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Views of a good life and allostatic load: Physiological correlates of theories of a good life depend on the socioeconomic context

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Abstract

This research examines the relationship between one's theory of a good life and allostatic load, a marker of cumulative biological risk, and how this relationship differs by socioeconomic status. Among adults with a bachelor's degree or higher, those who saw individual characteristics (e.g., personal happiness, effort) as part of a good life had lower levels of allostatic load than those who did not. In contrast, among adults with less than a bachelor's degree, those who saw supportive relationships as part of a good life had lower levels of allostatic load than those who did not. These findings extend past research on socioeconomic differences in the emphasis individual or relational factors and suggest that one's theory of a good life has health implications.

Keywords

socioeconomic status; good life; lay theories; physiology; health

Most societies have taken up the question of how to live in order to have a "good" life, often looking to religious, philosophical, and ethical traditions for guidance (Grayling, 2011). Examples from modern popular culture—from Oprah's advice on how to "live your best life" (*Live Your Best Life*, 2005) to the success of recent bestseller *Thrive*, which offers a new metric by which to define success (Huffington, 2014) —suggest that the topic, and the effort to figure out what view of a "good life" is the right one, remain popular among lay audiences. Although psychology as a discipline has offered its own insights into how to live a good life (e.g., Diener, 1999), the field has devoted relatively little attention to understanding the implications of how different people define a good life.

Here, we investigate whether the way that one conceptualizes a good life relates to one important life outcome, namely health. Coronary heart disease, stroke, chronic respiratory disease, and other chronic diseases of aging rank among the leading causes of death in the U.S. (Centers for Disease Control and Prevention, 2015). We explore how people's theories of a good life relate to allostatic load, a marker of cumulative biological risk that indicates risk for some of these diseases over time (Juster, McEwen, & Lupien, 2010; Seeman, Singer,

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Rowe, Horwitz, & McEwen, 1997; Seeman, McEwen, Rowe, & Singer, 2001). Moreover, given that the risk for many of these diseases is greater among those from lower socioeconomic backgrounds (Adler & Rehkopf, 2008; Adler et al., 1994; Centers for Disease Control and Prevention, 2011) and that lay theories of a good life may differ by socioeconomic status (SES; Markus, Ryff, Curhan, & Palmerscheim, 2004), we investigate whether different views of a good life might be protective in different SES environments.

Lay Theories of a Good Life

Researchers conceptualize and operationalize lay theories of a good life in multiple ways, but such theories generally encompass what people want or think others should want out of life; what they think makes life valuable or successful; and what they think helps life to go well (King & Napa, 1998; Markus et al., 2004; Twenge & King, 2005). Here, we define lay theories of a good life broadly, as incorporating all of these factors. Research taking various approaches suggests that people's life circumstances and environment shape their characterization of a good life (Diener & Suh, 2000; King & Napa, 1998; Markus et al, 2004; Twenge & King, 2005). Psychologists and lay people alike identify both individual factors (e.g., autonomy, personal fulfillment) and interpersonal factors (e.g., strong relationships with others) as central to positive functioning, and people from high and low SES backgrounds include both components in their theories of a good life (Markus et al., 2004; Ryff, 1989; Sheldon, Elliot, Kim, & Kasser, 2001). There is, however, an SES difference in the emphasis placed on each, with people from higher SES contexts stressing individual factors and people from lower SES contexts stressing interpersonal factors in how they define a good life (Markus et al., 2004).

Such differences in conceptualizations of a good life are part of a broader literature showing that attention to oneself versus others varies with SES. Relative to those from higher SES backgrounds, people from lower SES backgrounds tend to be more interdependent, valuing adjustment to and connection with others over the expression of personal traits and preferences (Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012; Stephens, Fryberg, & Markus, 2012; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012). This tendency may in part grow out of the circumstances of their environments. For example, when stressors are less controllable and predictable and the tangible resources for coping with them limited (Brady & Matthews, 2002; Gallo & Matthews, 2003), strong relationships with others who have your back can serve as a valuable resource (Piff, Stancato, Martinez, Kraus, & Keltner, 2010). Additionally, people with lower levels of educational attainment are often less geographically mobile (Börsch-Supan, 1990), which increases the importance of deep ties with family and others within the local community (Oishi & Talhelm, 2012).

In contrast, people from higher SES backgrounds are more likely to have a safety net of material resources and cultural capital that facilitate the cultivation of personal qualities and exploration of one's own uniquely chosen path. From an early age, parents from higher SES backgrounds guide their children toward developing and expressing their own preferences and interests (Lareau, 2011). Similarly, colleges and universities see cultivating independence as one of their most important goals (Stephens, Markus, Fryberg, Johnson, & Covarrubias, 2012), and jobs held by people with a college education offer more autonomy

and often reward people who stand out (Stephens, Markus, & Phillips, 2014). Consequently, people from higher SES backgrounds tend to be more independent and value expressing their own unique preferences and attributes (Stephens, Fryberg, & Markus, 2012).

Lay Theories of a Good Life and Physiology

Research suggests that people have better physiological profiles (e.g., lower inflammation levels, blood pressure) and health outcomes when their beliefs and behaviors fit in with their environments' social norms and structural constraints (Bennett et al., 2004; Dressler, Balieiro, Ribeiro, & dos Santos, 2005, in press; Stephens, Markus, & Fryberg, 2012). Building on these findings, we suggest that people from higher SES backgrounds whose views of a good life include individual factors will have better physiological profiles (i.e., lower levels of allostatic load) than those whose views do not. Conversely, people from lower SES backgrounds whose theory of a good life includes interpersonal factors will have better physiological profiles than those whose views do not.

Previous work looking at SES, individual and interpersonal factors, and outcomes relevant to health and well-being is consistent with our hypotheses. Among adults high in psychological well-being, those with a high school education tend to define a good life in terms of interpersonal qualities, while those with a college education emphasize individual qualities (Markus et al., 2004), suggesting that these theories of a good life have differential implications for psychological well-being among these groups. Physiological outcomes such as allostatic load may follow a similar pattern. Furthermore, prioritizing and valuing relationships can buffer against adverse physiological outcomes for people from lower SES backgrounds. Specifically, undergraduates whose parents did not attend college exhibit less of an increase in cortisol while giving a speech when they have been told that their university prizes interdependent norms, rather than independent norms (Stephens, Townsend, Markus, & Phillips, 2012). While this research did not look at theories of a good life or individual variation in the extent to which participants valued interdependence, it does suggest that valuing or emphasizing interpersonal ties has positive physiological consequences for people from lower SES backgrounds.

Allostatic Load

Our indicator of physiological risk was allostatic load, a marker of cumulative biological risk that reflects deregulation in multiple systems. Allostatic load is the physiological "wear and tear" that develops as an individual's body repeatedly adapts to cope with chronic stressors (Seeman et al., 1997, 2001). Over time, prolonged efforts at adaptation can result in the dysregulation of multiple systems, such as the cardiovascular, autonomic, metabolic, and inflammatory systems (Seeman, Epel, Gruenewald, Karlamangla, & McEwen, 2010). Higher levels of allostatic load predict the eventual occurrence of conditions such as hypertension, obesity, diabetes, cardiovascular disease, and mortality (Juster et al., 2010; McEwen & Seeman, 1999; Seeman et al., 2001). Thus, allostatic load is a composite indicator thought to reflect risk for a number of chronic diseases of aging.

Current Study

The current study investigated the relationship between people's theories of a good life—specifically, whether they included individual and interpersonal factors—and allostatic load, and how this relationship differs between people who have a college degree or not. We hypothesized that defining a good life in terms of the cultivation of individual qualities is likely to be physiologically protective for those who have a college degree, while defining a good life in terms of cultivating relationships with others is likely to be physiologically protective for those who have a less than a college degree.

Method

Participants

Participants were 261 parents (M_{age} = 45.82, 23.75% men, 60.15% white, 38.70% with less than a bachelor's degree) who came to the lab with their adolescent children (ages 13–16) and participated in a larger study on psychosocial predictors of cardiovascular disease risk in families. The sample size was thus determined independent of and prior to the current research. From each family, one parent and one child came into the lab. Of the 261 participants, 44 were excluded because they were missing data on variables relevant to our analyses, leaving a final sample of 217 (M_{age} = 45.69, 22.12% men, 60.37% white, 39.17% with less than a bachelor's degree).

Socioeconomic Status

Consistent with previous work on socioeconomic status and attention to individual and interpersonal factors (Stephens et al., 2012), we assessed socioeconomic status as level of educational attainment. We used level of educational attainment because it can be measured at the individual level (rather than the household level), and we were interested in the beliefs that an individual develops, and the implications of these beliefs for their own health. We theorize that individual beliefs develop out of the contexts people grow up in, which will be reflected in their own educational experiences (and not necessarily their spouse's). Thus, we used a measure of SES that reflects an individual's status.

Following the convention in this literature, we examined this as a dichotomous variable: people who had attained less than a bachelor's degree (BA) and people who had attained a BA or higher (Stephens et al., 2012; Markus et al., 2004). Previous research suggests that the college environment and the workplace environment of those who have a BA or higher are contexts in which the types of individual qualities that we are interested in continue to develop and become emphasized (Lareau, 2011; Stephens et al., 2012, 2014).

Theories of a Good Life

To assess participants' theories of a good life, trained interviewers asked participants three open-ended questions, which were adapted from research by Markus and colleagues (2004). Specifically, they were asked: (1) "What are your hopes for your child's future?" (2) "In your opinion, what would it mean for your child to have a good life?" and (3) "What do you think are the important factors that could help your child's life go well?" We asked these

questions about their children's lives, rather than their own because questions about their own life might have been too heavily influenced by whether or not they thought their lives had actually gone well. At the same time, the questions were still specific and concrete enough (i.e., about a real person who was important to them) that they could answer them relatively easily, with the idea that their answers would convey their ideals about a good life.

Responses were coded for whether they mentioned individual qualities (happiness, satisfaction, being a good person, individuation, personal goals, self-efficacy/effort, good character, personality development) or support from others (support, acceptance, love), kappas >.70. We focused on mentioning supportive relationships in particular rather than simply having relationships (e.g., having a spouse or children) in order to capture the idea of social connection and harmony that is valued among people with lower levels of educational attainment (Stephens, Fryberg, & Markus, 2012). Describing supportive relationships was a relatively common component of participants' elaboration about the value of interpersonal factors within our interviews. Furthermore, although we expected mentioning individual factors and supportive relationships to be differentially protective depending on socioeconomic status, these two factors are not mutually exclusive. Therefore, we coded the mention of individual qualities and supportive relationships separately.

Interviews were brief (a few minutes in total), and typically, participants mentioned ideas briefly but did not elaborate on them in enough detail for to allow for the creation of a continuous variable coding system of dimensions such as importance. Therefore, both individual qualities and support from others were coded in a binary fashion as present or absent.

Allostatic Load

Allostatic load, a measure of cumulative biological risk (Seeman et al., 1997, 2001) was calculated by taking a sum of the number of the following indices on which participants scored in the highest quartile (scores range from 0 to 7): Interleukin 6 (IL-6), C-reactive protein (CRP), total cholesterol, glycosylated hemoglobin, systolic blood pressure, diastolic blood pressure, and body mass index.

Interleukin-6—To assess IL-6, peripheral blood was drawn into Serum Separator Tubes (SSTs) (Becton-Dickinson, Franklin Lakes, NJ). Between 60 and 120 minutes after the blood draw, SST tubes were spun for 10 minutes at 1,200 rpm and then stored at −30 degrees C to be analyzed later. IL-6 was measured using a high-sensitivity ELISA kit (R&D Systems, Minneapolis, MN) (intra-assay CV<10%; detection threshold=.04 pg/ml).

C-Reactive Protein—As with IL-6, to assess CRP, peripheral blood was drawn into SST tubes (Becton-Dickinson, Franklin Lakes, NJ). Between 60 and 120 minutes after the blood draw, SST tubes were spun for 10 minutes at 1,200 rpm and then stored at −30 degrees C to be analyzed later. CRP was measured using a high-sensitivity, chemiluminescent technique on an IMMULITE 2000 (Diagnostic Products Corporation, Los Angeles, CA) (inter-assay CV=2.2%; detection threshold=.20 mg/L).

Total Cholesterol—Serum samples for cholesterol testing were collected in SST tubes (Becton-Dickinson, Franklin Lakes, NJ), and cholesterol was measured in a Hitachi 911 instrument (Kyowa Medex, Japan) using standard enzymatic techniques (inter-assay CV = 0.9%). Samples were tested in the Clinical Chemistry lab at St. Paul's Hospital, Vancouver, BC.

Glycosylated Hemoglobin—Blood samples to measure glycosylated hemoglobin (HbA1c) were collected into EDTA-containing Vacutainer tubes (Becton-Dickinson, Franklin Lakes, NJ), and HbA1c was measured with an ion exchange high-performance liquid chromatography technique (biorad, DIAMAT). Samples were tested in the Clinical Chemistry lab at St. Paul's Hospital, Vancouver, BC.

Blood Pressure—Resting systolic and diastolic blood pressure was recorded with a VSM-100 BpTRU automatic blood pressure monitor, using a standard occluding cuff on the participant's non-dominant arm. This is a reliable, non-invasive device whose measurements are within 5 mm Hg of a gold standard auscultatory mercury sphygmomanometer measurements 89.2% of the time, and within 10 mm Hg 96.4% of the time (Mattu, Heran, & Wright, 2004). After a five-minute period, during which participants acclimated to the device, three blood pressure readings were taken two minutes apart over a six-minute period. These three readings were averaged.

Body Mass Index—Body mass index was obtained by dividing participants' weight in kilograms by their height in meters squared. Height and weight were assessed using a medical-grade balance beam scale with height rod.

Covariates

Analyses controlled for age, gender, ethnicity (% White), and health practices (number of alcoholic drinks consumed per week and whether or not the participant had ever smoked daily; Miller, Cohen, & Herbert, 1999). Due to the small number of current smokers (N = 10, i.e., less than 5% of the sample) we combined this group with those who had formerly smoked to create a variable of ever smoked vs. never smoked. Similarly, because the majority of participants did not smoke (i.e., smoked 0 cigarettes/cigars per day), smoking was coded as a categorical rather than a continuous variable.

Results

Compared to participants with a BA or higher, participants with less than a BA were more likely to be White (70.59% vs. 53.79%, $\chi^2(1) = 6.10$, $p = .014$), drank more alcoholic beverages per week ($M = 3.11$, $SD = 5.02$ vs. $M = 1.64$, $SD = 3.82$, $t(215) = 2.41$, $p = .017$), were more likely to have smoked daily at some point (48.24% vs. 17.42%, $\chi^2(1) = 23.60$, $p < .001$) and had higher BMIs ($M = 26.74$, $SD = 4.92$ vs. $M = 24.66$, $SD = 4.15$, $t(215) = 3.33$, $p = .001$). Otherwise, the groups did not differ on any of the predictor, covariate, or outcome variables. See Table 1 for more detail.

In order to test whether mentioning individual qualities predicted lower levels of allostatic load among people from higher SES backgrounds but not people from lower SES

backgrounds, we conducted a 2 (highest degree: less than a BA or a BA or higher) by 2 (mention individual qualities: yes or no) ANCOVA to test whether mentioning individual qualities predicted lower levels of allostatic load for those with a BA or higher, but not for those with less than a BA. There was no significant main effect of education, $F(1, 208) = .58$, $p = .45$, $\eta_p^2 = .003$ or of mentioning individual qualities, $F(1, 208) = .91$, $p = .34$, $\eta_p^2 = .004$. However, as expected, there was a significant education by individual qualities interaction, $F(1, 208) = 4.04$, $p = .046$, $\eta_p^2 = .019$. Specifically, people with a BA or higher who mentioned individual qualities had lower levels of allostatic load ($M = 1.45$, $SD = 1.44$) than did those who did not ($M = 2.50$, $SD = 2.10$), $F(1, 208) = 5.29$, $p = .022$, $\eta_p^2 = .025$, 95% CI for the difference between the two groups [.15, 1.92]. Those with less than a BA who mentioned individual qualities ($M = 1.96$, $SD = 1.67$) did not differ from those who did not on allostatic load ($M = 1.70$, $SD = 1.77$), $F(1, 208) = .47$, $p = .49$, $\eta_p^2 = .025$, 95% CI for the difference between the two groups [−1.42, .68]. See Figure 1.

In order to test whether mentioning support from others predicted lower levels of allostatic load among people from lower SES backgrounds but not people from higher SES backgrounds, we conducted a 2 (highest degree: less than a BA or a BA or higher) by 2 (mention interpersonal support: yes or no) ANCOVA to test whether mentioning support from others predicted lower levels of allostatic load for those with less than a BA, but not for those with a BA or higher. There was no significant main effect of education, $F(1, 208) = 1.25$, $p = .27$, $\eta_p^2 = .006$. There was a marginal effect of mentioning support from others, $F(1, 208) = 2.88$, $p = .091$, $\eta_p^2 = .01$. As expected, there was a significant education by support from others interaction, $F(1, 208) = 4.29$, $p = .040$, $\eta_p^2 = .02$. Specifically, people with less than a BA who mentioned support from others had lower levels of allostatic load ($M = 1.39$, $SD = 1.42$) than did those who did not ($M = 2.33$, $SD = 1.75$), $F(1, 208) = 5.75$, $p = .017$, $\eta_p^2 = .025$, 95% CI for the difference between the two groups [.15, .1.53]. Those with a BA or higher who mentioned support from others ($M = 1.63$, $SD = 1.43$) did not differ from those who did not on allostatic load ($M = 1.52$, $SD = 1.67$), $F(1, 208) = .10$, $p = .75$, $\eta_p^2 < .001$, 95% CI for the difference between the two groups [−.63, .46]. See Figure 1.

Finally, to test whether defining a good life as including both individual qualities and supportive relationships, predicted lower levels of allostatic load among people with less than a BA or a BA or higher, we conducted a 2 (highest degree: less than a BA or a BA or higher) by 2 (mention individual qualities: yes or no) by 2 (mention interpersonal support: yes or no) ANCOVA. This three-way interaction was not significant, $F(1, 216) = .06$, $p = .81$, $\eta_p^2 < .001$.

Discussion

We find that people's theories of a good life predict allostatic load, but that the association varies with SES background. Specifically, for those with a bachelor's degree or higher, articulating individual qualities as part of a good life predicts lower allostatic load. In contrast, for those with less than a bachelor's degree, articulating supportive relationships as part of a good life predicts lower allostatic load. This research moves beyond describing the content of people's theories of a good life as past work has primarily done, to explore the implications of holding one view or another. Our findings highlight the role that including

individual or interpersonal factors in one's theory of a good life may play in buffering against physiological risk in higher and lower SES environments.

Previous research has linked psychological well-being to theories of a good life that include interpersonal factors among people from lower SES contexts and individual factors among people from higher SES contexts (Markus et al., 2004). Our findings, which are consistent with that work, join with it to suggest that predictors of health and well-being—and particularly, the extent to which one emphasizes and values individual and interpersonal factors—can differ across SES contexts, just as they differ across national contexts (De Leersnyder, Mesquita, Kim, Eom, & Choi, 2014; Diener & Suh, 2000; Kitayama et al., 2000). Our results also complement and extend research showing that interdependence can be physiologically protective for first-generation college students (Stephens, Markus, Townsend, & Phillips 2012) by revealing the buffering role that an emphasis on relationships might play for people from lower SES backgrounds even outside of settings where their group is underrepresented (e.g., college).

In contrast to other studies on social class showing that people from lower SES backgrounds are likely to emphasize and value strong relationships, while people from higher SES backgrounds are likely to emphasize and value personal qualities, we did not find any SES differences in the likelihood of mentioning individual qualities or support from others. One reason for this may be that while some other studies use procedures that pit a focus on the self versus on others against each other (e.g., whether one chooses a minority or majority pen; Stephens et al., 2007), the present design allowed participants to mention both individual qualities and support from others. It is possible that if we had asked them to choose which one they felt was more important, we, too, would have observed differences based on SES. The lack of SES differences in the prevalence of mentioning individual qualities or support from others might also be due to other differences in our sample and methodology. Specifically, most previous research on SES differences in emphasis or value placed on individual or relational qualities has been conducted in the United States. In contrast, the present research was conducted in Canada, where differences in the social safety nets might have diluted social class differences (Corak, 2013). Furthermore, asking participants to reflect on how they might define a good life for their children, rather than for themselves, might also have contributed to the lack of SES differences in responses.

Notably, although defining a good life in a way that fits with one's SES context predicted lower levels of allostatic load, the converse—failing to define a good life in a way that does not fit with one's SES background—did not. This may have occurred because when a quality is less valued in a socioeconomic context, it may become less relevant to people's lives and, its absence or presence may not play as strong a role in their physiology. The lack of relevance of characteristics that are not valued by one's socioeconomic context may also explain why mentioning both supportive relationships and individual qualities had no effect on allostatic load above and beyond that of mentioning the characteristic that is valued by one's SES context alone.

Our study has some other limitations, as well. First, although we suggest that particular views of life give rise to better physiology, our results are correlational. For example, people

who are very attuned to their environments may develop life goals that reflect the norms and expectations of that environment and also may be responsive and sensitive in ways that lower their levels of allostatic load. Furthermore, we do not investigate the mechanisms underlying our results. One possibility is that certain theories of a good life increase psychological well-being, which, in turn, improves physiological outcomes. Alternatively, defining a good life in a manner that fits with what is valuable or normative in one's environment may create the sense of connection to their social context that, in turn, improves health (Hale Ma, Hannum, & Espelage, 2005; Young, Russell, & Powers, 2004). A third limitation relates to our choice to assess participants' theory of a good life by asking what would make their children's, rather than their own, lives go well. This approach minimized the extent to which their impressions of how their lives had actually turned out could influence their responses. However, particular characteristics of their children (e.g., children's own hopes) might have affected their answers.

Future research could address these limitations by testing the causal relationships (e.g., by inducing people to consider what role individual or interpersonal factors play in a good life), measuring proposed mechanisms, and assessing theories of a good life in other ways. Additional work could also follow people over time in order to link their theories of a good life to cardiovascular disease or other clinical outcomes for which allostatic load indicates greater risk (Juster, McEwen, & Lupien, 2010; McEwen & Seeman, 1999; Seeman et al., 2001). Nonetheless, the present work takes a promising initial step in revealing how people's beliefs about a good life relate to allostatic load in different SES contexts. It sets the stage for further investigation into other implications of holding particular theories of a good life and into how one's approach to life in general can shape life outcomes.

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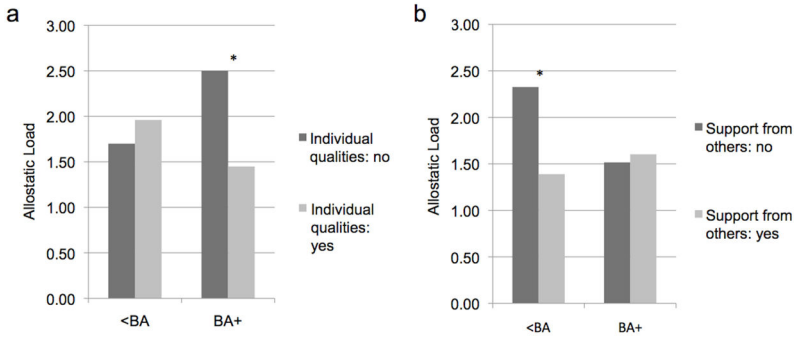

Figure 1.

Table 1

Descriptive Statistics

	N	Less than BA *M (SD)* or %	BA or higher *M (SD)* or %	*t* or χ^2	*p*
Age (years)	217	45.09 (6.69)	46.09 (4.78)	−1.25	0.21
Gender (% men)	217	25.88	19.70	1.15	0.28
Ethnicity (% White)	217	70.59	53.79	6.10	0.01
Number of alcoholic drinks/week	217	3.11 (5.02)	1.67 (3.82)	2.41	0.02
Smoker (% current or former)	217	48.24	17.42	23.60	<.001
Mention individual qualities (%)	217	88.24	89.39	0.07	0.79
Mention supportive relationships (%)	217	57.65	48.48	1.74	0.19
IL-6 (pg/ml)	217	1.82 (2.27)	1.71 (2.24)	0.34	0.74
CRP (mg/L)	217	1.61 (2.22)	1.56 (2.65)	0.16	0.87
Cholesterol (mmol/L)	217	4.89 (1.10)	4.87 (.93)	0.15	0.88
HbA1C (%)	217	5.42 (.38)	5.40 (.35)	0.31	0.76
BMI (kg/m^2)	217	26.74 (4.92)	24.66 (4.15)	3.33	0.001
SBP (mmHg)	217	111.85 (12.06)	109.51 (10.67)	1.49	0.14
DBP (mmHg)	217	72.25 (8.43)	71.69 (9.04)	0.46	0.65