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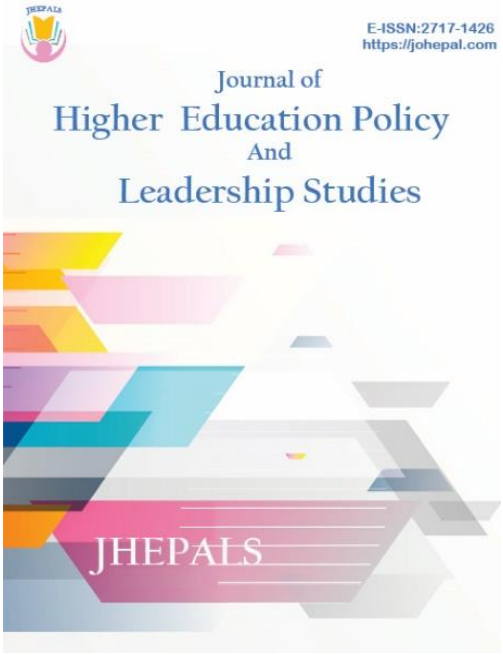

J. "Clay" Hurdle
College of Education & Human Development, University of Missouri, USA
Email: jhurdle@missouri.edu
https://orcid.org/0000-0002-2312-2671

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J. "Clay" Hurdle *

Abstract

The land-grant university system of the United States serves the public through teaching, research, and extension programming. Cooperative Extension's 4-H youth development program reaches 6 million youth in the U.S. through programming across a variety of content areas. Leadership development constitutes a large component of how 4-H prepares young people for success in adulthood, equipping them with transferable life skills. 4-H has a long, rich history of positively impacting youth. Research on 4-H and youth leadership development is a growing area of inquiry. Additional research grounded in a variety of leadership paradigms is necessary to better understand how 4-H develops young leaders. New research lines in 4-H will assist 4-H educators with evaluation efforts to better understand program outcomes. This research will also provide extensionists with perspective to better inform the future refinement of leadership curricula offered within 4-H. Land-grant universities are in effect responsible for capacity building with respect to youth leadership development. For land-grant universities – as well as universities who wish to engage in more public outreach – programs like 4-H have a variety of implications moving forward. These implications include but are not limited to university matriculation, civic engagement, workforce development, and positive youth development.

Keywords: Leadership; Land-Grant Universities; 4-H; Youth Development; University Extension; Outreach

* **Corresponding author's email:** jhurdle@missouri.edu

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Introduction

The National Center for Education Statistics (2023; 2024) reported that there were roughly 3,900 operational institutions of higher learning in the United States (i.e., both public and private 4-year and 2-year schools) with an estimated enrollment of 19 million students. Data indicates that bachelor's degree holders are 24% more likely to attain employment than their peers whose highest degree is a high school diploma (APLU, 2024). Holding a college degree is also typically associated with lower incarceration rates, higher tax revenue, and greater civic engagement (Mejia et al., 2025). From a leadership perspective, universities are often replete with leadership development opportunities to prepare students for success in and beyond school be they co-curricular (Knight & Novoselich, 2017), extra-curricular (Barnes, 2020; Posner, 2009), or even formal degree programs in leadership studies (Brungardt et al., 2006; Velez et al., 2014). In effect, U.S. universities have the capacity to develop upstanding citizens who are ready to impact their vocations and their communities as they begin adulthood. This begs the question, particularly in an age of public scholarship and heightened transparency: Is leadership development that is grounded in academic research and evidence-based best practices limited to learners within the U.S. higher education system?

Thinking specifically about public institutions, there already exist various mechanisms to provide leadership development opportunities not exclusive to learners on a university campus; rather, U.S. land-grant universities provide opportunities to develop leadership in nonformal, community-based settings to build leadership capacity across the nation. In particular, the U.S. Cooperative Extension Service carries out this responsibility in a unique way. Many extensionists across the nation are responsible for overseeing the leadership development of youth as they seek to make a difference in their communities and as they identify their college and/or career pathways that will lead them into adulthood. The purpose of this paper is to provide a summary of the 4-H program, including its historical development and its role in youth leadership development.

Background

Land-Grant Origins and Philosophy

In 1862, the U.S. Congress passed the Land-Grant Agricultural and Mechanical College Act (the Morrill Act of 1862), which would establish an institution of higher learning in each state intended for the instruction of agriculture, mechanic arts, natural sciences, and military sciences within a blended curriculum inclusive of widely taught classics such as mathematics, theology, and philosophy (Campbell, 1998). This act would fundamentally impact U.S. higher education, which had previously been reserved for members of the upper class, by expanding access to university enrollment to the then burgeoning middle class during the height of the American Industrial Revolution (Geiger, 2014). Furthermore, it would alter the prevailing outcomes of higher education to focus less on personal enlightenment but rather focus on the development of practical skills and knowledge to be of use to graduates in their professions. This in turn would reap short-term success for graduates in their fields in addition to long-term livelihood improvement and economic development for the nation (Hurdle, 2025).

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Coupled with subsequent federal legislation such as the Hatch Act of 1887, which established agricultural research and experiment stations within each state's land-grant university, the public and the U.S. agricultural infrastructure would become beneficiaries of the latest research and innovations carried out by land-grant university faculty (Weeks, 1989). While various iterations of the notion of public service had been present in American educational philosophy since the 18th Century (Geiger, 2014; See Benjamin Rush & Thomas Jefferson), the infrastructure and best practices developed as a result of the Hatch Act of 1887 (E.g., academic research associations, conferences, and state-state communication), established a precedent for public scholarship very much in line with the economic and workforce development that were a function of the Morrill Act of 1862 (Hurdle, 2025; Sternberg, 2014).

With the passage of the Smith-Lever Act of 1914, the Cooperative Extension Service was established with the intention of extending the land-grant university to local communities through nonformal programming grounded in the most cutting-edge research and teaching practices established by the state land-grant university (Gould et al., 2014). This nonformal education would encompass a multitude of areas that were prompted by community needs. Extension program areas that emerged from these needs and proved salient among most state Extension systems included home economics, youth development, forestry, farming practices, soil science, and water science (Seevers & Graham, 2012). Extension's physical makeup is predicated on a three-part partnership, comprising the U.S. Department of Agriculture's National Institute of Food and Agriculture (USDA-NIFA), a state's land-grant university, and county Extension offices (Bickell, 2024). In this partnership, each county may have an Extension office that is operated by an Extension agent (sometimes known as county faculty, field faculty, or field specialist; internationally this would be the equivalent of an agricultural extension officer or rural advisory services agent). These agents facilitate the nonformal educational programs for community development and collaborate with land-grant university faculty and researchers to be sure that clientele in the community receive the most up-to-date information and services that they need.

4-H Youth Development

The 4-H program traces its genesis to agricultural technology transfer. In the late 19th Century, university faculty and researchers found little success in urging agriculturalists to adopt advances in agricultural technologies and best management practices (Reck, 1963). However, they found that teaching young people about the aforementioned advances resulted in indirect technology transfer since the youth would go home and tell their family members about what they learned (National 4-H History Preservation Program, n.d.). These adults would eventually consult the universities, seeking out information on the advances in agricultural technology and practice. In effect, children were responsible for facilitating a concept that most adults find exceedingly difficult: change. Shortly after the turn of the century, 4-H programming began to develop rapidly – albeit independently – throughout the American Midwest and the South (Wessel & Wessel, 1982). While the impetus for the early "corn clubs" for boys and "tomato clubs" for girls was grounded in agricultural practice, these clubs afforded youth the opportunity to hold positions of leadership as club officers so that they could develop skills and in engage in activities pertinent to their leadership

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development: public speaking, parliamentary procedure, facilitation, and critical thinking (Van Horn et al., 1998).

These clubs would become known as 4-H clubs, recognizable by their four-leafed clover emblem and four H's signifying, head, hands, heart, and health (Sundgren, 2021). The clubs spread nationally and secured legitimacy as a national program through the Smith-Lever Act of 1914. Extension agents would oversee the execution of the 4-H program and the proliferation of nonformal teaching for youth across a variety of subjects related to agriculture, natural resources, and human sciences (Smith-Lever Act, 1914). Leadership development at the club level remained a staple of the experience. As a national identity for the program manifested in the 1920s, purposive efforts to develop leadership arose via 4-H camp programs (i.e., camp counselor trainings) as well as 4-H National Congress and 4-H National Conference (Hoover, 2007). Leadership remained a part of 4-H curricula with the advent of the 21St Century with the majority of state 4-H programs offering opportunities to serve as county club officers (Hill & Aikens, 2023), state-level officers (Moran et al., 2019), or state-level ambassadors (Hurdle et al., 2025). Additionally, states often have self-directed learning opportunities for youth specific to leadership such as projects, tracks, and/or content areas within a county-level program (See Florida 4-H, Georgia 4-H, Ohio 4-H, Tennessee 4-H, and Texas 4-H). While leadership has sometimes been operationalized as a single skill within 4-H outcomes parlance, many of the other life skills considered desirable takeaways from the program (e.g., critical thinking, emotional intelligence, etc.) lend themselves to the development of skills and behaviors complementary to effective leadership (Hendricks, 1998; Seevers & Dormody, 1994; Seevers et al., 1995; White et al., 2020). A review of the program outcome metrics from the National 4-H Council indicates that there had been a more acute focus on youth civic engagement in recent years (See Gagnon et al., 2023a; Gagnon et al., 2023b). Behaviors and skills specific to leadership are purported to be measured in broad-based evaluative efforts (See Hawley, 2022) and were more prevalent in the 2024 and 2025 National 4-H Index Studies than in preceding years (See Arnold et al., 2024; Arnold et al. 2025). Indeed, in data collected from over 7,369 4-H youth nationally, the 2025 study noted that 4-H had a moderate impact on leadership skills development. The authors underscored that youth who reported participation in a formal leadership project through 4-H (n = 4,711; 64%) reported higher levels of leadership skills, a positive implication for enhanced leadership development for youth who participate in 4-H (Arnold et al., 2025).

Scholarship on leadership (i.e., non-evaluative work such as original research) in 4-H contexts is still an emerging line of inquiry particularly within the last two decades, but findings to date speak to the impact of 4-H programming on youth leadership development. For example, research regarding state-level 4-H officer service has indicated that 4-H youth in these roles demonstrated gains in a variety of leadership life skills domains including critical thinking skills, teamwork, self-understanding, and decision making (Kelsey & Fuhrman, 2020). Moran et al. (2019) found that youth who participated in 4-H state-level leadership experiences exhibited leadership life skills development particularly regarding interpersonal relationships and working well with others. Furthermore, they found that these state-level leadership groups demonstrated high levels of youth involvement, adult involvement, and youth-adult interaction, thus indicating the presence of youth adult-

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partnerships throughout the state-level leadership experience. Additional studies have highlighted the impact of 4-H programming on leadership life skills development (Anderson et al., 2010; Tassin et al., 2010), with recent work pointing to long-term benefits of the program on emerging adult populations and early-career professionals across factors such as economic stability, health and well-being, and community involvement (Smith et al., 2024; Wheeler et al., 2023). These findings are in line with previous national efforts to capture the impacts of 4-H on positive youth development where it was found that 4-H youth are more likely to make contributions to their communities and to be civically active than their peers who are not involved in 4-H (Lerner & Lerner, 2013).

Additional research conducted around leadership in 4-H settings has been exploratory, seeking to understand the leadership identity development of 4-H youth in state-level leadership positions from the perspective of the Leadership Identity Development (LID) Model (Komives et al., 2005; 2006; 2009). Bush et al. (2022) found that the early stages of the LID Model were represented by what participants shared in open-ended surveys, and four themes were generated from how participants describe their leadership development: leaders are characterized by traits; leaders focus on individual; leaders are team-oriented; and leaders are community contributors. The authors noted that while the findings are of great interest to scholars and practitioners alike, there is much room for additional leadership identity development research within 4-H contexts.

Internally, 4-H programs across the 50 states oversee their own evaluation efforts to determine the effectiveness of programming designed for youth leadership development. Broadly, the National 4-H Council has underscored the 4-H program's role in "creating ready leaders with the skills to lead within their families, schools, communities, and the workforce" (National 4-H Council, 2023, p. 2). 4-H Common Measures (Hawley, 2022) have been used to provide stakeholders with perspective about youth life skills development, inclusive of leadership. While questions in this instrumentation are broad and not grounded in a particular leadership perspective or previously validated leadership instruments measuring skills or behaviors, the measures do indicate that 4-H youth exhibit high levels of civic engagement in their communities (Gagnon et al., 2023a; Gagnon et al., 2023b). Additionally, 4-H youth are likely to seek our leadership roles while engaging in such behaviors as thinking about how their choices affect others, finding ways to involve all members of a group, and getting along with people who are different than them (Arnold et al., 2024).

Conclusions & Recommendations

The land-grant university system democratized U.S. higher enabling everyday citizens to pursue courses of study in blended, holistic curricula grounded in agriculture, life sciences, and the classics (Geiger, 2014; Hurdle, 2025; Sternberg, 2014). As a matter of public scholarship, the land-grant system has impacted communities throughout the U.S. as a result of its research advances and particularly through its Extension programming (NIFA, 2023). The 4-H program is the largest youth development organization in the United States, reaching roughly six million youth across all 50 states and over 3,000 counties (National 4-H Council, n.d.). The 4-H program has many avenues for positive youth development, but its role in youth leadership development is significant. The growing body of leadership research relative to 4-H participation indicates that young people are developing skills critical to

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effective leadership among their peers, in their communities, and in their future careers. National 4-H directives and programmatic culture are keenly aware of their impact on youth leadership, and efforts are being made to communicate the nature of programmatic outcomes relative to leadership and civic engagement (Gagnon et al., 2023a; Gagnon et al., 2023b; Arnold et al., 2024; Arnold et al., 2025). This is significant for land-grant university leaders as they consider the impact extension initiatives and paying it forward relative to college matriculation and workforce readiness. Indeed, 4-H youth are 40% more likely to purse a college degree than other youth and feel more confident in goal attainment in areas such as: work-life balance, financial security, making a difference in the community, and contributing to science (Hart Research, 2024).

More must be carried out to explore the impact of 4-H programming and experiences therein on youth leadership development. The body of literature in this space is growing, but much of the literature to date has focused principally on state-level leadership groups such as state officer teams and state ambassadors. While this information is relevant, there is a population gap regarding youth who engage in leadership roles in 4-H at local levels and even in other content areas within the program (e.g., agriculture, natural resources, STEM, judging teams, etc.). Additionally, most of these efforts to date have explored leadership life skills development (Seevers et al., 1995). This perspective can certainly continue to be studied, but it would be prudent for scholars to approach future research from additional perspectives such as leadership identity development, servant leadership, authentic leadership, and/or adaptive leadership. On the one hand, there is a knowledge gap relative to these perspectives in the 4-H literature. Likewise, if 4-H develops a multitude of life skills in youth (e.g., critical thinking, emotional intelligence, self-reflection, etc.), then it stands to reason that such skills are factors relative to other leadership approaches. Beyond this, the diversity of youth represented in the program also speaks to the inherent need to explore their leadership development through a variety of theoretical lenses to holistically understand their journeys as young leaders. Continued research will validate the programmatic efforts of 4-H professionals in addition to providing perspective for structuring leadership curricula and developmental experiences around theory-based leadership education. This should also assist extensionists with evaluation efforts and provide a framework for more robust measures to assess leadership-related outcomes in 4-H programming. Additional research will also provide added legitimacy to broader skills approaches to youth development within 4-H. There might come a time when such models may be revisited, and leadership in 4-H contexts can be operationalized more appropriately rather than taxonomizing leadership as a single skill like in Hendrick's Targeting Life Skills in 4-H Model (Hendricks, 1998), which there have been calls to reevaluate in recent years (White et al., 2020).

Access to leadership development, particularly for young people, is critical for their development and has implications for community and professional impact. Recent U.S. university graduates are finding it difficult to obtain jobs in light of what employers perceive to be a soft skills development issue among Generation Z (Elting, 2024). Likewise, the emergence of AI has provided recent graduates with a new age competition for entry level jobs, necessitating that young professionals and graduates adapt with the emerging technology to stay competitive (Ma, 2025; Faber, 2025; Friedrich, 2025; Segal, 2025). The

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U.S., and indeed the global community, will need talented, adaptive leaders to address the grand challenges of society as the world approaches 2050 (Stedman & Andenoro, 2015). U.S. land-grant universities are jumpstarting the means to prepare a more civically engaged generation and adept workforce through programs like 4-H by educating youth in their communities whether they reach campus as university students (Lerner et al., 2013). Other tertiary institutions may wish to consider such efforts as a form of public outreach and capacity building. This could foster interest in university education as viable means of postsecondary life and career preparation for youth who previously never considered it. Such efforts could also positively impact society through these young people as they become productive members of society in adulthood.

Declaration of Conflicting Interests

The author declares no conflict of interest.

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Originality Note

The author affirms that this work is original and that it is not published elsewhere. The appropriate citations are included for any other works referenced throughout the manuscript.

Use of Generative AI/ AI-assisted Technologies Statement

The author affirms that there was "No Use of Generative AI/ AI-assisted Technologies" in preparing this research.

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Dr. J. "Clay" Hurdle, is an Assistant Professor of Human Development and Family Science at the University of Missouri where he also serves as the Statewide Extension Specialist in Leadership and Civic and Engagement within the Missouri 4-H Center for Youth Development. His research encompasses the teaching and learning of leadership, positive youth development, leadership in 4-H contexts, and land-grant university history. He is a five-time graduate of the University of Florida.

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