The Association Between Eating Competence and Daily Hassles and Uplifts of Eating Location in Undergraduate University Students

Aimee Marie Allen

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Committee:

Michelle Averill

Cristen Harris

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Abstract

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Aimee Marie Allen

Chair of the Supervisory Committee:

Michelle Averill

Food Systems, Nutrition, and Health

Objectives: The study sought to investigate the association between the daily hassles and uplifts related to eating location and eating competence (EC), and whether socio-demographics impact this association.

Methods: Using a cross-sectional study design and a convenience sample of undergraduate university students, the Lifecourse Eating and Feeding Registry was offered to 644 students during May and June of 2023. Daily hassles and uplifts were measured using the Daily Hassles and Uplifts Scale (DHUS), while EC was measured with ecSI 2.0^{TM}. University students completed a survey which collected socio-demographic data and responses to the DHUS and ecSI 2.0^{TM}. Multivariate regression was used to analyze whether DHUS items were associated with EC in three models: a base model, followed by a primary model with age and gender

included as additional independent variables, and finally an exploratory model with birth country and food security status included. A second set of multivariate models used the EC subdomain, Contextual Skills (CS), as the dependent variable using the same independent variables as the original three models.

Results: 482 students completed the sections of the survey included in the study. Three of the six DHUS items of interest were statistically significant: the hassle of eating at home, the hassle of eating out, and the uplift of eating out. The hassles of eating at home and of eating out were inversely associated with EC, while the uplift of eating out was positively associated with EC. Neither age nor gender was statistically significant in the primary model, and only birth country was statistically significant in the exploratory model: birth country of the United States was inversely associated with EC. In the CS models, three DHUS items were statistically significant in their association with CS: the uplifts of eating at home and of eating out and the hassle of eating at home. Again, only birth country was statistically significant in the subsequent models, with birth country of the US inversely associated with CS.

Conclusion: Viewing an eating location as an uplift is positively associated with EC and CS, while viewing an eating location as a hassle is inversely associated with EC and CS. Future qualitative research could illuminate the reasons these associations exist, while in current practice, Registered Dietitian Nutritionists can use nutrition counseling and ecSI 2.0™ results to work with clients to improve the relationship with food and eating.

Introduction

For undergraduate university students, life is full of rapid changes. There is a need to adjust to a new living situation, a new schedule, and new foods and ways of eating. For students living both on and off campus, university life comes with new and different challenges in feeding themselves. Those living on campus eat many meals in dining halls while those living off campus face the need to cook most of their own meals, possibly for the first time. Students may experience the wider variety of foods provided in a dining hall or begin to grocery shop and cook for themselves at home independently for the first time. The transition to university life disrupts students' typical routines and their eating patterns.[1] As this transition occurs, so do attitudes about eating and the location of the meals. Eating at home may become more of a challenge, while eating out becomes easier or even a joyful event to be shared with new friends. Eating on the go may be a planned daily necessity, or it could be the only way to ensure getting a snack or a meal during a particularly hectic time. How these students view eating in various locations may affect their attitudes toward food or their skills in consistently ensuring they eat and get enough to eat.

18-22% of university students report having a chronic disease,[2,3] a substantially lower prevalence than the CDC's reported 60% of American adults.[4] For individuals with chronic disease, there may be added stress surrounding eating in any location. For those who tailor their diet to manage or treat a chronic disease, it may be more challenging to find restaurants capable of meeting their needs. For others, it may be more challenging to prepare meals for themselves at home because of kitchen access or limited abilities and skills. University life surrounding food may be even more challenging for this population. Eating with others while using diet to manage a chronic condition creates its own challenges. It can be isolating to be the only one in a group who is unable to eat at some restaurants or needs to order in a way that can be viewed as inconvenient to restaurant workers – even if this is a perception and not a reality. For example, in a 2005 Swedish study on individuals

with celiac disease, researchers found that participants experienced isolation, shame, fear of accidental gluten exposure, and "worries about being a bother" related to using a gluten free diet to manage the disease.[5] For individuals with phenylketonuria (PKU), eating out can seem impossible due to a lack of knowledge about PKU and a lack of low-protein options on a menu. These individuals have reported not enjoying eating out because of a lack of knowledge among restaurant staff, feeling like the staff thought PKU was "made up," and confusion about low-protein compared with vegetarianism.[6] There is limited research in the setting of other chronic diseases directly related to the burden of maintaining a diet as a way to manage chronic disease.

Adaptive eating refers to mindful eating practices that are linked to positive health outcomes.[7] Eating competence (EC) is one form of adaptive eating with a focus on the "how" of eating and the "what" will follow naturally. The Satter Eating Competence Model (ecSatter) is a size-inclusive model consisting of four domains that describe a positive relationship with food and eating. EC incorporates the foundation of a consistent feeding/eating routine with unconditional permission to eat a wide variety of foods that allows a positive attitude toward food and eating to evolve. Consistently, research has shown that those who are eating competent (total score 32 or higher on the ecSI 2.0™) have a higher nutritional quality of their diet and have better health outcomes than those with lower scores.[8] Among university students, those who were eating competent were among the groups with better health indicators, including improved perceived dietary quality,[9] BMI in the "normal" category,[9] higher levels of physical activity,[10] and better sleep.[10,11] Higher ecSI 2.0 ™ score in university students has recently been found to be associated with lower weight-and-body guilt, lower risk of eating disorder,[12] lower risk of food insecurity, lower perceived stress, and higher stress management skills.[13] In the general adult population, EC has been associated with lower rates of metabolic syndrome, insulin resistance, and type 2 diabetes.[9–11,14–19]

The Daily Hassles and Uplifts Scale (DHUS) is a Likert-style scale that has been used in research since the 1980s.[20] While many studies prior to its development looked at the negative

impacts of highly stressful singular events like trauma or "severely taxing situations," the DHUS was developed to measure everyday stressful events with the added feature of looking at daily uplifts.[20] This two-sided view allows for a better understanding of the impact of both small everyday stressors as well as things that bring daily joy. The original study utilizing the DHUS found that daily stressors are a better predictor of psychological symptoms than larger, stressful life events,[20] which challenged previously held beliefs. For each of these questions, respondents answer to what extent or degree each of these is a hassle and how much it is an uplift, providing an opportunity to understand the reality of how each of these aspects of life can be both joyful and challenging.

While there has been a significant amount of research looking at the relationship between the DHUS and psychological symptoms of stress, including eating behaviors,[21–27] and research into various forms of stress and EC,[13,28–30] there has not yet been a study addressing the association between DHUS and EC. This study aimed to analyze a specific subset of the DHUS questions to evaluate how everyday hassles and uplifts related to where an individual eats is associated with their EC, and to determine if this differs for those who tailor their diet to manage a chronic disease.

This study utilized the DHUS to explore the associations between specific hassles and uplifts relating to eating location and EC, evaluated by the Satter Eating Competence Inventory (ecSI 2.0™) total score. Sociodemographic factors known to be associated with EC through prior research (i.e., age, gender, food security) were evaluated in developing the final model. A secondary aim was to investigate how tailoring diet to manage a chronic disease may affect the relationship between the DHUS questions about eating location and ecSI 2.0™ score. To the author's knowledge, this is the first study investigating the association between any form of the DHUS and EC. We predicted that a higher hassle score for each eating location would be negatively associated with ecSI 2.0™ score and a higher uplift score would be positively associated with ecSI 2.0™ score.

Methods

Participants and Study Design

The present study utilized a cross-sectional design based on self-reported survey responses. The Lifecourse Eating and Feeding Registry Survey was offered to a convenience sample of 644 undergraduate students registered in nutrition courses in May and June of 2023 at a large public university. Extra credit was offered for completing the survey, and an alternative assignment was offered for those who did not wish to participate in the study but still wished to earn extra credit. Respondents were excluded from the study if they were under 18 years of age or were unable to read, speak, or understand English. The Human Subjects Division determined that the study qualified for exempt status. Included in the survey were the full DHUS including items about eating location, the ecSI 2.0™, demographic questions, and other items not utilized in the present study.

Data collection

The survey was distributed using REDCap (Research Electronic Data Capture), an online survey and data collection tool that allows for the secure, anonymous collection of survey results for use in research.[31,32] To enter the survey, participants agreed to receive requests to complete subsequent surveys every two years for up to twenty years and confirm eligibility based on exclusion criteria. Names and email addresses for future iterations of the survey were collected separately from the study data to keep participants' identities separate from their survey responses. Participants were informed the 100-item survey would take about 20 minutes to complete.

The items from the survey included in this study were limited to socio-demographics, three questions from the DHUS,[20] the ecSI 2.0™[33], and two additional questions to ascertain the rationale for eating behaviors: "Do you have a mental or chronic condition?" and, "Do you tailor your diet to manage your chronic condition?" These two questions were utilized to address the secondary

research question and determine if tailoring the diet to manage a chronic condition affected the relationship between the DHUS and EC.

Measures

The DHUS was used to evaluate common everyday hassles and uplifts.[20] Instructions were to, "Think about how much of a hassle and/or how much of an uplift each item was for you today and please select the appropriate response for you." Participants provided two Likert scale ratings for each item: hassle and uplift. Answers ranged from 0, which is "not at all" or N/A, to 3, which is "a great deal." Topics covered in the DHUS include family, caregiving responsibilities, relationships, work, finances, substance use, personal and medical care, environment (natural, political), home maintenance & bills, entertainment, food, and social and community participation. The three DHUS items included in this study were, "Eating at home," "Eating out," and "Eating on the go." EC was measured using the valid and reliable ecSI 2.0™. This was used as a continuous variable with possible scores ranging from 0-48. A score of 32 or higher indicates EC.[15,33] This survey has been validated in adults across income groups in the United States in men and women.[15,34] The 16-question survey evaluates EC in four domains: eating attitudes, food acceptance, internal regulation, and contextual skills. Individual domain scores can be calculated, but no cutoff points exist for the individual domains.

Of the socio-demographic variables collected in the survey, five were used in the study: race, birth country, age, gender, and food security status. There were nine listed races/origins and an additional option to type in a response. Out of 31 birth countries from the sample, this was recoded as born in the United States or born in another country. Age was collected on the date the participant completed the survey. Gender options included man, woman, transgender man or transmasculine, transgender woman or transfeminine, queer or gender queer, non-binary or gender non-conforming, a different identity not listed above (this option included a box for free text entry) and prefer not to

answer. Food security status was assessed using the USDA's two-item food security screening tool. Those who answered "never true" to both questions were considered food secure, while those who answered sometimes true or often true to either question was considered food insecure, following the USDA's scoring guidelines for the tool.[35] The two items were:

1. Within the past 12 months, we worried whether our food would run out before we got money to buy more. Was this often true, sometimes true or never true for your household?
2. Within the past 12 months, the food we bought just didn't last, and we didn't have money to get more. Was this often true, sometimes true or never true for your household?[35]

Also, included in the survey were two questions relating to chronic conditions: "Do you have a mental or chronic condition?" and if so, "Do you tailor your diet to manage your chronic condition?"

Statistical Analysis

To evaluate the association between selected DHUS variables and ecSI 2.0™ total scores, a standard multivariate regression was conducted between the six DHUS variables of interest and ecSI 2.0™ score. All assumptions for multiple regression were met and multivariate regression was determined to be the most appropriate statistical analysis for the data. Out of the six independent variables of interest, three were found to be significant. These independent variables were used in the base model with ecSI 2.0™ score as the independent variable. Subsequent models used standard multivariate regression with demographic variables to produce a primary, then an exploratory model. Included in the primary model were gender and age because these factors have been found in previous research to be associated with EC. In adults, men tend to have the highest ecSI 2.0™ scores, while transgender, gender-queer, non-binary, or gender non-conforming individuals tend to have the lowest scores.[19,36–38] Studies have demonstrated that EC is greater in older age groups.[38,39] Additionally, the contextual skills (CS) subdomain of the ecSI 2.0™ was used as a secondary

outcome variable of interest to explore the association between the DHUS items of interest and university students' skills in feeding themselves consistently, i.e., regular meals and snacks Statistical analysis was completed in SPSS (v.29)[40] with a significance level of .05 for all tests.

Results

A total of 526 students began the survey and 482 completed the sections included in the analysis: DHUS, ecSI 2.0™ inventory, demographics, and the additional questions relating to chronic disease. The mean age of the sample was 20.4 years and 71.4% identified as women. 64.73% were born in the United States and 78.01% were classified as food secure based on the 2-item Food Security Screening Tool. Table 1 displays the demographic characteristics of the sample. The distribution of race within the sample was such that no meaning could be derived from its use as a potential confounder. As an alternative, birth country (U.S. vs. Outside the U.S.) was used as a proxy for cultural factors. Gender responses of Queer/Gender Queer, Non-binary/Gender Non-conforming, and Prefer not to answer were collapsed into a single group, resulting in three gender categories. An independent t-test was used to assess gender group differences in ecSI 2.0™ scores. There was homogeneity of variances between the Queer/Gender Queer, Non-binary/Gender Non-conforming, and Prefer not to answer groups, as assessed by Levene's test for equality of variances ($p = 0.499$). All assumptions were met with the exception of collinearity for gender; however, multivariate regression was determined to be most appropriate for statistical analyses.

Table 1: Variables and demographics: N = 482

Variable	Mean ± SD
DHUS Scale items[a]	
Hassle of eating at home	0.72 ± 0.777
Uplift of eating at home	1.76 ± 0.957
Hassle of eating out	0.72 ± 0.747
Uplift of eating out	1.91 ± 0.949
Hassle of eating on the go	0.80 ± 0.802
Uplift of eating on the go	1.06 ± 0.961
ecSI 2.0™ Total Score[b]	31.07 ± 9.754
Eating Attitudes	12.38 ± 4.359
Food Acceptance	5.51 ± 2.332
Internal Regulation	3.85 ± 1.621
Contextual Skills	9.33 ± 3.578
Age*	20.4 ± 1.655
	N (%)
Eating Competent[c]	240 (49.79)
Born in the US	312 (64.73)
Food Secure	376 (78.01)
Gender[d]	
Man	128 (26.6)
Woman	344 (71.4)
Queer/Gender Queer	1 (0.2)
Non-binary/Gender Non-conforming	7 (1.5)
Prefer not to answer	2 (0.4)
Has a mental or chronic condition	52 (10.86)
Tailors diet to manage a chronic condition	17 (32.69)†
Race	
African American or Black	22 (4.56)
Western Asian[e]	3 (0.62)
Southeast Asian[e]	51 (10.58)
South Asian[e]	27 (5.60)
East Asian[e]	165 (34.23)
Hispanic, Latinx, or Spanish origin	50 (10.37)
American Indian or Alaska Native	3 (0.62)
Native Hawaiian or Other Pacific Islander	5 (1.04)
Caucasian or White	118 (24.48)
More than one race or origin	37 (7.68)
A different race or origin not listed above	1 (0.21)

* N for age = 468 due to missing values.

† Percentage of those who have a chronic condition who tailor their diet to manage their chronic condition

a. DHUS items were measured using Likert scale ratings for each item: hassle and uplift. Answers ranged from 0, which is "not at all" or N/A, to 3, which is "a great deal."

b. Eating Competence was measured using the 16-item ecSI 2.0™. Scores range from 0-48. Individual domain score ranges: Eating Attitudes: 0-18; Food Acceptance: 0-9; Internal Regulation: 0-6; Contextual Skills: 0-15.
c. Eating Competent: the number of participants with a score of 32 or higher on the ecSI 2.0™.
d. For analysis, gender was collapsed into three categories: man; woman; and queer/gender queer, non-binary/gender non-conforming, and prefer not to answer.
e. Western Asian includes Georgian, Armenian, Azerbaijan, Turkish, Cypriot, Syrian, Lebanese, Israeli, Palestinian, Jordanian, Iraqi, Omani, Yemeni, Kuwaiti, Bahraini, Qatari, and Saudi Arabian
Southeast Asian includes Bruneian, Cambodian, Indonesian, Laotian, Malaysian, Burmese, Filipino, Singaporean, Thai, Timorese, Vietnamese
South Asian includes Sri Lankan, Bangladeshi, Indian, Afghan, Pakistani, Bhutanese, Nepali, Maldivian, Irani, Bengali, Punjabi, Singhalese
East Asian includes Chinese, Mongolian, North Korean, South Korean, Japanese, Taiwanese, Macau
Central Asian includes Tajikistani, Uzbekistani, Kazakhstani, Turkmenistani, Kyrgyzstani

Six daily hassles and uplifts were included in the study: the hassle and uplift of eating at home, the hassle and uplift of eating out, and the hassle and uplift of eating on the go. Means of these Likert scale values are displayed in Table 1. Of these six, three were included in the base model once significance was determined using multivariate regression: the hassle of eating at home ($p = 0.001$) and the hassle and uplift of eating out ($p = 0.032$ and $p < 0.001$). The three that were not significant were the uplift of eating at home ($p = 0.065$), the hassle of eating on the go ($p = 0.356$), and the uplift of eating on the go ($p = 0.298$).

The primary research question evaluated the association between daily hassles and uplifts and EC. Table 2 displays the results of the three multivariate regression models, including the three significant daily hassles and uplifts as independent variables and EC (ecSI 2.0™ total score) as the dependent variable. The hassles of eating at home and eating out were both inversely associated with EC with a beta coefficient of -2.039 and -1.394, respectively, and the uplift of eating out is positively associated with EC with a beta coefficient of 2.362. A second model, displayed in Table 2, included the addition of age and gender, neither of which were statistically significant. A third multivariate regression, Table 2, included birth country (U.S. vs. Outside the U.S), and food security status. Birth location was significant with a beta coefficient of -2.112 for those born in the United States. In this third model, only the hassle of eating at home and the uplift of eating out remained significant.

Table 2: Associations between model variables and ecSI 2.0™ score[b]

Variable	Beta coefficient	*P* value	Standard Error	T value
Model 1: Base				
Hassle of eating at home[a]	-2.039	0.001	0.622	-3.278
Hassle of eating out[a]	-1.394	0.032	0.647	-2.153
Uplift of eating out[a]	2.362	<0.001	0.445	5.310
Model 2: Primary				
Hassle of eating at home[a]	-2.051	<0.001	0.619	-3.313
Hassle of eating out[a]	-1.478	0.022	0.643	-2.298
Uplift of eating out[a]	2.407	<0.001	0.447	5.388
Age	0.336	0.197	0.260	1.292
Gender: man[c]	3.244	0.285	3.031	1.070
Gender: woman[c]	0.558	0.851	2.968	0.188
Model 3: Exploratory				
Hassle of eating at home[a]	-2.009	0.001	0.616	-3.261
Hassle of eating out[a]	-1.303	0.045	0.649	-2.009
Uplift of eating out[a]	2.351	<0.001	0.445	5.283
Age	0.423	0.109	0.263	1.605
Gender: man[c]	2.752	0.362	3.019	0.912
Gender: woman[c]	0.278	0.925	2.953	0.094
Born in the US	-2.112	0.017	0.879	-2.401
Food Secure[d]	1.498	0.158	1.060	1.413

a. DHUS items were measured using Likert scale ratings for each item: hassle and uplift. Answers ranged from 0, which is "not at all" or N/A, to 3, which is "a great deal."
b. Eating Competence was measured using the 16-item ecSI 2.0™. Scores range from 0-48. Individual domain score ranges: Eating Attitudes: 0-18; Food Acceptance: 0-9; Internal Regulation: 0-6; Contextual Skills: 0-15.
c. For analysis, gender was collapsed into three categories: man; woman; and queer/gender queer, non-binary/gender non-conforming, and prefer not to answer. Displayed here are those who answered, "man" vs. remaining gender groups and those who answered, "woman" vs. remaining gender groups.
d. Assessed using the USDA's two-item food security screening tool[35]

Table 3: Associations between model variables and CS subdomain score[b]

Variable	Beta coefficient	*P* value	Standard Error	T value
Model 4: Contextual Skills Base				
Hassle of eating at home[a]	-0.765	<0.001	0.204	-3.752
Uplift of eating at home[a]	0.433	0.026	0.194	2.226
Uplift of eating out[a]	0.438	0.026	0.196	2.240
Model 5: Contextual Skills Primary				
Hassle of eating at home[a]	-0.770	<0.001	0.205	-3.762
Uplift of eating at home[a]	0.465	0.017	0.195	2.387
Uplift of eating out[a]	0.424	0.031	0.196	2.162
Age	0.025	0.802	0.098	0.251
Gender: man[c]	0.294	0.797	0.036	0.258
Gender: woman[c]	-0.473	0.673	1.119	-0.423
Model 6: Contextual Skills Exploratory				
Hassle of eating at home[a]	-0.730	<0.001	0.206	-3.543
Uplift of eating at home[a]	0.458	0.019	0.194	2.358
Uplift of eating out[a]	0.410	0.036	0.196	2.097
Age	0.054	0.588	0.099	0.543
Gender: man[c]	0.136	0.905	1.140	0.119
Gender: woman[c]	-0.564	0.614	1.116	-0.505
Born in the US	-0.688	0.039	0.332	-2.071
Food Secure[d]	0.501	0.204	0.394	1.271

a. DHUS items were measured using Likert scale ratings for each item: hassle and uplift. Answers ranged from 0, which is "not at all" or N/A, to 3, which is "a great deal."
b. ecSI 2.^{0TM} Individual domain score range for Contextual Skills: 0-15.
c. For analysis, gender was collapsed into three categories: man; woman; and queer/gender queer, non-binary/gender non-conforming, and prefer not to answer. Displayed here are those who answered, "man" vs. remaining gender groups and those who answered, "woman" vs. remaining gender groups.
d. Assessed using the USDA's two-item food security screening tool[35]

When repeating the models using contextual skills (CS) as an outcome in place of total ecSI 2.0TM score, two of the DHUS items remained statistically significant in their association with CS: the hassle of eating at home ($p < 0.001$) and the uplift of eating out ($p = 0.026$). The third DHUS item that was associated with CS was the uplift of eating at home ($p = 0.026$), in contrast with the original model, where the third item was the hassle of eating out. Means of these Likert scale values for CS are displayed in Table 1. Three items were not significant in their association with CS: the hassle of eating out ($p = 0.711$), the hassle of eating on the go ($p = 0.065$), and the uplift of eating on the go ($p = 0.480$).

Table 3 displays the results of the CS specific multivariate regression models, with the three statistically significant DHUS items as independent variables and CS subdomain score as the dependent variable. The hassle of eating at home was inversely associated with CS subdomain score with a beta coefficient of 0.765, and the uplifts of eating at home and of eating out were positively associated with CS subdomain score with beta coefficients of 0.433 and 0.438, respectively. In the primary and exploratory models, the only demographic variable that was statistically significant in its association was birth country. This mirrors the results displayed in Table 2 for ecSI 2.0^{TM} score as the outcome variable.

The secondary question was whether this relationship is mediated by the presence of a chronic condition that is managed by tailoring the diet. Analysis for the secondary hypothesis was not conducted as only 17 respondents reported tailoring their diet to manage chronic conditions, which included mental health conditions, multiple sclerosis, asthma, gastroparesis, fibromyalgia, Elhers-Danlos disease, IBS, IBD, eating disorder, and migraine (Table 1).

Discussion

The hassles of eating at home and of eating out were both inversely associated with EC as displayed in Table 2. The uplift of eating out was positively associated with EC and was the most

strongly associated of those DHUS items that were significantly associated with EC. This supports the original hypothesis that hassles for eating location were inversely associated with EC and the uplift of an eating location is positively associated with EC. The primary model demonstrated neither age nor gender were significant variables when added to the base model. In the exploratory model, only birth country was significant, with those being born in the United States having lower EC than those born in another country. Food security status was not significant. A higher hassle rating for eating at home or eating out was associated with lower EC throughout the models, while those who found eating out to be an uplift tended to have higher EC in all models.

While there is a paucity of research specifically relating to the stress of eating in a particular location and its association with adaptive eating, there is research demonstrating how various forms of stress are associated with maladaptive eating. As mentioned earlier, stress in many forms has been found to be negatively associated with EC. Findings from the EAT 2018 study have demonstrated an association between everyday discrimination and maladaptive eating behaviors like overeating or binge eating.[7] If perceiving eating out or eating at home as a hassle could be considered a stressful experience, it follows that there is a negative association between those two hassles and EC, one characterization of adaptive eating. Similarly, in a study exploring the relationship between hassles and emotional eating, intuitive eating, and food addition, increased hassles in college students were associated with maladaptive eating behaviors.[41] Stress, however it is defined or measured, consistently demonstrates a negative association with adaptive eating.[7,13,21,23–26,28,29,41–44]

EC involves a positive relationship with food and with eating, relaxation around food and eating, and the acceptance of feelings surrounding food, i.e., "the enjoyment of food and eating and the experience of satiety."[45] The association between the uplift of eating out and higher EC further supports ecSatter assumptions about eating attitudes. It makes sense that those with higher EC and are more "relaxed about eating"[46] would find eating in a variety of locations to be an uplift, where those who have lower EC would find those same eating locations to be a hassle. Past research has

demonstrated those with higher EC are more likely to have better diet quality[9,14,15,17,39,47–49] and better cardiovascular health markers.[16,50–52] The ability to see eating, no matter the setting, as an uplift therefore would appear to be associated with positive outcomes. Those who identified eating in certain locations to be a hassle could feel higher stress about eating and food in general and therefore have lower EC resulting from stressful feelings and attitudes toward food and eating. Interestingly, the uplift of eating at home was not significantly associated with total ecSI 2.0™ score but was associated with CS subdomain score. Contextual skills include faithfully feeding oneself, paying attention to food and eating, considering the nutritious benefits of foods, and planning ahead to make time to eat.[46] The association between viewing eating at home as an uplift and CS is logical: eating at home requires some level of planning ahead to ensure foods and ingredients for meals are available and there is time to prepare and eat a meal. The hassle of eating out was inversely associated with total ecSI 2.0™ score but was not associated with CS score. Setting aside time multiple times each day to eat is part of CS, but many university students note a lack of time that prevents them from planning meals into their day or preparing food.[53,54] Other students have attributed choosing convenience foods during times of particularly high stress, for example, during finals.[55] It is possible that students who do not plan ahead may find themselves purchasing a convenience food or stopping in at the dining hall for a quick snack on their way to class or their next commitment when they had previously intended to eat at home.

The present study investigated hassles and uplifts rather than using the perceived stress scale or some other, more general measure of stress. In studies investigating the relationship between stress and EC in university students, two measures of stress have primarily been used. A frequent measure in many studies investigating stress is the Cohen's Perceived Stress Scale.[56] One recent study investigated the relationship between scores using this tool and a variety of eating behaviors, including the four domains of EC. This study found that lower perceived stress was correlated with higher scores in the four domains of EC.[42] Another commonly used measure of stress is the Everyday

Discrimination Sale (EDS), which assesses stress related to perceived discrimination experienced in day-to-day life. A 2023 study investigated the association between both perceived stress and everyday discrimination and EC, finding that higher stress from either scale was associated with lower EC.[13]

If the hassles scale items included in the models for this study are viewed as a proxy for stress related to food and eating, the results align with previous research demonstrating that higher perceived stress is associated with a lower EC score.[13,28–30] In addition, the DHUS items investigated in this study were specifically related to eating location. In all three models, viewing eating at home as a hassle was inversely associated with EC. It's possible this could be due to time constraints, access to a kitchen, culinary knowledge or experience, or financial concerns. The transition to university life, especially for those who move away from home for the first time, results in changes to schedule, eating habits, food choices, physical activity, and overall independence. Many factors can affect how each student handles this transition and the adaptive or maladaptive eating behaviors that result. The change in routine seems to be an important factor in this transition, with many students experiencing decreased regularity of meals and timing of meals.[1]

Limitations & Strengths

The participants recruited for this study were a convenience sample of undergraduate university students from two nutrition courses in one term, resulting in limited generalizability of the results. The participants all had some college education, and while they were not enrolled in a nutrition science degree, all had interest or exposure to nutrition in an academic setting. The survey for this iteration was cross-sectional, so no causality can be determined. The DHUS is limited to only responses 0 to 3, a limited range of answers to each question. A larger range of possible answers could provide more insight into the associations found. Due to the small number of participants who answered, "yes" to the question, "Do you tailor your diet to manage your chronic condition?"

(N=17), the second research question could not be investigated. While this study had its limitations, these can be mitigated with a few strengths. As mentioned above, ecSI 2.0™ has been validated in the population that was surveyed for the study sample. The DHUS has been used in varying forms since the 1980s for research on stress, psychology, and associations with eating behaviors. Participation in the study was voluntary and the software used to collect data allowed for anonymity, reducing the risk of bias in the sample.

Future Research

The survey utilized in addition to new participants being added continually, the dataset will continue to grow. Subsequent studies utilizing the Lifecourse Eating and Feeding Registry will have the benefit of longitudinal data and a wider variety of ages. These studies should investigate how responses to the DHUS items change over time and how these items relate to ecSI 2.0™ score. As the current study looked at just three of the DHUS items and how they relate to EC, additional quantitative research should evaluate the DHUS in its entirety compared to EC, which would allow for a broader comparison of this data to previous work looking at the relationship between stress and EC.[13,29,30] The Lifecourse Eating and Feeding Registry includes demographic questions relating to education and income, which can provide additional context as participants age and progress through stages of life after undergraduate education. Most importantly for the present study, the addition of new participants and the continuation of participation by past participants will increase the likelihood of sufficient responses of "yes" to the question, "Do you tailor your diet to manage your chronic condition?" which will allow future studies to address the secondary research question proposed. for data collection was the first distribution of the Lifecourse Eating and Feeding Registry. Participants agreed to be contacted every two years for up to twenty years, adding to the data with each iteration of the survey. With the additional data from each iteration,

Additional future research should include a qualitative analysis addressing causes for the perception of eating locations as a hassle or an uplift. The present study was a pilot study utilizing the Lifecourse Eating and Feeding Registry. There is an opportunity to assess the DHUS items qualitatively to ascertain what influences those hassles and uplifts. As the DHUS is usually investigated as a complete scale, rather than looking at answers to individual items as in the present study, qualitative analysis could illuminate the factors leading to eating in a certain location as a hassle or an uplift. Participants may feel eating out is more of a hassle due to financial reasons, health concerns, or social reasons. Comparing the reasons participants label eating locations as a hassle or an uplift may provide more information about the association between those hassles and uplifts and EC.

One interesting association that appeared was the higher likelihood of those born in a country other than the United States to have higher EC compared with those born in the United States. The distribution of birth country in the sample was such that no meaningful associations could be found by analyzing these on an individual basis, so there is not much that can be said about this association. As the dataset grows, further studies could identify associations between birth country and EC.

Conclusion

In this cross-sectional study of undergraduate university students, we found an association between EC and the hassles and uplifts of two eating locations: eating at home and eating out. When eating in a particular location was seen as a hassle, participants tended to have lower ecSI 2.0™ scores; whereas those who viewed eating out as an uplift tended to have higher ecSI 2.0™ scores. Future qualitative research on the reasons for each eating location being perceived as a hassle or an uplift could further describe the association between these DHUS items and EC.

Implications

Ideas for research encompass many of the implications of these results, however there may be some implications for current dietetics practice. In outpatient practice, where Registered Dietitian Nutritionists (RDNs) can use the ecSI 2.0™ to inform nutrition counseling, RDNs can seek to determine why an eating location is a hassle or an uplift for a client and get to the root cause of the hassle if there is one. The RDN and client could then work together to find ways to improve the client's relationship with food and eating.

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Appendix

Birth Countries

Country	N (%)
Afghanistan	1
Belgium	2
Burma	2
China	105
Colombia	2
Costa Rica	1
Eritrea	1
Ethiopia	3
Ghana	1
Hong Kong	4
India	6
Indonesia	7
Ireland	1
Japan	3
Kenya	1
Kuwait	1
Mauritania	1
Mexico	5
Netherlands	2
Northern Mariana Islands	1
Peru	2
Philippines	3
Province of China, Taiwan complete	8
Saudi Arabia	1
South Korea complete	2
Sweden	3
Thailand	1
United Kingdom	2
United States	235
Vietnam	10

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