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Development of an Attribution of Racial/Ethnic Health Disparities Scale

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Abstract The purpose of this study was to develop an Attribution of Racial/Ethnic Health Disparities (AREHD) scale. A convenience sample of undergraduate college students ($n = 423$) at four Midwestern universities was recruited to respond to the survey. A pilot test with undergraduate students ($n = 23$) found the survey had good acceptability and readability level (SMOG = 11th grade). Using exploratory factor analysis we found the two a priori subscales were confirmed: individual responsibility and social determinants. Internal reliabilities of the subscales were: individual responsibility ($\alpha = 0.87$) and social determinants ($\alpha = 0.90$). Test–retest stability reliabilities were: individual responsibility ($r = 0.72$) and social determinants ($r = 0.69$). The AREHD subscales are satisfactory for assessing college student’s AREHD.

Keywords Health · Disparities · Race · Scale · Reliability · Validity · Attribution

Background

Health disparities refers to racial/ethnic differences in premature morbidity and mortality, and access to quality health care [1, 2]. Health disparities is the term used primarily in the United States while much of Europe uses the term health inequality [3]. Inequality implies unfairness with a strong moral and ethical perspective where differences in health status are perceived to be able to be ameliorated by reasonable social and political actions [4, 5].

Disparities in health status continue to exist, especially among different racial/ethnic groups [6]. A wide range of health measures provide ample evidence of the breadth and depth of these disparities, including access to health insurance; prevalence and/or death rates for specific diseases such as asthma, HIV/AIDS, hypertension, diabetes, cancers, and strokes; infant and maternal mortalities; and life expectancies, just to name a few [7, 8]. These differences should not be attributed to immutable factors such as genetic differences [9]. The factors that cause these disparities are numerous but mutable with adequate resources and sufficient political will.

Attribution theory examines what people believe are the causes of health behaviors or health outcomes [10, 11]. Often the behaviors or outcomes of others are perceived to be directly caused by internal attributions, such as “hard work” versus “laziness”; “smart” versus “dumb”; “caring” versus “not caring”; “highly skilled” versus “unskilled”. This can be a form of victim-blaming when entire segments of society are held accountable for their poor health status so that other members of society can

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justify the neglect, powerlessness and social injustice that are the root causes of racial/ethnic differences in health status [12]. This represents the old belief that all individuals are capable of pulling themselves up by their “bootstraps”. Some in society blame the victims of poor health to justify their own inactions toward truly addressing the root causes of racial/ethnic health disparities in society. In reality, many racial/ethnic minorities are born and raised in environments that differ in their health-promoting resources than what many whites encounter in their lives [13]. People are more likely to explain much of their personal behaviors or outcomes to a particular situation or some outside force. This is termed external attribution [10]. Sometimes people see cause and effect relationships even where there are none. Thus, victims of unjust circumstances may be blamed for their health status.

Using attribution theory to explain racial/ethnic health disparities results in two potential explanations for these disparities: individual responsibility (internal attributions) and social determinants (external attributions) [10]. Social determinants of health is composed of broad structural factors such as discrimination, powerlessness, education levels, social status, housing, transportation, access to health care, and poverty [14, 15]. To believe in such causes requires abandoning the American ideal of our country as being... “a land of equality, justice and opportunity for all” [16]. The aforementioned diametrically opposed views of attribution are the basic principles of how the public explains what is occurring in their environment. If you can understand how people explain what is occurring in their environment then you might be able to change their perceptions and make their perceptions more congruent with reality.

In 2010, 41 % of Americans were unaware of racial/ethnic health disparities and it was more of an issue with whites (45 %) [17]. This level of unawareness of racial/ethnic health disparities may, in part, lead to incorrect attributions for racial/ethnic health disparities and to underestimations of the size or severity of the problem. Thus, the purpose of the current study was to develop an Attribution of Racial/Ethnic Health Disparities (AREHD) scale. Such a scale could be useful in examining public health and other health professional student’s attributions of health disparities. Since these individuals are still in the education arena they could be formally educated about correct attributions of racial/ethnic health disparities.

Methods

Subjects

Students were recruited from intact classrooms of undergraduate students. The classrooms were convenience

samples of general education classes or classes with broad representation of majors at four Midwestern universities. If two or more classes of the same subject (e.g. English, sociology, personal health, etc.) existed then the classes with the highest enrollment of racial/ethnic minorities were selected to ensure representation of racial/ethnic minorities. A total of 481 students were requested to complete the anonymous survey. The data were collected during the 2012 calendar year, subsequent to approval by Human Subjects Committee.

Instruments

A 47-item questionnaire was developed, consisting of 34 items measuring the two components of attribution theory regarding racial/ethnic health disparities: individual responsibility and social determinants. Thirty of the items were developed from a comprehensive review of the literature on racial/ethnic health disparities. The other four items were recommended by one of the expert reviewers. There are over 100 social safety net programs, four of the more commonly known programs were selected to assess how students would change funding (decrease funding, leave funding as is, or increase funding) for these selected government social safety net programs. In addition, nine background/demographics items (e.g. political affiliations, personal use of the selected government programs, age, sex, race/ethnicity, etc.) were included. The response scale for the attribution items asked the students how relevant (highly relevant, relevant, slightly relevant, or not relevant) they thought each item was in contributing to racial/ethnic health disparities.

The instrument was reviewed by 5 published authorities in racial/ethnic health disparities or survey research to assess content validity of the instrument. Minor wording changes were made to 6 of the 30 items as recommended by the reviewers. One of the reviewers recommended 4 additional items which were included on the final version of the questionnaire. None of the original 30 items were deemed inappropriate and should be excluded by the reviewers.

Data Analysis

Data from the study were analyzed using SPSS 17.0. Data analysis included descriptive statistics that included frequencies, percentages, means, and standard deviations to describe the responses to the two subscales as well as the demographic and background characteristics of the respondents. A median split of the potential range (0–45) of each subscale was used to denote low (0–22) and high (23–45) scores on each subscale. *T* tests and Chi square tests were calculated to determine differences between

dichotomous independent and parametric dependent variables and for dichotomous independent and dependent variables, respectively. In addition, psychometric properties of the instrument were established using Cronbach alpha, Pearson product moment correlation coefficients, Exploratory factor analysis, and SMOG readability analysis [18, 19].

Results

Respondent Characteristics

A total of 423 (88 %) questionnaires were returned completed. The undergraduate students were primarily white (75 %), female (54 %), with a plurality of Republicans (36 %) (Table 1). Two one-way analysis of variance tests of significance were calculated to determine if students at the four universities differed in their perceived support for individual responsibility ($F = 1.273; df = 3, 369; p > .05$) or social determinants ($F = 0.987; df = 3, 367; p > .05$) of racial/ethnic health disparities. Since the analyses were not significant, the four groups of undergraduate students were combined into one group for all further analyses of the data.

Table 1 Demographics and background of college students

Characteristics	N (%)
<i>Sex</i>	
Female	230 (54)*
Male	177 (42)
<i>College status</i>	
Freshman	82 (19)
Sophomore	105 (25)
Junior	113 (27)
Senior	99 (23)
<i>Race/Ethnicity</i>	
African American	55 (13)
Caucasian	316 (75)
Hispanic	14 (3)
Asian American	8 (2)
Other	31 (7)
<i>Political affiliation</i>	
Democrat	117 (28)
Republicans	154 (36)
Independent	70 (17)
Libertarian	19 (5)
Other	32 (8)
	M (SD)
Age (years)	21.6 (4.0)

* Due to missing responses categories do not total 100 %
N = 423

Acceptability and Readability

The final form of the questionnaire was pilot tested with a convenience sample of 23 undergraduate students for acceptability. The students found the items easy to read and understand. A SMOG readability analysis, a more conservative reading level analysis, was calculated for the 30 items [20]. The scale was found to have a satisfactory reading level of grade 11. However, the word “minorities”, a polysyllabic word, was used numerous times in the subscale items. If this word was known to the respondents then the reading level would be 10th grade. This grade level represents the number of years of formal education needed to completely comprehend the text.

Construct Validity

To assess whether the items created for the a priori individual responsibility and social determinants subscales of the AREHD scale were two distinct subscales (e.g. two dimensions) or multiple dimensions, exploratory factor analysis (EFA) with varimax rotation and Kaiser normalization were used to assess the construct validity of the items. The Catell scree plot of the eigenvalues was used to determine the number of dimensions suggested by the plot [21]. An examination of the EFA revealed two eigenvalues (values = 10.98 and 3.19) that explained almost 41 % (30.6 % for social determinants and 8.9 % for individual responsibility) of the total variance. Thirty of the 34 items loaded on the two subscales at .40 or above (Table 2). The four items that did not load were items added by one of the expert reviewers. These four items dealt with genetic causes, communication with health providers, trust of health professionals, and unsafe working conditions. Thus, the EFA confirmed the construct validity of the instrument, with 15 items loading on the social determinants subscale (even numbered items) and 15 items loading on the individual responsibility subscale (odd numbered items), resulting in equal numbers of items for the two subscales (Table 2).

Criterion Validity

In criterion validity, a new scale (predictor variable) is used to show that scores on some criterion variables can be predicted by the new scale (e.g. AREHD scale) [18]. The two subscales (individual responsibility and social determinants) were scored in the following manner: highly relevant = 3, relevant = 2, slightly relevant = 1, and not relevant = 0 for each of the 15 items on both subscales (potential range 0–45 per subscale). A higher score represented greater belief in social determinants or individual responsibility as the cause for existing racial/ethnic health disparities.

Table 2 Construct validity of the perceived etiology of Racial/Ethnic Health Disparities Scale

Item	Factor 1	Factor 2
2. The persistent level of racial/ethnic discrimination in society	.59	
4. The quality of schools available to low- income racial/ethnic minorities	.67	
6. The lack of political power of racial/ethnic minorities	.65	
8. The lack of adequate low cost housing for low- income racial/ethnic minorities	.67	
10. The lack of adequate low cost public transportation available for low- income racial/ethnic minorities	.60	
12. The proportion of racial/ethnic minorities without health insurance	.47	
14. Lack of employment opportunities for less well educated racial/ethnic minorities to achieve well-being	.68	
16. Failure of government programs to meet the needs of low- income racial/ethnic minorities	.70	
18. The vast income disparities between laborers and executives of companies	.62	
20. The level of environmental stressors affecting racial/ethnic minorities	.58	
22. The poorer quality of health care received by racial/ethnic minorities	.67	
24. The residential segregation of racial/ethnic minorities into poorer areas of the community	.69	
26. Racial/ethnic minorities lack of access to prescription drugs for health problems	.61	
28. The lack of safe parks, playgrounds, walking/biking trails and other recreational areas available to racial/ethnic minorities in low- income communities	.61	
30. The lack of racial/ethnic physicians practicing in the inner city and in low-income communities	.57	
1. The high rates of out-of-wedlock births among racial/ethnic minorities		.40
3. The high rate of single parent households in racial/ethnic minorities		.44
5. The poor child rearing practices of racial/ethnic minorities		.69
7. The high rate of criminal activity in which low-income racial/ethnic minorities are involved		.48
9. The high proportion of racial/ethnic minorities who expect government "handouts" (e.g. food stamps, Medicaid, etc.)		.61
11. Too few racial/ethnic minority males providing positive role models for youths		.52
13. Racial/ethnic minorities not caring about their health as much as they should		.72
15. Poor health behaviors (e.g. poor diet and smoking) of racial/ethnic minorities		.73
17. The selling and use of drugs in racial/ethnic minority communities		.67
19. The lack of exercise in racial/ethnic minority adults		.59
21. The lack of motivation to get ahead among low-income racial/ethnic minorities		.60
23. Too few racial/ethnic minorities seek preventative health screening		.60
25. Racial/ethnic minorities lack of knowledge about health issues		.58
27. Racial/ethnic minorities not seeking advanced education to become health professionals		.42
29. Racial/ethnic minorities not using routine medical care that leads to emergency room visits		.55

Factor 1 = Social determinants of health (30.6 % of variance)

Factor 2 = Individual responsibility (8.9 % of variance)

* Items were those that loaded at .40 or higher

It was hypothesized that support for increasing funding of some of the federal government social programs that help form the safety net for the poor would be more likely in individuals who scored high on social determinants as the cause for racial/ethnic health disparities. Research has shown that health professionals associate the poor with racial minorities and they often express victim blaming attitudes toward the poor [22, 23]. Also, it was hypothesized that those who scored low on individual responsibility as the cause of racial/ethnic health disparities would

be more supportive of raising funding for federal government social programs (e.g. food stamps, Medicaid, low income housing, and minimum hourly wage) (Table 3). A series of Chi square tests of level of support (high vs. low) by what should happen to the funding (decrease funding, leave funding as is, or increase funding) of the selected social programs were conducted. As predicted for the social determinants subscale, high scores on this subscale predicted support for increased funding for all four social programs. However, low individual responsibility as a

Table 3 Level of support for social programs by subscale scores

	N	Decrease funding n (%)	Leave funding As Is n (%)	Increase funding n (%)	Chi square	p
<i>Food stamps program</i>						
Individual responsibility	358				7.765	.02
Low		19 (22)	52 (59)	17 (19)		
High		99 (37)	138 (51)	33 (12)		
Social determinants	365				10.576	.005
Low		54 (40)	74 (54)	8 (6)		
High		72 (31)	117 (51)	40 (17)		
<i>Medicaid</i>						
Individual responsibility	364				2.026	.363
Low		9 (10)	34 (39)	44 (51)		
High		46 (17)	100 (36)	131 (47)		
Social determinants	372				38.507	.001
Low		39 (29)	51 (38)	43 (32)		
High		17 (7)	87 (36)	135 (56)		
<i>Low income housing</i>						
Individual responsibility	351				2.224	.329
Low		9 (11)	48 (57)	27 (32)		
High		42 (16)	130 (49)	95 (46)		
Social determinants	358				29.239	.001
Low		31 (23)	77 (58)	25 (19)		
High		21 (9)	104 (46)	100 (44)		
<i>Minimum hourly wage</i>						
Individual responsibility	373				1.847	.397
Low		3 (3)	40 (43)	49 (53)		
High		11 (4)	100 (36)	170 (60)		
Social determinants	382				20.005	.001
Low		8 (6)	73 (51)	62 (43)		
High		6 (3)	74 (31)	159 (67)		

cause for racial/ethnic health disparities was statistically significant only for increased funding for the food stamps program (Table 3).

Two additional tests of criterion validity included the ability of the two attribution subscales to differentiate between Republicans and Democrats and between African Americans and whites. The recent political campaign for President of the United States indicated Republicans supported cutting funding for social programs and Democrats were reticent to cut such programs. According to *Conservative HQ*, the difference between Democrats and Republicans is the difference between government dependency on federal welfare programs and the party of self-reliance and getting able-bodied Americans off welfare programs [24]. In other words, the philosophical bent of Republicans is to blame the poor for any inequalities that exist [25]. These political differences forms an ability to assess the discriminate validity of the subscales. A *t* test analysis of Republicans ($M = 28.49$; $SD = \pm 6.56$) versus Democrats

($M = 32.90$; $SD = \pm 6.51$) on the social determinants subscale found them to be statistically significantly different ($t = 5.32$, $df = 252$, $p < .001$). There was not a statistically significant difference ($t = 1.36$, $df = 250$, $p = .18$) between Republicans ($M = 32.21$; $SD = 5.84$) and Democrats ($M = 33.28$; $SD = \pm 6.52$) on the individual responsibility subscale.

T test analyses for race by attributions for health disparities found African Americans ($M = 35.5$, $SD = 5.0$) were significantly more likely than whites ($M = 29.3$, $SD = 6.3$) to attribute racial/ethnic health disparities to social determinants ($t = 6.628$, $df = 350$, $p < .001$). In addition, African Americans ($M = 34.5$, $SD = 5.9$) were significantly more likely than whites ($M = 31.9$, $SD = 5.9$) to also attribute individual responsibility as the cause of racial/ethnic health disparities ($t = 2.875$, $df = 340$, $p = .004$).

Based on the study findings an analysis of the relative attributions of the responding college students was conducted (Table 4). The majority (56 %) of college students

Table 4 Relative Attributions of Racial/Ethnic Health Disparities

Individual responsibility n (%)	Social determinants	
	High	Low
High*	202 (56 %)	72 (20 %)
Low*	28 (8 %)	61 (17 %)

N = 363

* Low = 0–22, high = 23–45

perceived that both individual responsibility and social determinants were responsible for racial/ethnic health disparities. In addition, about 1 in 6 students did not attribute a major role to either individual responsibility or to social determinants as causes for racial/ethnic disparities.

Reliability

Two forms of reliability were calculated for the two subscales. Internal consistency, a measure of the interrelatedness of the items were assessed using the final responses ($n = 423$) and were found to be high: social determinants $\alpha = 0.90$ and individual responsibility $\alpha = 0.87$. Stability reliability, also called test–retest reliability, was assessed using a convenience sample of 44 undergraduate college students. The questionnaire was given to the students and 1 week later the students completed the questionnaire a second time. The mean Pearson product moment correlation coefficients for the subscales were: social determinants $r = 0.69$ and for individual responsibility $r = 0.72$.

Discussion

The current study explored the psychometric properties of the AREHD scale in a convenience sample of Midwestern undergraduate college students. The results indicated that the subscales were easily understood by the college students, were valid and reliable, and consisted of 2 dimensions (factors). In addition, the social determinants of racial/ethnic health disparities scores were significantly associated with increased funding support for selected social safety net programs. The findings of the current study in relation to the social determinants subscale indicate it to be a robust predictor of funding support for social safety net programs. Such findings seem intuitively logical since support for helping individuals who are disadvantaged for reasons beyond their control has long been supported by Democrats, a group found to have greater attributions for social determinants of racial/ethnic health disparities than did Republicans [26, 27].

Those students who scored low on the individual responsibility AREHD subscale were not found to support funding for most of the social safety net programs. This is possibly due to the vast majority of students were attributing racial/ethnic health disparities to both individuals and their social circumstances. It may be that victim blaming (individual responsibility) is an outcome when students have not been taught about the determinants of racial/ethnic health disparities. Students who perceive there to be injustices in society but who do not understand the role played by environmental and social forces in constraining the choices of disenfranchised populations may be more likely to blame those populations. It may also be that having not been formally educated regarding racial/ethnic disparities that the students estimated the size or seriousness of the disparities as minor or perceived that government programs may not be effective at ameliorating the problems.

An unexpected finding was that 17 % (or about 1 in 6) of the students did not perceive either individual responsibility or social determinants played a major role in determining racial/ethnic health disparities. This may indicate these individuals perceived that another cause existed in creating these disparities that was not part of the existing subscales. A logical additional subscale would be inherent biological or genetic differences between the races. This erroneous theory of genetic differences having a major impact on health disparities has been widely reported previously in the literature [28–30]. Further research with the AREHD scale with the addition of a biological/genetic subscale may be warranted to more fully assess the attributions of various groups regarding racial/ethnic health disparities.

Public policy making to eliminate health disparities is strongly influenced by the underlying hypothetical attributions of racial/ethnic health disparities. It is entirely reasonable to hold individuals... “responsible for engaging in health promoting behaviors but they should be held accountable only when they have adequate resources to do so” [31]. In other words, many health related behaviors are often severely constrained by social processes and resources and need to be placed in context [9]. Thus, the social determinants subscale would seem to be a useful tool for assessing a wide range of individual’s perceptions of the contribution of a variety of social issues to health disparities. Some college students will graduate and take on the roles of community leaders and policy makers who will be responsible for developing policies to help diminish disparities. The AREHD scale can help assess the attributions of college students regarding racial/ethnic health disparities who can still be formally assisted in rethinking what are useful policies for narrowing the racial/ethnic health disparities gap. Specific educational endeavors regarding

racial/ethnic health disparities should help create a more nuanced understanding of the causes and implications of racial/ethnic health disparities. In addition, replication of this study should be conducted with other populations.

Limitations of the Study

There are several potential limitations of the current study that need to be acknowledged. First, the sample was a convenience sample at four Midwestern universities. It is possible that college students' attributions of racial/ethnic health disparities may differ in other geographic locations. Second, a debriefing of a sample of the classes found that none of the respondents had ever been taught about racial/ethnic health disparities either in high school or in college, nor had they studied the topic on their own. Many expressed the belief that they should have known more about the topic, especially the students from various health professions. Many students seemed to have intellectualized their responses rather than giving their personal perceptions on the causes of disparities. Several students volunteered they had talked with their peers about the topic between the two administrations of the instrument for stability reliability and that their discussions caused them to change several of their responses on the second administration. Thus, it is not surprising that the stability reliability was low and probably underestimates the stability reliability of the subscales. Third, the use of a monothematic questionnaire can often cause some respondents to misrepresent their true perceptions about the topic (e.g. socially desirable responding.) Should this have occurred it would be a threat to the internal validity of the findings. Fourth, our study was cross sectional in design, which prevented us from making any causal inferences.

Strengths of the Study

There are several notable strengths to the current study. First, the number of respondents per item on the subscales was good. Increasing the ratio of subjects to number of items on a scale is associated with lower Type I (e.g. items should not have been considered salient for a scale but were) and Type II errors (e.g. items should have been considered salient for a scale but were not) [33]. In addition, the traditional standard of at least 10 subjects per item was used [32]. Second, the magnitude of the item loadings has an important effect on lowering Type I errors. This is why .40 was used as a minimum loading for items on the two factors. Additionally, 25 of the 30 items loaded at .50 or higher, a strong indication of minimizing the Type I error in instrument construction. Third, this is the first instrument to our knowledge to assess the attributions of racial/ethnic health disparities.

Conclusion and Policy Implications

In conclusion, the findings indicate the AREHD scale can provide educators and researchers with an instrument that can provide valid feedback on attributions of racial/ethnic health disparities. Such feedback can provide educators with a way to assess what students perceive about health disparities as part of formative or summative evaluations. To our knowledge this instrument is the first such scale to provide researchers with a tool to identify which attributions (e.g. individual or social determinants) health professionals, policymakers and others support as the causes of racial/ethnic health disparities. Such assessments can help guide advocacy efforts for strengthening the ideological orientation of such professionals to ensure that health professionals and policy makers are addressing health disparities in a manner that fully addresses the factors that create and maintain racial/ethnic health disparities.

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