

Exploring the association of John Henry active coping and education on smoking behavior and nicotine dependence among Blacks in the USA

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Abstract

Although smoking is used as a coping tool in response to stress and Blacks have been found to report smoking more in response to stress than Whites, little research exists that has examined ethno-culturally specific constructs of stress and coping as they relate to smoking behavior and nicotine dependence among Blacks in the USA. This study explored the association between the ethno-culturally interactively defined construct of John Henryism, as well as the individual contributions of John Henry active coping and education on smoking behavior and nicotine dependence in a relatively urban-Midwestern Black population. Self-identified Black patients ($n = 146$) who had previously received a clinical intervention for nicotine dependence were followed to assess smoking status and John Henry active coping. Results revealed that patients with low levels of education who had low levels of John Henry active coping reported higher nicotine dependence scores than any other education by John Henry active coping group. Furthermore, low levels of John Henry active coping were associated with the use of menthol cigarettes and lower-educational level was associated with smoking greater than 20 cigarettes per day. Further community-based studies examining this construct among Black smokers in various socio-cultural contexts are needed to clarify the association between John Henry active coping and socioeconomic status on smoking behavior and nicotine dependence among Blacks.

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Introduction

Rates of smoking-related cardiovascular disease (CVD) morbidity and mortality are highest among Blacks when compared to Whites and other ethnic groups (American Heart Association, 2002; Morbidity and Mortality Weekly, 2002a,b). Rates of nicotine

dependence and smoking behavior among Blacks differ considerably from that of Whites, and it is postulated that these differences may explain the disproportionate rates of smoking-related morbidity and mortality between these groups. For example, compared to their White counterparts, Blacks smoke fewer cigarettes per day, begin smoking later in life, are more likely to smoke high-menthol brands, wait less time after awakening to smoke their first cigarette in the morning, intake more nicotine per cigarette, and have higher concentrations of serum cotinine (the principal metabolite of nicotine)

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(i.e., Ahijevych & Gillespie, 1997; Ahijevych & Wewers, 1994; Benowitz et al., 1999; Caraballo et al., 1998; Kabat, Morabia, & Wynder, 1991; McGrady, Ahluwalia, & Pederson, 1998). Furthermore, while Blacks typically endorse more confidence in being able to stop smoking and are more likely to try to stop smoking than Whites, they are less likely to be successful at achieving long-term smoking abstinence (Pederson, Ahluwalia, Harris, & McGrady, 2000; Royce, Hymowitz, Corbett, Hartwell, & Orlandi, 1993; Stotts, Glynn, & Baquet, 1991; Vander Martin, Cummings, & Coates, 1990). A variety of risk factors have been documented that may account for these smoking-related differences, including, but not limited to, the interaction as well as the direct influence of low socioeconomic status (SES), residential environment (regional; urban vs. suburban; racial segregation) and high stress on nicotine dependence and smoking behaviors themselves (Ahluwalia, Resnicow, & Clark 1998; Feigelman & Gorman, 1989; Hourani, Yuan, Bray, & Vincus, 1998; Landrine & Klonoff, 2000; Nil, 1991; Wills, 1990).

The stress-coping model of addiction, based on Lazarus and Folkman's (1984) transactional view of stress and coping, proposes that smoking is associated with stress and ineffective coping (Wills & Shiffman, 1985). Stress is defined as the relationship between a person and the environment that is appraised by the person as relevant to his/her well-being and in which the person's resources are taxed or exceeded (Folkman & Lazarus, 1985). Coping is defined as behaviors and thoughts individuals use to manage demands from the environment. Studies have shown that smoking is utilized as a tool to cope with stress (i.e., Castro, Maddahian, Newcomb, & Bentler, 1987; Epstein & Perkins, 1988; Pomerleau & Pomerleau, 1984; Romano, Bloom, & Syme, 1991; Rose, Ananda, & Jarvik, 1983). A wealth of studies have also shown individuals who report high vs. low levels of both chronic and acute stress are more likely to smoke and less likely to achieve successful abstinence (i.e., Ahijevych & Wewers, 1993; Ahluwalia, 1996; Billings & Moos, 1983; Castro et al., 1987; Cohen and Kamarck, 1983; Conway, Vickers, Ward, & Rahe, 1981; Feigelman & Gorman, 1989; Glasgow et al., 1985; Gunn, 1983; Lacey et al., 1993; Landrine & Klonoff, 2000; Pechacek, 1979; Orleans, 1985; Romano et al., 1991; Rose et al., 1983; Shiffman, 1982; Wills, 1986).

In recent years, there have been attempts to explore the relationship between the theoretical concepts of stress and coping and their individual and combined impact on health through the use of culturally sensitive constructs and assessment techniques. In an effort to understand the ethnic/racial disparity in the CVD risk factor of high blood pressure, James, Hartnett, and Kalsbeek (1983) developed the John Henryism Active Coping Scale (JHAC12) as a culturally sensitive tool to

help delineate the influence of stress and coping on blood pressure in Blacks. While, John Henry active coping is defined as a strong behavioral predisposition to cope in an active, determined, and hard-working manner with the stressors of daily life, John Henryism is an interactive construct which suggests that Blacks of low SES who frequently address psychosocial stress by actively coping will be vulnerable to negative health outcomes, including high blood pressure. This idea is controversial because it opposes extensive literature which suggests that active coping is adaptive and health promoting (Derogatis, Abeloff, & Melisaratos, 1979; Farberow, 1980; Goldstein, 1980; Katz, et al., 1970; Kobasa, 1979; Kobasa, Maddi, & Courington, 1981; Lieberman & Tobin, 1972; Turner, Tobin, & Lieberman, 1972).¹

Early studies on the John Henryism hypothesis that examine blood pressure among mostly rural Blacks revealed that when active coping was utilized in the presence of low socioeconomic resources (i.e., "John Henryism"), the most likely result was higher blood pressure levels than those of Blacks with greater socioeconomic resources (i.e., Dressler, Bindon, & Neggers, 1998; James et al., 1983; James, Strogatz, Wing, & Ramsey, 1987). More recent studies examining the construct among urban samples, however, have yielded no or contradictory support (Fernander, Durán, Saab, & Schneiderman, 2004; Francis, Ernst, Nevels, & Lemeh, 1991; Jackson & Adams-Campbell, 1994; James Keenan, Strogatz, Browning, & Garrett, 1992; Light et al., 1995; McKetney & Ragland, 1996). The majority of earlier studies examined the impact of John Henryism on blood pressure on middle-aged samples in rural Southern states who were at risk for hypertension (i.e., due to age, SES, and/or health status), while more recent studies have examined the hypothesis among younger or college-age samples in urban settings where the risk for the development of hypertension has been variable (again, perhaps due to contextual factors such as SES, age, and health status). Another reason for incongruent findings include failure to incorporate any index of SES.

Blacks are inclined to experience "greater stress" than Whites (Feigelman & Gorman, 1989), which may be

¹ Key to the John Henryism hypothesis is that the vulnerability of lower SES individuals who persist with effortful active coping (John Henry active coping) are at increased risk for hypertension. Due to the inconsistent use of the term "John Henryism" in previous literature (some studies referring to the combined effect of John Henry active coping and a socioeconomic index, and others referring to John Henry active coping alone), we clarify that for the purposes of this study we use the term "John Henryism" to refer to the combined effect of John Henry active coping and education on blood pressure and John Henry active coping to refer to active coping as measured by the JHAC12.

due, in part, to their experience of racism. Coping with racial discrimination as both an acute and chronic stressor may contribute to differences in smoking behavior, smoking cessation, and smoking-related morbidity and mortality among Blacks. However, very little research exists that has examined the stress and coping model of smoking and nicotine dependence from an ethno-culturally specific point-of-view. Examining the influence of ethno-culturally specific constructs will contribute to the understanding of smoking behavior, nicotine dependence, cessation rates, and related health disparities among Blacks. While the John Henryism construct was developed to examine the CVD risk factor of high blood pressure, we believe the construct of John Henryism may be relevant to other cardiovascular-related health status variables and health behaviors that are influenced by stress and coping, such as smoking. That is, Blacks who have low socioeconomic resources and report active coping in response to stress may exhibit more detrimental smoking behaviors than those with greater socioeconomic resources. Thus, the primary aim of this exploratory study was to examine the relationship between John Henry active coping, education, and John Henryism on nicotine dependence and other smoking behaviors in Black patients who had previously received a clinical intervention for nicotine dependence. We hypothesized that the combined effect of high John Henry active coping with low educational status (John Henryism) would be associated with more detrimental smoking behavior and higher levels of nicotine dependence than all other John Henry active coping by education status groups.

Methods

Patients

This study included Black cigarette smokers who had a consultation at the Nicotine Dependence Center (NDC) at the Mayo Medical Center between April 1, 1988 to September 30, 2000. The Mayo Clinic NDC intervention incorporates behavioral, addiction, and pharmacological approaches (Dale et al., 1997; Hurt et al., 1992). The intervention is brief and the session lasts between 45 and 60 min. A treatment plan individualized to the patient's specific needs and level of nicotine dependence is developed. If pharmacologic therapy is indicated, the patients' physician facilitates prescribing those medications. During the study time period, data on the type of interventions recommended and whether patients followed through with the recommendations were not entered into the electronic databases. The treatment plan is matched to the patient's stage of change. If patients were ready to set a stop date (preparation or action stages of change),

unless contraindicated, all were routinely recommended the nicotine patch, nicotine gum, or bupropion, since these were the only pharmacological therapies for smoking cessation recommended by the NDC during the time period studied. Only local patients who are interested and ready to set a stop date are scheduled for a post-NDC outpatient session with a nicotine dependence counselor (~10% of all patients). Of this 10%, very few (6–7%) actually attended the session. These patients attend an average of about three sessions after the initial consultation (Cox et al., 2002).

The study was approved by the Mayo Clinic Institutional Review Board. The patients were identified by use of a cross-referencing procedure conducted between an existing NDC database of patients seen by the NDC staff and the Mayo Clinic registration database. All NDC patients who self-identified themselves as Black in the Mayo Clinic registration database were included. Patients were excluded if they denied general research authorization for use of their medical records for research (one patient was excluded for this reason).

Procedures

Preliminary information from the NDC clinical database indicated that from April 1, 1988 to September 30, 2000, the NDC staff treated 146 self-identified Blacks ≥ 18 years of age at the time of their initial consultation. At the time of the NDC intervention, patients completed a comprehensive tobacco use questionnaire. The questionnaire assessed such items as age of tobacco use initiation, number of years of tobacco use, average number of tobacco products used per day, time of day of most frequent tobacco use, and length of period after awakening of first tobacco use. The Fagerström Test for Nicotine Dependence (FTND) was used to assess nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991). The FTND is a commonly used instrument to assess nicotine dependence. The majority of the patients were from urban areas of the Midwestern United States. Study patients were sent a tobacco use follow-up survey in Fall 2001. The follow-up survey assessed demographic information, current smoking status and behavior, and included the John Henry Active Coping Scale (JHAC12; James, 1994).

Follow-up survey

All patients were mailed an introductory letter with the survey in September 2001, with instructions to return the survey using a prepaid envelope. Approximately 2 weeks following the initial mailing a second mailing was performed for patients that had not responded. Three weeks following the second mailing, telephone follow-up was attempted for all subjects who did not respond to the mailed surveys. The telephone interviewer followed a

structured interview form that incorporated the assessments and questionnaires included in the mailed survey and recorded the patient's verbal responses.

John Henryism Active Coping Scale (JHAC12)

The JHAC12 is a 12-item Likert-type scale containing five response options per item (James, 1994). It measures a behavioral or strong personality predisposition to cope actively with psychosocial stressors in one's environment. The John Henry active coping score is the sum of the values assigned to each of the 12 responses. (If three or fewer of the 12 items have missing responses, the average value of the nonmissing responses can be substituted for the missing response. If responses are missing for more than 3 of the 12 items, the John Henryism score cannot be reliably calculated.) Scores can range from a low of 12 to a high of 60. In keeping with the methodology proposed by James and colleagues (James, 1994; James et al., 1983, 1987, 1992), scores are dichotomized at the median to categorize respondents into "high" and "low" John Henry active coping groups. Scores that fall above the sample median connote mental and physical vigor, tenacity, and a strong sense of personal efficacy when confronting psychosocial environmental stressors. Reliability coefficients for the scale from community-based, adult samples range from the mid-70s to the low 80s (Dressler et al., 1998; James, 1994). A similar reliability coefficient (Cronbach's $\alpha = 0.71$) was found for the JHAC12 in the current study sample. Scores tend to increase modestly with age, plateauing in the late 40s and early 50s. Blacks have been observed to score higher than Whites on John Henryism; however, among Blacks, men and women tend to score similarly (James, April 7, 2001, pers. comm.). Although James postulates the JHAC12 to be a stable measure of active coping as a trait, no published studies to date have assessed test-retest reliability of the scale.

There has been inconsistent use of the term "John Henryism" in previous literature (some studies referring to the combined effect of John Henry active coping and a socioeconomic index, and others referring to John Henry active coping alone). For the purposes of this study, we use the term "John Henryism" to refer to the interaction effect of John Henry Active coping and education. While John Henry active coping refers only to the effect of an active coping style. This approach is consistent with the work of James and colleagues (i.e., James et al., 1983, 1987, 1992).

Demographic and tobacco use questionnaire

The follow-up survey also assessed current and past smoking behavior and included items such as age of smoking initiation, average number of cigarettes smoked

per day, brand and type of cigarettes smoked, and whether they smoked menthol cigarettes. In addition, demographic information was obtained, including: region of residence, urban vs. rural residence, whether the patient resided in a segregated vs. integrated neighborhood, level of education (as a proxy for SES status), and whether the patient was a native-born US citizen.

Data analyses

To assess the association of John Henryism with smoking status, smoking behavior and nicotine dependence, JHAC12 score and education level were dichotomized by median splits. SES operationalized as educational level is consistent with other studies examining the John Henryism construct that use education as a proxy for SES (i.e., Dressler et al., 1998; James et al., 1983; McKetney & Ragland, 1996). To avoid "aggregation bias" (Dressler et al., 1998) as well as to be consistent with the methodology proposed by James and colleagues (James et al., 1983, 1987, 1992), relative median splits on JHAC12 score and education level were used to dichotomize patients into high and low groups. Smoking behaviors at the time of the nicotine dependence consultation and at the time of the follow-up survey were analyzed separately. Initial analyses were performed using logistic and linear regression to validate the assumption that study variables did not change significantly over calendar time. Logistic regression analyses were performed to assess the association of education and John Henry active coping with the following dichotomized smoking behaviors: average cigarettes per day at baseline (≤ 19 vs. ≥ 20 cpd*), age started using cigarettes regularly (≤ 17 vs. ≥ 18 years), type of cigarette smoked (menthol* vs. nonmenthol), FTND score (≤ 5 vs. ≥ 6 cpd*) smoking status at follow-up (abstinent vs. smoking*) and cigarettes per day at follow-up (≤ 19 vs. ≥ 20 cpd*). A logistic regression analysis was performed for each smoking behavior with the given behavior included as the dependent variable and defined using a value of 1 for the group indicated by * above and a value of 0 for the alternative group. For each logistic regression analysis JHAC12 ($-1 = \text{low}$, $+1 = \text{high}$) and education ($-1 = \text{low}$, $+1 = \text{high}$) were included as independent variables. The education-by-JHAC12 interaction term was included in the model to assess whether the effect of JHAC12 was dependent on education. The inclusion of the interaction term in the model is of specific interest since for the purposes of this study we use the term "John Henryism" to refer to the interaction effect of John Henry Active Coping and education. To supplement the findings from the logistic regression analyses, odds ratios and corresponding 95% confidence intervals were calculated for each model to indicate

the relative likelihood of the indicated behavior across the four groups defined by education and JHAC12 scores using the high education, high JHAC12 score groups used as the reference. In all cases, two-sided tests were used with p -values ≤ 0.05 used to denote statistical significance.

Results

Survey response rates

There were 147 self-identified Blacks ≥ 18 years of age seen at the NDC between April 1, 1988 and September 30, 2000. Of these, 146 ($>99\%$) were eligible for the current investigation (one patient was excluded because they had denied general authorization for use of their medical records for research). For these 146 patients (74 male, 72 female), the mean \pm SD age at the time of the intervention was 47.6 ± 13.3 years. Approximately half (54%) of the patients had at least a high school diploma and 53% of the sample reported smoking 20 or more cigarettes per day. Based on the FTND score, 32% were highly nicotine dependent (i.e., score ≥ 6). Fifty-seven percent of the sample reported smoking initiation at age 18 or above. Of the 146 patients, included in the investigation, 72 (49.2%) completed the follow-up survey (23 by mail and 49 by telephone), 17 were found to be deceased, 13 were contacted but refused to complete the survey, and 44 could not be contacted. Of the 72 patients who participated, the median time from NDC consult to follow-up was 5.8 years (range 1.5–13.3 years). The vast majority (82%) reported residing in an integrated neighborhood and most (67%) reported smoking menthol cigarettes. Among the 72 respondents, 26 (36%) reported current abstinence from all tobacco products at the time of the follow-up survey. There was no evidence suggesting patients who completed the follow-up survey differed from those who did not with regard to other baseline characteristics (i.e., age, gender, age of smoking initiation, and education) assessed during the nicotine dependence intervention (Fisher's exact $p > 0.25$ in all cases). Baseline characteristics assessed during the nicotine dependence intervention also did not differ significantly between those who responded to the mailed survey compared to those who failed to respond to the mailed survey but responded via telephone follow-up ($p > 0.33$ in all cases). In addition, those responding to the mailed survey did not differ significantly from those who responded via telephone with respect to the time from the NDC consult to follow-up (6.9 ± 3.6 vs. 6.1 ± 3.4 years for mail vs. telephone, respectively, $p = 0.36$) or JHAC score at follow-up (50 ± 4.6 vs. 52.1 ± 6.4 , $p = 0.17$).

Relationship of John Henryism with tobacco use behavior and nicotine dependence

Seventy patients completed the John Henry Active Coping Scale (JHAC12). For these patients the mean \pm SD JHAC12 score was 51.4 ± 5.9 (median 52, range 33–60). To examine the study's hypothesis that John Henryism would be a significant predictor of tobacco use behavior and nicotine dependence, JHAC12 scores and educational level were dichotomized by median splits. Education was dichotomized as less than high school graduate vs. high school graduate or more. JHAC12 score was dichotomized as ≤ 52 (low JHAC) and ≥ 53 (high JHAC). Using this approach, four groups were defined as low JHAC/low education ($n = 14$); low JHAC/high education ($n = 22$); high JHAC/low education ($n = 17$); and high JHAC/high education ($n = 17$) (Table 1).

Educational level was significantly ($p = 0.04$) inversely associated with smoking ≥ 20 cigarettes per day at the time of the NDC consultation and John Henry active coping was significantly ($p = 0.04$) positively associated with the use of menthol cigarettes at the time of the NDC consultation. Educational level and John Henry active coping were not found to be significantly associated with smoking behavior at follow-up. There was some evidence suggesting that for nicotine dependence, assessed by the FTND at the time of the NDC consult, the effect of education was dependent upon John Henry active coping ($p = 0.05$). The percentage of patients with FTND ≥ 6 , suggestive of high nicotine dependence, was highest among those with low education and low JHAC12 scores and lowest among those with low education and high JHAC12 scores (Fig. 1). The education by John Henry active coping interaction term (John Henryism) was not found to be statistically significant for any of the tobacco use behaviors assessed at follow-up (i.e., number of cigarettes smoked per day).

Discussion

This is the first report to link the construct of John Henryism to smoking behavior and nicotine dependence. While the development of the John Henryism hypothesis was intended to examine the cardiovascular risk factor of high blood pressure, we believe the construct of John Henryism may be relevant to other health status variables and health behaviors that are influenced by stress and coping, such as smoking. Inherent in the construct is an individual's active coping style, which is typically operationalized as a behavioral orientation. It would then follow that other health behaviors could be influenced by this behavioral construct.

Table 1
Smoking behaviors according to level of education and John Henry active coping^a

Smoking behavior (dependent variable for logistic regression)	Low education		High education		Logistic regression <i>p</i> -values ^b		
	Low JHAC (<i>n</i> = 14)	High JHAC (<i>n</i> = 17)	Low JHAC (<i>n</i> = 22)	High JHAC (<i>n</i> = 17)	Education	JHAC	Education × JHAC
<i>Age started using cigarettes regularly</i>					0.135	0.489	0.135
≤ 17 years ^c	8 (57)	8 (47)	5 (23)	8 (47)			
≥ 18 years	6 (43)	9 (53)	17 (77)	9 (53)			
Odds ratio	1.5	1.0	0.3	1.0			
95% CI	0.4, 6.2	0.3, 3.8	0.1, 1.3	—			
<i>Smoking behaviors at the time of NDC consult</i>							
Average cigarettes per day					0.045	0.524	0.609
≤ 19	5 (36)	4 (24)	12 (55)	9 (53)			
≥ 20 ^c	9 (64)	13 (76)	10 (45)	8 (47)			
Odds ratio	2.0	3.6	0.9	1.0			
95% CI	0.5, 8.6	0.8, 15.9	0.3, 3.3	—			
Type of cigarette smoked					0.454	0.043	0.606
Menthol ^c	11 (85)	9 (56)	16 (73)	9 (53)			
Nonmenthol	2 (15)	7 (44)	6 (27)	8 (47)			
Odds ratio	4.9	1.1	2.4	1.0			
95% CI	0.8, 29.1	0.3, 4.5	0.6, 9.0	—			
Fagerstrom test for nicotine dependence					0.409	0.354	0.051
≤ 5	5 (42)	10 (83)	14 (82)	7 (70)			
≥ 6 ^c	7 (58)	2 (17)	3 (18)	3 (30)			
Odds ratio	3.3	0.5	0.5	1.0			
95% CI	0.6, 19.3	0.1, 3.6	0.1, 3.1	—			
<i>Smoking behaviors at follow-up</i>							
Smoking status					0.834	0.897	0.224
Abstinent	4 (29)	7 (41)	10 (45)	5 (29)			
Smoking ^c	10 (71)	10 (59)	12 (55)	12 (71)			
Odds ratio	1.0	0.6	0.5	1.0			
95% CI	0.2, 5.0	0.1, 3.6	0.1, 3.1	—			
Cigarettes per day					0.897	0.944	0.639
≤ 19	11 (79)	14 (82)	18 (82)	13 (76)			
≥ 20 ^c	3 (21)	3 (18)	4 (18)	4 (24)			
Odds ratio	0.9	0.7	0.7	1.0			
95% CI	0.2, 4.8	0.1, 3.7	0.2, 3.4	—			

^aEducation was dichotomized as <high school graduate (low education) and ≥ high school graduate (high education). The John Henry Active Coping scale was dichotomized using a median split as ≤ 52 (low JHAC) and ≥ 53 (high JHAC). Within each of the four groups, *n* (%) are presented on the first two lines. For each smoking behavior, the data were analyzed using logistic regression with the given behavior included as the dependent variable and defined using a value of 1 for the group indicated by ^c and a value of 0 for the alternative group. From the logistic regression analysis, the odds ratio, and corresponding 95% confidence interval, was calculated for each of the groups defined by education and JHAC using the high education, high JHAC group used as the reference.

^bFor the logistic regression analyses education and JHAC were parameterized using effect coding (−1 = low, +1 = high).

^cThe dependent variable for the logistic regression analysis is constructed using *y* = 1 for this group and *y* = 0 for the alternative group. Corresponding odds ratios indicate the relative likelihood of this behavior across the four groups defined by education and JHAC using the high education, high JHAC group used as the reference.

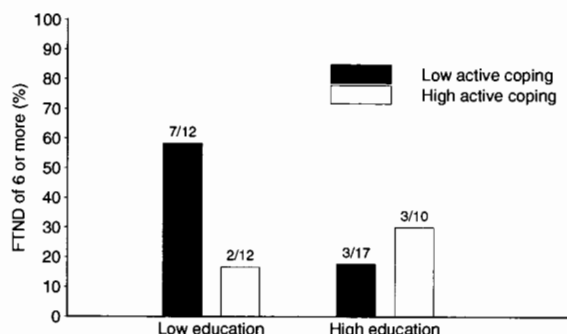


Fig. 1. Association between John Henryism and nicotine dependence. *Note:* Percentage of patients with FTND greater or equal to 6 according to education and John Henry active coping. Education is dichotomized as <high school graduate (low education) and greater than or equal to high school graduate (high education), and John Henry active coping (JHAC12) is dichotomized as less than or equal to 52 (low active coping) and greater than or equal to 53 (high active coping). From logistic regression analyses, there is evidence of an interaction effect ($p=0.051$) suggesting an association between active coping and nicotine dependence that is dependent on the level of education.

This study provides novel information regarding the association of John Henryism, operationalized as the combination of John Henry active coping and educational level, on the CVD risk factor of smoking. Traditionally, active coping is considered to be an adaptive response to stress, yielding positive health behavior and outcome (i.e., Kobasa, Maddi, & Kahn, 1982). However, the John Henryism hypothesis assumes that when high active coping is combined with low education, negative health consequences will result. Contrary to that hypothesis, our study revealed that patients with both low levels of John Henry active coping and low levels of education exhibited higher levels of nicotine dependence, while those with low education and high active coping scores had the lowest levels of nicotine dependence at the time of their initial consultation (Fig. 1).

This is not the first study whose findings have challenged the direction of the influence of the John Henry active coping and education interaction on the health status behavior/outcome being examined. Research on the construct is beginning to reveal that the socio-cultural context from which samples are drawn contribute to the direction under which John Henry active coping moderates the relationship of SES (in this case, education) on health. Stressors due to socio-cultural differences may explain inconsistent findings across regions. Mid-western Blacks may experience different socio-cultural stressors that require varying coping skills. This requires further examination.

The fact that associations between education, John Henry active coping, and a John Henry active coping-by-education interaction were not found to be associated with smoking behaviors or nicotine dependence at the time of the follow-up survey might suggest that smoking behaviors improved as a result of undergoing a nicotine consultation. That is, because fewer subjects exhibited detrimental smoking behavior and high nicotine dependence levels at the time of follow-up, there may have not been enough power to detect whether associations did in fact exist. Further research is needed to confirm whether among low socioeconomic individuals, an active coping style is a protective factor against becoming highly nicotine dependent.

The finding of an inverse relationship between the amount of cigarettes smoked and educational level confirms previous literature documenting the negative relationship between SES and smoking (i.e., Novotny, Warner, Kendrick, & Remington, 1988; US Department of Health and Human Services, 1998). However, it is noteworthy that the study revealed that low John Henry active copers were more likely to smoke menthol cigarettes. The preference for menthol cigarettes by these low active coping Blacks may serve as a coping response to stress. Previous studies have revealed that Blacks are more likely to smoke menthol cigarettes than Whites (i.e., Hymowitz et al., 1995; Wagenknecht et al., 1990). Because smoking is considered to be a maladaptive coping response to stress that is aimed at regulating an individual's emotional response to a stressor (i.e., Wills & Shiffman, 1985), the menthol contained in cigarettes may, in fact, serve a calming function to regulate a smokers emotional response to stress. Researchers have found that, among adults treated for nicotine dependence, coping style was associated with important treatment variables such that engagement-based coping (active coping) was related to better treatment progress and disengaged coping (passive coping) was associated with negative progress (Payne et al., 2002). Implications of such for practitioners are that if a smoker uses menthol cigarettes and has high John Henry active coping scores interventions need to consider mood and stress management strategies (e.g., relaxation) to attenuate negative affect and stress when quitting.

Although examining the John Henryism construct as it relates to smoking behavior is a novel idea, there are a number of limitations of the current study that should be considered. The current investigation was restricted to a follow-up of smokers that received a nicotine dependence consult. The use of this convenience sample limits the generalizability of the study findings. Furthermore, the proxy variable of education as primary SES indices may be limiting. Social class is not simply education, occupation, or income but incorporates many other social, cultural, and individual

characteristics. A summary index that incorporates such factors (i.e., job status) may contribute to more consistent findings in the literature. Additional studies will need to be performed using community-based samples that include both smokers and nonsmokers to assess the overall association of the John Henryism construct with cigarette smoking. In addition, studies of community-based samples of smokers would be needed to assess the generalizability of the observed association of John Henryism with the level of nicotine dependence to smokers other than those receiving a nicotine dependence consultation. The small sample size of the current investigation is also a limitation. Due to the small sample size, and resulting lack of statistical power, nonsignificant results from this investigation should be interpreted with caution and should not be considered as evidence of no association. It may be that findings from future studies will help inform future tobacco use prevention and cessation interventions conducted among Blacks. For example, future work could examine the effect of integrating the benefits of active coping in response to stress. Future intervention efforts may also need to incorporate more engagement and active coping behavioral training to enhance outcomes, particularly among Black menthol smokers and smokers of low SES.

References

- Ahijevych, K., & Gillespie, J. (1997). Nicotine dependence and smoking topography among Black and White women. *Research in Nursing and Health*, 20, 505–514.
- Ahijevych, K., & Wewers, M. E. (1994). Factors associated with nicotine dependence among African American women smokers. *Research in Nursing and Health*, 16, 283–292.
- Ahluwalia, J. S. (1996). Smoking cessation in African-Americans. *American Journal of Health Behavior*, 20(5), 312–318.
- Ahluwalia, J. S., Renisow, K., Clark. (1998). Knowledge about smoking, reasons for smoking, and reasons for wishing to quit in inner-city African Americans. *Ethnicity and Disease*, 8, 385–393.
- American Heart Association (2002). *Heart facts. All Americans*. Dallas, TX: American Heart Association.
- Benowitz, N., Perez-Stable, E., Fong, I., Modin, G., Herrera, B., & Jacob, P. (1999). Ethnic differences in N-glucuronidation of nicotine and cotinine. *Journal of Pharmacology and Experimental Therapeutics*, 291(3), 1196–1203.
- Billings, A. G., & Moos, R. H. (1983). Social-environment factors among light and heavy cigarette smokers: A controlled comparison with nonsmokers. *Addictive Behaviors*, 8, 381–391.
- Caraballo, R., Giovino, G., Pechacek, T., Mowery, P., Richter, P., Strauss, W., Sharp, D., Eriksen, M., Pirkle, J., & Maurer, K. (1998). Racial and ethnic differences in serum cotinine levels of cigarette smokers: Third national health and nutrition examination survey, 1988–1991. *Journal of the American Medical Association*, 280(2), 135–139.
- Castro, F., Maddahian, E., Newcomb, M., & Bentler, P. (1987). A multivariate model of the determinants of cigarette smoking among adolescents. *Journal of Health and Social Behavior*, 28, 273–289.
- Cohen, S., & Kamarck, T. (1983). A global measure of perceived stress. *Journal of Health and Social*, 24(4), 385–396.
- Conway, T. L., Vickers, R. R., Ward, H. W., & Rahe, R. H. (1981). Occupational stress and variation in cigarette, coffee, and alcohol consumption. *Journal of Health and Social Behavior*, 22(2), 155–165.
- Cox, L. S., Patten, C. A., Ebbert, J. O., Drews, A. A., Croghan, G. A., Clark, M. M., Walter, T. D., Decker, P. A., & Hurt, R. D. (2002). Tobacco use outcomes among patients with lung cancer treated for nicotine dependence. *Journal of Clinical Oncology*, 20(16), 3461–3469.
- Dale, L. C., Olsen, D. A., & Patten, C. A., et al. (1997). Predictors of smoking cessation among elderly smokers treated for nicotine dependence. *Tobacco Control*, 6, 181–187.
- Derogatis, L. R., Abelloff, M. D., & Melisaratos, N. (1979). Psychological coping mechanisms and survival time in metastatic breast cancer. *Journal of American Medicine Association*, 242, 1504–1508.
- Dressler, W., Bindon, J., & Neggers, Y. (1998). John Henryism, gender, and arterial blood pressure in an African-American community. *Psychosomatic Medicine*, 60, 620–624.
- Epstein, L., & Perkins, K. (1988). Smoking, stress, and coronary heart disease. *Journal of Consulting and Clinical Psychology*, 56, 342–349.
- Farberow, N. (1980). *Indirect self-destructive behavior in diabetics and Buerger's disease in patients*. New York: McGraw-Hill.
- Feigelman, W., & Gorman, B. (1989). Toward explaining the higher incidence of cigarette smoking among Black Americans. *Journal of Psychoactive Drugs*, 21(3), 299–305.
- Fernander, A. F., Durán, R. E. F., Saab, P. G., & Schneiderman, N. (2004). John Henry Active Coping, education and blood pressure among urban blacks. *Journal of the National Medical Association*, 96(2), 246–255.
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three states of a college examination. *Journal of Personality and Social Psychology*, 48(1), 150–170.
- Francis, R. A., Ernst, F. A., Nevels, H., & Lemeh, C. A. (1991). The relationship of blood pressure to a brief measure of anger during routine health screening. *Journal of the National Medical Association*, 83(7), 601–604.
- Glasgow, R. E. (1985). Quitting smoking: Strategies used and variables associated with success in a stop-smoking contest. *Journal of Consulting and Clinical Psychology*, 53(6), 905–912.
- Gunn, R. C. (1983). Smoking clinic failures and recent life stress. *Addictive Behaviors*, 8(1), 83–87.
- Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerström, K.-O. (1991). The Fagerström test for nicotine dependence: A revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction*, 86, 1119–1127.
- Hourani, L. L., Yuan, H., Bray, R. M., & Vincus, A. M., (1998). *Psychosocial correlates of nicotine dependence among*

- men and women in the US naval services. pp. 1–35. San Diego: Naval Health Research Center.
- Hurt, R. D., Dale, L. C., & McClain, F. L., et al. (1992). A comprehensive model for treatment of nicotine dependence in a medical setting. *Medical Clinics of North America*, 76, 495–515.
- Hymowitz, N., Corle, D., Royce, J. M., Hartwell, T. D., Corbett, K., Orlandi, M. A., & Piland, N. (1995). Smokers' baseline characteristics in the COMMIT Trial. *Preventive Medicine*, 24, 503–508.
- Jackson, L. A., & Adams-Campbell, L. L. (1994). John Henryism and blood pressure in Black college students. *Journal of Behavioral Medicine*, 17(1), 69–79.
- James, S. A. (1994). John Henryism and the health of African-Americans. *Culture, Medicine and Psychiatry*, 18, 163–182.
- James, S. A., Hartnett, S. A., & Kalsbeek, W. D. (1983). John Henryism and blood pressure differences among Black men. *Journal of Behavioral Medicine*, 6(3), 259–278.
- James, S. A., Keenan, N. L., Strogatz, D. S., Browning, S. R., & Garrett, J. M. (1992). Socioeconomic status, John Henryism, and blood pressure in Black adults. *American Journal of Epidemiology*, 135(1), 59–67.
- James, S. A., Strogatz, D. S., Wing, S. B., & Ramsey, D. L. (1987). Socioeconomic status, John Henryism, and hypertension in Blacks and Whites. *American Journal of Epidemiology*, 126(4), 664–673.
- Kabat, G. C., Morabia, A., & Wynder, E. L. (1991). Comparison of smoking habits of Blacks and Whites in a case-control study. *American Journal of Public Health*, 81(11), 1483–1486.
- Katz, J. L., Weiner, H., & Gallagher, T. F., et al. (1970). Stress, distress, and ego defenses. Psychoendocrine response to impending breast tumor biopsy. *Archives of General Psychiatry*, 23, 131–142.
- Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal Perspectives of Social Psychology*, 37, 1–11.
- Kobasa, S. C., Maddi, S., & Courington, S. (1981). Personality and constitution as mediators in the stress-illness relationship. *Journal of Health Social Behaviors*, 22, 368–378.
- Kobasa, S., Maddi, S., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality & Social Psychology*, 42(1), 168–177.
- Lacey, L. P., Manfredi, C., Balch, G., Warnecke, R. B., Allen, K., & Edwards, C. (1993). Social support in smoking cessation among Black women in Chicago public housing. *Public Health Reports*, 108(3), 387–394.
- Landrine, H., & Klonoff, E. A. (2000). Racial segregation and cigarette smoking among Blacks: Findings at the individual level. *Journal of Health Psychology*, 5(2), 211–219.
- Lazarus, R., & Folkman, S. (1984). Appraisal, coping, and adaptational outcomes. In S. Folkman (Ed.), *Stress, appraisal, and coping* (pp. 181–225). New York: Springer.
- Light, K. C., Brownly, K. A., & Turner, J. R., et al. (1995). Job status and high-effort coping influence work blood pressure in women and blacks. *Hypertension*, 25, 554–559.
- McGrady, G. A., Ahluwalia, J. S., & Pederson, L. L. (1998). Smoking initiation and cessation in African Americans attending an inner-city walk-in clinic. *American Journal of Preventive Medicine*, 14(2), 130–137.
- McKetney, E. C., & Ragland, D. R. (1996). John Henryism, education, and blood pressure in young adults: The CARDIA Study. *American Journal of Epidemiology*, 143(8), 787–791.
- Morbidity and Mortality Weekly Report (2002a). Annual smoking-attributable mortality, years of potential life lost, and economic costs—United States, 1995–1999. *Centers for Disease Control*, 51(14), 300–303.
- Morbidity and Mortality Weekly Report (2002b). Recent trends in mortality rates for four major cancers, by sex and race/ethnicity—United States, 1990–1998. *Centers for Disease Control*, 51(3), 49–53.
- Nil, R. (1991). A psychopharmacological and psychophysiological evaluation of smoking motives. *Reviews on Environmental Health*, 9(2), 85–115.
- Novotny, T., Warner, K., Kendrick, J., & Remington, P. (1988). Socioeconomic factors and racial smoking differences in the United States. *American Journal of Public Health*, 78(9), 1187–1189.
- Orleans, C. T. (1985). Understanding and promoting smoking cessation: Overview and guidelines for physician intervention. *Annual Review of Medicine*, 36, 51–61.
- Payne, T., Cropsey, K., Martin, P., McClure, J., Jeffries, S., Catz, S., Vander Weg, M., Ward, K., Smith, P. H., & Benesek, J. (2002). Effects of stress & coping on tobacco treatment. Presented at the eighth annual meeting of the society for research on nicotine and tobacco, February 2002, Savannah, GA.
- Pechacek, T. F. (1979). An overview of smoking behavior and its modification. *National Institute of Drug Abuse*, 25, 92–113.
- Pederson, L. L., Ahluwalia, J. S., Harris, K. J., & McGrady, G. A. (2000). Smoking cessation among African Americans: What we know and do not know about interventions and self-quitting. *Preventive Medicine*, 31(1), 23–38.
- Pomerleau, C., & Pomerleau, C. (1984). Neuroregulators and the reinforcement of smoking: Towards a biobehavioral explanation. *Neuroscience and Biobehavioral Reviews*, 8, 503–513.
- Romano, P. S., Bloom, J., & Syme, S. L. (1991). Smoking, social support, and hassles in an urban African-American community. *American Journal of Public Health*, 81(11), 1415–1422.
- Rose, J., Ananda, S., & Jarvik, M. (1983). Cigarette smoking during anxiety-provoking and monotonous tasks. *Addictive Behaviors*, 8, 353–359.
- Royce, J. M., Hymowitz, N., Corbett, K., Hartwell, T. D., & Orlandi, M. A. (1993). Smoking cessation factors among African Americans and Whites. COMMIT Research Group. *American Journal of Public Health*, 83(2), 220–226.
- Shiffman, S. (1982). Relapse following smoking cessation: A situational analysis. *Journal of Consulting and Clinical Psychology*, 50(1), 71–86.
- Stotts, R. C., Glynn, T. J., & Baquet, C. R. (1991). Smoking cessation among Blacks. *Journal of Health Care for the Poor and Underserved*, 2(2), 307–319.
- Turner, B. F., Tobin, S. S., & Lieberman, M. A. (1972). Personality traits as predictors of institutional adaptation among the aged. *Journal of Gerontology*, 27, 61–68.
- US Department of Health and Human Services. (1998). *Tobacco use among US racial/ethnic groups—African*

- Americans, American Indian and Alaska Natives, Asian American and Pacific Islanders, and Hispanics: A report of the surgeon general.* Atlanta: US Department of Health and Human Services, Center for Disease Control and Prevention.
- Vander Martin, R., Cummings, S. R., & Coates, T. J. (1990). Ethnicity and smoking: Differences in White, Black, Hispanic, and Asian medical patients who smoke. *American Journal of Preventive Medicine*, 6(4), 194–199.
- Wagenknecht, L., Cutter, G., Haley, N., Sidney, S., Manolio, T., Hughes, G., & Jacobs, D. (1990). Racial differences in serum cotinine levels among smokers in the coronary artery risk development in (young) adults study. *American Journal of Public Health*, 80, 1053–1056.
- Wills, T. A. (1986). Stress and coping in early adolescence: Relationships to substance use in urban school samples. *Health Psychology*, 5(6), 503–529.
- Wills, T. A. (1990). Stress and coping factors in the epidemiology of substance use. In L. T. Kozlowski, & H. Annis. (Eds.), *Research advances in alcohol and drug problems*, Vol. 10. (pp. 215–250). New York: Plenum Press.
- Wills, T. A., & Shiffman, S. (1985). Coping and substance use: A conceptual framework. In S. Shiffman, & T. A. Wills (Eds.), *Coping and substance use* (pp. 3–24). Orlando: Academic Press.