
The Application of Social Science in 4-H Youth Development

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Introduction

4-H, the largest youth-serving organization in the United States, reaches an estimated 6 million young people annually. At the beginning of the 20th century, educators organized rural youth clubs that formed the foundation of what is now the 4-H program (Wessel & Wessel, 1982). Although 4-H and its four-leaf clover emblem are often associated with county fairs and agriculture, 4-H, in fact, is so much more. Today, youth in 4-H pursue projects in a wide range of areas including robotics, mental health, photography, performing arts, dog training, and civic engagement, to name just a few. Ranging in age from five to 18 years old, 4-H members participate in clubs, camps, school classrooms, and after-school programs that can be found in rural communities, small towns, suburbs, big cities, and U.S. military bases throughout the world. The 4-H concept has been adapted around the world, where similar independent, country-led programs can be found

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in more than 80 countries (Archibald et al., 2021; Brinn, 2020).

From its inception, 4-H has been firmly rooted in empirical research, particularly in the field of the social sciences. The 4-H pledge itself embodies attention to the developmental needs of youth—head (clearer thinking), heart (greater loyalty), hands (larger service), and health (better living)—and to the nested environments in which they participate (e.g., their clubs, their communities, their country, the world). Thus, although the term *positive youth development* (PYD) did not emerge until the 1990s (Roth & Brooks-Gunn, 2016), 4-H programs were already being developed and implemented in support of the developmental and psychological needs of youth as championed by the likes of Gertrude Warren, a 4-H national program leader from 1917 to 1952 (Wessel & Wessel, 1982).

In this chapter, we write about 4-H as a research-informed program from a unique vantage point. Collectively, we have experience as 4-H professionals at the local, state, and national levels over a period of more than 40 years—from 1980 to the present. We can write about the recent historical development and incorporation of social science within the 4-H program because we have been part of its evolution. One of us (Mary) was a 4-H member; one of us (Theresa) has been a county educator. We are both now state specialists at our respective land-grant universities and have each been in these positions for 20+ years. Mary has worked in one state (Oregon); Theresa has worked in four (Maine, Michigan, Florida, Ohio). Both of us have served in national roles: Theresa was on loan for a year in 2008 to 4-H

National Headquarters to work with 4-H military programs; Mary is currently on loan as the Director of Youth Development Research and Practice with the National 4-H Council. In these roles we have designed, implemented, and evaluated programs; conducted volunteer and in-service training; carried out research projects and given scholarly presentations; written curriculum, grant proposals, reports, and publications; served on national committees; mentored teens, undergraduate and graduate students, and colleagues; and held leadership roles in 4-H's professional association. Perhaps most relevant to this chapter's topic, we have been champions of the science of youth development that forms the foundation of 4-H practice, and we have worked consistently to elevate this science across the 4-H system.

The story of 4-H's early years has been told many times and is documented in several sources (e.g., Rasmussen, 1989; Reck, 1950; Wessel & Wessel, 1982). Therefore, in this chapter, we aim to tell a different story. We discuss *why* and *how* 4-H goes about implementing its programs, right up until the present time. We begin by describing several PYD frameworks that have guided 4-H as developmental science evolved in the 1990s and early 2000s. We identify ongoing challenges to translating the science into practice where it means the most—at the point of service, where youth participants are engaged—that persist despite our efforts and those of others in the 4-H system past and present. We then describe the 4-H Thriving Model, and how 4-H has taken major steps toward embracing a comprehensive theory of change that makes meaningful

connections between context, content, and outcomes. Recent developments in understanding the science of learning and development and efforts to translate PYD research into practice are promising. We conclude with next steps for 4-H to position itself to take full advantage of these recent developments. Based at land-grant universities across the U.S. and working with national and local partners, we believe 4-H is well-positioned to capitalize on these developments and to intentionally apply them in practice.

The Application of Social Science in 4-H—Program Context, Content, and Outcomes

4-H is unique among youth development organizations across the United States. It is embedded within the national Cooperative Extension system, which is housed within the vast U.S. land-grant university system. It is connected to federal agencies, in particular the U.S. Department of Agriculture, which is the location of the 4-H National Headquarters. 4-H professionals thus have direct access to cutting-edge research conducted in universities across the country, as well as the resulting deep, research-based content knowledge that provides the subject-matter foundation of 4-H projects and experiences. Programs operate at local, state, and national levels, but at its core, 4-H is based in the community and thus is pivotal to accomplishing the Extension mission of “taking the university to the people” (Rasmussen, 1989, p. vii).

4-H is delivered in a wide range of settings and in the form of various educational experiences

designed to achieve learning goals—projects, which consist of a series of planned learning experiences that culminate in a tangible product; workshops and clinics; conferences and trips; camps; domestic and international exchanges; and fairs. Although subject matter content is important, as it is generally what attracts and hooks a young person to get involved in a program, content alone is not enough. 4-H’s educational approach emphasizes the development and mastery of life skills within the context of self-directed, hands-on learning experiences, reflected in the 4-H slogan “learn by doing” and the motto “to make the best better.” These educational experiences are intended to foster transferable skills such as teamwork, communication, and leadership. 4-H curriculum developers have focused on intentionally building on an experiential learning model (Dewey, 1938; Kolb, 1984) and embedding life skills along with a project’s subject-matter content. For example, an activity in a nutrition project (the subject matter) might involve reading food labels and ranking foods based on their sodium content (the project-specific skill) as one way to develop the life skills of critical thinking and making healthy lifestyle choices that transcend the project and are transferable to other settings.

Offering novelty and challenge, educational experiences in 4-H often take young people out of their comfort zone, but also expand their horizons. Young people meet others who share their interests, and they often develop lifelong friendships. They meet adults who can offer them instrumental and emotional support and social capital as they navigate their pathway

through childhood and adolescence. Regardless of delivery mode or program setting, the goal is to optimize young people's healthy development and empower them to reach their full potential (U.S. Department of Agriculture & National 4-H Council, 2017).

The importance of evaluating educational programs to assess whether resources have been used wisely and that these efforts are having their intended impacts has been broadly recognized in the scholarly community (Hatry, 2013; Roth & Brooks-Gunn, 2016). Once skills are identified they can be measured to evaluate the program's impact, which became particularly important as the pressure for accountability increased at the end of the 20th century (Arnold, 2015; Arnold & Cater, 2011; Peterson et al., 2001; see also Monk, this volume). However, youth programs presented a particular challenge to evaluators: to use an Extension agricultural analogy, how a crop grows depends on a variety of environmental factors, but unlike a crop of corn that is planted and harvested the same year, these people (i.e., youth) have a long growing season. It is precisely this involvement across time that contributes to the impact, but as has been pointed out by Roth and Brooks-Gunn (2016) and experienced directly by us and our counterparts, it also makes it difficult to tie this impact to one specific project, program, event, or experience. Despite this challenge, the impact of 4-H has been borne out by current members and alumni, who have put skills they gained through 4-H into practice in school, work, and community settings (e.g., Anderson, 2020; Anderson et al., 2010; Bates et al., 2020; Digby & Ferrari, 2007; Ferrari et al., 2009; Fox et al., 2003).

PYD Frameworks Commonly Used in 4-H

A paradigm shift occurred in the late 1980s when youth-serving organizations, informed by theories of human ecological development and resilience, began to take a strengths-based approach rather than one based on simply keeping youth out of trouble or narrowly focused on fixing problem behaviors (Blyth, 2011; Damon, 2004; Roth et al., 2016). As youth development emerged as a field of research and practice, a second shift occurred as scholars and practitioners grappled with what distinguished a program as a youth development program, what constituted program quality, and how to measure impact (Roth & Brooks-Gunn, 2003, 2016; Roth et al., 1998). Evidence supporting the link between high quality programs and youth outcomes mounted (e.g., Vandell et al., 2015). As important as it was to ascertain program outcomes, *how* programs produce the outcomes was also of interest to researchers and practitioners (e.g., Larson et al., 2019; Larson et al., 2011). Clearly, attention to what can be described as the program context, climate, or environment is paramount. This current focus on processes and youth programs as a context for development is part of the third wave in the youth development field (Roth & Brooks-Gunn, 2016). Unlike outcomes, these elements are "front loaded"; that is, they must be an intentional part of program design, and as such, are within the control of adult program leaders and are key determinants of program quality. This third wave also encompasses consideration of program evaluation methods and measures, better research designs that take individual differences and context into account, and longitudinal research (Roth & Brooks-Gunn, 2016).

Many complimentary forces were at work that advanced the practice of youth development during these years (Blyth, 2011). 4-H was influenced by and had an influence on the evolution of youth development as a field. For example, the National Association of Extension 4-H Agents (known since 2020 as the National Association of 4-H Youth Development Professionals), 4-H's professional association, established a Research and Evaluation Committee under its Vice President for Research, Evaluation, and Programs. After several years of discussion and planning by committee members, in 2006 the association launched the *Journal of Youth Development* with the intention of bridging developmental science and practice, not just for 4-H, but for the field more broadly. Both of us have served the journal in various capacities during its formation and throughout the past 17 years.

Conceptual frameworks provide a lens with which to view a topic of interest and show how concepts are related; they bring order to complex issues. Space does not permit an exhaustive review of all the various frameworks that have guided 4-H programs over the years, so we refer the reader to other sources for such reviews (Arnold & Silliman, 2017; Heck & Subramaniam, 2009; Lerner et al., 2011). Here we limit our discussion to four PYD frameworks prominent in 4-H during a time that parallels the expansion of the youth development field more broadly (late 1990s to early 2000s): critical elements from the National 4-H Impact Study (Peterson et al., 2001), program features identified by the National Research Council (Eccles & Gootman, 2002), Kress's (2003) four essential elements, and the Five Cs model

from the National 4-H Study of Positive Youth Development (Lerner et al., 2005).

Summarized in Table 1, Kress's (2003) essential elements are best characterized as developmental needs, 4-H critical elements (Peterson et al., 2001) and those of the National Research Council (Eccles & Gootman, 2002) are features that define quality programs, and the Five Cs (Lerner et al., 2005) are outcomes of participation. Collectively they are aligned, even though each framework describes just a piece of an overall program theory. For example, to address the need young people have for developing mastery, adult program leaders provide engaging opportunities for skill building; in turn such involvement leads to developing competence.

Roth et al. (1998) noted that effective youth development programs share some commonalities—intentional inclusion of youth development principles, opportunities for youth–adult relationships to flourish, and activities that allow for young people's active participation and skill development. The National 4-H Impact Study (Peterson et al., 2001) identified critical elements similar to those in work commissioned by the National Research Council to identify features exhibited in high quality programs (Eccles & Gootman, 2002). Dr. Cathann Kress, who from 2002 to 2008 was the Director of Youth Development at 4-H National Headquarters, recast the four elements of belonging, independence, mastery, and generosity from the Native American Circle of Courage (Brendtro et al., 2005; Brendtro et al., 1991) as the four essential elements of 4-H (Kress, 2003). Along with the eight elements from the national impact study, these four elements continue to guide 4-H

programming and frame program evaluation (e.g., Archibald et al., 2021; Bikos et al., 2014; Hensley et al., 2020; Lile et al., 2021; Martz et al., 2009; Wahle et al., 2019). These frameworks were important steps forward, but they did not go far enough.

As the realization grew that structured youth programs had great, but untapped, potential to support positive youth development, there was an increasing awareness among researchers and scholars of the need to understand that participation was more than just showing up; that to achieve positive youth outcomes, program participants had to become more fully engaged (e.g., Dawes & Larson, 2010; Larson, 2000; Saito & Sullivan, 2011). By far one of the most significant steps toward illuminating the science underpinning 4-H programs came with the advent of the 4-H Study of Positive Youth Development, an 8-year multiwave study started in 2002 by Richard Lerner and colleagues at Tufts University (Lerner et al., 2005; Lerner et al., 2013). The results of this study elucidated a more refined model of youth development that articulated the connection between youth and their ecological assets, to developmental outcomes, and ultimately, over time, to increased positive youth contribution and reduction of risk behaviors (Bowers et al., 2015). The positive youth development outcomes tested in the 4-H study were comprised of what has come to be known as the Five Cs model of youth development: competence, confidence, character, caring, and connection, leading to the sixth C—contribution. Although only a portion of the more than 7,000 study participants also participated in 4-H, the study revealed some key programmatic impacts

that were unique to those who did. For example, youth in 4-H programs, especially girls, displayed higher engagement in citizenship activities. 4-H youth also reported higher academic competence and higher school engagement at various grade levels than non-4-H participants, as well as greater engagement in science, engineering, and computer technology programs (Lerner et al., 2013). Altogether, results of the 4-H study are too numerous to describe fully here, as they are published in more than 88 scholarly articles, 51 book chapters, four books or monographs, and eight special journal issues or sections (Institute for Applied Research in Youth Development, 2019). The Five Cs model has been used to frame 4-H curriculum and programming outcomes (e.g., Bowers et al., 2013; Robinson et al., 2012; Worker et al., 2019) and to frame studies of youth development programs across the United States and internationally (Lerner, Terrel et al., 2019; Mercier et al., 2019).

The Five Cs model is quite robust, and it was widely adopted. Despite the success of the national study in establishing the Five Cs model, important critiques of the study were brought forth. One such critique commended the scope of the study, affirming that such important work was long overdue, yet pointed out the underrepresentation of minority youth in the study, and the associated concerns for the implications of the research on practice, policy, and further research (Spencer & Spencer, 2014). Other critiques pointed to the lack of specificity related to translating the results into effective youth development practice in general, and 4-H programs specifically (Arnold & Silliman, 2017; Heck & Subramanian, 2009). Lacking specificity for translating the

research into practice meant that, despite the far-reaching impact of the Five Cs model in youth development research, its practical adoption in 4-H programs remained underutilized (Arnold, 2018).

Challenges to Adopting a Consistent Framework to Guide Programming

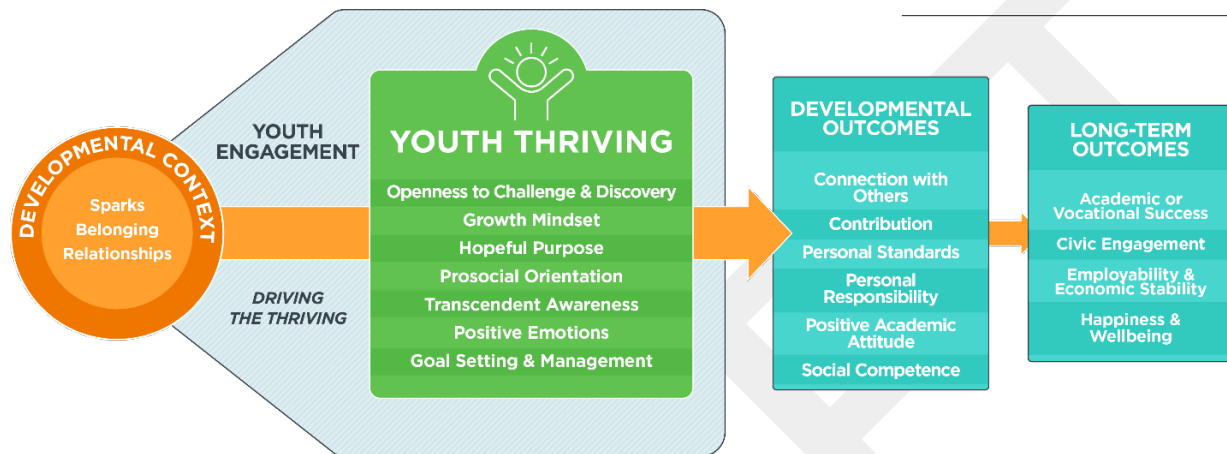
These four PYD frameworks, used with considerable consistency across the 4-H program, reflected the emerging awareness of the science underlying the practice of 4-H. Despite a general understanding of and support for the frameworks, several aspects of how 4-H is organized and implemented have worked against adopting a consistent framework to guide programming.

1. *Decentralized system across multiple institutions in 50 states and territories and variation even within states* – The decentralized nature of 4-H's multilevel organizational structure is both an advantage and disadvantage. The advantage is that programs can be tailored to meet local needs, often thought to be one of the overall strengths of Extension programs. The disadvantage is that lacking an organizing theoretical framework and with the wide variety of possible programs, assessing outcomes across similar programs, across a state, and across the country presents challenges.
2. *Program variety* – The wide variety and types of programs conducted by 4-H and the tendency to make local adaptations are a challenge to implementation fidelity and standardized reporting, which have made it difficult to assess outcomes on a

comprehensive scale. Conversely, this variety may be the reason why 4-H appeals to its members.

3. *Varying academic backgrounds of field staff* – Not all 4-H professionals (which encompasses various titles such as agent, educator, program coordinator, and program assistant) come to their positions with a background in youth development and with skills in program planning, evaluation, and research. Onboarding and in-service training vary from state to state, in large part due to the decentralized system mentioned above, which leads to wide variations in knowledge of the science underlying PYD.
4. *Programs delivered largely by volunteers* – Although there is oversight by 4-H professionals, 4-H clubs are facilitated by volunteer leaders and many 4-H programs use a teens-as-teachers model as well (Worker et al., 2019), which adds another level of complexity and needs to be considered when building PYD capacity.
5. *Time demands of the day-to-day aspects* – 4-H professionals generally juggle multiple administrative and organizational aspects of their positions that require their immediate attention. These concerns may overshadow the big picture and constrain the focus on the more abstract theoretical issues that may seem removed from the daily jumble of tasks.
6. *Disconnected from research* – Despite being situated at land-grant universities, 4-H is often not integrated into academic departments and thus may be disconnected from

Figure 1
The 4-H Thriving Model



research conducted at these institutions and from contributing to the research agenda. Practitioners' knowledge may not be valued within the research community.

7. *Lost in translation* – Lack of translating theories into practical strategies limits their application at the point of service, where it is most needed.

In addition, there would usually be some confusion when a new framework was introduced. Did this new framework replace the previous one? Were 4-H professionals supposed to revamp their programming to align with the new framework, and if so, how? The translation of theory and research findings to practice was one missing link. The frameworks each provided some conceptual pieces, but each had limitations, the most notable being that some models had limited or no empirical evidence to support their use (Arnold & Silliman, 2017; Heck & Subramaniam, 2009). In fact, frameworks such as the essential elements were developed with program implementation in mind. Their swift uptake and adoption indicated that 4-H professionals were seeking frameworks to guide their programs. A comprehensive

theory of change, that is, an explanation of why a particular way of working will be effective in leading to desired outcomes, was needed. Roth and Brooks-Gunn (2016) identified a focus on program context, coupled with what was in the programming "black box," as necessary for moving the field of youth development forward.

Bringing It All Together: The 4-H Thriving Model

To build on the national 4-H study and improve the translation of research to practice, Arnold (2015, 2018) articulated a theory of change for 4-H youth development. Entitled the 4-H Thriving Model, it consists of three elements: (a) 4-H programs as developmental settings for youth characterized by youth sparks, a safe physical environment and positive emotional climate, and developmental relationships; (b) indicators of youth thriving that reflect social, emotional, cognitive, and behavioral development; and (c) developmental outcomes, which are indicators of PYD, including academic motivation and success, social competence, responsibility, connection with others and contribution to others. Youth

Table 1*Alignment of Common Youth Development Frameworks Used in 4-H*

4-H Essential Elements (Kress, 2003)	4-H Impact Study (Peterson et al., 2001)	National Research Council (Eccles & Gootman, 2002)	Five Cs (Lerner et al., 2005)
Belonging	Positive relationship with a caring adult Physically and emotionally safe environment Inclusive, welcoming environment	Supportive relationships Physical and psychological safety Opportunities to belong	Connection
Mastery	Engagement in learning Opportunity for mastery	Opportunities for skill building	Competence
Independence	Opportunity for self-determination Opportunity to see oneself as an active participant in the future	Support for efficacy and mattering	Confidence
Generosity	Opportunity to value and practice service to others		Caring
		Appropriate structure	
		Positive social norms	Character
		Integration of family, school, and community efforts	

Note: Adapted from Cochran et al., 2007

engagement is what is “driving the thriving” along a developmental pathway to outcomes. The developmental outcomes, in turn, lead to long-term outcomes that are realized in adulthood (Arnold & Gagnon, 2020; see Figure 1).

Thus, the 4-H Thriving Model addresses the need to show how programs provide the developmental context (Roth & Brooks-Gunn, 2016), connects concepts from previous frameworks, and serves as the bridge between the program context and the developmental outcomes thought to result from participation. The three elements of the model form a predictive theory of change for 4-H programs (Arnold, 2018), the first time such a testable model had been put forward. Arnold and Gagnon (2019) tested and confirmed a full mediational model, in which youth thriving mediates the effect of the quality of the program setting (developmental context) on developmental outcomes. In other words, the effect of developmental context is important, but indirect. Prior to this point, 4-H had used developmental science largely to describe and frame what it did, but it never had a theory of change that articulated how the various aspects were connected. The importance of such a model is its potential to influence practice, because “by focusing on the processes through which PYD is promoted in 4-H programs, the purpose of program activities can be more clearly defined and thus implemented with greater intention” (Arnold & Gagnon, 2019, p. 44).

The 4-H Thriving model met a conceptual and practical need by providing a logical path that connected what 4-H professionals did every day with desired youth development outcomes. Because it was purposely presented in this manner, it made sense to 4-H professionals, and

they could situate their work easily in the model. Many expressed renewed pride in their work and in the connection of 4-H to the land-grant university and the Extension mission. As interest in the 4-H Thriving Model grew organically across the national 4-H system, so did the requests from state 4-H programs for professional development and training materials for 4-H professionals and volunteers. These growing needs led to the development of the Advancing the 4-H Thriving Model Task Force, which in 2019 was chartered by the national 4-H Program Leaders Working Group (Arnold & Gagnon, 2020). Establishment of the task force represented a major step toward embracing the model and legitimizing its system-wide adoption, and this work has continued to advance the foundation of science within 4-H.

Progress of the 4-H Thriving Model

Arnold and Gagnon (2020) provided an update on the work of the 4-H Thriving Model Task Force, sharing the advances that had been made as interest in the model increased and spread across the 4-H system. This paper re-articulated the importance of and need for a theoretical model to ensure that 4-H stays true to its research-based mission and to ensure that 4-H programs are based on the latest science related to youth development. The authors also pointed out the need for a theoretical model to ensure high-quality program evaluation—appraisal that needs to evolve beyond outcomes measures alone to include measures of program quality and the processes that lead to those outcomes (Arnold & Cater, 2016; Lerner et al., 2016; Roth & Brooks-Gunn, 2016).

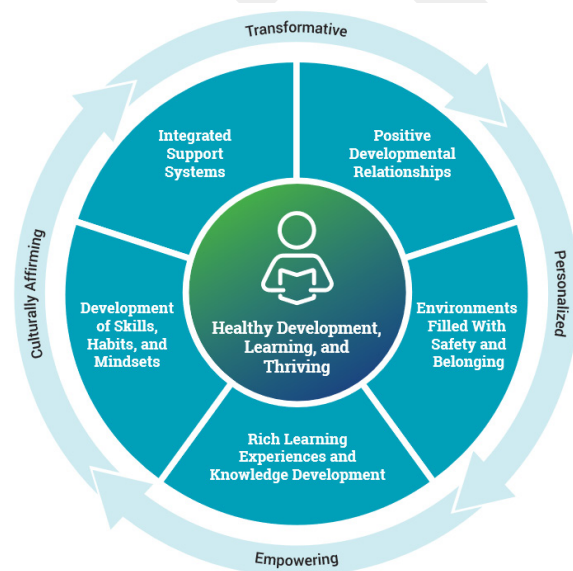
The establishment of a research-based theory of change for 4-H (as articulated in the 4-H

Thriving Model) and its alignment with the science of learning and development principles (which are discussed in the next section) have contributed to 4-H being more scientifically based than perhaps at any point in its history. Furthermore, researchers outside of 4-H have recognized 4-H's position as a leader in science-based youth development practice. In his commentary on the advancement of the 4-H Thriving Model, Lerner (2020) pointed out that the 4-H Thriving Model exemplifies a “creative and richly theoretically and empirically informed vision for promoting youth development” (p. 147). Lerner goes on to support the model as “an exemplar of how theoretically predicated and cutting-edge developmental science and the enactment of youth programs can be mutually informative.”

In a related commentary, Moroney (2020) supported the 4-H Thriving Model as an excellent example of the application of developmental science in youth development practice. Moroney goes on to state that the translation alone, although commendable, is not enough. Rather, if 4-H is going to move forward with strengthening the scientific base of its youth development practice, the organization as a whole must achieve a level of readiness for systemwide implementation. Three factors are crucial for successful implementation: motivation, general capacity, and content-specific knowledge (which Moroney portrays as $R = MC^2$, where R represents implementation readiness). Despite the work that still lies ahead, Moroney affirmed that the work the 4-H Thriving Model Task Force has done to foster organizational learning and development to implement science-based programming in 4-H is critical to implementing sound youth

Figure 2

Guiding principles for equitable whole child design



Note: Learning Policy Institute & Turnaround for Children, 2021. Used with permission.

development practices that are based on a scientific body of evidence.

Although the support of the scientific community related to youth development, and the general enthusiasm and interest in the 4-H Thriving Model as a theory of change for 4-H, has been positive for moving the model forward, further translation of the model into practical application was necessary before 4-H could intentionally and consistently implement programs based in science. As this work moved forward, it became clear that the scientific theory of change embodied in the model must be expressed differently across different levels of the 4-H system. One of the most important levels is the practitioner level, the professionals who are the individuals

in 4-H who design and implement programs at the local, state, and national level. Frontline 4-H professionals view themselves as practitioners of youth development, not developmental scientists. As such, they may not need to know the detailed body of evidence related to youth development, but they do need to understand the basic theory, and most of all, how to put the science into practice effectively (Arnold, 2015; Arnold & Cater, 2016). They, in turn, must be able to explain it in a way that makes sense to the volunteers and stakeholders with whom they work.

The Next Wave: The Science of Learning and Development

Simultaneously with the advancement of the 4-H Thriving Model as a theory of change for the 4-H program, significant advances in the science of learning and development (SoLD) were taking place. SoLD is a holistic view of developmental processes that has emerged from multidisciplinary strands of research to form a comprehensive understanding of how young people learn, grow, and develop (Cantor et al., 2019; Cantor et al., 2021; Osher, Cantor et al., 2020). Findings from this emerging field underscored the dynamic and interactional effects of context, relationships, environments, and social structures on development, and the importance of a “whole child” approach to learning. Of particular importance are the multiple contexts that shape who youth are, how they learn, and their experiences. One of the initial results of this work was the identification of eight key findings of how youth learn and develop:

1. Potential – every child, no matter their background, has the potential to succeed.
2. Malleability – young brains are highly malleable and resilient in learning new concepts and overcoming challenges.
3. Individuality – every child learns and develops differently.
4. Context – experiences, environments, and cultures are the most critically defining influences on development.
5. Relationships – strong and trust-filled relationships are essential for learning and development.
6. Integration – learning is accelerated and enhanced when it is intentionally integrated across learning environments.
7. Continuum – youth learn and develop continually in progression, but not necessarily in a linear fashion.
8. Meaning making – learning happens most effectively when connections to prior experiences and knowledge are made. (Science of Learning and Development Alliance, 2020)

The findings from SoLD were translated into five guiding principles for an equitable whole child approach to educational design. These five principles are (a) positive developmental relationships; (b) environments filled with safety and belonging; (c) rich learning experiences and knowledge development, (d) development of skills, habits, and mindsets; and (e) integrated support systems (Learning Policy Institute & Turnaround for Children., 2021; see Figure 2). The outer ring of the figure has four additional overarching concepts that are embodied in the principles: that learning environments,

Table 2

Alignment of the 4-H Thriving Model with the SoLD Principles of Equitable Whole Child Design and Youth Development Scholarship

SoLD Whole Child Design Principle	Design Principles Summary	Supporting Youth Development Research	4-H Thriving Model Element
Positive Developmental Relationships	Fostering developmental relationships through structures and practices that allow for caring, continuous, and secure youth-adult relationships	<i>Developmental Relationships</i> <ul style="list-style-type: none"> • Express Care • Challenging Growth • Providing Support • Sharing Power • Expanding Possibilities (Pekel, 2019; Roehlkepartain et al., 2017) 	Developmental Relationships
Environments Filled with Safety and Belonging	Providing physical, psychological, cultural, and identity safe learning environments where you experience safety, belonging, and inclusion	<i>Youth Program Quality Features</i> <ul style="list-style-type: none"> • Physical and psychological safety • Appropriate structure • Opportunities to belong • Positive social norms • Support for efficacy and mattering (Eccles & Gootman, 2002) 	Belonging
Rich Learning Experiences and Knowledge Development	Providing learning opportunities that are relevant, engaging, and inquiry based	<i>Sparks</i> (Benson & Scales, 2011) <i>Experiential Learning</i> (Dewey, 1938; Kolb, 1984)	Sparks Youth Engagement
Rich Learning Experiences and Knowledge Development	Integrating cognitive, social, and emotional learning that build resilience, a growth mindset, hope, purpose, social awareness, and self-regulation	<i>Whole Child Development, Learning, and Thriving</i> Leading to the development of skills; knowledge; and academic, social, and emotional outcomes (Devaney, 2015; Durlak et al., 2010; Osher, Pittman et al., 2020)	Indicators of Youth Thriving: <ul style="list-style-type: none"> • Growth mindset • Openness to challenge and discovery • Hopeful purpose • Prosocial orientation • Transcendent awareness • Positive emotionality • Goal setting and management
Integrated Support Systems	Supporting youth health and mental health; providing social services and opportunities to build on interests and passions	<i>Grounding, Well-Being, and Agency</i> (Damon, 2004; Osher, Pittman et al., 2020)	Sparks Youth Engagement

relationships, and support systems will be transformative, personalized, empowering, and culturally affirming.

Although presented in the context of formal education (i.e., referring to classrooms and students), the key design principles derived from the SoLD findings align directly with best practices identified in the youth development research literature. As a result, leading youth development researchers were quick to embrace the SoLD findings, pointing out the coalescing of theory, research methods, and related implications for application in youth development practice (Lerner, Geldhof et al., 2019). The initial SoLD findings align well with established youth development theory, perhaps most importantly with respect to the critical influence of mutually beneficial person <—> context relations on youth development and thriving (Lerner et al., 2003). The findings also align with cutting-edge research methods in youth development that increasingly focus on individual analysis, charting idiopathic, rather than average, developmental pathways (Nesselroade, 2019; Rose, 2016). Such non-reductionist advances in research methods are consistent with holistic and individual child development emphasized in the SoLD findings (Lerner, Geldhof et al., 2019). In terms of application for youth development practice, the SoLD findings underscore the importance of the specificity principle articulated by Bornstein (2019), which informs youth development practice by emphasizing the importance of determining the specific ways in which a program works, with what specific groups of youth, and under what specific conditions (Bronfenbrenner, 1979; Lerner, 2020).

Convergence: SoLD Design Principles, Youth Development Theory, and the 4-H Thriving Model

The SoLD scholarship (Cantor et al., 2019; Osher, Cantor et al., 2020) began to emerge at the same time as the development of the 4-H Thriving Model. Direct alignments can be drawn between the five SoLD design principles, youth development theory and research, and the elements of the 4-H Thriving Model (see Table 2). Specifically, the developmental context element of the 4-H Thriving Model describes the ingredients for a high-quality 4-H program: sparks, belonging, and relationships. Additional elements of 4-H programs that are important to a high-quality developmental setting are those identified by Peterson et al. (2001) and Eccles and Gootman (2002), among which include psychological and physical safety. All these elements align with the SoLD design principle of environments filled with safety and belonging. Fostering developmental relationships (Pekel, 2019; Roehlkepartain et al., 2017) is a key element of the 4-H Thriving Model, which aligns with the SoLD principle of positive developmental relationships.

The rich learning experiences design principle is reflected in the 4-H Thriving Model with its emphasis on youth sparks (Benson & Scales, 2011) and youth engagement, which center the 4-H learning experience in what a young person finds most interesting and most meaningful. 4-H has long embraced a youth-centered approach to learning and knowledge development that reflects the SoLD principle of productive

instructional strategies. 4-H begins with a young person's interests and builds a program of learning and development that is centered on that spark. An emphasis on learning by doing (i.e., experiential learning; Dewey, 1938; Kolb, 1984), which intentionally helps youth apply learning to novel settings, leads to the development of problem solving and metacognitive skills.

The thriving indicators identified in the 4-H Thriving model represent the critical social, emotional, cognitive, behavioral, and habits of mind articulated in the SoLD design principles. Research shows that regular participation in high-quality youth development programs contributes to the social and emotional development of young people (Devaney, 2015; Durlak et al., 2010; Osher, Pittman et al., 2020). Supporting the development of these thriving indicators along with rich content learning experiences leads to transformative learning for youth (Osher, Pittman et al., 2020).

The alignment between the integrated support systems design principle and the 4-H Thriving Model is not as direct as the others primarily due to the principle's roots in formal education, with the intent of emphasizing that meeting the ancillary needs of students is essential to academic success. Even so, 4-H practice reflects this understanding when considering the ultimate well-being and personal agency of young people, especially through a multitiered systems of support (e.g., 4-H volunteers, professional 4-H educators, parents, and other adults working with 4-H youth). Focusing on youth sparks, for example, supports positive youth identity, sense of purpose, and hope, all key aspects of mental health and positive youth development

(Damon, 2004). Likewise, youth engagement and empowerment through strong relationships and leadership opportunities promote youth agency (Larson, 2011; Larson & Angus, 2011), another important indicator of youth well-being. Throughout their 4-H career youth are encouraged to explore applications for their interests, with a particular emphasis on developing transferable life skills and college and career connections (e.g., Anderson, 2020; Cochran & Ferrari, 2009; Digby & Ferrari, 2007; Ferrari et al., 2008; Horrillo et al., 2021).

The social and emotional development identified in the SoLD whole child design model (Figure 2) aligns directly with the indicators of youth thriving in the 4-H Thriving Model (Figure 1). These seven indicators of thriving reflect social, emotional, cognitive, and behavioral learning that is critical for youth to form the positive habits and mindsets for success identified in the SoLD whole child design principles. Finally, 4-H youth development program design and practice methods embody the systems of supports identified in the SoLD principles and the opportunities for extended in-depth learning—long a hallmark of 4-H's approach to youth development. In short, the current scientific body of evidence for how youth learn and develop is in alignment with youth development scholarship and is reflected in the 4-H Thriving Model, which illustrates the translation of the research into 4-H practice.

Application: 4-H Practice Principles

To meet the need to put the science into practice, six principles of 4-H youth development practice have been proposed to ensure

developmental science and 4-H practice are consistently aligned in 4-H programs at all levels of the system (Arnold, 2021). These six principles translate science into practice by emphasizing that all 4-H programs:

- are based on the science of positive youth development (PYD);
- combine learning, teaching, and the promotion of youth thriving for life changing (transformative) learning;
- promote robust equity to ensure thriving and opportunity for all youth (robust equity is “the intentional counter to inequality, institutionalized privilege and prejudice, and systemic deficits and the intentional promotion of thriving across multiple domains for those who experience inequity and injustice”; Osher, Pittman et al., 2020, p. 3);
- prioritize youth voice, leadership, and civic engagement;
- facilitate the creation of pathways for youth leading to actionable postsecondary plans; and
- make continual investments in professional and volunteer capacity building to ensure that those responsible for planning and implementing 4-H programs have the knowledge, skills, and capacity to ensure that 4-H programs are grounded in science, while they are informed by practice.

Translation of the SoLD findings into the whole child design principles was a key step in translating the findings into practice. Likewise, aligning the principles with the 4-H Thriving Model connected the PYD theory to the science, and the 4-H practice principles guide practitioners as they plan 4-H programs based on science.

Building the capacity of 4-H professionals to implement 4-H programs grounded in science requires both translation and application. Although these six principles provide the foundation for translating the science of youth development into 4-H practice, it is important to underscore that as the science evolves, the how and the why of 4-H practice remain the same (Arnold, 2020). In other words, the science that is translated into the six principles must have real-world, authentic application in the everyday work of 4-H professionals to be fully adopted. Here is where the long-standing 4-H pedagogy and science intersect. Take, for example, 4-H camp counselor training programs, which are ubiquitous across the 4-H system. 4-H camp counselors are teens who lead and work with small groups of younger campers in a residential camp experience, typically held over 3 to 5 days. For the 4-H professional, the camp experience has two audiences that they must plan for: camp counselors and campers (Ferrari & McNeely, 2007). While every counselor must be trained for their role in ensuring a safe and fun camp for every camper, purposeful attention to these six principles when designing the camp counselor training program ensures that teen counselors are not only being prepared for a summer job; they are also receiving a transformational experience that is grounded in the science of youth development. For example, they are empowered when adult leaders entrust them to carry out their leadership position responsibly (Digby & Ferrari, 2007; Ferrari & Arnett, 2011; Ferrari & McNeely, 2007). Applying these principles ensures that the campers’ experience will be positive as well (e.g., Wahle et al., 2019).

Serious About the Science: What Comes Next for 4-H?

Outlining the alignment between developmental science and 4-H practice through the 4-H Thriving Model has advanced the scientific base of 4-H youth development practice considerably. The 4-H Thriving Model elucidates the necessary ingredients of effective 4-H program settings and opens the “black box” of 4-H program processes that lead to outcomes (as recommended by Roth & Brooks-Gunn, 2016). Arguably, this work has illuminated the science behind the practice more so than at any time in the history of the 4-H program. However, as Arnold (2018) pointed out, providing professional development to ensure the science is practiced across the 4-H system is a critical and daunting next step, requiring a commitment to building organizational learning at all levels of the 4-H organization.

But perhaps the moment has come for 4-H to get even more serious about the science. One way to do this is to address barriers that may affect 4-H professionals’ use of research evidence, such as locating and assessing what is available and having the skills to interpret and apply findings (Bikos et al., 2011). Further, because of its unique home within the land-grant university system, it is incumbent upon 4-H to be a leader in bridging research and practice—with research informing practice and practice informing research—and to ensure that there is research about practice and that it involves *practitioners*. It is not always easy to do such research, and it can be messy, as we and those who have done it can attest (e.g., Agans et al., 2020). As well, when research describes how practitioners achieve their aims, it can go far in validating good practice, as Burrow

et al. (2020) did in their recent study exploring 4-H as a context for developing youth’s sense of purpose. When practice validates the theory, we have come full circle.

Organizationally, the 4-H program is poised to take a pronounced step forward in building the connection between science and practice. The coalescing of cutting-edge developmental science and the 4-H Thriving Model has resulted in an organic groundswell of interest across the 4-H system, a departure from the historical national-to-local level approach of instigating change. Instead of being directed from a national 4-H office, a team of 4-H professionals from across the 4-H system has worked together for the past 2 years to advance the 4-H Thriving Model and its grounding in the science of learning and development. This task force is providing leadership, training, and resources to support frontline 4-H professionals and is working to build professional capacity from the ground up.

Developmental science is alive and well in 4-H. As we started writing this chapter, the first-ever 4-H PYD Academy brought together more than 900 4-H professionals from around the country. This 3-day virtual academy was designed with the sole purpose of connecting developmental science to applied practice, with a focus on understanding theory, creating effective developmental settings, and ensuring equity and opportunity for all youth. Unlike the approach in most 4-H professional development opportunities, the 4-H PYD Academy did not focus on any particular program content, but rather on the science of PYD. The virtual PYD Academy is one step on a long road of organizational change that lies ahead if 4-H is to get serious about the science of PYD. As Moroney (2020) stated:

The diverse 4-H system now has the ultimate challenge of adopting and implementing the principles presented in their theory of change... to implement a model into practice, the real and human factors of implementation readiness are key to success, which means that 4-H must align resources; coordinate professional learning; and get the adults, or implementers, bought in and up to speed on the theory of change and associated practices. (pp. 162–163)

4-H is ready and up to the task. After the successful 4-H PYD Academy, a 4-H Thriving Champions Regional Network was formed. These individuals, representing 36 land-grant universities, are charged with advancing the consistent use of the 4-H Thriving Model as the theory of positive youth development used in 4-H. Note the important difference between the standard use of the *model* versus using a standard 4-H *program*, as such program standardization would run counter to SoLD principles (Lerner, 2020). The thriving champions will focus primarily on capacity building efforts for 4-H professionals and volunteers, with a special focus on consistent orientation for onboarding new 4-H professionals (thereby addressing challenges previously confronting model adoption).

We must also acknowledge that we have been writing this chapter in the middle of a global pandemic, the impact of which on a generation of youth and youth organizations will become more and more apparent in the coming months and years. We are surrounded by insistent calls for racial and social justice, borne of frustration and anger at the relentless inequities that not only persist, but are exacerbated by the

pandemic and ongoing political and ideological strife. The message brought forth by the science of learning of development, however, is one of hope. It is a message that reveals how every young person has the potential to learn, grow, develop, and thrive given the right supports and opportunities. Ensuring that 4-H practitioners not only understand the science, but also use it to plan and implement 4-H programs, is key to helping today's youth find a successful pathway forward.

Perhaps the beauty of this moment is the realization that 4-H is already practicing the science—just as it has for more than 120 years. 4-H has always provided safe and structured contexts for youth, where belonging, mattering, and skill building were emphasized, even if we did not use those exact words to describe it. Since the beginning, youth's positive relationships with caring adults and the promotion of social, emotional, and cognitive skills have been woven into the fabric of everyday 4-H practice. 4-H has endured, despite its shortcomings and challenges, because as an organization it strives to walk the talk: to “learn by doing” and “to make the best better” when it comes to keeping pace with developments in science and applying them in practice, learning and improving along the way. 4-H must “do the work” if it is to reach its ambitious goals, including a more diverse membership and workforce (Fields, 2020; Sumner et al., 2018; U.S. Department of Agriculture and National 4-H Council, 2017). The 4-H Thriving Model and the resulting work it has catalyzed represent how 4-H has advanced as the science has advanced; it continues to influence and to be influenced by developmental science, and to bridge research

and practice. All these recent developments are now part of the next chapter in 4-H's continuing story. By continuing to apply what the best of science has to offer, we, as a 4-H organization, can ensure that as young people navigate their developmental pathway and write their own story, their 4-H experience is anchored upon a firm foundation.

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