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Journal

Psychophysiology, 53(1)

ISSN

0048-5772

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Publication Date

2016

DOI

10.1111/psyp.12499

Peer reviewed

HHS Public Access

Author manuscript

Psychophysiology. Author manuscript; available in PMC 2017 January 01.

Published in final edited form as:

Psychophysiology. 2016 January ; 53(1): 64–70. doi:10.1111/psyp.12499.

Ethnic/Racial Differences in the Association between Social Support and Levels of C-Reactive Proteins in the North Texas Heart Study

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Abstract

Perceived social support has been reliably related to lower rates of morbidity and mortality. However, studies modeling C-reactive protein (CRP) as an important biological pathway linking social support to health have produced inconsistent results. Given purported ethnic/racial differences in sensitivity to social resources, the present study tested if ethnicity/race moderated the link between perceived support and CRP in a diverse community sample of 300 participants from the North Texas Heart Study. Consistent with prior research, there was no overall link between social support and CRP levels. However, the association between social support and hs-CRP levels was moderated by ethnicity/race as perceived support predicted lower hs-CRP level primarily in African Americans. These results suggest the importance of considering how ethnicity/race may inform models on the complex biological mechanisms linking social support to health.

Keywords

social support; C-reactive protein; ethnicity/race; inflammation

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General perceptions of social support reflects one's view that others will be available during times of need and is a well-documented psychosocial predictor of lower cardiovascular morbidity, as well as all-cause mortality (Holt-Lunstad, Smith, & Layton, 2010; Uchino, 2004). In recent meta-analyses, the link between social support and mortality from all causes was consistent across age and sex (Holt-Lunstad et al., 2010; Shor, Roelfs, & Yogev, 2013). Indeed, the effect sizes for perceived support and mortality rates appeared comparable, if not larger, than standard biomedical risk factors (Holt-Lunstad et al., 2010).

One area that is receiving significant attention is the biological pathways by which social support may influence health. Of such biological pathways, the role of inflammation is being examined as it predicts the development and course of adverse chronic health conditions including heart disease (Eckel & Cornier, 2014; Emerging Risk Factor Collaboration et al., 2010; Libby, 2002). Inflammation appears to influence every step of the atherosclerotic process, including the early recruitment of immune cells to vessel walls and eventual plaque disruption which is associated with heart attacks (Libby, 2002). Of the inflammatory markers, C-reactive protein (CRP) is of particular interest because it is reliably related to cardiovascular, metabolic, and malignant diseases in both cross-sectional and prospective studies (Buckley, Fu, Freeman, Rogers, & Helfand, 2009; Guo, Pan, Du, Ren, & Xie, 2013; Lee, Adler, Sandhu et al., 2009). Although CRP can be thought of as a clinical marker of inflammatory processes, research is showing that CRP may also have a direct role on health (Bisoendial, Kastelein, & Stroes, 2007). For instance, CRP may decrease nitric oxide production and increase cytokine production (Verma, Szmitko, & Yeh, 2004). These factors can up-regulate adhesion molecules and increase monocyte recruitment (Khreiss, Jozsef, Potempa, & Filep, 2004). More generally, CRP appears to influence endothelial dysfunction, the formation of fatty streaks, and the rupture of vulnerable plaque (Bioendial et al., 2007).

Given the importance of CRP as a health-relevant biological pathway, the major aim of this study was to examine if ethnicity/race moderated the link between social support and CRP levels. Based on broader theoretical work in psychology and sociology, ethnicity/race may influence links between social support and CRP because it is related to one's sensitivity to social resources such as social support (Jacobson, 1987; Markus & Kitayama, 1991). Ethnicity/race is a proxy for culturally-transmitted values that orient the individual to the self and others (Betancourt & Lopez, 1993; Markus & Kitayama, 1991). In general, non-Hispanic Whites are characterized by an individualistic culture in which one's identity is viewed as distinct from others (Markus & Kitayama, 1991). African Americans and Hispanic/Latinos, in comparison, are characterized by a more interdependent cultural orientation where one's identity significantly overlaps with close others (Markus & Kitayama, 1991). This interdependent orientation is thought to increase the salience of close relationships processes across the lifespan with resulting influences on cognitive, emotional, and behavioral reactions to others (Markus & Kitayama, 1991). Consistent with this reasoning, Hispanic/Latinos and African Americans appear to utilize and have greater expectations for the family as a significant source of support (Haxton & Harknett, 2009; Taylor, Hernandez, Nicklett, Taylor, & Chatters, 2013), and interdependent cultures appear to benefit more from the perception that support will be available (Kim, Sherman, & Taylor, 2008). Although it is less clear if African Americans and Hispanic/Latinos differ from non-

Hispanic Whites on overall perceptions of support (Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2003), these data suggest that they are more sensitive to such social processes so that perceiving high levels of social support might be particularly beneficial for them (Uchino, 2004).

This theoretical argument becomes particularly important given findings in this area. That is, given the links between social support and better physical health one might expect it to be related to lower CRP levels (Taylor, 2011). Social support has been related to lower sympathetic nervous system activity which might in turn reduce inflammation (Bosch et al., 2003; Uchino, 2004). More generally, social support is associated with lower levels of stress and negative affect which have been linked to inflammation (Segerstrom & Miller, 2004; Wium-Andersen, Orsted, Nielsen, & Nordestgaard, 2013). It is thus surprising that the literature linking social support to CRP levels has shown inconsistent results. Some studies have found social support to predict lower CRP levels (Mezuk, Diez Roux, & Seeman, 2010). Most studies, however, have reported no significant link (McDade, Hawkley, & Cacioppo, 2006; Nakata, Irie, & Takahashi, 2014; Kamiya, Whelan, Timonen, & Kenny, 2010; Yang, Schorpp, & Harris, 2014) and one study even reported perceived support to predict increased CRP levels (Glei, Goldman, Ryff, Lin, & Weinstein, 2012). Many of these studies were large, population based samples (e.g., English Longitudinal Study on Aging, Midlife in Development Study, Multi-Ethnic Study of Atherosclerosis) so the lack of consistent findings in prior work does not appear to reflect issues of low statistical power.

Given theoretical arguments one possibility is that the link between perceived social support and CRP holds more strongly in specific ethnic/racial populations especially because prior studies have statically controlled or not considered ethnicity/race. It is interesting that one of the only studies that found social support to predict lower CRP levels had the largest sample of African Americans (30%, Mezuk et al., 2010), whereas the study that found the surprisingly opposite finding had a relatively low number of African Americans and Hispanic/Latino (12% across both ethnic/racial groups, Glei et al., 2012). Based on prior work and theorizing, social support was thus not predicted to be related to CRP in general. Due to the purported importance of perceived social support for Hispanic/Latinos and African Americans, it was predicted that social support would be related to lower CRP for individuals of these ethnic/racial backgrounds.

Method

Participants

The North Texas Heart Study is a diverse community sample of 300 adults (150 men, 150 women), ages 21 to 70 years. The sample is stratified by age within sex and ethnicity/race (see Table 1). Participants were recruited through a variety of sources including advertisements in local newspapers, flyers, community and university websites, hospital postings, and community organization postings. Inclusion criteria were: 1) 21+ years of age, 2) residing within Denton County, and 3) written and verbal fluency in English language. Exclusion criteria were 1) cognitively unable to give informed consent, 2) previous history of myocardial infarction, and 3) night shift workers. Given their widespread use, hypertensive and lipid medications were assessed as covariates but not cause for exclusion.

A total of 692 persons contacted the study. Participants were enrolled until the sample cells based on sex, age, and racial/ethnic representation were filled. Eighteen individuals were screened-out, 15 due to a history of myocardial infarction and 3 due to pregnancy within the last 12-months. In addition, two participants failed to show up to the intake appointment and were replaced. A majority of participants were married (60%), owned a home (63%), and employed outside the home (79%). Participants represented a broad range of educational backgrounds although more than 86% reported some college. Similarly, the sample reflects significant income diversity as 12% reported a household income less than $20,000, 10% above $150,000, and the modal annual household income reported to be $75,000 to $100,000.

Procedures

All sessions were conducted on a Thursday morning at a community vascular medicine clinic. Upon arrival, informed consent was obtained. All participants then underwent a brief physical exam, personal and family medical history, and a review of current medications and conditions. Participants were rescheduled in suspected cases of acute illness/infection. A fasting blood draw was used to assess levels of high sensitivity C-reactive protein (hs-CRP). Finally, participants completed surveys which included the interpersonal support evaluation, center for epidemiologic studies depression scale, and global physical health questionnaire (see below).

Assessments and Measures

Interpersonal Support Evaluation List (ISEL)—The short-form of the ISEL that contained 12 questions was utilized (Cohen et al., 1985). It assesses the perceived general availability of support. In the present study, the overall internal consistency of the scale was high (.86) and similar for each ethnic group (Hispanic/Latino = .80, African American = .88, Other = .80, non-Hispanic White = .88). The total score reflected an average of the items (Cohen et al., 1985) and ranged from a low of 1 (definitely false) to a high of 4 (definitely true).

Center for Epidemiologic Studies Depression Scale (CES-D)—The CES-D is a 20-item scale that assesses depressive symptoms. The Cronbach's alpha was high in both patient and control samples (.90), with a 4 week test-retest correlation of .67. (Radloff, 1977). The internal consistency of the CES-D in the current study was similarly high (.80).

Global Physical Activity Questionnaire (GPAQ)—The GPAQ was developed by the World Health Organization to assess physical activity across domains (World Health Organization, 2005). The GPAQ is a reliable measure and correlates with objective measures of moderate/vigorous physical activity (Cleland, Hunter, Kee, Cupples, Sallis, & Tully, 2014). Total metabolic equivalents were calculated for each participant as an index of physical activity (World Health Organization, 2005).

High Sensitivity CRP (hs-CRP)—The serum samples were assayed in duplicate using a Human CRP (hs) ELISA assay kit (BC-1119) from BioCheck (Foster City, CA). The assay used 5 uL (×100 dil) of sample per well and had a standard curve range of 0.005 to 0.1

mg/L. The lower limit of detection of the assay is 0.1 mg/L. Assay precision as determined by inter-assay and intra-assay coefficients of variation (%CV) were 3.3% and 4.4% respectively. Accuracy of the assay was determined by the linearity of dilution which yielded a correlation coefficient of 0.99.

Statistical Analyses

Inspection of hs-CRP values revealed 12 participants with levels over 10. Consistent with prior work and recommendations by the Center for Disease Control and Prevention/ American Heart Association (Pearson et al., 2003) these individuals were deleted as they likely reflect acute inflammatory reactions and not chronic inflammation. Seven additional participants who had missing data for the relevant variables in the model were deleted (1 for body mass, 4 for education, 2 for hs-CRP, final n = 281). Consistent with prior work, hs-CRP was natural log transformed to normalize the distribution prior to analyses (Mezuk et al., 2010). For primary analyses, simultaneous regression analyses with predictors centered at the grand mean were used to examine the links between perceived social support and hs-CRP levels. The Native American/Alaskan, Asian/Pacific Islander, more than 1, and unknown racial categories were combined into an “other” category given the small numbers in those groups. To examine the moderating role of ethnicity/race, the ethnic/racial categories (i.e., non-Hispanic White, Hispanic/Latino, Black/African American, Other) were coded with non-Hispanic Whites as the reference category because most work has been conducted with individuals of this background.

Based on the hypotheses, the African American and Hispanic/Latino groups were first combined for initial tests. Separate analyses within these ethnic/racial groups were then conducted to examine if the pattern of results differed for these two groups in comparison to non-Hispanic Whites. To conduct these tests, the Social Support × Ethnicity/Race cross-product terms (based on the centered main effects) were entered into the model after the respective main effects (Aiken & West, 1990). All analyses of hs-CRP controlled for age, sex, body mass index, education, and medication use linked to inflammation (i.e., hypertension, lipids, other cardiovascular, diabetes, see O’Connor et al., 2009). Additional analyses controlled for physical activity separately due to missing data for 41 participants on this assessment. Analyses aimed at examining if participants with missing data on physical activity differed on basic demographics showed that they were older and more likely to be female (p’s < .01) with no differences on education (p = .32). Importantly, participants with missing data on physical activity did not differ by ethnic/racial groups (p = .17), perceived support (p = .33), or hs-CRP levels (p = .12).

Results

Sample Descriptives and Preliminary Analyses

Characteristics of the final sample separated by ethnicity/race are shown in Table 2. Preliminary tests showed that the ethnic/racial groups differed significantly in terms of sex, age, and body mass only (p’s < .01). Follow-up tests within each ethnic/racial group found that there were more women than men in the Hispanic/Latino group and more men than women in the African American group (p’s < .05). In terms of age, the African American

group was younger on average than the Hispanic/Latino and the Non-Hispanic White groups, whereas the Other group was younger than the non-Hispanic White group only (*p*'s < .05). Hispanic/Latinos also had a larger body mass than the Other and non-Hispanic White groups, whereas the African American group had a larger body mass than the Other group only (*p*'s<.05). Preliminary analyses also revealed that there was no overall association between perceived social support and hs-CRP ($p = .99$).

Ethnicity/Race, Social Support, and Inflammation

Moderated regression analyses were used to test if ethnicity/race moderated the link between perceived support and CRP levels. Analyses with the combined African American and Hispanic/Latino groups revealed a marginal interaction with perceived support on hs-CRP, $b = -.39$, 95% CI [−.84, .06], $\beta = -.09$, $p = .09$. Subsequent moderated regression analyses separated each ethnic/racial group to examine more specific associations. As shown in Table 3, replicating prior work, older individuals ($p = .006$), women ($p = .08$), and individuals with greater body mass ($p = .0001$) had higher hs-CRP levels. Moreover, analyses did not show any moderating influence of ethnicity/race for Hispanic/Latinos, $b = .02$, 95% CI [−.56, .60], $\beta = .004$, $p = .94$; and Other backgrounds, $b = .33$, 95% CI [−.55, 1.22], $\beta = .04$, $p = .45$. However, the association between social support and hs-CRP levels was moderated by ethnicity/race for African Americans compared to non-Hispanic Whites, $b = -.79$, 95% CI [−1.35, −.22], $\beta = -.15$, $p = .006$ (see Figure 1). This interaction was comparable when statistically controlling for levels of physical activity despite the smaller sample due to missing data ($b = -.74$, 95% CI [−1.32, −.17], $\beta = -.15$, $p = .01$). In addition, these results were unchanged when statistically controlling for marital status ($p = .006$), tobacco use ($p = .007$), and depression ($p = .006$). Follow-up analyses stratified by ethnicity/race revealed that higher perceived support was related to lower hs-CRP in African Americans only, $b = -.58$, 95% CI [−1.09, −.06], $\beta = -.30$, $p = .03$ (see Figure 2 for raw data scatterplot for African Americans and Whites). Finally, specific contrasts between the African American group and Hispanic/Latino group, $b = -.81$, 95% CI [−1.50, −.11], $\beta = -.15$, $p = .02$; as well as the Other group, $b = -1.12$, 95% CI [−2.08, −.16], $\beta = -.21$, $p = .02$, showed that the link between perceived support and lower CRP was generally stronger in African Americans compared to these specific ethnic/racial groups.

Discussion

Although social support has been linked to a number of health-relevant biological processes (e.g., lower cardiovascular reactivity, ambulatory blood pressure, see Uchino, 2009), most prior studies using large population-based samples have found no association between perceived support and CRP (Nakata et al., 2014; Yang et al., 2014). We replicated this null finding in the present study. However, due to theoretical arguments regarding the role of ethnicity/culture on basic support processes, the main aim of this study was to examine if ethnicity/race moderated the link between perceived support and hs-CRP. Overall analyses combining the African American and Hispanic/Latino groups revealed weaker evidence for our hypotheses. However, analyses within specific ethnic/racial groups found that social support predicted lower CRP levels primarily in African Americans. Although these findings need to be confirmed in larger, representative samples, these data suggest that

social support may be particularly relevant to CRP levels in African Americans. Such a finding is important because CRP predicts future health problems including cardiovascular disease, metabolic disorders, cancer, and frailty more generally (Buckley, Fu, Freeman, Rogers, & Helfand, 2009; Guo et al., 2013; Lee et al., 2009).

One important question is why was the association between social support and lower CRP only obtained for African Americans and not Hispanic/Latinos as predicted? At a statistical level, the sample size was larger for Hispanic/Latinos than African Americans so group differences in statistical power do not appear to be driving these links. However, there was slightly more variability in social support for African Americans compared to Hispanic/Latino (see Table 2). Whether this variability represents actual differences in social support or are specific to this sample would require future work. It is also possible that these results reflect the use of a more general measure of support. The ISEL is one of the most widely used measure of perceived support due to its strong psychometric properties and predictive validity but it assesses support across one's social network (Cohen et al., 1985). This is important because the family is considered one of the most important sources of support for Hispanic/Latinos (Almeida, Molnar, Kawachi, & Subramanian, 2009). Thus, measures that focus or separate out familial support such as the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) might provide a stronger test of links to CRP in Hispanic/Latinos. Finally, these null findings for Hispanic/Latinos might reflect their lower cardiovascular disease risk and hence smaller effect sizes on relevant measures such as CRP (Ruiz, Steffen, & Smith, 2013).

These issues notwithstanding, at a conceptual level there are reasons to suspect that African Americans might show stronger links between global measures of support and CRP. Although both Hispanic/Latinos and African Americans are characterized by a collective cultural orientation (Markus & Kitayama, 1991), these groups differ in their sociocultural history related to support resources (Taylor et al., 2013). That is, African Americans appear to benefit from broader support resources which are based on familial and formal/informal non-kin networks (Chow, Auh, Scharlach, Lehning, & Goldstein, 2010; Taylor et al., 2013). For instance, the church has historically been an important source of both formal and informal support for African Americans (Lincoln & Mamiya, 1990). The National Survey of Black Americans found that 59% of African Americans reported daily contact with church network members and 63% reported receiving assistance from such social ties (Chatters, Taylor, Lincoln, & Schroepfer, 2002; Taylor, Lincoln, & Chatters, 2005). Of particular relevance to this study, recent research from the National Social Life, Health, and Aging Project showed that religious attendance predicted lower CRP and changes in CRP over time in African Americans whereas no such associations were found in non-Hispanic Whites (Ferraro & Kim, 2014). Such data are consistent with the notion that relationships may serve broader functions for African Americans and hence might be better captured by general measures of support such as the ISEL which was utilized for this study. It is also interesting that one of the only studies to show that perceived support predicts lower CRP included the largest sample of African Americans (Mezuk et al., 2010). Future research that specifically models ethnicity/race in large, representative samples would provide definitive answers to these questions.

A second important question concerns the potential mechanisms responsible for links between social support and CRP levels in African Americans. One possibility is that social support may have a direct influence on biological processes by reducing sympathetic nervous system activity which in turn might lower inflammation (Bosch et al., 2003). Social support may also have an indirect influence on health by influencing psychological states (e.g., depression) and health behaviors linked to inflammation. We did not find that depression had an influence on our results which is consistent with the lack of mediation via psychological processes for social support studies examining biological outcomes (Uchino, Bowen, Carlisle, & Birmingham, 2012). Future interdisciplinary work focusing on the brain mechanisms (e.g., ventromedial prefrontal cortex) that might mediate such links due to cascading influences on peripheral physiology would be needed to address these issues (Eisenberger, 2013).

Implications

The findings from this study have important implications for work on social support and health. Given the null main effect findings for social support in our study and prior work (e.g., Nakata et al., 2014; Kamiya et al., 2010), one might have reached the conclusion that variations in CRP were not a meaningful biological pathway linking social support to health. However, most of the prior work has either statistically controlled or ignored potential ethnic/racial differences. The results of this study which take such sociocultural variables into account suggest that the association between social support and lower hs-CRP is stronger in African Americans. These data highlight the possibility of support interventions in African Americans who have elevated CRP and/or low social support. It also suggests that support interventions in African Americans could track CRP levels as one important outcome given its links to future health problems.

Given the theoretical arguments regarding the importance of broad social resources for African American it might be predicted that links between general perceived support and health might be stronger across a number of health-relevant biological pathways. This might especially be the case for biological mechanisms related to cardiovascular disease given that African Americans have the highest rates of cardiovascular disease in the United States (Go et al., 2014) hence effect sizes might be larger in specific biological systems that confer cardiovascular risk. Although the data are strongest for cardiovascular disease, CRP is also linked to a broad range of health problems and the larger effect size for African Americans is consistent with their overall higher mortality rate from early life to older adulthood (Iribarren et al., 2005; Mathews & MacDorman, 2013). Most prior work in the area, however, has not appropriately modeled potential ethnic/racial differences in social support and health across the lifespan so future research will be needed to draw stronger inferences.

Another important question is whether these results for African Americans might hold for health-relevant social processes more generally given the hypothesized greater sensitivity to social processes. In this regard, relationship positivity (e.g., social support) and negativity (e.g., criticism) are broad but important distinctions as they have opposing and sometimes independent influences on health (Rook, 2015). So is it the case that African Americans are also more sensitive to negative aspects of relationships that might in turn elevate levels of

CRP? In general, most studies focusing on African Americans have found perceived discrimination from others to be linked to negative health outcomes, although studies that include direct comparisons with other ethnic/racial populations are rare (Pascoe & Richman, 2009). Whether other forms of social negativity from in-group members or close relationships (e.g., family members) would also result in similar links is unclear given the lack of studies in the area. Future health research that includes assessments of both positive and negative aspects of relationships among a diverse sample can best address these questions.

Future work attempting to model the more precise conditions and mechanisms responsible for these links should also consider more specific measurements of social-cultural processes. Ethnicity/race are broad constructs which are proxies for culturally transmitted social-cognitive and behavioral tendencies (Betancourt & Lopez, 1993). It is thus possible that these results might be stronger for individuals not born in the United States as acculturation may influence cultural identity over time (Betancourt & Lopez, 1993). We were not able to address such a possibility as over 87% of participants in this study were born in the U.S. Cross-cultural work that examines such questions across different countries of origin would address this gap in our study.

Ethnicity/race as a proxy for culture is just a first step in addressing issues of diversity in social support and health research. Another variable of interest includes sex as it is related to higher levels of inflammation in this study and others (Abdullah et al., 2007). More generally, future work can model the more proximal factors thought to be responsible for social support influences both between and within diverse groups (e.g., ethnicity/race, sex). For instance, variations in individualism-collectivism or agency-communion might better explain ethnic/racial or sex-related differences in social support and health (Helgeson & Fritz, 1998; Singelis, Triandis, Bhawuk, & Gelfand, 1995). An alternative measurement approach might focus on more specific intra-individual processes. For instance, one might examine perceptions of group identity which has been linked to cognitive, affective, and behavioral responses during social interactions (Sellers, Smith, Shelton, Rowley, & Chavous, 1998; Schmader, 2002). Such approaches might better capture the unique experiences of individuals within the broader social milieu (Sellers et al., 1998). If such associations can be confirmed in future studies, interventions might be better served by focusing on these more specific psychosocial attributes to maximize treatment effects.

Limitations and Conclusions

There are important limitations of this study that should be noted. First, the study is cross-sectional so future longitudinal work will be needed to strengthen inferences. Second, the sample size of this study was relatively small within the African American and Hispanic/Latino groups so future work will be needed using larger samples. Such larger samples will also be useful to detect relatively smaller effect sizes associated with social support, especially in Hispanic/Latino populations as little work has examined cultural influences on the link between relationships and health. The convenience sample is also a limitation as such sampling strategies are known to result in participants who are better educated and in good health (Ganguli, Lytle, Reynolds, & Dodge, 1998). The study also lacked important

lifestyle factors such as diet that might impact CRP levels (O'Connor et al., 2009). These limitations notwithstanding, future work should continue to explore ethnic/racial differences in social support and health that start from culturally-appropriate theoretical models. Such models highlight how socio-cultural factors shape the context for social support processes; including one's sensitivity to receiving and providing support from different sources (Taylor et al., 2013). Future work on the topic will be critical for refining mainstream theories and implementing more specific interventions that take such contextual processes into account.

Acknowledgments

Support for this research was provided by grant number R01 HL109340 from the National Heart, Lung, and Blood Institute and the Basic Behavioral and Social Sciences Research Opportunity Network (OppNet), National Institutes of Health (PI: John M. Ruiz).

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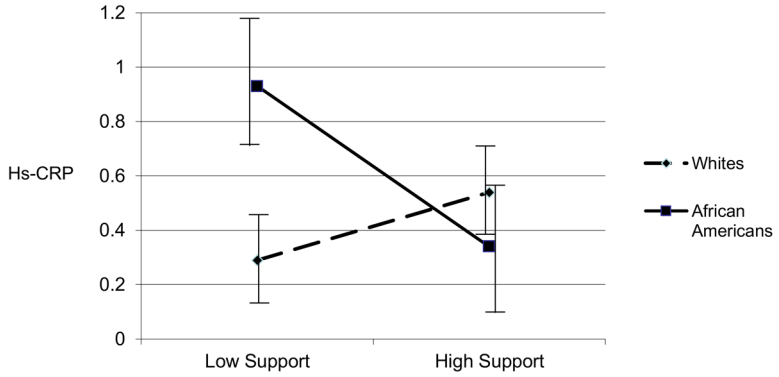

Figure 1.

Predicted hs-CRP levels and standard errors for Non-Hispanic Whites and African Americans one standard deviation above and below the mean for perceived social support.

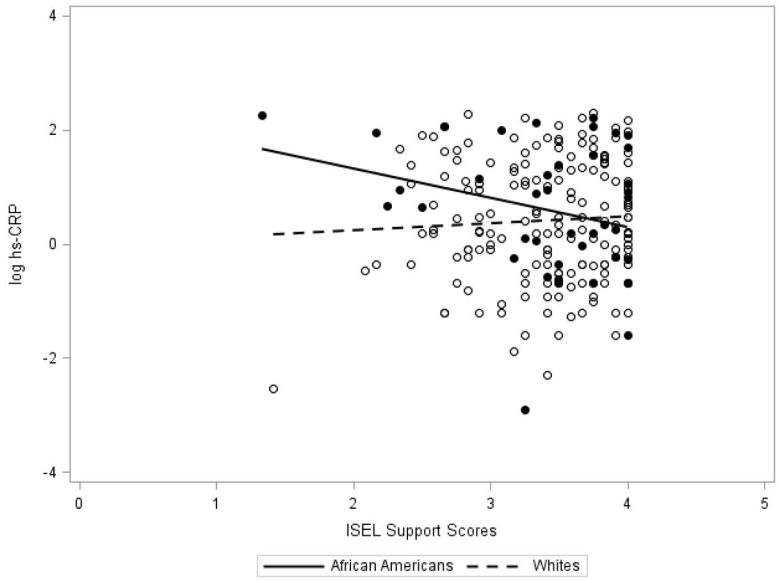

Figure 2.

Raw data scatterplot depicting the association between perceived support and hs-CRP in African Americans (filled circles, n = 41) and Non-Hispanic Whites (open circles, n = 170).

Table 1

Sample Breakdown by Ethnicity, Race, and Sex in the North Texas Heart Study

Variable	Men	Women	Total
Ethnicity			
Non-Hispanic	113	130	243
Hispanic/Latino	37	20	57
Total	150	150	300
Race			
American Indian/Alaskan	3	0	3
Asian/Pacific Islander	3	3	6
Black/African American	16	30	46
White	113	107	220
More than 1	7	5	12
Unknown	8	5	13
Total Sample	150	150	300

Table 2

Final sample characteristics by ethnicity/race (n = 281)

Variable	Hispanic/Latino	African American	Other	Non-Hispanic White
Mean Age (SD)	41.9 (11.4)	36.2 (11.4)	37.6 (13.1)	44.7 (13.0)
Mean Body Mass (SD)	30.8 (6.4)	30.2 (7.8)	24.5 (4.7)	28.5 (5.8)
Number of Females/Males	35/19	12/29	8/8	83/87
Median Education	Associate Degree	Some College	Bachelor's Degree	Bachelor's Degree
On Blood Pressure Medication	13.0%	21.9%	6.3%	14.7%
On Lipid Medication	11.1%	12.2%	6.2%	16.5%
On Other Cardiac Medication	3.7%	7.3%	0%	6.5%
On Diabetes Medication	5.6%	7.3%	0%	2.9%
Mean Perceived Support (SD)	3.2 (.51)	3.4 (.61)	3.4 (.58)	3.4 (.50)
Mean raw hs-CRP (SD)	3.4 (2.7)	3.1 (2.9)	1.3 (1.6)	2.5 (2.3)

Table 3

Moderated regression analyses predicting hs-CRP

Variable	*b*	*95% CI*	*β*	*t*	*p*
Age	.01	[.004, .02]	.17	2.75	.006
Sex female	.20	[−.03, .44]	.09	1.74	.08
Body mass index	.08	[.07, .10]	.48	9.04	.0001
Taking blood pressure medications	.14	[−.21, .49]	.05	.79	.43
Taking lipid medications	−.23	[−.62, .17]	−.07	1.13	.26
Taking other cardiac medications	.20	[−.30, .70]	.04	.78	.44
Taking diabetes medications	−.18	[−.81, .44]	−.03	.57	.57
Hispanic/Latinos-Whites (HL-W)	.18	[−.12, .48]	.06	1.16	.25
African Americans-Whites (AA-W)	.22	[−.12, .56]	.07	1.26	.21
Other-Whites (O-W)	−.27	[−.76, .23]	−.06	1.06	.29
Education	−.02	[−.09, .05]	−.03	.52	.60
Perceived Support	.04	[−.18, .25]	.02	.33	.74
HL-W*Perceived support	.02	[−.56, .60]	.004	.08	.94
AA-W*Perceived support	−.79	[−1.35, −.23]	−.15	2.76	.006
O-W*Perceived support	.33	[−.55, 1.22]	.04	.75	.45