hoyert DL, Heron M, Murphy SL, Kung HC. Deaths: Final data for 2003. National vital statistics reports. Vol 54.

Hyattsville, Maryland. National Center for Health Statistics. 2006; and unpublished numbers.

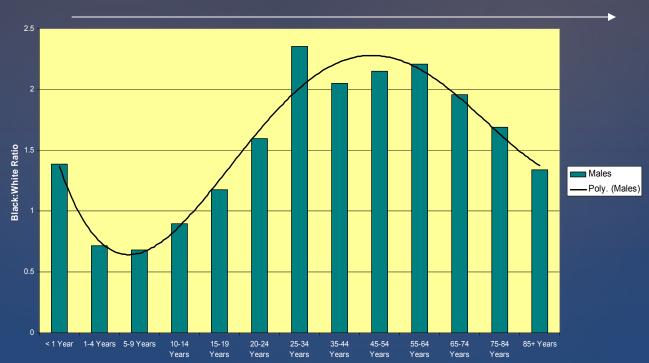
Endocrine, Nutritional, and Metabolic Diseases <u>Females</u> 1999-2004



Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1999-2004. CDC WONDER On-line Database, compiled from Compressed Mortality File 1999-2004 Series 20 No. 2J, 2007.

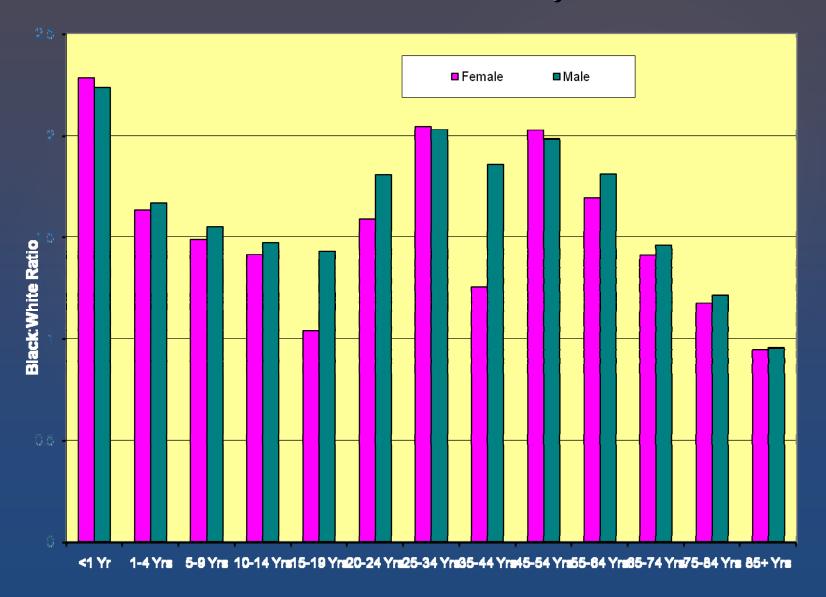
Endocrine, Metabolic, and Nutritional Diseases Males 1999-2004

Stressors



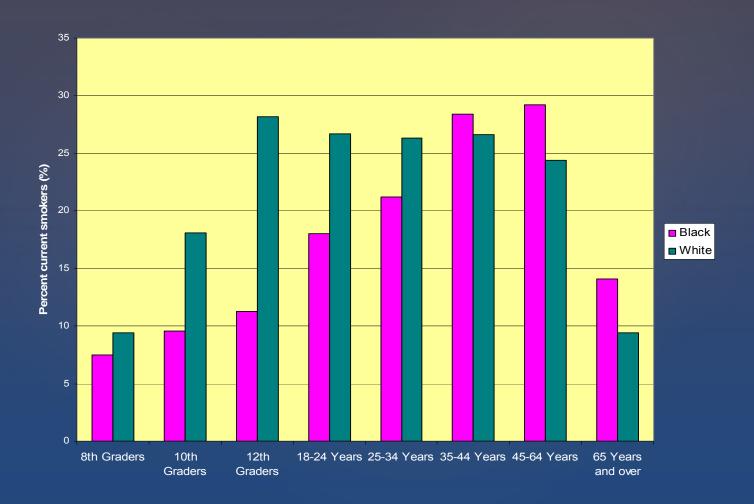
Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1999-2004. CDC WONDER On-line Database, compiled from Compressed Mortality File 1999-2004 Series 20 No. 2J, 2007.

All-Cause Mortality



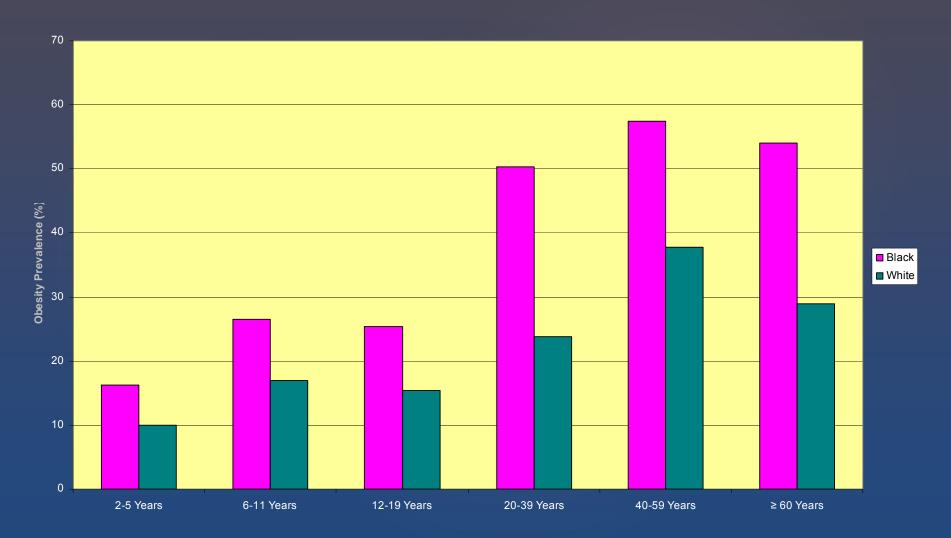
Poor health behaviors parallel the racial and ethnic group disparities found in health statuses (Cawley & Ruhm, 2011; Komlos & Brabec, 2011)

Smoking among Males - 2004



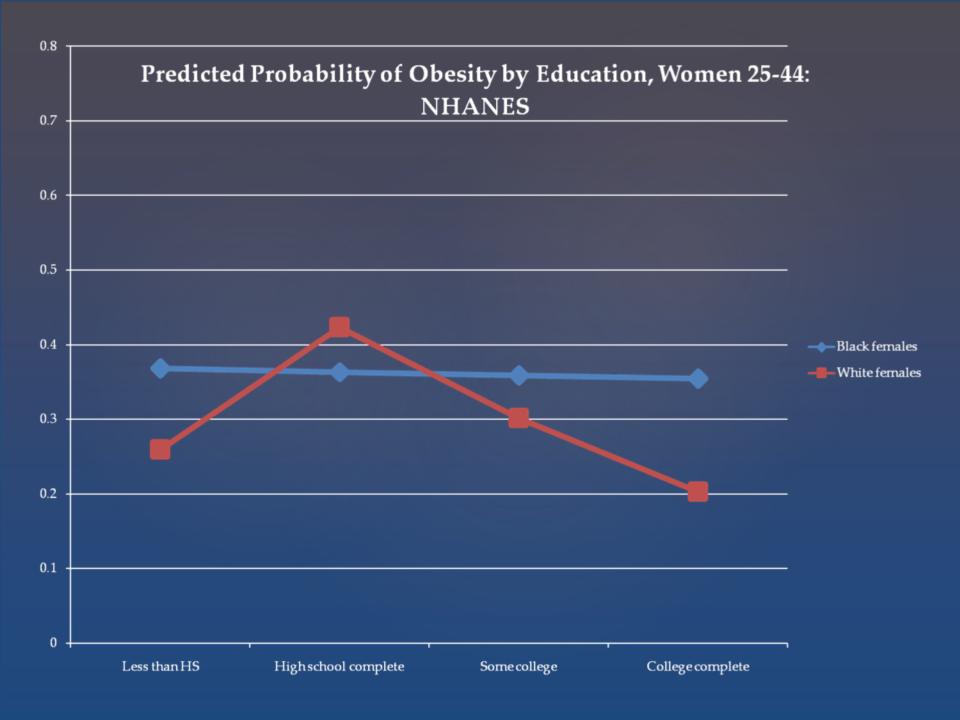
National Center for Health Statistics Health, United States, 2006 With Chartbook on Trends in the Health of Americans. Hyattsville, MD: 2006, Charts 63 and 67

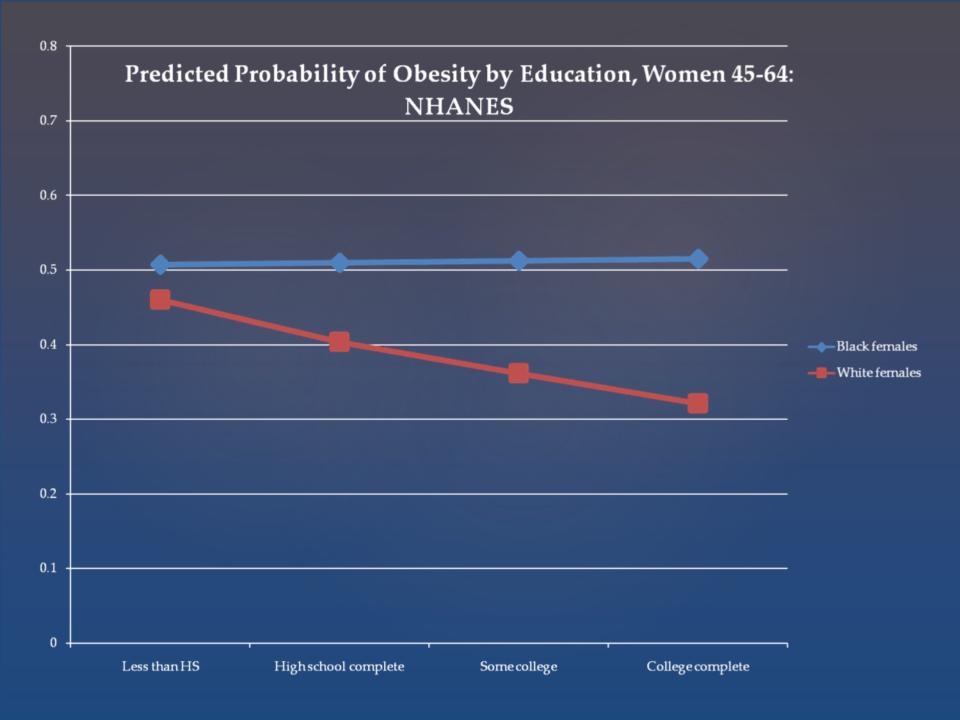
Obesity – Females 2003-2004

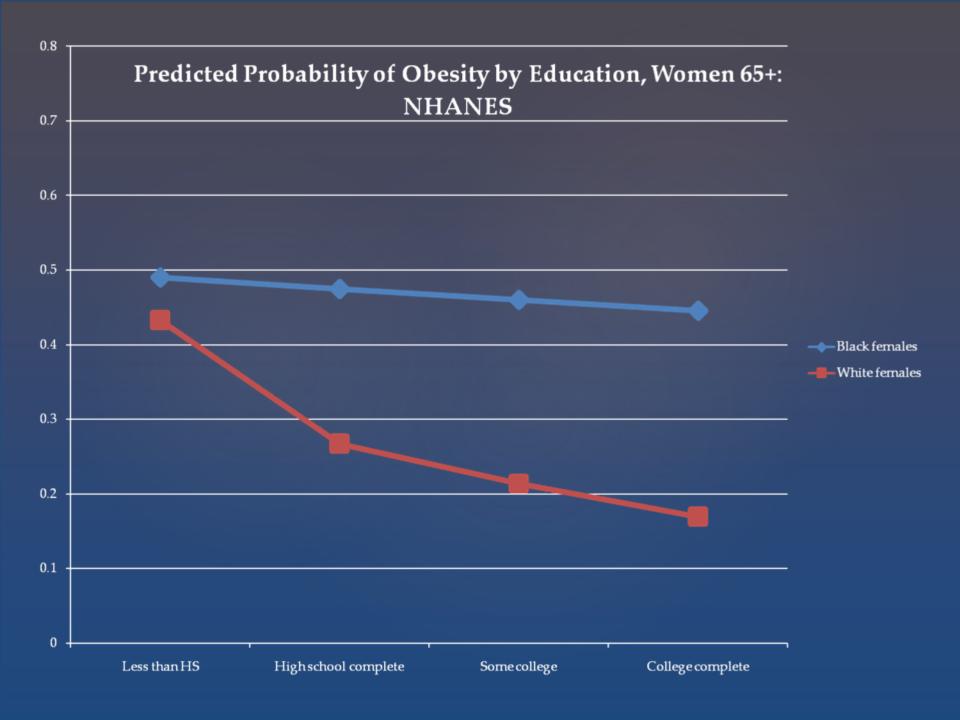


Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004. JAMA 295:1549-1555. 2006.

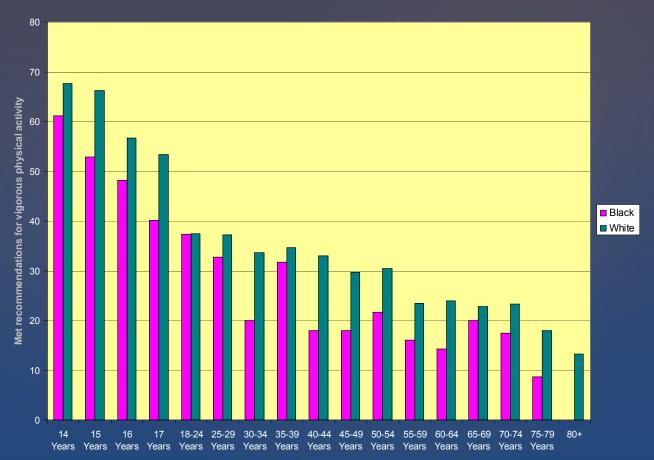
National Health and Nutrition Examination Survey (NHANES)







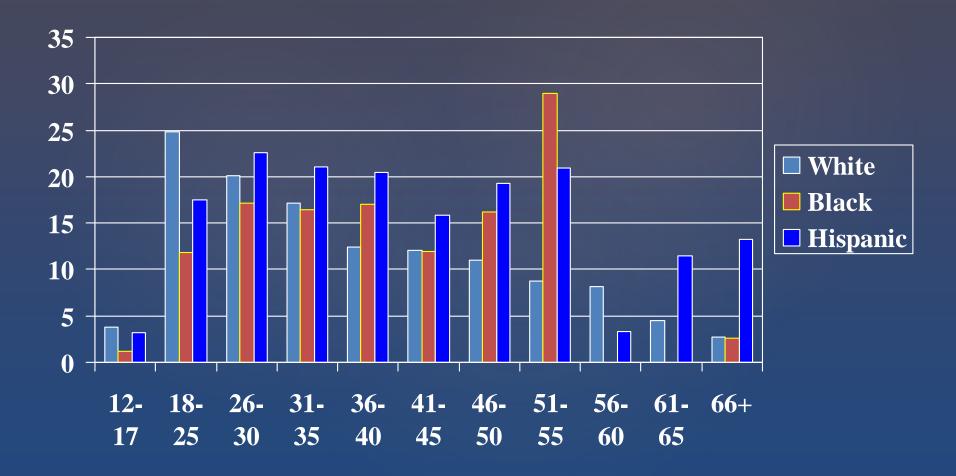
Vigorous Physical Activity – Females 2005



Centers for Disease Control and Prevention (CDC). *Youth Risk Behavior Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005

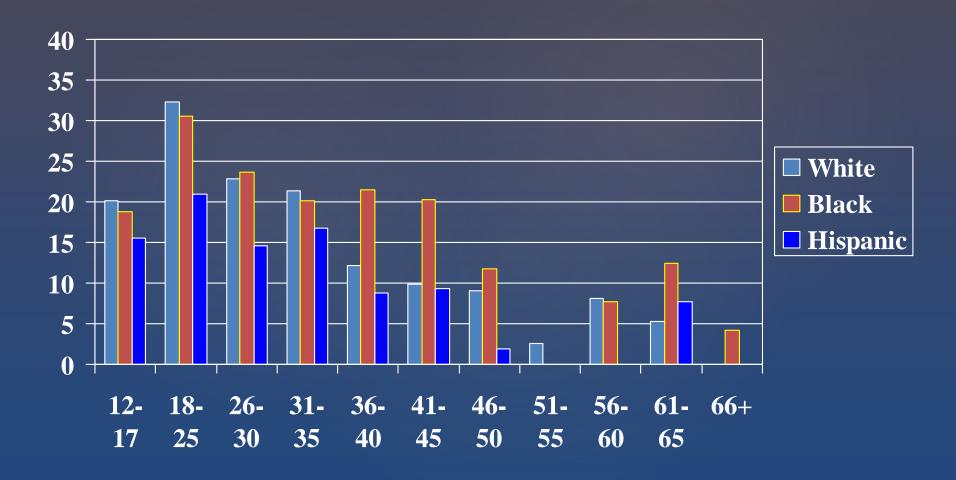
Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005

Percentage of Males Reporting Heavy Alcohol Use, by Age Group and Race
National Household Survey on Drug Abuse, 1992



NOTE: Heavy alcohol use is defined as drinking five or more drinks per occasion on 3 or more days in the past 30 days.

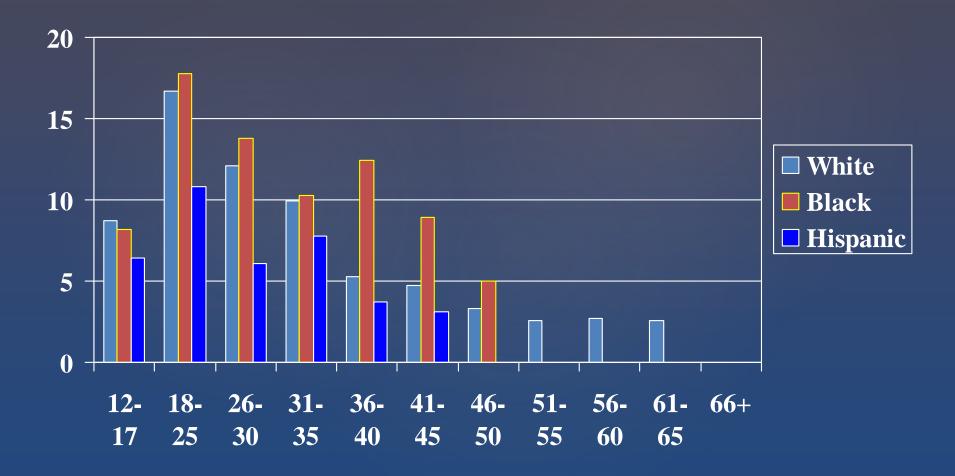
Percentage of Males Reporting Drug Use, by Age Group and Race
National Household Survey on Drug Abuse, 1995



NOTE: Drug use is defined as the use of any illicit drug in the past year.

Percentage of Males Reporting Marijuana Use, by Age Group and Race

National Household Survey on Drug Abuse, 1995

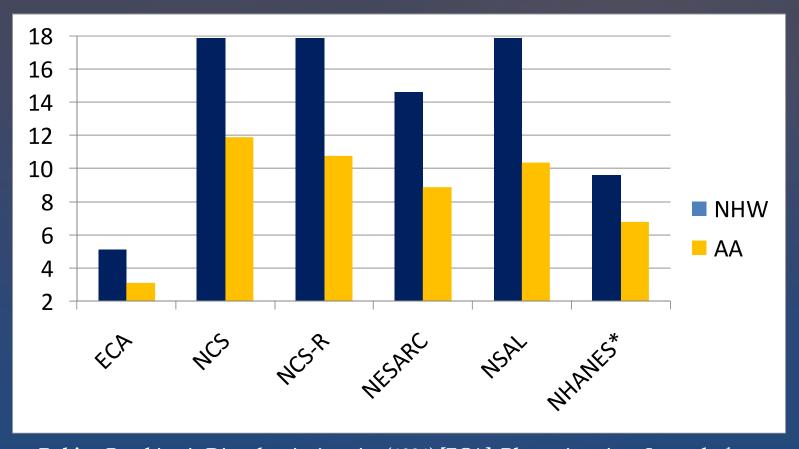


NOTE: Marijuana use is defined as the use of marijuana in the past 30 days.

Mental Health Disparities

In comparison to health statuses, mortality, and poor health behaviors, prevalence rates for major psychiatric disorders reveal very few, if any, black/white disparities favoring whites, and for most lower prevalence rates for African Americans (Jackson, Williams & Gomberg, 1998; Williams, 2007)

Lifetime Prevalence Rates of Major Depressive Disorder



From Robins Psychiatric Disorders in America (1991) [ECA], Blazer American Journal of Psychiatry (1994) [NCS], Breslau Psychological Med (2006) [NCS-R], Has in Arch Gen Psychiatry (2005) [NESARC], Williams Arch Gen Psychiatry (2007) [NSAL], and Jonas ,Social Psychiatry, Psychiatric Epidemiology (2003) [NHANES]. *Lifetime MDE not MDD

Suggests that socioeconomic status alone cannot explain disparities

Description of Disparities is Not Enough – Need Theoretically Driven Research

An Example

The Self-Regulation of Health Behaviors

The Interrelationships among Physical and Mental Health Disparities (Dave et al 2011)

 The Utilization of Stress Coping Mechanisms Over the Life-Course (Umberson et al, 2006)

A Possible Framework

- Structural life inequalities are hypothesized to "cause" both health and mental health disparities
- Structural life inequalities in income, wealth, employment and educational opportunities are large and unfavorable for African Americans and variable for other minorities
- Physical health disparities and mortality outcomes are large and unfavorable for African Americans and other minorities
- Mental disorder disparities in comparison to whites are small and often favorable for African Americans, but variable for other groups

WHY?

- Coping strategies in the face of non-race, and race specific, stressors may themselves be harmful to health (Jackson, 2002; Jackson & Knight, 2006)
- Stress-related precursors of serious mental health problems are more available to consciousness than are those of physical health problems
- This psychological awareness motivates individuals to action
- For example, Dallman et al (2003) suggested that people eat comfort food to reduce activity in the chronic stress-response network (Cannetti, et al, 2002)
- It is proposed that other behaviors, e.g. smoking, alcohol and drug use have similar, immediate, effects to reduce activation of the stress-response network

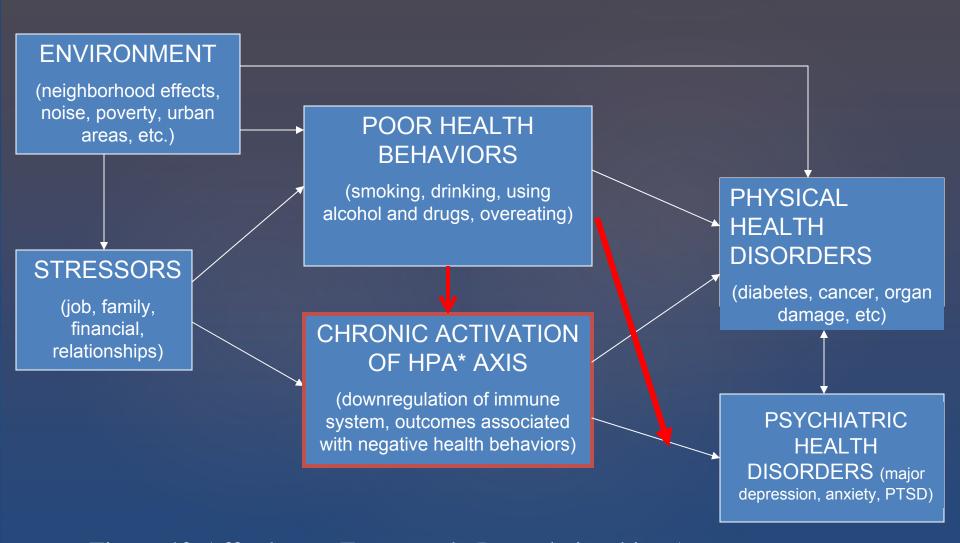
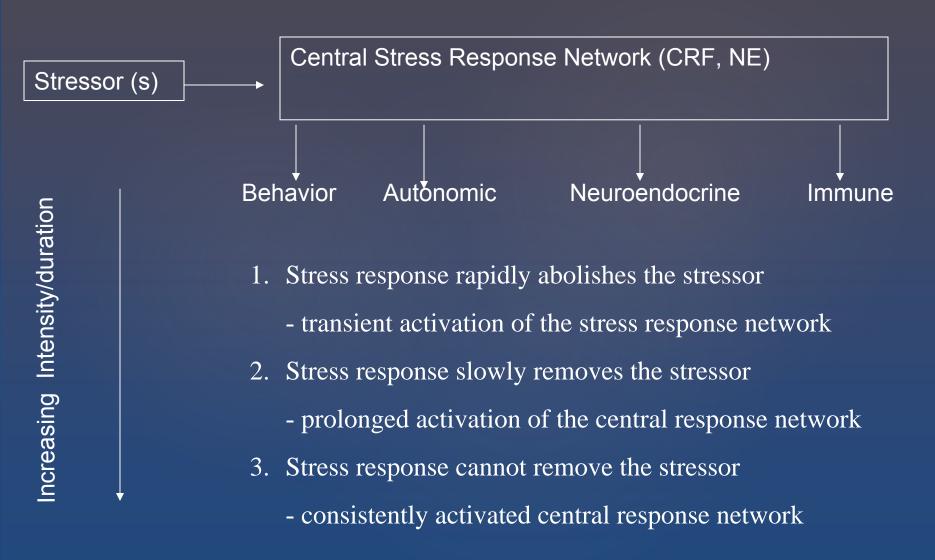


Figure 4f: Affordances Framework: Interrelationships Among Environment, Stressors, Negative Health Behaviors and Physical and Mental Health Disorders (Jackson & Knight, 2006; Jackson, Knight, & Rafferty, 2010, AJPH) *hypothalamic-pituitary-adrenal

Hypothesized Effects Through the HPA Axis

- Complex interactions between endocrine and neurological systems (Sapolsky)
- Under chronic stress negative feedback breakdown and there is continued release of CRF and cortisol
- Long term chronic activation of HPA axis may be related to etiology of some mental disorders (Barden, 2004; McEwen, 1989; Young et al, 2004a; 2004b; Vreeburg, et al, 2009)

Figure 3: "Adaptation?" (Dallman, 2003)



HPA Axis and Consequences of Poor Health Behaviors

- Comfort Foods (high in fats and carbohydrates) may aid in shutdown of stress response by inhibiting release of CRF (e.g. Dallman et al)
- Alcohol, nicotine, and drug use stimulate release of dopamine and beta-endorphins aiding in shutdown of stress response and leading to feelings of relaxation and calm (e.g. Akil & Cicero; Piazza & LeMoal; Marinelli & Piazza).
- Paradoxically these drugs may also further activation of the HPA axis – thus individuals may be psychologically released from stress, but they are not physically released from the effects of stress (Dallman, 2003)

General Hypotheses

- Weak: Poor health behaviors mask the stress response cascade of neural and hormonal events that have long-term effects on the development of mental disorders. Individuals are not able to report on stress-related symptoms that are ameliorated by poor health behaviors, though the physical cascade continues.
- Strong: Poor health behaviors through their actions on the HPA axis and other brain hormones actually interfere with the cascade of neural and hormonal events that ordinarily would lead over time to mental disorders.

An Example

Americans Changing Lives (ACL)

Panel Study: Waves I-IV 1986-2003

Analytic Variables

Negative Structural Conditions and Controls (Wave I)

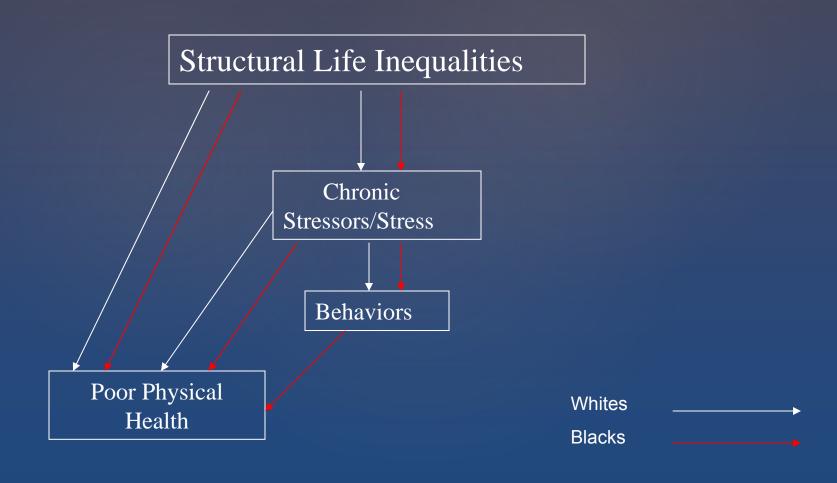
Gender, Age, Region, Education, Occupational and Employment Status, Family Income, Poverty

Negative Stressful Events (count) (Wave I) Serious illness, moved, lost job, robbed, anything else bad

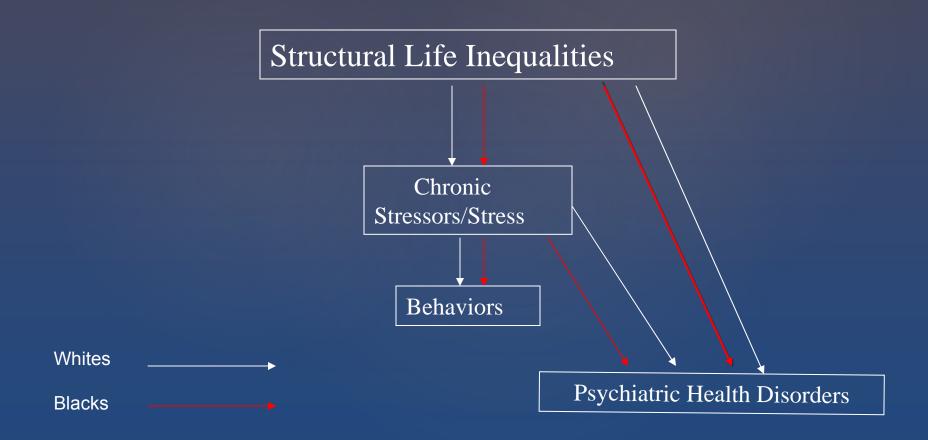
Analytic Variables

- Poor Health Behaviors (count) (Wave I)
 Currently smoke, ever smoke, drink, BMI
- Poor Self-Reported Health (Wave II)
- Poor Chronic Health (count) (Wave II)
 Arthritis, lung disease, hypertension, diabetes, etc.
- DSM IIIR Depression (Wave II)
 Early Version of Composite International Diagnostic Instrument – WHO-CIDI

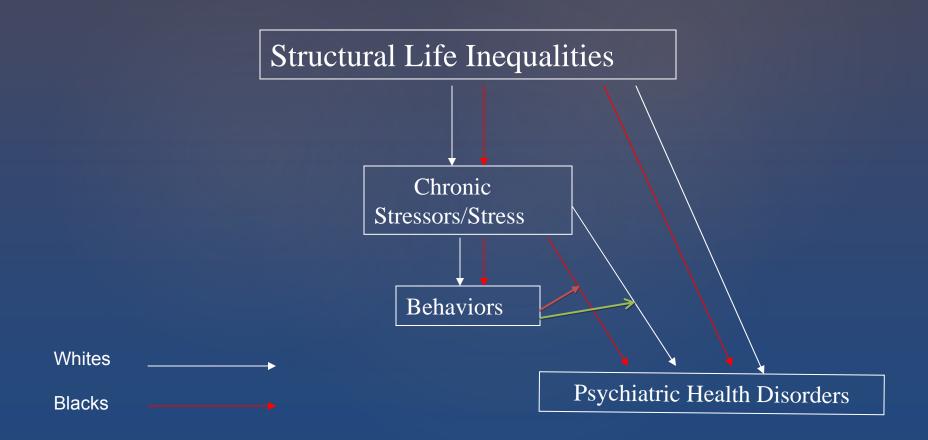
Relationships Among Structural Life Inequalities, Chronic Stress, Negative Behaviors and Poor Physical Health



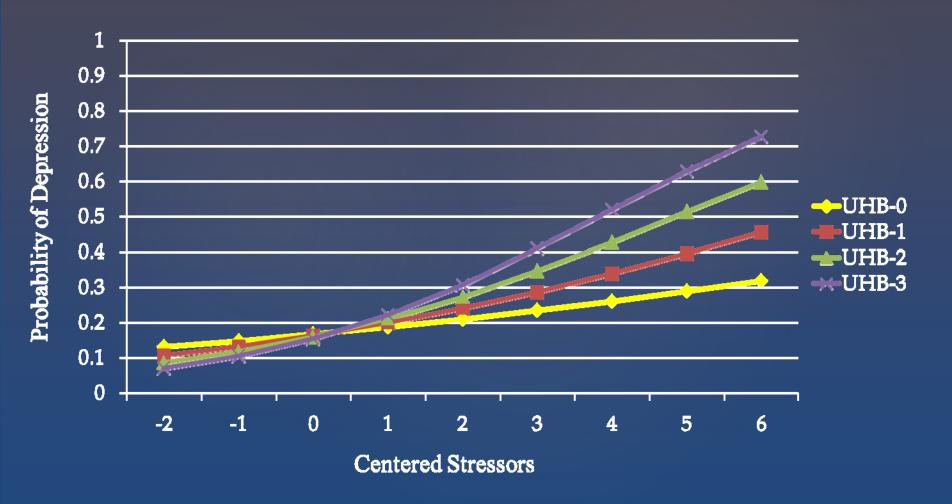
Relationships Among Structural Life Inequalities, Chronic Stress, Negative Behaviors and Psychiatric Health Disparities



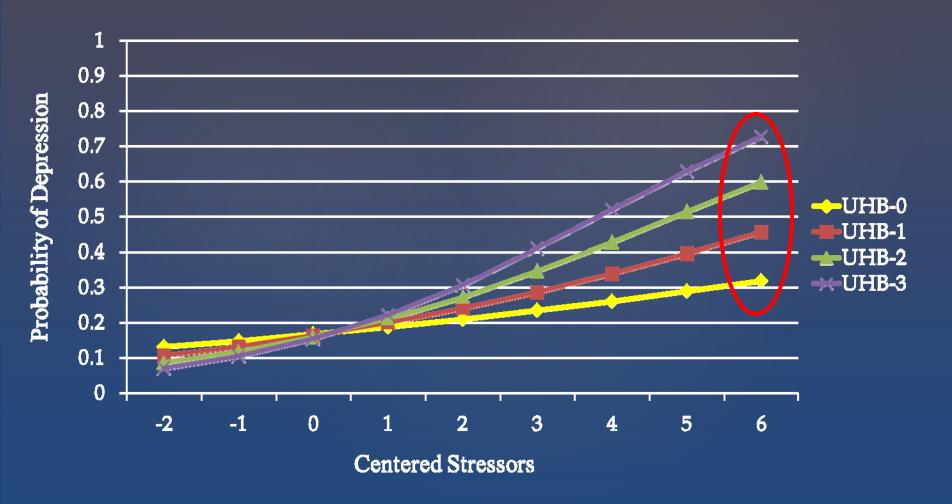
Relationships Among Structural Life Inequalities, Chronic Stress, Negative Behaviors and Psychiatric Health Disparities



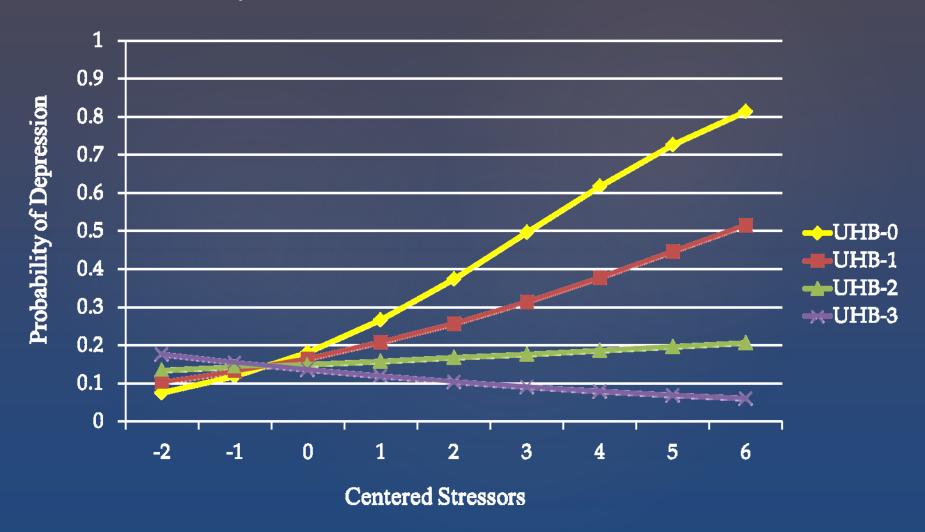
DSMIII Depression by Stressors at Levels of Unhealthy Behavior (UHB): Whites



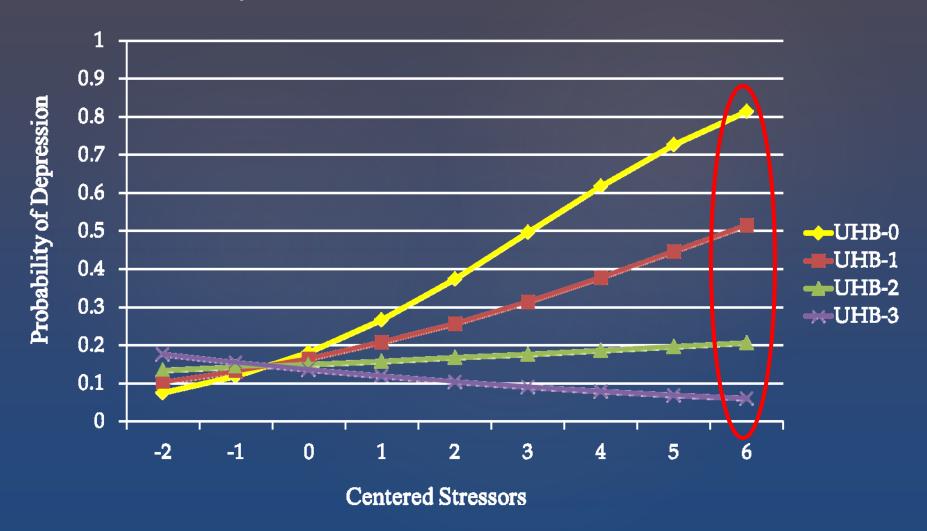
DSMIII Depression by Stressors at Levels of Unhealthy Behavior (UHB): Whites



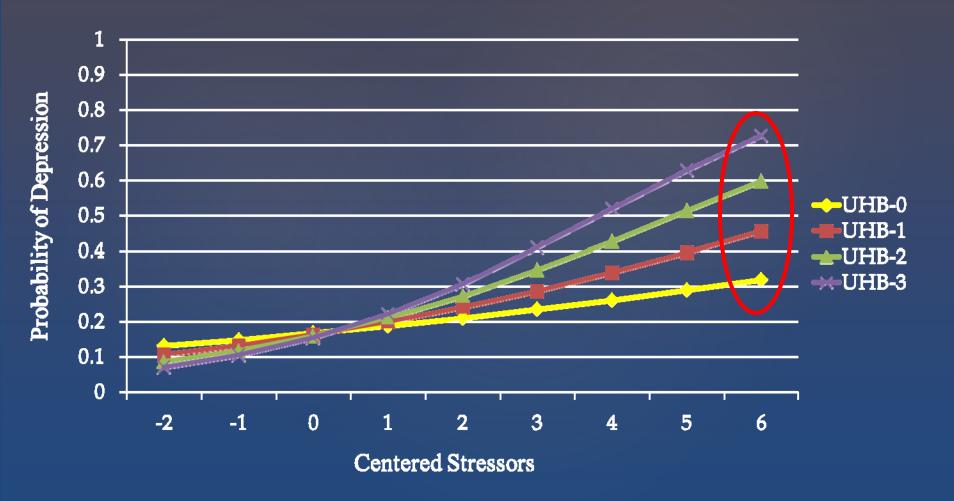
DSMIII Depression by Stressors at Level of Unhealthy Behavior (UHB): <u>Blacks</u>



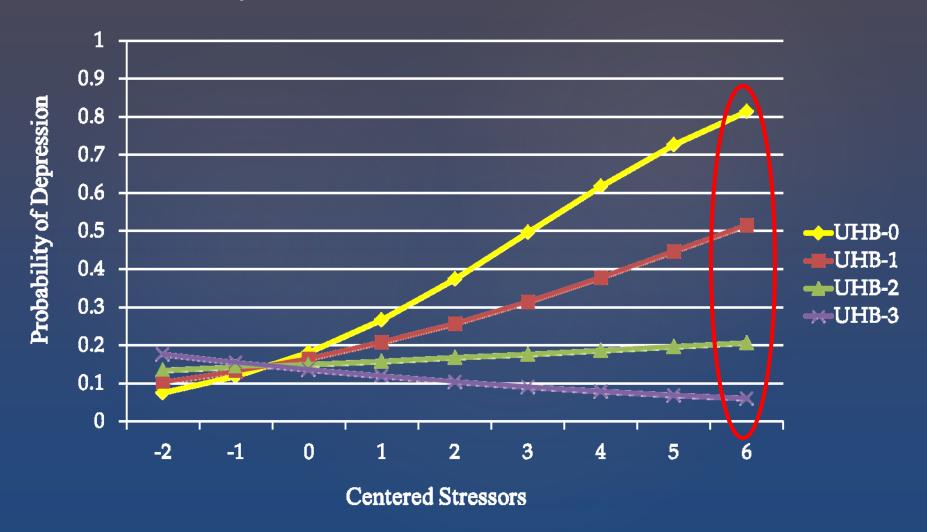
DSMIII Depression by Stressors at Level of Unhealthy Behavior (UHB): <u>Blacks</u>



DSMIII Depression by Stressors at Levels of Unhealthy Behavior (UHB): Whites



DSMIII Depression by Stressors at Level of Unhealthy Behavior (UHB): <u>Blacks</u>

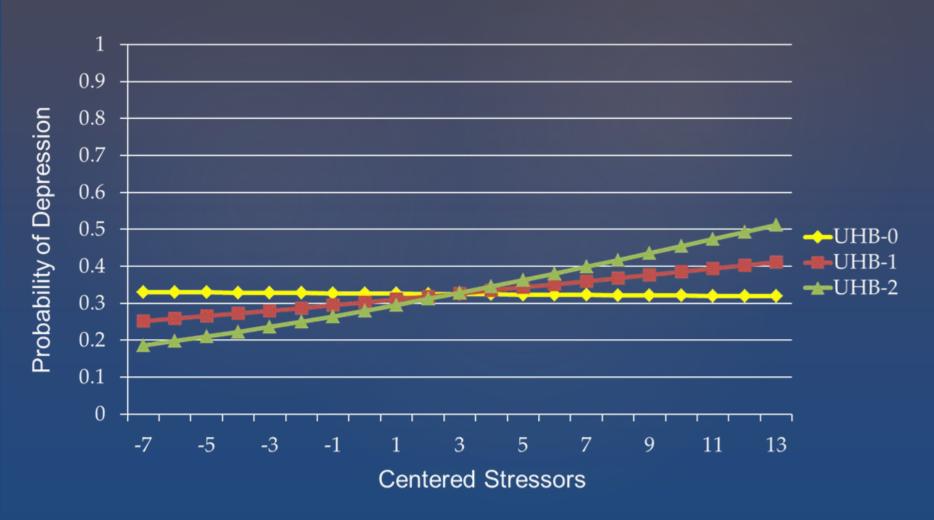


A Replication: The Baltimore Epidemiologic Catchment Area (ECA)
Study*

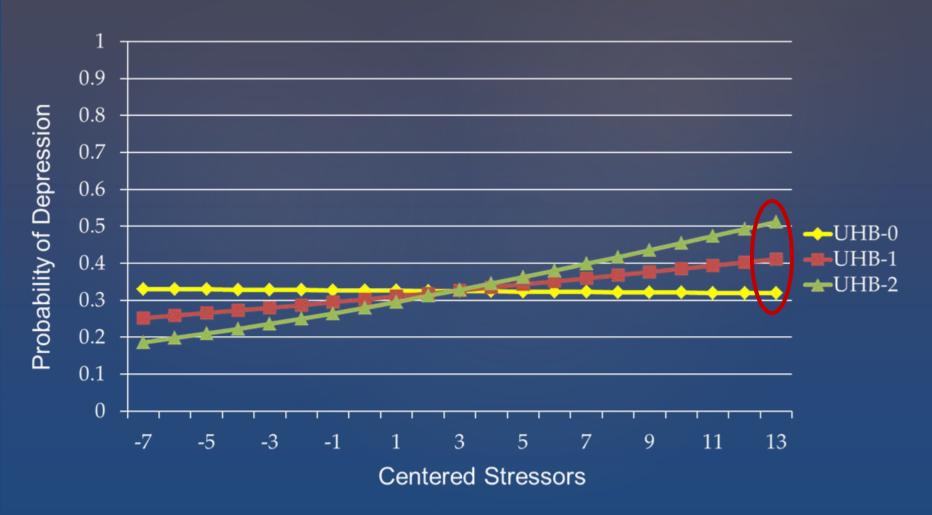
Sample

- Baltimore Epidemiologic Catchment Area (ECA) Study
 - Population-based multi-stage probability sample
 - Baseline N = 3481
 - 67% female
 - 34% African American
 - 18+ years old in 1981
 - Four waves 23 years of follow-up

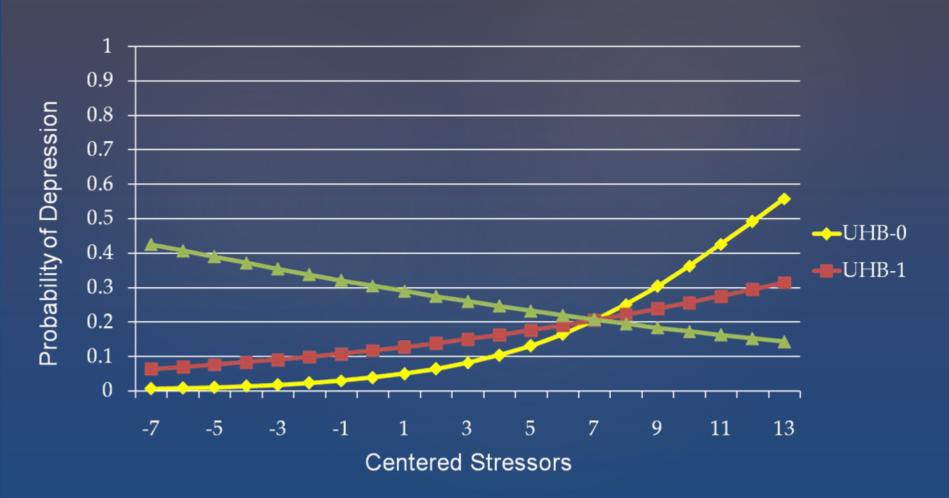
Baltimore ECA -- Predicting Depression Syndrome by Stressors at Levels of Unhealthy Behaviors (UHB): Whites



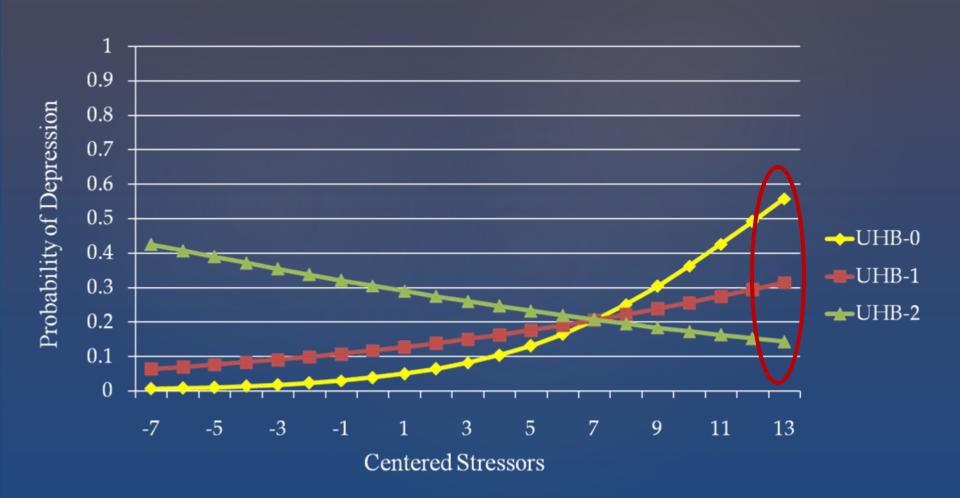
Baltimore ECA -- Predicting Depression Syndrome by Stressors at Levels of Unhealthy Behaviors (UHB): Whites



Baltimore ECA -- Predicting Depression Syndrome by Stressors at Levels of Unhealthy Behavior (UHB): <u>Blacks</u>



Baltimore ECA -- Predicting Depression Syndrome by Stressors at Levels of Unhealthy Behavior (UHB): <u>Blacks</u>



A Second Replication: The National Epidemiological Survey on Alcohol and Related Conditions (NESARC)*

National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) Overview

- Conducted by the U.S. Bureau of Census for the NIAAA/NIDA
- Wave 1: 2001-2002, (total sample n=43,093)
- Wave 2: 2004-2005, (total sample n=34,653)
- Panel response rate: just over 80%
- Sample represents civilian non-institutionalized US adult population, includes individuals living in households and group settings
- Over-sampled Blacks and Hispanics, as well as 18-24 year old

Wave 1 – Wave 2 Panel Analysis

Blacks n=6,065

Non-Hispanic Whites n=19,216

Control and Predictor Variables

Controls: Wave 1 Depressive Disorder, Age, Sex,
 Residence in south

- Socio-economic: Education, Poverty, Employed
- Stressor count (loss of job, death of relative, etc.)

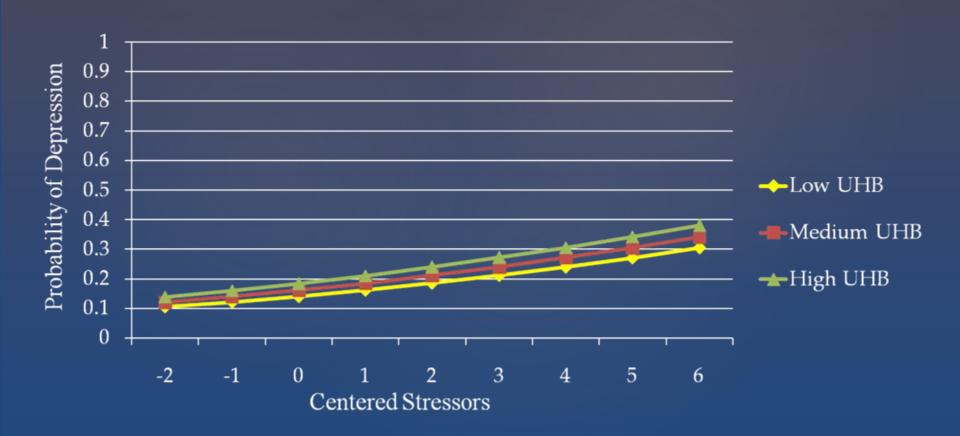
Unhealthy behavior engagement: Sum of 3, threelevel measures (smoking cigarettes, drinking alcohol, BMI)

Stressor Measure

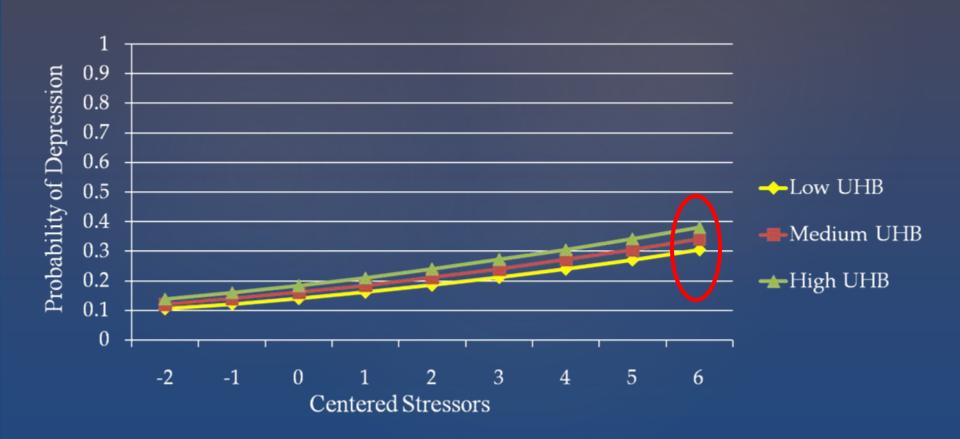
The sum of the occurrence of a series of stressful life events (Wave 1)

Collapsed upper end of the distribution, i.e. 0, 1, 2, 3, 4, 5, 6, 7; 8 and above (9 levels)

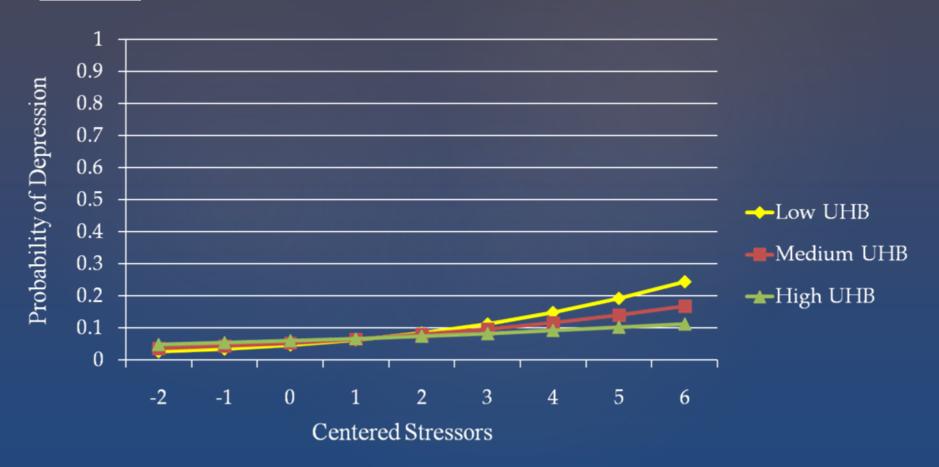
Predicting AUDADIS/DSM-IV Depressive Episode by Stressors at Levels of Unhealthy Behavior Engagement: Non-Hispanic Whites



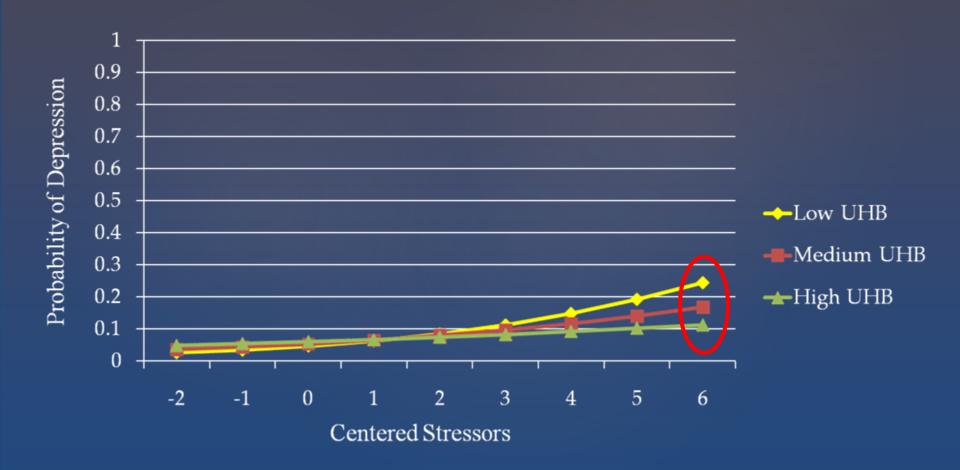
Predicting AUDADIS/DSM-IV Depressive Episode by Stressors at Levels of Unhealthy Behavior Engagement: Non-Hispanic Whites



Predicting AUDADIS/DSM-IV Depressive Episode by Stressors at Levels of Unhealthy Behavior Engagement: Blacks



Predicting AUDADIS/DSM-IV Depressive Episode by Stressors at Levels of Unhealthy Behavior Engagement: Blacks



Summary

- Blacks have early-learned, environmentally mediated, effective coping strategies to deal with stressful conditions of life; these behaviors are not "merely" hedonic but reflect adaptive responses to maladaptive environments
- These behaviors may be effective, perhaps through the chronic stress-response network, in impeding the biological cascade to mental disorders, resulting in positive mental disorder disparities for Blacks in comparison to non-Hispanic Whites
- These behaviors contribute, however, along with poor living conditions, lack of resources, and environmentally produced chronic stress, over the life-course, to negative race disparities in physical health morbidity and mortality

Summary

- Specifically, behavioral coping strategies, in the face of chronic stressful conditions, that may be effective in "preserving" African American mental health, may simultaneously contribute, along with structural inequalities and stressful life conditions, to observed physical health disparities in morbidity and mortality among some race and ethnic groups (Boardman & Alexander, 2010; Jackson, 2002; Jackson & Knight, 2006; Jackson, et al, 2010; Mezuk, et al, 2010)
- And this effect may be mediated by the stress response network (Dallman et all, 2003)

Conclusions

- Physical health and psychiatric disorder disparities are not reducible in any simplistic way to differences in social and economic statuses among groups (Report of the Surgeon General, 2001)
- Complex, multi-faceted -- racial, ethnic, culturally, environmentally and life-course, influenced
- Succinctly, blacks and other groups in this society may "<u>buy</u>" their reduced rates of psychiatric disorders with higher rates of physical health morbidities and excess and early mortality

When the Complex Contexts of Life "Masquerade" as Racial Group Differences

- Race (and Ethnicity) is Not a Variable
- Instead Race is a very Complex Construct that in Adulthood Captures a Wide Set of Life Experiences that are Difficult to Array Along a Simple Dimension (e.g. Tukufu Zuberi & Eduardo Bonilla-Silva, 2008)
- Individuals Become <u>Racialized</u> Through the Lived Experiences over the Life-Course Within a Particular Culture During Unique Periods of Historical Time

Biological and Social Perspectives on Race

Why should we observe such large and both consistent (African Americans), and inconsistent (Caribbeans, Latinos, Asians, etc), disparities among racial and ethnic groups?

 Self—reported (or other reported) race and ethnicity most often used categorization in both biological and social research

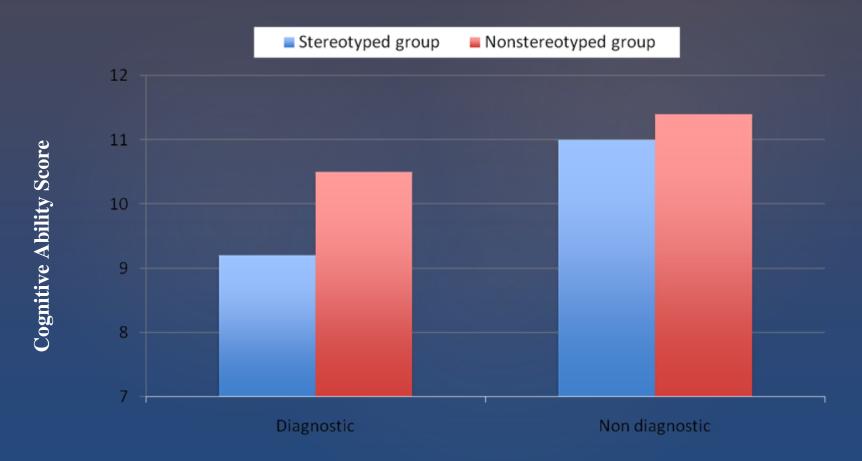
What does ones social group identity have to do with group disparities in morbidity And mortality?

Figure 2: Self and Other Race Perceptions

Self

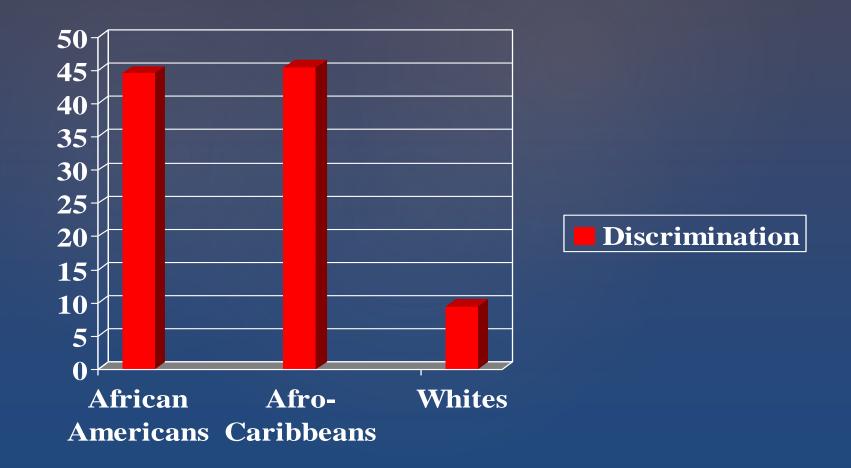
		Yes Black	Not Black
	Yes		Asian
	Black	African	Hispanic
Other		American	Afro Caribbean
	Not	Asian	
	Black	Hispanic	Non-Hispanic
		Afro Caribbean	White

Stereotype Threat Effects on Intellectual Performance

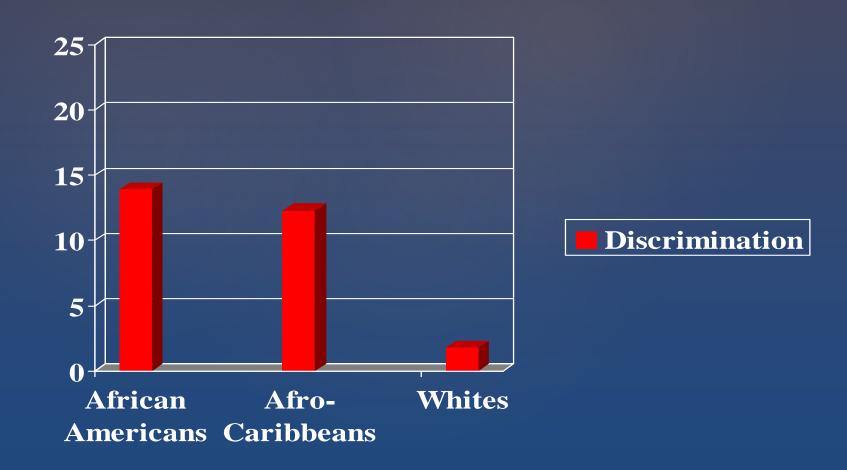


Intellectual Diagnosticity of the Test

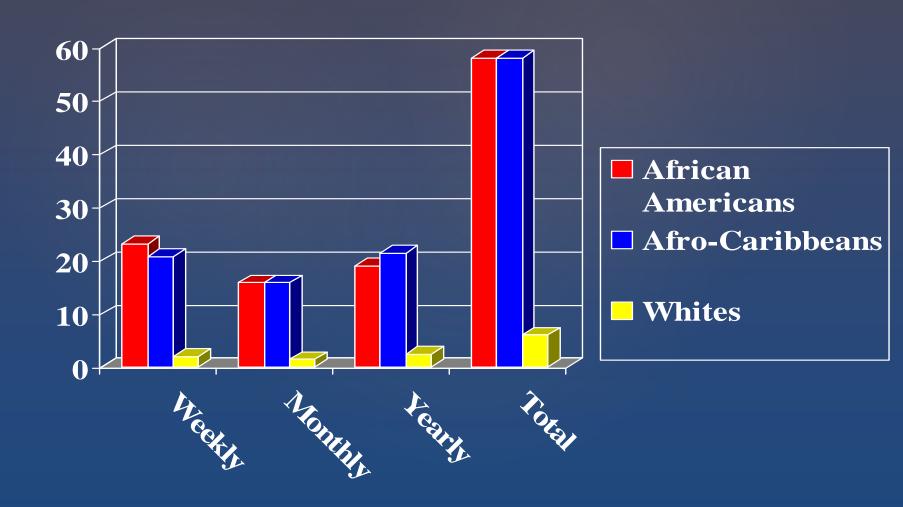
Perceived Major Discrimination Because of Race Over Life-Time Among African Americans, Afro-Caribbeans, and Whites in 2003



Perceived Major Discrimination Because of Race in the Last 12 Months Among Groups in 2003

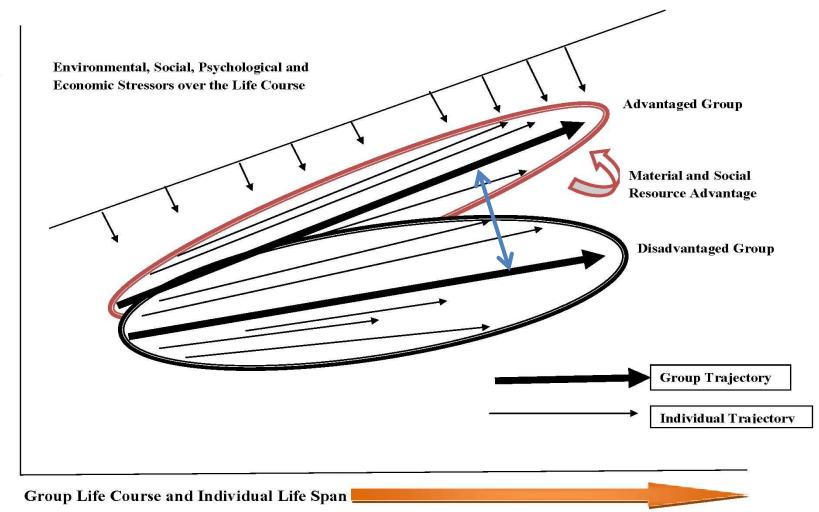


Perceived Every-Day Racial Discrimination Among African Americans and Afro-Caribbeans in 2003



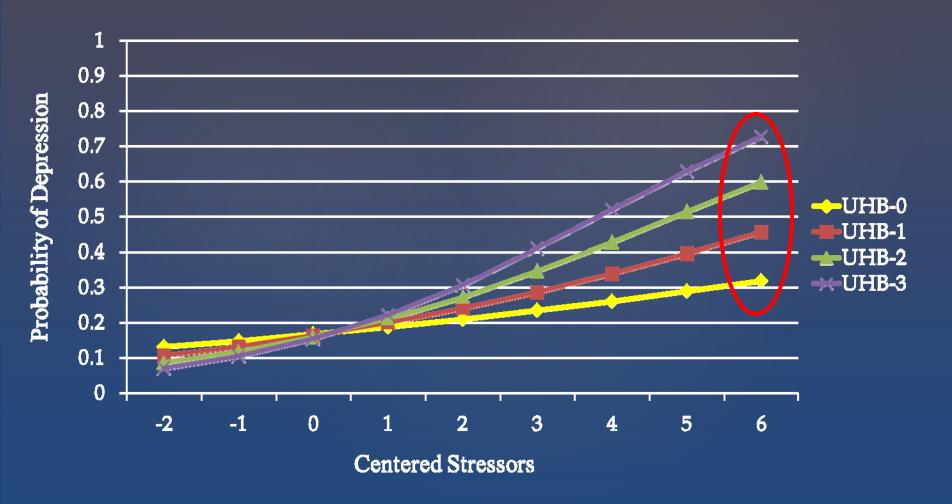
But Why Race Differences in Complex Physical and Psychiatric Health Outcomes?

Figure 1: Group Life Course and Individual Life Spans of Members of Advantaged and Disadvantaged Groups

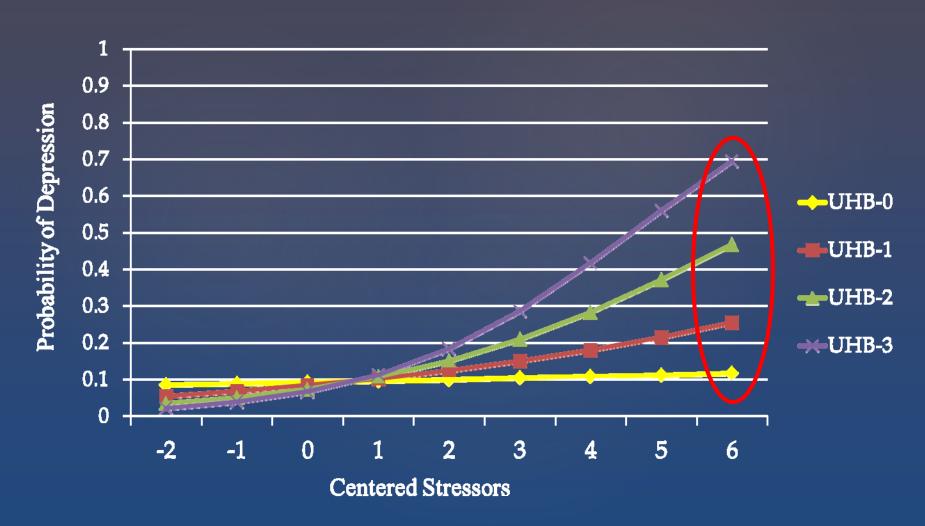


Using Propensity Score Analysis to explore the idea that this is not just a story about <u>race</u> but what is correlated with racial group membership over the life-course

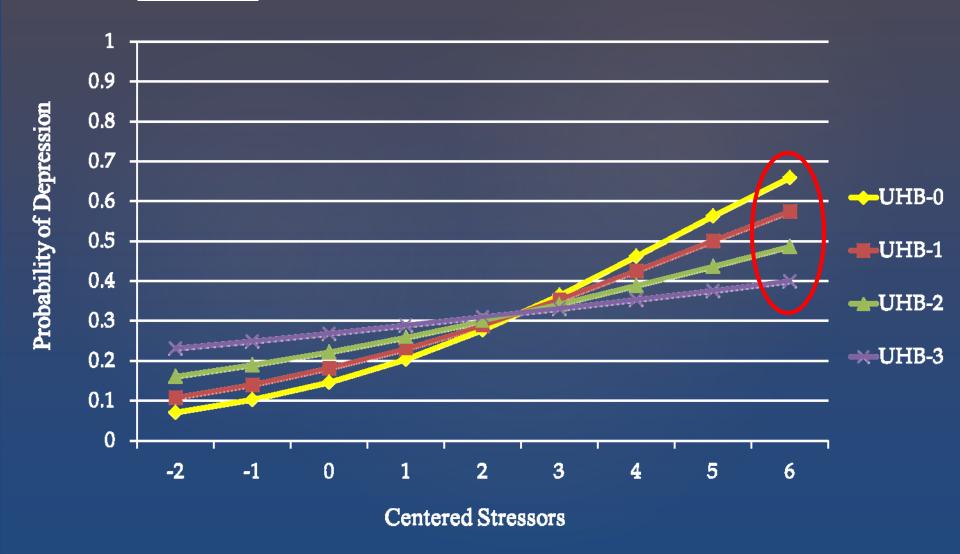
DSMIII Depression by Stressors at Levels of Unhealthy Behavior (UHB): Whites



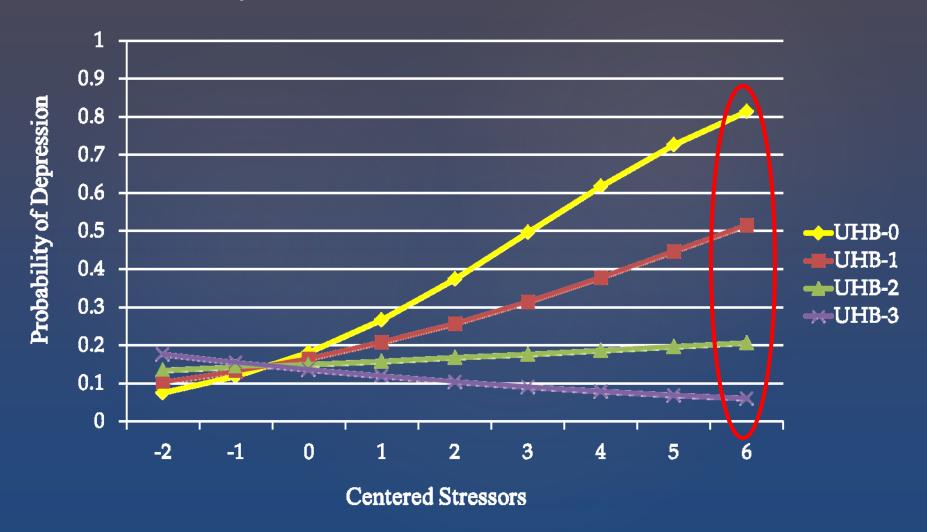
<u>Lowest</u> Quartile on Propensity of Being Black Score: Whites



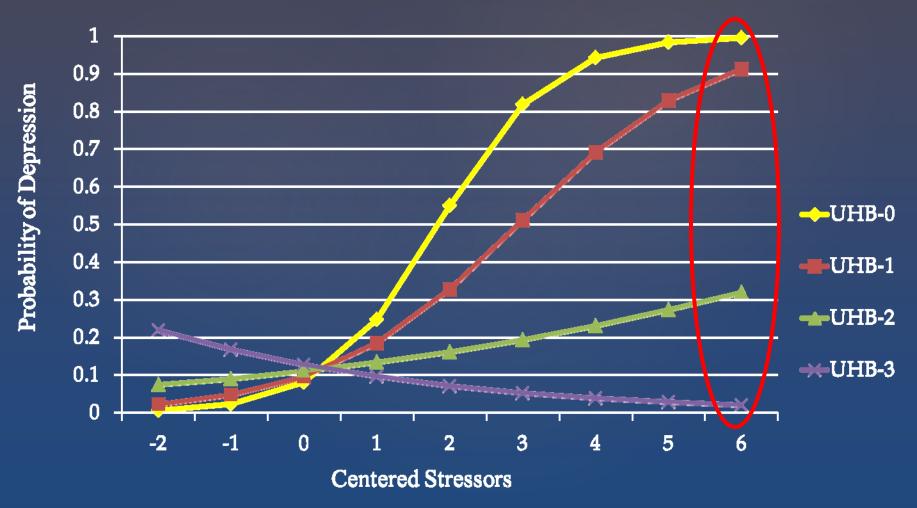
Highest Quartile on Propensity of Being Black Score: Whites



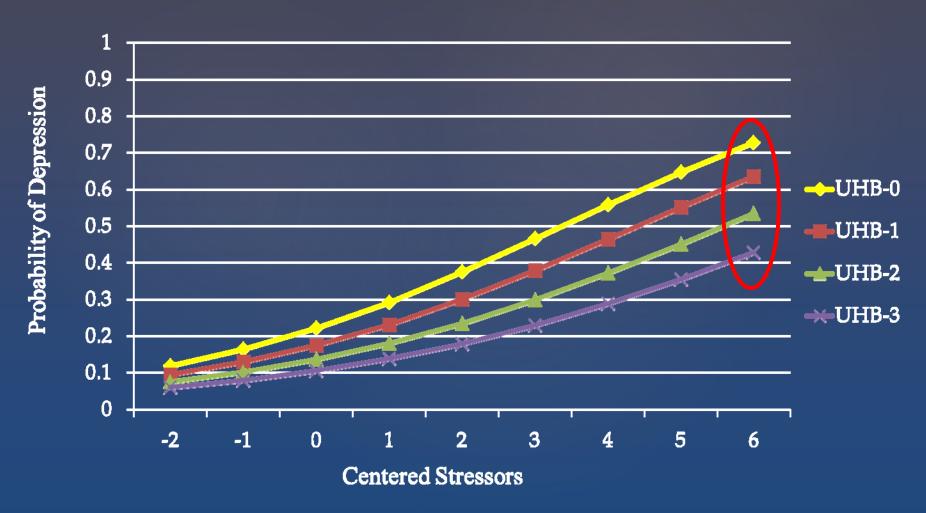
DSMIII Depression by Stressors at Level of Unhealthy Behavior (UHB): <u>Blacks</u>



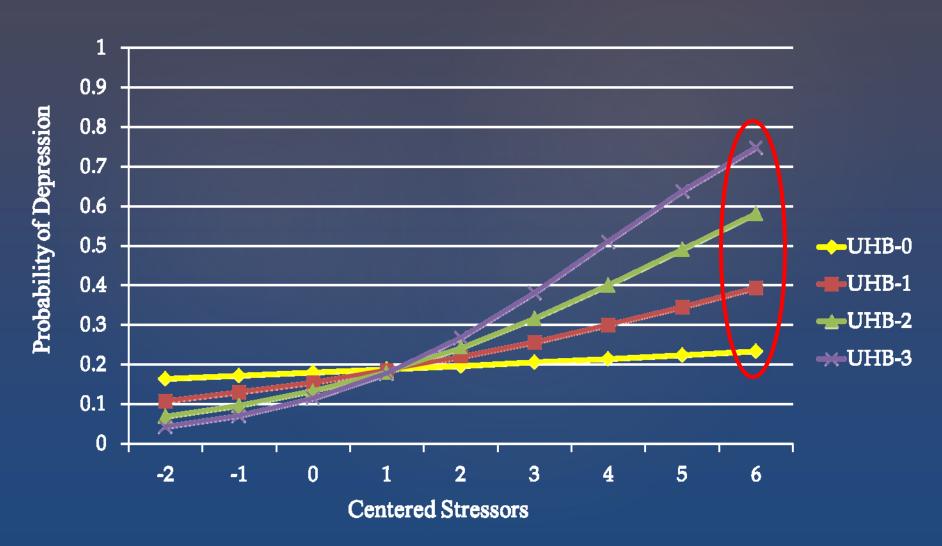
<u>Highest</u> Quartile on Propensity of Being Black Score: Blacks



Lowest Quartile on Propensity of Being Black Score: Blacks

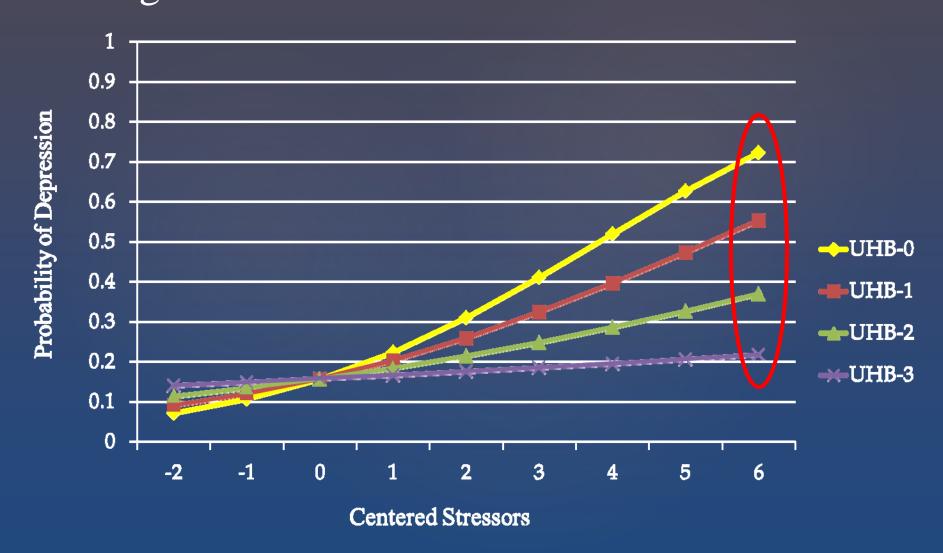


Blacks and Whites Below Median on Propensity of Being Black Score



Stressors x UHB b=.16, p=.03

Blacks <u>and</u> Whites <u>Above</u> the Median on Propensity of Being Black Score



Conclusions

Physical health and psychiatric disorder disparities cannot be understood outside of a Bioecological model that emphasizes the interrelationships of socio-economic position, life-course influences, period, context, race, ethnicity, gender, and individual resilience and coping capacities.

"A Mind is a Terrible Thing to Lose"

Human Agency and Individual Motivation Must be Considered in any Theoretical Formulation Related to "Explaining" Population Health Disparities

Thank You





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