

Western University

Scholarship@Western

PRECISE Preschool Speech and Language
Publications

PRECISE: Practice-based Research
Collaborative in Speech-Language Pathology

6-22-2019

Using implementation science to engage stakeholders and improve outcome measurement in a preschool speech-language service system

Barbara Jane Cunningham
Western University, bjcunningham@uwo.ca

Janis Oram Cardy
Western University, janis.cardy@uwo.ca

Follow this and additional works at: <https://ir.lib.uwo.ca/precisepreschoolpubs>



Part of the [Speech Pathology and Audiology Commons](#)

Citation of this paper:

Cunningham, Barbara Jane and Oram Cardy, Janis, "Using implementation science to engage stakeholders and improve outcome measurement in a preschool speech-language service system" (2019). *Speech, Language and Hearing* 12.
<https://ir.lib.uwo.ca/precisepreschoolpubs/12>

**Using implementation science to engage stakeholders and improve
outcome measurement in a preschool speech-language service**

Barbara Jane Cunningham^a and Janis Oram Cardy^a

*^aSchool of Communication Sciences and Disorders, Western University,
London, Canada*

Running Head: Improving outcome measurement

Corresponding Author:

Barbara Jane Cunningham
School of Communication Sciences and Disorders,
Western University, Elborn College, Room 2516,
1201 Western Road, London, ON Canada N6G 1H1
Phone: (519) 661-2111 x88179
Email: bcollin7@uwo.ca

Acknowledgements: The authors would like to thank the many professionals in Ontario's Preschool Speech and Language Program who shared their expertise to support the development of the FOCUS webinar modules, and those who willingly participated in the pilot study to test them.

Funding Details: Funding for this research was provided by the Ontario Ministry of Children, Community and Social Services

Disclosure of Interest: The authors report no conflict of interest.

Author biographical notes:

BJ Cunningham, PhD, SLP(C) is an Assistant Professor in Communication Sciences and Disorders at the University of Western Ontario (Canada). Her program of research explores communicative participation outcomes in preschoolers with speech-language impairments, often using the Focus on the Outcomes of Communication Under Six (FOCUS) as a primary outcome measure. Her research program also includes stakeholder engagement in practice-based and implementation research to improve programs and services for preschoolers with communication difficulties and disorders. Prior to this, Dr. Cunningham worked clinically with preschoolers for over 10 years. ORCID ID 0000-0002-2032-4999; twitter @bjcunninghamslp

Janis Oram Cardy, PhD, S-LP(C) is an Associate Professor in Communication Sciences and Disorders and Research Affiliate in the National Centre for Audiology at the University of Western Ontario (Canada). She studies neural, perceptual, and cognitive contributions to language ability and disability in children, and conducts practice-based research in collaboration with clinicians to improve outcomes for young children with speech, language, and hearing disorders. ORCID 0000-0002-7170-6145; twitter @oramorama

Using implementation science to engage stakeholders and improve outcome measurement in a preschool speech-language service

Abstract

This tutorial presents one example of collaborative implementation research in a preschool speech-language service system - Ontario Canada's Preschool Speech and Language Program. Working collaboratively with stakeholders including policy makers, managers, and speech-language pathologists (SLPs), four webinar modules were developed to support implementation of the Focus on the Outcomes of Communication Under Six (FOCUS), a new participation-focused outcome measurement tool in pediatric speech-language pathology. The webinar modules were pilot tested at two community sites to determine whether they were effective at increasing SLPs' knowledge, perceptions, and intentions for practice. The Knowledge-to-Action framework was used to inform all phases of this work. Forty-six SLPs completed an initial 15-item survey online, consecutively viewed the four webinar modules (67 minutes), and then completed a final 15-item survey online. After viewing the webinar modules, SLPs reported significantly higher perceptions about the value of participation-based outcome measures and outcome monitoring; perceptions of reliability, validity and clinical utility of the FOCUS; intentions to use data from the FOCUS to support clinical discussions and decision making; and intentions to submit data as part of a provincial outcome monitoring program. Barriers to this type of implementation research included a variety of challenges related to methodology. Facilitators included research products that were highly relevant to the practice context, high rates of participation in our pilot study, and external validity for pilot study results. Collaborating with stakeholders is an important part of implementation work and is critical for ensuring research is relevant to and applicable in clinical practice.

Keywords: speech-language pathology, stakeholder engagement, implementation science, preschool, service systems, webinars, Focus on the Outcomes of Communication Under Six (FOCUS)

Tutorial Overview and Aims

This tutorial presents one example of implementation science in a preschool speech-language service system. More specifically, a project designed to support use of a new participation-focused outcome measurement tool is used to illustrate implementation science in action in this context. For the purposes of this tutorial, implementation science is defined as the study of methods to promote the uptake of evidence-based innovations and procedures into routine clinical practice with the objective of improving services (Olswang & Prelock, 2015). Implementation science is different from the traditional passive approaches to disseminating research and is thought to help close the well-documented gap between research and practice (Olswang & Prelock, 2015). Key tenants of implementation science are that: (1) the clinical context is complex, and (2) practice is influenced by multiple factors outside of research including clinicians, administrators, and organizational structure and culture (Douglas & Burshnic, 2019). As such, to be successful in implementation work, researchers must engage with clinical stakeholders to ensure their expertise and insights are incorporated, and that research outputs and products are clinically meaningful, feasible, and can be easily integrated into the practice context (Douglas & Burshnic, 2019).

The Knowledge-to-Action (KTA) framework (Graham, Logan, Harrison, Straus, Tetroe, Creswell & Robinson, 2006; Figure 1) is one theoretical framework that can be used to support implementation research. It was developed for those wanting to implement research findings and products in practice to improve health systems and services (Graham et al., 2006). Theoretically, the KTA framework is divided into two parts, knowledge creation and knowledge action, but in practice all parts of the framework can interact and happen sequentially or simultaneously (Graham et al., 2006). The knowledge creation component represents existing knowledge or research, which may take the form of single studies, review papers, or evidence-based tools designed to meet the needs of specific stakeholders (Graham et al., 2006). The action cycle describes the activities that are needed for knowledge to be applied in practice (Graham et al., 2006).

The KTA framework and principles of Implementation Science were used to guide the development of the implementation materials and methods for our project, which was a collaborative effort between researchers at Western University (Ontario, Canada), senior policy maker stakeholders in Ontario's Ministry of Children, Community and Social Services, and managers and speech-language pathologists (SLPs) working in Ontario's Preschool Speech and Language (PSL) Program to solve a real-world clinical problem. This tutorial presents one possible model for supporting the implementation of new assessment tools and procedures in preschool speech-language service systems. The barriers and facilitators of this type of approach are discussed.

Implementation Science in a Preschool Speech-Language Service System

One division of Ontario's Ministry of Children, Community and Social Services is the PSL Program, a publicly funded service in which SLPs and speech-language therapy

assistants provide assessment, consultation, and intervention services to over 60,000 children and families at 29 regional sites each year. These services are delivered across a wide geographic region (1.076 million km²) and are freely available to all children who need them from birth to school entry.

In 2012, the PSL Program adopted a new participation-focused outcome measurement tool that could be used to evaluate changes in children's communicative participation following speech-language therapies. The Focus Outcomes of Communication Under Six (FOCUS; Thomas-Stonell et al., 2010) is a valid and reliable parent-report outcome measure (Oddson, Washington, Robertson, Thomas-Stonell & Rosenbaum, 2013; Thomas-Stonell et al., 2013a, 2013b). It was developed to fill a significant gap in pediatric speech-language assessment, that is, the ability to assess communicative participation - how children use their communication to participate or engage in everyday interactions (Cunningham et al., 2017). It also met the needs of the PSL Program for a tool that could (1) be used to measure change across a range of ages, communication impairment types, and levels of severity, and (2) support SLPs in delivering services that focus on the functional communication skills most meaningful and important to families (Lindsay & Dockrell, 2004; Roulstone, Coad, Ayre, Hambly & Lindsay, 2013). This move towards focusing on participation represented a significant shift in the field, as historically assessments focused primarily on changes specific to children's impairments (e.g., use of individual speech sounds or grammatical structures; Cunningham et al., 2017).

Initial efforts to implement the FOCUS in the PSL Program took place in 2012 and included having SLPs (1) independently view an online training video and read published papers about development and validation of the FOCUS; and (2) attend an online videoconference group training session presented by the research team. This session included information about the development and administration of the FOCUS, and SLPs could ask questions and hear responses from the research team. Following the trainings, SLPs were instructed by their managers to have all parents complete the FOCUS at six-month intervals and to submit the data for entry into the provincial program evaluation database. It was also expected that SLPs would use data from the FOCUS to inform their practice. Additional passive implementation strategies included adding a Q&A section to the FOCUS website, and the distribution of several electronic newsletters about the FOCUS via email.

It soon became clear that these initial implementation efforts were only somewhat effective, as SLPs and managers in the PSL Program began to identify and report problems. Specific clinical issues associated with implementation included: (1) a lack of understanding about the program evaluation project and how data would be used; (2) a lack of understanding about participation-based outcome measurement and the purpose of the FOCUS; and (3) a lack of understanding for how FOCUS data were relevant to clinical practice. These issues became especially apparent during collaborative research studies (2013-17), and during research presentations and meetings with SLPs from across the program (2015-18). Ultimately, these challenges resulted in inconsistent completion and submission of FOCUS data and an excess of

missing data, which prevented the PSL Program from using the data to inform evidence-based policy. These issues also resulted in SLPs not using FOCUS data to inform their practice or in discussions with families, which meant assessment was still focused on children's impairments, not their participation. Our research team was approached by the Ministry and asked to help with resolving these issues at a program level. Funding for this work was provided by the Ministry.

Implementation Science in Action

Stakeholders in this project included SLPs, managers, policy makers, and researchers, and all were involved in conceptualizing the project, contributing to the design and content of the webinar modules, and supporting implementation efforts. The project had two primary aims agreed upon by all stakeholders: (1) to improve SLPs' understanding about the importance and relevance of the FOCUS and of program evaluation more broadly, and (2) to support SLPs in using FOCUS data to inform clinical practice and discussions with families. We believed achieving these aims would support the collection of more complete health evaluation data and integration of participation-based outcomes in the PSL Program.

The KTA framework was used to guide the development of this implementation project, but only the action cycle was considered. The knowledge creation component had already been addressed by the publication of multiple research studies about the development, validity, and reliability of the FOCUS, and publication and distribution of the FOCUS outcome measure and manual. One action cycle was completed in 2012 when the PSL Program first implemented the FOCUS. The current project represents a second action cycle, which began with newly identified problems (described above). Phases of the action cycle as they apply to this project are described next.

(1) *Identifying the problem.* The Ministry, PSL Program managers, and members of our research team had identified two issues (1) PSL Program outcome data were not regularly collected or submitted, and (2) SLPs were not using data from the FOCUS to inform their practice.

(2) *Adapting knowledge to the local context and (3) assessing barriers to knowledge use* refers to the identification of potential barriers that may limit the uptake of knowledge and the process individuals and groups go through when making decisions about how useful knowledge is in their setting (Graham et al., 2006). From interactions with SLPs during presentations and meetings, we identified three main barriers to the systematic collection of FOCUS data and its application in clinical practice.

- (i) A lack of understanding about the purpose of the program evaluation and how data were used.* Since 2012, SLPs had been collecting and submitting FOCUS data and findings had never been shared with them. This led to confusion about the purpose of the program evaluation project and was disconcerting for SLPs who were unsure whether or how data were used. For

example, some SLPs questioned whether data were used to evaluate their individual clinical performance. Through informal discussions, we learned a few sites were attempting to use FOCUS data to understand the impact of their interventions, but this was the exception and not the rule.

(ii) *Questioning the FOCUS as a measurement tool.* On multiple occasions, SLPs reported a lack of understanding about why they were being asked to measure participation-based outcomes. We believe this was because SLPs were accustomed to measuring impairment-based outcomes, and use of the FOCUS represented a significant shift in thinking. SLPs also questioned the validity and reliability of the FOCUS, but this was mostly specific to children with lower functional abilities.

(iii) *A lack of understanding for how FOCUS data could inform clinical practice.* Except for a few individuals, SLPs reported they did not use FOCUS data in their clinical practice. Most SLPs reported that parents completed the FOCUS and passed it to the SLP, who then submitted the form for data entry (typically without reviewing parents' responses). This meant that most parents did not get feedback about how their child had changed, clinicians did not use data to support decisions, and discussions about communicative participation were not taking place.

(4) *Selecting, tailoring, and implementing interventions* refers to planning and executing interventions that promote the acquisition and application of knowledge (Graham et al., 2006). Following collaborative discussions with stakeholders, it was agreed that new evidence-based tools were needed to address the issues described above. Stakeholders agreed that webinar modules (hosted online) would be the most efficient and effective way of reaching busy SLPs working across a large geographic region.

BJC, first author and a former SLP in the PSL Program, wrote a memorandum providing background information about the program evaluation project, rationale for developing webinars, and proposed content and format for four webinar modules. The proposal was sent to select stakeholders, and the format and content of the modules were revised based on feedback. Examples of modifications include the addition of video clips to support some of the claims being made (e.g., that parents are most interested in participation-based outcomes), and the inclusion of specific clinical examples relevant to the PSL Program. Four PowerPoint webinar modules were then developed together with technical personnel (see Table 1 for content). Once developed, these modules were sent back to stakeholders for additional feedback and minor revisions were made.

(5) *Monitoring knowledge use* describes changes in levels of knowledge, understanding, or attitudes. Monitoring is done to determine the extent to which knowledge has diffused through the potential-adopter group (Graham et al., 2006). At this phase, we conducted a pilot study to determine whether SLPs reported

improved perceptions and intentions about the FOCUS and program evaluation, intentions to use FOCUS data in practice, and intentions to regularly submit data to the provincial database after viewing the webinar modules.

Ethics. The study was completed as part of a larger government Program Evaluation and Quality Improvement project that was reviewed by the Western University Research Ethics Board (REB). The REB considered the project not to be research as described in the Canadian Tri-Council Policy Statement V.2 (Research Exempt from REB Review, Article 2.4) and therefore it was not considered to fall under the purview of the REB.

Participants. Forty-six SLPs at two PSL Program sites were asked by their managers to participate in the pilot study. Forty-five SLPs participated (98% response rate). Most had over 10 years' experience working in the PSL Program ($n = 18$, 40%). Others had less than two ($n = 9$, 20%), 2-5 ($n = 11$, 24%) or 6-10 ($n = 7$, 16%) years' experience.

Design. A pre- post-test study design was used to determine whether SLPs' perceptions and intentions changed after viewing the online learning modules. SLPs took an anonymous pre-webinar survey, viewed the four webinar modules consecutively, and then immediately completed an anonymous post-webinar survey.

Materials. The pre-webinar survey included 15 questions that addressed SLPs' existing perceptions about outcome monitoring and participation-based outcomes; the development, validity, and reliability of the FOCUS; whether the FOCUS measured meaningful change and provided valuable information; whether they used FOCUS data to support clinical practice; the frequency with which they submitted FOCUS data; and their perceptions about the value of program evaluation. The post-module survey included the same questions, but were tailored to address SLPs' perceptions after viewing the modules and their intentions to implement new practices. On both surveys, items were rated using a 5-point Likert scale that ranged from (1) strongly disagree to (5) strongly agree (see Table 2). SLPs could enter optional comments at the end of each survey.

Procedures. After listening to a brief presentation about the issues at a provincial meeting of all the PSL Program managers, we recruited clinical managers from two sites to invite their SLPs to participate in the study. Managers were asked to send an initial email to their SLPs explaining the purpose of the webinar modules and the pilot study, and study procedures. SLPs were also given a URL link to access the surveys/webinar modules, which directed them to first complete the pre-webinar survey, then view the four webinar modules consecutively (67 minutes), and immediately complete the post-webinar survey. SLPs were given 4-5 weeks and release time from clinical duties to complete these tasks. Managers sent bi-weekly reminders to ensure high rates of participation.

Results. Ratings for individual survey items from the pre- and post-webinar surveys are presented in Table 2. A Wilcoxon sign-rank test was used to compare ratings at pre-test (existing perceptions and practices) to ratings at post-test (perceptions and intentions after viewing the modules). A McNemar's chi-square statistic was also computed to determine whether the proportion of SLPs rating an item positively changed from pre- to post-test. To calculate this statistic, responses were grouped into positive (strongly agree and agree) and negative (strongly disagree, disagree, and neutral) responses, and the proportion of positive:negative responses at pre- and post-test were compared. Significant differences in SLPs' ratings from pre- to post-test and significant differences in the proportion of positive:negative responses from pre- to post-test were found for all survey items (see Table 2).

Based on results of the pilot study, the webinar modules were posted publicly (<https://canchild.ca/en/resources/307-focus-webinars>), and the PSL Program mandated that all SLPs view each of the modules as part of new provincial training requirements. SLPs were also required to demonstrate learning by successfully completing four 5-item quizzes. To date, over 400 PSL Program SLPs have viewed the modules, but other large health centres have also used the modules to support clinical training. The pilot study ended at this phase of the action cycle, but future work will address the last two phases (described below).

(6) *Evaluating outcomes.* Outcomes are evaluated to determine whether new knowledge impacted areas including practitioner behaviours and attitudes, system outcomes, or patient health (Graham et al., 2006). To evaluate SLP behaviours, we will analyze provincial data to determine whether data collection and submission rates improved, and survey SLPs to learn whether and how FOCUS data have been incorporated into practice and discussions with families. With more complete provincial data, program outcomes will also be evaluated.

(7) *Sustaining knowledge use.* This phase of the action cycle is meant to direct groups back through the action phases of the framework to ensure new knowledge remains a part of clinical practice (Graham et al., 2006). Sustained knowledge use will be monitored through future collaborative research with the PSL Program and will include surveys of SLPs.

Barriers and Facilitators to Implementation

Multiple barriers were associated with our work to support further implementation of the FOCUS in the PSL Program, but these were most often related to methodological issues. Main barriers included targeting SLPs across a wide geographic region, engaging SLPs who were overburdened with clinical work, and using a strong study design in a real-world clinical context.

Geography was an issue we needed to consider when selecting an avenue for implementation. Together with stakeholders, we determined the best way to reach SLPs across Ontario was through webinars presented online, which was a relatively passive dissemination strategy (i.e., SLPs could review materials, but not interact with the

presenter). Passive dissemination strategies such as this have been found to be minimally effective for changing behaviour (Grimshaw et al., 2001) and under different circumstances (e.g., smaller-scale implementation, more time and funding), more active strategies may have been used to support implementation. That said, recent research has shown it is possible for low-cost passive strategies to lead to practice change under specific conditions (Vedel, LeBerre, Sourial, Arsenault-Lapierre, Bergman & Lapointe, 2018). These conditions include having clinicians with moderate to high levels of expertise; the presence of a practice champion; and enough professional resources.

SLPs working in the PSL Program have large clinical caseloads and must meet certain targets with respect to the number of children they serve each day, week, and month. This means they have little time for tasks outside of their clinical work. We collected information from SLPs about the issues related to the FOCUS and its implementation through informal discussions at meetings and during Q&A periods of presentations. Feedback on the content and format of the webinars was collected by sharing an electronic document, which allowed us to survey stakeholders from various regions across the province. These methods were used because these avenues were convenient and feasible for the SLPs, who would have struggled to participate in interviews or attend lengthy focus group meetings. More systematic and unbiased methods for engaging stakeholders are possible (Boaz, Hanney, Borst, O'Shea & Kok, 2018), and may have resulted in better products and results, but were not feasible within the context of our project.

Finally, we struggled with incorporating a strong study design in this clinical context. It has been our experience in this and other similar studies, that incorporating stronger study designs is challenging for various reasons (e.g., lack of clinical release time to support research). As such, our pilot study used a simple pre- post-test design. This made it difficult to determine whether the change reported by SLPs was due the webinar modules or another unrelated factor. We tried to address this barrier by having SLPs view the modules back-to-back and complete the post-module survey immediately after viewing the webinar modules, but it is still possible that the observed changes were due to a factor other than the webinar modules. We also cannot confirm that SLPs' reported intentions led to actual changes in practice. Although we cannot confirm this, the theory of planned behaviour suggests that an individual's intentions are strongly linked to behaviour change (Ajzen, 1991), so it is our hope that this has been the case. Future work (described in phases 6-7 of the action cycle) will explore this in more detail.

Multiple facilitators to implementation were identified in the context of this preschool speech-language service system. These included collaboration with multiple stakeholders offering varying viewpoints, a high rate of participation in our pilot study, and external validity for pilot study results.

One strength of our approach to implementation was the engagement of multiple stakeholders in the development of the webinar modules. This type of collaboration is widely believed to incorporate multiple perspectives and make research more applicable to specific clinical contexts (Crooke & Olswang, 2015; Kendall et al., 2018). By

engaging stakeholders, we ensured both format and content of the webinar modules were much more relevant and compelling than they would have been had we not included these varying perspectives.

A second strength of our project was the high rate of participation in our pilot study. Engaging SLPs in research can be difficult, particularly because they often lack time for additional non-clinical tasks (Kendall et al., 2018). Despite this, we had 98% of invited SLPs participate in our study. We believe this was achieved in part because of transparency and stakeholder engagement. Participating SLPs were fully informed about the ways in which the modules were developed (i.e., with stakeholder input), the purpose of the study (i.e., to support wide-scale implementation efforts), and the importance of their clinical expertise to the research team was emphasized. Engaging managers to recruit (and remind) SLPs about the pilot study and to provide clinical release time for them to complete the surveys and modules may have led SLPs to perceive the work as credible and worthwhile and increased compliance with participation.

Third, we believe our approach to evaluating the impact of implementation directly in the clinical context increases the external validity of our pilot study results. Conducting research directly in the practice context is challenging in many ways, but this type of approach incorporates real-world clinical challenges, thinking, and decision making in ways that traditional approaches to research cannot (Crooke & Olswang, 2015).

Real Word Implications and Future Research

The FOCUS webinar modules were developed through collaboration with multiple stakeholders and those working in various clinical contexts. We believe this was a critical factor that influenced the successful outcome of our pilot study and should be the focus for those wanting to engage in similar work developing tools or products designed to change practice. The best methods for engaging stakeholders in research are still under investigation, but those engaged in this type of work report factors that facilitate the process include strong communication processes and tools, and remuneration for collaborators (Kendall et al., 2018). Reported barriers include stakeholder time and resources, finding the right stakeholders, and ensuring stakeholders feel valued by the research team (Kendall et al., 2018). The development of guidelines and frameworks for planning, evaluating, and reporting on stakeholder engagement may facilitate the identification of the most important factors associated with strong engagement in implementation research (Ray & Miller, 2017).

Future research for our team will involve additional evaluation of the outcomes associated with SLPs viewing the FOCUS webinars (e.g., more consistent submission of data, use of data in practice), and determining whether sustained knowledge use was achieved. We also plan to engage stakeholders in the development and trialing of more sophisticated research designs that will be feasible in the clinical context.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. doi:10.1016/0749-5978(91)90020-T.
- Boaz, A., Hanney, S., Borst, R., O’Shea, A., & Kok, M. (2018). How to engage stakeholders in research: design principles to support improvement. *Health Research Policy and Systems*, 16(60). doi:10.1186/s12961-018-0337-6.
- Cunningham, B. J., Washington, K. N., Binns, A., Rolfe, K., Robertson, B., & Rosenbaum, P. (2017). Current methods of evaluating speech-language outcomes for preschoolers with communication disorders: A scoping review. *Journal of Speech-Language and Hearing Research*, 60(2), 447-464. doi:10.1044/2016_JSLHR-L-15-0329.
- Douglas, N. N. & Burshnic, V. L. (2019). Implementation Science: Tackling the research to practice gap in communication sciences and disorders. *Perspectives of the ASHA Special Interest Group*, 4(1), 3-7. doi:10.1044/2018_PERS-ST-2018-0000.
- Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W. & Robinson, N. (2006). Lost in Knowledge Translation: Time for a Map? *The Journal of Continuing Education in the Health Professions*, 26(1), 13–24.
- Grimshaw, J. M., Shirran, L., Thomas, R., Mowatt, G., Fraser, C., Bero, L., Grilli, E., Oxman, A., & O’Brien, M. (2001). Changing provider behavior: An overview of systematic reviews of interventions. *Medical Care*, 39(8, Suppl 2), 112–145.
- Kendall, C., Fitzgerald, M., Seoyeon Kang, R., Wong, S. T., Katz, A., Fortin, M...Liddy, C., (2018). “Still learning and evolving in our approaches”: Patient and stakeholder engagement among Canadian community-based primary health care researchers. *Research Involvement and Engagement*, 4(47). doi:10.1186/s40900-018-0132-0.
- Lindsay, G., & Dockrell, J. E. (2004) Whose job is it? Parents' concerns about the needs of their children with language problems. *Journal of Special Education*, 37(4), 225-35. doi:10.1177/00224669040370040201.
- Oddson, B., Washington, K., Robertson, B., Thomas-Stonell, N., & Rosenbaum, P., (2013) Inter-rater reliability of clinician’s ratings of preschool children using the FOCUS©: FOCUS© on communication outcomes under six. *Canadian Journal of Speech-Language Pathology and Audiology*, 37(2), 170–174.
- Olswang, L. B., & Prelock, P. A. (2015). Bridging the gap between research and practice: Implementation Science. *Journal of Speech, Language and Hearing Research*, 58(6), S1818–S1826. doi:10.1044/2015_JSLHR-L-14-0305.

- Ray, K. N., & Miller, E. (2017). Strengthening stakeholder-engaged research and research on stakeholder engagement. *Journal of Comparative Effectiveness Research*, 6(4), 375–389. doi:10.2217/cer-2016-0096.
- Roulstone, S., Coad, J., Ayre, A., Hambly, H., & Lindsay, G. (2013). *The preferred outcomes of children with speech, language and communication needs and their parents*. UK Department for Education Research Report DFE-RR247-BCRP12. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/219625/DFE-RR247-BCRP12.pdf.
- Thomas-Stonell, N. L., Oddson, B., Robertson, B., & Rosenbaum, P. L. (2010). Development of the FOCUS© (Focus on the Outcomes of Communication Under Six), a communication outcome measure for preschool children. *Developmental Medicine and Child Neurology*, 52(1): 47-53. doi:10.1111/j.1469-8749.2009.03410.
- Thomas-Stonell, N., Washington, K., Oddson, B., Robertson, B., & Rosenbaum, P. (2013a). Measuring communicative participation using the FOCUS©: Focus on the Outcomes of Communication Under Six. *Child Care, Health, and Development*, 39(4): 474–80. doi:10.1111/cch.12049.
- Thomas-Stonell, N., Oddson, B., Robertson, B., & Rosenbaum, P. (2013b). Validation of the FOCUS© on the outcomes of communication under six outcome measure. *Developmental Medicine & Child Neurology*, 55(6): 546–552. doi:10.1111/dmcn.12123.
- Vedel, I., Le Berre, M., Sourial, N., Arsenault-Lapierre, G., Bergman, H., & Lapointe, L. (2018). Shedding light on conditions for the successful passive dissemination of recommendations in primary care: a mixed methods study. *Implementation Science*, 13(129). doi.org/10.1186/s13012-018-0822-x.

IMPROVING OUTCOME MEASUREMENT

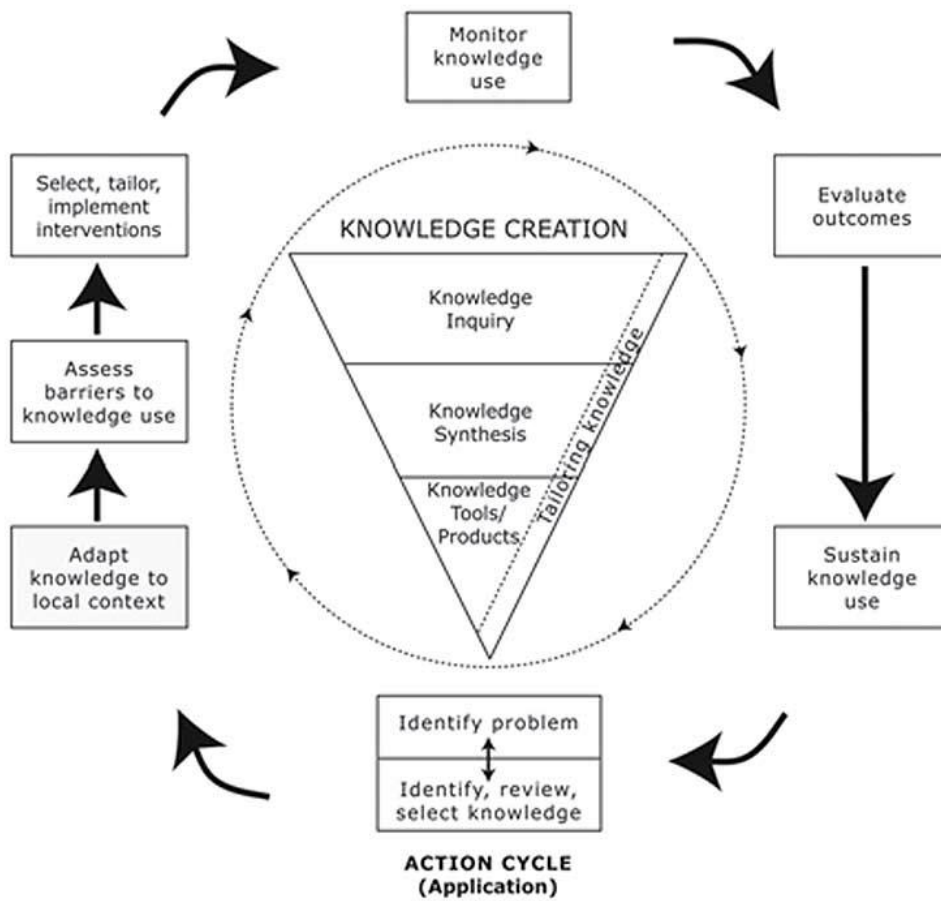


Figure 1. The knowledge-to-action framework (Graham et al., 2006)

Table 1	
Content of the four webinar modules	
Module 1	<ul style="list-style-type: none"> • Describes outcome measurement and evidence-based practice • Explains assessment in the context of the World Health Organization's framework of the International Classification of Functioning, Disability and Health
Module 2	<ul style="list-style-type: none"> • Describes the development and validation of the FOCUS with an emphasis on including parents in the development • Reports on research studies that have used the FOCUS to show meaningful change following speech-language interventions
Module 3	<ul style="list-style-type: none"> • Describes clinical applications for FOCUS outcomes data • Includes specific clinical examples to demonstrate this application
Module 4	<ul style="list-style-type: none"> • Describes how PSL Program FOCUS data have been used • Explains how FOCUS data can be used to support evidence-based decisions at individual PSL Program sites

Table 2						
Survey questions and response statistics						
Survey Question	Pre – Mode (range)	Post – Mode (range)	Pre- positive ratings <i>n</i> (%)	Post- positive ratings <i>n</i> (%)	Significant Change? (W sign- rank test)	McNemar's Chi Square (paired change)
1. Regular outcome measurement is an important part of my practice	Mode = 7 (1-7)	Mode = 7 (4-7)	<i>n</i> = 18 (40%)	<i>n</i> = 31 (69%)	<i>z</i> = 4.42, <i>p</i> < 0.01	χ^2 = 8.00, <i>p</i> < 0.01
2. I understand how outcomes are measured within the World Health Organization's International Classification of Functioning Disability and Health (ICF) framework	Mode = 5 (1-7)	Mode = 7 (5-7)	<i>n</i> = 14 (31%)	<i>n</i> = 22 (49%)	<i>z</i> = 5.31, <i>p</i> < 0.01	χ^2 = 11.00 <i>p</i> < 0.01
3. Measuring participation-based outcomes is important and meaningful	Mode = 7 (1-7)	Mode = 7 (5-7)	<i>n</i> = 22 (49%)	<i>n</i> = 32 (71%)	<i>z</i> = 3.20, <i>p</i> < 0.01	χ^2 = 5.00 <i>p</i> = 0.03
4. The FOCUS/FOCUS-34 was developed using rigorous research methods	Mode = 4 (1-7)	Mode = 7 (4-7)	<i>n</i> = 16 (36%)	<i>n</i> = 30 (67%)	<i>z</i> = 5.37, <i>p</i> < 0.01	χ^2 = 17.00 <i>p</i> < 0.01
5. The FOCUS/FOCUS-34 is a valid and reliable outcome measurement tool	Mode = 5 (1-7)	Mode = 7 (3-7)	<i>n</i> = 13 (29%)	<i>n</i> = 20 (44%)	<i>z</i> = 5.40, <i>p</i> < 0.01	χ^2 = 14 <i>p</i> < 0.01
6. Total Scores from the FOCUS/FOCUS-34 can be used to measure clinically meaningful changes children make during speech and language interventions	Mode = 5 (1-7)	Mode = 6 (1-7)	<i>n</i> = 13 (29%)	<i>n</i> = 19 (42%)	<i>z</i> = 4.64, <i>p</i> < 0.01	χ^2 = 11.27 <i>p</i> < 0.01
7. Total FOCUS scores provide valuable clinical information about the changes children make during intervention	Mode = 5 (1-7)	Mode = 6 (2-7)	<i>n</i> = 14 (31%)	<i>n</i> = 17 (37%)	<i>z</i> = 5.67, <i>p</i> < 0.01	χ^2 = 15.00 <i>p</i> < 0.01
8. I use/intend to use data from the FOCUS in my practice to determine whether children have made clinically meaningful changes in their communicative participation skills	Mode = 1 (1-7)	Mode = 5 (1-7)	<i>n</i> = 12 (27%)	<i>n</i> = 17 (38%)	<i>z</i> = 5.76, <i>p</i> < 0.01	χ^2 = 26.00 <i>p</i> < 0.01
9. Part of my practice includes discussing changes in children's total FOCUS/FOCUS-34 scores with families/I intend to discuss change in total scores with families	Mode = 1 (1-6)	Mode = 5 (1-7)	<i>n</i> = 21 (47%)	<i>n</i> = 14 (31%)	<i>z</i> = 5.77, <i>p</i> < 0.01	χ^2 = 27.00 <i>p</i> < 0.01
10. FOCUS/FOCUS-34 scoring profiles can be used to gather additional clinical information, to facilitate	Mode = 5 (1-7)	Mode = 6 (1-7)	<i>n</i> = 13 (29%)	<i>n</i> = 16 (36%)	<i>z</i> = 5.46, <i>p</i> < 0.01	χ^2 = 18.00 <i>p</i> < 0.01

IMPROVING OUTCOME MEASUREMENT

discussion with families, and for goal setting and intervention planning						
11. The FOCUS profile scores provide valuable clinical information about children's strengths and weaknesses	Mode = 5 (1-7)	Mode = 6 (1-7)	<i>n</i> = 13 (29%)	<i>n</i> = 20 (44%)	<i>z</i> = 7.32, <i>p</i> < 0.01	χ^2 = 22.00 <i>p</i> < 0.01
12. I use/intend to use the FOCUS/FOCUS-34 profile scores to explore where children's strengths are and where they have made gains between assessments	Mode = 1 (1-7)	Mode = 5/6 (1-7)	<i>n</i> = 12 (27%)	<i>n</i> = 15 (33% each)	<i>z</i> = 5.59, <i>p</i> < 0.01	χ^2 = 27.00 <i>p</i> < 0.01
13. Part of my practice includes reviewing profile scores with families and using profile scores for goal setting and intervention planning/I intend to review profile scores with families	Mode = 1 (1-7)	Mode = 5 (1-7)	<i>n</i> = 21 (47%)	<i>n</i> = 18 (40%)	<i>z</i> = 5.46, <i>p</i> < 0.01	χ^2 = 24.14 <i>p</i> < 0.01
14. I regularly submit/intend to regularly submit FOCUS data at the required times for children on my caseload (i.e., at least every 6 months).	Mode = 7 (1-7)	Mode = 7 (3-7)	<i>n</i> = 18 (40%)	<i>n</i> = 31 (69%)	<i>z</i> = 3.63, <i>p</i> < 0.01	χ^2 = 1.29 <i>p</i> = 0.26
15. It is important that I regularly submit FOCUS data for the children on my caseload	Mode = 7 (1-7)	Mode = 7 (4-7)	<i>n</i> = 19 (42%)	<i>n</i> = 35 (78%)	<i>z</i> = 4.23, <i>p</i> < 0.01	χ^2 = 6.00 <i>p</i> = 0.01