Strengthening the Science and Practice of Implementation Support:

Evaluating the Effectiveness of Training and Technical Assistance Centers ©

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*“If it is important to be evidence-based about our interventions, then it is important to be evidence-based about the support provided to practitioners via tools, training, and TA”* (Katz & Wandersman, 2016, p. 417).

This special issue of the journal *Evaluation & the Health Professions* addresses several pressing concerns in the fields of implementation science, prevention science, and treatment science. These three areas are important for the health and well-being of our nation and have been integral in the development of guidelines to improve our nation’s well-being (National Prevention Council, 2011; Office of Disease Prevention and Health Promotion, n.d., see also link [here](https://nam02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nga.org%2Fpublications%2Fimplementing-best-practices-across-the-continuum-of-care-to-prevent-overdose%2F%23%3A~%3Atext%3DDownload%2520the%2520Roadmap)-%2CImplementing%2520Best%2520Practices%2520Across%2520the%2520Continuum%2520of%2520Care%2520to%2520Prevent%2Cfor%2520overdose%252C%2520including%2520those%2520with&data=05%7C01%7CWANDERAH%40mailbox.sc.edu%7C3f74333e79424d4d39ad08db9f6350b6%7C4b2a4b19d135420e8bb2b1cd238998cc%7C0%7C0%7C638279021136770801%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=ashFrqW%2B6s2juriyEwk9svbuv0vWcAUPN0bUDs1GGIE%3D&reserved=0), which is the National Governor’s Association Roadmap for Governors, *Implementing Best Practices Across the Continuum of Care to Prevent Overdose)*. It has long been recognized that we can achieve better health outcomes if we can: (1) better bridge research and practice (e.g., Arthur & Blitz, 2000; Atkins et al., 2016; Chinman et al., 2005; Saul et al., 2008)[[1]](#footnote-1) and (2) provide support through training and technical assistance (TTA; e.g., Mitchell et al., 2002; Olson et al., 2020; Wandersman et al., 2012). Addressing both of these foci requires developing an evidence base of implementation support and using it. This has been referred to colloquially as going from “bench to bedside” (Wolf, 1974) and involves working in the trenches where front-line practice occurs (e.g., Brounstein et al., 2006).

In this introduction, we outline some major issues that lead to the gap between research and practice and explain how they might be overcome with implementation support through: a) motivation and capacity of practitioners to implement an intervention and b) mechanisms of support like TTA[[2]](#footnote-2).

Often, those responsible for implementing programs (practitioners) lack certain capacities (e.g., skills, knowledge, and fiscal resources) and face motivational issues in adopting and implementing interventions—particularly interventions that are new to them (Domlyn et al., 2021; Kenworthy et al., 2023; Leeman et al., 2015; McBeath et al., 2019). Capacity and motivational barriers hinder practitioners’ ability to achieve program goals and take interventions to scale (e.g., Dymnicki et al., 2017; Elliott & Mihalic, 2004; Kegeles et al., 2005). Awareness of the many barriers to program implementation has stimulated a literature that examines factors that inhibit implementation and scaling up (e.g., Aarons, et al., 2017; Fagan et al., 2019; Spoth & Greenberg, 2011). This literature contributes evidence regarding the need to promote quality implementation by providing practitioners with tools and TTA to improve fidelity and quality adaptation, foster buy-in, and achieve desired outcomes (e.g., Fagan et al., 2008; Mitchell et al., 2002; O’Donnell et al., 2000; Wandersman et al., 2012; Watson-Thompson et al., 2013). History repeats itself; many early studies in the field of prevention heralded TTA as an antidote to poor implementation (e.g., Brown, 1980; Florin et al., 1993; Northrup et al., 1994)[[3]](#footnote-3). This emphasis continues with others recognizing that TTA can create the means to achieve sustainable interventions that benefit organizations and communities for the long haul (Katz & Wandersman, 2016; Ray et al., 2012; Spoth & Greenberg, 2011).

To address the need for implementation support, millions of dollars are spent each year on TTA in an attempt to bolster health promotion, treatment, and prevention. The U.S. federal government funds numerous training and technical assistance centers (TTACs) (e.g., the Centers for Disease Control and Prevention, the Substance Abuse and Mental Health Services Administration [SAMHSA], the Health Resources and Services Administration, and many other federal agencies involved in stewarding our nation’s health and well-being). For example, SAMHSA funds Technology Transfer Centers (Olson et al., 2020 and Agley et al., this issue) and provides an approach for building workforce capacity in communities through TTA. Fundamental components include training, coaching, modeling, problem solving, and information dissemination (e.g., Albers et al., 2020; Dunst et al., 2019). Yet, there is relatively little published research that addresses the processes and outcomes of TTACs. If TTACs are focused on providing support to practitioners with the goal of enhancing capacity and ensuring quality implementation, how do they achieve these goals? The construction and purpose of TTACs are well-intentioned, but their effectiveness and factors that influence effectiveness remain obscure. This becomes a critical issue because the field needs to know: “What works, for whom, and under what conditions?” (e.g., Gottfredson et al., 2015).

Prevention science can contribute to a more refined understanding of how TTACs can be used to “bridge the gap.” For instance, if training is viewed as an “intervention” (some form of innovation brought to a community), then a theoretical “mechanism” needs to be specified that explains how TTA leads to behavior change (e.g., practitioners changing their work behaviors; Albers et al., 2020). TTA, like any intervention, requires a theory of change that specifies how intervention strategies designed around TTA affects knowledge, skills, efficacy, and motivation, which, in turn, improves delivery of evidence-based interventions (e.g., Chen, 1990). Metz et al. (2021) addressed one aspect of this issue by outlining core “competencies” (i.e., abilities) required by implementation support practitioners (ISP) who work with human service agencies (e.g., coaches, knowledge brokers, facilitators, change agents, and technical assistance [TA] providers)[[4]](#footnote-4). The goal of this effort is to link ISP competencies with capacity building and eventually boost practitioners’ ability to implement practices, policies, and programs. Leeman et al. (2017) proposed a theoretical framework for addressing intervening mechanisms involving capacity building. Aldridge et al. (2023) theorize about “mechanisms of change” that link core practice components associated with proximal practice outcomes (e.g., self-regulation, knowledge skills, and abilities) among implementation support providers. In turn, these “intermediate” outcomes influence implementation capacity further downstream, which should lead to population-based outcomes (e.g., decreases in child welfare placements or domestic violence). Failure to address the precise ways in which implementation support and capacity building achieves its target outcomes creates a “*black box*” conundrum (e.g., Astbury & Leeuw, 2010). Put simply, we lack a clear understanding of the mechanisms through which external implementation support targeting capacity building achieves the desired outcomes and under what conditions (see Hunter et al., 2009, for an example of how this issue can be addressed to develop a better theoretical understanding of TA)[[5]](#footnote-5).

It should be necessary for TTACs to address these pressing concerns. Becoming more rigorous in linking theory to evaluation principles is one step in the right direction. The Society for Prevention’s *Standards of Evidence* (Flay et al., 2005) can serve as a guide. The *Standards* were updated to address the specifics of implementation and dissemination that bear on processes in “scaling up” interventions (Gottfredson et al., 2015)[[6]](#footnote-6). The combined effort of the standards represents an accumulation of knowledge regarding what constitutes an intervention, how to evaluate program efficacy, and the methodological and statistical tools required to reach conclusions regarding evidence-based interventions. The standards apply both to individual-level capacity building and organizational performance and are consistent with implementation and accountability models such as the Getting-To-Outcomes® intervention (Chinman et al., 2008; Wandersman et al., 2000).

When TTA is brought to a community or organization as an “innovation,” it also raises the issue of fidelity vs. fit/adaptation (e.g., Castro et al., 2004). In many cases, “one size does not fit all,” and training will need to be adapted (tailored) to fit the organization, practitioner, or community needs. This can be tricky given there should be fidelity to the theory or concepts behind training but, perhaps, not to the specific training strategies (e.g., modes of delivery) or protocols. Communities and practitioners vary in their demographic composition as well as experience and needs. Moreover, recipients (practitioners or communities) that use various health-related services will vary considerably, requiring that training address these differences (e.g., heterogeneity in ethnocultural composition; Barrera et al., 2017). Training, in this respect, has to be flexible enough to meet the demands of the community, organization, or practitioners but, at the same time, remain consistent with respect to the underlying methods, strategies, and focus of the training. Anytime TTA occurs, there has to be consideration of how the training or technical assistance will impact practitioners and whether it can be made responsive to: their levels of engagement; efforts to adapt the training by practitioners to fit what they perceive as the needs, values, and expectations of the community; and the ability of practitioners to sustain the impact and lessons of the training in the absence of the experts[[7]](#footnote-7). The perspective of the trainer also needs to be considered; they may be inclined to institute “local reinventions” once conducting their work in the field. Although well intentioned, adaptations in TTA can lead to program drift (modifying, adding, or deleting training components) encountered with behavioral interventions, which can diminish the impact of training—if the adaptations are considerable and diminish core components (e.g., they can reduce effectiveness by diluting instructional content). There is much that can be learned from the trials and tribulations of prevention science, especially when dealing with behavioral interventions. Obtaining more information that bears on the question of fidelity to core components of training can provide a solid foothold in the effort to advance a more systematic and practical science of TTA.

There are additional challenges that the field must grapple with to advance TTA as a means of addressing the research-practice gap. Identifying what fosters buy-in and readiness at one delivery system site, but causes hesitancy or reluctance at another, is a major challenge for TTACs. Different facets of community may interact with the type (and efficacy) of TA including the cohesiveness or readiness of the community coalitions and its practitioners (e.g., Chilenski et al., 2018; Jackson et al., 2018). Other challenges include the variability of treatment integrity—the fact that so many different types and forms of TA occur, with varying doses and delivery methods (Scott et al., 2022). Time is a major factor (and often a barrier) for TTA providers and for recipients: there has been almost negligible research on the proper duration of either training or technical assistance. This is important because there may be dose-response relations (e.g., Feinberg et al., 2008; Leeman et al., 2015)[[8]](#footnote-8). All of this can undermine what is termed “treatment construct validity” and is an essential component of determining whether an intervention is successful in the manner hypothesized (McCaul & Glasgow, 1985).

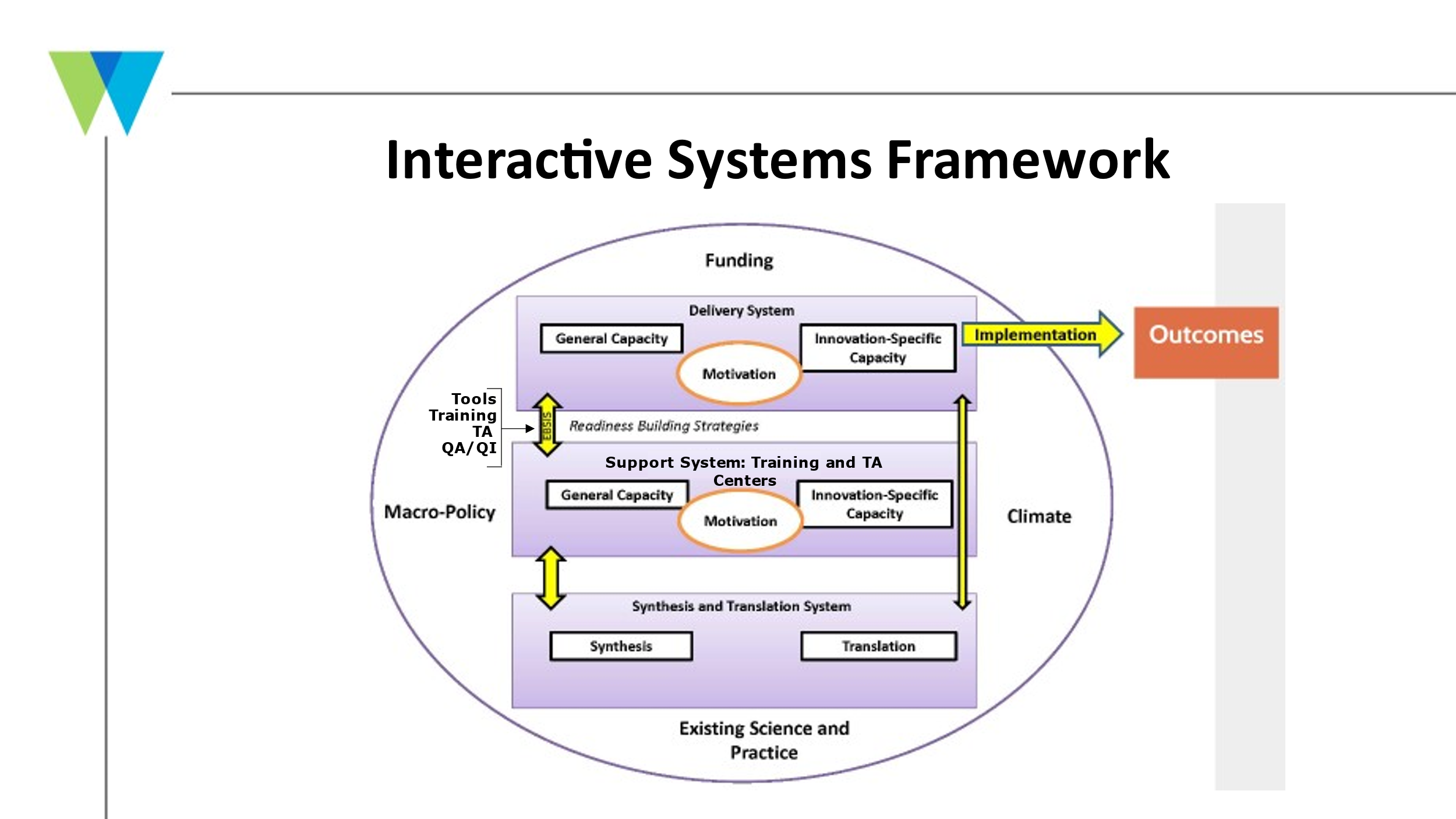
The critical issues that we described are part of the everyday reality for TTA providers and recipients and for the development of a robust science of implementation support. Yet, the issues have “flown under the radar*,*” with limited focus on standardization across sites or TA modalities. Importantly, there is a need to find ways to incorporate the issues into evaluation plans of TTACs. Unfortunately, large-scale published evaluations of different types of support systems have not been prominently considered. There is a lack of quantitative and qualitative evaluation results that consider the many different facets of TTA and whether they can individually or collectively affect implementation of community-based public health programs (see Beidas et al., 2012, and Woods et al., 2014, for exceptions). As a result, TTACs become hubs of activity that steward important resources that can benefit organizations and communities, but their reach, efficacy, approaches, and ability to achieve target outcomes and the determination of their cost-effectiveness remain obscure.

**Integrating Conceptual Frameworks**

Our assessment is that knowledge about the effectiveness of TTA and TTACs is extraordinarily limited; a major purpose of this special issue is to call attention to what might be done and what should be done to change this. We propose that it is important to have a framework or frameworks that can help build a theory of change and empirical evidence about what works and what does not work in implementation support. Numerous implementation science frameworks exist and can be helpful (see Strifler et al., 2018, and Tabak et al., 2012).

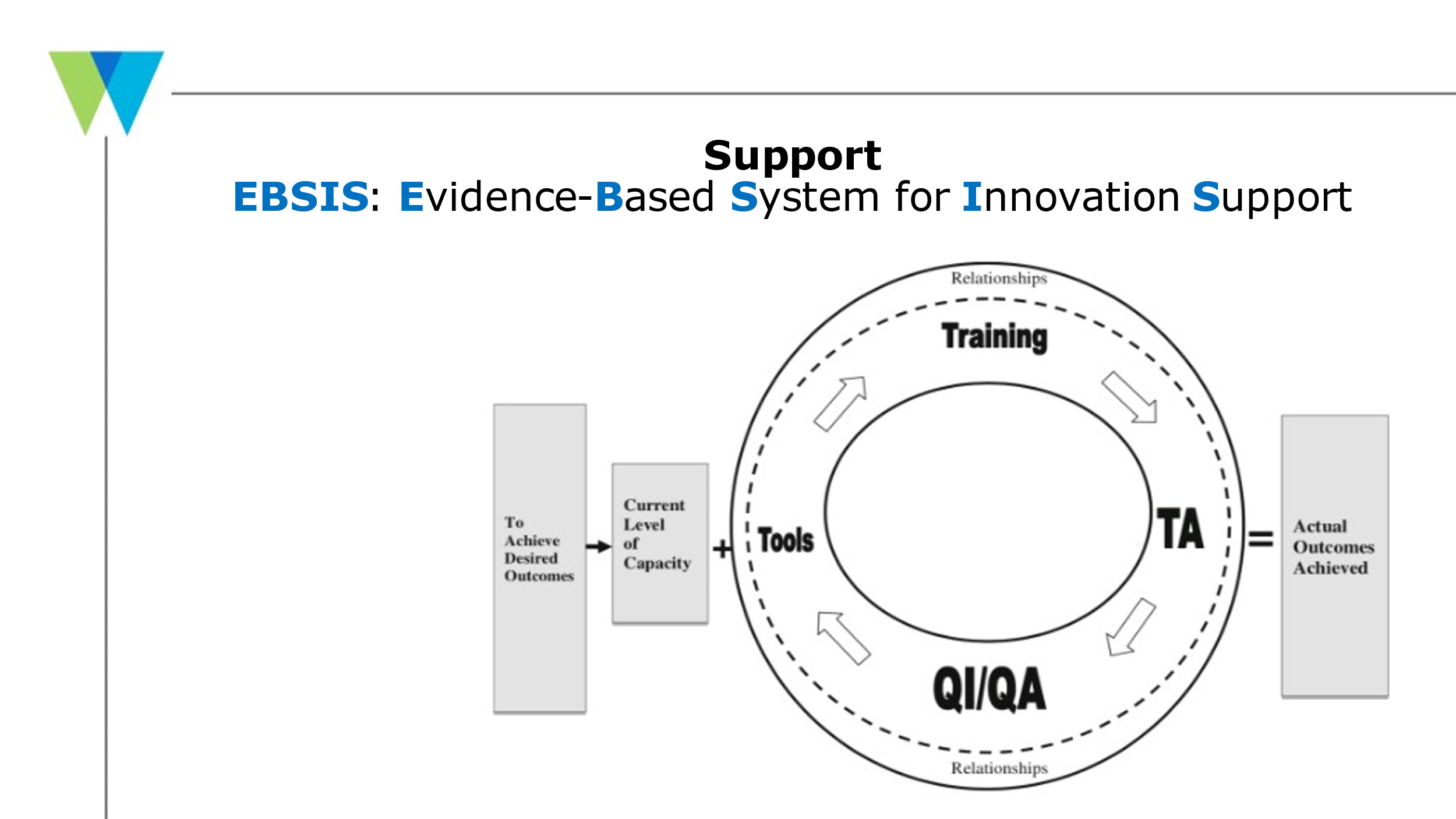
In line with the premises and evidence presented, we need an implementation science framework that features implementation support and TTACs. Wandersman et al. (2008) provided an interactive systems framework for dissemination and implementation (ISF) that integrates a research-to-practice model with a community-centered/practice-centered model (Wandersman, 2003). The ISF stresses the bidirectional relationships between research and practice, and the framework has three interacting systems: (1) a delivery system that provides treatment, prevention, and education services (e.g., mental health centers, community coalitions, and health care systems); (2) a support system (e.g., TTACs) that provides support via tools and TTA to the delivery system; and (3) a synthesis and translation system (e.g., organizations that distill information and make it user friendly to end-users—this can be a role that TTACs play). In the ISF, it can be readily seen that TTACs play a pivotal role in helping to bridge research and practice. Figure 1 presents an updated version of the ISF (e.g., Domlyn et al., 2021) and provides an overview of the interactions between the systems, with a special emphasis on the support system (highlighting the role of TTACs).

---- Insert Figure 1 about here ----



Special issue contributors were encouraged to consider the ISF as a skeletal structure that should be filled in with theory and practice so that connections can be made among their findings and more clearly reveal advances in theory and research on key issues in implementation support. We encouraged contributors to also consider take-aways that could improve the effectiveness of TTACs. In an effort to expand the scope of this work, we also pointed to refinements to the ISF. Wandersman et al. (2012) enhanced the ISF by integrating an evidence-based system for innovation support (EBSIS) as the channel by which a support system can work with a delivery system—via tools, training, TA, and quality assurance/quality improvement (QA/QI). EBSIS identifies an entity’s “current capacity” and their needs and resources in light of their desired outcomes. According to the EBSIS logic model (Figure 2), the four support approaches work iteratively to help an entity achieve its desired outcomes[[9]](#footnote-9).

---- Insert Figure 2 about here ----



Contributors were asked to address how to move the agenda forward (bridging research to practice and the use of TTACs) and to consider how to strengthen the science and practice of TTA (e.g., Dunst et al., 2019; Katz & Wandersman, 2016; Scott et al., 2022). These reviews pointed to the need for TTA to improve capacity and boost the effectiveness of innovations and programs. Scott et al. (2022), for instance, assessed two decades of the scientific literature on TA and reported the meager state of the science. Their work reveals many implications for improving both the science and practice of TTA, particularly in the context of offering evaluation schemes appropriate for TTA. If the goal is to help improve the world of intervention supports, then funders, as well as researchers/evaluators, support personnel (such as TTA providers), and other key stakeholders must help grow and use the evidence of effective support.

**Funders of TTACs and “The Chicken and the Egg” Challenge**

This brief overview underscores that there is a “chicken and egg” problem in the science of implementation support with several major elements. This can be illustrated with a focus on TTA:

* Generally, funders have not pushed for evidence-based or evidence-informed or even systematic, conceptual approaches to TTA in their requests for proposals. There are many questions to be clearly asked and answered. For example, what are the goals of TTA (e.g., capacity, motivation, and outcomes) and how can we best achieve the goals (e.g., how to engage TTA recipients and build trust)?
* Even if funders wanted to have these issues clearly addressed, not much science could be provided to bolster these efforts (e.g., scoping review by Scott et al., 2022).
* One funder of TTACs stated they needed to see results that demonstrate that systematic approaches to TTA produce desired outcomes in order to invest in systematic approaches to outcomes. Therefore, the status quo is highly inadequate: 1) funders have not requested systematic, evidence-based approaches; 2) funders have not funded much in the way of systematic evaluation and research; and 3) not much systematic research on implementation support is available for TTACs to use as they carry out their work.

**Article Anthology:**

**The Beginning of a Frame of the Articles in the Special Issue**

This overview highlights important issues that can contribute to the growth and development of implementation support. The articles in this special issue point to more evidence-informed directions for the research and practice of implementation support. It is crucial that funders pay more attention to these issues—if we are going to make progress and achieve desired outcomes to health and well-being at the local community level and for the nation as a whole. A second major goal is to collect and synthesize findings from disparate TTA evaluation efforts and create a more coherent state of the science and practice of TTA support. If it is important to be evidence-based in our interventions, then it should also be important to be evidence-based in how we provide support via tools, TTA, and QA/QI. Pursuing this clarion call is an important premise of the special issue.

**An Anthology of Articles in the Special Issue**

**References**

Aarons, G. A., Sklar, M., Mustanski, B., Benbow, N., & Hendricks-Brown, C. (2017). “Scaling-out” evidence-based interventions to new populations or new health care delivery systems. *Implementation Science, 12*(111). https://doi.org/10.1186/s13012-017-0640-6

Albers, B., Metz, A., & Burke, K. (2020). Implementation support practitioners – a proposal for consolidating a diverse evidence base. *BMC Health Services Research, 20*, 368. https://doi.org/10.1186/s12913-020-05145-1

Albers, B., Metz, A., Burke, K., Bührmann, L., Bartley, L., Driessen, P., & Varsi, C. (2020). Implementation support skills: Findings from a systematic integrative review. *Research on Social Work Practice*, *31*(2), 1-24. https://doi.org/10.1177/1049731520967419

Aldridge, W. A., Roppolo, R. H., Brown, J., Bumbarger, B. K., & Boothroyd, R. I. (2023). Mechanisms of change in external implementation support: A conceptual model and case examples to guide research and practice. *Implementation Research and Practice, 4*, 1-18. https://doi.org/10.1177/26334895231179761

Arthur, M. W., & Blitz, C. (2000). Bridging the gap between science and practice in drug abuse prevention through needs assessment and strategic community planning. *Journal of Community Psychology, 28*, 241-255. https://doi.org/10.1002/(SICI)1520-6629(200005)28:3<241::AID-JCOP2>3.0.CO;2-X

Astbury, B., & Leeuw. F. L. (2010). Unpacking black boxes: Mechanisms and theory building in evaluation. *American Journal of Evaluation, 31*(3), 363-381. https://doi.org/10.1177/1098214010371972

Atkins, M. S., Rusch, D., Mehta, T. G., & Lakind, D. (2016). Future directions for dissemination and implementation science: Aligning ecological theory and public health to close the research to practice gap. *Journal of Clinical Child and Adolescent Psychology, 45*(2), 215-226. https://doi.org/10.1080/15374416.2015.1050724.

Barrera, M., Berkel, C., & Castro, F. G. (2017). Directions for the advancement of culturally adapted preventive interventions: Local adaptations, engagement, and sustainability. *Prevention Science, 18*(6), 640-648. https://doi.org/10.1007/s1121-016-0705-9

Basch, C. E., Sliepcevich, E. M., Gold, R. S., Duncan, D. F., & Kolbe, L. J. (1985). Avoiding type III errors in health education program evaluations: A case study. *Health Education Quarterly, 12*(4), 315-331. <https://doi.org/10.1177/109019818501200311>

Beidas, R. S., Edmunds, J. M., Marcus, S. C., & Kendall, P. C. (2012). Training and consultation to promote implementation of an empirically supported treatment: A randomized trial. *Psychiatric Services, 63*(7), 660-665. https://doi.org/10.1176/appi.ps.201100401

Brounstein, P. J., Gardner, S. E., & Backer, T. E. (2006). Research to practice: Efforts to bring effective prevention to every community. *Journal of Primary Prevention, 27*, 91-109. https://doi.org/10.1007/s10935-005-0024-6

Brown, A. (1980). Technical assistance to rural communities: Stopgap or capacity building? *Public Administration Review, 40*(1), 18-23. https://doi.org/10.2307/976103

Castro, F. G., Barrera, M., & Martinez, C. R. (2004). The cultural adaptation of prevention interventions: Resolving tensions between fidelity and fit. *Prevention Science, 5*(1), 41-45. https://doi.org/10.1023/B:PREV.0000013980.12412.cd

Chen, H. T. (1990). *Theory-driven evaluation*. Sage Publication.

Chilenski, S. M., Welsh, J., Olson, J., Hoffman, L., Perkins, D. F., & Feinberg, M. E. (2018). Examining the highs and lows of the collaborative relationship between technical assistance providers and prevention implementers. *Prevention Science, 19*, 250-259. https://doi.org/10.1007/s11121-017-0812-2

Chinman, M., Hannah, G., Wandersman, A., Ebener, P., Hunter, S. B., Imm, P., & Sheldon, J. (2005). Developing a community science research agenda for building community capacity for effective preventive interventions. *American Journal of Community Psychology, 35*(3/4), 143-157. https://doi.org/10.1007/s10464-005-3390-6

Chinman, M., Hunter, S. B., Ebener, P., Paddock, S. M., Stillman, L., Imm, P., & Wandersman, A. (2008). The Getting To Outcomes demonstration and evaluation: An illustration of the prevention support system. *American Journal of Community Psychology, 41*(3/4), 206-224. https://doi.org/10.1007/s10464-008-9163-2

Dishion, T. J., Brennan, L. M., Shaw, D. S., McEachern, A. D., Wilson, M. N., & Jo, Booil. (2014). Prevention of problem behavior through annual family check-ups in early childhood: Intervention effects from home to early elementary school. *Journal of Abnormal Child Psychology, 42*(3), 343-354. https://doi.org/10.1007/s10802-013-9768-2

Dobson, D., & Cook, T. J. (1980). Avoiding type III error in program evaluation: Results from a field experiment. *Evaluation and Program Planning, 3*(4), 269-276. [https://doi.org/10.1016/0149-7189(80)90042-7](https://doi.org/10.1016/0149-7189(80)90042-7" \t "_blank" \o "Persistent link using digital object identifier)

Domlyn, A. M., Scott, V., Livet, M., Lamont, A., Watson, A., Kenworthy, T., Talford, M., Yannayon, M., & Wandersman, A. (2021). R = MC2 readiness building process: A practical approach to support implementation in local, state, and national settings. *Journal of Community Psychology, 49*(5), 1228-1248. https://doi.org/10.1002/jcop.22531

Dunst, C. J., Annas, K., Wilkie, H., & Hamby, D. W. (2019). Scoping review of the core elements of technical assistance models and frameworks. *World Journal of Education, 9*(2), 109-122. <https://doi.org/10.5430/wje.v9n2p109>

Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology, 41*(3-4), 327-350. https://10.1007/s10464-008-9165-0

Dymnicki, A. B., Wandersman, A. H., Osher, D. M., & Pakstis, A. (2017). Bringing interventions to scale: Implications and challenges for the field of community psychology. In M. A. Bond, I. Serrano-García, C. B. Keys, & M. Shinn (Eds.), *APA handbook of community psychology: Methods for community research and action for diverse groups and issues* (pp. 297–310). American Psychological Association. https://doi.org/10.1037/14954-017

Elliott, D. S., & Mihalic, S. (2004). Issues in disseminating and replicating effective prevention programs. *Prevention Science, 5*, 47-53. ttps://doi.org/10.1023/B:PREV.0000013981.28071.52

Fagan, A. A., Bumbarger, B. K., Barth, R. P., Bradshaw, C. P., Rhoades Cooper, B., Supplee, L. H., & Walker, D. K. (2019). Scaling up evidence-based interventions in US public systems to prevent behavioral health problems: Challenges and opportunities. *Prevention Science, 20*, 1147-1168. https://doi.org/10.1007/s11121-019-01048-8

Fagan, A. A., Hanson, K., Hawkins, J. D., & Arthur, M. W. (2008). Bridging science to practice: Achieving prevention program implementation fidelity in the Community Youth Development Study. *American Journal of Community Psychology, 419*(3/4), 235-249. https://doi.org/10.1007/s10464-008-9176-x

Feinberg, M. E., Greenberg, M. T., & Osgood, D. W. (2004). Technical assistance in prevention programs: Correlates of perceived need in Communities That Care. *Evaluation and Program Planning, 27*, 263-274. https://doi.org/10.1016/j.evalprogplan.2004.04.001

Feinberg, M. E., Ridenour, T. A., & Greenberg, M. T. (2008). The longitudinal effect of technical assistance dosage on the functioning of Communities That Care prevention boards in Pennsylvania. *The Journal of Primary Prevention, 29*(2), 145-165. https://doi.org/10.1007/s10935-008-0130-3

Flay, B. R., Biglan, A., Boruch, R. F., Castro, F. G., Gottfredson, D., Kellam, S., Mościcki, E. K., Schinke, S., Valentine, J. C., & Ji, P. (2005). Standards of evidence: Criteria for efficacy, effectiveness and dissemination. *Prevention Science*, 6, 151-175. https://doi.org/10.1007/s11121-005-5553-y

Florin, P., Mitchell, R., & Stevenson, J. (1993). Identifying training and technical assistance needs in community coalitions: A developmental approach. *Health Education Research, 8*(3), 417-432. https://doi.org/10.1093/her/8.3.417

Goodman, R. M. (2000) Bridging the gap in effective program implementation: From concept to application. *Journal of Community Psychology, 28*(3), 309-321. https://doi.org/[10.1002/(SICI)1520-6629(200005)28:3<309::AID-JCOP6>3.0.CO;2-O](https://psycnet.apa.org/doi/10.1002/(SICI)1520-6629(200005)28:3%3C309::AID-JCOP6%3E3.0.CO;2-O)

Gottfredson, D. C., Cook, T. D., Gardner, F. E. M., Gorman-Smith, D., Howe, G. W., Sandler, I. N., & Zafft, K. M. (2015). Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: Next generation. *Prevention Science, 16*, 893-926. https://doi.org/10.1007/s11121-015-0555-x

Hansen, N. B., Lambert, M. J., & Forman, E. M. (2002). The psychotherapy dose-response effect and its implications for treatment delivery services. *Clinical Psychology: Science and Practice, 9*(3), 329-343. [https://doi.org/10.1093/clipsy.9.3.329](https://psycnet.apa.org/doi/10.1093/clipsy.9.3.329)

Hunter, S. B., Chinman, M., Ebener, P., Imm, P., Wandersman, A., & Ryan, G. W. (2009). Technical assistance as a prevention capacity-building tool: A demonstration using the Getting to Outcomes® Framework. *Health Education & Behavior, 36*(5), 810-828. [https://doi.org/10.1177/1090198108329999](https://do.org/10.1177/1090198108329999)

Jackson, C. B., Brabson, L. A., Quetsch, L. B., & Herschell, A. D. (2018). Training transfer: A systematic review of the impact of inner setting factors. *Advances in Health Sciences Education, 24*, 167-183. https://doi.org/10.1007/s10459-018-9837-7

Jensen, T. M., Metz, A. J., Disbennett, M. E., & Farley, A. B. (2023). Developing a practice-driven research agenda in implementation science: Perspectives from experienced implementation support practitioners. *Implementation Research and Practice, 4*, 1-8. https://doi.org/10.1177/26334895231199063

Katz, J., & Wandersman, A. (2016). Technical assistance to enhance prevention capacity: A research synthesis of the evidence base. *Prevention Science, 17*, 417-428. https://doi.org/10.1007/s11121-016-0636-5

Kegeles, S. M., Rebchook, G. M., & Tebbetts, S. (2005). Challenges and facilitators to building program evaluation capacity among community-based organizations. *AIDS Education and Prevention, 17*(4), 284-299. <https://doi.org/10.1521/aeap.2005.17.4.284>

Kenworthy, T., Domlyn, A., Scott, V. C., Schwartz, R., & Wandersman, A. (2023). A proactive, systematic approach to building the capacity of technical assistance providers. *Health Promotion Practice, 24*(3), 546-559. https://doi.org/10.1177/15248399221080096

Leeman, J., Calancie, L., Hartman, M. A., Escoffery, C. T., Herrmann, A. K., Tague, L. E., Moore, A. A., Wilson, K. M., Schreiner, M., & Samuel-Hodge, C. (2015). What strategies are used to build practitioners’ capacity to implement community-based interventions and are they effective?: A systematic review. *Implementation Science, 10*(80). https://doi.org/10.1186/s13012-015-0272-7

Leeman, J., Calancie, L., Kegler, M. C., Escoffery, C. T., Herrmann, A. K., Thatcher, E., Hartman, M. A., & Fernandez, M. (2017). Developing theory to guide building practitioners’ capacity to implement evidence-based interventions. *Health Education & Behavior, 44*(1), 59-69. https://doi.org/10.1177/1090198115610572

Lewis, C. C., Boyd, M. R., Walsh-Bailey, C., Lyon, A. R., Beidas, R., Mittman, B., Aarons, G. A., Weiner, B. J., & Chambers, D. A. (2020). A systematic review of empirical studies examining mechanisms of implementation in health. *Implementation Science, 15*(21), 1-25. <https://doi.org/10.1186/s13012-020-00983-3>

Lewis, C. C., Klasnja, P., Powell, B. J., Lyon, A. R., Tuzzio, L., Jones, S., et al. (2018). From classification to causlity: Advancing understanding of mechanisms of change in implmentation science. *Frontiers in Public Health, 6*, 136. https://doi.org/10.3389/pubh.2018.00136

McBeath, B., Mosley, J., Hopkins, K., Guerrero, E., Austin, M., & Tropman, J. (2019). Building knowledge to support human service organizational and management practice: An agenda to address the research-to-practice gap. *Social Work Research, 43*(2), 115-128. https://doi.org/10.1093/swr/svz003

McCaul, K. D., & Glasgow, R. E. (1985). Preventing adolescent smoking: What have we learned about treatment construct validity? *Health Psychology, 4*(4), 361-387. [https://doi.org/10.1037/0278-6133.4.4.361](https://psycnet.apa.org/doi/10.1037/0278-6133.4.4.361)

Metz, A., Albers, B., Burke, K., Bartley, L, Louison, L., Ward, C., & Farley, A. (2021). Implementation practice in human service systems: Understanding the principles and competencies of professionals who support implementation. *Human Service Organizations: Management, Leadership & Governance, 45*(3), 238-259. https://doi.org/10.1080/23303131.2021.1895401

Mitchell, R. E., Florin, P., & Stevenson, J. F. (2002). Supporting community-based prevention and health promotion initiatives: Developing effective technical assistance systems. *Health Education & Behavior, 29*(5), 620-639. <https://doi.org/10.1177/109019802237029>

National Governors Association (2023). Implementing best practices across the continuum of care to prevent overdose. https://www.nga.org/wp-content/uploads/2023/08/2023Aug\_Roadmap\_Best\_Practices\_Prevent\_Overdose.pdf

National Prevention, Health Promotion, and Public Health Council (2011). *National prevention strategy: America’s plan for better health and wellness.* U.S. Department of Health and Human Services, Office of the Surgeon General. https://www.hhs.gov/sites/default/files/disease-prevention-wellness-report.pdf

Northrup, J., Wacker, D. P., Berg, W. K., Kelly. L., Sasso, G., & DeRaad, A. (1994). The treatment of severe behavior problems in school settings using a technical assistance model. *Journal of Applied Behavior Analysis, 27*(1), 33-47. <https://doi.org/10.1901/jaba.1994.27-33>

O’Donnell, L., Scattergood, P., Alder, M., San Doval, A. Parker, M., Kelly, J. A., Kegeles, S. M., Rebchook, G. M., Adams, J., Terry, M. A., Neumann, M. S. (2000). The role of technical assistance in the replication of effective HIV interventions. *AIDS Education and Prevention, 12*(5), 99-111. PMID: 11063073

Office of Disease Prevention and Health Promotion (n.d.) *Healthy people 2030: Building a healthier future for all*. U.S. Department of Health and Human Services. https://health.gov/healthypeople

Olson, J. R., Coldiron, J. S., Parigoris, R. M., Zabel, M. D., Matarese, M., & Bruns, E. J. (2020). Developing an evidence-based technical assistance model: A process evaluation of the National Training and Technical Assistance Center for Child, Youth, and Family Mental Health. *The Journal of Behavioral Health Services & Research, 47*, 312-330. https://doi.org/10.1007/s11414-020-09686-5.

Pinnock, H., Barwick, M., Carpenter, C. R., Eldrige, S., Grandes, G., Griffiths, C. J., Rycroft-Malone, J., Meissner, P., Murray, E., Patel, A., Sheikh, A., Taylor, S. J., & the StaRI Group. (2017a). Standard for reporting implementation studies (StaRI) statement. *BMJ (Clinical research ed.), 356*, i6795. https://doi.org/10.1136/bmj.i6795

Pinnock, H., Barwick, M., Carpenter, C. R., Eldrige, S., Grandes, G., Griffiths, C. J., Rycroft-Malone, J., Meissner, P., Murray, E., Patel, A., Sheikh, A., Taylor, S. J., & StaRI Group (2017b). Standards for reporting implementation studies (StaRI): Explanation and elaboration document. *BMJ Open, 7*(4), e013318. https://doi.org/10.1136/bmjopen-2016-013318

Ray, M. L., Wilson, M. M., Wandersman, A., Meyers, D. C., & Katz, J. (2012). Using a training-of-trainers approach and proactive technical assistance to bring evidence based programs to scale: An operationalization of the Interactive Systems Framework’s support system. *American Journal of Community Psychology, 50*(3/4), 415-427. https://doi.org/10.1007/s10464-012-9526-6

Rhoades, B. L., Bumbarger, B. K., & Moore, J. E. (2012). The role of a state-level prevention support system in promoting high-quality implementation and sustainability of evidence-based programs. *American Journal of Community Psychology, 50*(3-4), 386-401. https://doi.org/10.1007/s10464-012-9502-1

Saul, J., Wandersman, A., Flaspohler, P., Duffy, J., Lubell, K., & Noonan, R. (2008). Research and action for bridging science and practice in prevention. *American Journal of Community Psychology, 41*(3/4), 165-170. https://doi.org/10.1007/s10464-008-9169-9

Scott, V. C., Jillani, Z., Malpert, A., Kolodny-Goetz, J., & Wandersman, A. (2022). A scoping review of the evaluation and effectiveness of technical assistance. *Implementation Science Communications, 2*, 70. https://doi.org/10.1186/s43058-022-00314-1

Spoth, R., & Greenberg, M. (2011). Impact challenges in community science-with-practice: Lessons from PROSPER on transformative practitioner-scientist partnerships and prevention infrastructure development. *American Journal of Community Psychology, 48*(1-2), 106-119. https:/doi.org/10.1007/s10464-010-9417-7

Strifler, L., Cardoso, R. McGowan, J., Cogo, E., Nincic, V., Khan, P. A., Scott, A., Ghassemi, M., MacDonald, H., Lai, Y., Treister, V., Tricco, A. C., & Straus, S. E. (2018). Scoping review identifies significant number of knowledge translation theories, models, and frameworks with limited use. *Journal of Clinical Epidemiology, 100*, 92-102. https://doi.org/10.1016/j.jclinepi.2018.04.008

Tabak, R. G., Khoong, E. C., Chambers, D. A., & Brownson, R. C. (2012). Bridging research and practice: Models for dissemination and implementation research. *American Journal of Preventive Medicine, 43*(3), 337–350. https://doi.org/10.1016/j.amepre.2012.05.024

Wandersman, A. (2003). Community science: Bridging the gap between science and practice with community-centered models. *American Journal of Community Psychology, 31*(3-4), 227-242. <https://doi.org/10.1023/A:1023954503247>

Wandersman, A., Chien, V. H., & Katz, J. (2012). Toward an evidence-based system for innovation support for implementing innovations with quality: Tools, training, technical assistance, and quality assurance/quality improvement. *American Journal of Community Psychology, 50*(3-4), 445-459. <https://doi.org/10.1007/s10464-012-9509-7>

Wandersman, A., Duffy, J., Flaspohler, P., Noonan, R., Lubell, K., Stillman, L., Blachman, M., Dunville, R., & Saul, J. (2008). Bridging the gap between prevention research and practice: The Interactive Systems Framework for Dissemination and Implementation. *American Journal of Community Psychology, 41*(3-4), 171-181. https://doi.org/10.1007/s10464-008-9174-z

Wandersman, A., Imm, P., Chinman, M., & Kaftarian, S. (2000). Getting To Outcomes: A results-based approach to accountability. *Evaluation and Program Planning, 23*(3), 389-395. <https://doi.org/10.1016/S0149-7189(00)00028-8>

Watson-Thompson, J., Woods, N. K., Schober, D. J., & Schultz, J. A. (2013). Enhancing the capacity of substance abuse prevention coalitions through training and technical assistance. *Journal of Prevention & Intervention in the Community, 41*(3), 176-187. https://doi.org/10.1080/10852352.2013.788345

Wolf, S. (1974). Editorial: The real gap between bench and bedside. *New England Journal of Medicine, 290*, 802-803. https:// doi.org/10.1056/NEJM197404042901411

Woods, N. K., Watson-Thompson, J., Schober, D. J., Markt, B., & Fawcett, S. (2014). An empirical case study of the effects of training and technical assistance on community coalition functioning and sustainability. *Health Promotion Practice, 15*(5), 739-749. https://doi.org/10.1177/1524839914525174

1. This gap has been a major concern of many investigators involved in prevention, implementation, and translation sciences. Lessons learned in this special issue can apply to bridging research and practice in numerous fields including medicine and management (e.g., Goodman, 2000). [↑](#footnote-ref-1)
2. We propose that “training” and “technical assistance” are two related mechanisms required for successful implementation of model programs (for example, see Feinberg et al., 2004; Wandersman et al., 2012; Woods et al., 2014). Wandersman et al. (2012) define training as “a planned, instructional activity intended to facilitate the acquisition of knowledge, skills, and attitudes in order to enhance learner performance. Training is often performed in group settings.” They define TA as “an individualized, hands-on approach to building an entity’s capacity for quality implementation of innovations, usually following training.” [↑](#footnote-ref-2)
3. There are important parallels that exist between implementation science and prevention science. One area of great interest is the integrity (fidelity) of implementation (e.g., Durlak & DuPre, 2008). It has long been recognized that poor implementation leads to type III errors (failure to implement as planned). This holds for TTA as well, particularly when there is a failure to deliver training as planned (i.e., program drift), including omission or modification of certain training modalities (for example, see Basch et al., 1985; Dobson & Cook, 1980). There is also a literature on quality adaptation to fit the needs of a particular setting (e.g., Wandersman et al., 2016). [↑](#footnote-ref-3)
4. Albers et al. (2020) provide definitions and elaborate core competencies associated with these different implementation support practitioner and provider roles. [↑](#footnote-ref-4)
5. Lewis et al. (2020) provide a collection/synthesis (you choose the word) of studies that examine mechanisms in implementation, and Lewis et al. (2018) provide an overview of strategies (e.g., path modeling) that can be used to better understand causal processes involved in how implementation strategies achieve the desired proximal and distal outcomes. [↑](#footnote-ref-5)
6. Similar standards that serve as guidelines for reporting findings from implementation studies have been proposed (Pinnock et al., 2017a) and further elaborated (Pinnock et al., 2017b). The goal of these standards is similar to that of the Society for Prevention Research *Standards of Evidence* (Flay et al., 2005), which is to improve translation of research into practice. [↑](#footnote-ref-6)
7. This has been termed the “ironic gap” owing to the disconnect between implementation research and implementation practice (e.g., Jensen et al., 2023). The disconnect arises because the lives and workplace environment of practitioners are rarely addressed in implementation research. [↑](#footnote-ref-7)
8. This is not uncommon in prevention science and is well noted in research on the efficacy of psychotherapy (e.g., Hansen et al., 2002) and also studies that use complier average causal effects models to match tiered intervention delivery (dose) to severity of problem behaviors (e.g., Dishion et al., 2014). [↑](#footnote-ref-8)
9. Rhoades et al. (2012) highlight ISF as a conceptual model that requires greater elaboration of reciprocal interactions between the prevention synthesis and translation, support, and delivery systems. Their example involves a state-level prevention support system intended to create a new public health approach to prevent delinquency and youth violence. The focus of their approach was on maintaining fidelity and sustainability using research-informed technical assistance that links state-agency funders responsible for policy decisions with practitioners (i.e., communities implementing programs). [↑](#footnote-ref-9)