Factors Influencing Intention To Meet The Recommended Daily Intake Of Fruits And Vegetables In Black Emerging Adult Women

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Factors Influencing Intention To Meet The Recommended Daily Intake Of Fruits And Vegetables In Black Emerging Adult Women

Abstract
The current national guidelines recommend that adult women, ages 19-30, consume at least 2 cups of fruit and 2.5 cups of vegetables daily (U.S. Department of Agriculture, 2015). However, few women who are Black and emerging adults (ages 18-30) meet these recommendations. This sequential exploratory mixed methods study, guided by the Theory of Planned Behavior (Ajzen, 1985), sought to understand the factors influencing Black emerging adult women's (BEAW'S) intention to consume the recommended daily intake of fruits and vegetables (FVs). Beliefs about FV consumption were elicited via focus groups from a purposive sample of 27 BEAW (2 groups with 10 women per group, and 1 group with 7 women). Directed content analysis of the qualitative data revealed that key behavioral beliefs associated with meeting the recommended daily intake of FVs were increased perceived energy, weight loss, and nutrient intake. Family (i.e. parents, spouse/significant other, siblings), healthcare providers (i.e. doctor, nutritionist) and friends were associated with normative beliefs. Key control beliefs were time, cost, and access. Intention to meet the recommended daily intake of FVs was assessed through a cross-sectional researcher-developed survey administered to 100 BEAW. Hierarchical multiple regression analyses indicated that attitudes and self-efficacy were the strongest predictors of intention to meet the recommended daily intake of FVs. Furthermore, the availability of a supermarket in walking distance was the control belief driving self-efficacy. These findings suggest that interventions aimed at increasing FV consumption in BEAW should prioritize modifying attitudes, self-efficacy, and the food environment. The outcomes of this study provide preliminary evidence of factors important for developing interventions to increase FV consumption among BEAW.

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FACTORS INFLUENCING INTENTION TO MEET THE RECOMMENDED
DAILY INTAKE OF FRUITS AND VEGETABLES IN BLACK EMERGING
ADULT WOMEN

Terri-Ann Kelly

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FACTORS INFLUENCING INTENTION TO MEET THE RECOMMENDED DAILY INTAKE OF FRUITS AND VEGETABLES IN BLACK EMERGING ADULT WOMEN

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DEDICATION

To all the Black emerging adult women who contributed to this study, without your input none of this would have been possible.
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Terri-Ann Kelly

Lisa M. Lewis

The current national guidelines recommend that adult women, ages 19-30, consume at least 2 cups of fruit and 2.5 cups of vegetables daily (U.S. Department of Agriculture, 2015). However, few women who are Black and emerging adults (ages 18-30) meet these recommendations. This sequential exploratory mixed methods study, guided by the Theory of Planned Behavior (Ajzen, 1985), sought to understand the factors influencing Black emerging adult women’s (BEAW’S) intention to consume the recommended daily intake of fruits and vegetables (FVs). Beliefs about FV consumption were elicited via focus groups from a purposive sample of 27 BEAW (2 groups with 10 women per group, and 1 group with 7 women). Directed content analysis of the qualitative data revealed that key behavioral beliefs associated with meeting the recommended daily intake of FVs were increased perceived energy, weight loss, and nutrient intake. Family (i.e. parents, spouse/significant other, siblings), healthcare providers (i.e. doctor, nutritionist) and friends were associated with normative beliefs. Key control beliefs were time, cost, and access. Intention to meet the recommended daily intake of FVs was assessed through a
cross-sectional researcher-developed survey administered to 100 BEAW. Hierarchical multiple regression analyses indicated that attitudes and self-efficacy were the strongest predictors of intention to meet the recommended daily intake of FVs. Furthermore, the availability of a supermarket in walking distance was the control belief driving self-efficacy. These findings suggest that interventions aimed at increasing FV consumption in BEAW should prioritize modifying attitudes, self-efficacy, and the food environment. The outcomes of this study provide preliminary evidence of factors important for developing interventions to increase FV consumption among BEAW.
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CHAPTER 1

Introduction

Black women suffer disproportionately from obesity and its related medical complications such as stroke, hypertension, heart disease and type II diabetes (Ogden et al., 2014; Centers for Disease Control and Prevention, 2015a). An increased consumption of fruits and vegetables has been advocated for reducing the risk of cardiovascular disease, type II diabetes, and some cancers (Office of Disease Prevention and Health Promotion, 2016). A meta-analysis by He and colleagues (2007) demonstrated that increased consumption of fruits and vegetables is associated with a reduced risk of coronary heart disease (CHD). Specifically, a 17% reduction in CHD was shown for individuals consuming more than 5 servings /day (He, Nowson, Lucas, & MacGregor, 2007). Similarly, consuming the recommended daily intake of fruits and vegetables has been associated with a reduced risk of stroke (He, Nowson, & MacGregor, 2006). Yet, Black women are less likely to consume the recommended daily intake of fruits and vegetables when compared with other racial/ethnic groups (Casagrande, Wang, Anderson, and Gary 2007; Kant, Graubard, and Kumanyika, 2007; Li et al., 2012).

There are several psychosocial determinants of fruit and vegetable intake such as beliefs about capabilities, knowledge and taste (Guillaumie et al, 2010). An individual’s intention, however, to consume fruits and vegetables may be a better determinant of their fruit and vegetable intake (Ajzen, 1985). Moreover, an individual’s intentions are shaped by his/her behavioral, normative, and control beliefs associated with performing the given behavior. Middle to older age Black women’s beliefs about their food consumption
are well documented in the literature (Sheats & Middlestadt, 2013a; Sheats et al., 2013b; O’Neal et al., 2014). What is missing, however, are BEAW’s (ages 18 to 30) beliefs associated with their fruit and vegetable intake. Knowledge of these beliefs is important to consider because they can provide important information concerning the context of fruit and vegetable consumption for BEAW, thus providing opportunities to tailor interventions to improve their fruit and vegetable intake.

**Significance**

Promoting health and reducing chronic disease risk through consumption of healthful diets are national priorities (Office of Disease Prevention and Health Promotion, 2015). Evidence suggests that diets high in fruits and vegetables are associated with a decrease in the odds of mortality from cardiovascular disease, cancer, and other chronic diseases (Steinmetz & Potter, 1996; Van Duyn & Pivonka, 2000; Sharma, Sheehy, & Kolonel, 2014). Importantly, vegetable intake is associated with a significant reduction in risk for fatal stroke among Black women (Sharma et al., 2013). Yet, Black women show a lower consumption of fruits and vegetables (Kruger et al., 2007; O’Neal et al., 2014). The most recent statistics from the American Heart Association indicates that only 6.8% of Black women met the recommendations for total servings of fruit, when compared to their white counterparts intake at 9.2% (Benjamin et al., 2017). A similar pattern of low consumption was found for non-starchy vegetables, when comparing Black women and white women, 5.9% and 12.4% respectively (Benjamin et al., 2017).

The dietary intake of BEAW (ages 18-30) Black is important to study. Black women are more likely to consume diets high in fat and sodium when compared to other racial/ethnic groups (James, 2009). A nutrient dense diet in emerging adulthood has
demonstrated protective effects against future metabolic syndrome, hypertension, and excess weight gain (Ludwig et al., 1999; Yoo et al., 2004; Steffen et al., 2005). During emerging adulthood, the formation of atherosclerotic plaques begins and an unhealthy diet parallels a twofold increase in carotid arteriosclerosis (Brown, Geiselman, & Broussard, 2010). In essence, healthy lifestyle changes during emerging adulthood can be effective in preventing chronic diseases (McCracken, Jiles, & Blanck, 2007). Therefore, we need more information about the factors contributing to BEAW’s intention to achieve the recommended daily intake of fruits and vegetables.

**Purpose of the Study**

The overall purpose of this sequential exploratory mixed methods study was to understand the factors influencing BEAW’s intention to consume 2 cups of fruits and 2.5 cups of vegetables daily over the next 3 months. The theoretical framework guiding this study is the Theory of Planned Behavior (Ajzen, 1985). According to the Theory of Planned Behavior (TPB), intentions are the foundation of behaviors, and these intentions are determined by attitude, subjective norm, and perceived behavioral control regarding the behavior. A secondary purpose for this study was to examine the behavioral, normative, and control beliefs that are predictive of attitudes, subjective norms, and perceived behavioral control, as well as determine the influence of theoretical predictors on FV consumption among BEAW.
Specific Aims

Aim 1: To elicit BEAW’s behavioral, normative, and control beliefs pertaining to their intention to meet the recommended daily intake of fruits and vegetables over the next 3 months.

Aim 2: To determine which behavioral, normative, and control beliefs (identified in Aim 1) are predictors of attitudes, subjective norms, and perceived behavioral control.

Aim 3: To determine the influence of attitudes, subjective norms, and perceived behavioral control (PBC) on intention to meet the recommended daily intake of fruits and vegetables over the next 3 months among BEAW.

Exploratory Aim: To determine the influence of attitudes, subjective norms, PBC on fruit and vegetable consumption in BEAW.

Research Questions

1. What are the behavioral, normative and control beliefs that influence intention to meet the recommended daily intake of fruits and vegetables over the next 3 months among BEAW?
2. Which construct of the Theory of Planned Behavior (attitudes, subjective norms, and perceived behavioral control) has the greatest influence on BEAW’s intention to meet the recommended daily intake of FVs over the next 3 months?

Hypotheses

The Theory of Planned Behavior has been used in numerous studies to predict intentions and behavior. A meta-analysis of the efficacy of the TPB by Armitage and
Conner (2001) demonstrated support for the TPB as a predictor of intention and behavior. Results of the meta-analytic review indicated that the TPB accounted for 27% of the variance in intention and 39% of the variance in behavior (Armitage and Conner, 2001). Among studies specific to fruit and vegetable intake, emerging adults and Black adults have reported that: (a.) weight loss is associated with attitudes to consume dark green leafy vegetables among Black women (Sheats & Middlestadt, 2013a); (b.) family, friends, and significant others influence food choice for emerging adults (Berge et al., 2012, Larson et al., 2012); (c.) the availability of a supermarket, price of FVs and time impacts decisions about FVs (Disantis et al, 2014; Sheats & Middlestadt, 2013a; Larson et al, 2012; Zenk et al., 2011); and (d.) attitudes and perceived behavioral control are the strongest predictors of healthy eating and intentions to consume FVs (Rah et al., 2004; Blanchard et al., 2009a; Blanchard et al., 2009b; O’Neal et al., 2012; Emanuel et al., 2013; Sheats et al., 2013b). As a result, in this study hypotheses were developed consistent with the theory and prior findings.

H1: Weight loss as a consequence of eating FVs will be a significant predictor of attitudes.

H2: Family, friends, and significant other (spouse, boyfriend, girlfriend) will be significant predictors of subjective norms.

H3a: The availability of supermarket/grocery store within walking distance will be a significant predictor of perceived behavioral control.

H3b: Time (preparation, cooking, schedule) will be a significant predictor of perceived behavioral control.
H3c: The price (cheaper) of FVs will be a significant predictor of perceived behavioral control.

H4: Consistent with the TPB model, attitudes, norms, and PBC will all be significant predictors of intention.

H5: Attitudes and PBC will be the strongest predictors of intentions to meet the recommended daily intake of FVs.

Implications

A dietary pattern based on the national dietary guidelines for FV intake is associated with a decreased risk of mortality in women (Kant, Schatzkin, Graubard, & Schairer, 2000). As such, it is important to implement strategies that promote fruit and vegetable intake in BEAW. Though establishing healthy eating patterns in emerging adulthood is crucial, the guidelines for clinical care and health promotion programs specific to emerging adults are few (VanKim, Larson, & Laska, 2012). The results of this study provide valuable insights about the salient factors influencing BEAW’s intention to meet the recommended daily intake for fruits and vegetables. Knowledge of the beliefs that contribute to fruit and vegetable intake among BEAW will allow researchers to design interventions that are culturally tailored and targeted to promoting increases in fruit and vegetable intake. Furthermore, the objectives related to fruit and vegetable consumption are in alignment with Healthy People 2020 overarching goals of improving the nation’s health, promoting quality of life and eliminating health disparities (U.S. of Health & Human Services, 2012).
CHAPTER 2

Literature Review

The goal of this chapter is to synthesize relevant literature pertaining to the dissertation topic. Specifically, the review will focus on emerging adults, the influence of cultural norms, fruit and vegetable intake and Black adults, as well as the limitations in the literature. An overview of the conceptual framework guiding this study will also be presented.

Emerging Adults

A focus on the dietary intake of BEAW is important for several reasons: (a) emerging adulthood has been recognized as a critical transition period during which young people develop lasting health behavior patterns (Nelson et al., 2008), (b) negative health behaviors during emerging adulthood may provide the foundation for health problems in later adulthood (Tanner, Arnett, & Leis, 2009), and (c) unhealthy lifestyle patterns during emerging adulthood is associated with an increased risk for chronic diseases such as diabetes and cardiovascular disease (VanKim, Larson, & Laska, 2012). Emerging adulthood (ages 18-30), the period of transition from adolescence to adulthood has been described as a distinct period demographically, subjectively, and in terms of identity explorations (Arnett, 2000; Tanner, Arnett, Leis, 2009). This period of transition is distinguished by relative independence from social roles and normative expectations (Arnett, 2000; Schwartz, Côté, & Arnett, 2005). Emerging adulthood is a critical juncture in the life cycle, as emerging adults begin assuming responsibility for their own care (Irwin, 2010). During this period in their life, young people develop lasting health
behavior patterns, and individual trajectories are sensitive to contextual influences (Nelson et al., 2008; Park et al., 2014). According to VanKim, Larson, and Laska (2012), health promotion and disease prevention efforts targeted to emerging adults have the potential to influence the adoption of health attitudes and long lasting behaviors, as well as reduce immediate and future risk for adverse health outcomes.

The changing life circumstances, adult responsibilities and demands on time may often lead to an increase in unhealthy behaviors and a decline in the diet quality of emerging adults (Nelson et al., 2008; Laska et al., 2014). According to Krebs-Smith and colleagues (2010), over 90% of emerging adult women regardless of race/ethnicity do not meet recommendations for 8 food groups, including total fruits, whole fruits, several vegetable subgroups, whole grains, and milk. Findings also indicate that emerging adults’ average daily intake of fruits and vegetables corresponds to one-half cup of fruit and one cup of vegetables, well below the national recommendations (Larson, Nelson Laska, Story, and Neumark-Sztainer, 2012). However, increased consumption of sweetened beverages, salty snacks and beef, fast foods and a decreased consumption of fruit/fruit juices and milk are common in emerging adulthood (Demory-Luce et al., 2004; Niemeier et al., 2006).

**Black Emerging Adults**

Identity, which includes incorporating healthy lifestyle characteristics in the concepts of one’s self, is an important indicator of lasting health behavior change (Nelson et al., 2008). Identity formation, however, is more difficult for BEAW. According to Arnett & Brody (2008), “identity issues are more complicated and difficult for [Black] emerging adults than for emerging adults in other American ethnic groups because they
must overcome the negative assumptions that others have about them as young Black people” (pp. 291). Particularly, Black women may be more deeply affected by the experiences of prejudice and discrimination as they confront issues with identity during emerging adulthood (Arnett & Brody, 2008). According to Tyson (2012), contemporary media’s stereotypical representations of Black women as the antithesis of ideal womanhood create a painful context in which to engage in the tasks of identity formation for BEAW. The development of healthy identities for Black women must be centered in understanding that they are worthy and valued as Black women (Stephens & Phillips, 2005). This is especially important given that sense of self-worth is intimately tied to racial identity (Hood et al., 2012).

Racial discrimination is a persistent barrier impacting the health and well-being of Black Americans (Hope, Hoggard, & Thomas, 2015). According to Hope and colleagues, (2015), a number of negative biological and health outcomes (i.e. elevated blood pressure, increased heart rate and risk for cardiovascular diseases) can be attributed to the cumulative and chronic experiences of racial discrimination. Furthermore, due to their position at the intersection of Black ethnicity and female, Black women have an increased risk for negative outcomes associated with discrimination (King, 2005). As such, it is important to consider how societal forces such as racism and discrimination influence the cultural attitudes and beliefs of BEAW.

**Influence of Cultural Norms on Food Choice**

It is important to focus on historical and cultural factors when studying the dietary intake and food choices of Black women (James, 2004). Daroszewski’s (2004) work highlights the influence of culture on lifestyle. The decisions individuals make are
inseparable from their cultural backgrounds (Daroszewski, 2004). According to Hargreaves and colleagues (2002), Black women’s cultural norms regarding food selection and eating behaviors are characterized by social, cultural and emotional meanings, which differ based on upbringing, circumstance, and personal experience. For example, many Black women readily acknowledge that their grandparents and great-grandparents passed on traditions of food preparation (Bramble, Cornelius, & Simpson, 2009).

Cultural norms in the Black community regarding social gatherings, acceptance of larger body size, and the scarcity of role models endorsing healthy lifestyle behaviors are some of the greatest hindrances to Black women’s fruit and vegetable intake (Airhihenbuwa & Kumanyika, 1996; Bagley et al., 2003; Kumanyika, 2008; Fitzgibbon et al., 2008; Thomas et al., 2008). For many Blacks, food is the quintessential symbol of love, and the focal point of social gatherings (Liburd, 2003). Present at these gatherings (i.e. family barbecues, reunions, church fellowship meals) are traditional soul foods consisting of fried chicken, candied yams, cornbread and macaroni and cheese (Dodson & Gilkes, 1995; Airhihenbuwa & Kumanyika, 1996). Soul foods typically lack fruits and vegetables, and yet are often high in fat, sodium, and cholesterol, which are thought to promote disorders such as type II diabetes, cardiovascular disease and certain types of cancers prevalent among Blacks (Akbar et al., 2007).

**Fruit & Vegetable Intake and Health**

Fruits and vegetables are widely endorsed for their health promoting properties. Dietary recommendations specifically include fruits and vegetables due to their concentrations of vitamins, minerals, phytochemicals, and dietary fiber (Slavin & Lloyd,
Fruits and vegetables also contain the compounds carotenoids, flavonoids, and glucosinolates which has been shown to be protective against cancer (Finley, 2005; Boggs et al., 2010). When consumed in place of more energy dense foods, eating more fruits and vegetables adds nutrients to the diet, reduces disease risk, and helps manage body weight (Moore & Thompson, 2015).

Evidence in the existing body of literature suggests that high intakes of fruit and vegetables are associated with preventing chronic disease (Reddy & Katan, 2004; Office of Disease Prevention and Health Promotion, 2016). Findings from the Nurses’ Health Study suggests that high consumption of fruits and vegetables is associated with a lower incidence of cardiovascular disease (Hung et al., 2004). Specifically, Hung and colleagues (2004) noted that the risk of cardiovascular disease was 28% lower for participants who consumed at least 5 servings of fruits and vegetables per day compared to those who consumed less than 1.5 servings per day. Similarly, a critical review by Boeing and colleagues (2012) found that increasing consumption of fruits and vegetables is associated with a reduced risk of hypertension, coronary artery disease, and stroke. Furthermore, higher consumption of fruits and vegetables during emerging adulthood is associated with lower odds of prevalent coronary artery calcium after 20 years of follow-up (Miedema et al., 2015).

**Black Women Fruit and Vegetable Consumption**

Black women consume lower amounts of fruits and vegetables compared to other racial/ethnic groups (Yeh et al., 2008; O’Neal et al., 2014). This low intake is associated with preventable health problems such as obesity, cardiovascular disease and diabetes.
(O’Neal et al., 2014). In their study of weight status and dietary practices among college students by DeBate, Topping, and Sargeant (2001) found that when considered by gender and race, Black females consumed the least amount of the recommended servings of fruits and vegetables. However, multiple factors (Table of Evidence) influence perceptions about fruits and vegetables and serve as barriers to healthy eating among Black women (Reyes, Klotz, & Herring, 2013). Reasons cited for low consumption include: poor preparation skills, misconceptions about healthy foods, convenience, and taste preferences (Henry et al., 2003; Lucan et al., 2012; Fish, Brown & Quandt, 2013; Reyes, Klotz, & Herring, 2013; Sheats & Middlestadt, 2013a). Even when Black women have the knowledge of how to prepare vegetables, cultural factors intervene, and habits take precedence over healthy eating behaviors (Antin & Hunt, 2012; Johnson et al., 2014).

**Gaps in the Literature**

Though the extant literature is replete with studies on fruit and vegetable consumption, there are a dearth of studies examining this phenomenon among BEAW. Importantly, even though the literature has identified some control beliefs associated with FV consumption (Henry et al., 2003; Lynch, Holmes, Keim, & Koneman, 2012; Reyes, Klotz, Herring, 2013; Sheats & Middlestadt, 2013a), the research examining the behavioral and normative beliefs of BEAW is limited. The Theory of Planned Behavior can address these limitations in the literature by providing a framework to elicit behavioral, normative, and control beliefs held by BEAW. Knowledge of these beliefs is vital to provide information on contextual factors that can be used to guide and develop interventions from the cultural perspective of BEAW.
Theoretical Framework

Developed as an extension of the Theory of Reason Action (Fishbein, 1967; Ajzen & Fishbein, 1980), the Theory of Planned Behavior was proposed by Icek Ajzen in 1985. The Theory of Reasoned Action (TRA) asserts that behavioral intention is the most important determinant of behavior. The Theory of Planned Behavior (TPB) integrates perceived control to the TRA to account for one’s perceived ability and capacity to perform a behavior as well as instances where the individual may not have complete volitional control over the behavior. The TPB postulates that intention is directly driven by three major constructs—attitude, subjective norm, and perceived behavior control—and individuals are more likely to perform the behavior with stronger intentions (Ajzen, 1991; Fishbein & Ajzen, 2010). The TPB has been used in several studies in attempts to understand and explain health behavior (Armitage & Conner, 2001; Bogers, Brug, Van Assema, & Dagnelie, 2004; Branscum & Sharma, 2014; Jemmott et al., 2014, Kothe & Mullen, 2014; O’Neal et al., 2014; Brouwer & Mosack, 2015). A systematic review of 23 studies found the TPB to be one of the preferable social cognitive theories to predict behavior and to explain intention (Guillaumie, Godin, & Vezina-Im, 2010).

TPB Constructs

*Attitude* refers to the degree to which performance of a behavior is valued, which can be either positive or negative. Attitude toward a behavior is determined by a set of accessible behavioral beliefs. These behavioral beliefs link the behavior of interest to expected outcomes (Fishbein & Ajzen, 2010). Some studies examining fruit and
vegetable intake have found attitudes to be the strongest predictor of intention (Blanchard et al., 2009; Sheats et al., 2013b; O’Neal et al., 2014).

*Subjective Norms* refers to perceived social pressure to engage or not engage in a particular behavior (Fishbein & Ajzen, 2010). The theory assumes that subjective norms are influenced by a set of normative beliefs. The normative beliefs refer to the perceived behavioral expectations an individual holds based on important referent individuals or groups such as family, friends, or community (Fishbein & Ajzen, 2010).

*Perceived Behavioral Control* (PBC) refers to the individual’s perception of their ability to perform a given behavior. The assumption is that PBC takes into account the availability of information, skills, opportunities, and other resources required to perform the given behavior, as well as the barriers and obstacles they may have to overcome (Fishbein & Ajzen, 2010).

*Intention* is an indication of an individual’s readiness to perform a given behavior. Considered to be the immediate antecedent of behavior, intentions are assumed to capture the motivational factors that influence the individual to perform a given behavior. Intentions are indications of how hard individuals are willing to try, and how much effort they are planning to exert in order to perform the behavior (Ajzen, 1991).
Figure 1: Theoretical Model based on The Theory of Planned Behavior. Adapted from Icek Ajzen (1991).
CHAPTER 3

Methods

Research Design

This study employed a sequential exploratory mixed-methods approach (Figure 2). This methodology was chosen based on the purpose, specific aims, and research questions of this study. With this two-phase approach, the quantitative data were collected only after the qualitative data had been analyzed. A key feature of this design is the ability to translate qualitative findings based on small sample of study participants in the first phase, to a larger sample in the second phase (Creswell & Plano, 2011; Grove, Burns & Gray, 2013). In Phase I, 3 focus groups were conducted with 7 to 10 women per group to explore behavioral, normative, and control beliefs. In Phase II, a cross sectional study was conducted to examine theoretical predictors (i.e. behavioral beliefs/attitudes, normative beliefs/subjective norms, control beliefs/ perceived behavioral control) of behavioral intention to consume FVs in BEAW.
Figure 2

Mixed Methods Approach

Study Site

The current study was conducted in Philadelphia and the surrounding areas. Philadelphia is the largest city in the state of Pennsylvania. Estimates from 2014 indicate that approximately 1,560,297 individuals reside in Philadelphia. Over half of Philadelphia’s residents are female (52.8%) and 43.4% of the residents identify as Black or African American (U.S. Census Bureau, 2015).

Study Participants

The current study focused on recruiting emerging adult (ages 18-30) Black women who met inclusion and exclusion criteria for both phase I and phase II of this study. Inclusion and exclusion criteria are shown in Table 1 below.

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Table 1
Inclusion and Exclusion Criteria

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-identify as Black or African American</td>
<td>Population of interest in this study</td>
</tr>
<tr>
<td>Self-identify as female</td>
<td>Population of interest in this study</td>
</tr>
<tr>
<td>Ages 18-30</td>
<td>Population of interest in this study</td>
</tr>
<tr>
<td>Literate in English at the 5th grade reading level</td>
<td>Materials were printed in English and participants must have the capacity to understand study questionnaires</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exclusion Criteria</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food intolerance or allergies to fruit and vegetables</td>
<td>Study pertained to those who are able to eat FV</td>
</tr>
<tr>
<td>Pregnant</td>
<td>Changes in taste and cravings may occur during pregnancy: participant body mass index (BMI) was collected and weight changes with pregnancy.</td>
</tr>
</tbody>
</table>

Sample Size and Power

For **Phase I**, a convenience sample of 30 participants was recruited for the 3 focus groups. Ten BEAW participated in focus groups 1 and 2. A total of 7 BEAW participated in focus group 3. The sample size was justified because the data were saturated, that is, no new information, (i.e. only redundancy of previously collected data) were being collected (Grove, Burns, & Gray, 2013). In addition, (Morse, 2000), the quality of the data, scope of the study, the nature of the study, the qualitative method and study design were consistent with the number of participants. That is, previous qualitative studies of dietary intake in Black women have demonstrated data saturation between 20 to 30 participants (Antin & Hunt, 2012; Sheats & Middlestadt, 2013a; Sheats et al., 2013b).
Gill, Stewart, Treasure, and Chadwick (2008), indicate that for focus groups, 6 to 8 participants is the optimum size. However, a group of 10 may be productive if the topic is of minor concern to the participants (Krueger and Casey, 2015).

In Phase II, sample size was determined based on a priori power analysis to support our primary hypothesis that attitudes and perceived behavioral control would be the strongest predictors of intention. A sample size of 80 achieves 80% power to detect an R-Squared of 0.06 attributed to attitudes using an F-Test with a significance level (alpha) of 0.05. The variables tested were adjusted for norms and perceived behavioral control with an R-Squared of 0.32 based on previous literature (Blanchard et al., 2009; Jemmott et al., 2011; Middlestadt et al., 2011; Kothe, Mullan, & Butow, 2012). Though a sample size of 80 was deemed appropriate, recruitment and data collection took place for 100 BEAW who met inclusion criteria to account for the possibility of missing data.

Recruitment and Enrollment Strategy

A purposive sampling method that incorporated both proactive and reactive recruitment methods (Ibrahim & Sidani, 2014) was used for participant recruitment in Phase I & Phase II of this study. In qualitative research purposive sampling methods allow for rich data that are needed to gain insights and discover new meaning in an area of study (Sandelowski, 1995, 2000). Proactive recruitment involves direct face-to-face interactions of the researcher with potential study participants, whereas reactive recruitment involves indirect contact. The reactive recruitment method included the posting of flyers at university undergraduate and graduate campuses, as well as the posting of an advertisement for the study via twitter and the listserv for the Black Student Organization. Flyers contained information about the study and how to contact the
primary investigator. Proactive recruitment strategies included face-to-face interactions, and attendance at meetings such as the National Council of Negro Women. Face-to-face interactions by the primary investigator consisted of approaching potential participants at Septa terminals, on Septa trains, walking around University City, and visiting the Black Student Association. Potential participants contacted the primary investigator for a brief telephone screen to verify their initial eligibility (Appendix B). The screening tool assessed participants’ current fruit and vegetable intake, fruit and vegetable allergies or intolerances, race, age, education level, and status as a Philadelphia resident. Potential participants were invited to participate in the study if they met all inclusion criteria. The principal investigator (PI) collected participants’ contact information and scheduled an appointment for data collection.

**Data Collection Procedures**

The PI collected all data. Written informed consent was obtained from study participants prior to data collection. Data collection for both Phase 1 and 2 occurred in a private room at University of Pennsylvania School of Nursing, Temple University, or Bryn Mawr College.

*Phase 1: Focus Group Elicitation*

Participant eligibility was confirmed via telephone screening prior to data collection (Appendix B). Before the start of the focus group discussions, all participants completed a socio-demographic questionnaire, which provided information on employment status, age, income, and educational level. In addition, participants completed an open-ended questionnaire consisting of 6 items to assess beliefs related to
fruit and vegetable intake. The PI moderated each focus group session. A research assistant with experience in qualitative research and analysis was present at each session to take notes. All focus groups were audiotaped using a digital recorder. The focus groups began with a brief commentary on the purpose of the study and were conducted using a semi-structured interview guide based on the TPB constructs (Table 2). The first set of questions assessed behavioral beliefs associated with meeting the recommended daily intake of fruits and vegetables. The second set of questions assessed normative beliefs associated with meeting the recommended daily intake of fruits and vegetables. The third set of questions assessed control beliefs associated with meeting the recommended daily intake of fruits and vegetables. After asking the open-ended questions, probes were used to elicit additional information or explanations for participant responses. Probes included questions such as: a) “tell me more about that”, b) “do you think that is the same or different for other Black women in your age group”, and c) “are there any other issues that come to mind when you think about eating FVs.” On average, focus groups lasted from 50-90 minutes. At the completion of the focus groups, all participants were compensated $30 for their participation. Field notes depicting the interactions observed during the focus groups were transcribed after participants departed. To ensure there were no inconsistencies in transcription, each transcript was read through while listening to the recording.
Table 2
Focus Group Interview Guide

<table>
<thead>
<tr>
<th>Theoretical Constructs</th>
<th>Focus Group/Open-Ended Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Beliefs</td>
<td>What do you believe are the advantages of eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>What do you believe are the disadvantages of eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td>Who are the individuals or groups who would approve of your eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>Who are the individuals or groups who would disapprove of your eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td>Control Beliefs</td>
<td>What factors or circumstances would make it easier for you to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>What factors or circumstances would make it difficult or impossible for you to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
</tbody>
</table>

Phase II: Cross sectional Study

During this phase, the PI confirmed participant eligibility with questions from the telephone screen (Appendix B). Given that the purpose of the quantitative phase was to generalize the results to a larger population, participants from the qualitative phase were not recruited for phase II (Creswell and Plano, 2011). Once eligibility was confirmed either in-person or via phone, informed consent was reviewed and the participants completed baseline assessments (Table 3) which included: (1) Socio-demographic
information (i.e. employment status, age, income, and education level), (2) measured height and weight, (3) the National Cancer Institute (NCI) All-Day Screener, (4) The Six Item Food Security Module (FSM), and (5) a theory-based researcher-developed questionnaire to assess intention to consume FV.

Participants’ body mass index (BMI) was calculated using their height and weight. Height and weight were assessed according to the National Health and Nutrition Examination Survey (NHANES) Anthropometry Procedures (2007) by the PI who is a registered nurse. Weight was measured on a digital scale (HoMedics, Commerce Township, MI). Height was measured on a portable stadiometer (Seca 213, Hanover, MD). After a brief explanation of the measurement procedures, the participants were directed to remove their shoes, then stand in the center of the scale platform, hands at sides, and looking straight ahead for the weight assessment. To ensure accuracy in measurements for weight, participants were weighed 3 times and the average value was used for final measurement. Participants were then directed to the stadiometer platform for the height assessment. Participants were asked to remove any hair ornaments, jewelry, buns, or braids from the top of the head. The participants were instructed to stand up straight against the backboard with the body weight evenly distributed and both feet flat on the platform. Finally, the PI lowered the stadiometer head piece to rests firmly on top of the participants’ head, with sufficient pressure to compress the hair. For each participant, BMI was calculated using the equation: BMI=weight (kg) / height (m²). The NCI All-Day Screener was used to assess participants’ daily fruit and vegetable intake as cups per day over the previous month. This 19-item instrument assessed participants’ frequency of consumption of FVs as well as the average quantity of each item consumed.
Participants were asked to recall portion sizes for 9 items: 100% juice, fruit, lettuce salad (LSALAD), French fries/fried potatoes (FRFRY), other white potatoes (WHPOT), cooked dried beans (DRBEAN), other vegetables (OTHVEG), tomato sauce (TOMSAUCE), and vegetable soups (VEGSOUP). To minimize ambiguity and for clarification purposes, participants were provided with examples of serving sizes for fruits (1 cup sliced banana = 1 small, less than 6 inches) and vegetables (1 cup carrots = 12 baby carrots) based on the United States Department of Agriculture (USDA) guidelines. The Food Security Module measures the individual’s access to sufficient, safe, and nutritious food to meet their dietary needs (Jones et al., 2013). For the purposes of reporting food security status, a raw score of 0-1 is categorized as food secure, and the combination of the two categories “low food security” and “very low food security” is referred to as food insecure. The theory-based researcher-developed survey was based on analysis of the qualitative data collected in phase I and the TPB constructs.

Remuneration for participants in phase II was $15.

**Table 3**

Summary of data collected

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Estimated Completion Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>~3-5 minutes</td>
</tr>
<tr>
<td>Weight</td>
<td>~3-5 minutes</td>
</tr>
<tr>
<td>Participant Demographics</td>
<td>~1-5 minutes</td>
</tr>
<tr>
<td>Food Security Module</td>
<td>~1-2 minutes</td>
</tr>
<tr>
<td>National Cancer Institute (NCI) All-Day Screener</td>
<td>~5-10 minutes</td>
</tr>
<tr>
<td>Researcher Developed Questionnaire</td>
<td>~5-10 minutes</td>
</tr>
<tr>
<td>Total Visit Time</td>
<td>~10-20 minutes</td>
</tr>
</tbody>
</table>

**Primary Outcome Measurement**

The primary outcome for phase II of this study was participants’ intention to meet the recommended daily intake of 2 cups of fruit and 2.5 cups of vegetables over the next 3 months. An instrument to assess BEAW’s intention to eat the recommended daily intake of 2 cups of fruit and 2.5 cups of vegetables over the next 3 months does not exists. As such, an instrument was developed based on findings from elicitation research to assess BEAW’s FV intention, behavioral beliefs/attitudes, normative beliefs/subjective norms, and control beliefs/perceived behavioral control (Ajzen, 1991; Francis et al., 2004). For the purposes of instrument development, focus groups were focused on eliciting BEAW’s beliefs about their fruit and vegetable intake and a frequency analysis of the participants’ responses was conducted to generate items for the researcher-developed survey.

**Instrument Development:** A suggested format known to demonstrate adequate internal consistency was used to measure generalized intention (Ajzen, 1991; Francis et al., 2004; Glanz, Rimer, Viswanath, 2008). This included 3 items on a 5-point unipolar scale (1-5) with strongly disagree and strongly agree as endpoints. The 3 intention
questions were (1) “I expect to eat 2 cups of fruit and 2.5 cups of vegetables”, (2) “I want to eat 2 cups of fruit and 2.5 cups of vegetables”, and (3) “I intend to eat 2 cups of fruit and 2.5 cups of vegetables.” The intention score was then obtained by calculating the mean of the three intention scores for all participants.

Attitudes were measured with instrumental items and experiential items as suggested by Fishbein and Ajzen (2010) in the TPB questionnaire construction guide. Instrumental items were assessed by asking if participants felt eating 2 cups of fruit and 2.5 cups of vegetables for the next 3 months was worthless—useful on a 5-point unipolar response scale (1-5). Experiential items targeted the feelings participants associated with performing the behavior. For example, eating 2 cups of fruits and 2.5 cups of vegetables for the next 3 months is unpleasant—pleasant. The mean of the 4 items included in the survey were calculated to obtain an overall attitude score.

Subjective norms contained questions which referred to the opinions of salient referents. The 4 stems used to assess subjective norms were, (1) “Most people who are important to me think that”, (2) “It is expected of me to”, (3) “I feel under social pressure to”, and (4) “People who are important to me want me to.” The responses ranged from strongly disagree to strongly agree (1-5). The mean of the item scores were calculated to obtain an overall score for subjective norms.

Four questions were written to assess perceived behavioral control. The items for PBC were written to reflect the individual’s confidence in their ability (self-efficacy) to perform the target behavior (eat 2 cups of fruit and 2.5 cups of vegetables) and the individual’s perception about the controllability of the behavior. This was achieved by
asking participants to respond to questions such as (1) “I am confident that I could eat 2 cups of fruit and 2.5 cups of vegetables’ and (2) “The decision to eat 2 cups of fruit and 2 cups of vegetables is beyond my control.” Similar to the other TPB constructs, the mean of the item scores were calculated to obtain an overall score for perceived behavioral control (Ajzen, 1991; Francis et al., 2004; Glanz, Rimer, Viswanath, 2008).

The final researcher developed survey contained 36 questions in total, with 6 items that assessed participant demographics and 30 items based on TPB direct measures (attitude, subjective norms, perceived behavioral control) described above and indirect measures (behavioral beliefs, normative beliefs, control beliefs) obtained from frequency analyses of the responses in the elicitation study. Face validity of the survey for the target population was assessed by members of the dissertation committee, a public health expert with knowledge of the population and expertise in survey design, and 4 participants of the focus groups. The psychometric properties of the researcher-developed questionnaire were evaluated to ensure the instrument’s reliability and validity. Internal reliability was assessed through Cronbach’s $\alpha$ and test-retest reliability. Test re-test reliability of the questionnaire was assessed in a 2-week interval by a sub-set of the study participants (N=12). All participants completing the re-test were paid an additional $10.

**Data Management**

Recordings from the focus group interviews in phase I were uploaded to a designated, password-protected, research drive of the secure server at the University of Pennsylvania School of Nursing. Transcripts were uploaded to the Atlas.ti7 software (Atlas.ti Americas, Corvallis, OR) for storage and managing of the data during the coding process. Access to the transcripts and preliminary analysis of the data was limited to the
PI and members of the dissertation committee. All identifying data were deleted from the focus groups for the transcription process, and pseudonyms were used in place of participants’ names. The recordings on the drive were transmitted via a secure web link to a local transcription service that adheres to the University of Pennsylvania IRB confidentiality requirements. The recordings were transcribed verbatim for line by line analysis.

For Phase II, study data were collected and managed using REDCap electronic data capture tools hosted at the University of Pennsylvania School of Nursing. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources (Harris et al., 2009). To further ensure confidentiality, participants were assigned a numerical identification number, which served as a de-identified marker. A master list of codes and names were kept in a locked cabinet accessible only by the PI. Non-electronic data such as consent forms, and field notes were stored separately in a locked cabinet and identified by the participants’ identification number.

**Data Analysis**

**Phase I**

**Aim 1:** To elicit BEAW’s behavioral, normative, and control beliefs associated with intention to meet the recommended daily intake of fruits and vegetables over the next 3 months.
All focus interviews were transcribed by a professional transcription company, checked against the audiotape by the primary investigator, and imported into Atlas.ti (Atlas.ti Americas, Corvallis, OR) for analysis. Directed content analysis (Hsieh & Shannon, 2005) was used to analyze the data based on the TPB constructs. Content analysis is a systematic coding and categorizing approach that allows the researcher to explore large amounts of textual information to determine trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication (Vaismoradi, Turunen, & Bondas, 2013). The use of content analysis allows for obtaining a condensed and broad description of the phenomenon (Elo & Kyngas, 2008).

Compared with a conventional approach, directed content analysis is more structured. With directed content analysis, key concepts and variables are identified as initial coding categories based on the theoretical constructs. This process included reading the transcripts to identify the most frequently mentioned themes for the behavioral, normative, and control beliefs to meet the recommended daily intake of fruits and vegetables. Emergent themes were then mapped into a matrix based on a priori coded TPB constructs. Data that could not be coded were later analyzed to determine if they represent a new category or belong to a subcategory of an existing code (Hsieh & Shannon, 2005). The beliefs most frequently reported by focus group participants were selected for inclusion in the researcher-developed survey.

**Phase II**

**Aim 2:** To determine which behavioral, normative, and control beliefs are predictors of attitudes, subjective norms, and perceived behavioral control.

Basic descriptive statistics, such as means, standard deviations, frequencies and percentages were calculated for all study variables as appropriate to describe the sample.
Model assumptions were checked in preliminary analyses to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Internal consistency of the researcher-developed questionnaire was evaluated using Cronbach's Alpha. Multiple regression analyses were used to identify which specific behavioral beliefs, normative beliefs, and control beliefs were the strongest predictor of attitudes, subjective norms, and perceived behavioral control measured by the researcher-developed questionnaire. The dependent variables in the model were attitudes, subjective norms, and perceived behavioral control, and the independent variables were specific behavioral beliefs, normative beliefs, and control beliefs. A p value of < 0.05 was considered statistically significant. All data were analyzed using the statistical software SAS (SAS Institute Inc., Cary, NC). After the quantitative data were analyzed, the results were compared and contrasted with the qualitative findings in phase I. Specifically, themes and quotes from the focus groups were compared with findings from the multiple regression analyses.

**Aim 3:** To determine the influence of attitudes, subjective norms, and perceived behavioral control (PBC) on intention to meet the recommended daily intake of fruits and vegetables over the next 3 months among BEAW.

As with Aim 2, basic descriptive statistics, such as means, standard deviations, frequencies and percentages were calculated for all study variables as appropriate to describe the sample. Model assumptions were checked in preliminary analyses to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Internal consistency of the researcher-developed questionnaire was evaluated using Cronbach's Alpha. Pearson correlation tests were used to examine the bivariate associations among the variables of the TPB model. Hierarchical multiple
linear regression analyses were used to identify whether attitude, subjective norms, or perceived behavioral control is the strongest predictor of behavioral intention measured by the researcher developed questionnaire. The dependent variable in the model was intention, and the independent variables were attitudes, subjective norms, and perceived behavioral control. A p value of < 0.05 was considered statistically significant. All data were analyzed using the statistical software SAS (SAS Institute Inc., Cary, NC).

**Exploratory Aim:** Determine the influence of attitudes, subjective norm and PBC on fruit and vegetable consumption in Black emerging adult women.

Basic descriptive statistics, such as means, standard deviations, frequencies and percentages were calculated for all study variables as appropriate to describe the sample. Multiple regression analysis of the value for total daily number of servings with the TPB variables was generated. All data were analyzed using the statistical software SAS (SAS Institute Inc., Cary, NC).

**Ensuring Quality**

Though a mixed methods study, the rigor of the qualitative study was appraised differently from the quantitative study due to differences in the underlying philosophical perspectives of each approach (Grove, Burns, & Gray, 2013). Whereas quantitative rigor was ensured with the protocol for data collection and analysis, several measures were employed with the qualitative data. Detailed field notes were recorded immediately following the focus group interviews. To ensure trustworthiness, peer debriefing occurred with the dissertation committee and members of the Advanced Qualitative Collective (AQC) at the University of Pennsylvania. The individuals in the AQC (Abboud et al., 2016) are not associated with the study, but are well versed in qualitative methods and
provided feedback about the work presented. According to Elo and colleagues (2014), transferability, conformability, and credibility are linked to convey trustworthiness when reporting the results of content analysis. To enhance transferability, the findings of the present study are presented together with appropriate quotations (Graneheim & Lundman, 2004). Conformability was achieved by presenting the data to accurately reflect the information provided by participants (Elo et al., 2014). Credibility of the research findings deals with how well the categories and themes cover the data. The first step to achieving credibility is to continue interviews until data saturation has been reached (Milne & Oberle, 2005), which was done for this study.

**Ethical Considerations**

Prior to data collection, permission to conduct this study was obtained from the Institutional Review Board of the University of Pennsylvania. Written informed consent was obtained from all participants in Phase I and II. The main risks associated with this study were risk of fatigue during data collection, and breach of confidentiality.

*Risk of fatigue:* During data collection, risk of fatigue was possible due to subject burden. To minimize the risk of fatigue during data, questionnaires were chosen to be as short as possible. All data collection was scheduled at a time convenient for study participants. During data collection study participants were encouraged to take a break and rest for a few minutes if necessary.

*Breach of confidentiality:* There was a potential risk to the participants with respect to breach of confidentiality. All study visits were conducted in a private room at the University of Pennsylvania, or a community site that was convenient for participants. As part of the process involved in obtaining written informed consent, all participants were
reminded that their responses are confidential and that they may refuse to participate in the proposed study or withdraw at any time without explanation. Participants were also asked to keep all focus group discussions confidential.
CHAPTER 4

Results

This was a mixed methods study using the Theory of Planned Behavior (TPB) as a model to understand behavioral intentions for eating the recommended daily intake of FVs among BEAW. In each subsection, the presentation of the results will be guided by the specific aims and the TPB variables. The chapter concludes with a summary of the results from both subsections.

Results of Qualitative Analysis

Aim 1: To elicit BEAW’s behavioral, normative, and control beliefs associated with intention to meet the recommended daily intake of fruits and vegetables over the next 3 months.

Twenty-seven BEAW with a mean age of 24 completed the focus groups. Participants were mostly full time students. The annual household income reported by a majority of the participants was greater than thirty thousand. Participant demographics are reported in Table 4. The salient or top of the mind beliefs about eating FVs were obtained from an open-ended free-format response questionnaire with questions similar to those posed during the focus groups. A deductive approach was used to content analyze participant responses into themes (behavioral beliefs, normative beliefs, control beliefs) based on the TPB, and listed in order from most frequently mentioned to least frequently mentioned (Figure 3). Theme-related passages were also selected for use as code exemplars.
Table 4

Demographic Characteristics of Focus Group Participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years) (SD)</td>
<td>24.5 (±3.5)</td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>7</td>
<td>25.9</td>
</tr>
<tr>
<td>Part time</td>
<td>6</td>
<td>22.2</td>
</tr>
<tr>
<td>Student</td>
<td>11</td>
<td>40.7</td>
</tr>
<tr>
<td>Self-employed</td>
<td>2</td>
<td>7.4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td>Education</td>
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<td></td>
</tr>
<tr>
<td>Less than high school</td>
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<td>3.7</td>
</tr>
<tr>
<td>High school graduate</td>
<td>3</td>
<td>11.1</td>
</tr>
<tr>
<td>Some college</td>
<td>4</td>
<td>14.8</td>
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<tr>
<td>College graduate</td>
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<td>40.7</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>8</td>
<td>29.6</td>
</tr>
<tr>
<td>Household Income</td>
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<td></td>
</tr>
<tr>
<td>&lt;$30,000</td>
<td>8</td>
<td>29.6</td>
</tr>
<tr>
<td>&gt;$30,000</td>
<td>12</td>
<td>44.4</td>
</tr>
<tr>
<td>*missing</td>
<td>7</td>
<td>26.0</td>
</tr>
</tbody>
</table>
Behavioral Beliefs

The most salient behavioral beliefs associated with meeting the recommended daily intake of fruits and vegetables identified by participants were weight loss, increased perceived energy, and nutrients. Increased bowel movements and bloating were coded as gastrointestinal reaction. Overwhelmingly participants acknowledged the importance of consuming the recommended daily intake of FVs. Participants especially understood that the benefits of consuming FVs far outweighed the reasons for not meeting the daily recommendations. One participant stated:

People are dying, you know...so, even like the excuses I guess I tell myself to like, kind of excuse myself into eating however the hell I want to...verbalizing it, it was
like, so corny. It was so whack they’re not legitimate enough for me not to act like I have a sense, to eat like I love myself basically.

**Weight loss:** Participant in this study believed that weight loss was associated with consuming low calorie foods and replacing unhealthy foods with FVs.

When asked to speak directly to the advantage of eating fruits and vegetables for weight loss, one BEAW stated:

I think fruits and vegetables are generally low calories. Like, everybody who's really trying to lose weight and stuff...people are always just eating fruits and vegetables. So, they um, low calories can help with weight loss.

Another participant stated:

Uh, also just weight loss. I think if you're eating more fruits and veggies, you're probably eating less of [the unhealthy foods]- well, you don’t know but... You never know. You can be eating both. But if you eat fruits and veggies you could lose more weight.

**Perceived Energy:** Participants described perceived energy as the ability to engage in activities without feeling tired or lacking mental clarity.

Increased perceived energy was widely endorsed by BEAW as an advantage of eating FVs. To illustrate this, one participant stated:

I'm mostly plant based but I do have cheese. But eliminating um, dairy...it just changed. I had so much more energy. I stopped needing to take naps. And it's like when you're...when you have energy your mind is clear and then it also um, contributed to me being happier.

Another participant stated:

It like makes me feel good, it gives you energy, and makes it easier for you to go to the bathroom, like when you eat a lot of fruits and vegetables. You just feel like, lighter. Like, emptier.
**Nutrients:** The participants believed that nutrients were properties innate to FVs that include vitamins, minerals, and fiber.

The nutrients contained in FVs were also frequently mentioned by participants. Speaking on the nutrients in FVs, Kat stated:

> just basic nutritional value and vitamins because so many of these um, foods carry the essential vitamins and nutrients that we need without people having to take a vitamin supplement...If you clearly have a deficiency...like, a significant deficiency and like, a particular - like, if you're vitamin D deficient or something like that. Like, you should probably take some supplements for it. But for people who have a balanced lifestyle and eat a lot of fruits and vegetables, and things like that...it's like, that's the natural source of these things. And so, you don't need to like, supplement it with additional vitamins because you're getting it from your food. So, basically food is medicine.

Speaking on the benefits of consuming FVs for nutrients, another participant stated:

> Um, I would say just fiber. I think a lot of women in our age group don't get enough fiber, particularly when they I guess...even transition to an older age group, fiber might be uh, a bigger necessity. Uh, yeah...just being regular and, yeah...getting your fiber.

**Boring/Monotonous:** Participants described boring/monotonous as repetitively consuming the same FVs on a daily basis due to lack of variety.

When discussing the disadvantages of eating FVs, participants most often referenced the disadvantages to accessing FVs, not the disadvantage to the individual. The disadvantage to the individual most identified by BEAW referred to monotony of eating FVs daily.

One participant stated:

> I don't think there would be any disadvantages. You'd just get...some people get tired of eating the same things over and over again. Like me, I get tired of eating the same stuff and I just stop...I won't eat it and it makes me not like it anymore.

Another participant, Camille, stated:

> I think for me, what makes it hard is a lack of exposure to knowing about different fruits and vegetables. Because like, if you think about it...like, most
people...especially when it comes to vegetables...like, when you tell someone to name a vegetable, they'll name something like spinach, carrots, and it's always like this pattern of the same vegetables. So, like when it's time to eat it...it's like, okay I'll have broccoli, I'll have carrots. But it's like, how many times are you going to have the same vegetable over and over. It's like, I don’t want to have broccoli again...so it's like if I had more exposure to a wide variety of vegetables, I'd be willing to eat them more often because I'd have a lot of different things to choose from, as opposed to people who don’t have that much knowledge only know like, about certain ones and they probably aren't eating them a lot of the time and get tired of them.

The psychological component of eating was a novel theme that emerged across all 3 focus groups.

**Psychological:** participants believed their decisions about consuming FVs were influenced by a psychological component which included eating for comfort, as well as to relieve stress, and anxiety.

The psychological component of eating was illustrated in the comment by Soni, who stated:

I think stress, anxiety, depression, makes it really hard to eat healthy. Because as I said, I was vegan when I started my PhD program...and I am vegan no more. And it was always like, the most hectic times...like, when I was doing my masters I stopped...I started eating cheese, and ice cream, and dairy because when you're in that...you know, those circumstances...you're in survival...you're on autopilot when you reach for the sugar and you eat it. It gives you this immense satisfaction and it's a relief from that stress. It like, tastes so good to have that you know, ice cream when you're feeling stressed and you don’t want to deal with the world. So, I think stress, anxiety, depression, and you know, other factors that are similar to those mental things definitely make it hard to say...hey, I'm going to have will power...I'm going to like, stick to what I really know is going to be better for me in the long run.

Another participant stated:

Um, when I need comfort um, I get Chipotle and when I'm having a really, really bad day...I reach for that Rocky Road ice cream and I eat all of it because that's just what helps me...because I'm a crier. But like, I don’t know...food just comforts me and like, strawberries don’t do it for me. I like them but in that moment like, it's not what I need.
Normative Beliefs

The most salient normative referents identified by BEAW during the elicitation study were family (i.e. parents, spouse, siblings), friends, and healthcare providers (i.e. doctor, nutritionist).

Family: participants described family as parents, spouse, and siblings.

Speaking on the influence of family members as it relates to eating FVs, Nicole stated:

I have some family members who say like, when I thought about being vegetarian or I thought about being vegan, which is like, to the extreme...saying that I'm being bougie or that I've changed since I've moved out east and you know, doing this, doing that. Where it's like, oh you think you're better, you're trying to be a skinny minnie.

Another participant stated:

I feel like it's alongside this long standing stigma that to be interested in being healthy is um elitist...you know, culturally irrelevant, only white people do that, or hippies do that...It's like, we live in a world where you decide you're only going to have plant-based foods, there's something wrong with you and people judge you for it...It's people trying to make you feel bad about your decisions to care for your own body and make you feel like something's wrong with you.

Peers: participants described peers as classmates, co-workers, and close friends.

The feeling of being ridiculed/judged for the decision to eating FVs was also referenced in relation to peers. To illustrate this point, one participant stated:

I stopped eating carbs after like, 3pm and then I would eat fruits and vegetables in the evening. So, I had evening clinical and every day at clinical I would have my salad. And every day, they'd be like, oh you brought another salad...you're not hungry? Like, it's not really supportive...And I mean, it's not an easy thing to do, so it makes it hard for you to do it when people are like...why don’t you just eat like, a burger?
To further illustrate the influence of peers on the choice to eat FVs, another participant stated:

Um, I would say friends who do not care about like, fruits and vegetables. So, kind of peer pressure. Like, if you're eating - if you're going out with your friends to eat and they don't like fruits and vegetables...if you do try to get that like, they'll be like...what are you doing?

The concern about the significant other’s (spouse, boyfriend, girlfriend) perception of body size also had an influence on eating FVs. One participant stated:

If he likes you, you know, likes you thick. And you start eating all those fruits and vegetables...his [love] handle is getting a little low, he probably wouldn’t like it.

Control beliefs

The most salient control beliefs identified by participants in the elicitation study were cost, time, and access. Time was categorized to include preparation, cooking, and schedule.

Cost: Participants believed the price of FVs are expensive, and a financial burden.

One participant stated:

With fruits like strawberries. Like, it's so expensive. You know...the little eight-ounce thing is $5, sometimes $6. I mean, it's so long that I'm like, I'm done with this...I'm only buying this shit when it's on sale... When you eat mostly fruits and vegetables it goes fast. That thing of strawberries, you can sit there in one sitting and you're done and you spend $4. So, I've gotten so inured to paying for it...that now I'm done and I will only by like, that tiny little thing of those premium fruits when it's on sale. But otherwise, yeah. It's a big struggle, it's really expensive.

Another participant stated:

When I think about like, costs of fruits and veggies...I always add in the cost of gas. so, I live in like, northwest Philly. And so, I'm not far from the Fresh Grocer, but I only go there if I absolutely have to. Um, but within like, a three-mile radius, there's three Shop Rite's, but they don't have the same quality of produce. So, I always go to the one that's like, all the way in Cheltenham. And that's a little bit of a drive.
**Time:** Participants believed that time included grocery shopping, preparing the food, cooking the food, and the ability to accomplish the aforementioned based on the individual’s schedule. To illustrate this Sara stated:

I get everything at the same place because of the time factor. I always say, oh I want to go to like, Produce Junction and go somewhere where it's like, they definitely have lots of fresh produce and options. Um, but it's hard. It's really hard to get there and go to separate places to get separate types of food. I don't have time for that yet, I don’t think...and I don’t know if I ever will.

Another participant added:

I've thrown out so many fruits and vegetables, thinking I'm going to get to them before...and then I don't. So, it's like, I spend money and then it went bad...I mean, and I just can't get to the grocery store every few days. It's not part of my...it's just not...it's just too difficult for me at this time in my life. I think as I get older and maybe settle down and like, maybe I'm just working and like, that's all then like, I'll be able to get to the grocery store more often but right now, it's really hard.

**Access:** Participants described access in reference to the availability of FVs, as well as the proximity of unhealthy food options.

Accessibility of FVs was mentioned by participants in all focus groups as influencing their decision to eat FVs. An example of this was the comment by Renee:

I think accessibility is something that makes it easier. Like, where I'm from we don’t have fruit trucks and stuff. So, there's no way for me to buy like, an assortment of fruits on our way to here or there.

Another participant, Shira stated:

If there were fresh fruits and vegetables that were easier to buy like, on the go...uh, especially because like - well, if you go somewhere like, Starbucks or Wawa, it's like...a single banana and they want to charge like, $1 for, and that's crazy. But if it was cheaper and um, more accessible because you can buy a whole head of lettuce for like nothing but you’re not going to eat a whole head of lettuce in one sitting.
Although access in terms of obtaining FVs was most often listed as a barrier, access to unhealthy options was also identified as a barrier to eating FVs. This was illustrated by Angelica who stated:

So, there's like the one convenience that can help and then there’s convenience that can hurt. So like, for instance um...there's food trucks right around the corner, but for me, that vending machine is right on the first floor in my building. So, the fact that I'm not even making an effort just to go there and grab something else um...that hurts as well.

Another participant stated:

So, when I'm at home if I feel like cooking, I'm more likely to eat what I bought from the grocery store. Um, but what I have noticed is you know, like, when I come to work there are a lot of like...food trucks, and you know, a lot of options that are you know, unhealthy. It smells good, I'm outside, so I feel like I'm more likely to buy it and go to GiGi's Truck and get macaroni and cheese. Um, so you know, like if it's convenient and if there's a salad like, nearby then I'd be up for that but...if not...we're going to go to the bad stuff.

**Results of Quantitative Analysis**

A convenience sample (Table 5) of 100 BEAW had their height and weight measured, completed the National Institute All Day Screener, the Short Form Six Item Food Security Module, and a researcher developed survey based on the TPB constructs and the elicitation study. Mean age for participants was 21.1 (±2.7), with 75% of the sample identifying as college students. Participants had a mean BMI of 26.2 kg/m² (±5.6) with 49.4% of the participants classified as healthy weight, 48.4% classified as overweight/obese, and 2.2% as underweight. Food security status was closely distributed for participants with 49% reporting being food secure and 51% identifying as food insecure. Of those identifying as food insecure, 16% reported very low food security.
### Table 5
Demographic Characteristics of Survey Participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years) (SD)</td>
<td>21.1 (±2.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>91</td>
<td>91%</td>
</tr>
<tr>
<td>25-30</td>
<td>9</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>Part-time</td>
<td>15</td>
<td>15%</td>
</tr>
<tr>
<td>Student</td>
<td>75</td>
<td>75%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 12 or GED</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>College 1 year to 3 years</td>
<td>75</td>
<td>75%</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>6</td>
<td>6%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>Graduate/Professional Degree</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Weight Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Body Mass Index (kg/m²) (SD)</td>
<td>26.2 (±5.6)</td>
<td></td>
</tr>
<tr>
<td>Underweight/healthy weight</td>
<td>46</td>
<td>51.6%</td>
</tr>
<tr>
<td>Overweight/obese</td>
<td>43</td>
<td>48.4%</td>
</tr>
<tr>
<td>*missing=11</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Food Security Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food secure</td>
<td>49</td>
<td>49%</td>
</tr>
<tr>
<td>Food insecure</td>
<td>51</td>
<td>51%</td>
</tr>
</tbody>
</table>
Table 6

Food Security Module Frequency

<table>
<thead>
<tr>
<th>FSM</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>31</td>
<td>31.00</td>
<td>31</td>
<td>31.00</td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>18.00</td>
<td>49</td>
<td>49.00</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>18.00</td>
<td>67</td>
<td>67.00</td>
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<tr>
<td>3</td>
<td>12</td>
<td>12.00</td>
<td>79</td>
<td>79.00</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>5.00</td>
<td>84</td>
<td>84.00</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>9.00</td>
<td>93</td>
<td>93.00</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>7.00</td>
<td>100</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Food security status was assigned based on the following (Bickel et al., 2000):

- Raw score 0-1—High or marginal food security
- Raw score 2-4—Low food security
- Raw score 5-6—Very low food security

Researcher Developed Survey

The indirect measurements (behavioral, normative & control beliefs) were obtained from content analysis of the focus groups. The behavioral beliefs (Table 7), normative beliefs (Table 8), and control beliefs (Table 9) appearing most frequently were converted into statements to reflect beliefs which might influence the behavior of BEAW. It is recommended that 75% of all stated beliefs should be included in the survey (Francis et al., 2004). Novel concepts (i.e. organic FVs, negatively judged by salient referents, and
availability of a community garden) mentioned by participants during focus group discussions were also included as survey items.

*Behavioral beliefs* were commonly held beliefs about the likely consequences of consuming 2 cups of fruit and 2.5 cups of vegetables daily for the next 3 months.

**Table 7**

Frequency Count of Behavioral Beliefs

<table>
<thead>
<tr>
<th>Behavioral Beliefs</th>
<th>Frequency</th>
<th>Disadvantages</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>12</td>
<td>Expensive</td>
<td>7</td>
</tr>
<tr>
<td>Energy</td>
<td>11</td>
<td>Boring</td>
<td>5</td>
</tr>
<tr>
<td>Nutrients</td>
<td>8</td>
<td>None</td>
<td>3</td>
</tr>
<tr>
<td>Fiber</td>
<td>4</td>
<td>Increase bowel movements</td>
<td>2</td>
</tr>
<tr>
<td>Better Skin</td>
<td>4</td>
<td>Bloating</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time to prepare</td>
<td>2</td>
</tr>
</tbody>
</table>

*Normative beliefs* were the commonly held beliefs about which groups, or categories of reference groups who are likely to apply social pressure or have expectations of BEAW to eat 2 cups of fruit and 2.5 cups of vegetables daily for the next 3 months.
Table 8

Frequency Count of Normative Beliefs

<table>
<thead>
<tr>
<th>Normative Beliefs</th>
<th>Approve</th>
<th>Frequency</th>
<th>Disapprove</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td></td>
<td>18</td>
<td>No one</td>
<td>16</td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td>14</td>
<td>Friends</td>
<td>4</td>
</tr>
<tr>
<td>Healthcare professionals</td>
<td></td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myself</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everyone</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control beliefs were the presence of factors that either hindered or facilitated BEAW’s ability to eat 2 cups of fruit and 2.5 cups of vegetables daily for the next 3 months.

Table 9: Frequency Count of Control Beliefs

<table>
<thead>
<tr>
<th>Control Beliefs</th>
<th>Easy</th>
<th>Frequency</th>
<th>Hard</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheaper FVs</td>
<td></td>
<td>6</td>
<td>Expensive</td>
<td>7</td>
</tr>
<tr>
<td>More Money to Buy</td>
<td></td>
<td>4</td>
<td>Time/schedule</td>
<td>5</td>
</tr>
<tr>
<td>Access</td>
<td></td>
<td>4</td>
<td>Finances/limited budget</td>
<td>4</td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td>3</td>
<td>Access</td>
<td>4</td>
</tr>
<tr>
<td>Knowing how to prepare</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meal Prepping</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reliability

To measure the internal consistency of the items on the researcher developed survey, Cronbach’s alpha coefficients were determined. For the theory of planned behavior, an alpha > 0.6 for all the direct measures is deemed acceptable (Francis et al., 2004). Internal consistency criterion was met for all measures included in the researcher developed survey (Table 10).

Table 10

<table>
<thead>
<tr>
<th>Key Concepts</th>
<th>Example of Related Survey Items &amp; Number of Items in Survey</th>
<th>Reliability (Cronbach’s alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>“I intend to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months” (5 point Likert scale, strongly disagree to strongly agree); 3 items.</td>
<td>0.80</td>
</tr>
<tr>
<td>Attitude</td>
<td>“For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months…” (5 point Likert scale, very worthless to very useful); 4 items.</td>
<td>0.86</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>“It is expected of me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months” (5 point Likert scale, strongly disagree to strongly agree); 4 items.</td>
<td>0.71</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>“I am confident that I could eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months” (5 point Likert scale, strongly disagree to strongly agree); 2 items.</td>
<td>0.83</td>
</tr>
</tbody>
</table>

**Pearson Correlation for TPB Constructs**

The Pearson correlation coefficient ($r$), which measures the strength of the linear association between two variables was calculated for the TPB constructs. Although all variables in the TPB demonstrated significant correlations (Figure 4) with behavioral intentions, perceived behavioral control exhibited the strongest correlation ($r=0.68$, $p<0.0001$).
Figure 4
Pearson correlations between intention and behavioral attitudes, subjective norms, and perceived behavioral control. *=significant association between variables (P< 0.0001) **=significant association between variables (P<0.05).

The researcher developed tool was checked for test retest reliability by 12 participants at a 2-week interval. The means for each participant response was calculated for time 1 and time 2. Next, test retest reliability was evaluated using the intraclass correlation coefficient (ICC) and Pearson test (Weir 2005; Martinez-Vega et al., 2016). Similarities in results were obtained using both methods (Table 12). In addition, interaction plots for each theoretical construct was generated to show the relationship between participant responses at time 1 and time 2. Similar to the results of the ICC and person test, the plots demonstrate that participants were consistent in their responses at both time points for intention, attitude, and PBC.
Table 11
Pearson Correlation and Intraclass correlation

<table>
<thead>
<tr>
<th>Concept</th>
<th>Pearson correlation, r</th>
<th>Intraclass correlation (Shrout-Fleiss Single Score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention</td>
<td>0.80*</td>
<td>0.81</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.68*</td>
<td>0.67</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>0.48</td>
<td>0.48</td>
</tr>
<tr>
<td>PBC</td>
<td>0.83**</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*=significant for p<0.05    **significant for p<0.001

While we obtained acceptable reliability for intention, attitude and PBC, moderate reliability was observed with subjective norms. The measures displaying acceptable reliability indicate that there is a statistically significant association between time 1 and time 2; therefore, participants were consistent in their responses. Although subjective norms display a clinically relevant correlation at 0.48, the value was not statistically significant. The non-significant p value for subjective norms suggests that the sample size of 12 did not have enough power to detect associations.

**Aim 2:** To determine which behavioral, normative, and control beliefs are predictors of attitudes, subjective norms, and perceived behavioral control.

*Hypothesis 1a:* Weight loss as a consequence of eating FVs will be a significant predictor of attitudes.

Using multiple regression, we regressed attitudes on all of the predictor variables (lose weight, nutrients, perceived energy) of behavioral beliefs. Weight loss was not supported to be significant predictor of attitudes in a model of the behavioral beliefs; however, the model itself
was significant ($p=0.0016$). This was an indication of a possible high degree of correlation between the variables. To test for intercorrelation we generated a correlation matrix of the behavioral beliefs. The Pearson moment correlation indicated significant correlations between the variables (perceived energy, lose weight, nutrients). Given the results of the Pearson moment correlation, the individual predictors were regressed with the outcome (attitude). Using perceived energy as an individual predictor of attitude was significant ($p<0.01$), suggesting that perceived energy does effect attitude but when you control for lose weight, nutrients, and negatively judged, that effect becomes non-significant because of the intercorrelation among the variables. Although lose weight demonstrated evidence of intercorrelation, lose weight was a non-significant predictor of attitudes. Nutrients was a significant predictor of attitudes ($p<0.05$); however, nutrients effect is non-significant in a model with all the predictors.

**Hypothesis 2**: Family, friends, and significant other (spouse, boyfriend, girlfriend) will be significant predictors of subjective norms.

The hypothesis was supported, with family ($p<0.0001$), friends ($p<0.05$), and significant other ($p<0.05$) as significant predictors of subjective norms.

**Hypothesis 3a**: The availability of supermarket/grocery store within walking distance will be a significant predictor of perceived behavioral control.

**Hypothesis 3b**: Time (preparation, cooking, schedule) will be a significant predictor of perceived behavioral control.

**Hypothesis 3c**: The price (cheaper) of FVs will be a significant predictor of perceived behavioral control.

In a model with all the predictors, time and price were not significant predictors of perceived behavioral control. However, availability of a supermarket nearby ($p<0.05$)
was a significant predictor of perceived behavioral control. Similar to the model for attitudes we tested for evidence of intercorrelation by generating a correlation matrix. The Pearson moment correlation indicated significant associations for cheaper, organic, transportation, and supermarket nearby. In a model with cheaper, had time, and transportation as individual predictors of PBC, none of these control beliefs had a significant effect on PBC. Organic (p<0.01) and supermarket (p<0.01) as individual predictors are significant predictors of PBC.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Standardized coefficient</th>
<th>Standard error</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrients</td>
<td>0.221</td>
<td>0.370</td>
<td>0.0272</td>
</tr>
<tr>
<td>Perceived Energy</td>
<td>0.312</td>
<td>0.079</td>
<td>0.0016</td>
</tr>
<tr>
<td>Family</td>
<td>0.357</td>
<td>0.087</td>
<td>0.0002</td>
</tr>
<tr>
<td>Friends</td>
<td>0.231</td>
<td>0.089</td>
<td>0.0153</td>
</tr>
<tr>
<td>Significant other</td>
<td>0.221</td>
<td>0.068</td>
<td>0.0160</td>
</tr>
<tr>
<td>Organic FVs</td>
<td>0.270</td>
<td>0.094</td>
<td>0.0068</td>
</tr>
<tr>
<td>Supermarket nearby</td>
<td>0.315</td>
<td>0.095</td>
<td>0.0015</td>
</tr>
</tbody>
</table>

**Aim 3:** To determine the influence of attitudes, subjective norms, and perceived behavioral control (PBC) on intention to meet the recommended daily intake of fruits and vegetables over the next 3 months among BEAW.

**Hypothesis 4:** Consistent with the TPB model, attitudes, norms, and PBC will all be significant predictors of intention.
**Hypothesis 5:** Attitudes and perceived behavioral control will be the strongest predictors of intention to meet the recommended daily intake of FVs.

To test our hypotheses, we conducted a hierarchical multiple regression analysis with intentions as the outcome, and attitudes, subjective norms, and PBC as the predictors. In Step 1 intentions were regressed on attitudes and subjective norms. In this model, attitudes (p<0.0001) and subjective norms (p<0.05) were significant predictors of intentions to consume the recommended daily intake of FVs.

**Table 12**
Hierarchical Multiple Regression

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>Standardized Coefficient</th>
<th>Standard Error</th>
<th>P-value</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Attitudes</td>
<td>0.475</td>
<td>0.107</td>
<td>&lt;.0001</td>
<td>$0.305$</td>
</tr>
<tr>
<td></td>
<td>Subjective Norms</td>
<td>0.204</td>
<td>0.093</td>
<td>0.0202</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Attitudes</td>
<td>0.295</td>
<td>0.091</td>
<td>0.0001</td>
<td>$0.559$</td>
</tr>
<tr>
<td></td>
<td>Subjective Norms</td>
<td>0.128</td>
<td>0.076</td>
<td>0.0714</td>
<td>$0.254$</td>
</tr>
<tr>
<td></td>
<td>Perceived Behavioral Control</td>
<td>0.545</td>
<td>0.054</td>
<td>&lt;.0001</td>
<td></td>
</tr>
</tbody>
</table>

In Step 2, intentions were regressed on attitudes, subjective norms, and PBC. In this model, attitudes (p=0.0001) and PBC (p<0.0001) were revealed to be significant predictors of intentions, with PBC accounting for the greatest variance in intentions. The
change in R squared from Step 1 (R²=0.304) and Step 2 (R²=0.559), was 0.255 (F=40.08, p<0.0001) indicating that PBC significantly increases the intention of BEAW to consume the recommended daily intake of FVs.

**Assessing Moderation by BMI**

BMI and age were tested as covariates with the theoretical constructs. We hypothesized that age would not influence the outcome since the age of participants in our study was homogenous. BMI was also not significant in a model with all the theoretical predictors. A non-significant p-value for BMI suggests the a priori analysis was not powered to detect these differences; therefore, a sample size of 100 would not be sufficient. In a generalized linear model, we tested whether BMI was a moderator of the TPB variables. In separate analyses we found that BMI is not a moderator of the relationship between attitudes and intentions. Similarly, BMI was not a moderator of the relationship between subjective norms and intentions. BMI is a moderator of the relationship between PBC and intention (p<0.05). When BMI was categorized as a binary variable (normal weight vs. overweight/obese), we found that for normal-weight participants PBC predicts intention better than for participants with overweight/obesity. This relationship was non-significant for attitudes and subjective norms.

**Exploratory Aim:** To determine the influence of attitudes, subjective norm and PBC on fruit and vegetable consumption in BEAW.

The mean intake (Table 14) of FVs by BEAW was generated from the NCI questionnaire. The results of the screener indicate that BEAW consume more fruits than vegetables. For each participant, the today daily servings of FVs were calculated by multiplying the frequency responses of times per day participants consume FVs by the
number of servings of FVs based on the reported portion size and summing these products across all sources of FVs (Thompson et al., 2002).

Table 13

NCI Screener Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRTVEG</td>
<td>0.11</td>
<td>21.77</td>
<td>3.68</td>
<td>3.82</td>
</tr>
<tr>
<td>JUICE</td>
<td>0.03</td>
<td>12.50</td>
<td>1.04</td>
<td>1.86</td>
</tr>
<tr>
<td>FRUIT</td>
<td>0.02</td>
<td>7.50</td>
<td>0.88</td>
<td>1.28</td>
</tr>
<tr>
<td>LSALAD</td>
<td>0.02</td>
<td>6.00</td>
<td>0.47</td>
<td>0.89</td>
</tr>
<tr>
<td>FRFRY</td>
<td>0.01</td>
<td>3.75</td>
<td>0.21</td>
<td>0.46</td>
</tr>
<tr>
<td>WHPOT</td>
<td>0.02</td>
<td>10.00</td>
<td>0.43</td>
<td>1.26</td>
</tr>
<tr>
<td>DRBEAN</td>
<td>0.02</td>
<td>2.50</td>
<td>0.29</td>
<td>0.47</td>
</tr>
<tr>
<td>OTHVEG</td>
<td>0.02</td>
<td>4.50</td>
<td>0.67</td>
<td>0.98</td>
</tr>
<tr>
<td>TOMSAUCE</td>
<td>0.02</td>
<td>3.00</td>
<td>0.26</td>
<td>0.44</td>
</tr>
<tr>
<td>VEGSOUP</td>
<td>0.02</td>
<td>1.60</td>
<td>0.21</td>
<td>0.31</td>
</tr>
</tbody>
</table>

A regression analysis of the value for total daily number of servings (FRTVEG) with the TPB variables was generated. Attitudes and subjective norms were not predictive of BEAW consuming fruits and vegetables. PBC was predictive (p<0.05) of BEAW consuming fruits and vegetables.

<table>
<thead>
<tr>
<th>TPB Constructs</th>
<th>Standard Error</th>
<th>Standardized coefficient</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>0.586</td>
<td>-0.049</td>
<td>0.645</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>0.487</td>
<td>0.122</td>
<td>0.235</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>PBC</td>
<td>0.345</td>
<td>0.240</td>
<td><strong>0.027</strong></td>
</tr>
</tbody>
</table>

**Mixed Methods Findings**

After analysis of the quantitative data, the findings were compared and contrasted with the qualitative data. Analysis of the quantitative data revealed several statistically significant findings, reported in detail above. These findings provide support for specific beliefs from the qualitative study and the use of the Theory of Planned Behavior as a framework to address FV intake among BEAW.

*Nutrients (β=0.221) and perceived energy (β=0.312) are significant predictors of attitude.*

BEAW who believed FVs provide nutrients and promote perceived energy had a more positive attitude about meeting the recommended daily intake of FVs. These findings were supported by data from the qualitative study. As one focus group participant stated,

Yeah, and also just the smaller ways that [eating FVs] affects your health. So, like...since I've been trying to drink more water recently and that's just helped me feel like I've had more energy. And so, I think if someone’s would have told me that though, I would have been more inclined to do that much quicker or to adopt that into my life. Like, if you feel tired then you should try this. Or if your skin is breaking out, then you should try that.

*Family (β=0.357), friends (β= 0.231) and significant other (β= 0.221) are significant predictors of subjective norms.*

Perceived social pressure from salient referents is associated with meeting the recommended daily intake of FVs among BEAW. These findings are consonant with statements made by BEAW during the qualitative phase of this study. As one participant
stated,

But I think that they are just...particularly in social situations where you are out with one other person or a group of people who don’t necessarily have the same consciousness about eating particular foods that you might. It just makes it more...it's almost like a shaming. It's not necessarily like a disapproval, it's just like... Like, one time I went to a bar and I ordered a salad like, at the bar and they were like...why would you get a salad at the bar? You know like, why wouldn’t you get wings or whatever? I ordered a salad, I'm trying to get my intake of vegetables for the day, even in a bar [laughs]. I think it's just like, it's more so for me, in social situations and like, going out. It's like, going out to eat and things like that. And if the person is not eating...if they order a burger and you're like, oh can I get this like, vegan burger or can I get like, a salad or something like that? It automatically puts it; oh you're trying to be healthy.

The availability of organic FVs (β=0.270) and a supermarket nearby (β= 0.315) are significant predictors of perceived behavioral control.

BEAW are more confident in their ability to meet the recommended daily intake of FVs when they have access to organic produce and a supermarket within walking distance.

These findings were supported by data from the qualitative study. Speaking on the importance of organic FVs, Mary stated:

Being more confident in what's in the market because I mean, I hear somebody saying, the bananas have this and the fruits have that and they're GMO, and they have all these things. Like, being more confident in what's available in the market...just making sure that it's really - we can be sure that they're organic, and they're good for you, and there's no additions to them. I think that would be something that would make me definitely buy fruits and vegetables more.

Attitudes (β=0.475), subjective norms (β=0.204) and PBC (β=0.545) are significant predictors of behavioral intention.

Attitudes, perceived social pressure, and self-efficacy are associated with behavioral intention to meet the recommended daily intake of FVs among BEAW. Support for these associations were found in participants’ comments from the qualitative study. As stated by one participant, Jay:

So, I feel like it was maybe a week to a week and a half straight, I have packed my lunch every day for work. And you know, like I said, if I wanted chips or
something like that, I had like...yogurt and like, fruit in my lunch bag. And for like, that entire week...So, you know, like in the back of my mind I'm like...yeah, I brought this yogurt because at some point I had intention to eat it and I knew that would be good. But I felt like I wasn't really motivated to do it. So, when it got time for like, snacks and stuff like that...every day I would pull that yogurt out and it would sit right on my desk. Get like cookies or chips from the vending machine and stuff like that. Um, so, I think that like, being motivated and having like, that will power definitely does play a huge role in whether or not you're going to like, change your healthy eating and eating behaviors.

Though several findings from the quantitative and qualitative phases converged, there were findings in the quantitative phase which diverged from the qualitative data.

*Weight loss as a consequence of eating FVs was not significantly associated with attitudes to meet the recommended daily intake of FVs.*

BEAW who believed weight loss would result from meeting the recommended intake of FVs did not have a more positive attitude towards FVs. Contrary to these findings, participants in the focus group discussed weight loss to be an advantage of eating FVs.

*Healthcare professionals were not significantly associated with subjective norms.*

Perceived social pressure from healthcare professionals does not influence BEAW to meet the recommended daily intake of FVs. This finding was contrary to the qualitative data.

*The price of FVs was not significantly associated with perceived behavioral control.*

According to the quantitative findings, the price of FVs does not influence BEAW’s self-efficacy. Contrary to these findings participants in the focus groups listed price as a barrier to meeting the recommended daily intake of FVs. As stated by Tamika,
I think if it was...um, definitely cheaper... fruit is more expensive than other quick, microwaved foods and meals that are more filling. Um, like, being a student and like, working...I need something fast and there's usually...and cheap...and that's usually unhealthy stuff. Like, slices of pizza or microwaved...rather than paying like, a whole bunch of money for some strawberries that's not going to fill me up.

*Time was not significantly associated with perceived behavioral control.*

The quantitative findings on time are contrary to the findings of the qualitative data. During the focus groups, BEAW discussed the varying aspects of time, which they felt hindered their ability to meet the recommended daily intake of FVs. As one participant stated,

I'm a student...I'm shot for time. Like, I don’t have too much time to be like, roasting vegetables all the time [laughs] or sautéing them.

BEAW also discussed time in terms of distance and transportation barriers. As stated by one participant,

I'm not going to get on Septa and go super, super far because it's just more time. Like, I'm going to go down to the store down the street and try to get as much as I can and kind of make the best of the option I have.

*Transportation was not significantly associated with perceived behavioral control.*

For BEAW, transportation was discussed as a barrier to FV intake during the focus groups. However, these findings are not supported by the quantitative data. During discussions on transportation, one participant stated:

Like, I don’t have a car and you know, if I had a car I would definitely take a ride up to Produce Junction and see what's going down [laughs]. You know, and it's like, if there's not a train that's going to take me directly to it...for me it's like, the Co-Op is the closest to me and obviously I appreciate its ideas but...and I told my friend this, if they opened up a Trader Joes where that CVS was, I may not be a Co-Op member for too long [laughs] because it's so much more expensive to shop
at the Co-Op. But transportation is a really big one. Like, if I had a car I would probably be going all different kinds of places like, once a week or once every two weeks to get you know, lots of cheaper, organic produce.

Summary

The results of the qualitative findings indicated how BEAW’s beliefs influenced their intention to consume the recommended daily intake of FVs. Salient behavioral beliefs associated with meeting the recommended daily intake of fruits and vegetables were increased perceived energy, weight loss, and nutrients. Family (i.e. parents, spouse, siblings), healthcare providers (i.e. doctor, nutritionist) and friends were associated with normative beliefs. The most salient control beliefs were time, cost, and access.

In the quantitative component of this study, multiple regression analyses revealed: (a) nutrients and perceived energy are significant predictors of attitude, (b) family, friends and significant other are significant predictors of subjective norms, (c) the availability of organic FVs and a supermarket nearby are significant predictors of perceived behavioral control, (d) attitudes, subjective norms, and PBC are significant predictors of intention with PBC displaying the greatest magnitude of influence on intention, (e) PBC is predictive of FV consumption in BEAW. In addition, BMI is a moderator of the relationship between PBC and intention indicating that subjects with overweight/obesity are less likely to meet the recommended daily intake of FVs if they have low self-efficacy.
CHAPTER 5

Discussion

The main purpose of this sequential exploratory mixed methods study was to understand the factors influencing BEAW’s intention to consume 2 cups of fruits and 2.5 cups of vegetables daily over the next 3 months. Previous studies examining fruit and vegetable consumption among emerging adults is limited and the sample populations in these studies have been predominately white. To my knowledge this is the first study in the extant literature to examine this phenomenon exclusively in BEAW. The results of the qualitative study corroborate and extend prior research on fruit and vegetable consumption. Results from the quantitative portion of this study support the application of the Theory of Planned Behavior as a model of intentions to consume FVs for BEAW. Consistent with the TPB, hierarchical multiple regression analysis on fruit and vegetable intentions revealed that PBC added significant predictive power to BEAW’s intentions, compared to attitudes and norms which is noted in the change to the $R^2$.

Summary of the Qualitative Findings

Prior studies on fruit and vegetable intake during young adulthood have been mixed gender (Larson et al., 2008; Larson et al., 2012) with less than 15% of the sample representing Black young adults. While there are studies on the FV consumption in Black adolescents and adults, little is known about the factors influencing FV consumption in BEAW. This research study qualitatively explored the behavioral, normative and control beliefs among BEAW. The findings of this study provide evidence for the TPB as a theoretical model to address BEAW’s beliefs about consuming the recommended daily intake of FVs.
Behavioral Beliefs

The behavioral beliefs of our participants indicated they were knowledgeable about the health benefits of FVs. Participants accurately identified that FVs provide nutrients such as fiber, vitamins and minerals, are low in calories and would help with weight loss, would provide increased perceived energy, and reduce the risk of chronic diseases such as heart disease, diabetes, and cancer. These findings are consistent with Sheats & Middlestadt’s (2013a) qualitative inquiry which examined the salient beliefs of eating and buying dark green leafy vegetables (DGLV) among 30 adult Mid-Western Black women. Sheats & Middlestadt’s (2013a) findings indicate that 53.3% of participants reported that eating more cups of DGLV would improve health, 50% state eating more cups of DGLV would provide vitamins and minerals, and 23.3% stated eating more cups of DGLV would help with weight loss. For BEAW, the physical and psychological benefits of FVs (i.e. increased energy, mental clarity, and feeling happier) is an important motivator to meet the recommended daily intake. Findings from Lucan and colleagues (2010) study of the promoters and barriers to fruit, vegetable, and fast food consumption among a sample of 40 low-income Black Americans are consistent with our findings on perceived energy. Lucan and colleagues (2010) concluded that for younger adults, the perceived energy giving quality of fruits was a promoter of consumption. The positive association of FVs with psychical and psychological well-being, suggests that interventions targeted to BEAW should consider emphasizing the energy promoting and health benefits of FVs.

The health benefits promoting benefits of FVs are perceived as less significant during times of stress for BEAW. Participants in the current study stated that they do not
receive the same satisfaction from eating FVs as they do with unhealthy foods (ice cream, pop tarts, chips, cookies, candy) during stressful times. For BEAW the reward aspect associated with eating sweet, salty and other highly palatable foods, far outweighs the nutritious benefits of FVs. BEAW’s narratives about stress and food choice was consistent with findings from Antin & Hunt (2012). The study by Antin and Hunt (2012) which qualitatively explored food choice among 20 young adult Black women reported that participants suggested that unhealthy foods were used to decrease stress and provide comfort. Hargreaves and colleagues (2002) in their study of the contextual factors influencing the eating behaviors of 40 Black women also reported Black women’s decision to eat for comfort and indulging in unhealthy foods (i.e. cookies, candy, ice cream) after having a particularly difficult day. Similarly, in their sample of predominately Black women from disadvantaged neighborhoods, Baruth and colleagues (2014) found that depression and finding food comforting were barriers to healthy eating. Together these findings suggest that future studies should consider to what degree the interplay of psychological factors and reward sensitivity to highly palatable foods hinder consumption of FVs among BEAW.

The perceived disadvantage of consuming the recommended daily intake of FVs for BEAW was what participants termed boring/monotonous. For BEAW, FVs were boring due to lack of variety and the belief that FVs are not appetizing. According to BEAW in this study, lack of variety was due to consumption of familiar vegetables (carrots, broccoli, spinach). These findings about familiarity and the importance of taste suggest the need for exposure to a wide variety of FVs may be crucial during childhood and early adolescence. Prior studies (Larson et al., 2008; Larson et al., 2012) have also
found perceptions about taste to be an important factor influencing emerging adults FV consumption. Likewise, James’ study (2004) found the poor taste of healthy foods to be a factor influencing food choice attitudes among Black adults. Based on past studies and findings of this study, exposure to a variety of FVs, in conjunction with tips of various ways to cook/prepare FVs may be a viable strategy to increase FVs consumption in BEAW.

**Normative Beliefs**

Normative beliefs result in perceived social pressure to engage in a particular behavior based on the expectations and approval or disapproval of salient referents. For BEAW, the important referents were family, friends, healthcare providers, and significant others (i.e. partner, boyfriend, husband). Findings from our study suggests that BEAW are more likely to meet the recommended daily intake of FVs if salient referents such as one’s partner, friends, or family support the behavior. The influence of friends and significant others on intentions to consume FVs is consistent with previous findings on young adults (Graham et al, 2013; Larson et al, 2012). Similarly, findings from Berge and colleagues (2012) study on young adult’s health outcomes, indicate that for young adult women there was an increased likelihood of eating FVs if they had a significant other with health promoting attitudes and behaviors.

Although the support of family, friends, and significant others are important to BEAW, study participants’ narratives indicate feeling ridiculed/judged by salient referents for their decisions to eat FVs. To my knowledge, no studies in the existing body of knowledge has identified being ridiculed as a factor influencing FVs consumption in Black women. In the case of BEAW from this study, eating FVs was particularly difficult
due to the perception by family members that eating FVs was culturally irrelevant or an attempt to conform to white culture. The impact of cultural norms on the eating behaviors of BEAW is not surprising. Findings from Airhihenbuwa and Kumanyika’s (1996) study of the cultural aspects of African American eating patterns, noted that many aspects (i.e. flavors, food preparation practices) of eating are culturally defined and may be used consciously or unconsciously to preserve traditions and maintain group identity.

Similarly, participants in James’ (2004) study indicated that the Food Guide Pyramid did not represent the types of foods typically consumed by Black Americans, and that eating healthfully was an attempt to conform to the eating habits of the dominant culture. Taken together, these findings suggest that for Black emerging adult women identity and cultural norms may be linked; therefore, further exploration of cultural identity in the context of FV consumption is warranted.

Control Beliefs

Control beliefs include having the necessary knowledge to make a decision, confidence in the individual’s ability to enact the behavior (i.e. self-efficacy), and the necessary resources to facilitate the behavior. Based on this study, the control beliefs influencing BEAW’s decision to meet the recommended daily intake of FVs are time, cost, and access. Not only did BEAW identify FVs as being expensive, but spoilage concerns, and the physical distance BEAW had to travel to obtain FVs was included in cost considerations. Access was seen as 2 dimensional in that it was both a barrier and a facilitator of decisions to meet the recommended daily intake of FVs. Specifically, BEAW report that accessibility of FVs was low compared to unhealthy food options
which were deemed more palatable. Similarly, time had multiple meanings representing preparation, cooking, and schedule.

The cost of FVs is an important factor impacting BEAW’s decisions to consume FVs. Cost constraints frequently emerged as a hindrance to purchasing FVs. BEAW has identified FVs as boring; therefore, concerns about the expense of FVs may limit variety when shopping. The aforementioned would serve only to perpetuate BEAW’s impression of the monotony of FVs thereby limiting consumption. Our findings on cost considerations for BEAW are consistent with the existing literature (Hargreaves et al., 2002; Henry et al., 2003; James, 2004; Zenk et al., 2011; Reyes et al., 2013; Sheats & Middlestadt, 2013a; Fish et al., 2013; Zachary, Palmer, Beckham, & Surkan, 2013; Baruth et al., 2014) on Black adults. According to findings from Zenk and colleagues (2011), high food prices were an environmental barrier to obtaining food among low income Black women. Similarly, Fish and colleagues (2013) found that shopping for FVs was motivated by cost among low income Black and Latino women. Zachary and colleagues (2013) also noted that for low-income individuals, real time shopping decisions are affected by pricing, perceived quality of the supermarket and its products.

As is commonly reported in the literature, for BEAW access to unhealthy foods and inadequate access to healthy food is a barrier to consuming FVs. The ubiquity of unhealthy food options which BEAW identify with being more appealing than FVs is more readily accessible. As reported by BEAW in the present study, this type of convenience made it more difficult to consume FVs even if they had intentions to consume the FVs they had packed for lunch. The food environment as a barrier to healthy eating among Black adults have been well documented in the literature (Morland et al.,
Time is an important factor influencing BEAW’s decisions to consume FVs. For BEAW, time was multifaceted representing preparation, cooking, and schedule. Our findings on time is consistent with Sheats & Middlestadt’s (2013a) qualitative study on the salient beliefs about eating and buying dark green vegetables among Mid-Western Black women. Among younger adults, Lucan and colleagues (2010) found time to be a barrier to vegetable consumption. In a study by McGee and colleagues (2008) with a predominately Black sample of residents in the Lower Mississippi Delta, time to prepare was also cited as a barrier to healthful food consumption behavior. Similarly, in a study of low income women by Klassen and colleagues (2008) participants reported being less confident that they could eat FVs when time was a factor. To solve the issue of time, BEAW in this study believed prepackaged FVs based on the recommended serving sizes and meal planning strategies may be an effective solution.

Summary of the Quantitative Findings

The current study supports the TPB’s proposition that attitudes, subjective norms, and perceived behavioral control are predictive of intentions (Ajzen, 1991). It also identifies several beliefs held by BEAW that can be used to design culturally targeted interventions geared towards increasing consumption of FVs.

Behavioral Beliefs Predict Attitudes

Two behavioral beliefs were predictive of attitudes among BEAW. Participants who believed they were likely to have increased energy and obtain nutrients from FVs were more likely to consume the recommended daily intake of FVs. Therefore,
interventions for BEAW should consider highlighting these 2 aspects to increase FV consumption. Although focus group participants identified losing weight as a consequence of eating FVs it was not predictive of attitudes. We speculate that participants who believed that eating FVs would lead to weight loss were less likely to meet the recommended daily intake of FVs. This finding underscores the importance of understanding BEAW’s attitudes about weight.

**Normative Beliefs Predict Subjective Norms**

Family, friends, and significant others are predictors of subjective norms. Moreover, family members exert the greatest influence on subjective norms for BEAW. These findings are consistent with the influence of social support on fruit and vegetable intake reported by Shaikh and colleagues (2008). Findings from Shaikh and colleagues’ (2008) systematic review of the psychosocial predictors of fruit and vegetable consumption in adults concluded that social support is one of the strongest predictors of FV intake. Similar findings regarding social influences on food choice and eating behaviors have been noted in studies on emerging adults and Black adults (Hargreaves et al., 2002; McGee et al., 2008; Larson et al., 2012; Condrasky et al., 2013, O’Neal et al., 2014). In their study on the predictors of fruit and vegetable intake in young adulthood, Larson and colleagues (2012) found that healthy eating attitudes of friends and significant others were predictive of higher fruit intake. In a mixed gender study of 627 Black Americans, Condrasky and colleagues (2013) found that participants with higher levels of social support demonstrated higher fruit and vegetable consumption.

**Control Beliefs predict Perceived Behavioral Control**
The availability of a supermarket in walking distance was predictive of PBC for BEAW. A supermarket in walking distance was the strongest predictor of control beliefs, and remained significant even in the presence of the other predictors (i.e. cheaper, time, organic, transportation). Our findings on the importance of a supermarket is consistent with the existing literature (Zenk et al., 2011; Sheats et al., 2014). For example, Zenk and colleagues (2011) in their qualitative study among low income Black women ages 21 to 45, found that the lack of a full service supermarket within walking distance was a barrier to food acquisition. These findings are particularly important given concerns about dietary intake and weight gain during emerging adulthood. Larson, Story, and Nelson (2009) found lower levels of obesity and healthier diets in neighborhoods where residents had better access to supermarkets. Whereas, Walker and colleagues (2010) found a consequence of poor access to supermarkets is the increased exposure to energy-dense foods that are readily available at the local neighborhood convenience stores and fast food restaurants.

For BEAW, having access to organic produce was predictive of PBC. This was supported by research from Zenk and colleagues (2011). Findings from Zenk and colleagues (2011) indicate that low income Black mothers expressed the challenging nature of accessing organic fresh produce. For BEAW in our study, the desire for organic was related to lack of trust in the FVs available for purchase. Perceptions of mistrust as told by participants in focus groups, were a result of genetically modified foods, varying labels for organic products, and social media (i.e. Facebook and Instagram) postings depicting FVs in a negative light. The findings of the present study are similar to findings from James’ (2004) study which noted participants’ distrust of food technology.
Numerous studies (Zenk et al., 2011; Lucan et al., 2011; Reyes et al., 2013; Fish et al., 2013; DiSantis, Grier, Oakes, & Kumanyika, 2014) in the literature have identified price as a barrier to healthy eating among Black adults. DiSantis, Grier, Oakes, & Kumanyika (2014) found that reductions in prices may lead to increase purchases of healthier food among Black female shoppers. Reyes and colleagues (2013) in their study of the motivators and barriers to healthy eating in pregnant low income Black mothers, found that mothers perceived healthy eating to be more expensive. However, for BEAW, price was not predictive of PBC.

Though time is commonly reported in the literature (Hargreaves et al., 2002; Klassen et al., 2008; McGee et al., 2008; Lucan et al., 2010; Larson et al., 2012; Sheats & Middlestadt, 2013a) as a barrier to healthy eating for Black adults and emerging adults, this was not predictive of PBC. Specific to emerging adults, Larson and colleagues (2012) found that lower perceived time barriers to healthy eating predicted higher intakes of FVs. Participants in this study who perceived they had high self-efficacy were less likely to believe time influenced their intentions to meet the recommended daily intake of FVs.

**Theoretical constructs predict behavioral intention**

The current study is consistent with the TPB model, specifically that attitudes, subjective norms and perceived behavioral control are predictive of behavioral intentions. The predictability of PBC on behavioral intention exerted a stronger effect than that of attitudes and subjective norms. When PBC was added to the model in step 2 of the hierarchical multiple regression, the p value for subjective norms became non-significant, which suggest that both concepts explain some of the same variability in behavioral
intentions. However, the p value for PBC was still significant in the presence of subjective norms, indicating that PBC explains the variability in behavioral intentions beyond what is explained by subjective norms. Given that PBC and self-efficacy are conceptually similar (Fishbein & Ajzen, 2010), these findings indicate that BEAW with a more favorable attitude towards FVs, and more confidence in their ability to obtain FVs reported stronger intentions to meet the recommended daily intake of FVs. The present findings are consistent with Larson and colleagues’ (2012) study which concluded that self-efficacy for healthy eating during emerging adulthood predicted higher intake of vegetables. The findings of our study also suggest that interventions aimed at increasing FV consumption in BEAW should prioritize modifying attitudes and PBC, above influencing social norms.

**PBC predicts FV consumption**

Multiple regression analyses revealed that while PBC is a predictor of FV consumption for BEAW, attitudes and norms do not predict FV consumption for BEAW. These findings indicate that BEAW who report confidence in their ability to obtain FVs, are more likely to meet the recommended daily intake of FVs. This finding confirms other studies (Van Duyn et al., 2001; Brug et al., 2006; Fuemmeler et al., 2006; Shaikh et al., 2008; Sheats et al., 2013b) where self-efficacy was found to be determinants of FV intake. Taken together these findings suggest that efforts to increase FV consumption should aim to improve self-efficacy for BEAW.

**Summary of Mixed Methods Findings**

Integration of both the qualitative and quantitative data demonstrate the complexity of FV intake for BEAW. The integration of the findings provided insights to
allow for generalization of relevant qualitative findings, as well as the reliability and
validity of the researcher developed instrument. After integration, discrepancies were
noted between the qualitative and quantitative findings. The dissonance in findings may
reflect differences in participant age, the food environment, or purchasing behaviors.
Importantly, a majority of the participants in the qualitative phase were graduate students,
while participants in the quantitative phase were primarily undergraduate students
residing on campus. Whereas participants in the focus groups may be responsible for
purchasing their foods, participants completing the researcher developed instrument may
be limited to dining hall options based on a meal plan. Additionally, it is possible that
questions in researcher developed survey did not accurately reflect what was discussed
during the focus groups. Taken together the discrepant findings suggests that reliance on
one method of inquiry is not sufficient for understanding FV consumption among
BEAW. A more comprehensive mixed methods design to refine the researcher developed
instrument may be necessary. This may include conducting additional interviews to
understand the manner in which participants interpreted the researcher developed
questions, or follow up focus groups to ascertain whether the study findings resonated
with their experiences about FV consumption.

The specific beliefs identified in this study can serve as a foundation for
developing targeted interventions for BEAW. Interpretation of the qualitative and
quantitative findings indicate that there are individual, social, and environmental factors
which interact to influence FV intake among BEAW. Therefore, individual-level
programs may not be sufficient to increase FV intake among BEAW. Likewise, the
current dietary guidelines about intake of FVs may be discordant with tangible issues that
impact BEAW’s ability to meet the recommended daily intake. Though well-intentioned, the USDA recommendations about what to eat does not take into account BEAW’s social and environmental constraints.

**Conclusion**

Overall findings from the current study reveal that FV consumption among Black emerging adult women is dynamically complex. Results from this study fills a gap in the existing literature on FVs in emerging adults. The TPB as a theoretical framework provide evidence that several factors interact to influence BEAW’s intentions to meet the recommended daily intake of FVs. Specific of determinants of attitudes, subjective norms and perceived behavioral control should be considered when designing interventions to increase FVs among BEAW.

**Implications for Policy & Practice**

This study provides support for the TPB as a framework for theory-based intervention research aimed at increasing FV consumption among BEAW. Moreover, there are practical implications on the policy level. Public health initiatives designed to increase FVs among BEAW should articulate the health benefits of FVs, target self-efficacy and attitudes, include a social support component, and address the food environment.

The findings of this research provides evidence that BEAW considered the food environment to be a barrier to healthy eating. BEAW may be less apt to exercise individual or collective efficacy in enacting health promoting behaviors if they are beholden to the circumstances of their environment. According to Powell & Chaloupka (2009), a shift in consumption patterns to a more healthful diet may be contingent on
strategies addressing pricing policies of unhealthy, energy-dense foods. The environment in which individuals live not only influences, but also shape lifestyle decisions. Therefore, it may be necessary to expand the paradigm for intervention research by utilizing socio-ecological frameworks. Likewise, efforts must be made to develop a set of priorities and responsibilities that are comprehensive and aimed at generating measureable change to the current obesogenic environment. To that end, a multidisciplinary approach will be necessary to untangle the components exerting the greatest influence on the health behaviors of BEAW.

The findings of this study also has implications for nursing education and practice. Nutrition is one of the few modifiable predictors of health. Although nurses are taught nutrition basics as part of the curricula, a more extensive approach may be necessary to support practice. Integrating the social determinants of health in the nutrition curricula to promote awareness of the beliefs influencing behaviors may be an important step. Nurses are often responsible for nutrition screening and/or providing nutrition education for patients; therefore, understanding the role cultural beliefs around food choice may facilitate patient education about nutrition-related health concerns.

**Limitations and Directions for the Future Research**

Although there are a number of strengths in this research study, potential limitations should be acknowledged. The sample consists of Black emerging adult women in the Northeastern United States; therefore, it is possible that findings may not apply to emerging adults in different geographic settings. Participants in this study were highly educated; thus, future studies should include samples with more variability in educational attainment. Emerging adults in this study were primarily college students;
therefore, the results may not be generalizable to other subgroups of BEAW. The discordant findings suggest that future studies should examine the influence of early emerging adulthood (18-25) versus late emerging adulthood (26-30) in predicting FV behaviors among BEAW. Importantly, researchers should consider stratifying qualitative and quantitative data collection by age, as well as collecting information on purchasing behaviors. Self-report was used to assess fruit and vegetable eating behaviors; therefore, participants’ responses may be influenced by a social desirability bias. Moreover, self-report is susceptible to systematic error and recall bias in dietary measures of FVs. The present study was also correlational; therefore, we cannot draw causal conclusions.

Future studies examining FV consumption in BEAW, should consider employing a prospective research design and 24-hr recall to obtain dietary intake measures for FVs. Despite the limitations, this study provides valuable insights about the contextual factors influencing intentions to consume the recommended daily intake of FVs among BEAW.
Are you a Black/African American woman between the ages of 18-30?

Join the Re-FRESH Study!

Who can join the study?
- Black/African American women ages 18-30
- Philadelphia Resident
- No allergies or intolerance to fruits and vegetables
- Not pregnant

What will I be asked to do?
- Complete questionnaires about daily intake of fruits and vegetables
- Have height and weight measured

What else do I need to know?
- Participation is voluntary
- All participants will be paid for completing the questionnaires

To learn more about the study, contact:
Terri-Ann Kelly, PhD(c), MSN RN
terri285@gmail.com
856-217-6479
APPENDIX B

Scripted Telephone Screen

Thank you for inquiring about the research study: Re-FRESH with Fruits & Vegetables. The purpose of this screening interview is to see if you meet the criteria for taking part in our study. This interview will take approximately 10-15 minutes.

Information about you that you give me during this interview will be kept as confidential as possible as required by law. You can choose if you want, or do not want, to take part in this research screening procedure – it is up to you. If you refuse to answer the questions or stop answering them at any time, there will be no penalty.

The screening interview is not designed to ask you for sensitive personal information, but it is possible that some people may feel uncomfortable answering these questions with a person they do not know. If you qualify to take part in the study and are interested in taking part, then I will record your name and information; this will be kept confidential. If you are not interested in the study, then I will destroy any personal information you may have given to me.

You will not be paid for answering questions in this interview since it is only to see whether you qualify to take part in the study.

I am now going to go through a list of questions. You may choose not to answer these questions. You also may choose to stop participating in this interview at any time, if you want to stop, please tell me.

Question 1

How would you identify yourself? (Race or Ethnic Origin)

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

Question 2

What is your age?

Question 3

In general, would you say your health is:

a. Excellent
b. Good
c. Fair
d. Poor

**Question 4**
How tall are you without shoes?

**Question 5**
What is your current weight in pounds?

**Question 6**
Are you pregnant or planning to become pregnant in the next 6 months?

**Question 7**
Are you a resident of Philadelphia?

**Question 8**
What would you say is your primary language?

**Question 9**
What is the highest degree or level of school you have completed?

**Question 10**
Do you have any allergies / intolerances to fruits and vegetables?

**Question 11**
How many cups of fruit do you usually eat each day? Fruits include: 1 small banana= 1 cup of fruit, or 1 cup of fruit juice (orange, apple, grape)

**Question 12**
How many cups of vegetables do you usually eat each day? Vegetables include: 12 baby carrots=1 cup, 3 long spears of broccoli=1 cup, 1 large ear of corn=1 cup

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Notes</th>
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<td><strong>African American or Black</strong></td>
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<td><strong>Female</strong></td>
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<td><strong>18-30</strong></td>
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<td><strong>Height</strong></td>
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</table>
**Weight**

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<th>Not Pregnant or Planning on Becoming Pregnant</th>
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<th>Primary Language English</th>
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<table>
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<tr>
<th>Philadelphia resident</th>
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<table>
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<tr>
<th>No Fruit &amp; Vegetable allergies or Intolerances</th>
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<th>Level of Education</th>
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<tr>
<th>Fruit &amp; Vegetable intake below recommended daily intake</th>
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**ELIGIBLE**

Based on the information you gave me, it looks like you are eligible for this study. At this point, you have two choices. (1) I can take down your contact information and have contact you to set up an appointment; or (2) if you are not interested in learning more about the study, you should say that and I will not keep the information collected in this interview.

__________ OK TO CONTACT *(collect contact info)*  

__________ SUBJECT TO CONTACT *(give contact info)*  

__________ NOT INTERESTED  ➔ *(destroy all information collected)*

**INELIGIBLE**

Based on the information you gave me, it looks like you are not eligible for this study. I will not keep the information collected in this interview.

Thank you for your time. Good-bye.
Title of the Research Study: Re-FRESH with Fruits & Vegetables

Protocol Number: 825102

You are being asked to take part in a research study. This is not a form of treatment or therapy. It is not supposed to detect a disease or find something wrong. Your participation is voluntary which means you can choose whether or not to participate. If you decide to participate or not to participate there will be no loss of benefits to which you are otherwise entitled. Before you make a decision you will need to know the purpose of the study, the possible risks and benefits of being in the study and what you will have to do if decide to participate. The research team is going to talk with you about the study and give you this consent document to read. You do not have to make a decision now; you can take the consent document home and share it with friends, family doctor and family.

If you do not understand what you are reading, do not sign it. Please ask the researcher to explain anything you do not understand, including any language contained in this form. If you decide to participate, you will be asked to sign this form and a copy will be given to you. Keep this form, in it you will find contact information and answers to questions about the study. You may ask to have this form read to you.

What is the purpose of the study?

The purpose of the study is to understand the beliefs related to factors influencing Black emerging adult women’s intention to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months. Black emerging adult women are women who are between 18 and 30 years of age.

Why was I asked to participate in the study?

You are being asked to join this study because:
• You identify as a Black/African American female
• You are between the ages of 18-30
• You have no allergies or intolerances to fruits and vegetables
• You are not currently pregnant
• You are a resident of Philadelphia or the surrounding area.

**How long will I be in the study?**

If you choose to be in the study, it will take you about two hours to complete the study and there will be about 9 other people who take part in your focus group. There will a total of two other focus groups and about 29 other people who take part in this study.

**Where will the study take place?**

You will be asked to come to the Claire M. Fagin building at the University of Pennsylvania School of Nursing, located at 418 Curie Boulevard, Philadelphia, PA 19104. If the University of Pennsylvania is not a convenient place for you, we can choose a place with a private room that is convenient for you.

**What will I be asked to do?**

If you choose to be in the study, you will be asked to share your beliefs about fruits and vegetables in a two-hour focus group. During the focus group, you and other people like you will be asked what you know about the fruit and vegetable recommendations as well as your personal opinion and experiences with eating fruits and vegetables.

In addition to the focus group discussion, you will also be asked to complete a short written survey about your beliefs regarding eating fruits and vegetables. The survey questions are similar to the focus group questions; however, we would like you to complete the survey questions so that you have the opportunity to write about your feelings that may be too uncomfortable to share with the group. This written survey will also ask for information related to your age, marital status, and income level.

**What are the risks?**
There are no physical risks associated with this research study. You may feel tired, or angry when answering some of the questions. You are free to choose what information you wish to share, to pause for a break, or to discontinue your participation in the study.

**How will I benefit from the study?**

You are not expected to get any benefit from participating in this research study. A possible benefit of this study is that you may learn about the recommendations for fruit and vegetable intake and their importance to health. We hope the information learned from this study will help us design interventions that are culturally specific to the needs of Black emerging adult women.

**What other choices do I have?**

Your alternative to being in this research study is to not be in the study. You are also free to participate in other research studies on fruits and vegetables.

**What happens if I do not choose to join the research study?**

You may choose to join the study or you may choose not to join the study. Your participation is voluntary. There is no penalty if you choose not to join the research study. You will lose no benefits or advantages that are now coming to you, or would come to you in the future. There are no negative consequences should you choose not to participate.

When is the study over? Can I leave the study before it ends?

The study is expected to end after all participants have completed all visits and all the information has been collected. The study may be stopped without your consent for the following reasons:

- The PI feels it is best for your safety and/or health-you will be informed of the reasons why.
- You have not followed the study instructions
- The PI, the sponsor or the Office of Regulatory Affairs at the University of Pennsylvania can stop the study anytime
You have the right to drop out of the research study at any time during your participation. There is no penalty or loss of benefits to which you are otherwise entitled if you decide to do so.

If you no longer wish to be in the research study, please contact Terri-Ann Kelly, at 856-217-6479 and provide your numerical identification number and indicate that you no longer wish to take part in this research study. You will not be penalized for withdrawing from this study. All the personal information you have provided will be destroyed.

**How will confidentiality be maintained and my privacy be protected?**

We will do our best to make sure that the personal information obtained during the course of this research study will be kept private. However, we cannot guarantee total privacy. Your personal information may be given out if required by law. If information from this study is published or presented at scientific meetings, your name and other personal information will not be used.

All recordings from the focus group interviews in will be uploaded to a password-protected, computer file at the University of Pennsylvania School of Nursing. Access to the transcripts from the focus groups will be limited to the primary investigator, members of the dissertation committee, and the Institutional Review Board at the University of Pennsylvania. All identifying data will be deleted from the focus group interviews for the transcription process, and nicknames will be used in place of participants’ names. The recordings on the drive will be transmitted to a local transcription service that adheres to the University of Pennsylvania IRB confidentiality requirements.

The primary investigator will keep your name on a list of people who have been in the study. In order to protect the information we have about you, the list of names of people in the study will be kept in a locked file cabinet and in a password protected computer file. A code number will identify the information produced by this study. The code key connecting your name to specific information about you will be kept in a separate locked file cabinet and password protected computer file. Access to these records will be limited to the primary investigator, members of the dissertation committee, and the Institutional Review Board at the University of Pennsylvania.

**What happens if I am injured from being in the study?**

Not Applicable.

**Will I have to pay for anything?**

There are minimal costs associated with participating in the study. All participants will be responsible for providing their own transportation to the study site. We suggest
participants take public transportation (i.e. Septa Buses, Market-Frankford Line or Broad Street Line). Light refreshments will be provided for all participants.

**Will I be paid for being in this study?**
As a participant in this study you will be paid for your participation in a focus group. All focus group participants will be compensated $30 at the conclusion of the focus group.

**Who can I call with questions, complaints or if I’m concerned about my rights as a research subject?**
If you have questions, concerns or complaints regarding your participation in this research study or if you have any questions about your rights as a research subject, you should speak with the Principal Investigator listed on page one of this form. If a member of the research team cannot be reached or you want to talk to someone other than those working on the study, you may contact the Office of Regulatory Affairs with any question, concerns or complaints at the University of Pennsylvania by calling (215) 898-2614.

______________________________

When you sign this document, you are agreeing to take part in this research study. If you have any questions or there is something you do not understand, please ask. You will receive a copy of this consent document.

Signature of Subject ________________________
Print Name of Subject _______________________
Date ___________________________________
APPENDIX D

NCI All-Day Screener

INSTRUCTIONS

- Think about what you usually ate last month.
- Please think about all the fruits and vegetables that you ate last month. Include those that were:
  - raw and cooked,
  - eaten as snacks and at meals,
  - eaten at home and away from home (restaurants, friends, take-out), and
  - eaten alone and mixed with other foods.
- Report how many times per month, week, or day you ate each food, and if you ate it, how much you usually had.
- If you mark "Never" for a question, follow the "Go to" instruction.
- Choose the best answer for each question. Mark only one response for each question.

1. Over the last month, how many times per month, week, or day did you drink 100% juice such as orange, apple, grape, or grapefruit juice? Do not count fruit drinks like Kool-Aid, lemonade, Hi-C, cranberry juice drink, Tang, and Twister. Include juice you drank at all mealtimes and between meals.

<table>
<thead>
<tr>
<th>Never</th>
<th>1-3 times last month</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 times per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
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   (Go to Question 2)

   1a. Each time you drank 100% juice, how much did you usually drink?

<table>
<thead>
<tr>
<th>Less than ¼ cup (less than 6 ounces)</th>
<th>¼ to 1¼ cup (6 to 10 ounces)</th>
<th>½ to 1½ cups (10 to 16 ounces)</th>
<th>1¼ to 2 cups (10 to 16 ounces)</th>
<th>More than 2 cups (more than 16 ounces)</th>
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2. Over the last month, how many times per month, week, or day did you eat fruit? Count any kind of fruit—fresh, canned, and frozen. Do not count juices. Include fruit you ate at all mealtimes and for snacks.

<table>
<thead>
<tr>
<th>Never</th>
<th>1-3 times last month</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 times per day</th>
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<th>3 times per day</th>
<th>4 times per day</th>
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   (Go to Question 3)

2a. Each time you ate fruit, how much did you usually eat?

<table>
<thead>
<tr>
<th>Less than 1 medium fruit</th>
<th>1 medium fruit</th>
<th>2 medium fruits</th>
<th>More than 2 medium fruits</th>
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   OR

<table>
<thead>
<tr>
<th>Less than ¼ cup</th>
<th>About ½ cup</th>
<th>About 1 cup</th>
<th>More than 1 cup</th>
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</table>
3. Over the last month, how often did you eat lettuce salad (with or without other vegetables)?

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<th>Never (Go to Question 4)</th>
<th>1-3 times per week</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
<th>5 or more times per day</th>
</tr>
</thead>
</table>

3a. Each time you ate lettuce salad, how much did you usually eat?

- About ¾ cup
- About 1 cup
- About 2 cups
- More than 2 cups

4. Over the last month, how often did you eat French fries or fried potatoes?

<table>
<thead>
<tr>
<th>Never (Go to Question 5)</th>
<th>1-3 times per week</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
<th>5 or more times per day</th>
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</table>

4a. Each time you ate French fries or fried potatoes, how much did you usually eat?

- Small order or less (About 1 cup or less)
- Medium order (About 1½ cups)
- Large order (About 2 cups)
- Super Size order or more (About 3 cups or more)

5. Over the last month, how often did you eat other white potatoes? Count baked, boiled, and mashed potatoes, potato salad, and white potatoes that were not fried.

<table>
<thead>
<tr>
<th>Never (Go to Question 6)</th>
<th>1-3 times per week</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
<th>5 or more times per day</th>
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5a. Each time you ate these potatoes, how much did you usually eat?

- 1 small potato or less (1½ cup or less)
- 1 medium potato (1 to 1½ cups)
- 1 large potato (1 to 1½ cups)
- 2 medium potatoes or more (1½ cups or more)

6. Over the last month, how often did you eat cooked dried beans? Count baked beans, bean soup, refried beans, pork and beans and other bean dishes.

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<tr>
<th>Never (Go to Question 7)</th>
<th>1-3 times per week</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
<th>5 or more times per day</th>
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6a. Each time you ate these beans, how much did you usually eat?

- Less than ½ cup
- ½ to 1 cup
- 1 to 1½ cups
- More than 1½ cups
7. Over the last month, how often did you eat other vegetables?

**DO NOT COUNT:**
- Lettuce salads
- White potatoes
- Cooked dried beans
- Vegetables in mixtures, such as in sandwiches, omelets, casseroles, Mexican dishes, stews, stir-fry, soups, etc.
- Rice

**COUNT:**
- All other vegetables—raw, cooked, canned, and frozen

<table>
<thead>
<tr>
<th>Times</th>
<th>1-3 times last month</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
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7a. Each of these times that you ate other vegetables, how much did you usually eat?

- Less than ½ cup
- ½ to 1 cup
- 1 to 2 cups
- More than 2 cups

8. Over the last month, how often did you eat tomato sauce? Include tomato sauce on pasta or macaroni, rice, pizza and other dishes.

<table>
<thead>
<tr>
<th>Times</th>
<th>1-3 times last month</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
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<tr>
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8a. Each time you ate tomato sauce, how much did you usually eat?

- About ½ cup
- About 1 cup
- More than 1 cup

9. Over the last month, how often did you eat vegetable soups? Include tomato soup, gazpacho, beef with vegetable soup, minestrone soup, and other soups made with vegetables.

<table>
<thead>
<tr>
<th>Times</th>
<th>1-3 times last month</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
<th>5 more times per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>(Go to Question 10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9a. Each time you ate vegetable soup, how much did you usually eat?

- Less than 1 cup
- 1 to 2 cups
- 2 to 3 cups
- More than 3 cups

10. Over the last month, how often did you eat mixtures that included vegetables? Count such foods as sandwiches, casseroles, stews, stir-fry, omelets, and tacos.

<table>
<thead>
<tr>
<th>Times</th>
<th>1-3 times last month</th>
<th>1-2 times per week</th>
<th>3-4 times per week</th>
<th>5-6 times per week</th>
<th>1 time per day</th>
<th>2 times per day</th>
<th>3 times per day</th>
<th>4 times per day</th>
<th>5 more times per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you very much for completing this questionnaire. Please return it in the enclosed, postage-paid envelope or to the address listed on the front page.
APPENDIX E

[Begin Six-Item Food Security Module]

Transition into Module:

These next questions are about the food eaten in your household in the last 12 months, since (current month) of last year and whether you were able to afford the food you need.

NOTE: If the placement of these items in the survey makes the transition/introductory sentence unnecessary, add the word “Now” to the beginning of question HH3: “Now I’m going to read you....”

FILL INSTRUCTIONS: Select the appropriate fill from parenthetical choices depending on the number of persons and number of adults in the household.

HH3. I’m going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month).

   The first statement is, “The food that (I/we) bought just didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

   [ ] Often true
   [ ] Sometimes true
   [ ] Never true
   [ ] DK or Refused

HH4. “(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

   [ ] Often true
   [ ] Sometimes true
   [ ] Never true
[DK or Refused]

AD1. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

[Yes]

[No (Skip AD1a)]

[DK (Skip AD1a)]

AD1a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

[Almost every month]

[Some months but not every month]

[Only 1 or 2 months]

[DK]

AD2. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

[Yes]

[No]

[DK]

AD3. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?

[Yes]

[No]

[DK]

[End of Six-Item Food Security Module]
APPENDIX F

# ______

FRESH with Fruits & Vegetables

Focus Group Open-Ended Questionnaire

What do you believe are the advantages of you eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

What do you believe are the disadvantages of you eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Who are the individuals or groups who would approve of your eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?
Who are the individuals or groups who would disapprove of your eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?

What factors or circumstances would make it easier for you to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?
What factors or circumstances would make it difficult or impossible for you to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?
APPENDIX G
Re-Fresh Focus Group Script

Materials Needed

<table>
<thead>
<tr>
<th>Food and Beverages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsprint &amp; Markers</td>
</tr>
<tr>
<td>Nametags</td>
</tr>
<tr>
<td>Questionnaires</td>
</tr>
<tr>
<td>Attendance Sheet</td>
</tr>
</tbody>
</table>

A. Introductions

1. Team members with nametags will give participants nametags as they arrive.
2. Instruct participants to select a pseudonym (fictional character or celebrity icon)
3. Instruct participants to sign attendance sheet with pseudonym
4. All members of the investigative team will introduce themselves.
5. Explain the purpose of the focus group session by saying:

Welcome to today’s focus group. We are interested in the health of Black/African American women between the ages of 18 and 30 because we would like to use this information to develop a program. We would like to hear your opinions and ideas about eating fruits and vegetables. You are the experts and we can learn from you. We need your honest opinion, both good and bad. We would like to take what you say and put together a program for young Black/African American women. Everything you are thinking is important to us. There are no right or wrong answers. We value your opinion.

As a reminder we are going to turn on the tape recorder now.
Is everyone ok with that? TURN TAPE ON: and announce

“This is focus group # on / / for the “Re-Fresh with Fruits & Vegetables Study”

1. Ask the participants to introduce themselves by saying their pseudonym, why they are here today.

Then say,

Now, we would like to develop some group rules to help us learn as much as possible from each other.

B. Group Rules

Develop group rules to protect participants’ confidentiality. Let participants generate the list. Examples of group rules:

- Be respectful
- Be honest
- Maintain confidentiality
- One person speaks at a time
- Listen to others
- No put downs or insults
- All cellphones off or on silent if you have to take a call just step out

I’m going to throw out a question and would love for you to generate some discussion based on what your colleagues are saying?

What do other people think? Is that true for the rest of you?

Is it same or different?

Clarifying Concepts
1. What comes to mind when someone says you can have a cup of a particular item?

2. In your opinion, what are fruits?

3. What are vegetables?

4. What differences do you believe there are between fresh, frozen, and canned fruits and vegetables?

**NOW SHOW POWERPOINT AND ASK THEM IF THEIR OPINIONS HAVE CHANGED**

**C. Study Purpose**

- 1. Describe the purpose of the study/focus group.

The purpose of the study is to learn more about the factors influencing emerging adult (ages 18-30) Black women’s intention to consume 2 cups of fruits and 2.5 cups of vegetables daily for the next 3 months. The proposed study is being conducted for a dissertation as part of a longer-term research trajectory toward developing a comprehensive and culturally appropriate intervention to increase fruit and vegetable intake for emerging adult (ages 18-30) Black women.

- Solicit comments on the purpose of the study by asking the following questions:

<table>
<thead>
<tr>
<th>Behavioral Beliefs</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What do you believe are the <strong>advantages</strong> of eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>(2)</td>
<td>What do you believe are the <strong>disadvantages</strong> of eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>Is there anything else you associate with your own views about eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
</tbody>
</table>

**Normative Beliefs**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Are there any individuals or groups who would <strong>approve</strong> of your eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td>(2)</td>
<td>Are there any individuals or groups who would <strong>disapprove</strong> of your eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>Is there anything else you associate with other people’s views about eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
</tbody>
</table>

**Control Beliefs**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>What factors or circumstances would make it <strong>easier</strong> for you to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td>(2)</td>
<td>What factors or circumstances would make it <strong>difficult or impossible</strong> for you to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>Are there any other issues that come to mind when you think about eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months?</td>
</tr>
<tr>
<td></td>
<td>Where do you buy your food? Is this also where you buy your fruits and vegetables? Is cost ever a barrier? Do you have trouble finding the food and paying for the food?</td>
</tr>
</tbody>
</table>
Tell me about your day and how does eating fit in with that? What does that look like for you?

Do you think most women like you eat that way? Tell me more

Whom might you eat with? Do you sit at a table?

Are you cooking or eating out?

What about the taste of fruits and vegetables?

What about the time it takes cook?

Do you find it difficult to find the vegetables you like to eat?

**D. Design a Program**

1. Say to the participants:

   If someone gave you some money to design a program to increase fruit and vegetable intake among Black/African American women, what would you like to make sure it included?

2. Then say,
Now, think about the messages and themes. What messages and themes would you want to make sure it included?

E. Wrap Up

1. Ask the participants:

   How did you feel about participating in this session? What was easy? What was hard?

2. Summarize and thank participants by saying:

   We appreciate all of your great ideas. You have been a big help, and we want to thank you very much for all the information you have shared with us today.
   Thank you once again for your participation – we really appreciate you!
Thank you for giving us your time and for taking part in the Re-FRESH with Fruits & Vegetables Study.

As a reminder:

- Your participation is completely voluntary
- Be certain to circle your choice in each of the answers, and erase completely if you make any changes.
### FRUITS

<table>
<thead>
<tr>
<th>AMOUNT THAT COUNTS AS 1 CUP OF FRUIT</th>
<th>OTHER AMOUNTS (COUNT AS 1/2 CUP OF FRUIT UNLESS NOTED)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apple</strong></td>
<td></td>
</tr>
<tr>
<td>½ large (3 ¼&quot; diameter)</td>
<td>½ cup, sliced or chopped, raw or cooked</td>
</tr>
<tr>
<td>1 small (2 ¼&quot; diameter)</td>
<td></td>
</tr>
<tr>
<td>1 cup, sliced or chopped, raw or cooked</td>
<td></td>
</tr>
<tr>
<td><strong>Applesauce</strong></td>
<td></td>
</tr>
<tr>
<td>1 cup</td>
<td>1 snack container (4oz)</td>
</tr>
<tr>
<td><strong>Banana</strong></td>
<td></td>
</tr>
<tr>
<td>1 cup, sliced</td>
<td>1 small (less than 6&quot; long)</td>
</tr>
<tr>
<td>1 large (8&quot; to 9&quot; long)</td>
<td></td>
</tr>
<tr>
<td><strong>Cantaloupe</strong></td>
<td></td>
</tr>
<tr>
<td>1 cup, diced or melon balls</td>
<td>1 medium wedge (1/8 of a med. melon)</td>
</tr>
<tr>
<td><strong>Grapes</strong></td>
<td></td>
</tr>
<tr>
<td>1 cup, whole or cut-up</td>
<td>16 seedless grapes</td>
</tr>
<tr>
<td>32 seedless grapes</td>
<td></td>
</tr>
<tr>
<td><strong>Grapefruit</strong></td>
<td></td>
</tr>
<tr>
<td>1 medium (4&quot; diameter)</td>
<td>½ medium (4&quot; diameter)</td>
</tr>
<tr>
<td>1 cup, sections</td>
<td></td>
</tr>
<tr>
<td><strong>Mixed fruit (fruit cocktail)</strong></td>
<td></td>
</tr>
<tr>
<td>1 cup, diced or sliced, raw or canned, drained</td>
<td>1 snack container (4 oz) drained = 3/8 cup</td>
</tr>
<tr>
<td><strong>Orange</strong></td>
<td></td>
</tr>
<tr>
<td>1 large (3 1/16&quot; diameter)</td>
<td>1 small (2 3/8&quot; diameter)</td>
</tr>
<tr>
<td>1 cup, sections</td>
<td></td>
</tr>
<tr>
<td><strong>Orange, mandarin</strong></td>
<td></td>
</tr>
<tr>
<td>1 cup, canned, drained</td>
<td></td>
</tr>
<tr>
<td><strong>Peach</strong></td>
<td></td>
</tr>
<tr>
<td>1 large (2 ¾&quot; diameter)</td>
<td>1 small (2&quot; diameter)</td>
</tr>
<tr>
<td>Fruit</td>
<td>Amount</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Pear</td>
<td>1 cup, sliced or diced, raw, cooked, or canned, drained</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 medium pear (2 ½ per lb)</td>
</tr>
<tr>
<td></td>
<td>1 cup, sliced or diced, raw cooked, or canned, drained</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Pineapple</td>
<td>1 cup, chunks, sliced or crushed, raw, cooked or canned, drained</td>
</tr>
<tr>
<td>Plum</td>
<td>1 cup, sliced raw or cooked</td>
</tr>
<tr>
<td></td>
<td>3 medium or 2 large plums</td>
</tr>
<tr>
<td>Strawberries</td>
<td>About 8 large berries</td>
</tr>
<tr>
<td></td>
<td>1 cup, whole, halved, or sliced, fresh or frozen</td>
</tr>
<tr>
<td>Watermelon</td>
<td>1 small (1&quot; thick)</td>
</tr>
<tr>
<td></td>
<td>1 cup, diced or balls</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Dried fruit (raisins, prunes, apricots, etc.)</td>
<td>½ cup dried fruit</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>100% fruit juice (orange, apple, grape, grapefruit, etc.)</td>
<td>1 cup</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>1 large (3 1/16&quot; diameter)</td>
</tr>
<tr>
<td></td>
<td>1 cup, sections</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange, mandarin</td>
<td>1 cup, canned, drained</td>
</tr>
<tr>
<td>Peach</td>
<td>amt</td>
</tr>
<tr>
<td>---------------</td>
<td>----</td>
</tr>
<tr>
<td>1 large (2 ¾&quot; diameter)</td>
<td>1 cup, sliced or diced, raw, cooked, or canned, drained</td>
</tr>
<tr>
<td></td>
<td>1 small (2&quot; diameter)</td>
</tr>
</tbody>
</table>

### VEGETABLES

<table>
<thead>
<tr>
<th>Dark Green Vegetables</th>
<th>AMOUNT THAT COUNTS AS 1 CUP OF VEGETABLE</th>
<th>AMOUNT THAT COUNTS AS 1/2 CUP OF VEGETABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broccoli</td>
<td>1 cup, chopped or florets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 spears 5&quot; long raw or cooked</td>
<td></td>
</tr>
<tr>
<td>Greens (collards, mustard greens, turnip greens, kale)</td>
<td>1 cup, cooked</td>
<td></td>
</tr>
<tr>
<td>Spinach</td>
<td>1 cup, cooked</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 cups, raw</td>
<td>1 cup, raw</td>
</tr>
<tr>
<td>Raw leafy greens: Spinach, romaine, watercress, dark green leafy lettuce, endive, escarole</td>
<td>2 cups, raw</td>
<td>1 cup, raw</td>
</tr>
</tbody>
</table>

### Red and Orange Vegetables

<table>
<thead>
<tr>
<th>Carrots</th>
<th>AMOUNT THAT COUNTS AS 1 CUP OF VEGETABLE</th>
<th>AMOUNT THAT COUNTS AS 1/2 CUP OF VEGETABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 cup, strips, slices, or chopped, raw or cooked</td>
<td>1 medium carrot About 6 baby carrots</td>
</tr>
<tr>
<td>Ingredient</td>
<td>Quantity</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Baby carrots</td>
<td>1 cup, about 12</td>
<td></td>
</tr>
<tr>
<td>Pumpkin</td>
<td>1 cup, mashed, cooked</td>
<td></td>
</tr>
<tr>
<td>Red peppers</td>
<td>1 cup, chopped, raw, or cooked</td>
<td>1 large pepper (3&quot; diameter, 3 3/4&quot; long)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 small pepper</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1 large raw whole (3&quot;)</td>
<td>1 small raw whole (2 1/4&quot; diameter)</td>
</tr>
<tr>
<td></td>
<td>1 cup, chopped or sliced, raw, canned, or</td>
<td>1 medium canned</td>
</tr>
<tr>
<td></td>
<td>cooked</td>
<td></td>
</tr>
<tr>
<td>Tomato juice</td>
<td>1 cup</td>
<td>½ cup</td>
</tr>
<tr>
<td>Sweet potato</td>
<td>1 large baked (2 ¼&quot; or more diameter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 cup, sliced or mashed, cooked</td>
<td></td>
</tr>
<tr>
<td>Winter squash (acorn, butternut, hubbard)</td>
<td>1 cup, cubed, cooked</td>
<td>½ acorn squash, baked = ¾ cup</td>
</tr>
<tr>
<td>Dry beans and peas</td>
<td>1 cup, whole or mashed, cooked</td>
<td></td>
</tr>
<tr>
<td>(such as black, garbanzo, kidney, pinto, or soy beans, or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>black-eyed peas or split peas)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starchy Vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn, yellow or white</td>
<td>1 large ear (8&quot; to 9&quot; long)</td>
<td>1 small ear (about 6&quot; long)</td>
</tr>
<tr>
<td>Green peas</td>
<td>1 cup</td>
<td></td>
</tr>
<tr>
<td>White potatoes</td>
<td>1 cup, diced, mashed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 medium boiled or baked potato (2 ½&quot; to 3&quot; diameter)</td>
<td></td>
</tr>
</tbody>
</table>
## Other Vegetables

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bean sprouts</td>
<td>1 cup, cooked</td>
</tr>
<tr>
<td>Cabbage, green</td>
<td>1 cup, chopped or shredded raw or cooked</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>1 cup, pieces or florets raw or cooked</td>
</tr>
<tr>
<td>Celery</td>
<td>1 cup, diced or sliced, raw or cooked 2 large stalks (11&quot; to 12&quot; long) 1 large stalk (11&quot; to 12&quot; long)</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>1 cup, raw, sliced or chopped</td>
</tr>
<tr>
<td>Green or wax beans</td>
<td>1 cup, cooked</td>
</tr>
<tr>
<td>Green peppers</td>
<td>1 cup, chopped, raw or cooked 1 large pepper (3&quot; diameter, 3 ¾&quot; long) 1 small pepper</td>
</tr>
<tr>
<td>Lettuce, iceberg or head</td>
<td>2 cups, raw, shredded or chopped</td>
</tr>
<tr>
<td>Mushrooms</td>
<td>1 cup, raw or cooked</td>
</tr>
<tr>
<td>Onions</td>
<td>1 cup, chopped, raw or cooked</td>
</tr>
<tr>
<td>Summer squash or zucchini</td>
<td>1 cup, cooked, sliced or diced</td>
</tr>
</tbody>
</table>

---

**Re-FRESH Study Survey**

Please note that this questionnaire has **TWO** sections. Section 1 asks about background information; Section 2 asks your opinions about fruits and vegetables.

**SECTION 1**

*About your **BACKGROUND***
1. What is your date of birth? ____/____/_____

2. What is your zip code? ________________

3. What is the highest grade or year of school you completed?
   - Never attended school or only attended kindergarten (1)
   - Grades 1 through 8 (2)
   - Grades 9 through 11 (3)
   - Grade 12 or GED (4)
   - College 1 year to 3 years (5)
   - Associate’s degree (6)
   - Bachelor’s degree (7)
   - Graduate or professional degree (8)

4. What is your Current Marital Status?
   - Married (1)
   - Divorced (2)
   - Widowed (3)
   - Separated (4)
   - Never been married (5)
   - A member of an unmarried couple (6)

5. What is your current work status?
   - Employed full time (1)
   - Employed part time (2)
   - Self-employed (3)
   - Out of work for more than 1 year (4)
   - Out of work for less than 1 year (5)
   - A homemaker (6)
   - A student (7)
6. What was your total household income in the past 12 months?
   - Less than $10,000 (1)
   - $10,000 to $19,999 (2)
   - $20,000 to $39,999 (3)
   - $40,000 to 59,999 (4)
   - $60,000 to $100,000 (5)
   - More than $100,000 (6)

SECTION 2

The questions in this section are asking about the fruits and vegetables you eat as part of your regular diet.

7. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months would be

   1                        2                       3                     4                        5
   Very Harmful        Harmful           Neutral          Beneficial      Very Beneficial

8. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months would be

   1                  2                3                    4                 5
   Very Bad        Bad           Neutral          Good      Very Good

9. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months would be

   1                            2                       3                     4                        5
   Very Unpleasant       Unpleasant          Neutral          Pleasant     Very Pleasant

10. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months would be
11. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if I did not feel negatively judged by my family and friends

12. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months, will give me more energy

13. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months, will help me to lose weight

14. For me, eating 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months, would provide more nutrients (i.e. vitamins, minerals)

Questions (15-24) in this section are asking about what people in your life think about you eating 2 cups of fruit and 2.5 cups of vegetables

15. Most people who are important to me think that I should eat 2 cups of fruit and
2.5 cups of vegetables every day for the next 3 months.  
1  2  3  4  5  
Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree  

16. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if my family members were supportive  
1  2  3  4  5  
Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree  

17. It is expected of me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months:  
1  2  3  4  5  
Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree  

18. I feel social pressure to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months:  
1  2  3  4  5  
Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree  

19. People who are important to me want me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months  
1  2  3  4  5  
Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree  

20. My husband/boyfriend would want me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months  
1  2  3  4  5  

21. My family would want me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months

   1  2  3  4  5
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

22. Healthcare professionals (doctors, nutritionists, health coach) would want me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months

   1  2  3  4  5
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

23. My friends would want me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months

   1  2  3  4  5
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

24. When I am with my peers (friends, colleagues), I feel like an outcast if I eat fruits and vegetables

   1  2  3  4  5
   Strongly Disagree  Disagree  Neutral  Agree  Strongly Agree

Questions (25-34) in this section are asking about things that make it easy or hard for you to eat 2 cups of fruit and 2.5 cups of vegetables
25. I am confident that I could eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months

   1                            2               3                 4                  5
Strongly Disagree    Disagree    Neutral       Agree       Strongly Agree

26. For me to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months is

   1                         2                    3                     4                  5
Difficult    Somewhat Difficult    Neutral     Somewhat Easy    Easy

27. The decision to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months is beyond my control

   1                            2               3                 4                  5
Strongly Disagree    Disagree    Neutral       Agree       Strongly Agree

28. Whether I eat or do not eat 2 cups of fruit and 2.5 vegetables every day for the next 3 months is not entirely up to me

   1                            2               3                 4                  5
Strongly Disagree    Disagree    Neutral       Agree       Strongly Agree

29. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if fruits and vegetables were cheaper

   1                            2               3                 4                  5
Strongly Disagree    Disagree    Neutral       Agree       Strongly Agree

30. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if I had the time
31. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if I was sure it was organic

32. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if I had a community garden

33. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if transportation was readily available/if I had a car

34. I would eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months if a supermarket was nearby/within walking distance

Questions (35-37) in this section are asking about you eating 2 cups of fruits and 2.5 cups of vegetables

35. I expect to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months
36. I want to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months

37. I intend to eat 2 cups of fruit and 2.5 cups of vegetables every day for the next 3 months

Would you be interested in participating in a future study? If yes, please add your name, email, and phone number below.

Name: _____________________________
Email: _____________________________
Phone #: ___________________________

Thank you very much for completing this questionnaire.
APPENDIX I: Power Analysis

Multiple Regression Power Analysis

<table>
<thead>
<tr>
<th>Power</th>
<th>N</th>
<th>Alpha</th>
<th>Beta</th>
<th>Cnt</th>
<th>R2</th>
<th>Cnt</th>
<th>R2</th>
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<tbody>
<tr>
<td>0.80000</td>
<td>80</td>
<td>0.05000</td>
<td>0.20000</td>
<td>1</td>
<td>0.06</td>
<td>2</td>
<td>0.32</td>
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<tr>
<td>0.80000</td>
<td>90</td>
<td>0.05000</td>
<td>0.20000</td>
<td>1</td>
<td>0.06</td>
<td>2</td>
<td>0.32</td>
</tr>
<tr>
<td>0.80000</td>
<td>100</td>
<td>0.05000</td>
<td>0.20000</td>
<td>1</td>
<td>0.05</td>
<td>2</td>
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<td>0.05000</td>
<td>0.20000</td>
<td>1</td>
<td>0.05</td>
<td>2</td>
<td>0.32</td>
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</tbody>
</table>

References

Report Definitions
Power is the probability of rejecting a false null hypothesis.
N is the number of observations on which the multiple regression is computed.
Alpha is the probability of rejecting a true null hypothesis. It should be small.
Beta is the probability of accepting a false null hypothesis. It should be small.
Cnt refers to the number of independent variables in that category.
R2 is the amount that is added to the overall R-Squared value by these variables.
Ind. Variables Tested are those variables whose regression coefficients are tested against zero.
Ind. Variables Controlled are those variables whose influence is removed from experimental error.
Table of Evidence

<table>
<thead>
<tr>
<th>Citation</th>
<th>Purpose</th>
<th>Setting</th>
<th>Population</th>
<th>Study Design</th>
<th>Conceptual Framework</th>
<th>Fruit &amp; Vegetable Measur (s)</th>
<th>Results</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish, C. A., Brown, J. R., &amp; Quandt, S. A. (2013). African American and Latino low income families' food shopping behaviors: Promoting fruit and vegetable consumption and use of alternative healthy food options. Journal of Immigrant and Minority Health, 1-8.</td>
<td>Study of factors influencing the consumption of fresh fruits and vegetables, food shopping habits, and attitudes towards alternative sources of fresh fruits and vegetables among two groups of minority women, African Americans and immigrant Latinas</td>
<td>Forsyth County, North Carolina</td>
<td>N=48F minority women with children; 24 African American and 24 Latina participants</td>
<td>Qualitative design</td>
<td>N/A</td>
<td>N/A</td>
<td>- For African American women, poor cooking skills restricted the variety of fruits and vegetables purchased. - Latinas were receptive to alternative healthy food options, but did not use them because these sources were inconvenient. - African American women were interviewed with a small sample of women. The Latinas were first-generation immigrants primarily from Mexico, so their preferences and experiences may not apply to Hispanic women from other countries or to those who were born and raised in the United States.</td>
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</tbody>
</table>
Improving cooking skills and perceptions of acceptable foods may be as important as increased access to promote greater consumption of fruits and vegetables. The research did not include a detailed investigation of fruit and vegetables obtained from emergency food sources or restaurants.


| Henry, H., Reimer, K., Smith, C., & Reicks, M. (2006). Associations of decisional balance, processes of change, and self-efficacy with stages of change for increased fruit and vegetable intake among low-income, African-American mothers. Journal of the American Dietetic Association, 106(6), 841-849. | Determine the relationship between stage of change and decisional balance, processes of change, and self-efficacy variables of the Transtheoretical Model to increase fruit and vegetable consumption by low-income, African-American mothers, and to assess the usefulness of the model for intervention efforts | Community-based sites | Low-income, African-American mothers N=420; aged 18 to 45 years with children <12 years of age | Cross-sectional | The Transtheoretical stage of change model | NCI Brief Screener | American women | and vegetables in meals. | Convenience sample limiting generalizability to all low-income, African-American women; the all day fruit and vegetable screener was not validated for specific use with low-income, African-American women | -Perceptions of benefits for health and planning meals were stronger for women in later stages compared with earlier stages. The same relationship was observed for the use of processes of change related to becoming aware of health benefits and engaging in enabling behaviors, and variety of fruits and vegetables consumed. | -Self-efficacy based on eating fruits and vegetables for various eating |
occasions and in difficult situations was greater for women in later stages compared to earlier stages.


Examine the belief and behavioral dimensions of religiosity and their association with fruit and vegetable consumption and pre-behavioral variables such as self-efficacy, perceived barriers, and importance of interest in increasing consumption

10 public health centers in St. Louis, Missouri

N=1,227 Black women; mean age of 35.57 years.

Cross sectional

N/A

Five-A-Day survey

-Women with strong religious beliefs and behaviors reported more interest in eating more fruits and vegetables, perceived their consumption as being more important, and consumed more fruits and vegetables than women low in religious beliefs and behaviors.

Convenience sample of lower-income urban Midwestern African American women; self-selection bias; self-report
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Objectives were: (1) to explore participants’ concepts about healthy diet, and (2) to elicit participants’ suggestions for how to support healthier eating (specifically more produce and less fast-food consumption) for people like themselves.</td>
<td>Low-income neighborhood in west Philadelphia, PA</td>
<td>N=33; African American adults (18–81 years of age, 15 male participants)</td>
<td>Qualitative approach</td>
<td>N/A</td>
<td>Not Listed</td>
<td>-Participants generally expressed sufficient understanding of nutritional principles to eat healthfully, but disagreed about the healthfulness of specific foods and described largely unhealthy dietary consumption from the preceding day. Sample size was relatively small.</td>
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<tbody>
<tr>
<td>Apply the theory of planned behavior to explain the fruit and vegetable eating behaviors, a broad construct consisting of preparing, self-monitoring, and consuming fruits and vegetables, of older African Americans.</td>
<td>Community-dwelling, older African Americans in North Florida.</td>
<td>N=211; older African American women and men (73% women, 26% men; median age range of 57–63 years.</td>
<td>Secondarily data analysis; Structural equation modeling</td>
<td>Theory of Planned Behavior</td>
<td>Process of Change Instrument</td>
<td>-Attitudes about eating fruit and vegetables, subjective social norms, and perceived behavioral control were related to older African Americans’ intentions to consume fruits and vegetables. The data came from baseline measures completed by older African American churchgoers participating in a larger intervention study; use of secondary data somewhat limited our ability to fully...</td>
<td></td>
</tr>
</tbody>
</table>
Social norms and behavioral intentions were associated with fruit and vegetable eating behaviors. Perceived control did not moderate the influence of behavioral intentions on actual behavior.


| Reyes, N. R., Klotz, A. A., & Herring, S. J. (2013). A qualitative study of motivators and barriers to healthy eating in pregnancy for low-income, overweight, African American mothers. *Journal of the Academy of Nutrition and Dietetics, 113*(9), 1175-1181. | To understand the perceptions of low-income, overweight, and obese, African-American mothers about diet quality in pregnancy, specifically focused on what facilitators and barriers exist to eating healthy. | Philadelphia, PA | N=21; overweight/obese, pregnant low-income African-American mothers. | Qualitative approach | N/A | N/A | -Mothers believed that consuming healthy foods, like fruits and vegetables, would lead to healthy babies and limit the physical discomforts of pregnancy. However, more often than not, mothers chose foods that were high in fats | Small sample size; focused solely on low-income, urban, overweight/obese, African-American mothers who were recruited from one prenatal clinic, limiting our generalizability to mothers of higher-income, normal or underweight BMI, rural |
and sugars because of taste, cost, and convenience.

-In addition, mothers had several misconceptions about the definition of healthy (eg, “juice is good for baby”), which led to overconsumption. Many mothers feared they might “starve” their babies if they did not get enough to eat, promoting persistent snacking and larger portions.

<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Setting</th>
<th>Sample Size</th>
<th>Data Quality</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>Sheats, J. L., &amp; Middlestadt, S. E. (2013). Salient beliefs about eating and buying dark green vegetables as told by mid-western african-americans</td>
<td>To use the Reasoned Action Approach (RAA) to qualitatively assess salient,</td>
<td>Marion, County, Indiana</td>
<td>Adult Midwestern African–American women; N=30;</td>
<td>Qualitative approach</td>
<td>Reasoned Action Approach (RAA)</td>
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</table>

<table>
<thead>
<tr>
<th>Authors</th>
<th>Objective</th>
<th>Setting</th>
<th>Recruitment</th>
<th>Methodology</th>
<th>Sample Characteristics</th>
<th>Findings</th>
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<tr>
<td>Zenk, S. N., Odoms-Young, A. M., Dallas, C., Hardy, E., Watkins, A., Hoskins-Wroten, J., &amp;</td>
<td>To illuminate the barriers and facilitators to F&amp;V</td>
<td>Community health center</td>
<td>Low-income African American; Qualitative approach</td>
<td>N/A</td>
<td>N/A</td>
<td>-Women identified multiple environmental</td>
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<td>- interpersonal and environmental factors, with advantages of eating more dark green leafy vegetables generally being about a specific health outcome.</td>
</tr>
</tbody>
</table>

...consumption among African American, Hispanic and Caucasian populations and provide suggestions for program planners when developing future intervention programs. ...N=30; ages 21 to 45 years ...barriers—material, economic, and social-interactional—to acquiring food in an acceptable setting. In response, they engaged in several adaptive strategies to manage or alter these challenges, including optimizing, settling, being proactive, and advocating. ...on food procurement at stores ...
Bibliography


Berge, J. M., MacLehose, R., Eisenberg, M. E., Laska, M. N., & Neumark-Sztainer, D. (2012). How significant is the 'significant other'? associations between significant others' health behaviors and attitudes and young adults' health


Kumanyika, S. (2008). Ethnic minorities and weight control research priorities: Where are we now and where do we need to be? *Preventive Medicine, 47*, 583-586.


National Cancer Institute. Fruit and Vegetable Screeners in the Eating at America’s Table Study. Retrieved from 


Zenk, S. N., Odoms-Young, A. M., Dallas, C., Hardy, E., Watkins, A., Hoskins-Wroten, J., & Holland, L. (2011). "You have to hunt for the fruits, the vegetables": Environmental barriers and adaptive strategies to acquire food in a low-income