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Hope and Focus on Future as Protective Health Factors? A Moderation Analysis with Race and Income

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Hope and Focus on Future as Protective Health Factors?

A Moderation Analysis with Race and Income

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By

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June 3, 2019

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Biography

The author was born in Johnson City, New York, January 19, 1993. She graduated from Lima Christian School in Lima, NY and received her Bachelor of Arts degree from Houghton College in 2015.

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Abstract

Health promotion and prevention are important goals in public health (Dubois, 2017).

Hope and consideration of future consequences are two suggested protective factors that promote

healthy behaviors, such as healthy eating and physical activity (Joireman et al., 2012; Joireman

& King, 2016; Kwon et al., 2015; Scioli et al., 2011; Valle et al., 2006). These behaviors are

important preventive measures and promote optimum physical and mental health (Aboderin et

al., 2001; Elisaf, 2001; Hu et al., 2001; Key, Allen, Spencer, & Travis, 2002; WHO, 2018).

However, physical and mental health disorders disproportionally impact oppressed and

marginalized communities (Adler & Rehkopf, 2008; Davey-Smith, 1997; Oyserman, Smith, &

Elmore, 2014; Williams & Jackson, 2005). At the same time, research examining hope and

consideration of future consequences rarely examines the differential impact of these constructs

for different communities (Johnson, Blum, & Cheng, 2014; Kwon et al., 2015). This study

assessed how participants' levels of hope, future orientation, and present orientation promote

healthy eating and physical activity in the contexts of income and race. Specifically, results

showed that hope predicted physical activity but not healthy eating; consideration of future

consequences predicted both healthy eating and physical activity; and consideration of

immediate consequences predicted less healthy eating but did not predict physical activity.

Furthermore, income moderated the relationship between consideration of future consequences

and healthy eating. Race did not show any significant moderation effects. Interventions that

emphasize hope, considering future consequences, and considering immediate consequences

may have some effect on individuals' physical activity and healthy eating behaviors. However,

these results will likely be limited without additional intervention components. Indeed, the

efforts of any intervention should be aimed towards higher-order change, which is necessary for

affecting individuals' and communities' opportunities and likelihood of increasing health-promoting behaviors.

Hope and Focus on Future as Protective Health Factors?

A Moderation Analysis with Race and Income

Physical and mental health are intertwined (IOM, 1994). Communities with poor physical health are more likely to experience poor mental health as well as social, economic, and political disadvantages (Adler & Stewart, 2010; Braveman, Egerter, & Mockenhaupt, 2010; Braveman, Egerter, & Williams, 2011; Collins, Davis, Doty, & Ho, 2004; Mackenbach & Howden-Chapman, 2003; Santiago, Wadsworth, & Stump, 2011). Community psychology is founded on the paradigm shift from treatment to prevention (Anderson, Cooper, Hassol, Klein, Rosenblum & Bennett, 1966). Additionally, community psychologists value empowerment of communities and the equitable distribution of resources (Fisher, Sonn, & Evans, 2007; Kelly, 1971; Maton, 2008; Neal & Neal, 2011). In order for these values to be achieved, research needs to focus on the "upstream" causes of social issues, such as the prevention of poor health and the promotion of health and well-being (Dubois, 2017).

Health promotion is a component of prevention that is an important tool in promoting public health and extends beyond simply the prevention of disease (Breslow, 1999; National Research Council and Institute of Medicine, 2009). Health is more than the absence of illness and is rather a holistic well-being in body and mind (National Research Council and Institute of Medicine, 2009). Promotion is a potential end goal in public health and community psychology that emphasizes persons achieving their full potential and strengthening individuals' and communities' resistance to stress (Albee, 1996; Dubois, 2017). Prevention and promotion research needs to focus on determining the associated risk and protective factors of both disease and wellness (Dubois, 2017; IOM, 1994).

The aim of the current study was to examine the predictive potential of protective factors on health-promoting behavior outcomes. However, not all health risks may be avoided by simply altering one's behavior (CDC, 2014). Social determinants of health are any nonmedical factors that influence one's health (Braveman et al., 2011). These may include social, demographic, environmental, economic, geographic, and other attributes (Braveman et al., 2011; CDC, 2014). The differences and inequalities that stem from these attributes and experiences affect the health of individuals and communities in various ways (e.g., Barbeau, Krieger, & Soobader, 2004; Daly, Duncan, McDonough, & Williams, 2002; Gabel et al., 2002; Giles-Corti & Donovan, 2002; Gordon-Larsen, Nelson, Page, & Popkin, 2006; Nuru-Jeter et al., 2008; Pastor, 2001; Prilleltensky & Nelson, 2002; Williams & Mohammed, 2008). Health and well-being occur when there are sufficient resources and equity in the distribution of resources (Prilleltensky & Nelson, 2002). However, equity of resources and opportunity does not exist in our country (Albee, 1996); therefore, we need to examine the impact of social determinants of health in prevention and promotion interventions.

Sociodemographic differences such as income level and race affect one's health (Braveman et al., 2011; Galobardes, Shaw, Lawlor, Lynch, & Smith, 2006; Santiago et al., 2011). *Income level* is one social determinant of health. Economic resources affect health through poorer working conditions and poorer neighborhood conditions (Bravemant et al., 2011). A low-income neighborhood may expose families to toxins and pollution in the air, water, and building infrastructures (Evans, 2003; Krieger & Higgins, 2002). Low-income neighborhoods often have little or no access to affordable, nutritious foods and safe places to exercise (Booth, Pinkston, & Poston, 2005; Chuang, Cubbin, Ahn, & Winkleby, 2005; Giles-Corti & Donovan, 2002; Gordon-Larsen et al., 2006; Morland, Diez Roux, & Wing, 2006; Sallis & Glanz, 2006).

Additionally, because these neighborhoods are under-resourced, families and individuals living in these areas are less likely to have high quality neighborhood services available to them, such as schools, hospitals and other medical treatment centers, transportation, and employment (Fernandez, 2004; Pastor, 2001; Williams & Collins, 2001). Income can also affect health through avenues of having less education since education shapes employment opportunities, which affect health through employment status, work conditions, availability of health benefits, and compensation (Braveman et al., 2011; Gabel et al., 2002; U.S. Census Bureau, 2012). Furthermore, more educated individuals are more likely to perceive having personal control in life, which is associated with better health (Mirowsky & Ross, 1998). Finally, higher education is linked to increased social support, which is related to better physical and mental health because it is thought to buffer life stresses (Berkman & Glass, 2000; Mickelson & Kubzansky, 2003; Uchino, 2006).

Belonging to an *ethnic minority group* or being a person of color is another social determinant of health. Race and ethnicity are indirectly linked to poorer health outcomes through the experiences of racism and racial residential segregation (Braveman et al., 2011). Racism includes experiences of both overt, intentional discrimination and societal structures that systemically oppress and marginalize individuals and groups based on their race and ethnicity (Smedley & Smedley, 2005). Persons of color are more likely to live in disadvantaged neighborhoods with poorer quality of schools (Rouse & Barrow, 2006), which is likely to affect income and education potentials as well as self-esteem and personal agency. Racism also affects health through the stress that is related to experiencing bias and discrimination in daily life but also the stress from experiencing structural racism in the forms of income, neighborhood, and education disparities (Nuru-Jeter et al., 2009; Williams & Mohammed, 2009).

In general, poorer health is correlated with lower social stratification, whether it be income level or belonging to an ethnic minority group (Adler & Rehkopf, 2008; Davey-Smith, 1997; Oyserman, Smith, & Elmore, 2014; Williams & Jackson, 2005). Often the effects of these demographic categories are difficult to distinguish, as the causes and effects of being a part of one group bleeds into the others, particularly for income and education levels (Braveman et al., 2011; Davey-Smith, 2017; Galobardes et al., 2006). Perhaps socially determined differences in health are related to the stress that is associated with lower social status, poverty, or experiencing racism (Gee, Walsemann, & Brondolo, 2012). Another possibility is that historically underserved and underrepresented communities and community members experience less stability, sense of control, and agency over their life and decisions because of marginalization and systemic oppression (Losier, 1993; WHO, 2003). Additionally, persons from minority groups experience more barriers to pursuing preventive health care (Green et al., 2008). In order for any health-promoting behavioral intervention to be effective it must incorporate the context of the individuals and community groups as well as a social-ecological approach (Westmaas, Gil-Rivas, & Silver, 2011); that is, the intervention must not solely focus on the individual but also on the larger-scale systems that affect and influence the individual and his or her circumstances (Bronfenbrenner, 1979; Trickett, 2009).

Healthy Eating and Physical Activity

Two important health-promoting behaviors that contribute to wellness and preventing disease are *healthy eating* and *physical activity*. According to the 2015-2020 Dietary Guidelines from the U.S. Departments of Health and Human Services and of Agriculture (2015), a healthy diet for adults includes a plentiful variety of whole fruits, colorful vegetables, legumes, protein sources such as lean meats and nuts, whole grains, and fat-free or low-fat dairy. The guidelines

emphasize a healthy eating pattern that is varied, nutrient dense, and limiting the intake of added sugars, sodium, and saturated and trans fat. Shifting towards a healthy eating pattern is a lifelong commitment that should be integrated into Americans' daily lives (Dunton, 2018).

In addition, Americans are advised to meet the 2008 National Physical Activity Guidelines. *Physical activity* encompasses more than just structured exercise; it is defined as any bodily movement that uses muscles to expend energy (Craig et al., 2003; WHO, 2018). Physical activity includes movement done from working, playing, completing chores, travelling, structured exercise, and leisure. The guidelines distinguish between moderate-intensity and vigorous-intensity physical activity. Physical activity that is moderate-intensity may include brisk walking, water aerobics, slow bicycling, ballroom dancing, and gardening. Vigorous-intensity physical activities may include running, swimming laps, aerobic dancing, jumping rope, fast-paced bicycling, and hiking uphill. Both moderate- and vigorous-intensity physical activity are beneficial to one's health. Above all, the 2008 guidelines recommend avoiding inactivity (U.S. Department of Health and Human Services, 2008). Further recommendations include that each week adults should complete at least 150 minutes of moderate-intensity physical activity, at least 75 minutes of vigorous-intensity physical activity, or an equivalent combination of moderate- and vigorous-intensity activity (Haskell et al., 2007; U.S. Department of Health and Human Services, 2008; WHO, 2018). Additionally, adults should do muscle-strengthening activities at least two days a week (U.S. Department of Health and Human Services, 2008; WHO, 2018).

By incorporating these two behaviors into one's lifestyle, individuals may be able to prevent a plethora of diseases. Eating healthfully and participating in an adequate amount and level of physical activity prevents and reduces incidences of diabetes (Hu et al., 2001; Knowler

et al., 2002), heart disease (Elisaf, 2001; Stampfer, Hu, Manon, Rimm, & Willett, 2000; Wannamethee, Shaper, & Walker, 1998), stroke (Aboderin et al., 2001), and certain cancers (Davey-Smith, Shipley, Batty, Morris, & Marmot, 2000; Key, Allen, Spencer, & Travis, 2002; WHO, 2003; WHO, 2015; WHO, 2018). The latter three illnesses are some of the top leading causes of death in the United States today (National Center for Chronic Disease Prevention and Health Promotion, Division of Heart Disease and Stroke Prevention, 2015; National Institute for Diabetes and Digestive and Kidney Diseases, 2016; U.S. Department of Health and Human Services, 2016).

Unfortunately, the number of people who meet these healthy eating and physical activity recommendations is few. In 2015, for instance, 40% of U.S. adults reported not eating fruit daily and just over 20% reported not eating vegetables daily (CDC, 2015). A 2017 study looking at data from 2015 found that just over 12% of American adults meet the fruit intake recommendations and just over 9% meet the vegetable intake recommendations (CDC, 2017). Similarly, national data from 2015 show that only 20% of adults meet the recommendations for time spent doing physical activity and muscle-strengthening exercises (CDC, 2015).

Disparities in healthy eating and physical activity exist for sociodemographic characteristics such as race and income level (Taylor, Poston, Jones, & Kraft, 2006). Individuals and communities with lower income and belonging to racial or ethnic minority groups are less likely to meet the healthy eating and physical activity guidelines compared to their more socially and economically advantaged counterparts (Behavioral Risk Factor Surveillance System, 2000; Centers for Disease Control and Prevention & US Department of Health and Human Services, 2003; US Department of Health and Human Services, 2000). Specifically, adults living in poverty are less likely to meet vegetable intake recommendations compared to their wealthier

counterparts, as are Black Americans compared to white Americans (CDC, 2017). A similar study in 2017 found that 56.2% of non-Hispanic white adults meet the 2008 recommended physical activity guidelines whereas only 46.8% of non-Hispanic Black adults and 45.9% of Hispanic adults meet these guidelines (HHS, CDC, & NCHS, 2017). Additional examples include a study by Yen and Kaplan (1998), which found that even after accounting for individual income, education, smoking status, BMI, and alcohol consumption, impoverished areas were still associated with decreases in physical activity. Additionally, studies show that individuals living in lower-income neighborhoods consume fewer fruits and vegetables and eat poorer diets compared to individuals living in wealthier neighborhoods (Diez-Roux, Nieto, Caulfield, Tyroler, Watson, & Szklo, 1999; Lee & Cubbin, 2002).

However, reasons for not meeting these guidelines may revolve around structural, neighborhood-level barriers. For instance, Boslaugh and colleagues (2004) found that, compared to white participants, Black participants rated their neighborhoods lower on availability of physical activity; and having a higher individual income was related to greater availability of physical activity. Another study found that the density of fast-food restaurants was greatest in predominantly African-American neighborhoods (Block, Scribner, & DeSalvo, 2004). Furthermore, the availability of grocery stores that offer healthy food and beverage choices is substantially different in high- vs. low-income areas. Horowitz, Colson, Herbert, and Lancaster (2004) found that the density of these more desirable grocery stores was significantly greater in high-income neighborhoods than in low-income neighborhoods, thereby influencing the availability of and access to healthy food and beverage choices.

The public health implications of healthy eating and physical activity are decreased disease and increased health and longevity in the population. In order to increase these

preventive behaviors in a population and potentially design preventive interventions, it is important to know which individual characteristics predispose or motivate someone to eat healthfully and participate in physical activity (Dubois, 2017; Tanner-Smith, Durlak, & Marx, in press). Such individual characteristics might be seen as protective factors towards health-promotion outcomes.

Conceptualizing Hope: Two Models

One such individual characteristic that has been repeatedly shown to predict health-promotion behaviors and lifestyle is *hope* (Berg, Ritschel, Swan, An, & Ahluwalia, 2011; Esteves, Scoloveno, Mahat, Yarcheski, Scoloveno, 2013; Nothwehr, Clark & Perkins, 2013; Rothberger, 2017; Scioli, Scioli-Salter, Sykes, Anderson, & Fedele, 2016; Yarcheski, Mahon, Yarcheski, & Cannella, 2004). Hope may be conceptualized in a variety of ways; the most well known psychological conceptualization is Snyder's (2002) hope theory and scale. Snyder describes hope in the context of goal pursuit. Hope is a trait or general disposition that an individual uses in her or his pursuit of goals (Snyder, 2000a; Snyder et al., 1991). The process of hope, however, incorporates three domains of thinking: goals, pathways, and agency (Snyder, 2002; Snyder, Irving, & Anderson, 1991). *Goals* are the anchor of hope theory in that they provide a specific objective so that hope is not aimless and vague (Snyder, 1994b; Snyder, Cheavens, & Simpson, 1997). In hope theory, a goal can be positive – something to obtain – or negative – something to prevent from happening (Snyder, 2002). Individuals require plausible routes, or *pathways*, to reach these goals. Snyder's hope theory specifies that those with higher hope should be more certain about their pathways and also be adept at creating alternate routes when necessary (Snyder, 1994a, 1994b, 2000a, 2002). Finally, *agency* is one's perceived capacity to use their pathways to achieve a goal (Snyder, LaPointe, Crowson, & Early, 1998).

Agency thinking is the motivation that enables individuals to create and pursue alternate pathways (Irving, Snyder, & Crowson, 1998; Snyder, 1994b).

In the initial stages of the hope process, individuals evaluate the outcome values of a goal to determine if it is worth pursuing. Snyder (2002) notes that goals based on one's own standards are more attractive than goals based on external standards. Furthermore, Snyder theorized that hope should change how individuals respond to stressors and impediments to their goals; individuals with less hope should be more susceptible to stressors, and individuals with more hope are likely to view stress as a challenge and will generate alternate pathways to accomplish their goals (Snyder, 2000a, 2002; Snyder, LaPointe, Crowson, & Early, 1998). Snyder (2000b, 2002) purports that hope is learned throughout childhood and adult life and is crucial in enhancing one's quality of life. Additionally, hope has been shown to be distinct from similar personality constructs such as optimism, self-efficacy, and self-esteem (Bryant & Cvengros, 2004; Curry, Snyder, Cook, Ruby, & Rehm, 1997; Magaletta & Oliver, 1999; Scheier & Carver, 1985; Snyder et al., 1991; Sndyer, 2002)

Scioli and colleagues' alternative model of hope. A more recent conceptualization of hope expands Snyder's goal-contextual hope. Using literatures from psychology, philosophy, theology, spirituality, psychiatry, and nursing, Scioli, Ricci, Nyugen, and Scioli (2011) developed an alternative conceptualization of hope as a future-directed network of emotions. This integrated hope network is comprised of four subsystems: mastery, attachment, survival and coping, and spirituality. Each subsystem or cluster is broken down into subscales that are described below.

The mastery cluster combines *ultimate ends* and *supported mastery*. Ultimate ends refers to hope as being a long-range investment aimed at achieving value-based, transcendent goals

(Averill, Catlin, & Chon, 1990; Scioli et al., 2011; Scioli & Biller, 2009). These strivings of hope are deeply personal and provide guidance and meaning to one's life, and they provide information on both what a person aims to do and also who a person is trying to become (Emmons, 2005). Hopeful strivings might take the form of the following: *accept others as they are*; *not eat between meals to lose weight*; and *be myself and not do things to please others* (Emmons, 2005). The supported mastery subscale focuses on supportive attachments. Hopeful persons with supported mastery realize that in order to achieve these superordinate goals, they must rely on others' support and be empowered by these supportive attachments to pursue their personal hopes. The supported mastery subscale translates to how invested an individual feels with the supportive power to achieve important goals (Scioli et al., 2011; Scioli & Biller, 2009). Dufault and Martocchio (1985) provided validation of this portion of the integrated hope theory, finding that having social support or the availability of a support network is related to hope in individuals. Additionally, Kylma, Juvakka, Nikkonen, Korhonen, and Isohanni (2006) confirmed that hope is related to experiencing success in daily life, and Zimmerman's (1990) theory of learned hopefulness views hope as a process where individuals develop skills and a sense of personal control that contributes to psychological empowerment.

The attachment cluster encompasses the *basic trust* and *openness* subscales. Basic trust refers to an individual who is trusting and likely to disclose personal thoughts and feelings to others. This portion of the cluster is grounded in Erik Erikson's concept of trust versus mistrust. Greater trust provides the foundation of hope. Although this is an early life stage in Erikson's theory, trust versus mistrust as well as the other stages are challenges that individuals reconquer throughout their lives (Erikson, 1960); they are not simply conquered once and for all, and thus one's level of trust can vary throughout the lifespan based on experiences. The openness portion

of the attachment cluster purports that a hopeful person is both internally and externally open. Such an individual is imaginative, explores his or her inner life, and is open to new experiences, people, and feedback. Hope requires one to be open to the centers of hope, which are the unconscious, others, and the community. Connecting with positive forces both inside and those surrounding is necessary for openness hope (Scioli et al., 2011; Scioli & Biller, 2009). Kylma et al. (2006) found that having relationships with other people is related to higher hope; social support has also been linked to hope (Dufault & Martocchio, 1985).

The survival subsystem consists of *social terror management* and *personal terror management* subscales. The former encompasses concepts such as the capacity to trust in the goodwill of others and the ability to recruit needed care and support from others in times of crisis. These sorts of skills are founded in childhood upbringings (Scioli et al., 2011; Scioli & Biller, 2009). Personal terror management refers to individuals being able to self-regulate concerning fears and life stressors. This is related to Kohut's concept of self-calming (Baker & Baker, 1987), Schore's (2005) self-soothing, and Breznitz's (1986) hope as a coping mechanism to stress. Overall, the survival subsystem of hope refers to individuals being more likely to remain hopeful in times of crisis or stress; hopeful individuals have the skills to ask help from others when needed and are able to self-regulate loss (Scioli et al., 2011; Scioli & Biller, 2009).

Finally, the spirituality subsystem includes seven subscales: *spiritual empowerment, spiritual openness, mystical experience, benign universe, spiritual terror management, symbolic immortality*, and *spiritual integrity* (Scioli et al., 2011). The spiritual empowerment subscale refers to individuals feeling empowered by a spiritual force or higher power to achieve life goals. One views her or his actions as part of a larger mission, creating meaning for and a hopeful perspective on life purpose and events (Pargament & Maton, 2000; Scioli et al., 2011; Scioli &

Biller, 2009). Spiritual openness concerns individuals being open towards experiencing input from a higher power or the spiritual realm. Also included is an investment in a spiritual life and encompassing spiritual experiences into one's awareness. Mystical experience is defined as a sense of connectedness with a higher power or the spiritual world. The type of mystical experience can vary, such as bonding with a higher power, a loved one, or an overall oneness with humanity or nature. Additionally, the individual may feel guided or directed by this mystical experience. The fourth subscale is benign universe. This subscale constitutes a belief in there being goodness in the world, that there is a positive force present in the universe. Spiritual terror management refers to individuals feeling centered and at peace because one's spiritual beliefs and transcendent values provide a buffer against life stressors (Scioli et al., 2011; Scioli & Biller, 2009). The symbolic immortality subscale focuses on the belief that the self lives on in some way after death; this might be a belief in heaven and hell, reincarnation, or perhaps immortality as a function of generativity and making an impact on the world. In whatever form it takes, the symbolic immortality subscale refers to the belief that there is something eternal about human beings (Scioli et al., 2011; Scioli & Biller, 2009). Spiritual integrity is the last of the spirituality subscales. This subscale focuses on spirituality bringing a sense of life meaning. This life purpose is important to being hopeful and living well. Overall, the spiritual cluster is focused on a sense of meaning or purpose in life, being centered or grounded, a belief in a benign universe, and feeling empowered by a spiritual force or presence to achieve life goals.

Scioli and colleagues' hope concept is comprehensive and integrated, expanding hope beyond goals and incorporating social support, terror management, and meaning in life (Scioli et al., 2011). The integrative hope concept also includes an aspect of future orientation, referring to individuals viewing the future as a positive resource. Overall, according to Scioli and colleagues'

concept, hopeful individuals are attached, empowered, and skilled at regulating their responses to stress and loss (Scioli et al., 2011; Scioli & Biller, 2009).

Comparison of Snyder's and Scioli's hope concepts. Snyder's and Scioli and colleagues' concepts of hope share a focus on achieving long-term goals. However, the former concept emphasizes individual strivings towards goals, whereas the latter concept encompasses an enlarged perspective, including the supportive attachment, existential survival, and spiritual aspects of hope (Scioli et al., 2011; see Table 1).

Table 1.

Main Components of Snyder's (2002) and Scioli et al.'s (2011) Hope Concepts

Snyder's (2002) Hope Theory	Scioli et al.'s (2011) Comprehensive Hope
Goals	Mastery
Pathways	• Ultimate Ends
Agency	• Supported Mastery
	Attachment
	• Basic Trust
	• Openness
	Survival
	• Social Terror Management
	• Personal Terror Management
	Spirituality
	• Spiritual Empowerment
	• Spiritual Openness
	• Mystical Experience
	• Benign Universe
	• Spiritual Terror Management
	• Symbolic Immortality
	• Spiritual Integrity
	Positive Future

To date, only one study compares these two concepts of hope. In Scioli et al.'s (2016) study, the comprehensive, integrated hope concept was shown to outperform Snyder's goal-oriented hope on a broader range of health behaviors—specifically, overall health, moderate and

vigorous exercise, and adequate sleep. Such a finding is to be expected because integrative hope includes concepts of social support, self-regulation, religious or spiritual involvement, and terror management, all of which have been noted to relate to health (Goldenberg & Arndt, 2008; Pyszczynski, Greenberg, & Solomon, 1999; Scioli et al., 2016; Uchino, 2009).

Hope Predicts Health-Promoting Behaviors

Research supports hope as a predictor of health-promotion behaviors. Controlling for differences based on sex, education, and body-mass index, Nothwehr and colleagues (2013) found hope to be positively associated with participants' diet and physical activity behavioral strategies, such as portion control or limiting fat intake. In another study, college students' hope scores were correlated with their past 30-day health behaviors (Berg et al., 2011). After controlling for age, gender, race, and parental education, results showed that among students who exercised, those with higher hope scores exercised more frequently. Furthermore, scoring high on hope predicted if students limited their dietary fat intake and how frequently they did so. In their review of the literature, Yarcheski and colleagues (2004) found hope to have moderate effect sizes in predicting positive health practices, including diet and exercise. In another review, hope was found to be correlated with various health practices in adolescents (Esteves et al., 2013). Rothberger (2017) conducted a qualitative study of a 12-week running program where participants noted two dimensions of hope, specifically social support and setting goals, being important to their experience of the program and their confidence in continuing physical activity. In a longitudinal study, participants with higher hope scores were more likely to participate in health behaviors such as moderate and vigorous exercise and eating more fruits and vegetables (Scioli et al., 2016). Hope is an important predictor of and contributor to health promotion (Brown & Lent, 2000).

Individuals and communities may experience stress and subsequent mental and physical health conditions as an effect of poverty, exploitation, and prejudice (Albee, 1996). Hope, however, may be a potential protective factor or, as termed by Taylor, Repetti, and Seeman (1999), a "healthy portable environment" against this stress and ill health (as cited in Scioli et al., 2011). Hope has been shown to be a psychological strength among adolescents and can be used to mitigate stressors and other risk factors in adults (Kwon, Birrueta, Faust, & Brown, 2015; Valle, Huebner, & Suldo, 2006). Moreover, research indicates that hope is present across genders, cultures, religions, and the lifespan (Dufault & Martocchio, 1985; Peterson & Seligman, 2004; Scioli & Biller, 2009). Furthermore, new and coming research supports the idea that hope is malleable and can be increased through interventions (Cheavens, Feldman, Gum, Michael, & Snyder, 2006; Feldman & Dreher, 2012; Rolo & Gould, 2007). Viewed as a strength and protective factor, hope has the potential to be used for preventive interventions for a wide range of individuals (Peterson & Seligman, 2004). Perhaps hope can be used as part of a community-based intervention to promote healthy behaviors and wellness in communities and thereby prevent physical and mental disease and illness.

There are few studies, however, that specifically examine the effects of income level and race and ethnicity on one's level of hope. Given that hope may buffer effects of stress, one can imagine it being important for individuals of various minority groups; however, there is little research examining the differences in hope based on these sociodemographic characteristics (Kwon et al., 2015). One notable study by Nothwehr, Clark, and Perkins (2013) reported sociodemographic differences. The researchers found that, compared to higher educated participants, participants with less education had lower hope and were less likely to use behavioral strategies for health. They did not find any differences based on race. The authors

concluded that hope may be a necessary but insufficient motivator for individuals with

significant, structural barriers to pursue health goals (Nothwehr et al., 2013). By itself, the

protective factor of hope may not be enough for individuals and communities to overcome health

and race inequities. Additionally, Snyder (2002) outlined that goals are more attractive if they are

based on one's individual standards. Feldman and Sills (2013) note that the recommended health

guidelines are simply not adopted as personal goals for many people. Perhaps cultural

differences based on these sociodemographic characteristics may also provide some explanation.

Consideration of Future Consequences

In addition to hope, a second individual characteristic that has been shown to predict

health-promoting behaviors is the future-oriented construct of *consideration of future*

consequences (CFC; Adams & Nettle, 2009; Beenstock, Adams, & White, 2010; Bénard et al.,

2018; Dassen, Houben, & Jansen, 2016; Joireman, Shaffer, Balliet, & Strathman, 2012; Peters,

Joireman, & Ridgway, 2005; Yarcheski et al., 2004). This construct is defined as the extent to

which a person considers the immediate or the future consequences of potential behaviors when

acting in the present moment (Strathman, Gleicher, Boninger, & Edwards, 1994). The CFC

construct was first theorized as unidimensional, where considering future consequences signified

a value in distant outcomes over immediate outcomes and not considering future consequences

signified paying more attention to immediate consequences than future, distant ones (Strathman

et al., 1994).

Recently, Joireman, Shaffer, Balliet, and Strathman (2012) tested a two-factor model of

CFC, separating the construct between concern with future consequences and concern with

immediate consequences. This conception of the CFC construct allowed for future focus and

immediate focus to not be viewed as polar opposites. Rather, this conception proposed that

individuals may develop a dominant temporal orientation; they may consider future or immediate consequences of their actions, or they may consider and be influenced by both future and immediate consequences for the same behavior choice (Joireman et al., 2012). However, Joireman and colleagues (2012) state that additional research is needed to examine how future and immediate concern differentially affect behavior.

Unfortunately, little is known about the development and theoretical mechanisms of the CFC construct. Joireman, Strathman, and Balliet (2006) provide an integrative model of CFC in which they suggest that the development of CFC is influenced by a combination of factors throughout one's life, such as developmental factors (i.e., socialization, education, aging), neuropsychological challenges, substance abuse, and personality predispositions (Joireman et al., 2006). Joireman et al. (2006) also theorize that CFC is affected by and influences one's self-efficacy and locus of control. These authors theorized a developmental process for how individuals may favor concern for future consequences over concern for immediate consequences and vice versa.

Consideration of future consequences is related to delay of gratification (Strathman et al., 1994); specifically, individuals high in future concern will be more likely to prefer waiting for a larger reward than receiving a smaller reward immediately compared to individuals low in future concern. Joireman and colleagues (2006) stated that individuals with this future focus learn over time the connection between their immediate actions and distant outcomes (i.e., if they invest now they will receive large dividends later); therefore, perhaps it is that these individuals are better able to perceive this connection because it has consistently occurred. Furthermore, this connection between immediate actions and future outcomes might be a motivating factor when faced with obstacles (Joireman et al., 2006).

Consideration of future consequences with immediate concern also may be portrayed as individuals unable to delay gratification—someone who prefers a smaller reward now instead of a larger reward later. Joireman and colleagues (2006) theorized that a concern for immediate consequences over future consequences may develop in individuals who experience their immediate actions resulting in negative consequences. For example, one invests money now but does not receive a large dividend later or may even lose money later. Because immediate actions do not have the desired effects, the authors theorized that for individuals whom this occurs, they will be less and less likely to see the connection between actions and delayed positive consequences (Joireman et al., 2006). This downward spiral of experiencing negative consequences and being less likely to perceive a connection that may or may not occur is proposed to then lead one to focus more on immediate consequences as opposed to future consequences (Joireman et al., 2006).

There is ample research supporting that future orientation and concern with future consequences is related to and leads to participating in health-related activities. For instance, Edwards et al. (2008) found that future-oriented individuals were more likely to desire to be screened for breast cancer. Another study found that future oriented adolescents were less likely to participate in risky sexual behaviors (So, Voisin, Burnside, & Gaylord-Harden, 2016). Individuals high in concern with future consequences are less likely to smoke or consume hazardous amounts of alcohol (Adams & Nettle, 2009; Beenstock, Adams, & White, 2010). Therefore, having negative expectancies about one's future health, or not seeing a connection between today's actions and tomorrow's consequences, could have a great impact on one's health (Cole, Kemeny, & Taylor, 1997).

Specifically, future time orientation and CFC is related to health-promoting behaviors such as healthy eating. Joireman and colleagues (2012) found that being concerned with future consequences predicted if participants engaged in healthy eating. In a review of the literature Yarcheski et al. (2004) found future time perspective to have moderate effect sizes in predicting positive health practices, including diet. In their study, Bénard et al. (2018) found that individuals scoring high in CFC were more likely to consume fruits and vegetables. Another study showed that healthy eating was correlated with focusing on future consequences (Dassen et al., 2016). As can be expected, however, concern with *immediate* consequences predicted less healthy food behavior, as reported by Van Beek, Antonides, and Handgraaf (2013). Accordingly, in Adams and White's (2009) study, considering future consequences was negatively associated with body mass index (BMI). Since BMI is a measure of body fat based on height and weight, it may be a clue to participants' eating practices. In a subsequent study, Adams (2012) examined the differential relations for concern with immediate and concern with future consequences on BMI scores. She found that concern with immediate consequences was positively associated with BMI whereas concern with future consequences was not associated with BMI. These studies portray how, in addition to concern for future, concern for immediate consequences may also be an important determinant of health-related behaviors (Adams, 2012).

Research also shows that future time orientation and CFC is related to being physically active. Joireman et al. (2012) found concern with future consequences to also predict participants' engagement in exercise. Yarcheski et al.'s (2004) review of the literature specified moderate effect sizes for the relation between future time perspective and exercise. Gulley (2003) found a positive correlation between future time perspective and intention to participate in physical activity among low-income Appalachian adolescents. In another study, future time

perspective predicted frequency of exercise above and beyond gender and personality characteristics (Daugherty & Brase, 2010). Hall (2001) conducted a future time orientation intervention that resulted in participants who received the intervention reporting significantly greater increases in vigorous activity compared to the no-treatment condition. This difference was present after a 6-month follow-up. Van Beek et al. (2013) examined effects of both concern with future and concern with immediate consequences and found that concern for future consequences predicted exercise behavior but concern for immediate consequences did not. Both concern for future and concern for immediate consequences are important determinants of healthy eating and physical activity behavior.

Future time orientation and consideration of future consequences have been shown to vary based on *sociodemographic characteristics* (Nurmi, 1991). Persons with a lower income are more likely to discount the value of future outcomes (Green, Myerson, Lichtman, Rosen, & Fry, 1996). In a qualitative study, Warin and colleagues (2015) found that for individuals living in a low socioeconomic community in Australia the future-oriented health interventions were ineffective. For this community the focus was on immediate survival, not future health. In another study, Ward, Guthrie, and Butler (2009) found higher educational attainment is related to greater future orientation. The authors did not find any interaction for sex or race, however (Ward et al., 2009). In fact, there are few studies examining the differences on future orientation based on race and ethnicity (Johnson, Blum, & Cheng, 2014).

Like hope, consideration of future consequences is a good potential protective factor to be used in preventive interventions. The construct is believed to be generally stable over one's lifetime, but events can happen that change one's extent of CFC (Strathman et al., 1994; Toepoel, 2010). A change in working status or becoming a parent are two events that are

theorized to change an individual's CFC (Toepoel, 2010). Perhaps CFC interventions can be used to promote healthy behaviors and prevent disease.

However, the sociodemographic differences outlined above seem to align with real-world phenomena and need to be taken into account when developing interventions. Persons with greater social disadvantage – whether it be income or race and ethnicity – are more likely to have less power and control over their lives due to oppressive policies and systems (Fine & Cross, 2016). It is likely, therefore, that these individuals and communities do not experience their immediate actions causing positive consequences, perhaps because their future consequences do not depend as much on their personal behaviors compared to dominant societal individuals. Joireman et al. (2006) theorize that individuals who do not experience this linking between immediate behaviors and future consequences are less and less likely to see this connection as time goes on and will, therefore, focus more of their concern on immediate consequences. For this reason, it is important to differentiate the effects of concern for immediate and future consequences. Does concern for immediate consequences always lead to poorer health behaviors, or can it be adaptive? Interventions commonly emphasize concern for future consequences (Hall, 2001); however, is concern for future consequences a realistic or empowering goal for individuals and communities who remain oppressed and marginalized by policies and systems? These questions and others need to be addressed by future oriented interventions.

Connecting the Concepts of Consideration of Future Consequences and Hope

The concepts of consideration for future consequences and hope are theorized to have similar effects on health-promoting behaviors as described in the previous sections. These similarities extend to researchers referring to both future orientation and hope as related

constructs. For instance, Scioli et al. (2011) include positive future in their integrated hope concept. In Duggleby et al.'s (2012) meta-synthesis looking at twenty studies of hope in older persons, they describe hope as being future focused and involving choice and realistic possibilities. This description of hope aligns well with a concern for future consequences, where one has agency to affect her or his future outcomes with present behaviors. The psychologist Paul Pruyser (1963) refers to hopeful individuals as those who see reality as open-ended and unfixed, but for those who do not hope, they view reality as what has already happened in the past. According to this view, individuals give up hope because situations did not have a particular outcome in the past, so it is unlikely for a different outcome to occur this time. This lack of hope seems to correspond to immediate behaviors not having positive future consequences, which is theorized to develop into an emphasis on immediate consequences (Joireman et al., 2012). Beck, Steer, Kovacs, and Garrison (1985) agree, stating that recurring hopelessness may reflect schemas of negative expectations that are activated by life experience. Hopeless individuals have negative beliefs regarding the outcomes of their immediate and future goals and well-being (Beck et al., 1985). Additionally, hope is viewed as a protective factor for mental and physical health because those who hope are likely to act in the present to ensure a healthy future (Rasmussen, O'Bryne, Vandament, & Cole, 2017). Furthermore, in various studies with adolescents, future time perspective and hope exhibit a modest correlation (Adelabu, 2008; Esteves et al., 2013; Parker, 2017).

Researchers theorized that the constructs of hope and consideration of future consequences are developed and learned through one's life experiences (Joireman et al., 2006; Snyder, 2002; Toepoel, 2010). However, life experiences that are based on race and income are rarely cited as reasons for variations in hope and future orientation. If race and income

differences are incorporated, researchers often only control for these sociodemographic differences (e.g., Adams & Nettle, 2009; Beenstock, Adams, & White, 2010; Berg et al., 2011; Dassen et al., 2015; Yarcheski et al., 2004). But if preventive interventions that decrease disparities are to be developed, differences need to be examined with detail instead of taken out of the equation. How race and income differences affect someone's hope, consideration of future consequences, and, ultimately, his or her health-promoting behaviors is worth studying. However, such research should not blame the victim, parents, neighborhoods, or schools (Ryan, 1971) but rather work to fix the system that created these inequities in the first place (Gee & Ford, 2011).

Rationale

Health promotion is an important goal in public health and community psychology (Dubois, 2017). Research concerning the protective factors towards physical and mental health and wellness is necessary for later intervention development (Bradshaw, Waasdorp, & Leaf, 2012; Kumpfer & Alvarado, 2003; Tanner-Smith, Durlak, & Marx, 2018). Hope and consideration of future consequences are two suggested protective factors that promote healthy eating and physical activity (Joireman et al., 2012; Joireman & King, 2016; Kwon et al., 2015; Scioli et al., 2011; Valle et al., 2006). Physical and mental health disorders differentially impact oppressed and marginalized communities (Adler & Rehkopf, 2008; Davey-Smith, 1997; Oyserman, Smith, & Elmore, 2014; Williams & Jackson, 2005); however, research examining hope and consideration of future consequences rarely examines the differential impact of these constructs for diverse communities (Johnson, Blum, & Cheng, 2014; Kwon et al., 2015). Examining these differences is important because much of research and prevention programs have been developed for the dominant, U.S., white culture and assume that findings from this population are generic and can generalize to all groups (Adams et al., 2003; Kumpfer, Alvarado, Smith, & Bellamy, 2002). Therefore, the current study examined the differential effects for hope, concern for future consequences, and concern for immediate consequences on healthy eating and physical activity, testing for conditional effects of race and income level. The findings add needed information to the literature regarding the effect of these protective factors for historically marginalized and underrepresented groups. Additionally, this study adds to the literature by examining how concern for future consequences differs from concern for immediate consequences in predicting health-promoting behaviors (Joireman & King, 2016). This study

benefits intervention development focused on promoting health and wellness among diverse communities.

Statement of Hypotheses

<u>Hypothesis I</u>: *Income level will moderate the relationship between hope and healthy eating and will itself be moderated by race, such that the positive relationship between hope and healthy eating will be weaker for participants with lower income and participants of color (see Figure 1).*

<u>Hypothesis II</u>: *Income level will moderate the relationship between hope and physical activity and will itself be moderated by race, such that the positive relationship between hope and physical activity will be weaker for participants with lower income and participants of color (see Figure 1).*

<u>Hypothesis III</u>: *Income level will moderate the relationship between consideration of future consequences and healthy eating and will itself be moderated by race, such that the positive relationship between consideration of future consequences and healthy eating will be weaker for participants with lower income and participants of color (see Figure 1).*

<u>Hypothesis IV</u>: *Income level will moderate the relationship between consideration of future consequences and physical activity and will itself be moderated by race, such that the positive relationship between consideration of future consequences and physical activity will be weaker for participants with lower income and participants of color (see Figure 1).*

<u>Hypothesis V</u>: *Income level will moderate the relationship between consideration of immediate consequences and healthy eating and will itself be moderated by race, such that the*

negative relationship between consideration of immediate consequences and healthy

eating will be stronger for participants with lower income and participants of color (see

Figure 1).

Hypothesis VI: *Income level will moderate the relationship between consideration of immediate*

consequences and physical activity and will itself be moderated by race, such that the

negative relationship between consideration of immediate consequences and physical

activity will be stronger for participants with lower income and participants of color (see

Figure 1).

Figure 1. Conceptual model for Hypotheses I – VI.

Method

Participants

Data for this study were retrieved from a larger dataset of 298 U.S. adult participants (C. Roster, personal communication, April 2018). Fifty-eight participants were taken out of the current sample due to missing data; the current analysis required complete observations of each variable. The final sample size for the current study was 240. Participants included were approximately 43% women ($n = 100$) and 57% men ($n = 130$). The mean age of participants was 32 years old ($SD = 11.63$). Participants were able to select multiple races/ethnicities and identified as African American/Black ($n = 18$, 7.5%), American Indian/Native American ($n = 5$,

2.1%), Asian American/Pacific Islander ($n = 27$, 11.3%), Latinx ($n = 14$, 5.8%), white/Caucasian ($n = 198$, 82.5%), and other ($n = 1$, 0.4%). The majority of participants had less than a four-year college degree ($n = 132$, 55.0%), and participants' mean household income per household member was $26,850 ($SD = $20,170$).

Psychometric Scales

Participants responded to 13 reliable and validated self-reported scales (see Appendices A-F). The current study, however, focused on the relationship between only four measures and includes *social desirability* as a control. Each of the four measures are discussed below, as well as social desirability and demographic variables.

Comprehensive trait hope. Participants completed the 56-item *Comprehensive Trait Hope Scale* (CHS-T; Scioli, Ricci, Nyugen, & Scioli, 2011). This scale measured an integrated concept of hope that expands hope beyond goals and integrates social support, terror management, and meaning in life. Participants responded to items on a 4-point scale (0 = *Not me*; 4 = *Exactly like me*). The CHS-T scale includes five factor scales: Mastery, Attachment, Survival, Future, and Spiritual. These factor scales incorporate 14 different subscales.

The 8-item *Mastery* factor scale incorporates a perspective of hope that is a long-range investment aimed at value-based goals, which individuals are empowered to pursue by their supportive attachments to others. This factor scale includes the two subscales *Ultimate Ends* and *Supported Mastery*. A sample item for *Ultimate Ends* is *I believe that I am going to get what I really want out of life*. A sample item for *Supported Mastery* is *I give some credit to others for my successes in life*. *Ultimate Ends* and *Supported Mastery* show good internal reliability in the original authors' sample ($\alpha = .079$; $\alpha = 0.77$, respectively), as does the entire *Mastery* factor scale ($\alpha = 0.81$).

The 8-item *Attachment* factor scale views the hopeful individual as trusting of others and both internally and externally open to new experiences, people, and feedback. This factor scale includes the two subscales *Basic Trust* and *Openness.* A sample item for *Basic Trust* is *I have a trusted friend or family member in whom I can confide*. A sample item for *Openness* is *I like to seek out new experiences*. Both *Basic Trust* and *Openness* subscales and the entire *Attachment* factor scale exhibit good internal reliability in the original authors' sample ($\alpha = 0.88$; $\alpha = 0.83$; $\alpha = 0.84$, respectively).

The 8-item *Survival* factor scale refers to individuals being more likely to remain hopeful in times of crisis or stress; hopeful individuals have the skills to ask help from others when needed and are able to self-regulate loss. The *Survival* factor scale includes the two subscales *Personal Terror Management* and *Social Terror Management.* A sample item for *Personal Terror Management* is *I can find ways to relax*. A sample item for *Social Terror Management* is *I'm capable of finding support from others when I need it*. Both *Personal Terror Management* and *Social Terror Management* subscales and the entire *Survival* factor scale exhibit good internal reliability from the original authors' sample ($\alpha = 0.73$; $\alpha = 0.80$; $\alpha = 0.77$, respectively).

The 4-item *Positive Future* subscale incorporates viewing the future as a positive resource. This subscale stands alone without being included in a larger factor scale. A sample item for *Positive Future* is *The future will bring opportunities for a better life*. The *Positive Future* subscale exhibits good internal reliability from the original authors' sample ($\alpha = 0.85$).

The 28-item *Spirituality* cluster shows hope as focused on a sense of meaning or purpose in life, being centered or grounded, possessing a belief in a benign universe, and feeling empowered by a spiritual force or presence to achieve life goals. This factor scale includes seven subscales: *Spiritual Empowerment*, *Benign Universe*, *Spiritual Openness*, *Mystical Experience*,

Spiritual Terror Management, *Symbolic Immortality*, and *Spiritual Integrity*. A sample item for

Spiritual Empowerment is *My spiritual beliefs have empowered me to succeed in life*. A sample

item for *Benign Universe* is *I believe there is a positive force somewhere in the universe*. A

sample item for *Spiritual Openness* is *Spiritual experience can occur at any time or place*. A

sample item for *Mystical Experience* is *In the right environment, I can feel the presence of a*

spiritual force or a higher power. A sample item for *Spiritual Terror Management* is *My*

spiritual beliefs keep me calm during a crisis. A sample item for *Symbolic Immortality* is *When*

we die, there is a part of us that continues to live. Finally, a sample item for *Spiritual Integrity* is

My life has meaning. According to the original authors' sample, the *Spirituality* cluster has good

internal reliability ($\alpha = 0.95$) as do all seven subscales (*Spiritual Empowerment* $\alpha = 0.84$; *Benign*

Universe $\alpha = 0.84$; *Spiritual Openness* $\alpha = 0.82$; *Mystical Experience* $\alpha = 0.85$; *Spiritual Terror*

Management $\alpha = 0.86$; *Symbolic Immortality* $\alpha = 0.83$; and *Spiritual Integrity* $\alpha = 0.79$).

The total comprehensive trait hope scale views hopeful individuals as attached,

empowered, and skilled at regulating their responses to stress and loss. The total scale exhibits

high internal reliability ($\alpha = 0.95$) and a range of means across the authors' various sample

groups (college males: $M = 99.44$, $SD = 23.75$; college females: $M = 106.28$, $SD = 23.39$; adult

males: $M = 106.41$, $SD = 25.38$; adult females: $M = 114.90$, $SD = 24.50$). The current study used

sum scores to calculate the total comprehensive trait hope scale.

Consideration of future consequences. Participants also completed the 14-item

Consideration of Future Consequences scale (CFC-14; Joireman et al., 2012). This scale

assessed the extent to which individuals consider future consequences and/or immediate

consequences when determining current behavior and making decisions. Participants responded

to each item on a 7-point scale (1 = *very uncharacteristic of me*; 7 = *very characteristic of me*).

This measure has two 7-item subscales — *future* and *immediate*. The former measures the extent to which individuals' concern for future consequences influences current behaviors. Sample items for the *future* subscale include the following: *I consider how things might be in the future and try to influence those things with my day to day behavior* and *When I make a decision, I think about how it might affect me in the future*. The mean score for *CFC-future* from the Joireman et al.'s (2012) sample was 5.15 ($SD = 0.80$) and internal reliability was high (Cronbach's $\alpha = 0.80$). The immediate subscale measures the extent to which individuals' concern for immediate consequences influences current behavior. Sample items for this subscale include the following: *I only act to satisfy my immediate concerns, figuring the future will take care of itself* and *I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time*. Joireman and colleagues (2012) report a mean score for *CFC-immediate* of 3.67($SD = 1.03$) and high internal reliability (Cronbach's $\alpha = 0.84$). The current study used sum scores for each subscale.

   Healthy eating practices. *Starting the Conversation* (STC; Paxton et al., 2011) is an 8-item dietary assessment tool that assesses participants' specific eating habits. Participants chose from three responses specific to each question. Responses included options for the most healthful practices, less healthful practices, and the least healthful practices. A sample item is *How many times a week did you eat fast food meals or snacks?* Possible responses for this particular item include, *Less than 1 time*, *1-3 times*, and *4 or more times*. The mean summary score from the original authors' sample is 0.94 ($SD = 2.08$). STC shows robustness across various participant characteristics, including race/ethnicity, gender, education level, and health literacy (Paxton et al., 2011). Construct validity for the STC has also been exhibited; baseline STC scores and change in STC scores significantly correlated with related measures, such as the NCI fat screener

and a reduction in fat intake (Paxton et al., 2011). Inter-item reliability for this measure is modest as expected because of the assessment of various aspects of healthy eating (Paxton et al., 2011). However, the original authors show the STC items and the summary score to be moderately inter-correlated. The current study used a summed score of the index. Lower scores on the STC index indicate healthier eating habits.

Physical activity. Participants also completed a slightly moderated form of the 7-item *International Physical Activity Questionnaire Short Form* (IPAQ-SF), which is used to measure an individual's total amount of physical activity in the previous seven days (Craig et al., 2003). For our data collection we split questions into multiple, succinct items in order to make the survey more user-friendly. The questionnaire measures minutes per week doing physical activity in three levels – vigorous, moderate, and walking. A sample set of items includes the following: *During the last 7 days, did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?*; *During the last 7 days, on how many days did you do vigorous physical activities?*; and *How much time did you usually spend doing vigorous physical activities on one of those days*? Participants also were asked to estimate their total time sitting in the previous seven days.

Responses for the IPAQ-SF are summarized as Metabolic Equivalent (MET)-minutes per week; MET-minutes represent the amount of energy expended in a given activity (Forde, n.d.). To calculate MET-minutes per week, the MET value for activity level is multiplied by the minutes the activity was carried out for and again multiplied by the number of days the activity was completed. MET values for activity levels are as follows: vigorous activity is 8 METS, moderate activity is 4 METS, and walking is 3.3 METS. The total MET-minutes per week is calculated by summing the MET-minutes for each physical activity category. The IPAQ-SF has

good test-retest reliability; Craig and colleagues (2003) found a Spearman's rank correlation coefficient range from 0.66 to 0.88 for total MET-minutes per week across all physical activity dimensions in three U.S. Samples. The IPAQ-SF has also been shown to be reliable for use with adults in multiple countries, and validity has been exhibited through moderate agreement with objective measures of physical activity (Craig et al., 2003). Craig and colleagues (2003) found that across 1,974 participants responding to the IPAQ short form, the median MET-minutes was 2,514. The current study used total MET-minutes per week for physical activity calculations. As per scoring recommendations (Forde, n.d.), reported activity longer than three hours was truncated, creating a maximum of 21 hours per activity level in each week (three hours of each activity level allowed for seven days).

Control variable. Participants also completed Reynold's (1982) 13-item true-false form of the Marlowe-Crowne Social Desirability scale. This scale assessed individuals' tendencies to provide socially appropriate responses on self-report measures. Sample items include the following: *I sometimes feel resentful when I don't get my own way* and *No matter who I'm talking to, I'm always a good listener*. The 13-item short form has shown good internal reliability and has been validated by demonstrating a consistent correlation with the Edwards social desirability scale (Reynolds, 1982). Reynolds (1982) reports a mean of 5.67 ($SD = 3.20$) in his original study and a Kucher-Richardon Formula 20 reliability (an alternative to Cronbach's alpha for dichotomous measures) of 0.76.

Demographic variables. Participants also reported various demographics, including gender, age, race/ethnicity, income level, and education level. Participants were able to select multiple races and ethnicities and were presented with the following options: African American/Black, American Indian/Native American, Asian American/Pacific Islander,

Latina/o/Hispanic, white/Caucasian, and other. For this study participants who identified as African American/Black, American Indian/Native American, Asian American/Pacific Islander, or Latinx were categorized as participants of color. Household income level was calculated by dividing participants' self-reported annual household income by their reported number of household members and then divided by 1,000 to make the number more manageable for calculations.

Procedure

Participants were recruited from the online survey platform Prolific. Prolific is a reputable crowdsourcing platform for behavior research, shown to produce high-quality data and replicate known experimental effects (see Peer, Brandimarte, Samat, & Acquisti, 2017 for details). Participants received $3.25 compensation, according to standard levels of payment for Prolific surveys. Prior to agreeing to participate in the study, participants read a brief study description that specified their participation was voluntary and their responses anonymous. Completion of the survey signified participants' consent. According to pilot tests, the full questionnaire took approximately 25 minutes to complete. All data were collected using the online survey software Qualtrics. Participants were automatically linked to the Qualtrics survey through the Prolific site.

Results

Preliminary Analyses

All analyses were conducted using RStudio (Version 1.1.463). A post-hoc power analysis was conducted to ensure the archival sample size of 240 participants was adequate; power calculations ranged from 89.5-94.6%, confirming adequate sample size. Table 2 presents the mean and standard deviations for all variables and includes the zero-order correlations and partial correlations controlling for social desirability between all scale scores. As noted in Table 2, social desirability was significantly correlated with hope and considering immediate consequences. When social desirability was controlled using partial correlations, the significance of the relationship between variables only changed for hope and IPAQ. Therefore, subsequent analyses compare the effect of social desirability as a covariate on the results.

To compare differences between white participants and participants of color (i.e., participants who identified as African American/Black, American Indian/Native American, Asian American/Pacific Islander, or Latinx), t-tests for each of the predictor and outcome variables were conducted. No significant differences between groups were found (Hope, $t(70) = .74$, p = .4614; CFC-Future, $t(62) = .43$, $p = .6689$; CFC-Immediate, $t(61) = -.66$, $p = .5144$; Starting the Conversation, $t(69) = -.08$, $p = .9355$; IPAQ, $t(69) = -1.73$, $p = .0889$).

Assumptions for ordinary least squares regression were assessed. All measures passed the tests of linearity, normality, homoscedasticity, multicollinearity, and independence of residuals, with the exception of the IPAQ measure. The IPAQ measure did not appear to be linear nor were the residuals independent of each other. For this reason, weighted least squares regression was used in subsequent analyses that involved the IPAQ measure, thus allowing the data points to be weighted differentially. Weights were calculated with fitted values from a regression of absolute

residuals. Additionally, all predictor variables were centered on the mean for including the cross-product term in regression analyses.

Table 2.

Mean, zero order correlations, and partial correlations controlling for social desirability for all measures

Measures	M (SD)	1	2	3	4	5	6	7
1. Hope	88.86 (32.06)	[.96]	.31***	-.14*	-.05	.12	.06	—
2. Considering Future Consequences	4.95 (1.05)	.32***	[.84]	-.52***	-.19**	.18**	.24***	—
3. Considering Immediate Consequences	3.55 (1.30)	-.16*	-.53***	[.90]	.18**	.05	-.05	—
4. Starting the Conversation	7.10 (2.41)	-.07	-.20**	.20**	—	-.15*	-.21***	—
5. International Physical Activity Questionnaire	3012.25 (3025.73)	.13*	.19**	.04	-.16*	—	.06	—
6. Income (per $1,000)	26.85 (20.17)	.07	.24***	-.06	-.21***	.06	—	—
7. Social Desirability	5.26 (2.86)	.16*	.10	-.17**	-.13	.06	.03	[.71]

Note. Value along the diagonal is the coefficient α. Values below the diagonal are zero-order correlates. Values above the diagonal are partial correlates, controlling for social desirability. $n = 240$.
*$p < .05$. **$p < .01$. ***$p < .001$.

A multiple regression analysis was conducted to test the predictive value of hope, considering future consequences, and considering immediate consequences on healthy eating (STC). Results showed that the three predictors explained 5.2% of the variation in STC scores ($R^2 = .05$, $F (3, 236) = 4.34$, $p = .005$). However, none of the predictors were significant. These results did not change when social desirability was added into the model as a covariate ($R^2 = .06$, $F (4, 235) = 3.798$, $p = .005$). Figure 2 shows the coefficient results for this analysis.

Using a weighted least squares model, a second multiple regression analysis was conducted to test the predictive value of hope, considering future consequences, and considering

immediate consequences on physical activity (IPAQ). This model explained 4% of the variation in IPAQ scores ($R^2 = .04$, $F(3, 236) = 3.257$, $p = .02$). CFC-Future was a significant predictor of physical activity, $B = 761$, $p = .0007$. Figure 3 presents the coefficient results for this analysis.
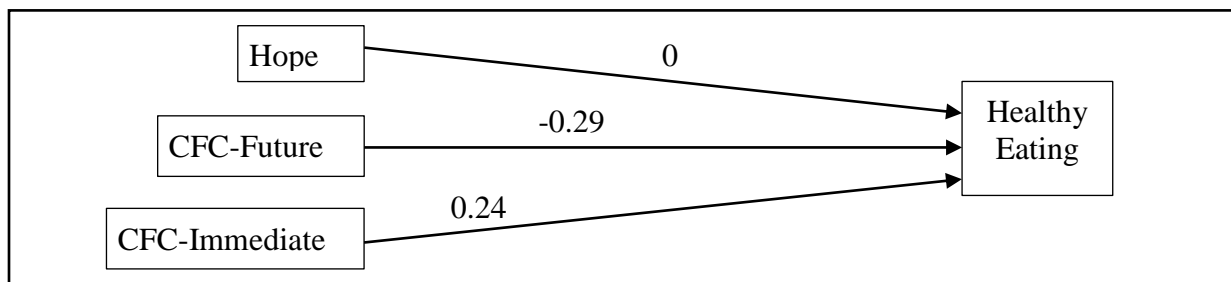
Figure 2. Results model for predicting healthy eating. No results are significant. Lower scores on STC indicate healthier eating.
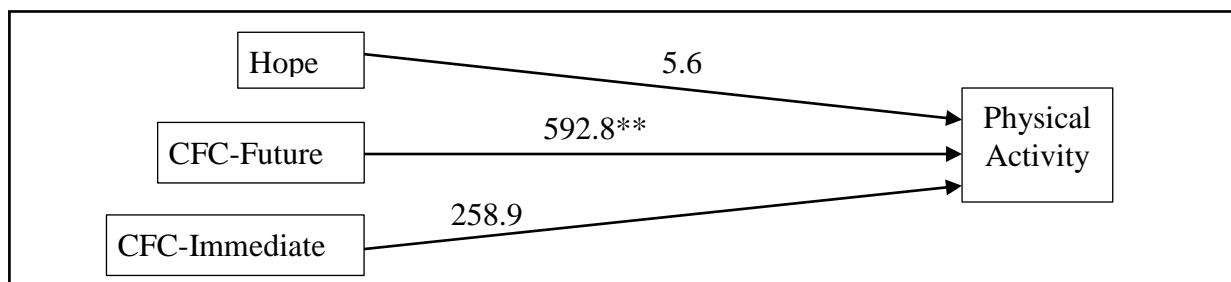
Figure 3. Results model for predicting physical activity. IPAQ measured in MET.
**$p < .01$.

Primary Analyses

<u>*Hypothesis I*</u>: *Income level will moderate the relationships between hope and healthy eating and*

will itself be moderated by race, such that the relationship between hope and healthy

eating will be weaker for participants with lower income and participants of color.

To test this hypothesis, a moderated moderation regression analysis was conducted. Three regression models were computed. Table 3 presents the results from all three models. Hope was not found to be a significant predictor of healthy eating ($B = -.004$, $p = .36$). Results showed income as a significant predictor of healthy eating ($B = -.025$, $p = .001$); specifically, the higher a participant's income, the lower their score on STC, indicating healthier eating

behaviors. However, no significant interaction effects were found; income and race did not moderate the effect between hope and healthy eating. Results did not change when social desirability was controlled.

Table 3.

Hypothesis I Results

	Model 1		Model 2		Model 3	
Variable	*B*	*SE B*	*B*	*SE B*	*B*	*SE B*
Hope	0	0	-0.02	0.01	-0.02	0.02
Income	-0.03**	0.01	-0.03**	0.01	0	0.02
Race	0.05	0.40	0.03	0.40	0	0.40
Hope x Income			0	0	0	0
Hope x Race			0.01	0.01	0.02	0.02
Hope x Income x Race					0	0
R^2	0.04		0.03		0.04	
F	4.05**		2.61*		2.33*	
ΔR^2			0.004		0	
ΔF			1.44		0.28	

Note. Lower scores on STC indicate healthier eating. $n = 240$.
*$p < .05$. **$p < .01$.

Hypothesis II: Income level will moderate the relationship between hope and physical activity and will itself be moderated by race, such that the relationship between hope and physical activity will be weaker for participants with lower income and participants of color.

To test this hypothesis, a moderated moderation regression analysis was conducted using a weighted least squares model. Three regression models were computed. Table 4 presents the results from all three models. Hope was found to be a significant predictor of physical activity

when interaction terms were not present (B = 12.70, p = .04). No other predictors were significant. Additionally, no significant interaction effects were found; income and race did not moderate the effect between hope and physical activity. Results did not change when social desirability was controlled.

Table 4.
Hypothesis II Results

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
Hope	12.70[*]	6.03	2.46	15.17	-9.07	17.33
Income	5.97	10.01	4.86	9.82	16.86	23.83
Race	786.27	456.21	784.13	457.02	763.21	471.59
Hope x Income			-0.02	0.38	-1.15	1.28
Hope x Race			12.15	16.41	23.80	18.63
Hope x Income x Race					1.15	1.34
R^2	0.02		0.01		0.01	
F	2.55		1.58		1.38	
ΔR^2			0.001		0.007	
ΔF			0.97		0.20	

Note. IPAQ measured in MET. *n = 240.*
*p < .05.

Hypothesis III: Income level will moderate the relationship between consideration of future consequences and healthy eating and will itself be moderated by race, such that the relationship between consideration of future consequences and healthy eating will be weaker for participants with lower income and participants of color.

To test this hypothesis, a moderated moderation regression analysis was conducted. Three regression models were computed. Table 5 presents the results from all three models. Consideration of future consequences (CFC-Future) was found to be a significant predictor of healthy eating (B = -.36, p = .02); participants with higher scores on CFC-Future were more

likely to score lower on STC, indicating healthier behaviors. CFC-Future was not a significant predictor once interaction terms were entered into the model. Income was also found to be a significant predictor of healthy eating (B = -.02, p = .007); specifically, the higher a participant's income, the lower their score on STC, indicating healthier eating behaviors. Income was a significant predictor in the first and second models. Furthermore, a significant interaction effect between income and consideration of future consequences was found (B = 0.02, p = .03). Figure 2 shows how high (one standard deviation above the mean income), average (mean income), and low (one standard deviation below the mean income) income levels affected participants' STC scores when CFC-Future scores were low. The test of simple slopes showed that the slope for participants with average and low incomes was significantly different from zero (mean income: B = -0.66, p = .001; low income: B = -.35, p = .02). Race did not moderate the effect between consideration of future consequences and healthy eating. Finally, results did not change when social desirability was controlled.
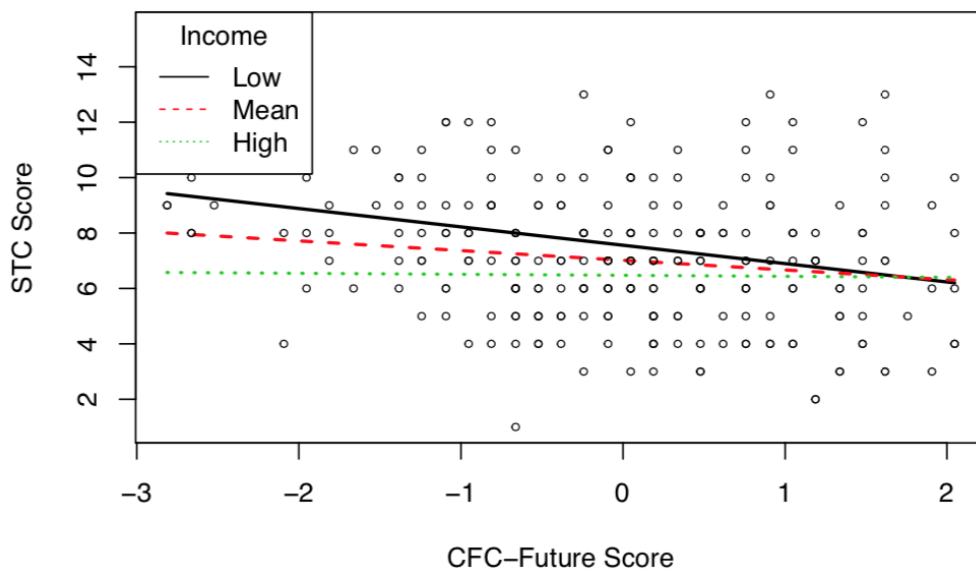
Figure 4. Interaction plot for income moderating consideration of future consequences and healthy eating. Low = 1 standard deviation below mean. High = 1 standard deviation above mean.

Table 5.

Hypothesis III Results

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Future	-0.36*	0.15	-0.01	0.37	-0.21	0.43
Income	-0.02**	0.001	-0.03***	0.01	-0.01	0.02
Race	0.04	0.40	0.18	0.40	0.13	0.45
CFC-Future x Income			0.02*	0.01	0.14	0.02
CFC-Future x Race			-0.40	0.40	-0.18	0.46
CFC-Future x Income x Race					0	0.02
R^2	0.06		0.07		0.07	
F	5.82***		4.69***		3.52**	
ΔR^2			0.02		0.005	
ΔF			1.13		1.17	

Note. Lower scores on STC indicate healthier eating. $n = 240$.
*$p < .05$. **$p < .01$. ***$p < .001$.

<u>*Hypothesis IV*</u>: *Income level will moderate the relationship between consideration of future*

consequences and physical activity and will itself be moderated by race, such that the

relationship between consideration of future consequences and physical activity will be

weaker for participants with lower income and participants of color.

To test this hypothesis, a moderated moderation regression analysis was conducted using

a weighted least squares model. Three regression models were computed. Table 6 presents the

results from all three models. Consideration of future consequences (CFC-Future) was found to

be a significant predictor of physical activity when interaction terms were not present ($B =$

511.52, $p = .005$). No other predictors were significant. Additionally, no significant interaction

effects were found; income and race did not moderate the effect between consideration of future

consequences and physical activity. Results did not change when social desirability was
controlled.

Table 6.

Hypothesis IV Results

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Future	511.52[**]	180.15	-127.25	434.18	-257.20	536.57
Income	0.64	10.30	3.41	10.42	24.46	34.07
Race	687.60	461.33	750.66	472.90	520.59	602.98
CFC-Future x Income			-0.93	9.46	-19.76	18.76
CFC-Future x Race			711.44	471.81	840.34	571.24
CFC-Future x Income x Race					22.27	21.94
R^2	0.03		0.03		0.03	
F	3.57[*]		2.26[*]		1.95	
ΔR^2			0.003		0.01	
ΔF			1.31		0.31	

Note. IPAQ measured in MET. $n = 240$.
**$p < .01$.

Hypothesis V: Income level will moderate the relationship between consideration of immediate

consequences and healthy eating and will itself be moderated by race, such that the

relationship between consideration of immediate consequences and healthy eating will be

stronger for participants with lower income and participants of color.

To test this hypothesis, a moderated moderation regression analysis was conducted.

Three regression models were computed. Table 7 presents the results from all three models.

Consideration of immediate consequences (CFC-Immediate) was found to be a significant

predictor of healthy eating when interaction terms were not present ($B = 0.35$, $p = .003$);

specifically, the higher a participant's score on CFC-immediate, the higher their score on STC,

indicated less healthy eating behaviors. Results also showed income as a significant predictor of healthy eating in the first and second models ($B = -.02$, $p = .001$); specifically, the higher a participant's income, the lower their score on STC, indicating healthier eating behaviors. However, no significant interaction effects were found; income and race did not moderate the effect between consideration of immediate consequences and healthy eating. Results did not change when social desirability was controlled.

Table 7.

Hypothesis V Results

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Immediate	0.35**	0.12	0.22	0.29	0.29	0.29
Income	-0.02**	0.01	-0.03***	0.01	0	0.02
Race	0.02	0.40	0.09	0.40	-0.03	0.40
CFC-Immediate x Income			0.01	0.01	0.01	0.01
CFC-Immediate x Race			0.13	0.31	0.06	0.02
CFC-Immediate x Income x Race					0	0.01
R^2	0.07		0.07		0.08	
F	6.95***		4.69***		3.78***	
ΔR^2			0.01		0.01	
ΔF			2.26		0.91	

Note. Lower scores on STC indicate healthier eating. $n = 240$.
**$p < .01$. ***$p < .001$.

Hypothesis VI: Income level will moderate the relationship between consideration of immediate consequences and physical activity and will itself be moderated by race, such that the relationship between consideration of immediate consequences and physical activity will be stronger for participants with lower income and participants of color.

To test this hypothesis, a moderated moderation regression analysis was conducted using a weighted least squares model. Three regression models were computed. Table 8 presents the results from all three models. Consideration of immediate consequences (CFC-Immediate) was not found to be a significant predictor of physical activity ($B = 1.77$, $p = .99$). Neither were other predictors found to be significant. Additionally, no significant interaction effects were found; income and race did not moderate the effect between consideration of immediate consequences and physical activity. Results did not change when social desirability was controlled.

Table 8.

Hypothesis VI Results

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Immediate	1.77	150.61	130.73	323.81	-11.60	303.42
Income	6.34	9.99	7.02	10.19	-14.35	18.99
Race	823.30	454.96	763.53	479.91	876.63	473.45
CFC-Immediate x Income			2.61	6.94	7.02	11.55
CFC-Immediate x Race			-164.57	365.48	-18.09	349.52
CFC-Immediate x Income x Race					3.07	14.19
R^2	0.003		-0.003		-0.004	
F	1.26		0.82		0.85	
ΔR^2			0.002		0.008	
ΔF			0.44		-0.03	

Note. IPAQ measured in MET. $n = 240$.

Discussion

The current study examined the predictive relationships between the individual personality characteristics of *hope, considering future consequences*, and *considering immediate consequences* on healthy behavior outcomes of *physical activity* and *healthy eating*. More specifically, the present study explored how socio-ecological factors of *income* and *race* affected the relationships between these variables. Social desirability was significantly correlated with only two variables (at low magnitudes) and controlling for it in analyses did not significantly change results (see Appendix G for results controlling for social desirability).

The first hypothesis, which expected hope to predict healthy eating behavior and for this relationship to be moderated by income and race, was not supported. Unlike previous research, the current study did not find evidence for hope acting as a predictor of or protective factor for healthy eating. A possible reason for this finding is that hope may indeed motivate individuals towards healthy eating but that systemic barriers such as availability and price of healthy food limit this relationship. Additionally, previous research on hope mainly used goal-based measures of hope, most often Snyder's Hope scale (Berg et al., 2011; Nothwehr et al., 2013). In the current study, an alternative measure of hope, reflecting a multi-dimensional and integrative conception, was used (Scioli et al., 2011). Scioli and colleagues (2011) theorized that hope involves various aspects of one's life, including social support, mastery over accomplishments and goals, dealing with death, meaning in life, and spirituality. How many servings of fruits and vegetables one consumes may not be directly related to this lofty, integrative conception of hope because there are multiple steps in between. It may be the case that a more integrative model of hope is too broad to predict healthy eating behaviors, and, following after Dassen et al. (2016), perhaps a healthy-eating-specific measure of integrative hope would show different results.

Hypothesis II expected that hope would predict physical activity and that this relationship would be moderated by income and race. Examining this hypothesis showed hope to indeed predict physical activity and, therefore, potentially be a protective factor towards encouraging individuals to be physically active. This finding fits with past literature that specifies hope as a possible motivational factor towards physical activity (Berg et al., 2011; Nothwehr et al., 2013; Yarcheski et al., 2004). Since the measure of physical activity includes daily activities and not simply formal exercise, it could be the case the individuals who score higher on hopefulness are also more active because they are not depressed. It was also hypothesized that income and race would both mediate this relationship between hope and physical activity; however, no moderation effect was found, limiting the support of the second hypothesis to only partial.

Hypotheses III and IV expected consideration of future consequences to predict healthy eating and physical activity, respectively, and for both relationships to be moderated by income and race. These two hypotheses were partially supported; consideration of future consequences (CFC-Future) predicted, and may be a potential protective factor for, both physical activity and healthy eating. Focusing on the future impact of one's day-to-day choices does indeed explain some of the variation in individuals' choices to exercise and eat healthfully. These findings fit with previous literature that show consideration of future consequences and future orientation to predict healthy behaviors, such as exercise (Joireman et al., 2012; Yarcheski et al., 2004) and nutrition (Benard et al., 2018; Dassen et al., 2016; Joireman et al., 2012; Yarcheski et al., 2004). Notably, Dassen and colleagues (2016) tested behavior-specific measures of considering future consequences and found that tailored measures of CFC more accurately predict individual health behaviors, such as exercise and healthy eating. Van Beek et al.'s (2013) study confirmed that high scores in an exercise-tailored CFC-Future measure predicted more exercise behavior.

Again, hypotheses III and IV were only partially supported. Although income was found to moderate the relationship between CFC-Future and healthy eating, no moderation effect by income was found for physical activity. Additionally, race was not a significant moderator for either physical activity or healthy eating.

Hypothesis V expected that consideration of immediate consequences would predict less healthy eating and that this relationship would be moderated by income and race. This hypothesis was partially supported; consideration of immediate consequences (CFC-Immediate) was found to significantly predict less healthy eating. Subsequently, focusing on the immediate outcomes of one's actions may act as a risk factor to one also eating less healthfully. Van Beek and colleagues (2013) found that a food-specific measure of CFC-Immediate predicted less healthy eating behavior. Although a significant relationship between CFC-Immediate and healthy eating behavior was found, using a food-specific measure of CFC-Immediate may result in a stronger relationship. Perhaps, focusing on immediate consequences and eating less healthfully coincide because they are symptoms or effects of similar circumstances, such as having a low socioeconomic status or experiencing marginalization and discrimination in society. However, this hypothesis was only partially supported as income and race did not moderate the relationship between CFC-Immediate and healthy eating.

The current study did not find evidence, however, to support hypothesis VI, which expected consideration of immediate consequences (CFC-Immediate) to predict less physical activity and for this relationship to be moderated by income and race. Perhaps an exercise-specific measure of CFC-Immediate would result in significant findings. It might also be the case that individuals have immediate consequences they focus on that physical activity satisfies in

some way. For example, individuals may exercise not for the future consequences of fitness but for the immediate consequences of clearing one's head.

In all six hypotheses, the current study hypothesized that *income* would act as a moderator between the predictors and outcome variables. This aspect of hypotheses I, III, and V was supported only for hypothesis III. More specifically, income significantly predicted healthy eating, such that earning a higher income was a protective factor towards eating more healthfully. A significant moderation effect was found with income moderating the relationship between considering future consequences and healthy eating, providing additional support for the third hypothesis. This moderation showed that income had an effect on healthy eating but only for participants who scored low on considering future consequences; for these individuals, having a lower income was related to eating less healthfully. However, income did not affect healthy eating when individuals scored high on considering future consequences. This evidence might suggest considering future consequences as a protective factor towards healthy eating even in the case of lower income levels. However, this evidence also points out that the level of healthy eating did not change across lower and higher scores of considering future consequences for individuals with higher income levels. Thus, earning a lower income makes it harder for individuals to eat healthfully. Perhaps this difference is caused by systemic barriers, such as inaccessibility and unaffordability of healthy food, that make it more difficult for individuals with a lower income to eat more healthfully. Although it is well known that a lower income is related to poorer health, few studies assess actual differences based on income and most ignore or simply control for income differences (e.g., Adams & Nettle, 2009).

No evidence was found to support *income* as a moderator between any of the predictor variables and physical activity as was hypothesized for hypotheses II, IV, and VI. The

International Physical Activity (IPAQ) measure counts all physical activity, including activity from labor, leisure, transportation, and formal exercise. Perhaps the reason that income did not moderate any relationships between the predictor variables and physical activity is because those who have a lower-income are also working more jobs, which may be more labor-intensive, and are on their feet throughout the day. It may be the case that higher- and lower-income participants have the same level of physical activity but for different reasons—formal exercise and daily activity, respectively.

In all six hypotheses, this study also hypothesized that *race* would act as a moderator between the predictor and outcome variables. However, no significant moderating effects of race were found. Similarly, when differences by race have been assessed in previous literature, no differences were found for considering future consequences (Ward et al., 2009) or hope (Nothwehr et al., 2013). The lack of findings concerning race might be because the overwhelming majority of participants were white. Race in the present study was dichotomized as white/Caucasian and people of color (which included all participants who identified as African American/Black, American Indian/Native American, Asian American/Pacific Islander, or Latinx). Perhaps differences exist based on the experiences of people with specific races and ethnicities; however, this study was not able to assess this due to its sample demographics.

Neither was evidence found to support the prediction in all six hypotheses that the relationships between our predictors (hope, considering future consequences, and considering immediate consequences) and outcomes (physical activity and healthy eating) were moderated by both race and income as a three-way interaction. This finding is understandable as we did not find any moderation effects for race alone. In total, none of the six hypotheses were fully supported by the findings. However, many were partially supported as discussed above.

Limitations of the Present Study

The current study is not without limitations. While the sample size was adequate for aggregated analyses, the sample consisted of a large white majority with few people of color. Even after grouping multiple races and ethnicities together into a person of color group, the white majority group was still much larger. Additionally, this study was not able to look into differences based on various races and ethnicities due to the low number of participants of color. Furthermore, all measures are self-reported and may not represent accurate depictions of participants' actual eating and physical activity behaviors. Finally, this study is based on cross-sectional data and, although it uses the language of predictor and outcome, directionality of these relationships cannot be concluded from this study.

This study also had theoretical limitations. First, the current study did not include behavior-specific measures of hope, considering future consequences, and considering immediate consequences. In theory, hope may indeed predict actual healthy eating behaviors but only if the measure of hope is specific towards eating behaviors. The same may be true for the other predictor variables; unfortunately, the current study did not include behavior-specific measures of the predictor variables. Second, it is possible that considering immediate consequences is an adaptive behavior for certain individuals. Perhaps focusing on one's immediate consequences leads to healthy behaviors, such as choosing to exercise in order to spend time with someone or, alternatively, to have time to oneself. The current study did not assess specific situations of future and immediate consequences nor the reasons why participants might be focusing on future or immediate above the other. Additionally, it is possible for someone to perform a behavior with both future and immediate consequences in mind; however, the current study is not able to delve into these complexities.

Future Directions for Research

Future research on physical activity and healthy eating behaviors is necessary and beneficial. The current study assessed hope as a total scale score; however, future researchers should look into potential differences in Scioli's (2011) hope subscales in predicting physical activity and healthy eating behaviors. Furthermore, future research should compare and contrast empricially Scioli's (2011) integrative hope measure with Snyder's (2002) goal-oriented hope. Since Snyder's hope emphasizes goals and multiple pathways to achieve these goals, this scale may be a better predictor of specific health behaviors in comparison to Scioli's integrated hope measure. However, this future research should examine what an integrative conception of hope adds to understanding health behaviors above and beyond Snyder's goal hope.

Additionally, researchers would benefit by measuring these behaviors with various methods that do not all require self-report surveys—using current technology and phone apps to log actual behaviors may prove useful in measuring physical activity and healthy eating. Researchers should continue to probe racial and ethnic differences in order to understand various groups' experiences and affect social change. To do so, it is necessary to recruit more racially diverse samples. Furthermore, income and race are closely tied to one's educational level, as one's income or race may impact opportunities for education. Future research should examine the effects of education on the relationships between the current study's predictors and behavioral outcomes. Finally, researchers should continue to examine sociocultural differences in populations when creating and testing interventions to ensure that interventions fit the population at hand and that the intervention makes sense for the situation communities are in (i.e., increasing one's hope will not directly eradicate food deserts and lack of employment opportunities). Thus, effective prevention requires social and policy change (Perry & Albee,

1994). Indeed, working with communities to create interventions is key to promoting overall health and well-being (Kaplan, 2000).

Implications for Community Psychology

Healthy eating and physical activity are two important behaviors for promoting overall health and wellness and decreasing disease. The current study assessed how helpful interventions focusing on individuals' levels of hope, future orientation, and present orientation may be in promoting these two health behaviors. Findings showed that an integrative conception of hope may be a protective factor towards physical activity but not healthy eating. It is likely the case that hopeful individuals are less likely to be depressed and, therefore, may be more active. However, hopefulness does not seem to affect healthy eating choices. Interventions, then, may focus on increasing individual levels of hope but need to do so in a multi-level intervention context.

Considering future consequences (CFC-Future) protects toward physical activity and healthy eating, meaning that individuals who allow future outcomes to affect their day-to-day behaviors are more likely to be active and eat healthfully. Therefore, interventions focusing on CFC-Future may prove useful to encouraging individuals towards healthier lifestyles. However, this study also found that income moderates the relationship between CFC-Future and healthy eating, such that individuals with lower incomes and lower levels of future concern are less likely to eat healthfully. This is why interventions cannot simply be focused on the individual level but need to incorporate systems thinking and policy components in order to impact systemic barriers to individuals' and communities' health behaviors. For example, in addition to individual-level components, interventions can include activities to change barriers to increasing one's income, such as supporting and making possible employment opportunities, better schools,

supports to graduate from college, and accessibility of healthy food in low-income neighborhoods.

Findings also indicated that considering immediate consequences (CFC-Immediate) was related to eating less healthfully but not related to physical activity. Additionally, individuals with a lower income were more likely to eat less healthfully. Although no moderation effect of income was found between CFC-Immediate and healthy eating, it is still worth noting that systemic barriers may be influencing this relationship. It makes sense that individuals who are focused on more immediate outcomes, such as hunger, convenience, exhaustion, taste, or desire, would be more likely eat less healthfully. Interventions may choose to orientate individuals toward more future focus than immediate focus; however, intervention developers should be aware of adaptive reasons for focusing on immediate consequences.

Interventions that emphasize hope, considering future consequences, and considering immediate consequences may have some effect on individuals' physical activity and healthy eating behaviors. However, these results will likely be limited without additional intervention components. Indeed, the efforts of any intervention should be aimed towards higher-order change, which is necessary to affecting individuals' and communities' opportunities and likelihood of increasing health-promoting behaviors.

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Appendix A

List of All Scales Included in Larger Dataset

Scale Name	Author(s)
Exercise Procrastination Scale	Haghbin & Pychyl, 2016
Exercise Habits	McCarthy et al., 2017
Capacity for Self-Control Scale	Hoyle & Davisson, 2016
Consumer Mindsets	Dweck, 1999; Dweck, Chiu, & Hong, 1995; Murphy & Dweck, 2016
Belief in Malleable Fate Scale	Au, 2008
Belief in Fixed Fate Scale	Kim et al., 2014
Self-Handicapping Scale – Short Form	Strube, 1986
Subjective Well-being	Diener et al., 1985
Starting the Conversation	Paxton, Strycker, Toobert, Ammerman, & Glasgow, 2011
International Physical Activity Questionnaire	Hagstromer et al., 2005
Comprehensive Hope Scale – Trait	Scioli et al., 2011
Consideration of Future Consequences	Strathman et al., 1994; Joireman et al., 2012
Adult Inventory of Procrastination	McCown & Johnson, 1989
Social Desirability	Reynolds, 1982
Decisional Procrastination	Mann, 1982

Appendix B

International Physical Activity Questionnaire (Hagstromer et al., 2005)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1.   During the **last 7 days**, did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

____ Yes

____ No

If No is selected, skip to question 4

2.   **During the last 7 days**, on how many days did you do **vigorous** physical activities?

_____ **days per week**

3.   How much time did you usually spend doing **vigorous** physical activities on one of those days? Please estimate how much time you spent to the best of your abilities. If you really don't feel that you can provide a good guess, then leave the fields below blank and skip to the next question.

    _____ hours

    _____ minutes

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

4.   During the **last 7 days**, did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

    ____ Yes

    ____ No

    If No is selected, skip to question 7

5.   **During the last 7 days**, on how many days did you do **moderate** physical activities?

    _____ days per week

6. How much time did you usually spend doing **moderate** physical activities on one of those days? Please estimate how much time you spent to the best of your abilities. If you really don't feel that you can provide a good guess, then leave the fields below blank and skip to the next question.

    _____ hours

    _____ minutes

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

7. During the **last 7 days**, did you **walk** for at least 10 minutes at a time?

    _____ Yes

    _____ No

    If No is selected, skip to question 4

8. **During the last 7 days**, on how many days did you **walk** for at least 10 minutes?

    _____ days per week

9.   How much time did you usually spend **walking** on one of those days? Please estimate how much time you spent to the best of your abilities. If you really don't feel that you can provide a good guess, then leave the fields below blank and skip to the next question.

_____ **hours**

_____ **minutes**

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

10.   During the **last 7 days**, how much time did you spend **sitting** on a **week day**? Please estimate how much time you spent to the best of your abilities. If you really don't feel that you can provide a good guess, then leave the fields below blank and skip to the next question.

_____ **hours**

_____ **minutes**

Appendix C

Starting the Conversation (Paxton, Strycker, Toobert, Ammerman, & Glasgow, 2011)

Over the past few months:

1. How many times a week did you eat fast food meals or snacks?

   Less than 1 time   1-3 times   4 or more times

2. How many servings of fruit did you eat each day?

   5 or more   3-4   2 or less

3. How many servings of vegetables did you eat each day?

   5 or more   3-4   2 or less

4. How many regular sodas or glasses of sweet tea did you drink each day?

   Less than 1 time   1-2   3 or more

5. How many times a week did you eat beans (like pinto or black beans), chicken, or fish?

   3 or more times   1-2 times   Less than 1 time

6. How many times a week did you eat regular snack chips or crackers (not low-fat)?

   1 time or less   2-3 times   4 or more times

7. How many times a week did you eat desserts and other sweets (not the low-fat kind)?

   1 time or less   2-3 times   4 or more times

8. How much margarine, butter, or meat fat do you use to season vegetables or put on potatoes, bread, or corn?

   Very little   Some   A lot

Appendix D

Social Desirability (Reynolds, 1982)

Listed below are a number of statements concerning personal attitudes and traits. Read each item

and decide whether the statement is true or false as it pertains to you.

1. It is sometimes hard for me to go on with my work if I am not encouraged.

2. I sometimes feel resentful when I don't get my way.

3. On a few occasions, I have given up doing something because I thought too little of my ability.

4. There have been times when I felt like rebelling against people in authority even though I knew they were right.

5. No matter who I'm talking to, I'm always a good listener.

6. There have been occasions when I took advantage of someone.

7. I'm always willing to admit it when I make a mistake.

8. I sometimes try to get even, rather than forgive or forget.

9. I am always courteous, even to people who are disagreeable.

10. I have never been irked when people expressed ideas very different than my own.

11. There have been times when I was quite jealous of the good fortune of others.

12. I am sometimes irritated by people who ask favors of me.

13. I have never deliberately said something that hurt someone's feelings.

Appendix E

Comprehensive Trait Hope Scale (Scioli et al., 2011)

<u>How I Generally Think and Feel</u>: In this section we are interested in how you *think, feel, and act <u>most of the time</u>*. You should answer the questions in this section according to what is *generally true* of you. For example, if you have had an unusually good or bad week, put those thoughts and feelings aside and focus on *your <u>typical</u> ways of thinking, feeling, and doing things*.

Please use the following scale to answer each question.

Not Me	A Little Like Me	A Lot Like Me	Exactly Like Me
0	**1**	**2**	**3**

___ 1.   I believe that I am going to get what I really want out of life.

___ 2.   I have a trusted friend or family member in whom I can confide.

___ 3.   I can find ways to relax.

___ 4.   I believe there are ways one can get in touch with a greater spiritual force.

___ 5.   I give some credit to others for my successes in life.

___ 6.   I find comfort in my spiritual beliefs.

___ 7.   The future looks bright to me.

___ 8.   I believe there is a positive force somewhere in the universe.

___ 9.   I like to seek out new experiences.

___ 10. In pursuing my goals, I try to work hand-in-hand with God or a higher power.

___ 11. I'm capable of finding support from others when I need it.

___ 12. I have never felt close to any kind of spiritual force or presence.

___ 13. I have a purpose in life.

___ 14. I believe that the spirit lives on in some form after the body perishes.

___ 15. I have doubts about achieving those things that really matter to me.

___ 16. I have a friend or family member who really listens to me.

___ 17. I have ways of reducing my fears and worries.

___ 18. Spiritual experiences are possible with the right attitude.

___ 19. I depend on a committed parent, friend, or mentor for advice.

___ 20. My spiritual beliefs keep me calm during a crisis.

___ 21. I'm hopeful about the future.

___ 22. I believe in a benevolent (kind) higher power.

___ 23. I find it stressful to travel and meet new people.

___ 24. My spiritual beliefs have empowered me to succeed in life.

___ 25. In these stressful times, I'm fortunate to have a network of friends and family.

___ 26. I have the ability to connect with God, a spiritual force or a higher power.

___ 27. My life has meaning.

___ 28. Every human being has an immortal soul.

___ 29.   I can succeed in ways that are important to me.

___ 30.   There are people in my life that I completely trust.

___ 31.   By looking within yourself, you can find untapped sources of strength.

___ 32.   I cannot imagine ever having a spiritual experience.

___ 33.   When setting goals, I like to get feedback from others.

___ 34.   My spiritual beliefs provide me with a feeling of safety.

___ 35.   The future will bring opportunities for a better life.

___ 36.   There is a higher intelligence that guides life in a positive direction.

___ 37.   I'm uncomfortable around strangers.

___ 38.   My goals can be achieved without prayer or "spiritual" assistance.

___ 39.   I feel safe knowing there are people I can call in a time of crisis.

___ 40.   In the right environment, I can feel the presence of a spiritual force or a higher power.

___ 41. I have made (or will make) a difference in this world.

___ 42. When we die, there is a part of us that continues to live.

___ 43. I will find ways to make my dreams come true.

___ 44. I feel safe enough with certain people in my life to share how I really feel.

___ 45. I can stay calm under almost any set of circumstances.

___ 46. Spiritual experience can occur at any time or place.

___ 47. I do some of my best work when inspired by others.

___ 48. I could never imagine relying on spiritual beliefs to manage fear or stress.

___ 49. I look forward to the future.

___ 50. There is too much evil in the world to believe in a just or caring higher power.

___ 51. I view life as an adventure and welcome new experiences.

___ 52. Accomplishments are due to human willpower; not prayer or spiritual guidance.

___ 53. I've had good success when seeking help from others.

___ 54. It's unlikely that I will ever experience a spiritual force or a "higher power".

___ 55. I have a reason to live.

___ 56. Immortality is a myth.

Appendix F

Consideration of Future Consequences (Strathman et al., 1994; Joireman et al., 2012)

For each of the statements below, please indicate whether or not the statement is characteristic of you. If the statement is extremely uncharacteristic of you (not at all like you) mark number 1; if the statement is extremely characteristic of you (very much like you) mark number 7. And, of course, use the numbers in the middle if you fall between the extremes.

1. I consider how things might be in the future, and try to influence those things with my day to day behavior.

2. Often I engage in a particular behavior in order to achieve outcomes that may not result for many years.

3. I only act to satisfy immediate concerns, figuring the future will take care of itself.

4. My behavior is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.

5. My convenience is a big factor in the decisions I make or the actions I take.

6. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.

7. I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years.

8. I think it is more important to perform a behavior with important distant consequences than a behavior with less-important immediate consequences.

9. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.

10. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.

11. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.

12. Since my day to day work has specific outcomes, it is more important to me than behavior that has distant outcomes.

13. When I make a decision, I think about how it might affect me in the future.

14. My behavior is generally influenced by future consequences.

Appendix G
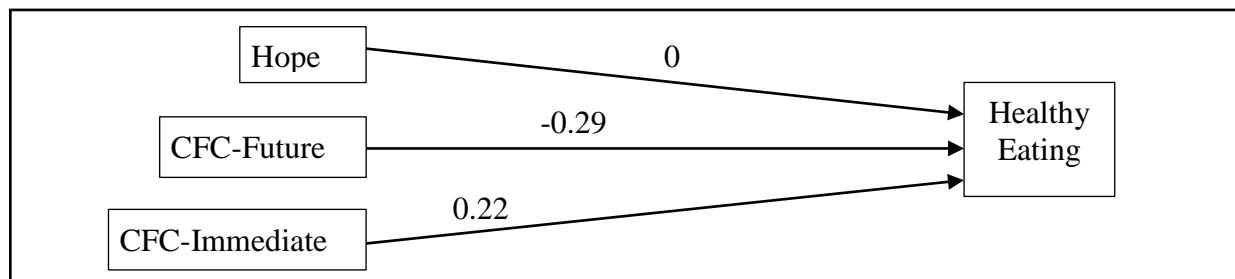
Results controlling Social Desirability

Figure G1. Results model for predicting healthy eating and controlling for social desirability. No results are significant. Lower scores on STC indicate healthier eating.
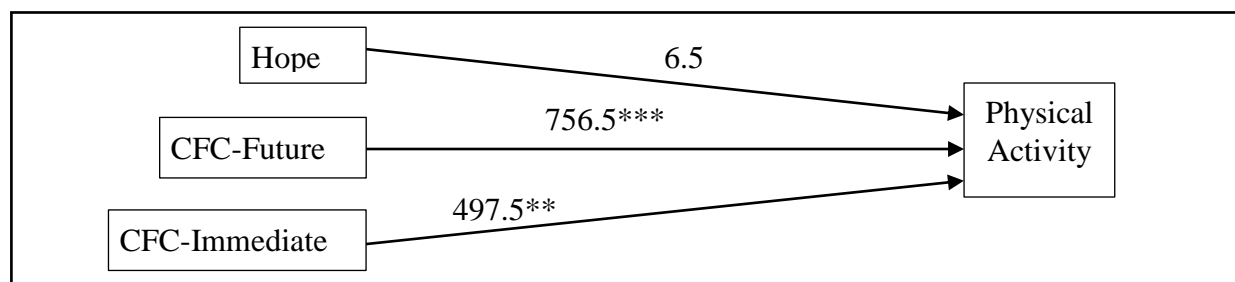
Figure G2. Results model for predicting physical activity and controlling for social desirability. IPAQ measured in MET.
**p < .01. ***p < .001

Table G1.

Hypothesis I Results Controlling for Social Desirability

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
Hope	0	0	-0.02	0.01	-0.02	0.02
Income	-0.02**	0.01	-0.03**	0.01	0	0.02
Race	0.07	0.40	0.04	0.40	0	0.40
Hope x Income			0	0	0	0
Hope x Race			0.01	0.01	0.02	0.02
Hope x Income x Race					0	0
R^2	0.05		0.04		0.05	
F	3.86**		2.74*		2.46*	
ΔR^2			0.004		0.01	
ΔF			1.12		0.28	

Note. Lower scores on STC indicate healthier eating. $n = 240$.
*$p < .05$. **$p < .01$.

Table G2.

Hypothesis II Results Controlling for Social Desirability

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
Hope	12.09[*]	6.11	0.85	15.31	-10.75	17.37
Income	6.47	10.03	5.49	9.87	19.40	24.28
Race	754.34	458.27	748.67	459.45	725.50	474.16
Hope x Income			-0.04	0.38	-1.22	1.29
Hope x Race			13.34	16.54	24.88	18.66
Hope x Income x Race					1.20	1.35
R^2	0.02		0.01		0.01	
F	1.93		1.33		1.25	
ΔR^2			0.001		0.001	
ΔF			0.60		0.08	

Note. IPAQ measured in MET. *n = 240.*

*p < .05.

Table G3.

Hypothesis III Results Controlling for Social Desirability

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Future	-0.34*	0.15	-0.01	0.37	-0.20	0.43
Income	-0.02**	0.01	-0.03***	0.01	-0.01	0.02
Race	0.05	0.40	0.19	0.40	0.17	0.44
CFC-Future x Income			0.02*	0.01	0.02	0.02
CFC-Future x Race			-0.38	0.40	-0.17	0.46
CFC-Future x Income x Race					0	0.02
R^2	0.06		0.08		0.07	
F	5.11***		4.41***		3.46***	
ΔR^2			0.02		0.01	
ΔF			0.70		0.95	

Note. Lower scores on STC indicate healthier eating. $n = 240$.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table G4.

Hypothesis IV Results Controlling for Social Desirability

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Future	499.69**	181.47	-130.91	436.21	-282.15	542.92
Income	0.94	10.32	3.43	10.49	25.45	34.49
Race	679.69	462.59	747.47	474.70	498.50	611.07
CFC-Future x Income			-0.86	9.44	-20.70	19.10
CFC-Future x Race			710.26	474.00	855.97	577.01
CFC-Future x Income x Race					23.75	22.25
R^2	0.03		0.02		0.03	
F	2.66*		1.90*		1.77	
ΔR^2			0.003		0	
ΔF			0.76		0.13	

Note. IPAQ measured in MET. *n* = 240.
**p < .01.

Table G5.

Hypothesis V Results Controlling for Social Desirability

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Immediate	0.32**	0.12	0.21	0.28	0.28	0.29
Income	-0.02**	0.01	-0.03***	0.01	0	0.02
Race	0.03	0.40	0.02	0.40	-0.02	0.40
CFC-Immediate x Income			0.01	0.01	0.01	0.01
CFC-Immediate x Race			0.10	0.31	0.03	0.32
CFC-Immediate x Income x Race					0	0.01
R^2	0.07		0.08		0.08	
F	5.75***		4.32***		3.60***	
ΔR^2			0.01		0.01	
ΔF			1.43		0.72	

Note. Lower scores on STC indicate healthier eating. $n = 240$.
$**p < .01. ***p < .001.$

Table G6.

Hypothesis VI Results Controlling for Social Desirability

Variable	Model 1		Model 2		Model 3	
	B	*SE B*	*B*	*SE B*	*B*	*SE B*
CFC-Immediate	45.39	152.88	155.65	321.87	155.65	321.87
Income	7.19	9.97	7.85	10.21	7.85	10.21
Race	752.24	451.81	696.89	478.39	696.89	478.39
CFC-Immediate x Income			2.00	7.02	2.00	11.55
CFC-Immediate x Race			-140.45	364.40	-140.45	364.40
CFC-Immediate x Income x Race					3.07	14.19
R^2	0.005		-0.002		-0.002	
F	1.31		0.91		0.91	
ΔR^2			0.001		0.009	
ΔF			0.40		0	

Note. IPAQ measured in MET. $n = 240$.