



HHS Public Access

Author manuscript

Drug Alcohol Depend. Author manuscript; available in PMC 2021 August 01.

Published in final edited form as:

Drug Alcohol Depend. 2020 August 01; 213: 108118. doi:10.1016/j.drugalcdep.2020.108118.

A Preliminary Validation of the Adolescent E-Cigarette Consequences Questionnaire

Julie V. Cristello^{a,b}, Matthew T. Sutherland^{a,b}, Elisa M. Trucco^{a,b,c,d}

^aDepartment of Psychology, Florida International University, 11200 SW 8th Street, Miami, FL 33199, USA;

^bCenter for Children and Families, Florida International University, 11200 SW 8th Street, AHC-1 Rm. 140, Miami, FL USA;

^cAddiction Center, University of Michigan, 4250 Plymouth Road, Ann Arbor, MI 48109, USA;

^dDepartment of Psychiatry, University of Michigan, 4250 Plymouth Road, Ann Arbor, MI 48109, USA;

Abstract

Introduction: Given the recent dramatic increase among adolescents in the use of electronic nicotine delivery systems (ENDS) or electronic cigarettes (e-cigarettes), there is a growing need to identify outcome expectancies that influence the initiation or continued use of e-cigarettes. While a self-report measure exists for assessing adolescent outcome expectancies for cigarette use, there is currently not one available for e-cigarette use. Validation and use of such a measure would provide insight into the growing popularity of e-cigarettes.

Methods: The sample consisted of 264 (50.76% female, 86.36% White, 84.47% Hispanic/Latinx) freshmen and sophomores from South Florida high schools who were identified as at-risk for e-cigarette use. The current study adapted the Adolescent Smoking Consequences Questionnaire (ASCQ) to derive the Adolescent E-Cigarette Consequences Questionnaire (AECQ) to characterize e-cigarette outcome expectancies. A confirmatory factor analysis was estimated to test the underlying factor structure.

Results: The confirmatory factor analysis provided support for a seven-factor structure (negative affect reduction, taste/sensorimotor manipulation, social facilitation, weight control, negative physical feelings, boredom reduction, and negative social impression) after removing two items

Corresponding Author: Julie V. Cristello, Florida International University, Center for Children and Families, 11200 SW 8th Street, AHC-1 Rm. 140, Miami, FL 33199. jcristel@fiu.edu Phone: 305-348-3375.

Contributors

JVC conceived of the study, participated in the design and coordination, conducted analyses, and drafted the manuscript. MTS participated in the design of the study, and edited the manuscript. EMT participated in the design and coordination of the study, and helped draft and edit the manuscript. All authors read and approved the final manuscript.

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Conflict of Interest

No conflicts declared.

with low factor loadings from the social facilitation subscale. After removing these items, factor loadings ranged from 0.46 to 0.86.

Conclusion: The current study provides preliminary evidence to suggest that the Adolescent E-Cigarette Consequences Questionnaire is a psychometrically sound measure. Future work should continue to test this measure among diverse samples of adolescents (e.g., non-Latinx samples) with varying levels of use.

Keywords

electronic cigarettes; vaping; outcome expectancies; adolescents; consequences

1. INTRODUCTION

The use of electronic nicotine delivery systems (ENDS) or electronic cigarettes (e-cigarettes) has increased among youth (Miech et al., 2020). Among middle and high school students, e-cigarette use increased 900% from 2011 to 2015 (Office of the Surgeon General, 2016). *Monitoring the Future* indicates that 16% of 8th graders, 31% of 10th graders, and 35% of 12th graders endorsed past year use (Miech et al., 2019). This has led the Surgeon General to declare youth e-cigarette use as an epidemic (U.S. Department of Health and Human Services, 2018). A greater understanding of factors influencing adolescent e-cigarette use is critical.

Prior work indicates that outcome expectancies impact cigarette use intentions, initiation, and escalation (Guller et al., 2015; Miller et al., 2017). Outcome expectancies are anticipated positive or negative consequences that result from engaging in a behavior (Reesor et al., 2017). Positive outcome expectancies (e.g., negative affect reduction, Heinz et al., 2010) have stronger associations with cigarette use initiation and escalation compared to negative outcome expectancies (e.g., poor health consequences; Chassin et al., 1984). Moreover, adolescents who smoke or intend to smoke cigarettes are more likely to endorse positive outcome expectancies (Lewis-Esquerre et al., 2005). Accordingly, understanding adolescent e-cigarette outcome expectancies could provide insight into the growing popularity of ENDS.

Prior work has focused on e-cigarette outcome expectancies among individuals that regularly use e-cigarettes and adults (e.g., Piñeiro et al., 2016; Pokhrel et al., 2014). To our knowledge, only one study examines a measure for both young adults and adolescents (Barker et al., 2019). Yet, this measure was derived primarily from quantitative studies based on adult cigarette and e-cigarette users (e.g., Harrell et al., 2015; Hendricks et al., 2015). Accounting for developmental stage is important as many risk factors are often age specific. For example, adolescents are more susceptible to peers, while young adults are at increased risk for substance use when entering college (Jackson and Sartor, 2014). Prior work also indicates that the appeal of e-cigarettes differs across age. Adolescents are strongly attracted to the flavors and social desirability of e-cigarettes, while adults are attracted to the accessibility and perceived safety of the products (Fadus et al., 2019; Kong et al., 2019). As such, examining a measure of outcome expectancies specifically for adolescents is warranted. The current study examines the psychometric properties of the

Adolescent E-Cigarette Consequences Questionnaire (AECQ), which was adapted from the Adolescent Smoking Consequences Questionnaire (ASCQ; Lewis-Esquerre et al., 2005). The ASCQ has seven subscales derived from an adolescent sample of cigarette users and non-users (Lewis-Esquerre et al., 2005). Using confirmatory factor analysis (CFA), we hypothesized that the AECQ would also be represented by a seven-factor structure. Convergent and discriminant validity with external constructs were also examined.

2. METHODS

2.1 Participants

Participants ($N=264$) completed wave one of a three-year longitudinal study investigating e-cigarette initiation among adolescents at-risk for future use. Participants had to: (a) be a freshman or sophomore at a South Florida public high school, (b) have no diagnosis of a learning disability, intellectual disability, or physical disability making it difficult to complete questionnaires, (c) have no diagnosis of a neurological disease or disorder characterized by psychotic or paranoid symptoms (e.g., schizophrenia), as well as severe forms of bipolar disorder, (d) be able to speak and understand English, and meet at least one of the following criteria: (e) exceed the cutoff score on the impulsivity (> 10) and/or sensation seeking (> 14) subscale on the Substance Use Risk Profile Screen (Castellanos-Ryan et al., 2013; Woicik et al., 2009), (f) endorse that a friend or sibling has tried a substance, or (g) endorse intentions to use cigarettes and/or e-cigarettes within five years. Participants ($M_{\text{age}} = 14.90$, $SD = 0.68$; 50.76% female) were mostly White (86.36%), and Hispanic/Latinx (84.47%). Approximately one third of participants (33.33%) reported lifetime e-cigarette use.

2.2 Procedure

Students provided contact information for their caregiver during recruitment events taking place within high schools, who was then contacted regarding the study. Eligibility screens were completed by phone. Study staff obtained informed consent from caregivers and assent from adolescents. All questionnaires were completed on tablets provided by study staff and administered through REDCap (Harris et al., 2019) at a university research laboratory. Adolescents and caregivers were compensated for their participation. The Institutional Review Board approved study procedures.

2.3 Measures

2.3.1 Adolescent E-Cigarette Consequences Questionnaire (AECQ).—Thirty items assessing e-cigarette outcome expectancies were adapted from the ASCQ (Lewis-Esquerre et al., 2005) by replacing the words “cigarettes” with “e-cigarettes/ENDS.” Adolescents rated the likelihood (1 = “*never*” to 5 = “*always*”) that each consequence would occur as a result of using e-cigarettes/ENDS (e.g., “*when a person is upset, an e-cigarette/ENDS helps him or her deal with it*”). Participants who had never used e-cigarettes were asked to take their best guess.

2.3.2 Substance use.—Items assessing lifetime e-cigarette use were adapted from the Population Assessment of Tobacco and Health (U.S. Department of Health and Human Services, 2016).

2.3.3 Demographic information.—Age, grade, biological sex, race, and ethnicity were assessed.

2.3.4 Measures to Assess Convergent Validity.—The Electronic Cigarette Attitudes Survey (ECAS; Diez et al., 2019) assesses e-cigarette attitudes among youth. Adolescents rated their agreement (1 = “*strongly disagree*” to 5 = “*strongly agree*”) with statements regarding e-cigarette/ENDS products (e.g., “*smoking e-cigarettes/ENDS is cool and might make me more popular*”). If a participant never used an e-cigarette, they were asked to guess. Adolescents also rated (1 = “*strongly disagree*” to 5 = “*strongly agree*”) a list of 13 reasons why they do/would use ENDS (e.g., “*ENDS are affordable*”; U.S. Department of Health and Human Services, 2016).

2.3.5 Measures to Assess Discriminant Validity.—Subscales from the Collective Efficacy Neighborhood Survey (Uchida et al., 2013) completed by caregivers were used to assess discriminant validity. Neighborhood problems (e.g., “*poor trash pickup by the city*”) and perceptions of incivilities (e.g., “*vacant or abandoned lots*”) subscales rated on a four-point Likert scale, and the willingness to intervene subscale (e.g., “*if some children were spray-painting graffiti on a local-building*”) rated on a five-point Likert scale were examined. Youth-report of their agreement on a single statement “*smoking regular (combustible) cigarettes is outdated and lame,*” from the ECAS (Diez et al., 2019) was also used.

2.4 Data Analysis

Descriptive statistics were conducted using SPSS Statistics version 22.0 (IBM Corp., Released 2013). A CFA using Mplus 8.1 (Muthén and Muthén, 2017) was estimated. The factors included: negative affect reduction (8 items), taste/sensorimotor manipulation (2 items), social facilitation (8 items), weight control (5 items), negative physical feelings (3 items), boredom reduction (2 items), and negative social impression (2 items). Covariances were included and freely estimated among all factors. The following indices were used to assess model fit based on recommended cutoffs (Hu and Bentler, 1999): χ^2 test, the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). Modification indices (> 10) were requested to determine whether model re-specification could improve model fit. An iterative process was used to determine whether removing items with low factor loadings (i.e., < 0.40 ; Costello and Osborne, 2005) significantly improved model fit using a χ^2 difference test.

3. RESULTS

All study variables were normally distributed (skewness and kurtosis $< |2|$). Each AECQ item had a correlation of > 0.30 with at least one other item, consistent with recommendations (Tabachnick and Fidell, 2007). Outcome expectancies reported with the

greatest likelihood included: “*smoking e-cigarettes/ENDS will make a person cough*”, and “*smoking e-cigarettes/ENDS makes a person less attractive*” (see Table 1 for descriptives and factor loadings).

Results revealed moderate support for the seven-factor model. All standardized loadings were significant ($p < 0.001$). Yet, two items (15 and 30) had low factor loadings (i.e., 0.40). Moreover, only two indices indicated good model fit (SRMR = 0.07; RMSEA = 0.07). The CFI (0.87) and TLI (0.85) approached the threshold value of 0.90. The χ^2 model fit index did not meet the threshold value ($\chi^2(384) = 822.0, p < 0.001$). Thus, items with low factor loadings were removed (see Table 2). Removing item 30 resulted in a significant improvement in model fit, as did removing item 15. While two of the model fit indices remained slightly below threshold, this is expected given challenges fitting a model with > 20 items (Bentler and Chou, 1987). Factor loadings were also examined across users and non-users. All factor loadings were significant. Yet, given that the sample size for users was smaller than the estimated number of parameters, caution is warranted when interpreting these findings.

Next, convergent and discriminant validity were examined. There were significant positive correlations between the taste/sensorimotor manipulation factor and items on the ECAS (Diez et al., 2019) relating to the taste and smell of ENDS: 1) “*the fruit and candy flavors available with e-cigarettes/ENDS is particularly appealing to kids my age*” ($r = 0.23, p < 0.01$) and 2) “*e-cigarettes/ENDS are more appealing because they are odorless or smell good compared to regular (combustible) cigarettes*” ($r = 0.44, p < 0.001$). One item reflecting social benefits (“*smoking e-cigarettes/ENDS is cool and might make me more popular*”) was positively correlated with the social facilitation factor ($r = 0.53, p < 0.001$) and negatively correlated with the negative social impression factor ($r = -0.26, p < 0.001$). The negative physical feeling factor was negatively correlated with an item describing reasons for use (U.S. Department of Health and Human Services, 2016): “*...because they might be less harmful to me than cigarettes*” ($r = -0.25, p < 0.001$). Regarding discriminant validity, the neighborhood subscales and the ECAS item reflecting cigarette smoking norms were not significantly correlated with the AECQ factors.

4. CONCLUSION

This study sought to validate a novel adolescent e-cigarette outcome expectancies measure. Identifying outcome expectancies may increase our understanding as to why adolescents initiate or continue using e-cigarettes. A seven-factor model was supported. Additionally, the factor loadings on the AECQ were comparable to those on the ASCQ (0.38 – 0.93). Namely, adolescents at-risk for e-cigarette use may expect that using e-cigarettes will: reduce negative affect or emotions, allow for taste/sensorimotor customizability, promote social facilitation, assist with controlling one’s weight, produce negative physical feelings, reduce feelings of boredom, and result in a negative social impression. Understanding adolescent outcome expectancies can help inform e-cigarette prevention and policies. The items with low factor loadings on the social facilitation factor were related to social status. The remaining items loading on this factor reflect perceptions that using e-cigarettes will make time spent with peers more enjoyable. While highly endorsed, the items with low

factor loadings were removed from the social facilitation subscale. This suggests that there may be an additional construct, related to social status or popularity, that impacts adolescent expectancies.

The current study has several limitations. First, given that this is the first wave of a prospective study investigating factors leading to the initiation of e-cigarettes, a majority of the sample, consisting only of freshmen and sophomores, did not use e-cigarettes. This may explain why outcome expectancy ratings were slightly more negative, as non-users endorse fewer positive consequences of use (Colder et al., 2017). Future work should assess whether outcome expectancies differ across various rates of use. Items reflecting negative affect reduction, weight control, and boredom reduction were not assessed on other measures; therefore, convergent validity for these factors was not tested. Also, items for the AECQ were rephrased directly from the ASCQ (Lewis-Esquerre et al., 2005) to reflect e-cigarettes/ENDS. Thus, expectancies specific to e-cigarettes/ENDS were possibly omitted. Lastly, the sample was comprised mostly of Hispanic/Latinx adolescents. Future work should test the validity of this measure with more diverse samples. Despite these limitations, findings provide preliminary support for the AECQ as a valid measure of adolescent e-cigarette outcome expectancies.

Acknowledgements

The authors gratefully acknowledge use of the services and facilities of the Research Center in Minority Institutions at Florida International University (U54MD012393). We thank the families participating in the ACE Project, the ACE Program Coordinator, Nasreen Hidmi, and the ACE Project staff. The authors declare no conflicts of interest.

Role of Funding Sources

This research was supported by the National Institutes of Health [U54MD012393 Subproject: 5378 to E.M.T and M.T.S, K08AA023290 to E.M.T, and T32DA043449 PI: Pelham]. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

References

- Barker JO, Kelley DE, Noar SM, Reboussin BA, Cornacchione Ross J, Sutfin EL, 2019. E-Cigarette Outcome Expectancies among Nationally Representative Samples of Adolescents and Young Adults. *Subst. Use. Misuse* 54, 1970–1979. DOI: 10.1080/10826084.2019.1624773 [PubMed: 31188055]
- Bentler PM, Chou C-P, 1987. Practical Issues in Structural Modeling. *Sociol. Methods. Res* 16, 78–117. DOI: 10.1177/0049124187016001004
- Castellanos-Ryan N, O’Leary-Barrett M, Sully L, Conrod P, 2013. Sensitivity and specificity of a brief personality screening instrument in predicting future substance use, emotional, and behavioral problems: 18-month predictive validity of the Substance Use Risk Profile Scale. *Alcohol. Clin. Exp. Res* 37, E281–290. DOI: 10.1111/j.1530-0277.2012.01931.x [PubMed: 22974180]
- Chassin L, Presson CC, Sherman SJ, 1984. Cognitive and social influence factors in adolescent smoking cessation. *Addict. Behav* 9, 383–390. DOI: 10.1016/0306-4603(84)90038-8 [PubMed: 6532145]
- Colder CR, Read JP, Wieczorek WF, Eiden RD, Lengua LJ, Hawk LW, Trucco EM, Lopez-Vergara HI, 2017. Cognitive Appraisals of Alcohol Use in Early Adolescence: Psychosocial Predictors and Reciprocal Associations With Alcohol Use. *J. Early. Adolesc* 37, 525–558. DOI: 10.1177/0272431615611256 [PubMed: 28479653]
- Costello AB, Osborne JW, 2005. Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Prac. Assess* 10, 1–9. DOI: 10.7275/yj1-4868

- Diez SL, Cristello JV, Dillon FR, De La Rosa M, Trucco EM, 2019. Validation of the electronic cigarette attitudes survey (ECAS) for youth. *Addict. Behav* 91, 216–221. DOI: 10.1016/j.addbeh.2018.11.022 [PubMed: 30473247]
- Fadus MC, Smith TT, Squeglia LM, 2019. The rise of e-cigarettes, pod mod devices, and JUUL among youth: Factors influencing use, health implications, and downstream effects. *Drug. Alcohol. Depend* 201, 85–93. DOI: 10.1016/j.drugalcdep.2019.04.011 [PubMed: 31200279]
- Guller L, Zapolski TCB, Smith GT, 2015. Longitudinal test of a reciprocal model of smoking expectancies and smoking experiences in youth. *Psychol. Addict. Behav* 29, 201–210. DOI: 10.1037/adb0000002 [PubMed: 25180556]
- Harrell PT, Marquinez NS, Correa JB, Meltzer LR, Unrod M, Sutton SK, Simmons VN, Brandon TH, 2015. Expectancies for cigarettes, e-cigarettes, and nicotine replacement therapies among e-cigarette users (aka vapers). *Nicotine. Tob. Res* 17, 193–200. DOI: 10.1093/ntr/ntu149 [PubMed: 25168035]
- Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O’Neal L, McLeod L, Delacqua G, Delacqua F, Kirby J, Duda SN, 2019. The REDCap consortium: Building an international community of software platform partners. *J. Biomed. Inform* 95, 103208. DOI: 10.1016/j.jbi.2019.103208 [PubMed: 31078660]
- Heinz AJ, Kassel JD, Berbaum M, Mermelstein R, 2010. Adolescents’ expectancies for smoking to regulate affect predict smoking behavior and nicotine dependence over time. *Drug. Alcohol. Depend* 111, 128–135. DOI: 10.1016/j.drugalcdep.2010.04.001 [PubMed: 20547013]
- Hendricks PS, Cases MG, Thorne CB, Cheong J, Harrington KF, Kohler CL, Bailey WC, 2015. Hospitalized smokers’ expectancies for electronic cigarettes versus tobacco cigarettes. *Addict. Behav* 41, 106–111. DOI: 10.1016/j.addbeh.2014.09.031 [PubMed: 25452052]
- Hu LT, Bentler PM, 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Modeling* 6, 1–55. DOI: 10.1080/10705519909540118
- IBM Corp., Released 2013. IBM SPSS Statistics for Windows, Version 22.0. IBM Corp., Armonk, NY. <https://www.ibm.com/support/pages/spss-statistics-220-available-download>
- Jackson KM, Sartor CE, 2014. The natural course of substance use and dependence, in: Sher K (Ed.) *The Oxford Handbook of Substance Use and Substance Use Disorders: Volume 1*. Oxford University Press, New York. <https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199381678.001.0001/oxfordhb-9780199381678>
- Kong G, Bold KW, Morean ME, Bhatti H, Camenga DR, Jackson A, Krishnan-Sarin S, 2019. Appeal of JUUL among adolescents. *Drug. Alcohol. Depend* 205, 107691. DOI: 10.1016/j.drugalcdep.2019.107691 [PubMed: 31706249]
- Lewis-Esquerre JM, Rodrigue JR, Kahler CW, 2005. Development and validation of an adolescent smoking consequences questionnaire. *Nicotine. Tob. Res* 7, 81–90. DOI: 10.1080/14622200412331328475 [PubMed: 15804680]
- Miech R, Johnston L, O’Malley PM, Bachman JG, Patrick ME, 2019. Trends in Adolescent Vaping, 2017–2019. *N. Engl. J. Med* <https://www.nejm.org/doi/full/10.1056/NEJMc1910739>
- Miech R, Johnston L, O’Malley PM, Bachman JG, Schulenberg JE, Patrick ME, 2020. Monitoring the Future national survey results on drug use, 1975–2019: Volume I, Secondary School Students. Ann Arbor: Institute for Social Research, The University of Michigan, 590 pp. http://www.monitoringthefuture.org/pubs/monographs/mtf-vol1_2019.pdf
- Miller S, Pike J, Stacy AW, Xie B, Ames SL, 2017. Negative affect in at-risk youth: Outcome expectancies mediate relations with both regular and electronic cigarette use. *Psychol. Addict. Behav* 31, 457–464. DOI: 10.1037/adb0000272 [PubMed: 28383934]
- Muthén LK, Muthén BO, 2017. Mplus user’s guide (8th ed.). Author, Los Angeles, CA. https://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf
- Office of the Surgeon General, 2016. E-cigarette use among youth and young adults: A report of the Surgeon General. Department of Health and Human Services, Centers for Disease Control and Prevention, Washington, D.C. https://ecigarettes.surgeongeneral.gov/documents/2016_SGR_Full_Report_non-508.pdf

- Piñeiro B, Correa JB, Simmons VN, Harrell PT, Menzie NS, Unrod M, Meltzer LR, Brandon TH, 2016. Gender differences in use and expectancies of e-cigarettes: Online survey results. *Addict. Behav* 52, 91–97. DOI: 10.1016/j.addbeh.2015.09.006 [PubMed: 26406973]
- Pokhrel P, Little MA, Fagan P, Muranaka N, Herzog TA, 2014. Electronic cigarette use outcome expectancies among college students. *Addict. Behav* 39(6), 1062–1065. DOI: 10.1016/j.addbeh.2014.02.014 [PubMed: 24630824]
- Reesor L, Vaughan EM, Hernandez DC, Johnston CA, 2017. Addressing Outcomes Expectancies in Behavior Change. *Am. J. Lifestyle. Med* 11, 430–432. DOI: 10.1177/1559827617722504 [PubMed: 29302249]
- Tabachnick BG, Fidell LS, 2007. *Using multivariate statistics* (5th ed.). Allyn & Bacon/Pearson Education, Boston, MA. <https://psycnet.apa.org/record/2006-03883-000>
- U.S. Department of Health and Human Services, 2016. Population Assessment of Tobacco and Health (PATH) study wave 1 youth/parent restricted use file: Annotated Instruments. Inter-University Consortium for Political and Social Research, Ann Arbor, MI. DOI: 10.3886/ICPSR36231.v23
- U.S. Department of Health and Human Services, 2018. Surgeon General releases advisory on E-cigarette epidemic among youth. <https://e-cigarettes.surgeongeneral.gov/documents/surgeon-generals-advisory-on-e-cigarette-use-among-youth-2018.pdf>
- Uchida CD, Swatt ML, Solomon SE, Varano S, 2013. Neighborhoods and Crime: Collective Efficacy and Social Cohesion in Miami-Dade County. National Criminal Justice Reference Service. <https://www.ncjrs.gov/pdffiles1/nij/grants/245407.pdf>
- Woicik PA, Stewart SH, Pihl RO, Conrod PJ, 2009. The Substance Use Risk Profile Scale: a scale measuring traits linked to reinforcement-specific substance use profiles. *Addict. Behav* 34, 1042–1055. DOI: 10.1016/j.addbeh.2009.07.001 [PubMed: 19683400]

Highlights

- A measure to assess outcome expectancies of adolescent e-cigarette use is needed.
- The Adolescent E-Cigarette Consequences Questionnaire (AECQ) was developed.
- Psychometric properties of the AECQ Questionnaire were examined.
- A seven-factor model was supported.
- Future work should test the validity of the AECQ with more diverse samples.

Table 1.

Mean, standard deviation (SD), and standardized factor loading for each item.

Parameter	Mean	SD	Seven-Factor							NSI	
			NAF	TSM	SF	WC	NPF	BR			
Loadings											
1. Help calm an angry person down	2.72	1.03	0.64	--	--	--	--	--	--	--	--
7. Help with concentration	1.78	0.93	0.50	--	--	--	--	--	--	--	--
14. Help a person forget about problems at home	2.84	1.16	0.69	--	--	--	--	--	--	--	--
19. Help when a person is worried	2.65	1.11	0.78	--	--	--	--	--	--	--	--
22. Helps if a person feels bad about himself/herself	2.39	1.13	0.72	--	--	--	--	--	--	--	--
25. Will help feel better when sad	2.66	1.04	0.79	--	--	--	--	--	--	--	--
27. Will help when someone is feeling cranky	2.29	1.08	0.86	--	--	--	--	--	--	--	--
29. Helps deal with it when a person is upset	2.38	1.11	0.83	--	--	--	--	--	--	--	--
2. Taste good	2.89	1.18	--	0.68	--	--	--	--	--	--	--
8. The look and feel on the mouth is good	2.15	1.20	--	0.85	--	--	--	--	--	--	--
3. Parties are more enjoyable	2.18	1.23	--	--	0.72	--	--	--	--	--	--
9. Make a person feel more comfortable around others	2.41	1.08	--	--	0.74	--	--	--	--	--	--
15. People look up to those who use	2.10	1.09	--	--	0.36	--	--	--	--	--	--
20. Make a person more friendly or outgoing	2.37	1.10	--	--	0.71	--	--	--	--	--	--
23. Makes a person feel older and more mature	2.90	1.22	--	--	0.50	--	--	--	--	--	--
26. Hanging out with friends is more fun	1.88	1.10	--	--	0.70	--	--	--	--	--	--
28. Makes people look tough or cool	1.89	1.20	--	--	0.56	--	--	--	--	--	--
30. Most popular people use	3.25	1.17	--	--	0.25	--	--	--	--	--	--
4. Controls a person's weight or eating habits	2.01	1.12	--	--	--	0.59	--	--	--	--	--
10. Keeps a person from eating too much	1.98	0.95	--	--	--	0.78	--	--	--	--	--
16. Helps a person stay slim	1.75	0.83	--	--	--	0.72	--	--	--	--	--
21. People gain weight when they stop	2.02	0.95	--	--	--	0.47	--	--	--	--	--
24. Makes a person less hungry	2.09	1.00	--	--	--	0.65	--	--	--	--	--
5. Burns a person's throat	3.18	1.17	--	--	--	--	0.46	--	--	--	--
11. Make a person's lungs hurt	3.14	1.21	--	--	--	--	0.63	--	--	--	--

Parameter	Mean	SD	Seven-Factor							
			NAF	TSM	SF	WC	NPF	BR	NSI	
17. Will make a person cough	3.84	0.82	--	--	--	--	--	0.71	--	--
6. Can help kill time	2.57	1.22	--	--	--	--	--	--	0.83	--
12. Give a person something to do with their hands	2.75	1.17	--	--	--	--	--	--	0.62	--
13. Makes people look ridiculous, silly, lame	3.36	1.22	--	--	--	--	--	--	--	0.75
18. Makes a person less attractive	3.42	1.24	--	--	--	--	--	--	--	0.69

Note: All factor loadings were significant at the $p < 0.001$ level. NAR = negative affect reduction, TSM = taste and sensorimotor manipulation, SF = social facilitation, WC = weight control, NPF = negative physical feelings, BR = boredom reduction, NSI = negative social impression.

Table 2.

Model fit statistics for the seven-factor model and each model with one item removed.

	7-Factor Model	Minus 1 Item (30)	Minus 2 Items (30, 15)
χ^2 (DF), p -value	χ^2 (384) = 822.0 ^{***}	χ^2 (356) = 750.27 ^{***}	χ^2 (329) = 691.05 ^{***}
χ^2 (DF), p -value	--	χ^2 (28) = 131.73 ^{***}	χ^2 (27) = 47.93, 0.0003
CFI	0.87	0.88	0.89
TLI	0.85	0.86	0.87
SRMR	0.07	0.06	0.06
RMSEA	0.07	0.07	0.07

Note. Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), the standardized root mean square residual (SRMR), and the root-mean-square error of approximation (RMSEA). χ^2 represents the difference test between the current model and the model run previously (i.e., to the left of the current column).

*** = $p < 0.001$.