Name of the tool:	**The Green Eating Survey**
Purpose:	To assess four constructs of the Transtheoretical Model (TTM) related to environmentally conscious or sustainable eating referred to as Green Eating (GE). These constructs consist of Stage of Change (SOC) for Green Eating, the Green Eating Behavior scale (BEH), the Green Eating Decisional Balance (Pros and Cons) scale (DB), and the Green Eating Self-Efficacy scale (SE). The most widely used instrument is GESOC.
How was it conceptualized?	GE was conceptualized as encompassing the factors of personal health, environmental protection, and social values. The TTM is a widely used model of behavior change that has been used to tailor interventions to improve a range of behaviors. In order to develop TTM-tailored interventions for GE, we had to develop an instrument assessing key TTM constructs.
What were the steps in development (including face/content validation, cognitive interviews, psychometrics, etc.)?	The initial step was a review of the literature related to personal decision making to adapt "pro-environmental" or sustainable eating behavior to determine both the extent of the construct as well as existing instruments. We found that no existing instrument assessed the TTM constructs, but items from existing instruments could be used for instrument development and for an initial definition for SOC. The next step was to assess student understanding of the SOC definition through cognitive interviews (n=20). The term Green Eating was widely endorsed and the specific items listed in the definition were also widely endorsed; the definition was found to be clear and understandable. Our overall strategy was to use the sequential approach to instrument

	development. The research team and experts on sustainable eating generated items for the three instruments which were tested in an initial convenience sample of 76 then included in a large survey (n=954 after exclusions) that was randomly split into exploratory and confirmatory samples. The survey included demographic and validation items as well as the TTM items. The full sample was used for measure invariance and validation. Exploratory principal components analyses with the varimax rotation using the minimum average partial and parallel analyses procedures to determine the number of factors for the BEH, DB and SE instruments. Items with low loadings and complex items were removed and final item selection was based on item clarity, lack of redundancy and conceptual breadth. Confirmatory factor analyses utilized structural equation modeling and final models for each scale were finalized based on comparative indices. Measurement stability (invariance) was assessed across gender and white/non-white subgroups and measures were found to be stable. The GEBEH and GESOC were found to have strong convergent validity and DB and SE were found to have known groups validity
Who was it tested with? (initial sampling)	The instrument was validated with a convenience sample of students from the University of Rhode Island in 2011.
How is it scored?	Green Eating was defined as ''eating locally grown foods, produce that is in season and limited intake of processed foods, consuming foods and beverages that are labeled fair trade certified or certified organic and consuming meatless meals weekly and (if consuming animal products) selecting meats, poultry, and dairy that do not contain hormones or antibiotics.'' Participants read the definition and chose 1 of

	the following statements: (Precontemplation) ‘‘No, and I do not intend to in the next 6 months’’; (Contemplation) ‘‘No, but I intend to in the next 6 months’’; (Preparation) ‘‘No, but I intend to in the next 30 days’’; (Action) ‘‘Yes, I have been, but for < 6 months’’; or (Maintenance) ‘‘Yes, I have been for the past 6 months.’’ BEH consists of 6 items assessing the frequency of sustainable food related behaviors. Response options included ‘‘barely ever to never,’’ ‘‘rarely (25%),’’ ‘‘sometimes (50%),’’ ‘‘often (75%),’’ and ‘‘almost always.’’ The DB scale consisted of 10 items reflecting the pros and cons of GE. Participants responded by assessing the importance of each item to their GE decisions, ranging from ‘‘not at all important’’ (1) to ‘‘extremely important’’ (5). Eight items in the SE scale reflected a range of challenging situations ranging from ‘‘not at all confident’’ (1) to ‘‘extremely confident’’ (5) five at school and three at home. Average scores for each scale should be calculated to allow comparison of scales with different numbers of items. See reference below for details of the scales. Weller K, Greene G, Redding C, Pavia A, Lofgren I, Nash J. Kobayashi H. Development and Validation of Green Eating Behaviors, Stage of Change, Decisional Balance and Self Efficacy Scales in College Students. J Nutr Educ Behav. 2014;46:324-333.
How has it been used since?	Dr. Monroe used the instrument to assess outcome of an online intervention that was found to increase GE behaviors. The GESOC and GEBEH measures have been used in cross sectional assessments of student health

	and behavior in ongoing research URI as well as with Dr. Colby's FRUVED study and Dr. McNamara's Critical Thinking research. Monroe J, Lofgren I, Sartini B, Greene G. The Green Eating Project: Web-based intervention to promote environmentally conscious eating behaviors in United States university students. Public Health Nutrition 2015; 18(13):2368-2378 McNamara J, Sweetman S, Connors P, Lofgren I, Greene G. Using interactive nutrition modules to increase critical thinking skills in college courses. J Nutr Educ Behav. 2019, https://doi.org/10.1016/j.jneb.2019.06.007 Brown, G, Arts, J, Nash, JT, Lofgren, I, Greene, GW. Green eating and dietary quality in university students. Experimental Biology, Boston, MA 2013. McPartland S, Nash JT, Melanson K, Hall R, White A, Horacek T, Greene G. Environmentally conscious behavior at three Northeastern universities. Experimental Biology, Boston MA, 2013. Vandeputte, E, Nash JT, Weller, K, Greene, G, Lofgren, IE. Relationship between green eating and environmental attitudes and behaviors. *J FASEB.* 2013.27:1065.13. Nash JT, Arts J, Lofgren IE, Greene GW. Stage stability and test-retest reliability of the Green Eating survey. J Nutr Educ Behav. 2013;45(4S):S43-S44. Colby S, Olfert M, Mathews A, Kattelmann, Kidd T, Brown O, White A, Horacek T, Shelnutt K, Byrd-Bredbenner C, Greene G, Morrell J. "Get Fruved": the RCT Year. Journal of Nutrition Education and Behavior, 2018, Volume 50, Issue 7, S116 - S117

Limitations for use:	The instrument was developed using a college population age 18-24 and would likely need to be adapted to other populations. The breadth of the construct assessed in GEBEH is limited and should be expanded in future research. In addition, since the measures were developed in 2011, modifications may be needed for current use.
Potential applications and future applications:	We have consistently found that students in GESOC Precontemplation, Contemplation and Preparation have lower dietary quality than students in Action and Maintenance. Therefore, the measure could be used to tailor interventions to improve dietary quality as well as to increase sustainable eating behavior. The GEBEH scale provides a continuous measure that could be used in a similar fashion. GEDB and GESE could be used to provide tailored feedback for interventions.