

APPENDIX B

Jackson Heart Study Manuscript Proposal Form

Please read JHS Publications & Presentations Guidelines before completing this proposal form.

JHS P # 0611

Date of Submission: 6/10/2015

Date of Approval: ____ (07/07/2015)

PART I. OUTLINE OF PAPER

**Daniel Hale Williams Scholar, in the JHS Graduate Training and Education Center
(GTEC)**

1. Title Information

a. Proposal Title: (Please include the phrase “Jackson Heart Study” whenever possible)

Is Goal – Striving Stress Related to Incidence and Prevalence of Cardiovascular Disease Among Jackson Heart Study Participants?

b. Abbreviated Title: (50 characters)

Is there a link between goal-striving stress and Cardiovascular Disease?

c. Suggested key words:

Goal-Striving Stress, Cardiovascular Disease, Jackson Heart Study, CVD Risk Factors, African Americans

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3. Co-authors, Contact Information, and Responsibilities: (Proposed co-authors, Email address and/or telephone numbers and proposed responsibilities. Examples of responsibilities include design and concept of study, statistical analysis, data acquisition, methodological expertise, funding acquisition, literature review. Also indicate specific writing assignments including: introduction methods, results, discussion, preparation of

tables and figures. Items not assigned to a co-author are assumed to be the responsibility of the lead author. Corresponding author should also be identified if it is not to be the lead author.)

| Name | Contact Information | Responsibilities |
|-------------------------------|--|--|
| Mario Sims | msims2@umc.edu | Introduction, methods, results, lay summary |
| Ervin Fox | efox@umc.edu | Results; discussion |
| Ana Diez-Roux | avd37@drexel.edu | Introduction; results; discussion |
| James Jackson | jamesj@umich.edu | Results & Discussion |
| Clifton Addison | clifton.addison@jsums.edu | Review of manuscript & psychosocial expertise |
| Brenda Jenkins | brenda.w.campbell@jsums.edu | Results, discussion |
| Marinelle Payton | marinelle.payton@jsums.edu | Through analytical review of manuscript & CVD and epidemiological expertise |
| Wei Wang | wwang@umc.edu | Analysis, methods |
| Jacqueline Reese-Smith | jacqueline.y.reese-smith@jsums.edu | Discussion and lay summary |

4. Non-JHS Lead Authors: Non JHS Lead authors are required to have a JHS co-author and primary contact person (indicate with an asterisk). Non-JHS Lead Authors are encouraged to visit the JHS website at www.jacksonheartstudy.org for information on JHS investigators. The JHS Steering Committee may nominate additional authors if special expertise for interpreting JHS data is needed)

5. Brief Overview:

Cardiovascular disease (CVD) continues to be a major public health concern. Despite increased research efforts, little research has focused on the relationship between goal-striving stress and CVD outcomes. Goal-striving stress (GSS) is defined as "...the discrepancy between aspiration and achievement, weighted by the subjective probability of success, and the level of disappointment experienced if goals are not reached" (Neighbors et al., 2011 p. 52). GSS has been linked to negative mental health outcomes (e.g., Neighbors, Sellers, Zhang & Jackson, 2011; Sellers & Neighbors, 2008; Sellers, Neighbors, & Bonham, 2011). Additionally, a vast amount of literature has reported that stress, in general, is related to CVD and adverse behaviors that contribute to CVD (Esch, Stefano, Fricchione, & Benson, 2002). As a result, the current proposal will investigate the relationship between GSS and CVD. This proposal is based on the following aim: 1) to examine the association of baseline GSS and CVD prevalence among participants in the Jackson Heart Study (JHS); and aim 2:) to examine the association of GSS with CVD incidence among participants without CVD at baseline in the JHS. We hypothesize that increased levels of GSS will be related to increased CVD prevalence and incidence. Adjustments for behaviors, CVD risk factors and additional psychosocial factors, will be made in

the analysis of GSS and CVD. Logistic regression analysis will be used to estimate the association between GSS and CVD. Cox proportional regression analysis will be utilized to investigate the association between GSS and incident CVD.

6. Background/Rationale (Include the relevance of this proposal to African Americans and justify the need for the JHS cohort to answer the research question):

In 2010, in the United States, approximately 600,000 individuals died of cardiovascular disease (CVD), making it the leading cause of death of both men and women (Murphy, Xu, & Kochanek, 2013). CVD accounts for decreased productivity, burdensome medication regimes, and poor quality of life. Ultimately, CVD costs the United States approximately \$108.9 billion each year (Heidenreich et al., 2011). Given the clinical and public health significance of CVD, there is considerable interest in identifying psychosocial factors related to CVD so that mortality may be reduced, and quality of life improved.

To date, a vast body of research has found associations between psychosocial risk factors, such as stress and CVD. Stress plays an essential role in vulnerability, development, and outcome of CVD (Esch, Stefano, Fricchione, & Benson, 2002; Olivo, Dodson-Lavelle, Wren, Fang, & Oz, 2009). A longitudinal study conducted by Nabi and colleagues (2013) found participants who reported higher levels of stress had a 2 times higher (95% CI 1.52-2.98) risk of coronary death or incident of non-fatal myocardial infarction (MI) events than participants who reported no stress. Various chronic stressors, such as job strain, socioeconomic status (SES), marital stress, and caregiver stress were associated with an increased frequency of adverse cardiac events (Rozanski et al., 1999, 2005).

Despite increased research efforts focusing on the relationship between the various forms of stress and CVD, little empirical research has examined the effects of Goal-striving stress (GSS) on CVD. GSS is defined as "...the discrepancy between aspiration and achievement, weighted by the subjective probability of success, and the level of disappointment experienced if goals are not reached" (Neighbors et al., 2011). To the best of our knowledge, no research exists that has examined the relationship between GSS and CVD incidence and prevalence in a large sample of African Americans. In fact, the vast majority of research conducted on GSS has focused on the relationship between GSS and mental health. For instance, Sellers and Neighbors (2008) found that GSS was significantly associated with lower levels of happiness, life satisfaction, and self-esteem among a sample of African Americans (N = 2,107). Additionally, the results revealed that GSS was significantly related to higher levels of psychological distress. Consistent with the findings of Sellers and Neighbors (2008), Sellers et al. (2011) found GSS was significantly related to poorer psychological well-being among college educated African American men. Neighbors et al. (2011) found that participants who reported higher levels of GSS reported lower levels of happiness, lower life satisfaction, lower self-esteem, and higher levels of depression and psychological distress. Similarly, research conducted by Sellers, Neighbors, Zhang, and Jackson (2012) focusing on physical health, found an inverse relationship between GSS and physical health. Specifically, Sellers et al. (2012) found that GSS was inversely related to self-evaluation of health, BMI, hypertension, and the sum of health problems for White Americans, African Americans, and Caribbean Blacks. However, there is little research investigating GSS and CVD. Thus, the purpose of this study is to examine the relationship between GSS and the prevalence and incidence of CVD (or prevalent and incident CVD) among a well-characterized sample of African American men and women in the JHS.

Examining the link between GSS and CVD in this population will be advantageous in assisting clinicians to identify non-traditional risk factors that could adversely impact the well-being of patients as well as implement appropriate and effective interventions that could ultimately reduce CVD and mortality. This could be accomplished by cardiologists and mental health providers intervening and assisting patients with changing both negative behaviors and cognitions (Dimsdale, 2008).

The following **aims** will be accomplished in this study:

Aim 1: To examine the association of GSS and prevalent CVD among men and women in the JHS.

Aim 2: To examine the association of GSS and incident (or risk of) CVD among men and women without CVD at baseline in the JHS.

7. Research Hypotheses:

H1: GSS will be positively associated with CVD prevalence.

H1.a. Associations will be modified by levels of socioeconomic status (SES). In other words, low SES (vs. higher SES) participants will show higher levels of GSS that will adversely impact CVD prevalence.

H1.b. Associations will be mediated by levels of psychosocial factors, such as hostility, depressive symptoms, perceived discrimination, and social support.

H2: GSS will be positively associated with incident or risk of CVD among participants without CVD at baseline.

H2.a. Associations will be modified by levels of socioeconomic status (SES). In other words, low SES (vs higher SES) participants will show higher levels of GSS that will adversely impact CVD incidence.

H2.b. Associations will be mediated by levels of psychosocial factors, such as hostility, depressive symptoms, perceived discrimination, and social support.

8. Data: (Visits and variables to be used, sample inclusions/exclusions)

Study design: cross sectional and longitudinal

Inclusion: participants from JHS baseline exam who completed exams 1, 2, and 3.

Exclusion: participants with missing data on psychosocial variables, CVD history, demographic variables, and risk factors. Longitudinal analysis: participants without CVD at baseline.

Outcomes:

- Cross-sectional analysis – prevalent CVD
- Longitudinal analysis – incident CVD (ECG-defined silent MI, stroke, self-reported CVD, CHD)
- For the current analysis, definite or probable CVD events (i.e., coronary heart disease [CHD], nonfatal MI or acute CHD death or stroke defined as non-carotid embolic or thrombotic brain infarction, brain hemorrhage or subarachnoid hemorrhage) and all-cause mortality will be examined for the most current data available.

Primary predictor:

Goal-striving stress (PDS form questions 13-17) – defined as “...the discrepancy between aspiration and achievement, weighted by the subjective probability of success, and the level of disappointment experienced if goals are not reached” (Neighbors, Sellers, Zhang, & Jackson, 2011 p. 52). Goal-striving stress will be measured by asking participants to imagine a ladder consisting of 10 possible steps (with step 10 representing the best way of life and step 1 representing the worst way of life. Aspirations will be measured by assessing question 15, which asked participants to “... please tell me the step number that best describes where you would like to be next year?” Achievement will be measured by assessing question 14, which asked “... will you tell me the step number that best describes where you are now?” Finally, importance of the goal will be measured by assessing question 17, which asked “how disappointed would you be if you found out that you could never reach (STEP # IN Q#15)?” The goal-striving stress equation that will be utilized is (aspirations – achievement) X importance of goal.

Covariates: baseline age, sex, marital status, SES (annual family income and education), smoking, alcohol use, diet (% calories from fat), physical activity, sleep, hypertension, diabetes, total cholesterol, BMI, triglycerides, depressive symptoms, anger, hostility, and perceived discrimination.

9. Brief Statistical Analysis Plan and Methods: (Including power calculations, if necessary.)

1. Characteristics of the sample will be stratified by sex where differences will be assessed using χ^2 for categorical variables and ANOVA or t-test for continuous variables.

For the current analysis, definite or probable CVD events (i.e., coronary heart disease [CHD], nonfatal MI or acute CHD death or stroke defined as non-carotid embolic or thrombotic brain infarction, brain hemorrhage or subarachnoid hemorrhage) and all-cause mortality were available through December 31, 2011.

Aim 1: To examine the association of goal-striving stress and prevalent CVD among participants in the JHS.

2. Multivariable logistic regression analysis will be used to estimate the odds ratios (OR, 95% confidence interval – CI) of the association of goal-striving stress (GSS) with prevalent CVD. Regression analysis (from baseline data, exam 1) will be estimated with sequential adjustments for covariates in the following order: Model 1 will include age, sex, SES (annual family income and education), marital status, and GSS. Model 2 will adjust for model 1 plus alcohol consumption, tobacco use, sleep, physical activity, and percentage of fat consumption from diet; Model 3 will adjust for model 2 plus CVD risk factors, such as hypertension, diabetes, total

cholesterol, BMI, and triglycerides; and Model 4 will adjust for model 3 plus psychosocial variables, including depressive symptoms, anger, hostility, and perceived discrimination.

To examine the effect modification by SES, GSS will be interacted with SES; and if this interaction is significant, the analysis will be stratified by levels of SES, where we will assess the extent to which the association of GSS with prevalent CVD is modified by SES.

Aim 2: To examine the association of goal-striving stress with incident (or risk of) CVD among men and women in the JHS.

3. Multivariable Cox regression analysis will be used to estimate the hazard ratios (HR, 95% CI) of the association of GSS with incident CVD. Longitudinal regression analysis (from baseline to exam 3) will be estimated with sequential adjustments for covariates in the following order: Model 1 will adjust for age, sex, SES (annual family income and education), marital status and GSS; Model 2 will adjust for model 1 plus alcohol consumption, tobacco use, sleep, physical activity, and percentage of fat consumption from diet; Model 3 will adjust for model 2 plus CVD risk factors; and Model 4 will adjust for model 3 plus psychosocial variables, including depressive symptoms, anger, hostility, and perceived discrimination.

To examine the effect modification by SES, GSS will be interacted with SES; and if this interaction is significant, the analysis will be stratified by levels of SES, where we will assess the extent to which the association of GSS with incident CVD is modified by SES.

10. References: (Maximum 15)

- Dimsdale, J. E. (2008) Psychological stress and cardiovascular disease. *Journal of the American College of Cardiology*, 51, 1237-1246.
- Esch, T., Stefano, G. B., Fricchione, G. L., & Benson, H. (2002). Stress in cardiovascular diseases. *Medical Science Monitor*, 8, RA93-RA101.
- Heidenreich, P. A., Trogon, J. G., Khavjou, O. A., Butler, J., Dracup, K., Ezekowitz, M. D., Finkelstein, E. A., ... Y. J., Woo. (2011). Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. *Circulation*, 123, 933-944.
- Murphy, S. L., Xu, J., & Kochanek, K. D. (2013). Deaths: Final data for 2010. *National Vital Statistics Reports*, 61, 1-118.
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Rozanski, A., Blumenthal, J.A., & Kaplan, J. (1999). Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. *Circulation, 99*, 2192-2217.

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Sellers, S. L., Neighbors, H. W., & Bonham, V. L. (2011). Goal-striving stress and the mental health of college-educated Black American men: The protective effects of system-blame. *American Journal of Orthopsychiatry, 81*, 507-518.

Sellers, S. L., Neighbors, H. W., Zhang, R., & Jackson, J. S. (2012). The impact of goal-striving stress on physical health of White Americans, African Americans, and Caribbean Blacks. *Ethnicity & Disease, 22*, 21-28.

PART II. AUTHOR CONTRIBUTIONS

11. Have all co-authors reviewed and approved this document? Yes (Required)

12. Does the lead author (or designee) agree to present findings at a JHS Colloquium? or Seminar? Yes (required)

PART III. ADDITIONAL INFORMATION

13. Is this manuscript proposal based on an Ancillary Study? Yes No
If yes, please provide the ASC # _____.

14. Type of Study:

Full Cohort Family Study Sub-Study
 Ancillary Study Case Control Other (list):

15. Type of Data:

Longitudinal Cross-Sectional Other (list):

16. Location of Statistical Analysis:

Central (by Jackson Heart Study Staff)
 Local (list site)

17. Genetic Information:

- a. Do you propose use of data from a participant's DNA? Yes (see b) No
b. If yes, for a primary aim or secondary aim of JHS? (Please check one or both)
 Primary Aim (heart, vascular disease) Secondary Aim (other conditions)

18. Conflict of Interest

- a. Are these analyses to involve a for-profit corporation? Yes No
b. Do you or any member of your Writing Group intend to patent any process, or aspect of outcome from these analyses? Yes No

19. Data Sharing Agreement

Has the Lead Author and any co-authors who will have direct access to JHS data signed the JHS Data Sharing Agreement? Yes (Required)

20. JHS Manuscript Overlap

The Lead Author is responsible for reviewing the manuscript list on the JHS website <http://jhs.jsums.edu/jhsinfo>, listing the JHS manuscripts / manuscript proposals that are similar to the one he/she is proposing and justifying the differences and similarities. The lead author is encouraged to contact lead authors of the most related manuscript proposals for comments on the new proposal or collaboration.

- a. Similar manuscripts / proposals : No Yes
b. If "yes", list MS # title and Lead Author below)

21. Manuscript Completion

It is expected that the manuscript will be completed in less than one year. The manuscript proposal will expire if no manuscript is submitted for JHS review at the end of one year from the date of approval. If additional time is needed after one year, the Lead Author should request an extension from the Publications and Presentations Subcommittee.