



The Evidence for Outcomes from Youth Participation in 4-H

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(with thanks to Hee Jin Jeon and Matt Avila)

Research Question

What is the quality of empirical evidence for youth outcomes as a result of their participation in 4-H?

Bottom Line

Most evidence of 4-H youth participation outcomes consists of observational studies using single-time, self-report surveys. Results from these studies suggest some positive outcomes to youth from 4-H participation, but most studies lack rigorous research designs, which reduces confidence in the validity of these results.

Background

4-H is the largest youth development organization in the United States. In partnership with the national land-grant university system, 4-H provides programming to over six million youth. Despite its reach, very little research has been conducted to assess youth outcomes within 4-H. The most extensive study of youth outcomes in 4-H was a longitudinal study in which Lerner and colleagues found that 4-H youth are more likely to make healthy choices and contribute to their communities than their peers (Lerner & Lerner, 2013). However, this study examined 4-H as a whole, rather than specific 4-H programs, and cannot connect youth outcomes to the type and duration of 4-H participation.

To better understand the body of evidence for 4-H youth participant outcomes, the Cornell Program for Research on Youth Development and Engagement (PRYDE) requested a Systematic Translational Review (STR) to describe the quality, type, and focus of available evidence from both peer-reviewed and grey literature.

Methods

Beginning in March of 2016, the STR research team searched databases EBSCO Host (includes PsychINFO, SocINDEX and ERIC), PubMed, Google Scholar, and ProQuest Dissertations and Theses and hand searched the Journal of Youth Development.

Search terms included: 4-H, youth development, club, program, evaluation, assessment, results and /or outcomes. Search parameters included English language studies conducted in the U.S., published since 2006, and scanned for population, organization, and topic. Papers related to program development, organizational structure, or focused on adults as volunteers and/or program leaders were excluded.

This search yielded 234 unique records, which were catalogued using Zotero citation management software.

These results were abstracted and coded by the research team for relevance. Abstraction included identification of populations, programs, study methods, and results measured and reported, in addition to overall research quality. Inter-rater reliability was established through an iterative process involving four cycles of research-team-pair review within a shared spreadsheet. This review included fact checking and review of inclusion/exclusion criteria and initial assessment of evidence quality. The first phase covered 20% of the total sample and the final three phases included cross checking of all included papers. Regular team meetings were held to discuss and resolve questions and any disagreements in the coding process. A final sample of 109 papers was identified as reporting specific outcomes of youth participants in 4-H programming.

Further coding sorted those papers into “lower,” “medium,” and “higher” categories for evidence quality based on strength of design, sample size, appropriate use and reporting of statistical or qualitative analysis, thorough description, and use of validated measures. Coders judged quality of papers compared to others in the included sample.

Findings

No randomized control trials were identified in this STR. Only 12% of the included studies used a quasi-experimental design. Of the quantitative studies, 52% were single-time, self-report surveys using researcher-developed measures.

Overall, 40% of the papers were judged to be of “lower” quality (e.g., small samples, poorly-conducted analyses, and/or inadequate descriptions of procedures) and 34% were judged to be of “higher” quality (e.g. strong research designs and analyses, validated measures, and adequate samples), while 26% were graded as “medium” quality (i.e., a mix of elements from “high” and “low”). Most were published in peer-reviewed journals (primarily Journal of Extension and

Findings - continued

Journal of Youth Development, which do not report impact factor scores). Seventeen percent of the studies were published dissertations or theses and 4% were reports in grey literature. Studies of “higher” quality with more than one data collection point are described briefly in **Table 1**.

The most commonly measured outcomes were in the area of general life skills, leadership, or career readiness (77%). Other outcome areas measured included civic engagement/environment (14%), nutrition/healthy living (15%), and STEM/Robotics (8%).

Conclusion

In sum, the body of evidence for youth outcomes from 4-H programming is weak. More rigorous research is needed

to evaluate and report the evidence for youth outcomes. Results from existing studies suggest some positive outcomes to youth from program participation, but most studies lack rigorous research design (i.e., use of appropriate participant sample selection and size, a comparison group, and appropriate statistical and/or qualitative data analysis), which reduces confidence in the validity of these results. The results of this STR suggest that additional support from funders, universities, and researchers is needed to enhance the evidence base within 4-H programs and strengthen 4-H programming in the future.

Table 1. Included papers of “higher” quality evidence, and with more than one data collection point

First Author/Year/Title	Publication Type	Data Collection Points; Methods	Focus of Reported Outcomes	Results
Barker, 2010 Robots, GPS/GIS, and programming technologies: The power of “digital manipulatives” in youth extension experiences	Peer-reviewed (Journal of Extension)	Pre/post; Observational	Career/Workforce Science/STEM/ Robotics	The program increased scores on assessment of programming, math, engineering, and robotics knowledge and was successfully scaled up.
Barker, 2008 Examining 4-H robotics in the learning of science, engineering and technology topics and the related student attitudes	Peer-reviewed (Journal of Youth Development)	Pre/post; Quasi-Experimental	Life Skills/Leadership Science/STEM/ Robotics Skills/Knowledge	The intervention increased scores on science, engineering, and technology concepts post-test; more limited impact on general student attitudes towards science were observed.
Baughman, 2009 Consistency of developmental outcomes of 4-H camp experiences over time and across sites	Peer-reviewed (Journal of Youth Development)	Retrospective pre/post (collected over three years); Observational	Life Skills/Leadership	Parents reported increases in their child’s life skills after 4-H camp, especially in the area of responsibility.
Brower, 2012 Got dating: Outcomes of a teen 4-H relationship retreat	Peer-reviewed (Journal of Youth Development)	Pre/post; Observational	Life Skills/Leadership	Participants reported increases in knowledge of relationship skills after the retreat.

Table 1. Included papers of “higher” quality evidence, and with more than one data collection point - cont.

First Author/Year/Title	Publication Type	Data Collection Points; Methods	Focus of Reported Outcomes	Results
Capeheart, 2015 Effects of the Texas 4-H Equine Ambassador Short Course on 4-H youth and the perceived impact on equine production knowledge, career awareness and professional development	Dissertation	Pre/post; Quasi-Experimental	Career/Workforce Skills/Knowledge	Participants reported increased equine production knowledge, equine expertise, career awareness and professional development following program.
Cutz, 2015 Impact of a 4-H Youth development program on at-risk urban teenagers	Peer-reviewed (Journal of Extension)	Pre/post; Observational	Career/Workforce Civic Engagement/Environment Skills/Knowledge	Behavior/punctuality and past participation in a similar program increased knowledge gained.
Dodge, 2014 Evaluation of the impacts of a cooperative extension 4-H nutrition education and gardening program on nutrition behavior and self-efficacy	Dissertation	Pre/post; Quasi-Experimental	Civic Engagement/Environment Nutrition/Healthy Living	Treatment groups reported increased fruit and vegetable intake.
Haas, 2015 The effects of age, gender, and 4-H involvement on life skill development	Peer-reviewed (Journal of Extension)	Two time points (one year follow up); Observational	Life Skills/Leadership	Increased levels of 4-H youth involvement were significantly linked with changes in youth decision making, critical thinking, and communication.
Higginbotham, 2010 4-H mentoring: Youth and families with promise—adult engagement and the development of strengths in youth	Peer-reviewed (Journal of Prevention & Intervention in the Community)	Pre/post; Observational	Life Skills/Leadership	Based on parents' reports, youth interpersonal strengths and intrapersonal strengths improved from pre- to post-assessment.
Horn, 2012 Leadership skill development: The perceptions of Connecticut 4-H adolescent 4-H leaders in the Connecticut 4-H Youth Development Program	Dissertation	Three interviews with each participant over 4 months; Observational, mixed methods	Life Skills/Leadership	Youth felt that they learned leadership through program participation; themes identified from interviews and record books were consistent with previous work.

Table 1. Included papers of “higher” quality evidence, and with more than one data collection point - cont.

First Author/Year/Title	Publication Type	Data Collection Points; Methods	Focus of Reported Outcomes	Results
Kumaran, 2014 The 4-H Health Rocks! Program in Florida: Outcomes on youth tobacco, alcohol, and other substance abuse prevention	Peer-reviewed (Journal of Youth Development)	Retrospective pre/post (collected over three years); Observational	Nutrition/Healthy Living Substance use risk reduction	Participants reported an overall significant increase in drug knowledge, beliefs/attitudes, and behavioral skills to resist drugs.
Lerner, 2013 The positive development of youth: Comprehensive findings from the 4-H study of positive youth development	Report to National 4-H Council	Eight time points; Observational	Civic Engagement/Environment Life Skills/Leadership Nutrition/Healthy Living Science/STEM/Robotics	4-H youth were more likely to contribute to their communities, participate in science, technology, and engineering programs, and make healthy choices, compared to non-4-H peers.
Ripberger, 2013 Training teens to teach agricultural biotechnology: A national 4-H science demonstration project	Peer-reviewed (Journal of Youth Development)	Pre/post; Observational	Life Skills STEM	Study results indicate significant gains in science content knowledge and life skills.
White, 2009 The effect of youth participatory evaluation and youth community action training on positive youth development	Dissertation	Pre/post longitudinal over 6 months; Quasi-Experimental	6 C's of Positive Youth Development (Competence, Confidence, Connection, Character, Caring, and Contribution)	Participation in training did not significantly and consistently affect the levels of competence, confidence, connection, character, caring, and contribution.

Bibliography

- Barker, B. S., Grandgenett, N., Nugent, G., & Adamchuk, V. I. (2010). Robots, GPS/GIS, and programming technologies: The power of “digital manipulatives” in youth extension experiences. *Journal of Extension*, 48(1). Retrieved from <http://www.joe.org/joe/2010february/a7.php>
- Barker, B. S., Nugent, G., Hampton, A., & Grandgenett, N. (2008). Examining 4-H robotics in the learning of science, engineering and technology topics and the related student attitudes. *Journal of Youth Development*, 2(3).
- Baughman, S., Garst, B. A., & Fuhrman, N. E. (2009). Consistency if developmental outcomes of 4-H camp experiences over time and across sites. *Journal of Youth Development*, 4(2).
- Brower, N., MacArthur, S., Bradford, K., Albrecht, C., & Bunnell, J. (2012). Got dating: Outcomes of a teen 4-H relationship retreat. *Journal of Youth Development*, 7(1), 119–124.
- Capeheart, M. L. (2015). Effects of the Texas 4-H Equine Ambassador Short Course on 4-H youth and the perceived impact on equine production knowledge, career awareness and professional development. Unpublished doctoral dissertation, Texas A&M University, College Station, Texas.
- Retrieved from <http://search.proquest.com/pqdtglobal/docview/1770453869/abstract/D42B8BEEF4564DEDQP/1>
- Cutz, G., Campbell, B., Filchak, K. K., Valiquette, E., & Welch, M. E. (2015). Impact of a 4-H youth development program on at-risk urban teenagers. *Journal of Extension*, 53(4).
- Dodge, E. C. (2014). Evaluation of the impacts of a cooperative extension 4-H nutrition education and gardening program on nutrition behavior and self-efficacy. Unpublished doctoral dissertation, The University of Maine, Orono, Maine. Retrieved from <http://search.proquest.com/pqdtglobal/docview/1636897744/abstract/31C9552FB1484707PQ/19>
- Haas, B. E., Mincemoyer, C. C., & Perkins, D. F. (2015). The effects of age, gender, and 4-H involvement on life skill development. *Journal of Extension*, 53(3). Retrieved from <http://www.joe.org/joe/2015june/a8.php>
- Higginbotham, B. J., MacArthur, S., & Dart, P. C. (2010). 4-H mentoring: Youth and families with promise—adult engagement and the development of strengths in youth. *Journal of Prevention & Intervention in the Community*, 38, 229–243. <http://doi.org/10.1080/10852352.2010.486300>

Bibliography - continued

Horn, L. R. (2012). Leadership skill development: The perceptions of Connecticut 4-H adolescent 4-H leaders in the Connecticut 4-H Youth Development Program. Unpublished doctoral dissertation, University of Connecticut, Mansfield, Connecticut. Retrieved from <http://search.proquest.com/docview/884828850>

Kumaran, M., Fogarty, K., Terminello, A., & Fung, W. M. (2014). The 4-H Health Rocks! program in Florida: Outcomes on youth tobacco, alcohol, and other substance abuse prevention. *Journal of Youth Development*, 9(2), 66–76.

Lerner, R. M., Lerner, J., & Colleagues. (2013). The positive development of youth: Comprehensive findings from the 4-H study of positive youth development (pp. 1–53). Chevy Chase, MD: National 4-H Council.

Ripberger, C., & Blalock, L. B. (2013). Training teens to teach agricultural biotechnology: A national 4-H science demonstration project. *Journal of Youth Development*, 8(3), 47–66.

White, D. J. (2009). The effect of youth participatory evaluation and youth community action training on positive youth development. Unpublished doctoral dissertation, Oregon State University, Corvallis, Oregon. Retrieved from <http://ir.library.oregonstate.edu/xmlui/handle/1957/13732>

A full bibliography is available online at: <https://www.bctr.cornell.edu/wp-content/uploads/2016/12/Systemic-Translational-Review-4-H-evidence-bibliography.pdf>

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For an overview of the review process, please see [Systematic Translation Review Description](#) at www.bctr.cornell.edu/?attachment_id=3965

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