1. Title:
Stability and change in trait anger and the relationship to CVD risk factors. The Atherosclerosis Risk in Communities (ARIC) Study

2. Writing Group:
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4. Timeline:
November 1998 - completion of data analysis
February 1999 - manuscript to Publications Committee
May 1999 - journal submission

5. Research questions
1. What is the degree of stability in anger proneness, measured over a 6-year interim, in a population-based sample of middle-aged men and women?
2. How do stability and change in anger proneness vary by demographic characteristics, e.g., race/ethnicity, educational level, gender, and age?
3. What is the association between change in anger proneness over time and change in CVD risk factors levels?

6. Rationale:
Trait anger is conceptualized as a relatively stable propensity to react to situations with an emotion that ranges from mild irritation to fury and rage (1). High, compared to low, trait anger individuals perceive more situations as anger-provoking, react more intensely and experience longer lasting episodes. Research on life-span development indicates that personality traits are established in childhood and are relatively stable throughout adulthood (3, 4). It is predicted, therefore, that a high degree of stability exists over time in anger proneness in a population-based sample of middle-aged men and women. Early studies establishing the Spielberger scale as a reliable instrument reported two-week test-retest reliability correlations of .70 and .77 for men and women, respectively (5). Relative to the risk factors, one study in the literature examined the relationship between change in trait anger and change in one of the CVD risk factors. In this prospective analysis, Markovitz, Matthews, Wing et al (6) reported that increases in trait anger from baseline to three years of follow-up were associated with increases in blood pressure over the same time interval.

The design of the ARIC study presents a unique opportunity to assess the stability of anger proneness and to assess the relationship of change in this personality attribute to sociodemographic characteristics and changes in each of the major CVD risk factors. The results of this study could make a substantial contribution to the existing literature examining the validity of anger proneness as an enduring personality trait.
7. Variables:
Visit 1 variables: gender, racegroup, center, education;
Visit 2 and Visit 4 variables: Spielberger Trait Anger scores, age, systolic BP, diastolic BP, hypertensive status, body mass index, LDL-cholesterol, HDL cholesterol, serum total cholesterol, cigarettes smoked per day, cigarette smoking status
Visit 3 variables: systolic BP, diastolic BP, hypertensive status, body mass index, LDL-cholesterol, HDL cholesterol, serum total cholesterol, cigarettes smoked per day, cigarette smoking status.

8. Statistical analyses:
Questions #1 and #2:
For each individual, the difference in total anger score from Visit 2 to Visit 4 will be calculated. Difference scores will be grouped along the dimensions of: No Change in Anger (score that will vary about zero ± a to-be-determined value), Increase in Anger, and Decrease in Anger categories will be distinguished further by low, moderate, and high, using specified cut points. Low, Moderate, and High changes will be defined by a range in trait anger values. In addition, mean change in anger will be reported for these categories. The above distributions will be reported by race/ethnicity, educational level, age, and gender. We will also investigate whether time between visits has an effect on change in anger.

Question #3:
Change in CVD risk factors that have continuous distributions (e.g., systolic BP, diastolic BP, body mass index, HDL cholesterol, LDL cholesterol, total cholesterol, cigarettes per day) will be represented by the difference in values between visits 4 and 2.
Change in the categorical risk factors (e.g., hypertensive status, smoking status) will be classified in a manner that captures an individual's cumulative history on these dimensions. HDL, LDL, and total cholesterol levels will also be categorized using the National Cholesterol Education Program cut points. The classification and coding will be as follows:

1) Current and previous (hypertension, smoker, or high cholesterol)
2) Newly classified (hypertension, smoker, high cholesterol) with no prior history
3) No current (hypertension, smoker, high cholesterol) and prior positive history
4) Never (hypertensive, smoker, high cholesterol)

The relationship of change in the risk factors to change in anger will be analyzed using linear (for the continuous variables) or logistic regression (for the categorical variables), taking time into account and adjusting for age, gender, race/ethnicity, education, and trait anger measurement error.

References: