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Credible and Actionable Evidence in Extension Practice: Framing Issues, Contexts, and Principles

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Organizations that translate emerging science and provide community outreach, such as the Cooperative Extension Service and similar outreach engagement programs at universities, face ongoing challenges in establishing the credibility of program content and results as the pace of discovery of new knowledge, demand for effective applications, and diversity of audiences and other stakeholders continues to expand. This special edition of the Journal of Human Sciences and Extension (JHSE) explores the theme, “What is credible and actionable evidence in Extension programs?” Like a good evaluation, we begin this introductory article by framing the question, including academic, policy, and practical contexts; definitions of terms; discussion of the Extension context of credible evidence; and a sample of frameworks used to ground claims to credibility across disciplines and levels of reporting. A brief review of each article in the special edition concludes this overview of the JHSE special edition.

Keywords: credible evidence, actionable evidence, Cooperative Extension, program evaluation, evidence-based practice, program evaluation standards, logic models

“Unfortunately, seeking truth or agreement about what constitutes credible and actionable evidence does not seem to be an easy matter in most fields.”

—Stewart I. Donaldson (2015)

Introduction

Over many years of working with the Cooperative Extension Service (*Extension*), we have heard statements and questions similar to the following about Extension program effectiveness:

- “I know I am making a difference,” a confident young county Extension agent declares. “Our nutrition education program served 4,500 people last year.” “OK,” the county director replies, “So, how many of those participants and their families are eating healthy meals or saving money on food or medical bills?”

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- “I know I am making a difference,” explains an experienced field crop Extension agent, “Producers are implementing conservation practices, trying drought-resistant varieties, and recognizing early-on when they have disease problems.” “Great,” replies a state Extension specialist, “But did producers “check off” those items on a list, or describe what they actually do? Have you been in the field with them to observe these changes?”
- “I know I am making a difference, an Extension program leader notes. “Three counties with long-standing financial management programs saw an increase of ten percent in families becoming self-sufficient. In three counties where there was never an interest in those programs, at least five participating families became self-sufficient and recommended the program to their friends.”
- “I know I am making a difference,” an Extension volunteer youth leader insists, “Our programs teach life skills, so they will be productive citizens in the future.” An interested county commissioner replies, “What exactly are those skills, and how do you know it is your program that turns youth into productive citizens?”

These statements and the follow-up questions raise an underlying issue. What counts as credible evidence for design and impact in community-based programs such as Extension and other engagement outreach programs of public and private universities? Our focus in addressing this question in this special edition of the *Journal of Human Sciences and Extension* (JHSE) will be on the programs of the Cooperative Extension System (CES), a partnership between the U.S. Department of Agriculture’s National Institute for Food and Agriculture (NIFA) and the nation’s land-grant universities, but the insights provided by the authors in this special edition will likely be applicable for a variety of organizations. As the scenarios above suggest, expectations for the amounts and types of evidence for program impact (i.e., making a difference) varies widely among Extension stakeholders.

Criteria for credible evidence include evidence-based practice, rigorous evaluation designs and measures, and usability of data for participants, practitioners, and decision-makers (i.e., stakeholders). Yet rigorous programming and evaluation entail different credibility criteria across diverse disciplines, settings, and stakeholder needs. Resources and conditions in non-formal, community-based educational programming settings rarely match those in research laboratories or model programs where evidence standards are established. Moreover, the process for translating science, delivering programs, and generating evidence for program effectiveness are not well-understood by many decisionmakers, participants or other citizen-stakeholders, or for that matter, many practitioners themselves. Thus, it is often challenging to know exactly how to support claims for “making a difference” or how to apply evidence of success to program improvement or policy decisions.

This special edition focuses on what types of evidence demonstrate the quality and impact of Extension programs, how evidence is generated, and how that evidence can be used by

stakeholders to make decisions on a wide range of concerns. Extension programs reflect diverse disciplines, strategies, objectives, contexts, and resources and serve stakeholders with diverse expectations. Stakeholders have differing capacities to understand and weigh program effectiveness evidence. We cannot answer all questions related to what evidence is *credible* (i.e., relevant and trustworthy) and *actionable* (i.e., useful for decisions about policy, practice, personal organizational change). We hope to show why credible evidence is often not implicit in Extension work, often not easy to produce, and in some cases, not universally acclaimed by stakeholders.

We also recognize that, for many stakeholders, credibility also connotes not simply program integrity or validity of impact data, but customer satisfaction with a program's processes, outcomes, and relationships. In a world of information overload, conflicting claims, and significant consequences for policies, programs, and personal decisions, skilled interpreters of credible and actionable evidence can add value to policy, program, and personal decisions. Cooperative Extension organizations that can translate knowledge, generate evidence of program impact, and facilitate understanding and use of credible evidence will sustain the mission of their land-grant universities.

In this introductory article, we describe the concepts and contexts of the broader credible evidence discussion and their relevance to Extension work. We will also highlight evaluation frameworks and resources that may be useful in thinking about what is credible and actionable evidence and useful in your own efforts to collect such evidence.

Framing the Discussion: What Counts as Credible and Actionable Evidence?

Defining Credible Evidence

Credible evidence, in the broadest sense, is information that stakeholders perceive as trustworthy and relevant for answering their questions about a program (Centers for Disease Control and Prevention [CDC], 2012, *Program Evaluation Framework*, as cited in Donaldson et al., 2015, p. 7). The CDC Framework also notes that stakeholders may judge credibility based on how questions are posed or results interpreted, sources of information accessed, data collection methods and measures, and quality control procedures employed. Across different types of programs¹, settings, and stakeholder priorities, the quantity and quality of evidence required for policy, practice, or funding decisions varies widely (Franz, 2013; Franz & Townson, 2008), and the definition of high-quality evidence is vigorously debated (Donaldson et al., 2015, p. 9). In practice, credibility of evidence is affected by stakeholders' engagement in identifying

¹ Program types include information campaigns, educational or training programs, implementation of policy recommendations, or other activities directed toward enrichment, prevention, or remediation (cf. Ripley et al., 2011; see also Franz & Archibald, 2018 on programming continuum).

evaluation questions and evidence criteria as well as practitioners' expertise, time, and resources for gathering evidence (Donaldson et al., 2015, p. 6; Franz & Archibald, 2018).

Mark (2015, p. 277) describes four attributes of evidence that influence decisions and actions: 1) credibility, or trustworthiness of processes and quality of the product; 2) relevance, or importance of the process or product; 3) inferential potency, or level of confidence in evidence based on critical criteria; and 4) comprehensiveness, or evidence across a broad range of questions. Health and safety criteria for agricultural processes and products reflect these attributes. Stakeholders, ranging from consumers to state health inspectors to dairy farmers, rely on a complex of procedural observations, lab tests, and anecdotal reports to establish a research evidence base and monitor practice from farm-to-fork. Different criteria may be relevant for different products. Food safety may be compromised or enhanced by a variety of expected and unexpected factors in the supply chain; thus, inferences about safety usually require more than one type of evidence. Moreover, evidence for food safety is interconnected with evidence about the environment, plant or animal as well as human health, economics, politics, ethics, and much more. Consequently, the credibility of a food system requires triangulated evidence from multiple sources, filtered through diverse perspectives and criteria. A similar process might be applied to Extension programming about food systems or other mission areas.

Relevance and trustworthiness of program outcome data are enhanced by collaboration between program evaluators, or the program deliverers who will conduct the evaluations, and program stakeholders who, together, work toward a common understanding of the problem or opportunity, prioritize evaluation questions, and agree on appropriate evidence, as time and resources permit (Donaldson, 2015, pp. 3–4). In this process, an Extension educator, supported by subject matter and evaluation specialists, can assess needs and assets and introduce diverse stakeholders to current evidence from basic and applied science. Together, guided by program theory (Donaldson, 2015, p. 5), collaborators can identify relevant evaluation questions and standards for credible evidence of program effectiveness. The planning process, which does not have to be long and contentious, also provides opportunities to build personal rapport (with the evaluator and among stakeholders) and organizational credibility, enhancing subsequent use of findings (Owen & Rogers, 1999, p. 117–120). Over time, an evaluator and/or planning facilitator can help stakeholders reflect on deeper value claims that influence their views of credible evidence, including personal preferences, perceptions of public value, legal or professional standards, contextual significance, and exemplary value (Scriven, 2007).

In this context, credible evidence, as interpreted by Donaldson and colleagues (2015), is not about what is true in an ultimate or absolute sense. Rather, credibility refers to what is relevant and trustworthy within a particular scientific paradigm or evaluation theory. Horgan (2012) notes that Kuhn (1962), argued that both falsification and verification each:

imply absolute standards of evidence, which transcend an individual paradigm. A new paradigm may solve puzzles better than the old one does, and it may yield more practical applications. But that does not make it absolutely more true than previous paradigms.

The new paradigm to which Kuhn refers may include new theories or evidence from science, alternative theories or approaches to evaluation, legal or policy criteria, cultural assumptions, and theories about reality. In this regard, professionals involved in evaluation must be consistently self-reflective and transparent about the personal and professional assumptions that guide their work and ready to question and/or better understand the credibility of established policy or practice (Miller, 2015, pp. 53–58).

In agriculture, for instance, paradigms and place are critical to credibility and actionability in agroecology (Reynolds, Smith, & Farmer, 2014; Valenzuela, 2016; Welsh & Rivers, 2011). In program delivery, research suggests that experiential learning facilitates motivation, learning, and creativity in many settings, but is not as efficient or effective as direct instruction for immediate memory and analytical skills (Baker & Robinson, 2018).

The traditional positivist approach to science produced many advances in discovery and application but often became too rigid in method or application of findings. Modern post-positivist evaluation science appreciates diverse voices, contexts, and processes, but may produce nonreplicable results (Christie & Fleischer, 2015, pp. 29–35). Consistent with discussions of the conduct of research (Pennock & O'Rourke, 2017) and Guiding Principles for Evaluators (American Evaluation Association, 2018), Extension professionals serve best as humble stewards who are honest about their assumptions, objectives, and limitations and patient interpreters, whether stakeholders are supportive or skeptical about the credibility of their evidence.

Defining Actionable Evidence

Actionable evidence describes evaluation results that are adequate and useful for making policy or programming decisions (Julnes & Rog, 2015, p. 221). Credible evidence is not always actionable. For instance, we may recognize patterns of productivity or resiliency but not fully understand how to promote those outcomes programmatically or how to adjust for differences in organism or context. However, in many situations, educators may know enough to take preventive or proactive steps, even though they do not have complete knowledge of the change mechanisms, contexts, or other factors. As with credibility, what evidence is actionable depends on evaluation questions and contexts, and some methods may be more helpful than others in supplying that evidence (Julnes & Rog, 2015, p. 221). Julnes and Rog (2015, pp. 226–227) present Weiss' (1998) taxonomy of evaluation questions and Mark, Henry, and Julnes' (2000) related comment on evaluation tasks as a useful guide for program leaders or evaluators to decide what level of evidence is needed for action. For instance, at the Implementation level, similar to Rockwell and Bennett's (2004) output level, program reach or accessibility and fidelity

to evidence-based models are key questions for evaluation use. Blyth (2011) underlines this point regarding youth development: If programs are not accessible to all youth, how (or how much) does that compromise program claims for promoting positive youth development? Actionability questions at the Outcome level focus on the improvement of program participants relative to prior levels of performance (e.g., knowledge, attitudes, skills, and aspirations) and/or in comparison to a control group. At the level of Impact, or long-term sustained change, actionability focuses on aggregated impact (e.g., changes due to the program), disaggregated impact (e.g., relative benefits for participant groups), and causal mechanisms (e.g., program components critical to sustained changes).

Weiss (1998) also includes actionability questions related to cost-benefit analysis and critical program review (e.g., unanticipated effects, limitations and practical implications, recommendations for programs and policy changes, implications for new policies).

Actionability, like credibility, must be defined in terms of context and stakeholder questions, but the levels of analysis suggested by Weiss (1998) continue to provide a general rubric for thinking about practical uses of program evaluation data.

Julnes and Rog (2015) suggest that evaluations focused on program activities or outcomes require relatively less rigorous evidence than programs being piloted as models or programs being evaluated for cost-effectiveness or policy decisions. For instance, a drop-in program offering fitness activities and nutrition information in a community senior center might be monitored for participation (e.g., evidence of community interest, accessibility), program protocols (e.g., fitness screening) and quality (e.g., appropriate activities, supportive interaction). A more rigorous program would include these same participation, protocol, and quality checks, but also track indicators such as participants' weights, muscle tones, and blood pressures over time as well as conduct interviews of participants for details about the quality of their experiences and impacts of their participation. Targeted questions, representative sampling, and advanced analyses may help program leaders and evaluators weigh benefits based on participants' traits or the program's strategy to inform decisions about program improvements or expansion. Data on local health trends, comparisons across program sites, and with research on similar programs could further assist stakeholders in knowing how to invest resources in senior wellness programs. However, if decision-makers lack information on questions, such as where new services are needed or what additional organizations will contribute resources, they may not be able to act on program expansion.

A wide range of evaluation theories and methods have been developed to provide credible and actionable evidence to address particular evaluation questions and contexts. No one method can adequately address all questions and contexts, and mixed methods (e.g., quantitative and qualitative approaches) may be needed to provide compelling evidence on a single question.

Patton's Mountain of Accountability model (Patton & Blandin Foundation, 2014) describes an even broader range of indicators for organizational integrity and growth as well as program quality and outcomes. In this model, the first level, Basic Accountability for Management Processes, focuses on fiscal and program management, emphasizing intentional planning, effective management, fiscal and operational transparency. This level also involves due diligence in delivering activities and managing resources, consistent with sponsor expectations. Evidence for due diligence may be inferred as readiness to manage more complex or extended projects and achieve targeted impacts.

The next level, Accountability for Impact, entails the gathering of program quality and outcome data through internal and external evaluations utilizing diverse sources (e.g., staff, participants, boards, and broader stakeholders). The next higher level of Patton's mountain model, Accountability for Learning, Development, and Adaptation, focuses on reflective practice and process improvements that fuel learning and system change. Once programs consistently show desired results, a focus on continuous quality improvement is critical to sustaining or extending benefits, building capacity, and innovation. Significantly, the model emphasizes management and review functions of program evaluation and organizational learning that are ignored or presumed by other planning and evaluation models. Both the "bottom end" and "top end" evaluation questions are critical to credibility of programs and sponsoring organizations.

The Broader Practice and Policy Debate

Organizations and policymakers in all fields face major challenges in determining credible evidence for a wide range of decisions, including issues with implications for life and death (e.g., medical treatments, technology innovations) and public or private investments (e.g., social, economic, environmental, social policies and program support). Stewart Donaldson and his colleagues addressed this ongoing debate in the book, *Credible and Actionable Evidence: The Foundation for Rigorous and Influential Evaluations* (Donaldson, Christie, & Mark, 2015). That book is a touchpoint for this special edition.

While conceding the idealism of Donald Campbell's *Methods of the experimenting society* (1991), where all policy decisions would be informed by rigorously-tested evidence, Donaldson et al. (2015), agreeing with Shadish, Cook, and Leviton (1991), recognized that "information or evidence judged to be poor by experimental scientific standards was often considered acceptable by key decision makers, including managers, politicians, and policy makers" (Donaldson, 2015, p. 8). Further discussion of the debate between these two paradigms is available at the American Evaluation Association's (2003) website (<https://www.eval.org/p/cm/ld/fid=95>). Articles in special issues of the publication *New Directions for Evaluation* also offer further discussion on credibility and validity (Chen, Donaldson, & Mark, 2011) and on mixed methods (Mertens & Hesse-Biber, 2013).

Credibility in Extension Programming

Diverse Criteria and Contexts for Credibility

The Cooperative Extension System (CES) provides one institutional context in which to reflect on the challenges of generating credible and actionable evidence. The goal of the CES, concisely stated on the NIFA website (National Institute for Food and Agriculture [NIFA], 2014), is “translating research into action: bringing cutting-edge discoveries from research laboratories to those who can put knowledge into practice.”

Given the breadth of Extension programming (Bull, Cote, Warner, & McKinnie, 2004; Kellogg Commission on the Future of State and Land-Grant Universities, 1999), Extension’s “research laboratories” are not limited to clean rooms populated by white coats and microscopes, although that may be the popular stereotype for scientific credibility. Field trials, non-formal educational programs, or 4-H camps illustrate settings with less controlled conditions than clinical laboratories and are typically more challenging contexts in which to establish credibility and actionability.

The NIFA website also states that the CES “empowers farmers, ranchers, and communities of all sizes to meet the challenges they face, adapt to changing technology, improve nutrition and food safety, prepare for and respond to emergencies, and protect our environment” (NIFA, 2018). In fact, the CES mission is much broader than described, including diverse disciplines, serving diverse stakeholders in diverse settings. Stakeholders in each discipline and decision-makers at each level of the CES (e.g., county governments, state land-grant universities, state legislatures, and the U.S. Department of Agriculture) hold differing standards of evidence and have preferences for different types of data, based on the different evaluation questions addressed by each field or type of program. Moreover, in each field, the complexity of the setting, strength of the research base, level of program maturity, and capacities of program staff and evaluators influence the quality of evidence that can be gathered about program merit and worth. In addition, new discoveries or innovative technologies often profoundly shift standards (e.g., hybrids/crop yields) or criteria (e.g., sustainability, environmental stewardship, animal welfare, farm labor health) for credible evidence in science and society.

Extension, like many organizations, is constantly challenged to collect and present evidence for program impacts in ways that are both scientifically credible and easy for stakeholders to understand. Making that challenge even harder in recent years has been social media and advocacy outlets swirling with either attacks on or support for the credibility of others that may or may not include the use of scientific-based data and often contains biased inferences. Credibility questions may extend beyond just program impacts to program and evaluation strategies, to organizational reputation, to questions of the common good and societal priorities. Extension professionals are challenged today, more than ever, to examine and interpret the substance and delivery of educational programming, the methods of evaluating program

strategies and impacts as well as their interactions with stakeholders who hold diverse views of what is credible evidence and how it is determined. The process of defining, generating, and interpreting credible evidence is continually a work in progress. At any given point, organizations and individuals can only determine what is “good enough” evidence in present circumstances.

Criteria for “Good Enough” Evidence in Public-Serving Organizations

Given the diverse range of expectations and resources to support evidence-gathering, what is “good enough” evidence for a program’s impact and value to stakeholders? As with all credibility and actionability questions, the shortest answer is, “It depends.” We suggest three broad principles, including integrity, transparency, and adaptability, as a way to frame discussion and decisions on what qualifies as “good enough” evidence for Extension programs.

Integrity to mission and standards. As a public institution, Extension provides programs in the public interest and for the common good. Extension organizations have professionals who understand, apply, and help create standards and methods for generating and judging credible evidence both within their specific disciplines and within broader disciplines, such as communication, non-formal education, and leadership. Relying on program theory, evidence-based practices, and the use of high-quality measures and methods enables these professionals to produce outcomes at the higher levels of actionability (e.g., impact, cost-benefit, program review). While hierarchies of evidence are emerging in education (Institute of Education Sciences, 2019) and healthcare (Evans, 2002), rigorous and comprehensive evidence for practice is somewhat less advanced in areas such as agriculture (Virgona & Daniel, 2011) and social programs (Fraser, Richman, Galinsky, & Day, 2009).

Integrity to public value and the common good is equally critical to credibility (Franz, 2013; Greene, 2015; Kellogg Commission on the Future of State and Land-grant Universities, 1999). Across diverse disciplines, all practitioners are expected to conform to legal, professional, and ethical standards. However, outside the public sector, evidence is typically generated, interpreted, and accessible to only particular stakeholders. Proprietary information in the private sector is not generally accessible to those not designated to receive and use it. Sometimes, evidence may even be suppressed or overemphasized, or implications slanted to promote a particular product or organization. Historical examples of this include evidence on tobacco use and health (Brandt, 2012) and public vs. proprietary control of agricultural products (DeSchutter, 2011; Eisenberg & Nelson, 2002). Such practices can diminish the relevance and trustworthiness of that evidence in the general population. By contrast, access to high quality, understandable and unbiased evidence at the front end of programs (e.g., evidence for program content and delivery strategies) and the back end of programs (e.g., program results and actionable recommendations) is most likely to be judged relevant and trustworthy by a wide range of stakeholders.

Transparency on practice and results. High-quality evidence earns credibility not only because it is relevant and trustworthy to stakeholders but because it is presented and interpreted clearly and respectfully, at their level of understanding (Greene, 2015, pp. 208–109). Engaging stakeholders from initial needs assessment processes to actionability decisions typically enhances stakeholders' understanding of what, how, and why program strategies work and what evidence is needed to show program quality and impact.

Ideally, Extension professionals can develop and implement evidence-based programs and well-tested evaluation methods. Quite often, they encounter challenging situations and offer programming in settings where research evidence and the application of scientific standards are not well-established and often not practical. In these cases, the Extension professional must utilize and generate the best available evidence. Yet even programs based on well-tested models may yield weaker evidence than the original models, as we know with automotive fuel efficiency estimates. Realistically, many Extension educational programs may help participants gain the skills to make decisions or change behaviors but cannot eliminate the risks associated with those decisions being successful or guarantee that those changes actually occur. Transparency about program potential, limitations, and implications would help stakeholders judge a program's value and take appropriate actions based on evaluation evidence.

Adaptability to conditions and criteria. Program resources and conditions often limit the quantity and quality of evidence that can be gathered. Bamberger, Rugh, and Mabry (2012) identified effective strategies to generate evidence under budget, time, data, and political constraints. When inconsistent participation patterns and lack of program evaluation capacity limit the collection of outcome data, stakeholders may need to either focus more on program quality (Arnold & Cater, 2016) or scale up evaluation resources and capacity-building to generate a higher level of evidence (cf. Weiss, 1998, evaluation questions taxonomy). When evaluation resources and capacity are in short supply, one thing that program developers and implementors need to keep in mind is that not all programs require extensive evidence of merit or worth (Scriven, 2007). Typically, Extension professionals cannot conduct in-depth evaluations of all programs simultaneously, so decisions need to be made as to which evidence is most important and a priority for stakeholders and which evidence is not.

Even when evidence is relevant or trustworthy to one set of stakeholders at a given time and place, other evidence may be needed by stakeholders asking different questions. For instance, Federal officials may be interested in impact evidence of programs across states, whereas state or local officials may be satisfied with evidence just from their own jurisdiction. Thus, the process of generating “good enough” evidence is always a work in progress. Fortunately, a variety of frameworks and tool have been developed in the last two generations. A few of these are discussed below.

Evaluation Frameworks that Foster Credible Evidence

Logic Models to Plan, Manage, and Interpret Credible Evidence

Donaldson (2015, pp. 5–8) recommends that, regardless of the problem or opportunity being addressed, credible and actionable evidence is most likely to emerge from an intentional and systematic process that identifies, generates, and utilizes credible evidence. Logic models such as the Wisconsin Extension Program Evaluation Model (Taylor-Powell, Steele, & Doughlah, 1996) and the Centers for Disease Control and Prevention (CDC) Program Evaluation Framework (Centers for Disease Control and Prevention [CDC], 1999; Milstein, Wetterhall, & CDC Program Evaluation Working Group, 2000) provide such tools.

Each of these program logic models includes the input of program stakeholders in the program planning processes, including the needs assessment phase, the identification of desired program outcomes, and what evaluation measures will represent program successes. As diverse program stakeholders share in the program planning process, all those involved in the process will gain perspective on what evidence seems relevant and trustworthy to others. This exchange provides Extension professionals opportunities to review the research base and facilitate open discussion and reflection on program criteria, concerns, and consensus. Such dialogues also provide opportunities to explore the limits of credibility (e.g., probability vs. absolute certainty, assumptions underlying programming and evaluation decisions, variations in implementation strategies, possible alternative interpretations of data) and the significance of actionability (e.g., gathering data specific to making critical decisions and taking actions). Finally, stakeholder interaction during planning, implementation, and interpretation processes can result in credible indicators of the sustainability and effectiveness of the organization or partnership leading a program.

Developmental Evaluation

Developmental evaluation, involving the continuous revision of evidence expectations and data-gathering strategies to fit changing conditions and goals, can provide a more flexible approach than a logic model, especially for new and complex initiatives (Franz, Garst, & Gagnon, 2015; Honadle, Zapata, Auffrey, vom Hofe, & Looye, 2014). Exploratory or start-up programs that want to establish parameters for credible evidence for processes (e.g., program delivery, evaluation, management, collaboration), impact (e.g., targeted outcomes and levels of change), or context (e.g., conditions and settings influencing change) may benefit from a developmental evaluation approach.

Evidence-based Practices

The credibility of evidence for impact at the end of a program depends on the credibility of program design and implementation.

Ideally, program theory (Braverman & Engle, 2009; Sharpe, 2011) and implementation (Bauer, Damschroder, Hagedorn, Smith, & Kilbourne, 2015; Duerden & Witt, 2012) fit program content and delivery to audience needs in order to achieve desired outcomes. For programs such as pesticide management or youth shooting sports, protocols for program delivery must be followed closely to maintain safety and achieve positive outcomes. Other programming may allow more latitude for timing, instructional approaches, social and environmental conditions. However, not all Extension programs have a strong research and practice base. In such cases, the use of principles-focused evaluation (Patton, 2017) may aid decision-makers in tracking a program's processes (e.g., program delivery, program management, use of results) critical to achieving outcomes valued by an organization.

Program Evaluation Standards

The Program Evaluation Standards (PES), developed for the Joint Committee on Standards for Educational Evaluation (JCSEE) (Yarbrough, Shulha, Hopson, & Caruthers, 2011), describe principles for effective and ethical practice of program evaluation that are integral to building credible and actionable evidence. In brief, the JCSEE PES include:

- 1) *Utility*, or usefulness of the process and results for stakeholders, facilitated by qualified evaluators who engage and communicate with all stakeholders in negotiating relevant purposes and promoting responsible and adaptive use of results.
- 2) *Feasibility*, or efforts to increase evaluation effectiveness and efficiency through good management, practical and responsive procedures, balancing political realities and stakeholder needs, and wise use of resources.
- 3) *Propriety*, or strategies to maintain what is “proper, fair, legal, right and just” in evaluations involving responsive and inclusiveness, protection of human rights, including formal agreements with stakeholders, evaluating and reporting in ways that are clear and fair, transparent and complete, disclosing conflicts of interest, and exercising fiscal responsibility.
- 4) *Accuracy*, or findings and interpretations that promote dependability and truthfulness, such as justifying conclusions in relation to context, valid and reliable information, explicit descriptions of program and context, with sound designs, interpretative judgments, and reporting accuracy.

The JCSEE PES also includes accountability standards to periodically explore and reflect on the purposes and processes of evaluations (e.g., meta-evaluation). Attention to the PES may seem like a time and resource investment that exceeds already-limited time and expertise for evaluation activities. Evidence from several fields indicates that the PES can be a valuable evaluation planning and capacity-building tool (Gill, Kuwuhara, & Wilce, 2016; Ruhe & Boudreau, 2013). The American Evaluation Association (2018) Guiding Principles for Evaluators also provide further professional guidance for the evaluation process.

Closing Thoughts: Building More Credible and Actionable Evidence

Credible and actionable evidence is neither implicit in Extension work, easy to produce, or universally acclaimed. Some stakeholders, ranging from average citizens to policymakers, would count “anything reminiscent of Mom, the flag, and warm apple pie” as evidence-based practice or simply “good evaluation practice” (Shadish, Cook, & Leviton, 1991, as cited in Donaldson, 2015, p. 5). To paraphrase, “whatever evaluation produces results that satisfy clients is a good evaluation.”

Daniel Stufflebeam (2001) identified two evidence-gathering strategies that, while they may seem trustworthy and relevant, at least to some stakeholders, are likely to promote invalid or incomplete findings:

- 1) public relations-inspired studies designed to tout program value without solid scientific evidence, and
- 2) politically controlled studies, making claims that support an agenda or outcome favored by particular stakeholders (e.g., grantor, organization, interest group, or program leader) while withholding evidence that might conflict with their interests.

The former may take the shape of testimonials or marketing campaigns in lieu of rigorous evidence. The latter may include not only biased questions and methods but interpretations that overemphasize the positive and avoid the negative in order to impress funders or maintain a positive public image.

Because Extension’s mission is more than just keeping the customer satisfied, turning a profit, or doing science for its own sake, and because resources and data are almost always limited, the generation of trustworthy and usable evidence requires the use of programming and evaluation standards; professional judgments; and systemwide, long-term commitment to evaluation (Franz, Arnold, & Baughman, 2014; Lamm & Israel, 2013). Moreover, the way in which Extension engages, educates, and empowers stakeholders in the program development, implementation, and evaluation processes will likely influence not only the stakeholders’ perspectives of issue-related evidence but also their views of the credibility of the organization itself.

Reflecting on “Making a Difference” Statements

We close by reflecting on some simple strategies and principles for building credible and actionable evidence of program effectiveness related to situations in which Extension professionals often find themselves, similar to the scenarios at the beginning of this article:

- Traditionally, program reporting focused on participant numbers, assuming that a broad range of citizens was served, and a significant portion would change behavior. More concrete evidence of behavior change is not only more credible but often provides actionable clues to next steps for programs and participants.

- Although much evidence can be gathered with a brief survey or checklist, more in-depth data on what, how, and why of program effects can be obtained with qualitative methods.
- Differences in context may necessitate different thresholds for credibility and strategies for data collection and interpretation. How can we compare programs at different stages and settings? It depends...
- Activities such as teaching do not necessarily produce outcomes, which is why programs are evaluated. More precise measures of specific skills with sustained outcomes provide more credible evidence than claims of broad skill change in a short period of time. In addition, simply citing resources such as the Targeting Life Skills Model (Hendricks, 1998) or research such as the national 4-H Study (Lerner, Lerner, & Colleagues, 2011) does not offer universal validation of all Extension youth programs.²

Special Edition Topics

This special edition of the *Journal of Human Sciences and Extension* introduces Extension professionals at all levels as well as other professionals who are conducting similar types of educational programs, to key concepts related to using and generating credible evidence with diverse stakeholders in diverse situations. Authors in this special edition will address key issues and practices that should spark learning and debate on how we can plan, implement, and evaluate programs; tell our stories; and use program insights more effectively. We believe these steps are crucial in the pursuit of the land-grant mission and in the sustainability of evidence-based, public-serving programs across the length and breadth of the Cooperative Extension System.

Credible evidence begins with understanding the mission and meaning of Extension programming for diverse stakeholders and programs. In his article, “Whose Extension Counts? A Plurality of Extensions and Their Implications for Credible Evidence Debates,” Tom Archibald discusses how different understandings of Extension’s mission and program evidence has both enhanced and hampered Extension’s effectiveness. He goes on to show how engagement and empowerment of all stakeholders provides the best guide to setting objectives and achieving outcomes.

² Targeting Life Skills identifies potential life skills strategies and outcomes but does not provide a curriculum or evidence for specific amounts and types of training needed to produce specific changes in life skills. The National 4-H Study of Positive Youth Development surveyed child and adolescent 4-H participants whose civic engagement and career aspirations were higher than non 4-H peers. Other research suggests positive implications for adult development. A local program would need its own evidence for program quality (e.g., since no single model was noted in the National 4-H Study) and outcomes (e.g., to support its own claims to short- and long-term impact).

Credible evidence should be explained to stakeholders clearly and simply but is typically generated within complex contexts. In their article, “Situational Complexity and the Perception of Credible Evidence,” Scott Chazdon and Samantha Grant discuss how principles of developmental evaluation can help educators and evaluators navigate complex contexts with diverse stakeholders to produce a trustworthy and relevant process and a story of transformative change.

Much of the debate about credible evidence in the fields of evaluation and policy focuses on methods and measurement. Ken Jones, Eugenia Gwynn, and Allison Teeter, in their article, “Quantitative or Qualitative: Selecting the Right Methodological Approach for Credible Evidence,” describe how quantitative and qualitative methods—numbers and narratives—provide unique and complementary evidence for program accountability and improvement. In his article, “Measurement and Credible Evidence in Extension Evaluations,” Marc Braverman describes the qualities of good measures, advantages of matching measures to evaluation questions, possibilities and limitations of common measures for Extension program evaluation.

Credible evidence is never a “one-size-fits-all” proposition. In their article, “Credible and Actionable Evidence Across Extension Program Areas: A Case Example,” Mary Marczak, Emily Becher, and Patricia Olson illustrate how criteria for valuing and strategies for gathering evidence differ horizontally across Extension disciplines. Nick Place and colleagues explore differences vertically in their article, “Credible and Actionable Evidence Across Stakeholder Levels of the Cooperative Extension System,” as stakeholders at local, state, and federal levels value different kinds of evidence and communication about results.

Evidence often becomes more credible because of the way it is collected and interpreted to stakeholders. In the article, “Communicating with Data: Telling the Extension Story in Credible and Actionable Ways,” Diane Craig and Ruth Borger address the organizational and professional process of “telling the story,” including the use of traditional and emerging media.

Credible evidence can reach no higher than the evaluation capacity of Extension professionals and organizations. Chelsea Heatherington, Cheryl Eschbach, and Courtney Cuthbertson discuss key skills and strategic options for evaluation capacity building for generating and using evidence with a wide range of stakeholders in their article, “How Evaluation Capacity Building Grows Credible and Actionable Evidence for Cooperative Extension Programs.”

As co-editors of this special edition of *JHSE*, we close out the edition with reflections on these diverse themes, the challenges in using, generating, and interpreting credible evidence, and the implications of the credible and actionable evidence discussion for the future of Extension.

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