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**BODY WEIGHT AND PSYCHOLOGICAL WELL-BEING:  
DO THE ASSOCIATION AND MECHANISMS DIFFER ACROSS ADULTHOOD?**

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RUNNING HEAD: Body Weight and Psychological Well-Being

### Abstract

The present study examines the association between body weight and psychological well-being among young, middle-aged, and older adults using Wave I (1995) of the Midlife Development in the United States study ( $N = 2,931$ ). I also explore the extent to which perceived discrimination, weight control behaviors, and physical health explain the association between body weight and psychological well-being and how these may differ for young, middle-aged, and older adults. Results show that morbidly obese ( $35 \geq \text{BMI}$ ) individuals report lower psychological well-being than normal weight ( $18.5 \leq \text{BMI} \leq 24.9$ ) individuals, and this association was significant for all age groups. Physical health explained the association between body weight and psychological well-being for young and middle-aged adults, but not for older adults. Although perceived discrimination had negative effects on psychological well-being for all age groups, it explained the association between body weight and psychological well-being for middle-aged adults only.

Key Words: Body Weight, Psychological Well-Being, Obesity, Age Differences, Life Course, Stigma

## Body Weight and Psychological Well-Being: Do the Association and Mechanisms Differ Across Adulthood?

The obesity prevalence rate in the United States has increased over the past three decades (Flegal et al. 2012). Nearly 70% of adults in the U.S. are at least overweight, and a little over one-third are obese with a body mass index (BMI) of 30 or greater. Prevalence estimates, however, vary in adulthood by age. Young adults (20 to 39 years old) have the lowest obesity prevalence rate of 32.55%, followed by middle-aged adults (40 to 59 years of age) with 36.6%, and older adults (60 years or older) have the highest obesity prevalence rate of 39.45%. Although obesity is increasingly common in adulthood, obese individuals are still stigmatized and targets of discrimination (Puhl and Heuer 2009; Puhl and Brownell 2001). The stigma and discrimination that obese individuals experience, in turn, can have negative implications for psychological well-being (Carr, Friedman, and Jaffe 2007; Carr and Friedman 2005).

Previous research that has explored the relationship between body weight and psychological well-being suggests there is little or no association (Friedman and Brownell 1995), while other studies have found morbidly obese ( $BMI \geq 35$ ) individuals report lower psychological well-being (Carr et al. 2007; Carr and Friedman 2005) compared to their thinner counterparts. However, many of these studies fail to consider how the association between body weight and psychological well-being may change throughout the life course. The timing of obesity may be important to the understanding of the association between body weight and psychological well-being because the same experiences can affect individuals differently depending on when they occur in the life course (George 1993). Moreover, it is important for research on body weight and psychological well-being to specify the pathways that may explain

that association, particularly with the recognition that the pathways may differ for young, middle-aged, and older adults.

This study answers two research questions: (1) Does the association between body weight and psychological well-being differ among young, middle-aged, and older adults? And (2) Do different mechanisms explain the association between body weight and psychological well-being differently for young, middle-aged, and older adults? I address these questions by focusing on three distinct stages in the adult life course. In doing so, I compare psychological well-being of young, middle-aged, and older adults to the different BMI cutpoints. I also consider several underlying mechanisms—perceived discrimination, weight control behaviors, and physical health—that may explain the association between body weight and psychological well-being for each age group and test whether these mechanisms differ for young, middle-aged, and older adults.

## BACKGROUND

### *Body Weight, Stigma, and Psychological Well-Being*

Obesity is considered one of the most enduring social stigmas (Cahnman 1968). Goffman (1963:3) defined stigma as “an attribute that is deeply discrediting to its possessor.” Goffman differentiated among three key types of stigma: 1) Abominations of the body; 2) Blemishes of an individual’s character; and 3) Tribal stigma of race, nation, and religion. Prior research has documented that obese individuals are stigmatized for having an abomination of the body as they are perceived to be less attractive and less desirable than their nonobese counterparts (Puhl and Heuer 2009; Sobal 2005; Puhl and Brownell 2001; Harris 1990), and for having a blemish of their individual character (Allon 1982; DeJong 1980). The stigma of obesity is unique in the sense that obese individuals are often perceived to be responsible for their weight

because they lack self-control or willpower (DeJong 1980), thus they are deserving of such stigma that is associated with obesity. In turn, the stigma that obese individuals often face can have negative implications for psychological well-being.

Studies that have explored the association between obesity and psychological well-being, thus far, have found mixed results. Some research suggests that there is little or no association between obesity and psychological well-being (Friedman and Brownell 1995), while other studies have found morbidly obese ( $BMI \geq 35$ ) individuals have lower self-acceptance (Carr and Friedman 2005) and more negative affect (Carr et al. 2007) compared to their normal weight counterparts. These inconsistent findings in the literature are likely reflective of methodological oversights. Prior studies that have explored the association between body weight and psychological well-being have used clinical or community samples (O'Neil and Jarrell 1992; Stunkard and Wadden 1992). These samples are likely to bias the findings when studying the association between body weight and psychological well-being. Obese individuals who seek treatment and who are drawn from clinical samples are more likely to have lower psychological well-being than their respective counterparts (Stunkard and Wadden 1992), thus the association between body weight and psychological well-being is likely to be overestimated. Using community samples in which the sample is drawn from one specific region is likely to be nonrepresentative of the population, so the association between body weight and psychological well-being is likely to be underestimated or overestimated, depending on the exact nature of the sample. Furthermore, prior studies have defined psychological well-being differently. Previous research has generally used depression (Istvan, Zavela, and Weidner 1992), anxiety (Wadden et al. 1989), or body dissatisfaction (Brodie and Slade 1988) to gauge psychological well-being. Studies that have examined the association between body weight and psychological well-being

using nationally representative samples have failed to distinguish between different age groups (Carr et al. 2007; Carr and Friedman 2005), or have combined young and middle-aged adults together (Heo et al. 2005). It is important to examine age differences between the association of body weight and psychological well-being because the prevalence of obesity differs among different age groups in adulthood. Moreover, the salience of obesity as it relates to psychosocial and physical well-being differs throughout the life course. Thus, the association between body weight and psychological well-being (and the mechanisms that may help explain it) may change throughout adulthood. As obesity continues to be an important health and social issue for all ages, the need to clarify the association between body weight and psychological well-being and its mechanisms for different age groups will become an important issue.

#### *Body Weight and Psychological Well-Being in a Life Course Perspective*

The life course perspective emphasizes that the timing of an experience can have more important implications on an outcome than the event itself (Elder 1995). This may be particularly true for body weight as the prevalence rate of obesity differs among age groups in adulthood. The association between body weight and psychological well-being is likely to be negative throughout the adult life course given the stigma of obesity; but the social, psychological, and health factors that may explain the association between body weight and psychological well-being are likely to change over time.

Previous research suggests that the association between body weight and psychological well-being is stronger for young and middle-aged adults compared to older adults because obesity is less likely to be stigmatized during old age (Hebl et al. 2008; Heo et al. 2005). Thus, young and middle-aged adults who are obese may endure more social consequences that, in turn, negatively affect their psychological well-being compared to older obese adults. On the other

hand, obesity may lead to more severe health consequences for older adults as the health risk factors of obesity are likely to accumulate over the life course (Ferraro and Kelly-Moore 2003), and thus the health consequences of obesity may be more important to understanding the association between body weight and psychological well-being among older adults than either young or middle-aged adults. It is important to examine the salience of these potential pathways that may influence the association between body weight and psychological well-being because they are likely to differ for young, middle-aged, and older adults. Mechanisms that may have particular importance for the association between body weight and psychological well-being for young, middle-aged, and older adults include perceived discrimination, weight control behaviors, and physical health.

#### *Different Mechanisms for Different Age Groups*

*Perceived Discrimination.* Although obesity is stigmatized, stigmatizing attitudes toward obesity and its psychological consequences may change throughout the adult life course. Hebl and colleagues (2008) discuss how prejudicial attitudes toward obese individuals persist into old age, albeit they are much weaker for older adults than young or middle-age adults. Prior research suggests that perceived weight discrimination is much more salient for young and middle-aged adults than older adults (Andreyeva, Puhl, and Brownell 2008; Carr, Jaffe, and Friedman 2008). The increased perception of discrimination by young and middle-aged adults may be because of three factors. One, the stigma of obesity, and hence the increased perception of mistreatment for an individual's weight, is likely to be greater for young and middle-aged adults because weight is much more of a salient factor for the formation of relationships (Sobal 2005). Two, both young and middle-aged adults are more engaged in work roles that may make them more susceptible for perceiving discrimination than older adults (Carr and Friedman 2005).

Last, young and middle-aged adults are simply more aware of mistreatment given its increased attention in society (Andreyeva et al. 2008; Carr et al. 2008), thus perceiving discrimination is likely to negatively affect their psychological well-being much more than older adults.

Despite evidence that suggests older adults are less likely to perceive weight discrimination (Andreyeva et al. 2008; Carr et al. 2008), the association is unclear as to whether young or middle-aged adults perceive more discrimination. Young adults have the lowest obesity prevalence rate than any other age group; however, individuals who are obese during this stage in the life course when obesity is relatively uncommon may be more highly visible targets and suffer increased discrimination because of their obesity. Furthermore, weight is much more of a salient factor for forming relationships among young adults than middle-aged or older adults (Harris 1990). Thus, obese individuals who are young may experience more negative social consequences for their obesity than middle-aged or older adults and result in decreased psychological well-being because of the increased denigration for their obesity. On the other hand, middle-aged adults may perceive more discrimination than young or older adults because middle-aged adults are more likely to be obese than young adults and may be more visible targets for discrimination and this may translate into poor psychological well-being.

*Weight Control Behaviors.* In an attempt to overcome the perceived discrimination, obese individuals may engage in weight loss strategies. As previously mentioned, thinness is highly valued during young adulthood and even into middle adulthood (Sobal 2005; Harris 1990); hence, individuals during young and middle adulthood may be more likely to engage in weight control behaviors that promote weight loss or a more desirable physique (Weiss et al. 2006; Kruger et al. 2004). The frequency of dieting, and in particular unsuccessful dieting, has been associated with increased depression among obese individuals (Ross 1994). Middle-aged



adults may be affected more by unsuccessful dieting or weight maintenance than young or older adults because it may be more difficult for middle-aged adults to maintain their desired body weight due to such factors as decreased metabolism (**Van Pelt** et al. 1997) or less time to exercise because of familial or employment responsibilities (Nomaguchi and Bianchi 2004). Despite the reason to maintain a healthy weight, the inability to successfully maintain weight loss for obese individuals may only serve to reinforce the stigma that obese individuals are lazy and lack self-control (Allon 1982; DeJong 1980). This reinforced stigma then may contribute to poorer psychological well-being much more among middle-aged adults than either young or older adults. Weight cycling is also associated with poorer health (Diaz, Mainous, and Everett 2005; Lee and Paffenbarger 1992), which may contribute to lower psychological well-being given physical health is strongly related to psychological well-being (Hayes and Ross 1986).

*Physical Health.* For older adults, the association between body weight and psychological well-being may have less to do with perceived discrimination or weight control behaviors than physical health. Research has documented the health consequences of obesity extensively (World Health Organization 2002), and physical health is strongly associated with psychological well-being (Hayes and Ross 1986). Obesity is often related to increased incidence of chronic conditions such as heart disease, diabetes, and certain types of cancers (WHO 2002). Obese individuals are also more likely than nonobese individuals to experience limitations on their daily activities (Jensen and Friedmann 2002; Galanos et al. 1994) and other health symptoms such as joint pain or trouble sleeping (Heo et al. 2010; Ferraro and Kelley-Moore 2003). These health consequences may be more salient among older adults than both young and middle-aged adults as the health consequences of obesity accumulate throughout the life course (Ferraro and Kelley-Moore 2003), thus they may contribute more to poorer psychological well-

being than other factors for older adults in comparison to young and middle-aged adults (Sachs-Ericsson et al. 2007).

Furthermore, as opposed to thinness being valued during young and middle adulthood for purposes of mate selection (Sobal 2005; Harris 1990), for example, thinness takes on a different meaning during older adulthood. Thinness is often problematic when an individual is old because it is often a sign of poor health (Losonczy et al. 1995; Launer et al. 1994), thus poor health is more likely to explain the association between body weight and psychological well-being for older adults than either young or middle-aged adults. Alternatively, from a life course perspective, poorer health during older adulthood may be more of an “on-time” event. Research has shown that “on-time” events are less distressing and are associated with relatively more positive outcomes, whereas “off-time” events generally produce more negative consequences (Elder, Johnson and Crosnoe 2003; Settersten 1999; Elder 1994). Thus, poor health during young or middle adulthood where is relatively uncommon may contribute to lower psychological well-being than during older adulthood when it is more common (Ferraro and Kelley-Moore 2003; Jensen and Friedmann 2002; Hoffman, Rice, and Sung 1996; Galanos et al. 1994; Perlmutter and Nyquist 1990).

Research has shown that the prejudicial attitudes toward obesity are much stronger toward whites, women, and individuals of a higher socioeconomic status (Carr et al. 2008; Latner, Stunkard, and Wilson 2005). Furthermore, obese individuals are more likely to be women, Black, and individuals of a lower socioeconomic status compared to nonobese individuals (Flegal et al. 2012; Sobal and Stunkard 1989). Studies have shown that many of the characteristics associated with obesity are also associated with psychological well-being (Kessler and Neighbors 1986, Kessler 1982), thus in the current study, I control for demographic

characteristics that are likely to confound the association between body weight and psychological well-being.

## METHOD

### *Data*

The data for this study come from Wave I (1995) of MIDUS. MIDUS is a national multistage probability sample of noninstitutionalized, English-speaking adults, aged 25-74, in the coterminous United States that were selected from working telephone banks. MIDUS is appropriate for the present investigation for three reasons. First, MIDUS captures a wide age range that encompasses young, middle-aged, and older adults. Second, many studies merely use the concept of stigma and discrimination to explain any group differences between stigmatized and non-stigmatized groups, and they do not directly measure perceived discrimination. Moreover, many studies fail to assess an individual's own attribution for perceived discrimination. MIDUS, on the other hand, contains measures of perceived discrimination and the attribution for why an individual perceived the discrimination. Last, MIDUS contains rich data on potential pathways that may help explain the association between body weight and psychological well-being. The total main MIDUS sample includes 3,487 adults (1,721 men and 1,766 women). This analysis is limited to the 2,931 persons (950 young adults; 1,364 middle-aged adults; and 617 older adults) who completed both the telephone interview and self-administered questionnaire. Respondents who did not have valid sampling weights ( $n=1$ ) and who were born after 1970 ( $n=21$ ) were dropped from the sample. Respondents who were underweight (2.15 % of the sample) were also dropped from the analyses as they are not the focus of the current inquiry. The response rates for the telephone interview and self-administered question were 70% and 86.8%, respectively.

*Measures*

*Dependent variable.* Ryff's (1989) assessment of psychological well-being was included in Wave I of MIDUS. A total of 15 items were included that measured five dimensions: positive relations with others (e.g., "I have not experienced many warm and trusting relationships with others"), self-acceptance (e.g., "In many ways I feel disappointed about my achievements in life"), personal growth (e.g., "I gave up trying to make big improvements or changes in my life a long time ago"), environmental mastery (e.g., "I am good at managing the responsibilities of daily life"), and purpose in life (e.g., "I sometimes feel as if I've done all there is to do in life")<sup>1</sup>. Item responses were made on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items were reverse coded as needed to reflect higher psychological well-being. Factor analysis was performed and all items loaded on one factor. Thus, I combined and averaged the scores of these 15 items to form one scale that ranged from 1 to 7 ( $\alpha = .80$ ).

*Key independent variable.* Body mass index (BMI) is calculated as weight (in kilograms) divided by height (in meters). Continuous BMI scores were recoded into five weight categories using cutpoints defined by the guidelines set by the National Heart, Lung, and Blood Institute (2000). The weight categories include normal weight (BMI between 18.5 and 24.9), overweight (BMI between 25 to 29.9), obese I (BMI between 30 and 34.9), obese II (BMI between 35 and 39.9), and obese III (BMI of 40 or higher). Due to small cell sizes, obese II and obese III categories were combined. BMI was calculated from self-reports of weight and height. These estimates may be biased because individuals tend to overestimate their height while underestimating their weight (Bowman and DeLuca 1992). However, this bias is usually small and does not alter results greatly (Palta 1982).

*Explanatory variables.* Perceived discrimination was assessed by asking respondents whether they have ever experienced daily or lifetime discrimination. Daily discrimination captures discrimination due to such things as blemish of character (e.g., “People act as if they think you are not smart”), experience lack of respect (e.g. “You are treated with less courtesy than other people”), and experience harassment or teasing (e.g., “You are called names or insulted”). Lifetime discrimination appraises discrimination due to such things as perceived mistreatment in schooling or employment. Respondents who report either daily or lifetime discrimination are then asked what was the main reason for why they experienced it. Responses included things such as gender, race, sexual orientation, or height and weight. Two dichotomous indicators were created: (1) whether one has ever experienced any discrimination due to height and weight, and (2) whether one has ever experienced any discrimination due to other reasons. The reference group includes respondents who report never experiencing any type of discrimination.

Weight control behaviors were examined with two items. Weight cycling was examined by asking respondents about how many times in their lifetime they lost 10 pounds or more (excluding women after childbirth). Responses ranged from 0 to 500, but were top-coded at the 90<sup>th</sup> percentile, thus weight cycling ranged from 0 to 10<sup>2</sup>. Dieting was assessed dichotomously (0=No; 1=Yes). Respondents were asked if he/she was on a special diet in the previous 12 months to treat a physical health problem, to treat an emotional or personal problem, to maintain or enhance your wellness, or to prevent the onset of illness.

Physical health was also assessed with two items. Self-rated physical health was assessed by asking respondents how they would define their physical health. Response categories ranged from 1 (Poor) to 5 (Excellent), but were measured dichotomously (0=Good or better;

1=Poor/Fair) due to small cell sizes. Chronic conditions were measured dichotomously (0=No; 1=Yes) by asking respondents if they had experienced any of 29 chronic conditions, such as asthma, thyroid disease, or high blood pressure, in the past 12 months. Items ranged from 0 to 27, but were summed and top-coded at the 90<sup>th</sup> percentile to create a scale that ranged from 0 to 6.

*Control variables.* I also control for several demographic variables that have been found to be related to either body weight or psychological well-being (Flegal et al. 2012; Lanter et al. 2003; Sobal and Stunkard 1989; Kessler and Neighbors 1986; Kessler 1982). Age was a continuous variable that ranged from 25 to 74, but was recoded into three age categories to be consistent with age cutpoints defined in national estimates of the obesity prevalence rate (Flegal et al. 2012): young adults (age 25 to 39), middle-aged adults (age 40 to 59), and older adults (age 60+). Sex was coded as a dichotomous variable with male as the reference category. Marital status was coded as four dichotomous variables: married (reference group), divorced or separated, widowed, and never married. Race was coded as three dichotomous variables: white (reference group), African American, and other race. Whether respondents had children was coded dichotomously (0=No; 1=Yes). Socioeconomic status was assessed with three variables: current employment, education, and occupation status. Whether a respondent was currently employed was coded dichotomously (0=No; 1=Yes). Education was coded as four dichotomous variables: less than 12 years of education, 12 years of education (reference group), 13 to 15 years of education, and at least 16 years of education. Current occupation was coded into two categories: upper white-collar (i.e., professional or executive occupations) and a combined category of lower white-collar (i.e., sales or clerical) and blue-collar (i.e., labor and farm occupations). The latter category is the reference group. BMI at the age of 21 was measured as

a dichotomous variable with being classified with a BMI of 25 or greater as the reference group. BMI at the age of 21 was derived from retrospective self-reports of weight (in kilograms) at the age of 21 divided by current height (in meters). BMI at the age of 21 is controlled for because research has shown that one of the strongest predictors of adult obesity is if an individual was obese during childhood or adolescent (Ferraro and Kelly-Moore 2003), thus it is important to control for an individual's potential long-term trajectory of obesity.

### *Analytic Strategy*

I used ordinary least squares (OLS) for all of the analyses. Analyses were run separately for young, middle-aged, and older adults. I first assessed the zero-order relationship between body weight and psychological well-being. I then examined the extent to which the association between body weight and psychological well-being could be accounted for by demographic characteristics. I then tested whether the remaining association between body weight and psychological well-being could be explained by the potential mechanisms separately by using nested models. Clogg tests (Clogg, Petkova, and Haritou 1995) were conducted to examine individual coefficients between models for young, middle-aged, and older adults in order to analyze whether different factors are related to psychological well-being differently for young, middle-aged, and older adults.

Variance inflation factors (VIFs) for all predictors were checked for all age groups. For all age groups, the VIF factors for all predictors were all below 2.5; thus the VIFs suggest little multicollinearity among predictors across age groups (Allison 1999). Missing data were estimated using multiple imputed data created from imputations using chained equations (ICE) program for Stata, Version 11 (Acock 2005; Royston 2005). The results presented below are based on ten replicates of imputed data.

## RESULTS

### *Bivariate Analysis*

Table 1 presents descriptive statistics for all variables in the analysis, by age group. All statistics were weighted to adjust for differences in the probability of selection and differential nonresponse. Young, middle-aged, and older adults did not significantly differ in their reports of psychological well-being. In regards to BMI, young adults were more likely to be classified as normal weight (BMI 18.5 to 24.9) and less likely to be obese I (BMI 30 to 34.9) than both middle-aged and older adults. These findings are consistent with national estimates where young adults are more likely to be of normal weight compared to middle-aged and older adults (Flegal et al. 2012).

[Table 1 about here]

Several characteristics varied by respondents' age. Roughly 80 percent of the MIDUS sample was white; however, both middle-aged and older adults were more likely to be white than young adults. Young and middle-aged adults were significantly more likely to report obtaining at least some education post high school than older adults. Nearly 80 percent of the respondents reported that they had a normal or underweight BMI at the age of 21; however, middle-aged and older adults were significantly more likely to report a normal or underweight BMI at the age of 21 than young adults. These estimates may reflect cohort differences in the prevalence rate of obesity, given it has nearly doubled for U.S. adults in the past three decades (Flegal et al. 2012).

Age was also associated with ever experiencing perceived weight and height discrimination. Both young and middle-aged adults were more likely to report perceived discrimination due to weight and height than older adults. These figures are consistent with previous studies that have found older individuals are less likely to perceive mistreatment than



their younger counterparts (Carr et al. 2008). These figures may also suggest young adults are more highly visible targets for discrimination because of their weight and height during the stage in the life course when the prevalence rate of obesity is relatively low (Flegal et al. 2012).

Middle-aged and older adults were significantly more likely to engage in weight control behaviors than young adults. Middle-aged and older adults reported a greater frequency of losing 10 or more pounds over their lifetime than young adults. A larger percentage of middle-aged adults also reported being on a special diet in the previous 12 months compared to young adults. Consistent with prior research (Losonczy et al. 1995; Launer et al. 1994; Perlmutter and Nyquist 1990), older adults were significantly more likely to report poor or fair health compared to young and middle-aged adults. Older adults were also more likely than both young and middle-aged adults to suffer from chronic conditions.

#### *Multivariate Analysis*

*Young Adults.* In Table 2, model 1 shows respondents who were classified as obese II/III reported psychological well-being scores that were 0.40 points lower than respondents who were normal weight ( $p < .001$ ). The association between obese II/III and lower psychological well-being persisted once demographic characteristics were controlled (model 2). The association between obese II/III and psychological well-being reduced only minimally when perceived discrimination was controlled (model 3). Weight control behaviors did little to explain the association (model 4). The association between obese II/III and psychological well-being was reduced to nonsignificance once physical health was controlled (model 5). Young adults who reported poor or fair health was associated with 0.35 points lower on the psychological well-being scale compared to their counterparts who reported good or excellent health ( $p < .001$ ). Each chronic condition experienced by young adults was also associated with a decrease on the

psychological well-being scale by 0.10 points ( $p < .001$ ). In sum, there was a significant association between body weight and psychological well-being for young adults, but it was only significant for respondents who were classified as obese II/III. Moreover, the association disappeared when physical health was controlled.

[Table 2 about here]

*Middle-aged Adults.* Table 3 presents similar analyses for middle-aged adults as described previously for young adults. Similar to young adults, middle-aged adults who were classified as obese II/III reported 0.25 points lower on the psychological well-being scale than normal weight respondents, and this association persisted when demographic characteristics were controlled (model 2). Once perceived discrimination was controlled, the association between obese II/III and psychological well-being reduced dramatically and it became nonsignificant (model 3). Clogg tests (Clogg et al. 1995) revealed that when BMI and demographic characteristics were controlled, perceived discrimination due to weight and height had a larger effect on psychological well-being for middle-aged adults ( $b = -0.57$ ;  $p < .001$ ) who perceived weight and height discrimination than young ( $b = -0.27$ ;  $p < .01$ ) adults who perceived weight and height discrimination (results not shown). The inclusion of weight control behaviors helped explain little of the association between obese II/III and psychological well-being (model 4). Model 5 suggests physical health explains the association between obese II/III and psychological well-being.

[Table 3 about here]

In sum, like young adults, obese II/III was associated with lower psychological well-being for middle-aged adults. Similar to young adults, physical health explained the association between obese II/III and psychological well-being for middle-aged adults. But unlike young

adults in which perceived discrimination only partially explained the relation between obese II/III and psychological well-being, perceived discrimination explained away the association between obese II/III and psychological well-being for middle-aged adults. This latter finding provides evidence that despite middle-aged adults' high obesity prevalence rate and hence the normalcy of it, they are still highly visible targets for the stigma of obesity, and in turn targets of increased discrimination.

*Older Adults.* Analogous to the findings for young and middle-aged adults, Table 4 shows that BMI had a larger effect on psychological well-being for older ( $b = -0.52$ ;  $p < .001$ ) adults who were classified as obese II/III compared to their middle-aged counterparts ( $b = -0.25$ ;  $p < .01$ ). Perceived discrimination only slightly explained the association between obese II/III and psychological well-being (model 3). And again, like young and middle-aged adults, weight control behaviors did little to explain the association between obese II/III and psychological well-being for older adults (model 4). Contrary to the findings for young and middle-aged adults, physical health did not explain the association between obese II/III and psychological well-being for older adults (model 5), although it was negatively related to psychological well-being. Clogg tests (Clogg et al. 1995) further revealed that chronic conditions experienced by middle-aged adults contributed more to lower psychological well-being scores than older adults who experienced chronic conditions, net of BMI, demographic characteristics, perceived discrimination, and weight control behaviors (results not shown).

[Table 4 about here]

In sum, parallel to the findings of young and middle-aged adults, there was a significant association between obese II/III and lower psychological well-being. Similar to young adults, perceived discrimination helped to partially explain the association between obese II/III and

psychological well-being for older adults. But unlike young and middle-aged adults, physical health did not explain away the association between obese II/III and psychological well-being for older adults.

## DISCUSSION

There has been much research examining the social, health, and psychological consequences of obesity. Research has demonstrated that obese individuals are often stigmatized and targets of discrimination (Carr et al. 2008; Carr and Friedman 2005; Allon 1982; DeJong 1980). The stigma and discrimination, in turn, can result in poor psychological well-being (Carr et al. 2007; Carr and Friedan 2005). Although obesity is stigmatized, stigmatizing attitudes toward obese individuals and the subsequent consequences may change throughout the adult life course. The present study helped to improve our understanding of the association between body weight and psychological well-being and the extent to which different mechanisms explain the association between body weight and psychological well-being and how these may vary for different age groups during adulthood.

Results show that there are general and age-specific mechanisms that explain the association between body weight and psychological well-being among young, middle-aged, and older adults. For middle-aged adults, the age-specific mechanism that explained the association between body weight and psychological well-being was perceived discrimination. Middle-aged adults have a high obesity prevalence rate (Flegal et al. 2012) and are large targets of discrimination that then negatively affects their psychological well-being. For both young and middle-aged adults, physical health explained the association between body weight and psychological well-being but it did not for older adults. This finding suggests the importance of considering the life course when examining the timing of events and its effect on psychological

well-being. For instance, events that occur “off-time” are often associated with poorer outcomes than events that occur “on-time” because “off-time” events are generally more distressing (Elder et al. 2003; Settersten 1999; Elder 1994). During old age, it is relatively common to suffer from chronic conditions (Hoffman et al. 1996) than during an earlier point in the life course, thus young and middle-age adults who suffer from chronic conditions during a stage in the life course when it is relatively uncommon may tend to have lower psychological well-being as the event is likely to be more distressing. Additionally, as the results show, young and middle-aged adults were less likely to be normal weight or thin at the age of 21, thus the health consequences of obesity may develop and accumulate earlier in the life course and contribute to poorer psychological well-being for these age groups. Furthermore, the role of physical health in the association between body weight and psychological well-being may be weaker because there are other causes of poorer physical health besides obesity that may contribute to lower psychological well-being during older adulthood (Ormel et al. 1998).

Although the present study helps to clarify the association between body weight and psychological well-being over the adult life course and its possible mechanisms for different age groups, it has several limitations to consider. First, because the MIDUS data are cross-sectional, causal order cannot be determined. Additionally, intra-individual changes cannot be assessed because life course studies require longitudinal data. Age is used in the present study as a proxy for aging, but it cannot be confirmed as to whether age or cohort effects are expressed in the results. Second, discrimination is based on individuals’ perceptions, so it may not reflect actual incidents of discrimination. Last, the weight cycling measure used only asks respondents how many times in their lifetime they lost 10 or pounds and does not necessarily specify whether respondents regained the lost weight, or maintained their weight for a period of time and then

subsequently lost more weight. These patterns of weight loss may have differential effects on psychological well-being. Despite these limitations, the present study sheds light on the heterogeneity among obese individuals with respect to psychological well-being, and advances research by clarifying the mechanisms among young, middle-aged, and older adults that explain the association between body weight and psychological well-being.

Future studies should employ longitudinal data to better understand individuals' weight trajectories on psychological well-being, along with understanding how the possible mechanisms operate throughout the adult life course. It is also important to examine gender and race differences when trying to understand the association between body weight and psychological well-being and its mechanisms. Research has shown that the obesity prevalence rates are higher for women and racial minorities than their respective counterparts (Flegal et al. 2012), thus the association between body weight and psychological well-being is likely to be stronger for women and racial minorities than men or whites. Moreover, the mechanisms that help to explain the association are likely to be different because the social consequences of obesity are less severe for men and racial minorities than women or whites (Averett and Korenman 1999; Hebl and Heatherton 1998). Future research should also explore how the current high obesity prevalence rate among both children and adolescents (Ogden et al. 2012) and adults (Flegal et al. 2012) will affect the association between body weight and psychological well-being and its mechanisms. Studies have suggested that the stigma of obesity has increased (Andreyeva et al. 2008), thus the consequences of obesity may develop earlier and persist throughout the life course. However, obesity may become more normalized and the consequences may diminish or change in the future.

It is unlikely that obesity will decrease in importance in the years to come as it is associated with many social, psychological, and health outcomes. The present study helps to inform social policies that there are distinctive mechanisms that explain the association between body weight and psychological well-being for different age groups. Recognition of these different mechanisms for different age groups by clinicians and through public education can help obese individuals increase their psychological well-being. For instance, improving an individual's physical health can help to increase psychological well-being for morbidly obese adults who are young and middle-aged. In addition to these two factors, it is also important to decrease weight-based discrimination to increase psychological well-being for morbidly obese individuals, particularly for middle-aged adults.

## NOTES

1. The autonomy subscale was also included in Wave I of MIDUS, but it is not included in the measurement of psychological well-being because some previous research has shown that this subscale operates differently than the other subscales (e.g., Kling, Ryff, and Essex 1997).
2. In preliminary analyses, a categorical indicator was used to assess weight cycling where not ever experiencing weight cycling was the reference group. Three dichotomous indicators were created to assess low weight cycling (defined as 1 or 2 times), medium weight cycling (defined as 3, 4, or 5 times), and high cycling (defined as 6, 7, 8, 9, or 10 times). The results of these analyses are very similar to the results presented.



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**Table 1 Means (and Standard Deviations) or Percentages of All Variables in the Analysis by Age Group**

Variable	Total	Young <sup>a</sup> Adults (age 25-39)	Middle-Aged <sup>b</sup> Adults (age 40-59)	Older <sup>c</sup> Adults (age 60+)	Significant Subgroup Differences
Dependent variable					
Psychological Well-Being (1-7)	5.49 (0.02)	5.52 (0.03)	5.48 (0.03)	5.43 (0.04)	
Independent variable					
Body Mass Index (BMI)					
Normal (18.5 – 24.9)	39.96	46.63	35.97	34.77	ab; ac
Overweight (25 – 29.9)	36.72	34.80	38.03	37.85	
Obese I (30 – 34.9)	15.22	12.02	16.95	18.08	ab; ac
Obese II/III ( $\geq$ 35)	8.10	6.54	9.05	9.29	
Control variables					
Female (1=Yes)	55.85	56.26	54.16	58.54	
Marital status					
Married	68.31	62.76	72.73	70.36	ab; ac
Divorced or separated	15.62	15.31	18.99	9.24	ab; ac; bc
Widowed	4.63	0.28	2.96	16.91	ab; ac; bc
Never married	11.44	21.65	5.32	3.49	ab; ac
Race					
White	83.95	80.31	85.40	88.33	ab; ac
African American	11.37	12.68	10.97	9.57	
Other race	4.67	7.02	3.63	2.10	ab; ac
Has any children (1=Yes)	80.27	68.29	87.99	88.45	ab; ac
Education					
< 12 years	13.12	7.60	11.62	27.43	ab; ac; bc
12 years	38.33	37.80	37.80	40.60	
13-15 years	25.49	30.18	24.07	18.96	ab; ac; bc
$\geq$ 16 years	23.05	24.45	26.51	13.01	ac; bc
Currently Employed (1=Yes)	61.20	73.37	68.63	21.08	ab; ac; bc

Occupation (1=Upper White-Collar)	43.80	42.87	46.01	41.07	
BMI at age 21: normal/underweight (1=Yes)	78.36	74.56	79.64	83.37	ab; ac
Discrimination					
Ever experienced any discrimination, due to weight	7.84	10.23	7.28	4.16	ab; ac; bc
Ever experienced any discrimination, due to other reason	54.92	60.23	56.30	41.31	ac; bc
Weight Control Behaviors					
# times lose 10+ pounds (0-10)	2.94 (0.06)	2.48 (0.10)	3.32 (0.10)	3.05 (0.15)	ab; ac
Special diet (1=Yes)	11.78	9.62	13.42	12.74	ab
Physical Health					
Self-reported health (1=Poor/Fair)	16.50	10.80	16.57	27.89	ab; ac; bc
Chronic conditions (0-6)	2.28 (0.04)	1.85 (0.07)	2.39 (0.07)	2.92 (0.10)	ab; ac; bc
Unweighted <i>N</i>	2931	950	1364	617	
Weighted %	100	39.66	40.76	19.59	

*Source:* Midlife Development in the United States 1995.

*Notes:* Weighted results are presented.

Significant subgroup differences ( $p \leq .05$ ) are denoted as ab: young adults versus middle-aged adults; ac: young adults versus older adults; bc: middle-aged adults versus older adults.

**Table 2 OLS Regression of Psychological Well-Being on BMI, Demographic Characteristics, Perceived Discrimination, Weight Control Behaviors, and Physical Health, for Young Adults (age 25-39)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Body Mass Index (BMI)</b>						
(Normal weight is reference)						
Overweight (25-29.9)	-0.06 (0.06)	-0.06 (0.06)	-0.06 (0.06)	-0.05 (0.06)	-0.05 (0.06)	-0.05 (0.06)
Obese I (30-34.9)	-0.14 (0.09)	(-0.13) (0.10)	-0.11 (0.10)	-0.11 (0.10)	-0.05 (0.10)	-0.03 (0.10)
Obese II/III ( $\geq 35$ )	-0.40 <sup>***</sup> (0.11)	-0.42 <sup>***</sup> (0.12)	-0.37 <sup>**</sup> (0.13)	-0.38 <sup>**</sup> (0.13)	-0.23 (0.12)	-0.17 (0.13)
Sex (1=Female)		-0.03 (0.06)	-0.01 (0.06)	-0.01 (0.06)	0.03 <sup>b</sup> (0.05)	0.03 <sup>b</sup> (0.05)
<b>Marital status</b>						
(Married is reference)						
Divorced or separated		-0.40 <sup>***</sup> (0.07)	-0.40 <sup>***</sup> (0.07)	-0.40 <sup>***</sup> (0.07)	-0.34 <sup>***</sup> (0.07)	-0.34 <sup>***</sup> (0.07)
Widowed		-0.52 (0.46)	-0.53 (0.46)	-0.50 (0.46)	-0.58 (0.44)	-0.57 (0.44)
Never married		-0.26 <sup>***a</sup> (0.07)	-0.25 <sup>***</sup> (0.07)	-0.26 <sup>***a</sup> (0.07)	-0.24 <sup>***a</sup> (0.07)	-0.24 <sup>***</sup> (0.07)
<b>Race</b>						
(White is reference)						
African American		0.17 (0.10)	0.21 <sup>*</sup> (0.10)	0.17 (0.10)	0.13 (0.09)	0.16 (0.09)
Other race		0.04 (0.10)	0.07 (0.10)	0.03 (0.10)	0.05 (0.09)	0.06 (0.09)
Has any children (1=Yes)		-0.13 (0.07)	-0.14 <sup>*</sup> (0.07)	-0.13 (0.07)	0.05 <sup>*</sup> (0.09)	-0.15 <sup>*</sup> (0.06)
Currently Employed (1=Yes)		0.01 <sup>b</sup> (0.06)	0.01 <sup>b</sup> (0.06)	0.01 <sup>b</sup> (0.06)	-0.01 (0.06)	-0.01 (0.06)
<b>Education</b>						
(High school is reference)						
< 12 years		-0.37 <sup>***</sup> (0.12)	-0.37 <sup>***</sup> (0.11)	-0.37 <sup>**</sup> (0.12)	-0.27 <sup>*</sup> (0.11)	-0.26 <sup>*</sup> (0.11)
13-15 years		0.06	0.08	0.07	0.09	0.10

	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)
≥ 16 years	0.30 <sup>***</sup>	0.32 <sup>***</sup>	0.31 <sup>***</sup>	0.30 <sup>***</sup>	0.30 <sup>***</sup>
	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)
Occupation (1=Upper White-Collar)	0.11	0.10	0.11	0.09	0.08
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
BMI at age 21: normal/underweight (1=Yes)	-0.06	-0.06	-0.07	-0.05	-0.06
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Discrimination (No discrimination is reference)					
Ever experienced any discrimination, due to weight		-0.27 <sup>**a</sup>			-0.20 <sup>*a</sup>
		(0.10)			(0.10)
Ever experienced any discrimination, due to other reason		-0.14 <sup>*</sup>			-0.09
		(0.06)			(0.06)
Weight Control Behaviors					
# times lose 10+ pounds (0-10)			-0.01		-0.01
			(0.01)		(0.01)
Special diet (1=Yes)			-0.02		0.10
			(0.09)		(0.09)
Physical Health					
Self-reported health (1=Poor/Fair)				-0.35 <sup>***</sup>	-0.35 <sup>***</sup>
				(0.09)	(0.09)
Chronic conditions (0-6)				-0.10 <sup>***</sup>	-0.10 <sup>***</sup>
				(0.01)	(0.01)
Constant	5.62 <sup>***</sup>	5.72 <sup>***</sup>	5.80 <sup>***</sup>	5.74 <sup>***</sup>	5.90 <sup>***</sup>
	(0.04)	(0.12)	(0.12)	(0.12)	(0.12)

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$  (two-tailed tests).

<sup>a</sup> Significant difference in coefficients between young and middle-aged adults (one-tailed tests).

<sup>b</sup> Significant difference in coefficients between young and older adults (one-tailed tests).

Source: Midlife Development in the United States 1995.

Notes:  $N = 950$ . Regression coefficients are unstandardized. Numbers in parentheses are standard errors.

**Table 3 OLS Regression of Psychological Well-Being on BMI, Demographic Characteristics, Perceived Discrimination, Weight Control Behaviors, and Physical Health, for Middle-aged Adults (age 40-59)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Body Mass Index (BMI)</b>						
(Normal weight is reference)						
Overweight (25-29.9)	-0.03 (0.06)	-0.03 (0.06)	0.004 (0.06)	-0.01 (0.06)	0.003 (0.05)	0.02 (0.05)
Obese I (30-34.9)	-0.15* (0.07)	-0.13 (0.07)	-0.08 (0.07)	-0.10 (0.08)	-0.05 (0.07)	-0.01 (0.07)
Obese II/III (≥35)	-0.25**c (0.09)	-0.26* (0.10)	-0.11 <sup>c</sup> (0.10)	-0.21* (0.10)	-0.13 (0.10)	-0.02 (0.10)
Sex (1=Female)		0.03 <sup>c</sup> (0.05)	0.08 <sup>c</sup> (0.05)	0.04 <sup>c</sup> (0.05)	0.08 <sup>c</sup> (0.05)	0.11* <sup>c</sup> (0.05)
<b>Marital status</b>						
(Married is reference)						
Divorced or separated		-0.29*** (0.06)	-0.26*** (0.06)	-0.28*** (0.06)	-0.23*** (0.05)	-0.21*** (0.05)
Widowed		0.14 (0.13)	0.13 (0.12)	0.13 (0.13)	0.16 (0.12)	0.15 (0.12)
Never married		-0.51***a (0.12)	-0.45*** (0.11)	-0.51***a (0.12)	-0.49***a (0.11)	-0.45*** (0.11)
<b>Race</b>						
(White is reference)						
African American		0.18 (0.10)	0.23* (0.09)	0.17 (0.10)	0.17 (0.09)	0.22* (0.09)
Other race		-0.08 (0.12)	-0.04 (0.11)	-0.09 (0.12)	-0.07 (0.11)	-0.04 (0.11)
Has any children (1=Yes)		-0.08 (0.08)	-0.07 (0.08)	-0.09 (0.08)	-0.08 (0.08)	-0.07 (0.08)
Currently Employed (1=Yes)		0.08 (0.05)	0.08 (0.05)	0.08 (0.05)	0.02 (0.05)	0.02 (0.05)
<b>Education</b>						
(High school is reference)						
< 12 years		-0.24* (0.09)	-0.23* (0.09)	-0.24* (0.09)	-0.12 (0.09)	-0.12 (0.09)
13-15 years			0.11 (0.11)	0.14* (0.11)	0.09 (0.11)	0.12* (0.11)

≥ 16 years	(0.06) 0.37*** (0.06)	(0.06) 0.40*** (0.06)	(0.06) 0.37*** (0.06)	(0.06) 0.27*** (0.06)	(0.06) 0.29*** (0.06)
Occupation (1=Upper White-Collar)	0.06 (0.05)	0.06 (0.05)	0.06 (0.05)	0.09 (0.05)	0.09 (0.05)
BMI at age 21: normal/underweight (1=Yes)	-0.02 (0.07)	-0.04 (0.07)	-0.03 (0.07)	-0.01 (0.06)	-0.02 (0.06)
Discrimination (No discrimination is reference)					
Ever experienced any discrimination, due to weight		-0.57*** <sup>a</sup> (0.11)			-0.48*** <sup>a</sup> (0.10)
Ever experienced any discrimination, due to other reason		-0.23*** <sup>c</sup> (0.05)			-0.19*** <sup>c</sup> (0.05)
Weight Control Behaviors					
# times lose 10+ pounds (0-10)			-0.01 (0.01)		-0.001 (0.01)
Special diet (1=Yes)			0.001 (0.07)		0.15* (0.07)
Physical Health					
Self-reported health (1=Poor/Fair)				-0.24*** (0.07)	-0.22*** (0.07)
Chronic conditions (0-6)				-0.11*** <sup>c</sup> (0.01)	-0.11*** <sup>c</sup> (0.01)
Constant	5.56*** (0.04)	5.50*** (0.12)	5.58*** (0.12)	5.53*** (0.12)	5.76*** (0.12)

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$  (two-tailed tests).

<sup>a</sup> Significant difference in coefficients between young and middle-aged adults (one-tailed tests).

<sup>c</sup> Significant difference in coefficients between middle-aged and older adults (one-tailed tests).

Source: Midlife Development in the United States 1995.

Notes:  $N = 1,364$ . Regression coefficients are unstandardized. Numbers in parentheses are standard errors.

**Table 4 OLS Regression of Psychological Well-Being on BMI, Demographic Characteristics, Perceived Discrimination, Weight Control Behaviors, and Physical Health, for Older Adults (age 60+)**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Body Mass Index (BMI)</b> (Normal weight is reference)						
Overweight (25-29.9)	-0.06 (0.08)	-0.09 (0.08)	-0.07 (0.08)	-0.08 (0.08)	-0.09 (0.07)	-0.07 (0.07)
Obese I (30-34.9)	-0.20 (0.10)	-0.20* (0.10)	-0.18 (0.10)	-0.17 (0.11)	-0.15 (0.10)	-0.14 (0.10)
Obese II/III (≥35)	-0.52*** <sub>c</sub> (0.13)	-0.48*** (0.13)	-0.41*** <sub>c</sub> (0.14)	-0.43*** (0.14)	-0.31* (0.13)	-0.26 (0.14)
Sex (1=Female)		-0.14 <sup>c</sup> (0.07)	-0.12 <sup>c</sup> (0.07)	-0.13 <sup>c</sup> (0.07)	-0.12 <sup>bc</sup> (0.07)	-0.12 <sup>bc</sup> (0.07)
<b>Marital status</b> (Married is reference)						
Divorced or separated		-0.27* (0.11)	-0.28** (0.11)	-0.27* (0.11)	-0.30** (0.10)	-0.31** (0.10)
Widowed		-0.04 (0.09)	-0.05 (0.09)	-0.04 (0.09)	-0.04 (0.09)	-0.04 (0.09)
Never married		-0.57** (0.20)	-0.48* (0.20)	-0.57** (0.20)	-0.53** (0.19)	-0.46* (0.19)
<b>Race</b> (White is reference)						
African American		0.16 (0.15)	0.19 (0.15)	0.14 (0.15)	0.12 (0.14)	0.14 (0.15)
Other race		-0.17 (0.21)	-0.13 (0.21)	-0.18 (0.21)	-0.10 (0.20)	-0.09 (0.20)
Has any children (1=Yes)		0.02 (0.12)	-0.00004 (0.12)	0.02 (0.12)	0.02 (0.12)	0.003 (0.12)
Currently Employed (1=Yes)		0.18* <sub>b</sub> (0.08)	0.19* <sub>b</sub> (0.08)	0.18* <sub>b</sub> (0.08)	0.11 (0.08)	0.11 (0.08)
<b>Education</b> (High school is reference)						
< 12 years		-0.18 (0.10)	-0.16 (0.10)	-0.18 (0.10)	-0.09 (0.09)	-0.08 (0.09)
13-15 years		0.11 (0.10)	0.12 (0.10)	0.11 (0.10)	0.08 (0.09)	0.09 (0.09)

	(0.09)	(0.09)	(0.09)	(0.08)	(0.080)
≥ 16 years	0.27**	0.30**	0.27**	0.19*	0.21*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Occupation	0.06	0.05	0.06	0.09	0.08
(1=Upper White-Collar)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
BMI at age 21:	-0.03	-0.03	-0.05	-0.03	-0.02
normal/underweight (1=Yes)	(0.09)	(0.09)	(0.10)	(0.09)	(0.09)
Discrimination					
(No discrimination is reference)					
Ever experienced		-0.54**			-0.47**
any discrimination,		(0.19)			(0.18)
due to weight					
Ever experienced		-0.07 <sup>c</sup>			-0.04 <sup>c</sup>
any discrimination,		(0.07)			(0.07)
due to other reason					
Weight Control Behaviors					
# times lose 10+ pounds (0-10)			-0.01		-0.002
			(0.01)		(0.01)
Special diet (1=Yes)			-0.02		0.12
			(0.10)		(0.10)
Physical Health					
Self-reported health				-0.31***	-0.31***
(1=Poor/Fair)				(0.08)	(0.08)
Chronic conditions (0-6)				-0.07*** <sup>c</sup>	-0.07*** <sup>c</sup>
				(0.02)	(0.02)
Constant	5.57***	5.60***	5.62***	5.63***	5.84***
	(0.06)	(0.16)	(0.17)	(0.17)	(0.16)

\*  $p \leq .05$ ; \*\*  $p \leq .01$ ; \*\*\*  $p \leq .001$  (two-tailed tests).

<sup>b</sup> Significant difference in coefficients between young and older adults (one-tailed tests).

<sup>c</sup> Significant difference in coefficients between middle-aged and older adults (one-tailed tests).

Source: Midlife Development in the United States 1995.

Notes:  $N = 617$ . Regression coefficients are unstandardized. Numbers in parentheses are standard errors.