Intentions and Trait Self-Control Predict Fruit and Vegetable Consumption During the Transition
to First-Year University

Major Article (The American Journal of College Health)

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Abstract

Objective. To examine the independent and combined effects of Theory of Planned Behavior (TPB) variables and trait self-control (TSC) in the prediction of fruit and vegetable consumption (FVC) among first-year university students.

5 **Participants.** Seventy-six first-year undergraduate university students.

Methods. In their first week of class (September 2011), participants completed baseline measures of TSC, attitudes, subjective norms, perceived behavioral control and intentions about their FVC. One week later, students completed a 7-day food recall, from which daily FVC was calculated.

10 **Results.** Baseline attitudes and perceived behavioral control predicted intentions ($\text{adj}R^2=.34$). Intentions and TSC predicted FVC ($\text{adj}R^2=.24$).

Conclusions. The TPB may be a useful framework on which to base a FVC intervention for first-year undergraduate students; however, focusing solely on increasing positive intentions to consume FVC will not necessarily translate into FVC behavior as other personal- and
15 environmental-level variables may play a role.

Keywords. First-year undergraduate students; fruit and vegetable consumption; Theory of Planned Behavior; trait self-control.

25 A balanced diet with adequate fruit and vegetable consumption (FVC) can increase one's
life expectancy and reduce risk of chronic illnesses such as cardiovascular disease, diabetes, and
cancer.¹⁻³ Public health guidelines have been developed to encourage consumption of healthy
foods. For example, Canada's Food Guide recommends that women and men between the ages
of 14-50 should eat at least seven servings of fruits and vegetables per day.⁴ However, FVC
30 among Canadians is generally below recommended levels, and a decline in FVC is seen around
age 20 with only 49% of women and 36% of men meeting FVC guideline recommendations
during their young adult years.⁵ The decline in FVC in early adulthood is not only problematic
at this time in life, but may also influence dietary patterns as individuals age,⁶ potentially
impacting their future health.⁷

35 Experiences during early adulthood present numerous challenges for health behaviors,
including FVC.^{6,8} During their young adult years, approximately half of Canadians will
experience a transition from high school to post-secondary education.⁹ Some of the challenges
associated with this transition may be due to students living away from their parents' home for
the first time and becoming more personally responsible for managing their own health
40 behaviors and finances.^{8,10} For example, students residing in college dormitories and eating all
of their meals in buffet-style cafeteria report challenges associated with overeating and making
habitually unhealthy food choices despite having healthier food (e.g., salad bar) options
available.¹¹ Studies based on large-scale epidemiological databases have documented that fewer
than 12% of university students in Canada⁸ and 9% of college students in the United States¹²
45 consume five or more servings of fruits and vegetables per day. While at least two longitudinal
studies have demonstrated that this decline in FVC occurs at some point between high school

and university years,^{13,14} there are limited data indicating what personal or environmental factors are associated with this change. Thus, understanding the timing, correlates, and predictors FVC behavior during the transition to university would provide insight that could be used to develop intervention strategies that could help promote FVC among university students.

Although evidence demonstrates a decline in FVC among students transitioning from high school to university, no studies we are aware of have used social-cognitive theories to understand predictors of FVC specifically among first-year university students. Given that first-year university students are self-regulating their food selections for the first time, it is an important period in which to investigate intra- and interpersonal factors that are predictive of their eating behaviors. One theory that has been used extensively to investigate intra- and interpersonal correlates of numerous health behaviors is the Theory of Planned Behavior (TPB).¹⁵ According to the TPB, an individual's intention to perform a target behavior is influenced by his/her attitudes, subjective norms, and perceived behavioral control (PBC) for the behavior.¹⁵ In turn, intention and PBC are theorized to influence an individual's behavior.

A recent review demonstrated that the TPB is a useful framework for predicting both FVC intentions and behavior in studies of the general adult population.¹⁶ However, few studies have investigated psychosocial predictors of FVC in college or university samples. Several contemporary studies focused on students' intentions for healthy eating, which may have included FVC, but none have assessed FVC behavior. For example, the TPB variables of attitudes, subjective norms, and PBC were found to account for 72% of the variance in intentions to eat a healthy diet in a sample of competitive collegiate baseball players.¹⁷ The TPB variables also explained 61% of the variance in intentions to consume a plant-based diet in a general sample of university undergraduates.¹⁸ Although investigations of the predictors of intentions

70 may be important for understanding motivation for FVC, it is also critical to investigate and understand predictors of FVC behavior.

We were able to locate only two studies have used the TPB to predict FVC behavior in university student samples.^{19,20} De Bruijn²⁰ found that intentions and PBC were significant predictors of a target behavior of consuming two servings of fruit daily; explaining 26% of the variance in behavior. However, there was no investigation of attitudes, subjective norms and PBC, so an understanding of factors that might predict FVC intentions are not available from that study. Further, the target behavior, two servings of fruit, is well below contemporary recommendations of at least seven or five servings of fruit and vegetables per day (e.g., Health Canada⁴ and United States Department of Health and Human Services²¹, respectively). In another study, Blanchard and colleagues¹⁹ used the TPB to examine psychosocial predictors of a target behavior of consuming five servings of fruit and vegetables per day among undergraduate students enrolled in a health and fitness program at a U.S. university. In that study, results showed attitudes and PBC predicted 50% of the variance in FVC intentions, yet PBC and intentions to eat five or more servings of fruits and vegetables accounted for only 11% of the variance in FVC behavior.

Together, the aforementioned studies provide some evidence that the TPB may provide insight into psychological factors associated with FVC during students' undergraduate years at university. However, because participants in both studies were surveyed across all undergraduate years (i.e., not just during their first year) the data cannot be adequately interpreted in terms of first-year students' perceptions and experiences. Furthermore, participants in Blanchard and colleagues'¹⁹ study were drawn from a course in which their academic major was specifically oriented towards health and fitness and, therefore, may not be

representative of university students with other educational interests and exposures. In short, although research has demonstrated the utility of the TPB for predicting FVC among
95 undergraduate students, studies have yet to explicitly examine FVC among first-year students during their transition to university life.

The TPB offers a reliable set of psychosocial predictors that may be useful in explaining and predicting health behaviors.²² However, Conner and Armitage²³ suggest that the TPB be expanded to consider factors that may moderate the intention-behavior relationship. For
100 example, when the ongoing performance of a behavior requires planning, effort, and persistence, an individual's dispositional ability to self-regulate his/her behavior may be an important personal factor that affects behavior and the intention-behavior relationship. This dispositional ability to self-regulate behavior has been conceptualized as trait self-control (TSC).²⁴ With respect to health behaviors, TSC has been shown to be associated with physical activity and
105 healthy eating.²⁵ Researchers have suggested that self-control may moderate the intention-behavior relationship.²⁶ That is, people who have better abilities to exert self-control over their behaviour should be more likely to carry through with their behavioral intentions. To the best of our knowledge, no research has investigated TSC in the context of the TPB.

The purpose of the present study was to examine psychosocial predictors of intentions for
110 FVC as well as the independent and combined effects of intention and TSC on FVC among first-year university students. In line with previous TPB studies examining FVC in undergraduate student samples,^{19,20} and the role TSC may play in the adherence to behavioral intentions,²⁵ we hypothesized that: (1) attitudes, subjective norms and PBC would predict students' intentions to consume seven servings of fruits and vegetables; (2) intentions and PBC would predict FVC
115 behavior; (3) higher TSC scores would be associated with higher FVC; and (4) TSC would

moderate the intention-FVC behavior relationship such that students with higher TSC scores would show a stronger intention-behavior relation compared to students with lower TSC.

Methods

120 *Participants and recruitment*

Participants were recruited from two first-year Psychology classes and were given course credit for their participation. The sample ($N = 76$) consisted of first-year undergraduate university students who were living in an on-campus university dormitory and enrolled in a meal plan.^a The participants had a mean age of 17.8 years ($SD = 0.5$ years), 60 were women, and 71
 125 had graduated from high school two months prior to study participation. Participants spent an average of 19.0 ($SD = 4.0$) hours in class per week. Additionally, 48 students were enrolled in a science-related degree (e.g., life sciences, nursing, kinesiology), 11 were in business, 10 were in humanities or social sciences, and 7 were in physical sciences or engineering. The students were primarily Caucasian ($n=35$) or Asian ($n=25$), and the remaining ($n=16$) were African Canadian,
 130 Latin/South American, or Other. The study was approved by the University's Research Ethics Board.

Measures

Demographic characteristics. Participants' age, sex, ethnicity, program of study, date of high school graduation, and current hours of class time were obtained by a self-report questionnaire.

135 **TPB questionnaire.** In order to provide a contextual frame of reference, prior to completing the TPB questionnaire, students were provided with numerous examples of what constitutes a

^a The study advertisement seen by the two first-year psychology classes indicated that students were eligible to participate if they were enrolled in their first-year of studies, living in on-campus residence, and had purchased a campus meal plan. Therefore, only students who met the inclusion criteria attended the data collection sessions.

serving size for fruits (e.g., 1 medium-sized piece of fruit; ½ cup of fresh, frozen, or canned fruit or 100% fruit juice, etc.) or vegetables (e.g., 1 medium-sized carrot or other fresh vegetable, ½ cup of fresh or cooked vegetables, 1 cup of raw leafy vegetables or salad, etc.), and any

140 ambiguities were clarified by the investigators.^b All items on the TPB questionnaire were developed based on previous TPB measures,^{27,28} and were phrased relative to Canada's Food Guide's recommendations for young adults to consume at least seven servings of fruits and vegetables every day.⁴

145 Attitudes were measured in response to the question: "During the next week, eating seven servings of fruits and vegetables every day for me will be... *useless-useful; foolish-wise; harmful-beneficial; bad-good; worthless-valuable; unpleasant-pleasant; unenjoyable-enjoyable*". Items were scored using 7-point, semantic-differential adjective scales that tapped instrumental and affective aspects of attitude.²⁹ The six attitude items were averaged to give a score out of seven. Internal consistency for the 6-item scale was good ($\alpha = .79$).

150 Subjective norms were assessed with four items that were rated on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). The four items preceded the following stem: "(Insert item here) think I should eat at least seven servings of fruit and vegetables every day over the next week". The four items were (1) My close family members, (2) My best friends, (3) People I have met in university, and (4) Most people who are important to me. An average of the four

155 items was computed to give an overall subjective norm score out of seven. Internal consistency for this scale was good ($\alpha = .85$).

^b In some cases, it was unclear to students how to estimate the serving size of raw vegetables on a sandwich, or the serving size of cooked vegetables on a pizza. The investigators talked students through these examples by asking students to imagine that the vegetables were in isolation, and then compare them to the serving sizes indicated on Canada's Food Guide.

PBC was assessed with five items rated on a 7-point Likert scale. Sample items include: “For me to eat seven or more servings of fruits and vegetables every day over the next week will be” (1 = *extremely difficult*, 7 = *extremely easy*), and “It is up to me whether or not I eat at least seven servings of fruit and vegetables every day over the next week” (1 = *strongly disagree*, 7 = *strongly agree*). The scores for the five items were averaged to give an overall PBC score out of seven. Internal consistency for this scale was good ($\alpha = .75$).

Intention was assessed using three items rated on a 7-point Likert scale. The items were: (1) “I intend to eat at least seven servings of fruits and vegetables per day (on average) over the next week” (1 = *strongly disagree*, 7 = *strongly agree*); (2) “I will try to eat at least seven servings of fruits and vegetables per day (on average) over the next week” (1 = *strongly disagree*, 7 = *strongly agree*); and (3) “How likely is it that you will eat at least 7 servings of fruits and vegetables everyday (on average) during the next week” (1 = *extremely unlikely*, 7 = *extremely likely*). An average of the three items was computed to give an overall intention score out of seven. Internal consistency for the scale was good ($\alpha = .89$).

FVC (behavior). Participants used a 7-day food diary recall to report what they ate (item and serving size) each day over the previous week. A completed sample of a 1-day food diary was provided as an example of the level of detail required with respect to describing food items eaten and their serving sizes. A copy of Canada’s Food Guide was also provided as a reference for serving size examples and the recommended daily intake of each food group. In keeping with previous studies that have used self-report recall measures to assess FVC in accordance with national servings sizes,^{28,30,31} FVC on each of the seven days was extracted using Canada’s Food Guide as a reference. Average daily FVC over the week was then calculated. Internal consistency for this measure was satisfactory (ICC = .78).

180 ***Trait self-control (TSC)***. The 13-item self-control scale (brief version²⁴) was used to assess students' TSC. This questionnaire consists of 13 items with participants indicating the degree to which they believe each statement (e.g., "I am good at resisting temptation") applies to them from 1 ("*Not at all like me*") to 5 ("*Very much like me*"). All 13 items were then summed with higher scores indicating greater TSC (possible range = 13-65). This scale has been shown to
 185 produce reliable scores and valid interpretations when assessing individuals' dispositional self-control.²⁴ In the current study, internal consistency of the scale was good ($\alpha = .79$).

Procedures

Participants attended two data collection sessions. The first session (i.e., Time 1) occurred during the first week of classes in September 2011. At Time 1, participants provided
 190 informed consent and then completed the demographic questionnaire, TPB questionnaire, and the TSC measure. Seven days later (i.e., Time 2), participants attended the second session where they completed the 7-day food diary recall and were then debriefed and thanked for their participation.

Data analysis

195 Statistical software (SPSS 19.0, SPSS Inc., Chicago, IL, 2010) was used to compute descriptive statistics, correlations between the measured variables, and multiple regression analyses to test the study hypotheses. The first hypothesis was evaluated with multiple regression using attitude, subjective norms and PBC as predictors and intention as the criterion variable. The second hypothesis was tested using hierarchical multiple regression analysis with
 200 intention entered in the first block followed by PBC in the second block with FVC as the dependent variable. Following recommendations by Cohen and colleagues,³² in order to analyze TSC as a moderator of the intention-behavior relationship, intention and TSC were mean

centered and a multiplicative interaction term (intention x TSC) was created. For the third regression model testing the third and fourth hypotheses, a hierarchical model was used to predict FVC with intention entered in block 1, TSC entered in block 2, and the intention x TSC interaction entered in block 3.

Results

Descriptive statistics and bivariate correlations between the measured variables are presented in Table 1. Participants generally had positive attitudes, subjective norms, PBC and intentions scores with respect to consuming seven or more servings of fruits and vegetables over the next week, with mean scores greater than the scale midpoints. The mean score for TSC was 43.3 (out of 65). Participants reported consuming an average of 2.8 servings of fruits and vegetables per day over the seven-day recall period. As can be seen in the correlation matrix of Table 1, there were significant bivariate correlations between all of the measured variables of the TPB questionnaire. Attitudes, TSC, PBC and intention were also correlated with FVC (p s < .05).

A summary of the regression analysis testing the first hypothesis is presented in the top panel of Table 2. Attitude ($\beta = .20, p < .05$) and PBC ($\beta = .64, p < .001$) both contributed significantly to the model; however, subjective norm was not a significant predictor. The overall model was significant, accounting for 58% of the variance in intention ($\text{adj}R^2 = .58, F(3,72) = 35.52, p < .001$).

A summary of the second hierarchical regression analysis, testing hypothesis two, is presented in the middle panel of Table 2. In the first step, intention predicted FVC ($\beta = .47, p < .001$). In the second step, intention remained a significant predictor ($\beta = .43, p < .05$), while PBC

225 did not contribute significantly to the model ($p > .05$). The overall model accounted for 20% of the variance in FVC ($\text{adj}R^2 = .20$, $F(2,72) = 9.97$, $p < .001$).

Since PBC was not a significant predictor of FVC when analyzed in concert with intentions, PBC was not included in the third hierarchical regression analysis investigating the hypothesized main effect and moderating role of TSC (Table 2, bottom panel). As shown in
 230 Table 2, TSC was a significant predictor in both the second and third steps of the model ($\beta_s = .21$, $p_s < .05$). Intention was a significant predictor of FVC in all three equations ($\beta_s \geq .45$, $p_s < .001$). Contrary to the prediction of hypothesis four, the interaction between intention and TSC in step three of the model was not significant, (R^2 change = 0.00). The overall regression model including intention, TSC, and the intention x TSC interaction was significant and accounted for
 235 22% of the variance in FVC ($\text{adj}R^2 = .22$, $F(3,72) = 7.93$, $p < .001$).

Comment

The purpose of the present study was to examine psychosocial predictors of intentions for FVC as well as the independent and combined effects of intention and TSC on first-year
 240 university students' FVC behavior. The findings generally supported our hypothesis that attitudes, subjective norms, and PBC would be positively associated with first-year undergraduate students' FVC intentions. Intentions and TSC were also found to independently predict FVC behavior. However, contrary to our hypotheses, there was no evidence that intention was more strongly associated with FVC among students who reported higher levels of
 245 TSC.

The present findings provide support for the use of the TPB when examining FVC during young adults' transition from high school to first-year university. Attitudes and PBC were

statistically significant predictors of students' intentions, collectively accounting for 58% of the variance. These results support an interpretation that more positive feelings and instrumental perceptions about the value of FVC lead to stronger intentions to consume more fruits and vegetables. Furthermore, students who felt more strongly that eating the recommended servings of fruits and vegetables were under their personal control also reported stronger FVC intentions. This finding is in line with Blanchard and colleagues' findings,¹⁹ as well as with previous literature that has used the TPB to predict other health behaviors.^{28,33,34}

Our findings showed that while scores for the measure of subjective norms were correlated with intentions in the bivariate analysis, they were not a significant predictor of FVC intentions in the multivariate analysis including attitudes and PBC. A similar result was seen in the study by Blanchard and colleagues.¹⁹ Together these results suggest that normative beliefs may not be influential factors determining some health behaviors during university. Given that university students' social circles may fluctuate and opportunities to make independent food consumption choices when living in university residence may vary throughout the week, normative influences from traditionally strong sources such as friends and family members may have little effect on behavior relative to one's self-perceptions.³⁵

Intention was the sole predictor of FVC from the TPB model in this study. These findings also align with those of Blanchard and colleagues,¹⁹ suggesting that PBC does not contribute substantially to FVC after accounting for behavioral motivation. However, it is interesting to note that participants consumed an average of less than three servings of fruits and vegetables per day, which is well below both Canadian⁴ and U.S.²¹ recommendations of at least seven and five servings per day, respectively. Thus, there appears to be a gap between participants' intention scores and FVC. This intention-behavior gap has been noted in research

on numerous health behaviors,²² and may have resulted from obstacles that prevent students from following through with their intentions, such as unanticipated demands of academic and social life or environmental barriers such as higher costs of fresh fruits, vegetables and salads compared to cheaper alternatives.

275 Although PBC was not a significant predictor of FVC, it was a significant predictor of FVC intentions. This finding suggests that perceptions of control over behavior may be important to the development of intentions, but that additional factors may affect the translation of intentions to behavior. First-year students may have an optimistic sense of control over their behavior during the transition to university while they are constantly faced with new challenges
280 and experiences as they adjust to living on campus. A number of external influences (e.g., a perceived lack of healthy options on campus, the way food is prepared on campus, lack of places to cook in residences, requirement to subscribe to meal plans when living in residence, the normative busyness of college life) have been reported as barriers to FVC among university students).^{11,36} While students may sometimes be aware of such external influences, the impact of
285 these factors may not become salient until they attempt to perform the behavior, which may be another factor contributing to the gap between motivation to engage in FVC and FVC behavior. For example, students in the current study had access to options for purchasing and consuming fruits and vegetables at on-campus dining facilities, as well as at on- and off-campus markets; thus, personal and environmental factors other than a lack of availability of fruits and vegetables
290 may play a role in translating positive intentions into FVC behavior. Future research examining environmental barriers and facilitators for FVC would inform the development of relevant interventions to increase FVC among this cohort.

In an attempt to explore one factor that may account for the intention-behavior gap, we examined TSC as a moderator of the intention-behavior relationship. Findings revealed that TSC was independently associated with FVC; students who reported stronger TSC values consumed more fruits and vegetables. Yet, contrary to our predictions, students who scored higher on TSC did not exhibit a stronger intention-FVC relationship. These findings are interesting to interpret in light of results shown in a paper by Hall and colleagues³⁷ that found individual differences in executive function capacity moderated the intention-behavior relationship for physical activity (Study 1) and FVC (Study 2) in samples of undergraduate students. In both of Hall and colleagues' studies, the intention-behavior relationship was much stronger among students who scored higher on laboratory tests of executive function using a version of the Go/No-Go task. Although self control and executive functioning are not synonymous, Hofmann et al. have discussed parallels between constructs and evidence from the self control and executive function literatures, noting that greater self control is consistently accompanied by greater executive function.³⁸ The present findings indicate TSC does not moderate the intention-behavior relationship; however, future research should utilize alternative or additional measures of self control and executive function to investigate these potential relationships more fully.

Strengths

To the best of our knowledge, this study is the first to apply a theoretical model of volitional behavior (TPB) to explore potential determinants of FVC specifically among first-year undergraduate students undergoing the transition to university life. This study is also the first to examine TSC as an independent predictor of FVC and moderator of the intention-behavior relationship. Thus, findings from the present study advance knowledge in terms of understanding dispositional, personal and environmental factors associated with FVC during young adulthood.

Limitations

Despite these strengths, limitations should also be noted. For instance, the measure used for FVC was a 7-day food diary recall. As with any self-reported recall measure, social desirability and memory distortion may have impacted the accuracy of reports. Future studies should consider using internet-based food diaries where participants report their FVC at the end of each day to help avoid recall bias. Another limitation is that the study included only first-year undergraduate students who were living in campus dormitory housing. Thus, findings may not generalize to first-year undergraduate students who live off-campus and are faced with other challenges (e.g., commuting time, packing a lunch) that may influence their FVC during the transition to university life. Although some students commuting to campus may experience similar barriers to FVC as those students living on campus, others may not; such as in cases where students reside at their parents' home and may have FVC access or restrictions not experienced by those living in a dormitory. Future studies should explore the unique experiences and predictors of FVC among first-year students in varied living arrangements.

We should also acknowledge that the TPB questionnaire items were framed relative to a behavioral criterion of consuming seven or more servings per day of fruits and vegetables using a response scale ranging from (1-7). In contrast, the measure of FVC (food diary recall) was computed as a continuous scale (zero to infinity) representing daily consumption frequency rather than behavior relative to the seven-serving criterion. Researchers who use the TPB to predict physical activity behavior have suggested scale correspondence may be a factor that improves interpretation of findings.³⁹ Previous work by Blanchard and colleagues¹⁹ used logistic regression analysis to address this issue in their study of FVC among university students with a dichotomous representation of FVC (<5 servings/day vs. $\geq$ 5 servings/day). Although

dichotomizing continuous data may assist with scale correspondence, it may be costly to data
 340 interpretation in other ways (cf. Cohen⁴⁰). In the present study, only one participant reported
 consuming seven or more servings per day of fruit and vegetables. Consequently, our data did
 not allow for the type of analysis used by Blanchard and colleagues.¹⁹ Thus, although the
 present data may be limited by scale correspondence issues, they nonetheless indicate how much
 of a challenge it may be for students to eat the recommended amount of fruits and vegetables
 345 during the transition to first-year university.

Implications for research and practice

The current study provides evidence based on a brief longitudinal window of behavior.
 However, we recommend future research examining FVC during the transition to university
 should assess psychological variables and behavior over a longer period of time. Measures of
 350 FVC obtained prior to students' enrolment and throughout their first year at university would
 reveal patterns of change in behavior. A longitudinal approach would help further our
 understanding of how psychosocial and environmental factors may fluctuate independently, and
 in association with FVC behavior, as students transition to young adulthood. In addition,
 examining possible mechanisms by which TSC or intentions may influence behavior (e.g., action
 355 planning) would help solidify our understanding of how self control may impact students'
 engagement in healthy eating habits and other health behaviors (e.g., physical activity, sleep
 patterns, alcohol or tobacco use, etc.).

Conclusions

Understanding the predictors of and barriers to FVC among first-year university students
 360 can inform the design of interventions aimed to improve healthy eating among young adults.
 Despite their high intentions to consume seven servings per day, the average FVC of first-year

students in the present study was 2.8 servings per day. Thus, focusing solely on increasing positive intentions to consume FVC will not necessarily translate into FVC behavior.

Interventions should address external barriers such as availability and affordability of fruits and

365 vegetables at on-campus food service venues in order to increase FVC behavior. Such interventions would also benefit from encouraging students to learn to self-regulate their consumption by setting goals,⁴¹ planning the execution of FVC,^{42, 43} and developing coping capabilities allowing them to overcome barriers that may hinder positive intentions for FVC (c.f. Schwarzer⁴⁴).

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Table 1. *Descriptive statistics and bivariate correlations among the study variables (n=76).*

	1	2	3	4	5	6	Mean	SD
1. Attitude		.24*	.43**	.49**	.14	.28*	6.0	0.7
2. Subjective Norm			.23*	.26*	-.12	.18	5.1	1.0
3. PBC				.75**	.13	.37**	5.3	1.0
4. Intention					.06	.47**	5.0	1.5
5. TSC						.24*	43.3	7.8
6. FVC (behaviour)							2.8	1.6

Note. TSC, trait-self-control; PBC, perceived behavioural control; FVC, fruit and vegetable consumption. * $p < 0.05$. ** $p < 0.01$. Means for attitude, subjective norm, PBC, and intention are out of seven. The possible range for TSC scores is 13-65. FVC units are average servings of fruits and vegetables per day based on a 7-day recall.

Table 2. *Hierarchical multiple regression analyses predicting intention and FVC (n=76).*

Model 1									
Criterion	Predictors	R^2	$\text{Adj}R^2$	df	β				
Intentions									
	Attitude				.20*				
	Subjective norm				.07				
	PBC	.60	.58	1,72	.64**				
Model 2									
Criterion	Predictors	R^2	$\text{Adj}R^2$	$R^2 \Delta$	$F \Delta$	df	β_1	β_2	
FVC									
	1. Intention	.22	.21		20.09**	1,73	.47**	.43*	
	2. PBC	.22	.20	.001	0.09	1,72		.05	
Model 3									
Criterion	Predictors	R^2	$\text{Adj}R^2$	$R^2 \Delta$	$F \Delta$	df	β_1	β_2	β_3
FVC									
	1. Intention	.21	.20		19.02**	1,71	.46**	.45**	.45**
	2. TSC	.26	.24	.05	4.25*	1,70		.21*	.21*
	3. Intention x TSC	.26	.22	0.00	0.00	1,69			-.002

Note. FVC, fruit and vegetable consumption; TSC, trait self-control. Δ = change, * $p < .05$; ** $p < 0.01$. β_1 : standardized beta coefficients for regression equation 1. β_2 : standardized beta coefficients for regression equation 2. β_3 : standardized beta coefficients for regression equation 3.