

Article

Family Structure and Subsequent Anxiety Symptoms; Minorities' Diminished Return

Shervin Assari ^{1,2,3,*} , Cleopatra Howard Caldwell ^{3,4} and Marc A. Zimmerman ^{3,5}¹ Department of Psychology, University of California, Los Angeles (UCLA), Los Angeles, CA 90095, USA² Department of Psychiatry, University of Michigan, Ann Arbor, MI 48104, USA³ Department of Health Behavior and Health Education, School of Public Health, University of Michigan, Ann Arbor, MI 48104, USA; cleoc@umich.edu (C.H.C.); marcz@umich.edu (M.A.Z.)⁴ Center for Research on Ethnicity, Culture, and Health, School of Public Health, University of Michigan, Ann Arbor, MI 48104, USA⁵ Prevention Research Center, School of Public Health, University of Michigan, Ann Arbor, MI 48104, USA

* Correspondence: assari@umich.edu

Received: 8 May 2018; Accepted: 30 May 2018; Published: 31 May 2018



Abstract: Background: Minorities' Diminished Return (MDR) theory suggests that socioeconomic position (SEP) may have a smaller effect on health and well-being of members of the minority than the majority groups. **Aim:** Built on the MDR theory, this study compared Whites and African Americans for the effects of three family SEP indicators (family type, parental education, and parental employment) during adolescence on subsequent symptoms of anxiety 18 years later during young adulthood. **Methods:** Flint Adolescents Study (FAS), 1994–2012, followed 359 youth (ages 13 to 17, 295 African American and 64 Whites) for 18 years. The independent variables were family type, parental education, and parental employment during adolescence. The dependent variable was subsequent symptoms of anxiety, measured using the Brief Symptom Inventory (BSI), 18 years later. Age and gender were the covariates and race/ethnicity was the focal effect modifier (moderator). Four linear regression models were estimated to investigate the effects of the three family SEP indicators at age 15 on subsequent symptoms of anxiety at age 33 in the pooled sample and also by race/ethnicity. **Results:** In the pooled sample, having married parents at age 15 was inversely associated with symptoms of anxiety at age 33. We found an interaction between race/ethnicity and family type, indicating a smaller protective effect of having married parents against symptoms of anxiety for African American compared to White participants. The other two SEP indicators did not show any effect and did not interact with race/ethnicity on the outcome. **Conclusion:** In support of the MDR theory, marital status of parents during adolescence protects White but not African American young adults against anxiety symptoms. Diminished return of SEP is one of many underlying mechanisms involved in shaping racial and ethnic disparities in anxiety, however, that is often overlooked. Future research that examines economic and social policies and programs that can equalize the health gains that follow SEP resources among racial groups would be a useful next step.

Keywords: ethnic health disparities; socioeconomic position; populations; race/ethnicity; Blacks; African Americans; anxiety

1. Introduction

A large body of empirical and theoretical work has documented the strong protective effects of socioeconomic position (SEP) on a wide range of physical and mental health outcomes [1–7]. High SEP measured by education [8], income [1,4,5], employment [9,10], and marital status [11–14] reduces risk of morbidity [15] and mortality [16–18]. SEP indicators such as education, income, and marital status also protect populations against poor mental health outcomes such as anxiety and depression [14,19].

Demographic factors such as race/ethnicity have been shown to alter how people gain health benefits from their resources [20–23]. According to the Minorities' Diminished Return (MDR) theory [24,25], equal SEP indicators generate unequal health gains for the majority and minority group members [24–26]. Researchers have provided extensive support for the MDR theory by showing a smaller protective effect of SEP indicators for the health of racial minorities such as African Americans compared to Whites [22,24,25,27]. Educational attainment [21], income [28], employment status [29], and marital status [30] have all shown stronger health effects for the socially privileged (dominant) than the socially disadvantaged (historically oppressed) group. This theory suggests that racial/ethnic minority status restricts the health gain that usually follows SEP resources [31,32], suggesting that race/ethnicity and SEP have multiplicative rather than additive effects on racial disparities [24,25]. The MDR theory argues that economic and health return of SEP indicators are smaller for non-Whites than Whites because of structural racism [24,25] and interpersonal discrimination [33]. As a result, eliminating racial differences in SEP does not result in a full elimination of racial and ethnic health disparities, and such a goal requires addressing racial and ethnic disparities in gains from SEP as well as disparities in access to SEP resources [24,25].

Although research has established a link between high SEP and better mental health [19], less is known about diminished return of SEP indicators on anxiety than depression [20,23,34–36] and suicide [37]. For African Americans, high SEP may operate as a risk factor for clinical and subclinical depression [20,23,34]; however, very few studies, if any, have investigated these patterns for anxiety.

Aims

The current study compared African American and White youth for the effect of family SEP (family type, parental education, and parental employment) during adolescence on subsequent symptoms of anxiety during young adulthood 18 years later.

2. Materials and Methods

2.1. Design and Setting

The Flint Adolescent Study (FAS) is an 18-year longitudinal study of youth in Flint, Michigan. This prospective study started in 1995 (wave 1) and ended in 2012 (wave 12) [38].

2.2. FAS Design and Methods

The FAS followed a high-risk group of youth that were susceptible to school dropout and substance use for up to 18 years. This study followed youth regardless of remaining in school, as well as those who experienced school dropout.

2.3. FAS Participants and Sampling

Participants were enrolled from four local public high schools in Flint Community Schools. Non-random sampling was used to draw participants. The study participants were all ninth graders at entry to study (average age 14.5). Students were enrolled in the fall semester of their ninth grade if their grade point average (GPA) was 3.0 or less in eighth grade and if they did not have a known diagnosis of a developmental/emotional impairment. Although most participants were from working-class households, only 1 out of 4 families included married biological parents. The study had a very low refusal rate. The study participants represented 92% of the eligible youth in the Flint public high schools.

2.4. Analytical Sample for Current Analysis

Data for the current analysis were limited to the wave 1 (year 1995) and wave 12 (year 2012) of the participants who were a part of the study during the 18 years of follow up. The retention rate was 90% from wave 1 to wave 4; 75% from wave 4 to wave 8, and 65% from wave 9 to wave 12. The attrition did

not differ between the African American and White youth. The analytical sample of the current study was composed of 359 youth (ages 13 to 17, 295 African American and 64 Whites) who were followed 18 years.

2.5. Process and Measures

Most of the data were collected via face-to-face interview, followed by a brief paper-and-pencil survey. The paper-and-pencil survey was considered for collecting data on sensitive items. Interviews lasted 60 min on average. Participants were interviewed annually from 1994–1997, 1999–2003, and 2008–2012, with a total number of 12 times. For the years 1994 to 1997, structured/face-to-face interviews were used for data collection. For the years 2003 to 2008, interviews were conducted in community setting or by telephone. Most interviewers were trained community members or college students who were native to the area. We did not find any effects of interviewer race/ethnicity or gender as a source of bias [38].

2.6. Measures

2.6.1. Dependent Variable

Symptoms of Anxiety. Symptoms of anxiety were measured by the Brief Symptom Inventory (BSI) [39]. The BSI uses six items to assess the frequency of feeling uncomfortable due to anxiety during the past seven days. The root question was “I am now going to read a list of problems and complaints that people sometimes have. During the past week, including today, please tell me how uncomfortable you felt because of the following problems: (1) “Nervousness or shakiness inside”; (2) “Suddenly scared for no reason”; (3) “Feeling fearful”; (4) “Feeling tense or keyed up”; (5) “Spells of terror or panic”; and (6) “Feeling so restless you couldn’t sit still”. Responses were on a Likert scale ranging from 1 (“not at all uncomfortable”) to 5 (“extremely uncomfortable”). All six items were then averaged to calculate the anxiety symptoms, with higher score indicating more symptoms. This scale has acceptable reliability (Cronbach’s alpha is 0.78) [40–42].

2.6.2. Independent Variables

Three family SEP (family type, parental education, and parental employment) during adolescence were the independent variables. Family type was reflective of family structure, operationalized as a dichotomous variable (1 married parents vs. 0 not married family). Other family SEP indicators included employment status of parents (parents employed, parents unemployed) and highest education level of parents. While employment status of parents was treated as a dichotomous variable, highest education level of parents was operationalized as a continuous measure.

2.6.3. Covariates

Baseline age and gender (0 male, 1 female) were the control variables. Age (years) was treated as a continuous variable, while gender was treated as a categorical variable.

2.6.4. Moderator

Race/ethnicity was the focal effect modifier (moderator). Race/ethnicity was self-identified and was recorded as African American/Black, White, and mixed race/ethnicity (African American and White). As very few individuals were mixed race/ethnicity ($n = 20$), we operationalized race/ethnicity as a dichotomous variable (African American or mixed race/ethnicity 1, Whites 0). In this study, respondents self-identified their race/ethnicity which was conceptualized as a social rather than biological measure. In this study, race/ethnicity is viewed as a salient social construct that shapes how a social group is treated by society. In this view, race/ethnicity is a proxy of access to the opportunity structure, rather than innate fixed abilities.

2.7. Analytical Plan

For descriptive purposes, we reported mean and frequency, and standard deviation (SD). For bivariate analysis we used independent sample *t*-test and Pearson Chi square to compare study variables between African Americans and Whites. We also used Spearman correlation test in the pooled sample and by race/ethnicity to estimate the associations between study variables. For multivariable analysis, we used linear regression models. Adjusted *b* (regression coefficient), 95% confidence intervals (CIs), and *p*-values were reported.

We ran four linear regression models. In all our models, three family SEP indicators at baseline (age 15) were the independent variables, symptoms of anxiety at wave 12 (age 33) as the dependent variable, and demographic characteristics were the covariates. Race/ethnicity was the focal effect modifier (moderator). The first two linear regression models were fitted to the overall sample. *Model 1* did not include any interaction terms. *Model 2* included three race/ethnicity by SEP indicator interaction terms. Subsequently, we estimated race/ethnicity-specific linear regression models for Whites (*Model 3*) and African Americans (*Model 4*).

3. Results

3.1. Descriptive Statistics

This study included 359 youth (ages 13 to 17, 295 African American and 64 Whites) who were followed for 18 years. Table 1 summarizes the descriptive information for the pooled sample and by race/ethnicity. At baseline, African Americans were less likely to be from families with an employed parent and married parents in comparison to Whites. African Americans and Whites had comparable age, gender, baseline parental education, and symptoms of anxiety 18 years later (Table 1).

Table 1. Descriptive statistics in the pooled sample and by race/ethnicity.

Characteristics	All		Whites		African Americans	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Men	156	43.45	28	43.75	128	43.39
Women	203	56.55	36	56.25	167	56.61
SEP Marital Status ^{*,a}						
Not Married	260	73.65	32	50.79	228	78.62
Married	93	26.35	31	49.21	62	21.38
SEP Parental Employment ^{*,a}						
Parents unemployed	78	21.79	8	12.50	70	23.81
At least one parent employed	280	78.21	56	87.50	224	76.19
	Mean	SD	Mean	SD	Mean	SD
Age (years)	14.50	0.62	14.45	0.62	14.50	0.62
SEP Parental Education (Highest Parental Education)	4.26	1.49	4.06	1.49	4.31	1.49
Symptoms of Anxiety ^b	1.50	0.65	1.53	0.64	1.49	0.65

Notes: SEP, Socioeconomic position, * $p < 0.05$ for comparing African Americans and Whites; ^a Pearson Chi square;

^b Independent samples *t* student test. 95% CI: 95% confidence interval.

3.2. Bivariate Correlations

Table 2 presents the results of three sets of correlation matrix in the pooled sample and by race/ethnicity. In the pooled sample, none of the SEP indicators at baseline were correlated with symptoms of anxiety 18 years later. Marital Status of the family at baseline was correlated with symptoms of anxiety 18 years later for White but not African Americans (Table 2).

Table 2. Correlations in the pooled sample and by race/ethnicity.

Characteristics	1	2	3	4	5	6	7
All							
1 Race/ethnicity (African Americans)	1	0.00	0.03	0.07	−0.11 *	−0.24 **	−0.02
2 Gender (Females)		1	−0.03	−0.09	0.03	−0.05	0.15 **
3 Age			1	−0.17 **	−0.09	−0.15 **	0.05
4 SEP Parental Education (Highest Parental Education)				1	0.14 *	0.05	−0.07
5 SEP Parental Employment (At least one parent employed)					1	0.15 **	−0.04
6 SEP Marital Status (Married)						1	−0.09
7 Anxiety Symptoms							1
Whites							
2 Gender (Females)	-	1	−0.02	−0.26 *	0.14	0.11	0.14
3 Age			1	−0.01	0.13	0.09	0.15
4 SEP Parental Education (Highest Parental Education)				1	0.18	−0.03	−0.01
5 SEP Parental Employment (At least one parent employed)					1	0.09	0.05
6 SEP Marital Status (Married)						1	−0.32 *
7 Anxiety Symptoms							1
African Americans							
2 Gender (Females)	-	1	−0.04	−0.04	0.01	−0.09	0.15 **
3 Age			1	−0.21 **	−0.13 *	−0.21 **	0.03
4 SEP Parental Education (Highest Parental Education)				1	0.14 *	0.10	−0.08
5 SEP Parental Employment (At least one parent employed)					1	0.14 *	−0.06
6 SEP Marital Status (Married)						1	−0.04
7 Anxiety Symptoms							1

Notes: SEP, Socioeconomic position, * $p < 0.05$, ** $p < 0.01$.

3.3. Linear Regression Models in the Pooled Sample

Table 3 summarizes the results of two linear regression models in the overall sample with family SEP indicators at baseline (wave 1) as the independent variables, anxiety symptoms at wave 12 as the dependent variable, and demographic factors as covariates. *Model 1* included the main effects but not the interaction terms. *Model 2* included main effects as well as interaction terms between race/ethnicity and SEP indicators. *Model 1* showed that marital status (married parents) at wave 1 was associated with lower symptoms of anxiety at wave 12 net of all study covariates. *Model 2* showed a significant interaction between the effects of race/ethnicity and marital status (married parents) at wave 1, indicating that the effect of having married parents at baseline was smaller for African American compared to White individuals (Table 3).

Table 3. Summary of linear regressions between marital status (married parents) at wave 1 and symptoms of anxiety at wave 12 in the pooled sample.

Characteristics	<i>Model 1</i> Main Effects		<i>Model 2</i> Model 1 + Interactions	
	B	95% CI	B	95% CI
Race/ethnicity (African Americans)	−0.08	−0.27–0.10	0.21 **	0.07–0.35
Age	0.04	−0.08–0.15	0.62	−1.21–2.45
Gender (Females)	0.19 **	0.05–0.33	0.05	−0.07–0.17
SEP Parental Education (Highest Parental Education)	−0.02	−0.06–0.03	−0.08	−0.63–0.47
SEP Parental Employment (At least one parent employed)	−0.01	−0.18–0.16	0.01	−0.09–0.12
SEP Marital Status (Married)	−0.15 *	−0.32–0.00	−0.01	−0.19–0.18
SEP Education × Race/ethnicity	-	-	−0.43 **	−0.76–0.11
SEP Employment × Race/ethnicity	-	-	−0.04	−0.16–0.08
SEP Marital Status × Race/ethnicity	-	-	−0.03	−0.21–0.14
Intercept	0.87	−0.93–2.67	0.40 *	0.02–0.78

Notes: SEP, Socioeconomic position, * $p < 0.05$, ** $p < 0.01$.

3.4. Linear Regression Models by Race/Ethnicity

Table 4 summarizes the results of two linear regression models that were specifically fitted for Whites (*Model 3*) and African Americans (*Model 4*). *Model 3* in Whites showed an inverse association between being from a family with married parents at baseline and subsequent anxiety symptoms at wave 12. *Model 4* showed that among African Americans, being from a family with married parents at baseline was unrelated to anxiety symptoms at wave 12 (Table 4).

Table 4. Results of linear regression models between marital status (married parents) at wave 1 and symptoms of anxiety at wave 12 in Whites and African Americans.

Characteristics	Model 1 Whites		Model 2 African Americans	
	B	95% CI	B	95% CI
Age	0.18	−0.08–0.43	0.02	−0.12–0.15
Gender (Females)	0.26	−0.07–0.59	0.20 *	0.04–0.36
SEP Parental Education (Highest Parental Education)	0.02	−0.09–0.13	−0.03	−0.08–0.03
SEP Parental Employment (At least one parent employed)	0.06	−0.42–0.55	−0.04	−0.23–0.15
SEP Marital Status (Married)	−0.46 **	−0.77–0.15	−0.05	−0.25–0.16
Intercept	−1.35	−5.09–2.38	1.11	−0.97–3.18

Notes: SEP, Socioeconomic position, * $p < 0.05$, ** $p < 0.01$.

4. Discussion

Supporting the MDR theory [24,25], this study documented racial/ethnic variation in the effects of family SEP at age 15 and subsequent symptoms of anxiety at age 33. While being from a family with married parents at baseline was associated with lower anxiety symptoms at wave 12 for Whites, the protective effect of having married parents was absent for African Americans. This is another example that health gain from SEP is unequal for race/ethnic groups, and compared to Whites, African Americans are at a disadvantage. As these patterns were not found for two of three SEP indicators, the results were only suggestive.

Although this is not the first study to provide support for MDR theory, it is one of the first studies that shows that this theory also holds for symptoms of anxiety. Most of the literature on this theory has focused on physical rather than mental health outcomes [43–47]. From studies on mental health outcomes, most of the research has focused on depression and suicide [34,37,48], and less is known about anxiety.

Our finding extends MDR theory to a new outcome, namely anxiety [24,25]. Previous research has well documented smaller health effects of educational attainment, income, and employment, and physical health outcomes such as chronic medical conditions, obesity, and mortality are also well documented [21,22,26,28,29]. Similar patterns have also been shown for health risk behaviors such as substance use [22,49]. In several studies, psychological assets such as self-efficacy, affect, and coping have shown stronger effects on Whites' than African Americans' health status [50–60]. Family SES generates more income for White than African American families [61,62].

The MDR theory argues that structural racism [24,25] and discrimination [33] reduce the economic return of SEP indicators for non-Whites. Due to the existing racism in American society, Whites consistently maintain higher benefits and gains than African Americans. Many social welfare policies that benefit minorities are regarded to be un-American by the dominant group, which also has the political power. Tax cuts still benefit the wealthy more than the middle class, and Whites and African Americans receive education of different quality. Whites and African Americans still live separately, given the existing residential segregation [24,25,29].

The MDR theory does not blame African Americans and other non-White groups for having a tendency to mismanage or waste their economic resources. Instead, the theory attributes the diminished returns to the very fabric of American social structure that fails African Americans and

other minorities at each SEP. In US, non-White groups with high ambitions and aspirations pay extra psychological costs (minorities' tax) for their social mobility. This extra cost takes its toll by placing high-SEP African Americans at an increased risk of poor mental health [20,36,37,63].

In contrast to existing theoretical frameworks such as Multiple Disadvantage [64] and Double [34,65], Triple [66], and Multiple [67] Jeopardy, the MDR theory suggests that it is Whites, not the minority populations, whose health is more strongly dependent upon SEP resources [67]. The models listed above, however, have traditionally conceptualized minority status as a vulnerable status. In addition, most theoretical models that are being used in the health disparities research attributes the racial gap in health to differential exposures rather than to effects and vulnerabilities [24,25]. Unfortunately, differential effects of SEP indicators across social groups are traditionally overlooked [21,22]. These findings question the assumption that SEP is a universal protective factor, suggesting that health disparity researchers should systemically explore interactions between the health effects of race/ethnicity and SEP resources [24,25]. Given the similarities in the two groups in our data, we are very confident in the results that are due to diminished returns.

We did not find significant interaction between race and parental education and employment. The parental employment measure had limited variance, as most families were lower-middle/working class. This is also the case for parental education which did not have large variance. There are only a few Whites with low education and unemployment. Low statistical power is likely to be the reason for lack of interaction between the other SEP indicators.

4.1. Implications

Our findings may have implications for policy and public health practice. Policies and programs should go beyond equalizing access of racial groups to SEP by minimizing the diminished returns of minorities as a strategy to reduce or eliminate racial and ethnic health disparities [24,25]. Tailored programs that address these gaps may be needed to ensure that all social groups equally gain from similar programs, and well-intentioned policies and programs reach populations regardless of race/ethnicity and color. Addressing health disparities should go beyond addressing the racial gap in SEP and reduce the racial variation in the cost of upward social mobility, as well as the prevalent barriers in their daily lives that limit non-Whites' ability to translate their resources to gain [24,25].

Researchers should consider the diminished health return of SEP as a major source of racial health disparities in the US [68–71]. Policies that universally increase overall access to SEP resources may unintentionally widen the existing health disparities, given that Whites gain more than non-Whites from the very same resources that become available. Policy and program evaluators should be aware that race/ethnicity may alter the real effect of their interventions and Whites may gain more than non-whites from the very same policy or program. We need to know more about how a policy and program changes the life and health of population sub-groups, without assuming that all groups are ready to take advantage of a new program/policy.

4.2. Limitations

Our study had a few limitations. Despite the longitudinal design, the current study was an observational study. The current results should not be interpreted as causal associations between SEP and mental health. As SEP and mental health have bidirectional associations, future research should explore reverse causality between poor mental health and SEP. Another limitation of our study was omission of several covariates. We did not include covariates such as parental mental health, mental health history, and other risk factors of future anxiety. Similarly, all the study variables were limited to individual characteristics. Higher-level characteristics such as community SEP, density of crime and violence in the neighborhood, and composition of racial groups in the neighborhood may all effect discrimination which may explain risk of anxiety for Whites and African Americans. The sample size was not balanced between Whites and African Americans, and the model was under-powered for Whites. Finally, differential validity of anxiety symptoms by race/ethnicity may be a source of

measurement bias [72]. Another limitation is combining individuals of mixed ethnicity as African Americans. This may cause a problem, as some studies have found significant differences in the mental health among adolescents/young people who self-identify as being mixed when compared to African Americans [73]. None of the above limitations that affect the current study are fatal flaws. Thus, the study still makes a unique contribution to the field of health disparities.

5. Conclusions

To conclude, in the US, race/ethnicity alters the protective effects of family structure during adolescence on subsequent symptoms of anxiety 18 years later. The effect of race/ethnicity is not just through changing the distribution of SEP resources, but also changing their health effects. Health disparities are due to multiplicative not additive effects of race/ethnicity and SEP.

Author Contributions: Conceptualization, S.A.; Methodology, M.A.Z.; Validation, M.A.Z. and S.A.; Formal Analysis, S.A.; Investigation, M.A.Z.; Resources, M.A.Z.; Data Curation, M.A.Z.; Writing-Original Draft Preparation, S.A.; Writing-Review & Editing, C.H.C., M.A.Z.; Supervision, C.H.C., M.A.Z.; Project Administration, M.A.Z.; Funding Acquisition, M.A.Z.

Acknowledgments: S.A. is partially supported by the Heinz C. Prechter Bipolar Research Fund and the Richard Tam Foundation at the University of Michigan Depression Center. The FAS was funded by the National Institute on Drug Abuse (NIDA) (grant DA07484; Principle Investigator = MZ). The content of this article does not reflect NIDA's views or policies.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Dowd, J.B.; Albright, J.; Raghunathan, T.E.; Schoeni, R.F.; Leclere, F.; Kaplan, G.A. Deeper and wider: Income and mortality in the USA over three decades. *Int. J. Epidemiol.* **2011**, *40*, 183–188. [[CrossRef](#)] [[PubMed](#)]
2. Marmot, M.G.; Shipley, M.J. Do socioeconomic differences in mortality persist after retirement? 25 year follow up of civil servants from the first Whitehall study. *Br. Med. J.* **1996**, *313*, 1170–1180. [[CrossRef](#)]
3. Morris, J.K.; Cook, D.G.; Shaper, A.G. Loss of employment and mortality. *Br. Med. J.* **1994**, *308*, 1135–1139. [[CrossRef](#)]
4. Van Groenou, M.I.B.; Deeg, D.J.; Penninx, B.W. Income differentials in functional disability in old age: Relative risks of onset, recovery, decline, attrition and mortality. *Aging Clin. Exp. Res.* **2003**, *15*, 174–183. [[CrossRef](#)]
5. Berkman, C.S.; Gurland, B.J. The relationship among income, other socioeconomic indicators, and functional level in older persons. *J. Aging Health* **1998**, *10*, 81–98. [[CrossRef](#)] [[PubMed](#)]
6. Burgard, S.A.; Elliott, M.R.; Zivin, K.; House, J.S. Working conditions and depressive symptoms: A prospective study of US adults. *J. Occup. Environ. Med.* **2013**, *55*, 1007–1014. [[CrossRef](#)] [[PubMed](#)]
7. Galobardes, B.; Shaw, M.; Lawlor, D.A.; Lynch, J.W.; Davey Smith, G. Indicators of socioeconomic position (part 1). *J. Epidemiol. Community Health* **2006**, *60*, 7–12. [[CrossRef](#)] [[PubMed](#)]
8. Baker, D.P.; Leon, J.; Smith Greenaway, E.G.; Collins, J.; Movit, M. The education effect on population health: A reassessment. *Popul. Dev. Rev.* **2011**, *37*, 307–332. [[CrossRef](#)] [[PubMed](#)]
9. Eliason, M. Alcohol-related morbidity and mortality following involuntary job loss: Evidence from Swedish register data. *J. Stud. Alcohol. Drugs* **2014**, *75*, 35–46. [[CrossRef](#)] [[PubMed](#)]
10. Noelke, C.; Beckfield, J. Recessions, job loss, and mortality among older US adults. *Am. J. Public Health* **2014**, *104*, e126–e134. [[CrossRef](#)] [[PubMed](#)]
11. Kaplan, R.M.; Kronick, R.G. Marital status and longevity in the United States population. *J. Epidemiol. Community Health* **2006**, *60*, 760–765. [[CrossRef](#)] [[PubMed](#)]
12. Robards, J.; Evandrou, M.; Falkingham, J.; Vlachantoni, A. Marital status, health and mortality. *Maturitas* **2012**, *73*, 295–299. [[CrossRef](#)] [[PubMed](#)]
13. Manzoli, L.; Villari, P.; Pirone, G.; Boccia, A. Marital status and mortality in the elderly: A systematic review and meta-analysis. *Soc. Sci. Med.* **2007**, *64*, 77–94. [[CrossRef](#)] [[PubMed](#)]

14. Scott, K.M.; Wells, J.E.; Angermeyer, M.; Brugha, T.S.; Bromet, E.; Demyttenaere, K.; de Girolamo, G.; Gureje, O.; Haro, J.M.; Jin, R.; et al. Gender and the relationship between marital status and first onset of mood, anxiety and substance use disorders. *Psychol. Med.* **2010**, *40*, 1495–1505. [[CrossRef](#)] [[PubMed](#)]
15. Herd, P.; Goesling, B.; House, J.S. Socioeconomic position and health: The differential effects of education versus income on the onset versus progression of health problems. *J. Health Soc. Behav.* **2007**, *48*, 223–238. [[CrossRef](#)] [[PubMed](#)]
16. Hummer, R.A.; Lariscy, J.T. Educational attainment and adult mortality. In *International Handbook of Adult Mortality*; Springer: Dordrecht, The Netherlands, 2011; pp. 241–261.
17. Masters, R.K.; Hummer, R.A.; Powers, D.A. Educational differences in US adult mortality a cohort perspective. *Am. Soc. Rev.* **2012**, *77*, 548–572. [[CrossRef](#)] [[PubMed](#)]
18. Brown, D.C.; Hayward, M.D.; Montez, J.K.; Hummer, R.A.; Chiu, C.T.; Hidajat, M.M. The significance of education for mortality compression in the United States. *Demography* **2012**, *49*, 819–840. [[CrossRef](#)] [[PubMed](#)]
19. Lorant, V.; Deliege, D.; Eaton, W.; Robert, A.; Philippot, P.; Anseau, M. Socioeconomic inequalities in depression: A meta-analysis. *Am. J. Epidemiol.* **2003**, *157*, 98–112. [[CrossRef](#)] [[PubMed](#)]
20. Assari, S. Combined racial and gender differences in the long-term predictive role of education on depressive symptoms and chronic medical conditions. *J. Racial Ethn. Health Disparit.* **2016**, *4*, 385–396. [[CrossRef](#)] [[PubMed](#)]
21. Assari, S.; Lankarani, M.M. Race and urbanity alter the protective effect of education but not income on mortality. *Front. Public Health* **2016**, *4*. [[CrossRef](#)] [[PubMed](#)]
22. Assari, S.; Lankarani, M.M. Education and alcohol consumption among older Americans. Black-White Differences. *Front. Public Health* **2016**, *4*. [[CrossRef](#)] [[PubMed](#)]
23. Assari, S. Social Determinants of Depression: The Intersections of Race, Gender, and Socioeconomic Status. *Brain Sci.* **2017**, *7*, 156. [[CrossRef](#)] [[PubMed](#)]
24. Assari, S. Health Disparities Due to Diminished Return among Black Americans: Public Policy Solutions. *Soc. Issues Policy Rev.* **2018**, *12*, 112–145. [[CrossRef](#)]
25. Assari, S. Unequal gain of equal resources across racial groups. *Int. J. Health Policy Manag.* **2017**, *6*, 1–6. [[CrossRef](#)] [[PubMed](#)]
26. Assari, S.; Thomas, A.; Caldwell, C.H.; Mincy, R.B. Blacks' Diminished Health Return of Family Structure and Socioeconomic Status; 15 Years of Follow-up of a National Urban Sample of Youth. *J. Urban Health* **2017**. [[CrossRef](#)] [[PubMed](#)]
27. Assari, S. Socioeconomic Status and Self-Rated Oral Health; Diminished Return among Hispanic Whites. *Dent. J.* **2018**, *6*, 11. [[CrossRef](#)] [[PubMed](#)]
28. Assari, S. The Benefits of Higher Income in Protecting against Chronic Medical Conditions Are Smaller for African Americans than Whites. *Healthcare* **2018**, *6*, 2. [[CrossRef](#)] [[PubMed](#)]
29. Assari, S. Life expectancy gain due to employment status depends on race, gender, education, and their intersections. *J. Racial Ethn. Health Disparit.* **2017**. [[CrossRef](#)] [[PubMed](#)]
30. Beckett, M.; Elliott, M.N. *Does the Association Between Marital Status and Health Vary by Sex, Race, and Ethnicity?* No. 02-08; RAND Corporation: Santa Monica, CA, USA, 2002.
31. Steenland, K.; Henley, J.; Thun, M. All-cause and cause-specific death rates by educational status for two million people in two American Cancer Society cohorts, 1959–1996. *Am. J. Epidemiol.* **2002**, *156*, 11–21. [[CrossRef](#)] [[PubMed](#)]
32. Montez, J.K.; Hayward, M.D.; Brown, D.C.; Hummer, R.A. Why is the educational gradient of mortality steeper for men? *J. Gerontol. Ser. B Psychol. Sci. Soc. Sci.* **2009**, *64*, 625–634. [[CrossRef](#)] [[PubMed](#)]
33. Assari, S.; Gibbons, F.X.; Simons, R.L. Perceived Discrimination among Black Youth: An 18-Year Longitudinal Study. *Behav. Sci.* **2018**, *8*, 44. [[CrossRef](#)] [[PubMed](#)]
34. Assari, S.; Caldwell, C.H. High Risk of Depression in High-Income African American Boys. *J. Racial Ethn. Health Disparit.* **2017**. [[CrossRef](#)] [[PubMed](#)]
35. Heeringa, S.; Wagner, J.; Torres, M.; Duan, N.H.; Adams, T.; Berglund, P. Sample designs and sampling methods for the collaborative psychiatric epidemiology studies (CPES). *Int. J. Methods Psychiatr. Res.* **2004**, *13*, 221–240. [[CrossRef](#)] [[PubMed](#)]
36. Assari, S.; Lankarani, M.M.; Caldwell, C.H. Does Discrimination Explain High Risk of Depression among High-Income African American Men? *Behav. Sci.* **2018**, *8*, 40. [[CrossRef](#)] [[PubMed](#)]

37. Assari, S. Ethnic and Gender Differences in Additive Effects of Socio-economics, Psychiatric Disorders, and Subjective Religiosity on Suicidal Ideation among Blacks. *Int. J. Prev. Med.* **2015**, *6*, 53. [CrossRef] [PubMed]
38. Zimmerman, M.A.; Schmeelk-Cone, K.H. A longitudinal analysis of adolescent substance use and school motivation among African American youth. *J. Res. Adolesc.* **2003**, *13*, 185–210. [CrossRef]
39. Degoratis, L.; Spencer, P. *The Brief Symptom Inventory (BSI): Administration, Scoring and Procedures Manual—I*; Clinical Psychometric Research: Baltimore, MD, USA, 1982.
40. Boulet, J.; Boss, M.W. Reliability and validity of the brief symptom inventory. *Psychol. Assess.* **1991**, *3*, 433–437. [CrossRef]
41. Connolly, M.B.; Crits-Christoph, P.; Shelton, R.C.; Hollon, S.; Kurtz, J.; Barber, J.P.; Butler, S.F.; Baker, S.; Thase, M.E. The reliability and validity of a measure of self-understanding of interpersonal patterns. *J. Couns. Psychol.* **1999**, *46*, 472–482. [CrossRef]
42. Derogatis, L.R. *SCL-90-R: Administration, Scoring and Procedures Manual for the R (revised) Version and Other Instruments of the Psychopathology Rating Scale Series*; Clinical Psychometric Research: Towson, MD, USA, 1992.
43. Hayward, M.D.; Hummer, R.A.; Sasso, I. Trends and group differences in the association between educational attainment and U.S. adult mortality: Implications for understanding education’s causal influence. *Soc. Sci. Med.* **2015**, *127*, 8–18. [CrossRef] [PubMed]
44. Backlund, E.; Sorlie, P.D.; Johnson, N.J. A comparison of the relationships of education and income with mortality: The national longitudinal mortality study. *Soc. Sci. Med.* **1999**, *49*, 1373–1384. [CrossRef]
45. Everett, B.G.; Rehkopf, D.H.; Rogers, R.G. The nonlinear relationship between education and mortality: An examination of cohort, race/ethnic, and gender differences. *Popul. Res. Policy Rev.* **2013**, *32*, 893–917. [CrossRef] [PubMed]
46. Cutler, D.M.; Lleras-Muney, A. Education and Health: Evaluating Theories and Evidence. National Bureau of Economic Research. Available online: <http://www.nber.org/papers/w12352/> (accessed on 9 September 2017).
47. Holmes, C.J.; Zajacova, A. Education as “the great equalizer”: Health benefits for black and white adults. *Soc. Sci. Q.* **2014**, *95*, 1064–1085. [CrossRef]
48. Assari, S. High Income Protects Whites but Not African Americans against Risk of Depression. *Healthcare* **2018**, *6*, 37. [CrossRef] [PubMed]
49. Assari, S.; Mistry, R. Educational Attainment and Smoking Status in a National Sample of American Adults; Evidence for the Blacks’ Diminished Return. *Int. J. Environ. Res. Public Health* **2018**, *15*, 763. [CrossRef] [PubMed]
50. Lampe, F.C.; Walker, M.; Lennon, L.T.; Whincup, P.H.; Ebrahim, S. Validity of a self-reported history of doctor-diagnosed angina. *J. Clin. Epidemiol.* **1999**, *52*, 73–81. [CrossRef]
51. Assari, S.; Lankarani, M.M.; Burgard, S. Black-white difference in long-term predictive power of self-rated health on all-cause mortality in United States. *Ann. Epidemiol.* **2016**, *26*, 106–114. [CrossRef] [PubMed]
52. Assari, S.; Burgard, S.; Zivin, K. Long-term reciprocal associations between depressive symptoms and number of chronic medical conditions: Longitudinal support for black-white health paradox. *J. Racial Ethn. Health Disparit.* **2015**, *2*, 589–597. [CrossRef] [PubMed]
53. Assari, S.; Moazen-Zadeh, E.; Lankarani, M.M.; Micol-Foster, V. Race, depressive symptoms, and all-cause mortality in the United States. *Front. Public Health* **2016**, *4*, 40. [CrossRef] [PubMed]
54. Assari, S.; Lankarani, M.M. Depressive symptoms are associated with more hopelessness among white than black older adults. *Front. Public Health* **2016**, *4*, 82. [CrossRef] [PubMed]
55. Assari, S.; Burgard, S. Black-White differences in the effect of baseline depressive symptoms on deaths due to renal diseases: 25 year follow up of a nationally representative community sample. *J. Ren. Inj. Prev.* **2015**, *4*, 127–134. [PubMed]
56. Assari, S. Hostility, anger, and cardiovascular mortality among Blacks and Whites. *Res. Cardiovasc. Med.* **2016**. [CrossRef]
57. Assari, S. Race, sense of control over life, and short-term risk of mortality among older adults in the United States. *Arch. Med. Sci.* **2016**. [CrossRef] [PubMed]
58. Assari, S.; Lankarani, M.M. Association between stressful life events and depression; intersection of race and gender. *J. Racial Ethn. Health Disparit.* **2016**, *3*, 349–356. [CrossRef] [PubMed]

59. Assari, S.; Sonnega, A.; Pepin, R.; Leggett, A. Residual effects of restless sleep over depressive symptoms on chronic medical conditions: Race by gender differences. *J. Racial Ethn. Health Disparit.* **2016**. [[CrossRef](#)] [[PubMed](#)]
60. Assari, S. Perceived neighborhood safety better predicts 25-year mortality risk among Whites than Blacks. *J. Racial Ethn. Health Disparit.* **2016**. [[CrossRef](#)]
61. Assari, S.; Lapeyrouse, L.M.; Neighbors, H.W. Income and Self-Rated Mental Health: Diminished Returns for High Income Black Americans. *Behav. Sci.* **2018**, *8*, 50. [[CrossRef](#)] [[PubMed](#)]
62. Assari, S. Parental Education Better Helps White than Black Families Escape Poverty: National Survey of Children's Health. *Economies* **2018**, *6*, 30. [[CrossRef](#)]
63. Chen, E.; Martin, A.D.; Matthews, K.A. Understanding health disparities: The role of race and socioeconomic status in children's health. *Am. J. Public Health* **2006**, *96*, 702–708. [[CrossRef](#)] [[PubMed](#)]
64. King, D.K. Multiple jeopardy, multiple consciousness: The context of a Black feminist ideology. *Signs J. Women Cult. Soc.* **1988**, *14*, 42–72. [[CrossRef](#)]
65. Dowd, J.J.; Bengtson, V.L. Aging in minority populations an examination of the double jeopardy hypothesis. *J. Gerontol.* **1978**, *33*, 427–436. [[CrossRef](#)] [[PubMed](#)]
66. Wilson, K.B.; Thorpe, R.J.; LaVeist, T.A. Dollar for dollar: Racial and ethnic inequalities in health and health-related outcomes among persons with very high income. *Prev. Med.* **2017**, *96*, 149–153. [[CrossRef](#)] [[PubMed](#)]
67. Bowleg, L.; Huang, J.; Brooks, K.; Black, A.; Burkholder, G. Triple jeopardy and beyond: Multiple minority stress and resilience among Black lesbians. *J. Lesbian Stud.* **2003**, *7*, 87–108. [[CrossRef](#)] [[PubMed](#)]
68. Navarro, V. Race or class, or race and class. *Int. J. Health Serv.* **1989**, *19*, 311–314. [[CrossRef](#)] [[PubMed](#)]
69. Mehta, N.; Preston, S. Are major behavioral and sociodemographic risk factors for mortality additive or multiplicative in their effects? *Soc. Sci. Med.* **2016**, *154*, 93–99. [[CrossRef](#)] [[PubMed](#)]
70. Williams, D.R.; Collins, C. U.S. socioeconomic and racial differences in health: Patterns and explanations. *Ann. Rev. Sociol.* **1995**, *21*, 349–386. [[CrossRef](#)]
71. Farmer, M.M.; Ferraro, K.F. Are racial disparities in health conditional on socioeconomic status? *Soc. Sci. Med.* **2005**, *60*, 191–204. [[CrossRef](#)] [[PubMed](#)]
72. Assari, S.; Moazen-Zadeh, E. Ethnic Variation in the Cross-sectional Association between Domains of Depressive Symptoms and Clinical Depression. *Front. Psychiatry* **2016**, *7*, 53. [[CrossRef](#)] [[PubMed](#)]
73. Choi, Y.; Harachi, T.W.; Gillmore, M.R.; Catalano, R.F. Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial and multiracial adolescents. *Am. J. Orthopsychiatry* **2006**, *76*, 86–97. [[CrossRef](#)] [[PubMed](#)]

