MULTIDIMENSIONAL ASSESSMENT OF LIFE SATISFACTION IN SOUTHERN APPALACHIA

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ABSTRACT

People living in Southern Appalachia have been burdened by lack of resources, economic disparity, gender issues, and an increased probability to develop chronic disease linked to stress and anxiety. These problems can severely affect the individual's evaluation of the quality of life. In this study the authors assessed several predictors of life satisfaction. Undergraduate students enrolled at Marshall University participated in the study (n = 149). Participants filled out several questionnaires (Self-monitoring, Revised Life Orientation Test, Multidimensional Scale of Perceived Social Support, Depression Anxiety Stress Scale, and Satisfaction with Life Scale) during one session that lasted between 30-45 minutes. Alternative hierarchical models of life satisfaction were tested including the following predictors: dispositional variables (optimism and self-monitoring), perceived stress and anxiety, social support from three different sources (family, friends, significant others), and gender. Results indicated that life satisfaction was high (80% of the subjects reported to be satisfied above average), a figure comparable to the national average. Dispositional variables played an opposite role: whereas high optimism had a very significant impact on life satisfaction, excessive self-monitoring was related to lower levels of life satisfaction. Social support, in particular family support, played a moderating role in reducing the level of perceived anxiety and thus increasing life satisfaction. In conclusion, these results indicated that different sources of stress drive distinct coping mechanisms in different physical and socio-cultural environments, and a combination of high optimism and family support is critical to help reducing anxiety in an environment characterized by poverty, social and gender disparity, and high suicide rate.

Keywords: Stress and Anxiety, Social Support, Self-monitoring, Quality of Life.

INTRODUCTION

Southern Appalachia is characterized by rural cultural traditions and considerable economic disparity (Obermiller & Maloney, 2002). Economy in this region has become significantly more diversified in the past two decades, but *per capita* income is still at the lower end of U.S. average (little over $23,700 per person, or 77% of the national average), and poverty rate is close to 18%, one of the highest in the nation (US Department of Labor, 2002). Lack of resources is a well-known stressor able to detract from the quality of life of many people. Although the stress response is functional to overcome acute stressors, it can lead to the emergence of stress-related disease when it becomes chronic, as in a situation of continuous lack of resources (Sapolsky, 2000). Indeed, people living in Southern Appalachia have faced a heavier burden from chronic diseases directly linked to stress and anxiety, such as obesity, heart diseases, and depression (Halverson, Ma, Harner, & Brahman, 2004; Huttlinger, Schaller-Ayers, & Lawson, 2004). To complicate the matter further, studies have shown the different role of the two genders in shaping the economic development in this region (Billings & Blee, 2000; Rogers, Mencken, & Mencken, 1997). Gender relationships and cultural biases have heavily affected the distribution and consequences of social and economic disparities in the Appalachian region (Latimer & Oberhauser, 2005). Women experience a high prevalence of mood and anxiety disorders. Both mood and anxiety disorders disturb sleep, attention and, thereby, cognitive function, increasing the vulnerability to stress-related diseases (Bonanno & Mancini, 2008; Alexander, Dennerstein, Kotz, & Richardson, 2007). As a

consequence, it is of critical importance to comprehend the effects of gender on life satisfaction in Southern Appalachia.

Life satisfaction has been a major aim of investigation in the last three decades (Krause, 2004; Moons, Budts, & DeGeest, 2007). Defining life satisfaction as a cognitive assessment of the fit between the desired goals in life and actual life outcomes, and considering the importance that most people give to life outcomes, the lack of research on this topic for people who live in West Virginia is puzzling. While it is possible that West Virginians are, on average, as happy as other populations in different states, the extreme poverty rate of this state points toward a different direction. After all, West Virginia's suicide rate, which is probably the most crude and direct indicator of life satisfaction, tells a different story. West Virginia's suicide rate is among the highest in U.S. (16 for every 100,000 residents, compared to the U.S. rate of 11 per 100,000 – US Department of Health and Social Services, 2005). The literature on the association between stress / anxiety disorders and suicidal behavior is complex and contradictory evidence emerge, but recently a consistent pattern has been shown, which links specific anxiety disorders, such as panic attack and obsessive-compulsive behavior, to an increased risk in suicidal behavior (Hawgood & De Leo, 2008).

Research on stress and health shows that social support (Cohen, Gottlieb, & Underwood, 2000) and the quality and quantity of social interactions (Kiecolt-Glaser & Newton, 2001) can be important factors in downplaying the role of stressors such as lack of resources. For example, individuals with low sociability were about 2.5 times as likely as the others with high sociability to get a cold (Cohen, Doyle, Turner, Alper, & Skoner, 2003). Studies on the direct link between immune-suppression and stress have helped us to explain these results: a prolonged and sustained stress response can interfere with the activity of the immune system, making people more vulnerable to pathogens (Dinkel, Ogle, & Sapolsky, 2002). People who have the perception of living in a supportive social network report lower stress and anxiety in demanding situations with continued effort, whereas people with unfavorable expectancies are more prone to give up (Gladstone, Parker, Malhi, & Wilhelm, 2007). Indeed, social support is often seen as one of the best way to deal with chronic stress and anxiety disorders (Sapolsky, 2000). Social support can be received from several distinct sources, including one's own family, friends, and significant others, and thus it is important to parse the effect of these different sources.

If lack of resources and gender disparity can lead to such a catastrophic emergence of stress-related disease, what are the mediating effects of individual dispositional characteristics, such as optimism and self-monitoring? Optimists tend to have favorable expectancies about outcomes that are important to them, and therefore they do not dwell much on negative circumstances when assessing their happiness, and instead focus on factors such as social life and feelings of personal safety. The active reframing of their experience can explain why a number of studies have shown that differences in optimism are linked to both physical and psychological well-being, including resiliency, stress-response, and health crises (Armor & Taylor, 2003; Carver & Scheier, 2000).

Optimism can reduce the effect of stereotypes on one's experience. Stereotypes are sets of beliefs about a group of people (Fiske, 1998). Stereotypes ignore the actual variation among group members and generalize identical characteristics to virtually all members of the group. West Virginians who focus on negative sides of living in this state can be vulnerable by a stereotype of living in place characterized by high poverty, economic disparity, and gender issues. Findings reported by Schkade and Kahneman (1998) indicated that people ability to be satisfied in their own environment can transcend even their own stereotypical view of that environment. In their study, they asked students at universities in the Midwest and in California to judge their own happiness and the happiness of students at the other location. Both groups predicted they would be happier living in California than in the Midwest, but the two groups turned out to be equally happy. When individuals predict their future feelings, they tend to focus on a central event

whose emotional impact they are trying to predict, but they tend to ignore all the peripheral events that follow the central event (Wilson & Gilbert, 2003). These considerations are consistent with the findings that most people are happy (Biswas-Diener, Vitterso, & Diener, 2005; Diener & Diener, 1996). For example, 86% of their national based representative samples reported their happiness above average (Diener & Diener, 1996). Being in positive emotional state of mind is clearly adaptive in an evolutionary perspective because it broadens people's thoughts and actions, and builds their enduring resources of coping with adversity (Aspinwall & Taylor, 1997; Fredrickson, 2001). Moreover, positive emotions can facilitate approach / consumatory behaviors such as seeking food, sex, shelter, social support, and increase creativity by enabling people to be flexible and to broad their perspective (Isen, Daubman, & Nowicki, 1987). If being in positive mood has survival benefit, we predict that the majority of West Virginians are also happy despite the external circumstances.

Life satisfaction is closely linked to our ability to learn. Studies have shown that, after controlling for socio-demographic factors, the rate of dropout in both high school and college is closely related to life satisfaction (Ou, 2008). Students whose creativity efficacy was moderately high were found to have reported higher ratings of life satisfaction after having participated in service learning *(*Tan, Ho, Ho, & Ow, 2008). Students who reported a better life satisfaction showed positive attitudes toward teachers, perceptions of physical ability, and relationships with parents (Papaioannou & Siskos, 2008). Considering that it is virtually impossible to separate overall life satisfaction and students' scholastic achievements, it is of primary importance to assess students' life satisfaction in order to improve students' self-image and reduce academic stress (Chow, 2007).

This study assessed the role of gender, dispositional variables (optimism and self-monitoring), and external variables (perceived social support, perceived stress / anxiety level) in the life satisfaction of a large sample of students living in West Virginia. It was hypothesized that gender, resilience to stress, social support, and high optimism played a significant role on the quality of life of West Virginians. Several different alternative models were tested to study the reciprocal interactions among these predictors and to assess which variables contributed the most to life satisfaction of students living in Southern Appalachia.

Method

Participants

Participants consisted of 149 students of Marshall University who agreed to be part of this study in exchange for extra-credits. Participants were required to be 18 years of age or older and a member of Psychology 201 (General Psychology) human subjects pool to participate in the present study. Cognitively impaired individuals, mentally disabled individuals, and non-English speaking individuals unable to provide informed consent were excluded from the study. Eligible participants were instructed on the goals and procedures of the present study before the completion of the anonymous questionnaire, and they retained a copy of the anonymous survey consent.

There were 109 (73%) females and 40 (27%) males, with an age range between 18 and 39 years (M = 20.18, SD = 3.9). The majority of the participants were of Caucasian ethnicity (n = 132, 88.6%), with other minority groups in similar proportion (Alaskan, African-American, Hispanic, and Asian).

Materials

The tests were taken collectively. Participants filled out several questionnaires during one session that lasted between 30-45 minutes. The order of the different questionnaires was as follows:

Self-monitoring (Snyder & Gangestad, 1986).

The degree to which individuals change their behavior depending on situational demands. High *self-monitors* change and vary their behavior across situations because they are more sensitive to social and interpersonal cues of different social contexts, whereas low self-monitors behave consistently across situations (Gangested & Snyder, 2000). Self-monitoring is related to cognitive style, such as the ability to innovate and to operate "outside the

box" in order to solve problems differently (Hutchinson & Skinner, 2007). Some items from this scale include, "I find it hard to imitate the behavior of other people", and "In a group of people I am rarely the center of attention". A true/false format was used in this section for the 18-item revised scale. A higher score indicates a greater amount of self-monitoring among participants.

Revised Life Orientation Test (LOT-R) (Scheier, Carver, & Bridges, 1994).

The degree to which individuals have favorable expectancies about outcomes that are important to them was assessed using the 10-item LOT-R with four fillers. People who have favorable expectancies are likely to respond to problems with continued effort, whereas people with unfavorable expectancies are more prone to give up (Perczek, Carver, & Price, 2000). Differences in optimism have been linked to both physical and psychological well-being in a number of studies, including resiliency (Carver & Scheier, 2000), stress-response and health crises (Armor & Taylor, 2003). Examples from this scale include, "In uncertain times, I usually expect the best", and "I don't get upset too easily". A 5-point Likert scale ranging from 1 to 5 was used by participants to rate their agreement with each statement. A higher score indicates a greater amount of optimism among participants.

Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988).

The amount of physical and emotional comfort individuals believe their family, friends, and significant others are giving to them was assessed using the 12-item MSPSS. Differences in perceived social support have been linked to both physical and psychological well-being in a number of studies, including depression (Gladstone, Parker, Malhi, & Wilhelm, 2007), trauma recovery (Malec, Testa, RushBrown, & Moessner, 2007), and post-natal depression (Husain et al., 2006). Examples from this scale include, "There is a special person who is around when I am in need", and "I have friends with whom I can share my joys and sorrows". A 7-point Likert scale, ranging from 1 (*very strongly disagreement*) to 7 (*very strongly agreement*) was used by participants to rate their agreement with each statement. A higher score indicates a greater amount of perceived social support among participants.

Depression Anxiety Stress Scale (DASS) (Lovibond & Lovibond, 1995).

The amount of perceived stress / anxiety was assessed using the 28-item DASS. Although anxiety and stress are generally distinct from one another, people who have an elevated stress or anxiety response to problems are usually characterized by symptoms of elevated negative emotions such as irritability and physiological hyperarousal (Clark & Watson, 1991). Examples from this scale include, "I was aware of dryness of my mouth", and "I was aware of the action of my heart in the absence of physical exertion". A 4-point Likert scale, ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much*) was used by participants to rate their agreement with each statement. A higher score indicates a greater amount of perceived stress or anxiety.

Satisfaction With Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985).

The SWLS is a short 5-item instrument designed to measure global cognitive judgments of satisfaction with one's life. The SWLS is shown to be a valid and reliable measure of life satisfaction, which is suited for use with a wide range of age groups and applications, and which makes possible the savings of interview time and economic resources compared to many measures of life satisfaction (Pavot, Diener, Colvin, & Sandvik, 1991). In addition, the high convergence of self- and peer-reported measures of subjective well-being and life satisfaction provides strong evidence that subjective well-being is a relatively global and stable phenomenon, not simply a momentary judgment based on fleeting influences (Pavot & Diener, 1993). Examples from this scale include, "In most ways my life is close to my ideal", and "So far I have gotten the important things I want in life". A 7-point Likert scale, ranging from 1 (*very strongly disagreement*) to 7 (*very strongly agreement*) was used by participants to rate their agreement with each statement. A higher score indicates

a greater amount of perceived stress or anxiety.

Statistical Analysis

Bivariate explorative correlations were calculated using Pearson's *r* coefficients. The difference in life satisfaction between males and females were tested using an independent t-test. Multiple regression was used to assess different models of the effects of the predictors on life satisfaction (dispositional predictors: optimism and self-monitoring; external predictors: perceived stress and anxiety; perceived social support from family, friends, and significant others). Diagnostics were checked for each model to verify the reliability of the proposed model. The Statistical Package for the Social Sciences (15th version) was used to carry out the analyses (SPSS Inc., Chicago, IL).

Results

Life Satisfaction

Scores on life satisfaction ranged from 8 to 35, with mean M = 25.8 and standard deviation SD = 6.0. Most of the participants claimed to have a satisfactory life. Indeed, the median score for life satisfaction was 27, that is more than half of the participants reported the highest range of life satisfaction. On the other hand, just 5% of the participants scored below 14 (lowest quartile), and another 17% scored in the second quartile (Figure 1).

Life satisfaction in the two genders was almost identical. The average life satisfaction score for female was 25.8, whereas in males was 25.7. This very small difference was not significant ($t_{147} = 0.06$, N = 149, p = 0.95).

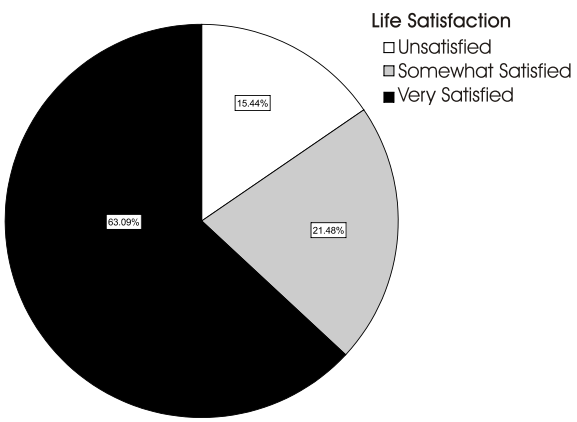

Figure 1. Life satisfaction in Appalachian students, as measured by the Satisfaction With Life Scale (SWLS). Most students declared to be very satisfied with their life (63%), whereas only a fraction (15.44%) declared to be unsatisfied with their life.

Bivariate Correlations

Pearson product-moment correlations were computed to examine the relationships between life-satisfaction and dispositional (optimism and self-monitoring) and external (perceived stress and anxiety, social support from family, friends, and significant others) predictors. Range of the self-monitoring scale varied from 1 to 18, and the total sample mean and the standard deviation were M = 9.22 and SD = 3.5. Scores on optimism ranged from 6 to 30, and the total sample mean and the standard deviation were M = 20.7 and SD = 5.2. Scores on the perceived social support measure ranged from 4 to 28 for all three categories, with grand average M = 22.8 and grand standard deviation SD = 5.9. Finally, scores on stress ranged from 0 to 42, with M = 14.5 and SD = 9.4. Scores on anxiety ranged from 0 to 35, with mean M = 8.5 and standard deviation SD = 7.4. Life satisfaction in West Virginia was correlated with all these predictors. Among the dispositional variables, optimism showed a significant positive correlation with a large magnitude according to Cohen's criteria (r = 0.62, size effect = 0.39), and self-monitoring a weak negative correlation (r = 0.19, size effect = 0.04) (Figure 2). Social support in all three categories (from family, from friends, and from significant others) showed a significant positive correlation with life-satisfaction, but the effect size was small (family: r = 0.25, size effect = 0.06; friends: r = 0.28, size effect = 0.08; significant others: r = 0.23, size effect = 0.05). Both perceived stress and anxiety showed a negative correlation with life-satisfaction with medium magnitude (stress: r = -0.40; size effect = 0.16; anxiety: r = 0.36, size effect = 0.13).

Hierarchical Regression Models

Correlations are useful to identify possible variables of interest in explaining a phenomenon, but since most of the predictors are correlated with each other, they cannot portray a coherent and clear picture. More importantly, they often convey redundant information. For example, stress and anxiety are both negatively correlated with life satisfaction, but they are positively correlated to each

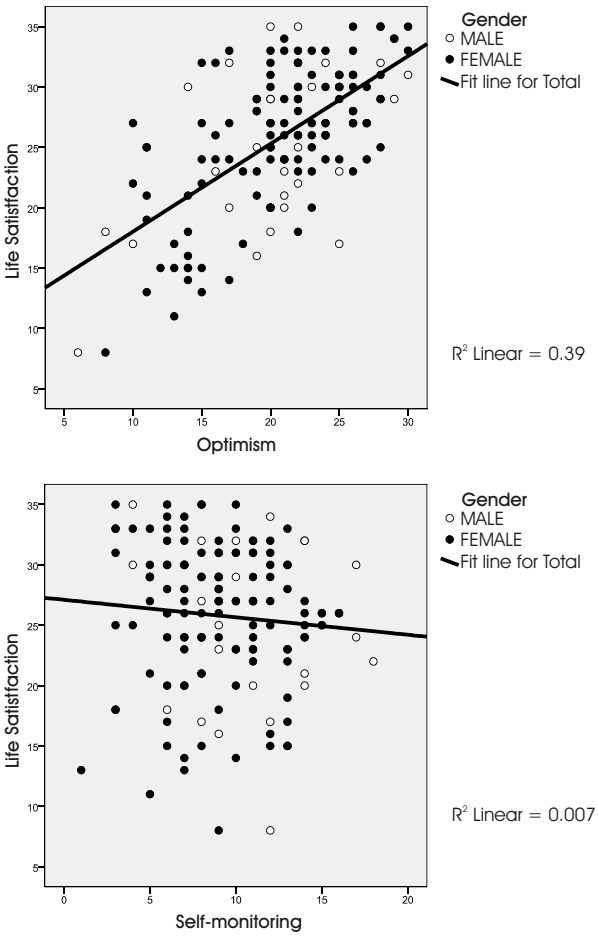

Figure 2. Bivariate correlation between life satisfaction and optimism (A) ($r = 0.62$, size effect = 0.39, $p < 0.01$) and between life satisfaction and self-monitoring (B) ($r = 0.19$, size effect = 0.04, $p < 0.05$).

other, and therefore it may be possible that only one of these two predictors has a significant and independent effect on life satisfaction. To address the inter-correlation among the predictors, and to establish which predictors had a moderating effect on the others, several multiple regressions were computed.

In the first analysis, the researchers calculated which predictors had a significant and independent effect on life satisfaction in West Virginia. A stepwise multiple regression was used to identify the variables of importance. Our results indicated that just three predictors were necessary to explain life satisfaction in our sample: optimism, social support from family, and anxiety level ($F_{3,145} = 42.4$, $N = 149$, $p < 0.001$) with a significant size effect (partial eta squared = 0.49). In other words, in almost half of the participants a combination of high optimism, adequate social support received from family members, and low anxiety level was enough to significantly increase the score of their assessment of life.

To assess which of the three identified predictor played a moderating role, they tested several hierarchical regression models. In the first model they tested a direct effect of optimism on life satisfaction, without moderating variables. This model was able to explain 36% of the variability in our sample (Figure 3A). In an alternative model, we used optimism as having both a direct effect on life satisfaction and a moderating role on anxiety, diminishing the overall anxiety level of the participants. This model was a significant improvement, being able the explain 44% of the variability in our sample (Figure 3B). Finally, the best fit was for a model including family support as the moderating factor for anxiety, with optimism having a direct, independent effect on life satisfaction. This model was able to explain 49% of the variability in our sample (Figure 3C).

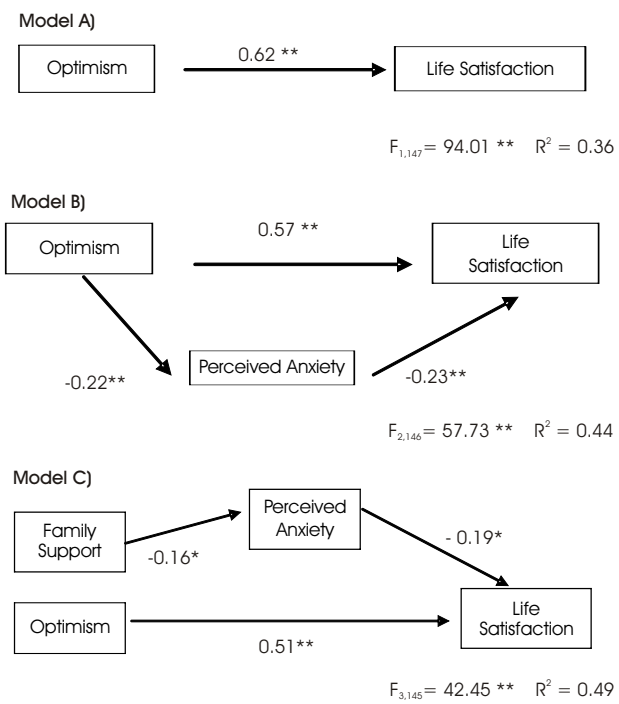

Figure 3. Alternative hierarchical models explaining life satisfaction in West Virginia. The numbers close to the arrows indicate the correlation of the predictors and life satisfaction. The overall fitness of the model is expressed by R^2. (**) indicates a very significant association ($p < 0.001$) and (*) a significant association ($p < 0.05$).

Discussion

Human beings are well-known for the behavioral flexibility and ability to adapt to even the most extreme environmental conditions, due to the plasticity of the functional organization of their cognitive and cortical processes (Li, Brehmer, Shing, Werkle-Bergner, & Lindenberger, 2006). This remarkable adaptability is functional to human ability to colonize and prosper in very different climatic conditions, from the deserts to the coldest region of the Arctic, as it is functional to human survival under the most arduous situations, like during prolonged lack of resources (Lambert et al., 2006; Sapolsky 2005; Simeon et al., 2007). The results in this study confirm this expectation, considering that about 80% of the participants reported an above average happiness level. This is a little lower than the 86% figure reported by Diener and Diener on their national sample (Diener & Diener, 1996), but it is still a remarkable result considering the poverty rate and suicide rate in West Virginia.

Consistently with these considerations, populations under different sources of stress should be able to use different coping mechanisms in order to maintain the overall assessment of their life into ranges compatible with their daily activity. Our results verified this prediction, since family support played a moderating role for anxiety, in a state were family traditions are important, and high anxiety levels are related to a chronic lack of resources that can spell a negative light on the future (Dinkel, Ogle, & Sapolsky, 2002). In Southern Appalachia family traditions are important, and often one's own family is seen as a refuge from external threats (Lewis & Billing, 1997). Historically, West Virginia has suffered from lack of mobility in its work-force, and family closeness has often conjured as a possible explanatory mechanism (Pudup, 1990). Therefore, it is not surprising that the social support involved in life satisfaction for West Virginians was closely linked to family support. The other significant factor affecting life satisfaction in this group was anxiety level. From a physiological point of view, the negative effects of chronic stress are manifested when mostly psychogenic stressors are involved (Bardi, Bode, Ramirez, & Brent 2005; Sapolsky, 2000), rather than when physical stressors afflict individuals. This is why harsh climatic conditions are effectively counterbalanced by positive dispositional traits, (Koolhaas et al., 1999), but lack of resources is not.

Among the dispositional variables, high optimism had a direct impact on life satisfaction, and indeed optimism can help West Virginians to focus on positive aspects of their life, in spite of the harsh economic and environmental conditions. Excessive self-monitoring in people living in Southern Appalachia can be detrimental, as the data support. Indeed, continuous monitoring activity can be advantageous in the short-term, but if prolonged for long period of times can significantly increase the activation of the stress system in both human and nonhuman primates (Sapolsky, 2005). The opposing roles of optimism and self-monitoring finds support from previous studies on depression and counterfactual thinking as well (Roese, Hur, & Pennington, 1999). Depressed people tend to ruminate on negative events, increasing their anxiety and the probability of long-term neuroendocrine damages which, in the end, can prevent them from effectively counterbalancing stressors and other negative events in their life (McEwen, 2003). When asked why they tend to spend so much time reflecting on negative episodes, depressed people rationalize their behavior claiming that it enables them to get useful insights related to their situation, which is not true in most cases. Counterfactual thinking ("if only") research also shows that "what might have been" thoughts are functional for controllable event but not for uncontrollable events.

As to the influence of gender, it was puzzling the lack of a clear and direct association of gender with life satisfaction among West Virginians, especially considering the vast literature in support of this association in several rural areas (Latimer & Oberhauser, 2005; Oberhauser & Pratt, 2004). One possible explanation for this controversial result is that the average age of the participants recruited in this survey was very young (little over 20 years old), a limitation due to the way in which participants were recruited. It has been reported that gender differences in coping mechanisms increase with age (Wright and Steptoe, 2005), and therefore further studies based on sampling the entire

population are necessary to disentangle this unexpected result.

Reducing academic stress is of critical importance to improve students' learning (Chow, 2007). It may be possible that the positive and negative interaction between optimism, self-monitoring, and social support in students could lead to differences in academic motivation and coping (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Therefore, our data suggest that understanding the motivational and coping processes associated, respectively, with the optimism and pessimism of students is of critical importance to provide a fulfilling learning experience in the classroom (Thompson & Gaudreau, 2008).

In conclusion, our results indicated that no matter what kind of stressors people have to cope with, the overall assessment of the quality of life does not vary dramatically, thus transcending even our own stereotypic view of what life should be. This mechanism is most likely functional to survivability in the most diverse environments, a distinctive characteristic of our species linked to our neural and cognitive plasticity. This model predicts that moderating variables affecting life satisfaction will be dependent on the specific stressor, and indeed our findings indicated that dispositional variables such as high optimism and low self-monitoring were linked to life satisfaction in West Virginia. Social support, especially from family members, played a moderating factor on life satisfaction via a reduction of anxiety level: lack of resources and uncertainty for the future can be perceived less dramatically if a supporting family can provide a refuge for both emotional and physical distress. Further studies assessing causal links between the variables indicated in the present work are necessary to provide a better understanding of the internal (physiological and dispositional) and external (social and environmental) mechanisms underlying life satisfaction in different socio-cultural conditions.

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