

**Juntos, We Grow: A Culturally-Tailored Youth Program Capitalizing on the Nexus of
Agricultural Literacy and Nutrition Education**

Sarah Sprayberry, *Texas A&M University*

Dr. Robert Strong, *Texas A&M University*

Emerging and Continuing Projects
Extension Education

Juntos, We Grow: A Culturally-Tailored Youth Program Capitalizing on the Nexus of Agricultural Literacy and Nutrition Education

Introduction, Purpose and Objectives

Childhood obesity is a national health crisis with roughly 14.7 million affected youth in 2020 (Stierman et al., 2021). In 2019, it is estimated that the medical care costs associated with obesity in the U.S. was \$173 billion (Ward et al., 2021). Though this pervasive health problem affects a vast number of adolescents, there is a higher prevalence of this disparity among the Hispanic population (Stierman et al., 2021). Hales et al. (2017) discovered that one in four Hispanic children are deemed to be obese. As the United States continues to see an upward trend in the Hispanic population, it is imperative that programs are established to assist in alleviating the health disparity seen in youth. This is especially the case for [State] as it possesses the second largest number of Hispanic residents in the nation (Texas Demographic Center, 2021). Further, [State] possesses the eighth highest childhood obesity rating in the U.S. (Robert Wood Johnson Foundation, 2021).

Concurrent with today's societal health issues, there is an evident downward trend in Americans' agricultural literacy levels (Bradford et al., 2019; Kovar & Ball, 2013; Whitehead & Estep, 2016). As the gap widens between youth and the source of their food, it prevents youth from being able to make informed decisions about their food choices (Lakin & Little, 2008; Pierce, 2012). Raj et al. (2017) highlights the nexus of agriculture and nutrition being essential for eliciting a food behavior change in our youth. Blair (2010) discovered that teaching youth the origins of their food through experiential learning allowed for youth to become aware of how to make healthy choices.

Though garden programs are not a novel concept, these interventions have proven to be successful for addressing healthy eating habits and behaviors among youth (Rush et al., 2014). By implementing a garden within a community or school, it provides a local source of nutritionally rich food to low-income families (Davis et al., 2011). It is imperative for nutrition-related programs to recognize the vital role that parents have on their children's behavior (Gentile et al., 2018). Tamayo et al. (2021) underlines the benefits that family-centered nutrition interventions have on empowering Hispanic families to adopt healthy lifestyles.

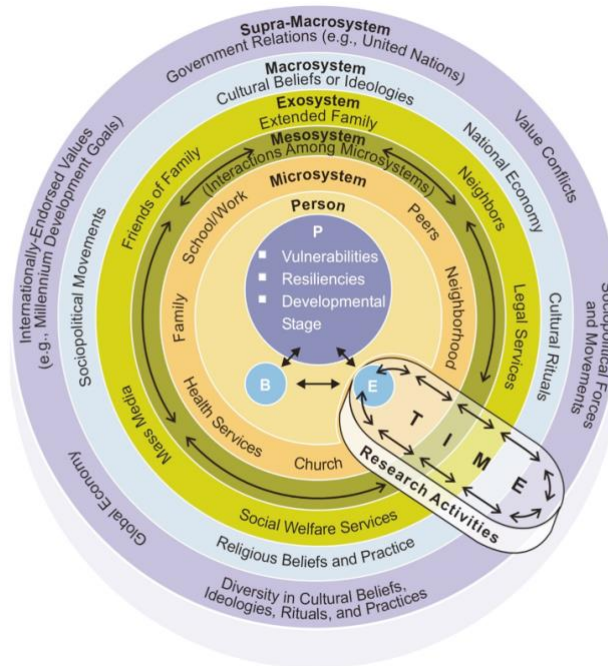
The Juntos, We Grow Program aligns with several *Healthy People 2030* objectives for adolescents (U.S. Department of Health and Human Services, 2022). Additionally, this program follows the National Institute of Food and Agriculture (NIFA)'s mission to cultivate a society that has foundational agricultural knowledge and literacy as well as improving overall human health and well-being (USDA-NIFA, 2021).

The purpose of this study will be to investigate the effects of a culturally-tailored nutrition-sensitive agricultural literacy program on self-reported food behavior, agricultural literacy level, and understanding of the agriculture-nutrition interaction in Hispanic youth.

Theoretical Framework

This research will be guided by utilizing the Bronfenbrenner (1979) ecological systems theory, youth development involves the interactions of a multitude of layers. As youth are positioned at the center, the systems that surround them interact with the child to assist them in their personal growth and development (Figure 1). Through the Juntos, We Grow program, the systems will be allowed to be transactional with one another through the incorporation of family, community, and cultural values. These transactions

Figure 1. *Illustration of the ecological systems theory (Bronfenbrenner, 1979).*



Methods

Through a randomized control trial, this 10-week program will be implemented by utilizing school gardens. The curriculum will consist of 10 classes, each 90 minutes in length. Each class will involve experiential learning to educate youth on the interconnectedness of agriculture and nutrition. Further, each class will conclude with students and parents learning how to cook a culturally-tailored healthy meal or snack utilizing fruit and vegetables from the garden. The curriculum for Juntos, We Grow will be guided by the National Ag in the Classroom as well as the LA Sprouts program. Educators with nutrition and agricultural knowledge will be hired to assist in the facilitation of the program. Bi-lingual change agents that are more homophilic (Rogers, 2003) to the target audience of underrepresented youth in marginalized communities is necessary to improve adoption of the curricula and potential learning impacts.

Families will be eligible for the Juntos, We Grow program if they have at least one youth attending the middle school located in the high risk, food desert area of South Texas and identify themselves as being Hispanic/Latino. Recruitment will occur through sending emails out to the parent listserv, providing information to teachers at the designated schools, and through Texas

A&M AgriLife Extension office for youth and their families to enroll in the afterschool program. Materials will be offered in both English and Spanish.

The intervention and control participants completed questionnaires at baseline as well as post-intervention. The first questionnaire consisted of demographic information, attitudes and beliefs toward nutrition, self-reported dietary habits, and pre-nutrition and agricultural knowledge.

Anticipated Results/Findings/Applications

It is anticipated that the results of this project will contribute to the scholarship of agricultural literacy and nutrition education in our youth. Specifically, it is predicted that this program will catapult the development of additional nutrition-sensitive agricultural literacy programs that are culturally-tailored to the target population. The predicted outcomes for the given project are:

- a) Youth enrolled in the intervention will understand the interconnectedness of agriculture and nutrition.
- b) A dietary habits questionnaire will be given to parents as well or just them. Since parents have a larger realm of influence on food consumption at this age (compared to high school).
- c) A biometrics assessment will be administered to gather data such as height and weight to better understand participants conditions.
- d) It is anticipated that students with less access to nutritious food will have lower dietary habits than the treatment groups.
- e) Anticipated results include the treatment groups, due to their participation in Juntos, We Grow as the intervention, will increase knowledge, dietary behavior changes, and significant differences in the longitudinal biometric post assessment juxtaposed to the control group members.
- f) A medium and short-term result will be increased collaborations between agricultural education faculty and transdisciplinary faculty at multiple institutions.
- g) Short, medium, and long-term results include increased digital and face-to-face visibility of program impacts to stakeholders in marginalized communities.
- h) A long-term impact would be pipelining underrepresented students to agricultural education undergraduate programs and potentially graduate education.
- i) An increased level of student diversity in agricultural education academic departments.
- j) A long-term expectation downstream is the development of students for career success in industry, government or academia.

Requests for Input/Guidance/Mentorship/Questions

American Association for Agricultural Education members can assist in providing input and guidance to multi-disciplinary faculty located at their institutions to partner. Schools of Public Health, Colleges of Medicine, Departments of Food Science and Nutrition or any specific Institutes or Centers would be appropriate. AAEE members can also mentor in identifying school district administrators or gatekeepers to assist in developing teacher networks interested in shared goals and collaborations. Both academics and practitioners can provide recommendations toward instrument development and potential field days, career fairs at local schools to share information with students and data collection.

Solutions for the nexus of agricultural literacy and nutrition education has not been this imperative since World War II coincidentally when the proliferation of 4-H and FFA programs reached critical mass since their federal creation approximately 30 years earlier. Precision nutrition requires agricultural literacy as a foundation. Input and guidance from American Association for Agricultural Education members would be essential and appreciative to help solve this multidimensional societal issue for individuals that have been left out of loop of research findings and extension dissemination.

References

- Andrade, J., Lotton, J., & Andrade, J. (2018). Systematic review: Frameworks used in school-based interventions, the impact on Hispanic children's obesity-related outcomes. *Journal of School Health*, 88(11), 847–858. <https://doi.org/10.1111/josh.12693>
- Baker, C., Strong, R., McCord, C., & Redwine, T. (2022). Evaluating the effects of social capital, self-Stigma, and social identity in predicting behavioral intentions of agricultural producers to seek mental health assistance. *International Journal of Environmental Research and Public Health*, 19(19), 12110. <https://doi.org/10.3390/ijerph191912110>
- Blair, D. (2010). The child in the garden: An evaluative review of the benefits of school gardening. *Journal of Environmental Education*, 40(2), 15–38. <https://doi.org/10.3200/JOEE.40.2.15-38>
- Bradford, T., Hock, G., Greenhaw, L., & Kingery, W. (2019). Comparing experiential learning techniques and direct instruction on student knowledge of agriculture in private school students. *Journal of Agricultural Education*, 60(3), 80–96. <https://doi.org/10.5032/jae.2019.03080>
- Davis, J. N., Ventura, E. E., Cook, L. T., Gyllenhammer, L. E., & Gatto, N. M. (2011). LA Sprouts: A gardening, nutrition, and cooking intervention for Latino youth improves diet and reduces obesity. *Journal of the American Dietetic Association*, 111(8), 1224–1230. <https://doi.org/10.1016/j.jada.2011.05.009>
- Gentile, N., Kaufman, T. K., Maxson, J., Klein, D. M., Merten, S., Price, M., Swenson, L., Weave, A.L., Brewer, J., Rajjo, T., Narr, C., Ziebarth, S. & Lynch, B. A. (2018). The

- effectiveness of a family-centered childhood obesity intervention at the YMCA: A pilot study. *Journal of Community Medicine & Health Education*, 8(1).
<https://doi.org/10.4172/2161-0711.10000591>
- Hales, C. M., Carroll, M. D., Fryar, C. D., & Ogden, C. L. (2017). Prevalence of obesity among adults and youth: United States, 2015–2016.
- Kovar, K. A. & Ball, A. L. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Extension*, 54(1), 167–178.
<https://doi.org/10.5032/jae.2013.01167>
- Lakin, L., & Littledyke, M. (2008). Health promoting schools: Integrated practices to develop critical thinking and healthy lifestyles through farming, growing and healthy eating. *International Journal of Consumer Studies*, 32(3), 253–259.
<https://doi.org/10.1111/j.1470-6431.2007.00658.x>
- Lee, C. L., Strong, R., & Dooley, K. E. (2021). Analyzing precision agriculture adoption across the globe: A systematic review of scholarship from 1999–2020. *Sustainability*, 13(18), 10295. <https://doi.org/10.3390/su131810295>
- Olsovsky, T., Strong, R., & Berthold, A. (2021). Enhancing landowner adoption of the Natural Resource Conservation Service’s recommended beef cattle grazing management practices. *Advancements in Agricultural Development*, 2(1), 56–69.
<https://doi.org/10.37433/aad.v2i1.89>
- Pierce, M. (2012). *An evaluation of urban youth gardening program participants' dietary behaviors, agricultural knowledge, and leadership skills: a case study* [Master’s thesis, University of Illinois at Urbana-Champaign]. Illinois Digital Environment for Access to Learning and Scholarship. <http://hdl.handle.net/2142/34210>
- Raj, S., Raja, S. & Dukes, B. A. (2017) Beneficial but constrained: Role of urban agriculture programs in supporting healthy eating among youth. *Journal of Hunger & Environmental Nutrition*, 12(3), 406–428. <https://doi.org/10.1080/19320248.2015.1128865>
- Robert Wood Johnson Foundation. (2021, October). *Obesity rates for youth ages 10 to 17*. The State of Childhood Obesity. <https://stateofchildhoodobesity.org/children1017/>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Rush, S. E., & Knowlden, A. P. (2014). Systematic review of school and community-based fruit and vegetable interventions for minority children. *Pediatric Health, Medicine and Therapeutics*, 5, 111–126. <https://doi.org/10.2147/PHMT.S56206>
- Seitz, P., Strong, R., Hague, S., & Murphrey, T. P. (2022). Evaluating agricultural extension agent’s sustainable cotton land production competencies: Subject matter discrepancies restricting farmers’ information adoption. *Land*, 11(11), 2075.
<https://doi.org/10.3390/land11112075>

- Stierman, B., Afful, J., Carroll, M., Te-Ching, C., Orlando, D., Fink, S., & Fryar, C. (2021). National Health and Nutrition Examination Survey 2017–March 2020 Prepandemic Data Files—development of files and prevalence estimates for selected health outcomes. *National Health Statistics Report*, (158), 1–20. <https://doi.org/10.15620/cdc:106273>
- Strong, R., Wynn, J. T., Lindner, J. R., & Palmer, K. (2022). Evaluating Brazilian agriculturalists' IoT smart agriculture adoption barriers: Understanding stakeholder salience prior to launching an innovation. *Sensors*, 22(18), 6833. <https://doi.org/10.3390/s22186833>
- Tamayo, M. C., Dobbs, P. D., & Pincu, Y. (2021). Family-Centered interventions for treatment and prevention of childhood obesity in Hispanic families: A systematic review. *Journal of Community Health*, 46(3), 635–643. <https://doi.org/10.1007/s10900-020-00897-7>
- Texas Demographic Center. (2021). *Hispanic heritage month: Hispanic Americans in Texas*. Texas Demographics. https://demographics.texas.gov/Resources/Publications/2021/20211004_HispanicHeritageMonth.pdf
- U.S. Department of Health and Human Services. (2022). *Adolescents*. Adolescents - Healthy People 2030. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/adolescents>
- USDA-NIFA. (2021). *U.S. Department of Agriculture, National Institute of Food and Agriculture (USDA/NIFA)*. U.S. Department of Agriculture, National Institute of Food and Agriculture (USDA/NIFA). <https://www.nano.gov/USDANIFA#:~:text=NIFA%27s%20mission%20is%20to%20advance,System%20and%20other%20partner%20organizations>
- Ward, Z. J., Bleich, S. N., Long, M. W., & Gortmaker, S. L. (2021). Association of body mass index with health care expenditures in the United States by age and sex. *PloS one*, 16(3). e0247307. <https://doi.org/10.1371/journal.pone.0247307>
- Whitehead, I. M., & Estep, C. M. (2016). Agricultural knowledge and perceptions among students enrolled in agriscience programs in Texas counties bordering Mexico. *Journal of Human Sciences and Extension*, 4(2). <https://www.jhseonline.com/article/view/697>