The Cost and Cost-Effectiveness of Training School-Based Personnel in Motivational Interviewing

by

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DISSERTATION ABSTRACT

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Title: The Cost and Cost-Effectiveness of Training School-Based Personnel in Motivational Interviewing

The use of Motivational Interviewing (MI) in school-based settings has increased dramatically over the last decade. Yet, relatively little is known about the costs associated with training school-based personnel in MI and the extent to which they can transfer the declarative and procedural knowledge and skills gained during training into proficient use within school-based settings. This study applies an Implementation Science lens to examine the cost and cost-effectiveness of an MI training model. School-based instructional coaches (n = 31) from two school districts in Kentucky and Missouri were randomly assigned to receive either a standardized coach training (i.e., *Coaching Best Practices* [CBP]) or CBP training *and* intensive training in MI (CBP+MI). This study reports the cost of MI training and support components (e.g., preparation, workshop, consultation and feedback sessions, and community of practice meetings); incremental and dissemination costs associated with MI training; variations in cost estimates using sensitivity analysis; and provides preliminary exploratory data on the incremental cost effectiveness of training school-based personnel to fidelity in MI. This study found that the majority of trainers' average and incremental cost estimates were attributable to delivering MI workshops, followed by CBP workshops and then consultation and feedback sessions. Roughly an additional 25% of trainees in the CBP+MI condition demonstrated basic proficiency in MI's relational and technical skills across sessions. The CBP+MI training model was the cost effective option when using a rigorous cutoff that required

trainees to meet all four fidelity cutoffs across two or more sessions. Per trainee cost to train *to fidelity* was $3,910.

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DEDICATION

This work is dedicated to my wife, Hollie, and to my children, Zoë and Sachin. Their love, support, encouragement, and patience made this work possible, inspired me to persist despite moments of fatigue and frustration, and – to this day – help me appreciate each and every day of life.

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Statement of the Problem

The use of Motivational Interviewing (MI) to support students in general education settings and students receiving special education services has increased dramatically over the last decade. MI is a person-centered, conversation-based approach to fostering growth and change (Miller & Rollnick, 2023). It has an extensive evidence base supporting its use as an adjunctive intervention to support the identification and exploration of feelings of ambivalence and to promote engagement, motivation, and autonomous, self-determined decision-making. Within general education settings, researchers have integrated MI into coaching models to improve teacher effectiveness (Bradshaw et al., 2018; Lee et al., 2014; Reinke et al., 2011). They have used MI to support the behavioral and academic needs of students (Lambie et al., 2019; Terry et al., 2021); to explore adolescent behavioral health (Curtis et al., 2014; Stewart et al., 2015); and to promote healthy eating and exercise (Bogart et al., 2016; Neumark-Sztainer et al., 2010; Pfeiffer et al., 2019). They have integrated it into evidence-based intervention models promoting effective parenting practices (Herman et al., 2012; Stormshak et al., 2020). They also have explored MI as an implementation strategy to bolster the adoption and use of evidence-based practices (EBP; Frey et al., 2023).

MI also has been used to support students with or at risk of developing disabilities as well as their parents, teachers, and others school-based personnel. Researchers have integrated MI approaches into coaching models to improve teachers' support of students with or at risk of developing ADHD (Owens et al., 2017). They have developed intervention models to support parents with children who have, or at risk of developing, a disruptive behavior disorder (Frey et al., 2022). The have also integrated MI into intervention models that provide direct support to students with or at risk of developing a disability in both school-based (Rollnick et al., 2016; Sheftel et al.,

2014) and community settings (Sibley et al., 2021). Preliminary recommendations are also available to support the adaptation of MI techniques when used to support individuals with ADHD, Autism, or a mild intellectual disability (Frielink & Embregts, 2013; Gersib, 2023; Svensson et al., 2021).

Yet, despite this burgeoning and varied use of MI within school-based settings, relatively little is known about the costs associated with training school-based personnel in MI and the extent to which school-based personnel can transfer the declarative and procedural knowledge and skills gained during training into proficient use within school-based settings. For MI to bridge the research-to-practice gap and for it to be integrated broadly into school-based practices and processes, more information is needed about requisite training and support costs to ensure decision makers have a clear understanding of the potential costs and consequences associated with the uptake, use, and sustainment of proficient MI use in K-12 settings.

To address these limitations, this study applies an Implementation Science lens to examine the cost and cost-effectiveness of an MI training model used to train school-based personnel as part of an IES-funded Development and Innovation grant. In the broader intervention development study, school-based instructional coaches (n = 31) from two school districts in Kentucky and Missouri were randomly assigned to receive either a standardized coach training (i.e., *Coaching Best Practices* [CBP]) or CBP training *and* intensive training in MI (CBP+MI). Each instructional coach then implemented the CBP coaching model with two teachers, focusing on improving teachers' use of positive feedback and opportunities to respond (OTRs) to support students at risk of developing disruptive disorders. This cost study (a) calculates the cost of MI training and support components (e.g., preparation, workshop, consultation and feedback sessions, and community of practice meetings); (b) estimates the total, incremental, and dissemination costs associated with MI training; and (c) examines variations in cost estimates using sensitivity analysis. Cost data and independently

coded MI fidelity data – the outcome for this study – are compared to costs and fidelity outcomes for instructional personnel in the comparison condition.

Motivational Interviewing

Motivational Interviewing (MI) is an evidence-based, person-centered approach to fostering conversations about change and growth via strategic use of specific relational strategies and conversational skills. In the words of Miller and Rollnick (2023), MI is "a particular way of talking with people about change and growth to strengthen their own motivation and commitment" (p. 3). MI was developed from direct clinical experience rather than an explicit theoretical model (Miller, 2023). Numerous researches, however, have noted the complementary relationship between MI and Self Determination Theory (SDT; Ryan and Deci, 2017), noting that MI provides a structured approach to promoting the basic needs of autonomy, competence, and relatedness central to SDT and supporting the promotion of intrinsic motivation within conversations about behavior change (Deci & Ryan, 2012; Markland et al., 2005; Patrick & Williams, 2012; Vansteenkiste et al., 2012). Autonomy-supporting approaches such as those proposed in SDT and supported within MI are associated with increased student motivation and engagement, improvements in academic outcomes and student well-being (Aelterman et al., 2019; Bureau et al., 2022; Day et al., 2022; Guay, 2022; Howard et al., 2021; Jeno et al., 2021; Reeve & Cheon, 2021; Snape & Atkinson, 2016), as well as improvements in teacher motivation and well-being (Slemp et al., 2020).

Research spanning roughly 35 years supports the efficacy of MI use across numerous settings and various populations (Bahafzallah et al., 2020; Lundahl et al., 2009; Miller, 2023). There is also nearly 20 years of process research examining MI's underlying mechanisms of change (Apodaca & Longabaugh, 2009; Copeland et al., 2015; Frey et al., 2021; Magill et al., 2014; Magill et al., 2018; Romano & Peters, 2015). This work on mechanisms specifies two *primary* hypotheses about MI's active ingredients. According to the technical hypothesis, proficient use of core MI skills, such as

open questions, affirmations, reflections, and summaries enables a practitioner to (a) evoke a client's talk about change and, then, (b) differentially reinforce statements for and against change (Magill et al., 2019). According to the relational hypothesis, the practitioners' spirit of compassion, acceptance, and partnership, and their focus on empowering the client within the process (a) promote collaborative focus and (b) enable the client to consider and speak about change and growth within a safe and supportive environment (Magill et al., 2019). Below, I describe MI's core components (i.e., relational and technical component) and MI's four tasks within which MI strategies and skills are typically used (i.e., engaging, focusing, evoking, planning).

MI's Relational Component

MI's relational component is derived from the principles of client-centered counseling (Miller & Rollnick, 2023). There are four relational strategies used in MI: compassion, acceptance, partnership, and empowerment, which – in combination – are referred to as the guiding spirit of MI or the "MI Spirit." The four relational strategies are summarized in Table 1. *Compassion* pertains to the practitioner's intention to prioritize the needs and well-being of the client. Compassion requires the practitioner to acknowledge their altruistic role within the process and to approach the conversation knowing they cannot demand or force change, but they can meet a person where they are and encourage growth and change as talk about it emerges within the conversation (Miller & Rollnick, 2023; p. 9).

Acceptance entails the practitioner demonstrating respect for and interest in the client as a unique individual with inherent worth. The practitioner demonstrates acceptance when they *do not* judge, shame, criticize, or voice disapproval of a client's words or actions. As Miller and Rollnick (2023) note, when a person feels accepted, they can open themselves to the idea of change; but, when a person feels unaccepted, it can result in feelings of inertia and immobilization.

Table 1. MI's Relational Strategies.

Strategy	Examples
Compassion	• Prioritizing the well-being of the client • Approaching the conversation understanding change cannot be forced or demanded • Encouraging growth and change as talk about it emerges
Acceptance	• Demonstrating respect for and interest in the client as a unique individual with inherent worth • Avoiding judgement, shame, criticism, or disapproval of the client's words or actions
Partnership	• Acknowledging the client possesses expertise about themselves • Recognizing the client must lead the process of deciding how, when, and if they move toward change
Empowerment	• Accepting the client's autonomy • Acknowledging the client possesses the strengths, abilities, and resources needed to move toward change • Identifying, highlighting, and evoking strengths • Elevating the client's power to make decisions about their own actions and behaviors

Partnership involves acknowledging that each individual possesses expertise about *themselves* and, as such, must take the lead role in the conversation and in the process of deciding how, when, and if they move towards change (Miller & Rollnick, 2023). When approaching a conversation in partnership with a client, the practitioner works collaboratively with the client. The practitioner brings their expertise to the conversation but, ultimately, is there to honor the client's own expertise and serve as "a privileged witness to change" (Miller & Rollnick, 2013; p. 16).

Finally, *Empowerment* requires the practitioner to accept the client's autonomy and recognize that their role as a practitioner is to help "evoke and call forth" the client's own wisdom, strength, and ability (Miller & Rollnick, 2023). Empowerment is a strengths-based view. It encourages the practitioner to appreciate and elevate the client's power to make decisions about their own actions and behavior.

MI's Technical Component

There are four core technical skills used in MI: Open questions, Affirmations, Reflections, and Summaries. These four skills are referenced using the acronym OARS. The practitioner uses *open questions* to (a) invite the client to speak and (b) allow them space to determine what they would like to share (Miller & Rollnick, 2023). Closed questions place the client in a passive position and make the practitioner a fact finder. Open questions, in contrast, foster the client's active engagement as they share their thoughts and enable the practitioner to learn and develop understanding.

Miller and Rollnick (2023) describe *affirmations* as the act of "noticing and commenting appreciatively on something real that you can affirm" (p. 61). Affirmations can be simple or complex. Simple affirmations (e.g., "you said that well") are easy to construct and use but may be seen as disingenuous if not used judiciously. In turn, Miller and Rollnick (2023) recommend practitioners use simple affirmations sparingly and only when there is genuine appreciation for what the client has said or done. Complex affirmations (e.g., "you're someone people can rely on") highlight "an enduring strength or admirable attribute" (p. 61). Use of affirmations focuses the practitioner on a client's strengths. As Rollnick et al. (2016) note, "behind an affirmation lies an open-minded willingness to notice positive things" (p. 37). Affirmations are useful – when used within the MI spirit – to reduce a client's defensiveness and to increase openness, especially when discussing difficult topics or information.

Reflections, the third of the four core skills, are a response to a client statement. They too can be simple or complex. Simple reflections reflect back, typically with some rewording, something the client has said. Complex reflections reflect back a client's statement as well but they also extend the client's statement as the practitioner adds meaning or emphasis to it (Miller & Rollnick, 2013). Complex reflections are essentially reasonable guesses made within the context of the client's previous statement that help propel the conversation forward. Many reflections are questions

transformed by the upward inflection of the practitioner's voice at the end of a statement (Miller & Rollnick, 2023). The value of changing a response from a question (e.g., "Was it difficult for you?") to a reflection (e.g., "It was difficult for you.") is that it encourages the client to continue sharing, whereas a question – used in the same moment – can introduce doubt into the client's mind even when it is not the practitioner's intention. More importantly, reflections allow the practitioner to highlight an aspect of something the client has said. A reflection mirrors back to the client what they have said so they can slow down, listen to, and reflect on their own words (Miller & Rollnick, 2023).

Finally, *summaries* pull together a collection of reflections. Practitioners use summaries at transition points, the end of a conversation, or at strategic points throughout a conversation (e.g., "mini summaries"). Like reflections, summaries provide the client with another opportunity to hear and reflect on their own words and they convey to the client that the practitioner is listening to and paying attention to their words (Miller & Rollnick, 2023).

MI's Four Tasks

There are four tasks in MI: engaging, focusing, evoking, and planning. The tasks are roughly linear and sequential, but are also recursive. The practitioner returns to earlier tasks as needed. During *engaging*, the practitioner works to build a collaborative and trusting relationship with the client. The task of engaging can take many forms but often can involve a process of value discovery where the client explores and identifies values important to them and the practitioner affirms those values while supporting the client's autonomy. According to Miller and Rollnick (2023), roughly 20 percent of the time spent with a client should be dedicated to establishing engagement, especially during initial interactions. For example, a practitioner likely will spend more time engaging during initial meetings when establishing a collaborative working alliance. Then, as the practitioner and client move to subsequent tasks, engaging is less prominent with the practitioner returning to it as needed to strengthen and reinforce working alliance with the client.

During *focusing*, the practitioner and client identify a common goal to help guide their conversation. Focusing is important for multiple reasons. It helps define potential outcomes of the interaction. It also helps the practitioner and client clarify the purpose of their interaction and identify topics of discussion. Within the context of school-based coaching this might involve identifying what – if any – areas of classroom management a teacher might want to discuss.

Evoking is the third task. It is arguably the most important of the four tasks and is "the task that particularly differentiates MI from other approaches" (Miller & Rollnick, 2023; p. 25). Within the evoking task, the practitioner makes strategic use of the OARS to reinforce differentially the client's statements for and against change. Thus, the practitioner does not tell the client what they should do but helps evoke and strengthen the client's own reasons for wanting to do something.

Finally, the *planning* task emerges naturally from the evoking task when (and if) the client moves from exploring *why* they want to change to discussing *how* to make change. The practitioner does not impose a change plan on the client. Instead, the practitioner evokes motivation for change during the preceding step and development of a change plan (when appropriate) occurs when the client is ready. A change plan can be simple or complex and may depend on the intervention within which MI is embedded. A change plan can be agreement on next steps; it can be the willingness to try one of a menu of options; or it can be a more formal set of agreed-upon actions that provide the client with a path forward. A change plan may also just be a first step toward change with the practitioner providing subsequent follow-up as requested by the client.

Although the aforementioned descriptions of compassion, acceptance, partnership, and empowerment sound clinical in nature, their application and the application of MI's technical skills are equally appropriate outside of a clinical setting, in general, and within a school-based setting, in particular. For example, MI's relational component speaks to the need for school-based personnel – whether working with teachers, students, or parents – to approach the interaction as a collaborative

conversation; to focus on strengths; and to allow space for the voice of the person with whom they are working. The spirit of MI shifts a behavioral coach or a school counselor (or any other school-based personnel using it) from a directing stance to a guiding stance. This is especially important in school settings where the default for many school-based personnel is to teach, instruct, and lead. This spirit – with respect to proficient use of MI – also is necessary to ensure the conversation is non-coercive. If school-based personnel *do not* use MI's technical skills in combination with the spirit of MI, their words and actions can be interpreted as an attempt to nudge or manipulate a student, teacher, or parent into doing something they otherwise would not choose to do (Rollnick et al., 2016). In the following sections, I describe the use of MI as a professional tool in school-based settings, research on MI use in school-based settings, and provide examples of how researchers are using MI to support students with or at-risk of developing a disability.

MI as a Professional Tool within School-Based Settings

The broad use of MI as a professional tool within school-based settings has been relatively untested – or at least underreported – outside of research studies that primarily have used structured protocols to facilitate use of MI's relational and technical components within MI-aligned tasks (i.e., engage, focus, evoke, plan). Recent qualitative research from a number of countries (i.e., Australia, Sweden, United States, and United Kingdom) has begun to examine facilitators and barriers to MI use by school counselors, educational psychologists, teachers, and others school-based personnel who are trained in MI and using it in their work with students, families, or fellow colleagues (i.e., coaching and consultation). Much of this work is focused on feasibility of use, which MI skills are used and prioritized, and how MI is adapted when used in school-based settings to support students.

In these studies, school-based personnel noted that training in, and use of, MI changed how they approached and interacted with students and families. They became more respectful of students, more confident in students' decision-making abilities, and more patient when working with students

(Svensson et al., 2021). They reported MI was helpful for building relationships with students, facilitating collaboration, and promoting student autonomy and follow through (Pennell et al., 2020; Pincus et al., 2019). Jones & Atkinson (2021) reported that educational psychologists found it useful when working with students who were uncertain how to move forward. Regarding work with parents, Svensson et al. (2021) reported teachers used MI to build rapport and trust and to raise difficult questions. Teachers reported the use of core MI skills increased their confidence when speaking with parents because they had tools to diffuse situations, which allowed them to create "conditions for a constructive conversation" and "manage and respond to parents' feelings in a respectful way" (Svensson et al., 2021; p. 452).

School-based personnel reported that their use of MI drew their attention to how they spoke with students, parents, and fellow colleagues. They developed greater awareness of how they formed questions, when they used open-ended questions and reflections, and which MI skills were most useful to them. For example, Svensson et al. (2021) reported that teachers used open-ended questions to help students see new opportunities and to shift students' focus during emotional outbursts. Pincus et al. (2019) reported that school counselors thought summary statements were useful because students could make corrections if something was misunderstood. They also noted that summary statements were a useful tool because students felt their words were heard and understood when echoed back to them in a summary. Svensson et al. (2021) noted the importance of affirmations which served as positive reinforcement for students and helped them "feel seen and listened to" (p. 447). In one study (Svensson et al., 2021), teachers reported integrating MI with other conversational techniques, and – in turn – were "able to create their own guiding and autonomy-supportive conversation style" (p. 445).

Respondents in these studies also noted difficulties with implementing MI skills and tasks in school-based settings. School-based personnel reported difficulties balancing a guiding and

controlling approach (Svensson et al., 2021). They found it difficult not to give advice (Jones & Atkinson, 2021; Svensson et al., 2021). They also noted difficulties identifying change talk (Svensson et al., 2021). Respondents within these studies noted that on-going contextualized training, opportunities to practice, and feedback on their use of MI were needed to ensure skillful use and continued skill development (Jones & Atkinson, 2021; Pennell et al., 2020; Svensson et al., 2021; Thomas et al., 2019), especially in contexts where school-based personnel had limited opportunities to use MI consistently (Pennell et al., 2020; Thomas et al., 2019).

Research on the Use of MI in School-Based Settings

According to a recent scoping review of MI training and fidelity monitoring in school-based settings (Small et al., under review), the majority of school-based MI studies to date have reported use of MI with students (66%) and in secondary settings (69%). A smaller but growing number of studies have reported use with parents (21%) and teachers (14.5%). The studies targeted a range of outcomes, including supporting students' social, emotional, and behavioral needs (21%); preventing or addressing teen substance use (19%); promoting healthy eating and exercise (18%); improving academic achievement (15%); bolstering teacher effectiveness (11%); and enhancing parenting skills (10%).

Researchers have integrated MI into school-based interventions and frameworks in various ways. One frequent use of MI with students is within brief screening and referral models focused on supporting students' behavioral health needs. Models such as *Screening, Brief Intervention and Referral to Treatment* (SBIRT; Curtis et al., 2014; Hunt et al., 2022) utilize MI to engage students and motivate behavior change within a brief (10-15 minutes), structured conversation between a school-based interventionist (e.g., school nurse, counselor, etc.) and a student. Similar brief screening and referral models include the *Check Yourself* intervention (McCarty et al, 2019), a technology-enhanced, MI-infused screening and brief intervention model delivered within school-based health centers

(SBHCs), and population-specific adaptations such as *SACRED Connections*, which was developed to support American Indian youth (Morris et al., 2021). Stepanchak et al. (2022) have further adapted the SBIRT model to provide broad behavioral health support to middle school students. Their model is strengths-based; is designed to connect students "with a caring adult" in the school setting; links the student to a continuum of school- and community-based supports; and expands SBIRT's screening component to include anxiety, depression, self-harm, and bullying in addition to substance use (Stepanchak et al., 2022; S50).

The most frequently cited and researched MI-infused intervention model targeting parents and caregivers within (and outside) school-based settings is the *Family Check-Up* (FCU; Dishion & Stormshak, 2007). The FCU is a brief, multi-step intervention model that includes an initial interview, an ecological assessment, a goal-focused feedback session, and optional follow-up sessions tailored to the unique needs of the family. The FCU incorporates MI's relational and technical skills to promote collaboration and family engagement, strengthen the caregiver's own motivation to change, and reinforce and empower the caregiver within the process. Most recently, researchers have examined FCU implementation with families of children in Kindergarten (Garbacz et al., 2019, 2020; Resnik et al., 2023; Stormshak et al., 2020, 2021). Within a school-based context, researchers have also examined use of the FCU with middle school students (i.e., 6th to 8th grade) and their families (Fosco et al., 2013, 2016). In addition, researchers have combined the FCU with other interventions to increase engagement and optimize impact. For example, Herman et al. (2012) described preliminary efforts to integrate a modified FCU model with the parent Coping Power program, an indicated (i.e., Tier 3) intervention for fourth and fifth grade students exhibiting signs of disruptive behavior and aggression in the classroom setting. Herman et al.'s (2012) modified version collapsed the FCU into fewer sessions (e.g., two rather than three) and focused primarily on strengthening motivation to participate, building positive expectations, and developing scaffolding

(e.g., preparing partners for teaming, addressing conflict, repairing relations) to support subsequent implementation of Coping Power.

The *Classroom Check-Up* (CCU; Reinke et al., 2011) is the most frequently cited and used MI-enhanced intervention targeting teachers. The CCU is a brief, classwide consultation model that infuses MI into its multi-step coaching process to support change in teachers' classroom management practices. Both the CCU and FCU intervention models align with core principles of brief motivational interventions (Miller & Rollnick, 2013) and, therefore, share a similar structure. The CCU includes an initial interview; collection of observation data and teacher-reported data on classroom structure, behavioral expectations, and instructional management; a personalized feedback session; a menu of intervention options; and action planning and ongoing monitoring to support implementation (Reinke et al., 2008, 2011). The CCU has been used to support implementation of other interventions (Reinke et al., 2012) and has been adapted to support the use of culturally responsive classroom management strategies (Bradshaw et al., 2018; Gion et al., 2022; Pas et al., 2016).

Other school-based coaching and consultation models have described integrating MI into their processes and procedures. For example, the *Teachers Supporting Teachers* model (Shernoff et al., 2011) and the *Classroom Strategies Coaching* model (Shernoff et al., 2015, 2017) include MI strategies that have been incorporated into coaching materials and supervision procedures (Shernoff et al., 2015). Coaches use these embedded strategies "to facilitate teacher engagement in coaching and to ensure that goals were teacher driven" (Shernoff et al., 2017). Similarly, Collier-Meek et al. (2019) have described use of "Motivational Consulting" as a strategy within school-based problem-solving consultation and Hagermoser Sanetti and Collier-Meek (2019) have developed an implementation support and evaluation model that incorporates MI into the support phase of their model to "increase the implementer's motivation to implement consistently and comprehensively" (p. 27).

They integrated a structured, 14-step MI process into a single session of their model. The MI steps were embedded in the protocol, included structured prompts (e.g., "Elicit the implementer's perception of intervention implementation"), and aligned with MI's four tasks of engaging, focusing, evoking, and planning.

Use of MI to Support Students with or at risk of Developing a Disability

Although much of the school-based research on MI has focused on use in general education settings, a growing body of research documents the use of MI to support the needs of students with or at-risk of developing disabilities or the caregivers, teachers, and other school-based personnel who support them. Below I briefly describe four example of MI-infused approaches developed to support students with or at risk of developing a disability and discuss recommended adaptations for using MI to support students with disabilities.

Sheftel et al. (2014) developed an MI-infused group intervention to support high school students "enrolled in special education and transition classes within the context of their traditional school schedule" (p. 211). Their intervention model was delivered by a special education teacher, transition specialist, or vocation rehabilitation counselor who participated in an 8-hour training in MI. The intervention was delivered across ten 1-hour group sessions that were aligned with MI's tasks (i.e., the sessions moved from engagement to planning). During these sessions, facilitators used MI-aligned activities (i.e., decisional balance, value exploration, etc.) to encourage students to think about past career aspirations, past and current work experience, skills developed while working, and what "dream job" they would like to have in the future. Students then developed a plan to obtain their dream job, including brainstorming roadblocks to getting the job and possible solutions to these roadblocks. Across sessions, the activities were designed to promote students' self-determination, self-efficacy, and expectations with respect to vocational outcomes.

Atkinson and colleagues have developed a multi-session intervention model that utilizes MI to support students who are eligible for special education supports (Atkinson & Amesu, 2007; Atkinson & Woods, 2003; Cryer & Atkinson, 2015; Snape & Atkinson, 2015; Snape & Atkinson, 2017). Versions of the model vary across studies. Here I describe the version reported by Snape and Atkinson (2015) given that this more recent version was delivered by school-based personnel rather than researchers. The school-based personnel facilitating the intervention held a range of positions, including teaching assistant, special education needs coordinator, and inclusion manager. Facilitators completed a brief, 90-minute training in MI prior to implementation. The intervention was delivered across five sessions. Session 1 focused on engaging and getting to know the students and included activities to explore the student's strengths and skills. During session 2, the student and facilitator explored "what happens on days when problem behaviors do and do not occur" (p. 73) and identified particular lessons that are more difficult or problematic for the student (i.e., curricular content that is more likely to prompt unwanted student behaviors). Session 3 focused on identifying and weighing the pros and cons of identified behaviors and helping the student "think about their motivation and ability to change" (p. 73). Finally, sessions 4 and 5 were future-focused with the student considering their future (i.e., job, health), mapping out different life courses with and without changes in their current behavior, and then developing goals and a plan to achieve those goals.

Owens et al. (2017) developed a multi-component consultation model that utilized MI to support teachers working with students with or at risk for developing ADHD. Coaches who received training in MI strategies used MI within their consultation sessions to promote teacher engagement in skill practice and to differentially respond to teachers' change and sustain talk related to their teaching practices. Specifically, the model trained consultants to first assess a "teacher's values and intervention-related beliefs" (Owens et al., 2017; p. 220). The consultant then evoked

change talk about the teacher's desire for change or reasons for change as they related to the benefits of implementing the intervention and evoked change talk about the teacher's belief in their ability to implement the intervention. Finally, if the teacher identified a possible implementation barrier, the consultant worked with the teacher to explore and consider alternative beliefs.

Finally, Forber-Pratt et al. (2024) described a 9-week, one-on-one MI intervention model, the "Peace over Drama" leadership program, developed to support the social-emotional skill development of middle school students with or at-risk of developing a disability. Their pilot model was delivered by graduate-level psychology students who participated in a one-day MI training. The model consisted of three phases. During phase 1 (weeks 1-3), the student and facilitator participated in engagement activities designed to build rapport. Facilitators used different tools (e.g., interviewing worksheets, emotion cards, storytelling prompts) to learn more about the student's interests, personality, experiences, interests, strengths, and their social and familial support systems. Tools were developed to accommodate differences in how students process and learn new skills and information. During phase 2 (weeks 4-6), the facilitator shifted to focusing and evoking tasks designed to help the student identify a focal issue. These sessions were again supported by activities and tools (i.e., SWOT worksheet, Stress and Coping Skill Worksheet) to "help students communicate their feelings and express their experiences" (Forbert-Pratt, 2024; p. 41). During these sessions, the facilitator used "reflective thinking questions," "empathy-driven questions," and affirmations to promote students' perspective taking, encourage students to learn and talk through how to apply new strategies, and help students explore past experiences responding to difficult situations. Finally, during the action planning phase (weeks 7-9), students identified the coping skills they thought would most benefit them going forward. The focus of this final phase was on planning but also encouraging students to see they could make positive change.

The majority of aforementioned models utilize a similar structure and align with the four MI tasks (i.e., engage, focus, evoke, plan). Yet, despite these common elements, there is also a need – especially when supporting students with disabilities – to adapt MI use to ensure that it is appropriate and understandable to individual students. As one example, Forber-Pratt et al. (2024) described the use of "experiential tools" such as visuals and worksheets to accommodate differences in how students process and learn new skills and information (p. 40). Recommendations are beginning to emerge to facilitate adaptation of MI for individuals with specific disabilities, including ADHD, Autism, or a mild intellectual disability (Frielink & Embregts, 2013; Gersib, 2023). These recommendations focus on the form, structure, and content of MI-infused conversations with individuals with disabilities. For example, Svensson et al. (2021) recommended (a) providing additional time to process and respond; (b) using visual strategies such as scales rather than open-ended questions; and (c) frequently asking permission, summarizing, and repeating parts of the conversation when using MI to support students with Autism. With respect to student with Autism, Gersib (2023) added affirmations should be consistent, predictable, and should not exaggerate something done well. They also recommended breaking change into small, manageable steps. Frielink and Embregts (2013), when using MI to support individuals with a mild intellectual disability and challenging behavior, made numerous recommendations, including (a) using language that is clear and concrete; (b) using simple, short sentences; (c) asking one question at a time; (d) leaving sufficient time for a response; and (e) avoiding use of the word "why" to start a question because it can imply accountability and elicit a negative response. They also recommended the use of verbal and non-verbal affirmations for students with mild intellectual disability, personalizing affirmations, providing frequent summaries between topics, and the use of visuals (e.g., pictures, film fragments) and participatory methods (e.g., drawing, role playing) to support understanding of questions.

Extending MI Use within the Field of Special Education

Despite the current use of MI within the field of special education and proposed adaptations to support specific groups of learners, there are numerous opportunities for its broader use if cost-effective training models are available to support the skill development of school-based personnel as they learn to use MI. In this section, I will highlight three areas within the field of special education where researchers *have not* proposed use of MI but where integration of MI into conversations and more structured, manualized supports holds potential to improve practices and processes in support of students, families, and teachers. These three areas are (a) improving Section 504 planning and implementation (b) increasing parent engagement in the Individualized Education Program (IEP) process, and (c) enhancing support for special education teacher retention.

Improving Section 504 Plan Implementation

The field of special education could benefit from the development of a brief, MI-enhanced decision-making framework to support the Section 504 planning and implementation processes. Within school settings, a 504 plan is one mechanism to ensure students with disabilities have access to accommodations that ensure they receive a Free and Appropriate Public Education (FAPE). *Section 504 of the Rehabilitation Act of 1973,* prohibits schools from treating students with disabilities unequally and typically – at least within academic settings – involves providing students with instructional accommodations or testing and assessment accommodations (Lovett & Nelson, 2021; Yell, 2019). Within the 504 planning and implementation process, a number of factors contribute to inconsistent implementation. First, as a civil rights law, implementation of 504 plans fall under general education rather than special education. This alone can hinder implementation since many general education teachers are unaware the law even exists (Yell, 2019). Second, Section 504 is an unfunded mandate, meaning there are no federal dollars attached to implementation (Yell, 2019; Zirkel & Weathers, 2015). Third, specification of how teachers will implement accommodations,

who will oversee implementation, and what accountability mechanisms will ensure implementation are often vague or altogether absent (Hustus et al., 2020). Fourth, even though failure to implement a 504 plan is "a violation of federal law and local policy" (Yell, 2019), most state and district-level guidance focuses on describing the law, discussing eligibility requirements, defining roles, and providing templates to guide 504 plan development (e.g., referral form, notice to parents, checklist of possible accommodations) rather than on implementation. Finally, some teachers, parents, and students express ambivalence, frustration, or – on the part of some teachers – outright opposition to 504 plan implementation (Lovett & Nelson, 2021). In combination, the aforementioned factors leave schools with limited resources to ensure proper implementation of students' 504 plans, limit teachers' understanding of their legal obligation to ensure a student is receiving the supports as written, and place students – and, by extension, their families – in a position of having to monitor and ensure implementation.

Training 504 Plan Coordinators in MI and developing a brief MI-infused framework to support Section 504 planning processes could address a number of factors limiting implementation and, in turn, improve the academic outcomes of students with disabilities. For examples, schools could use a process (similar to the SBIRT model) to systematically screen, identify, and refer eligible students to a school-based team. This step alone (screen, identify, and refer) would ensure schools meet "child find" requirements under Section 504 (Yell, 2019). Then, students who are eligible would participate (along with their parents) in a team-based, MI-infused meeting during which the student's needs are identified and aligned with evidence-based accommodations. MI's core tasks of engaging, focusing, and planning lend themselves to integration within stepped decision-making frameworks. The process of value discovery within MI's engagement task could prove particularly useful to facilitate understanding of a student's individualized needs. MI's relational components would help center the process on the student, encourage school-based team members to acknowledge the

expertise students and families possess about themselves, and facilitate collaboration and engagement among team members. Finally, if a 504 Plan Coordinator was proficient in MI's technical skills, they could strategically use open questions to create space for the students to share their perspective. They could use affirmations to reduce defensiveness and increase openness when discussing difficult decisions and they could use reflections to respond differentially in a supportive and non-coercive way to feelings of ambivalence, frustration, and opposition among team members. Although the Coordinator's use of MI could focus solely on the student within the process, a team-based focus targeting students, parents, and teachers could be most beneficial in this context given the competing and conflicting opinions and perceptions of different team members reported in the literature.

Parent[1] Engagement in the IEP Process

The field of special education also could benefit from incorporating MI's relational and technical skills into processes for IEP development. Under the Individuals with Disabilities Education Act (IDEA), parents are core member of the IEP team and equal partners in decisions pertaining to IEP development and placement. From a procedural standpoint, IDEA mandates schools take certain steps to increase the likelihood of parent engagement. For example, schools must (a) provide sufficient advance notification about IEP meetings; (b) make a good-faith effort to schedule meetings on a mutually agreeable day and time; (c) provide up-front information about the purpose, time, and location of the meeting; (d) provide alternative methods for attending; and (e) share a copy of the IEP if requested (Yell, 2019). Yet, despite the procedural safeguards in place under IDEA to facilitate parents' engagement, research suggests a number of barriers impede *meaningful* parental engagement. For example, within meetings, parents face unequal power dynamics, have limited

[1] I use the term parent and parents here because it aligns with the terminology used in the IDEA statutes (20 U.S.C. 1414[d][1][B]).

opportunities to provide input (i.e., are treated as passive recipients rather than active participants), and – even when provided opportunities to contribute – report their ideas and suggestions are not included (Cavendish & Connor, 2018b; Tucker & Schwartz, 2013; Zeitlin & Curcic, 2014). Furthermore, these barriers compound and are particularly disempowering for parents with intersecting identities (Cavendish et al., 2018a).

The incorporation of MI into IEP processes holds the potential to facilitate parent-school collaboration, promote perspective taking among school-based personnel, and – in turn – move parental engagement beyond compliance to sincere involvement. For example, providing special educators and others involved in IEP processes (i.e., school psychologists, principals) with training in MI and building MI into collaborative decision-making frameworks that center the child and their parents in the process, IEP teams could empower parents and afford them opportunities to provide more meaningful input. Additionally, providing school-based personnel with a set of relational and communication skills that emphasizes acceptance, compassion, partnership and the empowerment of those they are serving could help shift their approach to IEP processes and encourage them to seek, support, and value parent input.

Special Education Teacher Retention

The field of special education is grappling with (a) growing concerns among special educators about the manageability of their workload, (b) increased rates of teacher burnout and attrition, and (c) shortages in qualified teachers (Cormier et al., 2022; Hester et al., 2020; Mason-Williams et al., 2020; Peyton et al., 2021). Increasingly, teaching is no longer a life-long career (Glazer, 2018) despite most early-career teachers entering the field with the intent to stay (Hughes et al., 2012; Scott et al., 2022). When good teachers leave the profession for the wrong reasons, it is an "educational loss" to the field (Kelchtermans, 2017; p. 965). Unfortunately, the field of special education is providing many special educators with a myriad of "wrong reasons" to leave. As one example, when teachers

perceive their workload as manageable they experience less emotional exhaustion but when they perceive it as unmanageable it is a significant predictor of stress, burnout, and – ultimately – attrition (Bettini et al., 2020). For special educators, the nature of their job alone can make the workload seem unmanageable. From week to week, special educators navigate a variety of roles and responsibilities. They support the social and academic needs of diverse groups of learners with a range of disabilities. They provide supports in a variety of academic content areas across several settings, interact with a range of school personnel and families, and negotiate complex legal requirements. These matters are even more complex in small, understaffed, or rural districts where special educators often face increased caseloads, fewer resources, and may be required to work across multiple schools (Cornelius et al., 2020; Urbach et al., 2015; Woolf, 2019).

MI cannot replace the need for systemic or organizational change nor can it supplant extrinsic motivators such as increased compensation or support, which help reduce teachers' dissatisfaction (Scott et al., 2022; Tran & Smith, 2020). Yet, as a human-centered approach, MI can improve teachers' satisfaction by fostering shared understanding of, *and* a response to, the complex, interacting factors that push teachers out of the profession. In a recent article, Tran and Smith (2020) noted that identifying solutions to teacher retention must begin with empathy – with school administrators developing a deep understanding of the needs, wants, fears, and frustrations of teachers. MI would lend itself to these processes in many of the ways mentioned before (i.e., centering the teacher, prioritizing the needs and well-being of teachers, etc.). From a process standpoint, however, MI would look different in this context. Group-based implementation would be most beneficial with a facilitator trained in MI guiding teachers and administrators through the process. During engagement, the facilitator could identify teachers' values important to their own persistence within the profession while also creating an environment in which administrators develop empathy and understanding of teachers' needs. During focusing, facilitators would guide the

identification of organization-level areas for improvement. Then, during a solution-generating phase aligned with MI's evoking and planning tasks, the facilitator could use MI's technical skills to facilitate identification of opportunities for organizational change with a focus on administrators, in particular, given their role in affecting change within the broader system.

Training Transfer

As a first step toward understanding what is necessary to ensure school-based personnel develop sufficient skills and knowledge to use MI proficiently within school-based settings, it is beneficial to understand the training transfer literature. The term training transfer pertains to the extent to which a trainee translates the knowledge and skills gained during training to their day-to-day work environment (Ford et al., 2018). The successful transfer of training knowledge and skills to daily use is contingent on a number of conditions. First, trainees must retain declarative and procedural knowledge and maintain any skills acquired during training. Then, they must use the newly acquired knowledge and skills within their daily work routines. Finally, they must integrate and refine their knowledge and skills through repeated use and reflection to ensure generalization and optimize the effectiveness of what they learned (Blume et al., 2019; Ford et al., 2018; Nielsen & Shepard, 2022).

The complexity and difficulty of training transfer depends on skill type. Yelon et al. (2014) distinguish between closed skills and open skills. Training transfer for closed skills involves teaching a task that a trainee must complete in a specific way. Teaching staff how to submit a timesheet via an online payroll portal is an example of transferring a closed skill. There are specific procedures and steps the staff member must follow to complete the task successfully (e.g., log into system, navigate to time entry log, enter time, etc.). In contrast, Yelon et al. (2014) describe open skills as "ideas, rules, principles, or procedures" that guide actions. For open skills, how a trainee uses what they learned in training depends on individual need, ability, creativity, and context. There is also an element of choice with open skills. A trainee can choose whether to transfer their learning from the

training environment to their work environment. In general, training in any evidence-based practice (EBP) entails transfer and use of open skills. Even if a training is mandated and the trainers emphasize fidelity to procedural guidelines, *if* and *how well* a participant actually implements the EBP hinges on a myriad of interpersonal and contextual factors. The use of open skills will vary – to some extent – on each implementation occasion with variability diminishing as generalizability and fluency (i.e., proficiency) increases.

Training Transfer Models

Researchers from a range of disciplines have developed models to explain skill development and training transfer. One strand of model development focuses broadly on within-system training transfer and the individual and organizational factors influencing skill acquisition and use. Examples of *within-system models* include: (a) the Transfer of Training Model (TOT; Baldwin & Ford, 1988); (b) the Dynamic Transfer Model (DTM; Blume et al., 2019); and (c) the Integrated Training Transfer and Effectiveness Model (ITTEM; Nielsen & Shepherd, 2022). Another strand of model development focuses broadly on within-individual training transfer, identifying cognitive and skill-based processes and attitudinal and relational mechanisms that influence the uptake and use of skills. Examples of *within-individual models* include: (a) the Outcome-based Training Transfer (OTT) Model (Kraiger et al., 1993); (b) the Declarative, Procedural, and Reflective (DPR) Model (Bennett-Levy, 2006); and (c) the Longitudinal Education for Advancing Practice (LEAP) Model (McLeod et al, 2018). I describe each of these models briefly below.

Transfer of Training Model. The TOT model is an early model depicting the training transfer process. The TOT model describes training transfer as a linear process moving from inputs (i.e., trainee characteristics, training design, and work environment) to outputs (i.e., learning and retention) and then to conditions of transfer (i.e., generalization and maintenance). The model also posits direct and indirect effects for how inputs affect training transfer. The TOT model describes

the three training inputs as having a direct effect on training outputs. With respect to conditions of transfer, the model depicts direct effects of (a) trainee characteristics (input), (b) work environment (input), and (c) learning and retention (output) and an indirect effect of training design (input) mediated by what the trainee learns and retains during training (i.e., training outputs).

Dynamic Transfer Model. DTM includes three-phases: Training, first transfer attempt, and second transfer attempt. The model depicts how individual-level and contextual factors interact with and influence training transfer across time. It also places particular emphasis on evaluation-informed feedback loops that enhance intent to transfer during the two transfer attempt phases. Blume et al. (2019) state their model takes a "dynamic interactionist perspective," noting that the model "highlights the impact and importance of the early experiences (and choices)" and the "reciprocal interaction of various person, situation, and criterion constructs on transfer as it unfolds over time" (p. 271). A unique aspect of this model is the interaction of individual and contextual factors with the three training phases over time. Training and training transfer attempts influence (and are influenced by) the trainee and their work environment.

Integrated Training Transfer and Effectiveness Model. ITTEM integrates the TOT model (Baldwin & Ford, 1988) and the DTM model (Blume et al., 2019). It also leverages recent training transfer and effectiveness literature to construct a five-phase training evaluation model. The five phases of Nielsen and Shepherd's (2022) model are (a) pre-training, (b) training, (c) post-training, (d) 1st follow-up, and (e) 2nd follow-up. The ITTEM model considers individual and organizational enabling factors at each phase and proposes the collection of emotional, cognitive, and behavioral outcomes across phases. At *pre-training* (Phase 1), the ITTEM model defines individual and organizational factors that influence trainees' intent to attend training. At the individual level, factors include learning goal orientation (i.e., trainees' motivation to set and achieve learning goals), conscientiousness, learning self-efficacy (i.e., trainees' belief in their ability to acquire knowledge and

skills), and voluntary participation (i.e., the absence of pressure to attend training). Pre-training organizational factors include supervisor support and communication. Nielsen and Shepherd (2022) posit that increased supervisor support (e.g., encouraging attendance and emphasizing the importance of knowledge and skill development) coupled with organizational communication about the objectives and benefits of training increase trainees' intent to attend. During *training* (Phase 2), focus shifts to methods for promoting trainees' engagement in training. Training content and design influence the extent to which trainees' engage with, and learn from, the training. Nielsen and Shepherd (2022) note that a training's objectives and intended outcomes must be understandable to trainees and that training content must be meaningful and relevant. From a design standpoint, training content should incorporate activities closely resembling real-world implementation, utilize multiple learning strategies, include opportunities for discussion, incorporate error management strategies (i.e., opportunities to make and learn from mistakes), and offer opportunities through role play and other strategies to repeat and implement learning. Individual enabling factors during training mirror those described in the pre-training phase. Organizational factors include (a) providing trainees with time to attend trainings and (b) creating and supporting opportunities to use and practice skills in the work environment. At *post-training* (Phase 3), focus shifts to factors promoting trainees' active engagement in transfer attempts. Nielsen and Shepherd (2022) identify trainees' intent to transfer and work-related self-efficacy (i.e., trainees' belief in their ability to manage work-related challenges) as two important individual-level factors following training. At an organizational level, they stress the need for creating a "transfer climate" that enables knowledge and skill use, adjusts workload to accommodate practice and use, and provides supervisor and peer support to encourage skill application. Phases 4 and 5 (*1st and 2nd follow-up*) of the ITTEM model capture the iterative nature of skill development and the temporal nature of skill refinement. Training transfer occurs through active repetition. Successful transfer attempts strengthen skills and

spur continued implementation whereas unsuccessful attempts (i.e., depletion cycles), particularly within an unsupportive organizational context, increase the likelihood trainees will abandon the training transfer process.

Outcome-based Training Transfer Model. The OTT model situates cognitive, skill-based, and affective outcomes within a temporal training transfer process. Kraiger et al. (1993) describe three categories of cognitive outcomes that capture knowledge refinement over time and align with the acquisition of declarative (i.e., what), procedural (i.e., how), and conditional (i.e., when, where, and why) knowledge. The three cognitive outcomes are: (a) verbal knowledge, (b) knowledge organization, and (c) cognitive strategies. *Verbal knowledge* is "task-relevant knowledge" that is "a necessary but not sufficient condition for higher order skill development" (Kraiger et al., p. 313). *Knowledge organization* involves the creation of meaningful and complex knowledge structures (e.g., mental models) that enable the organization and deeper understanding of information. Finally, *cognitive strategies* pertain to the development and refinement of strategies to rapidly and fluidly access and apply knowledge. Development of cognitive strategies is an on-going process that involves compiling information and developing "more elegant task strategies" to enhance knowledge access and application (Kraiger et al., 1993; p. 315). Skill-based outcomes develop in tandem with cognitive outcomes but target the acquisition of technical or motor skills across three definable stages: initial skill acquisition, skill compilation, and skill automaticity. *Initial skill acquisition* occurs when participants translate declarative knowledge to procedural knowledge. During initial skill acquisition, a participant's task and response time slow due to an increased reliance on mental rehearsal and working memory. During *skill compilation*, trainee combine discrete behaviors into domain-specific routines (a process described as proceduralization) and mentally group and link procedures into successive steps (a process described as compilation). At this stage, proceduralization and composition occur concurrently, resulting in improved performance and reduced errors. Kraiger et

al. (1993) note that during skill compilation trainees begin to understand when a skill is useful (i.e., contextual considerations), start to use learned skills in different settings (i.e., initial generalization), and begin to modify and adapt skill use to specific situations. Through continual and on-going use and practice, a trainee reaches *skill automaticity,* a level of skill use defined as "fluid, accomplished, and individualized" (p. 317). When a trainee achieves skill automaticity, the demands on cognitive resources diminish (i.e., reduced cognitive load), allowing focus to shift to secondary tasks or to address extraneous cognitive demands. Kraiger et al.'s (1993) final set of outcomes address changes in attendees' attitudes, motivation, or goals. They describe these affective outcomes as typically being secondary to knowledge and skill development. Examples of affective outcomes include strengthening organizational commitment, norm acceptance, and skill-aligned values; promoting intrinsic motivation; enhancing self-efficacy; and strengthening goal commitment.

Declarative, Procedural, and Reflective Model. Bennett-Levy's DPR model (Bennett-Levy, 2006) takes an information processing perspective, distinguishing between declarative, procedural, and reflective systems that guide skill acquisition, development, and refinement. The DPR model is a cognitive model of therapist skill development. In turn, the model focuses on client-therapist communication and how the therapist (a) obtains knowledge via the declarative system, (b) integrates it into skills expressed within the procedural system (through client-therapist interactions), and then (c) refines those skills within the reflective system. The DPR model defines three types of declarative knowledge: conceptual, interpersonal, and technical. Then, in the procedural system, "declarative understandings become actualized in practice and refined" (Bennett-Levy, 2006; p. 64). Bennett-Levy situates conceptual, relational, and technical skills within a *self-as-therapist schema*, which includes not only these skills but also the procedures and rules to organize them (e.g., when-then rules) and the therapist's attitude (i.e., their relational attitude towards clients in terms of warmth, understanding, respect, and genuineness). Within the DPR model's procedural system, skills are

organized and expressed through the therapist's responses to their client. During this process, however, factors outside the *self-as-therapist schema* affect skill use. These include the therapist's *self-schema* and their *interpersonal perceptual skills*. The therapist's *self-schema* pertains to pre-established knowledge, skills, attitudes and personal attributes developed outside the therapist professional role. *Interpersonal perceptual skills* that affect both the therapist's *self-schema* and *self-as-therapist schema* and, in turn, their use of interpersonal, conceptual, and technical skills, include empathy, mindfulness, and reflection-in-action. Bennett-Levy defines reflection-in-action as the therapist's ability "to process complex information as it is happening, and derive appropriate plans of action" (p. 65). These perceptual skills dictate how receptive and attuned the therapist is to a client's in-the-moment needs and influence how and when the therapist uses skills learned during training. Finally, skill refinement occurs within the reflective system where the therapist engages in "reflection-on-action" (i.e., reflection after a client-therapist interaction). It is through "reflection-on-action" that the therapist develops expertise and is able to "make finer and finer differentiations between different situations and circumstances" and "develop a progressively more sophisticated set of when-then rules, plans, procedures, and skills" (p. 68). In other words, the therapist's "reflection-on-action" outside the client-therapist interaction (e.g., reflective practice) improves their in-the-moment "reflection-in-action" during subsequent client-therapist interactions thereby making them more responsive to their client's needs and better able to apply learned skills fluidly, efficiently, and effectively. Although Bennett-Levy's DPR model is specific to therapeutic interactions, it is equally applicable to the implementation of EBPs outside clinical settings, especially EBPs like MI that are heavily reliant on the implementer's communication skills.

Longitudinal Education for Advancing Practice Model. McLeod et al.'s (2018) LEAP is a mechanistic model that integrates aspects of previously discussed within-systems models (e.g., organizational and individual factors influencing use) but focuses primarily on within-person change

that occurs during training and consultation. First, the LEAP model defines training and consultation inputs that influence training outcomes. These inputs include a trainee's previous experience, their pre-training attitudes and motivation, and the organizational environment in which they work. The model then situates learning within a longitudinal framework that begins with performance (i.e., skills and knowledge that are still fluctuating) and progresses to long-term learning (i.e., lasting and stable skills and knowledge). Performance begins during training. Long-term learning emerges over time with the support of on-going consultation. Within this learning process, the LEAP model distinguishes between (a) cognitive-based mechanisms, (b) skill-based mechanisms, and (c) attitude and relationship-based mechanisms. LEAP's three cognitive-based mechanisms (i.e., declarative knowledge, knowledge organization, and cognitive strategies) and three skill-based mechanisms (i.e., initial acquisition, compilation, and automaticity) align with Kraiger et al.'s (1993) work with respect to sequencing and definition. The LEAP model's attitude and relationship-based mechanisms include trainee attitudes, self-efficacy, and their alliance with the training consultant. Finally, the LEAP model delineates two sets of outcomes impacted by the longitudinal learning process: treatment integrity and any clinical outcomes pertaining to the specific EBP.

In combination, these six training transfer models highlight the complex, multi-dimensional nature of the training transfer process. The models identify individual and organizational factors that moderate training outcomes (i.e., determinants); yet these same factors can be targeted within trainings (i.e., mechanism) and can mediate change in proximal and distal training outcomes. Figure 1 integrates and adapts earlier depictions of the training transfer process (Bennett-Levy et al., 2006; Kraiger et al., 1993; McLeod et al., 2018; Small et al., 2014), providing an integrated depiction that incorporates within-system and within-individual models.

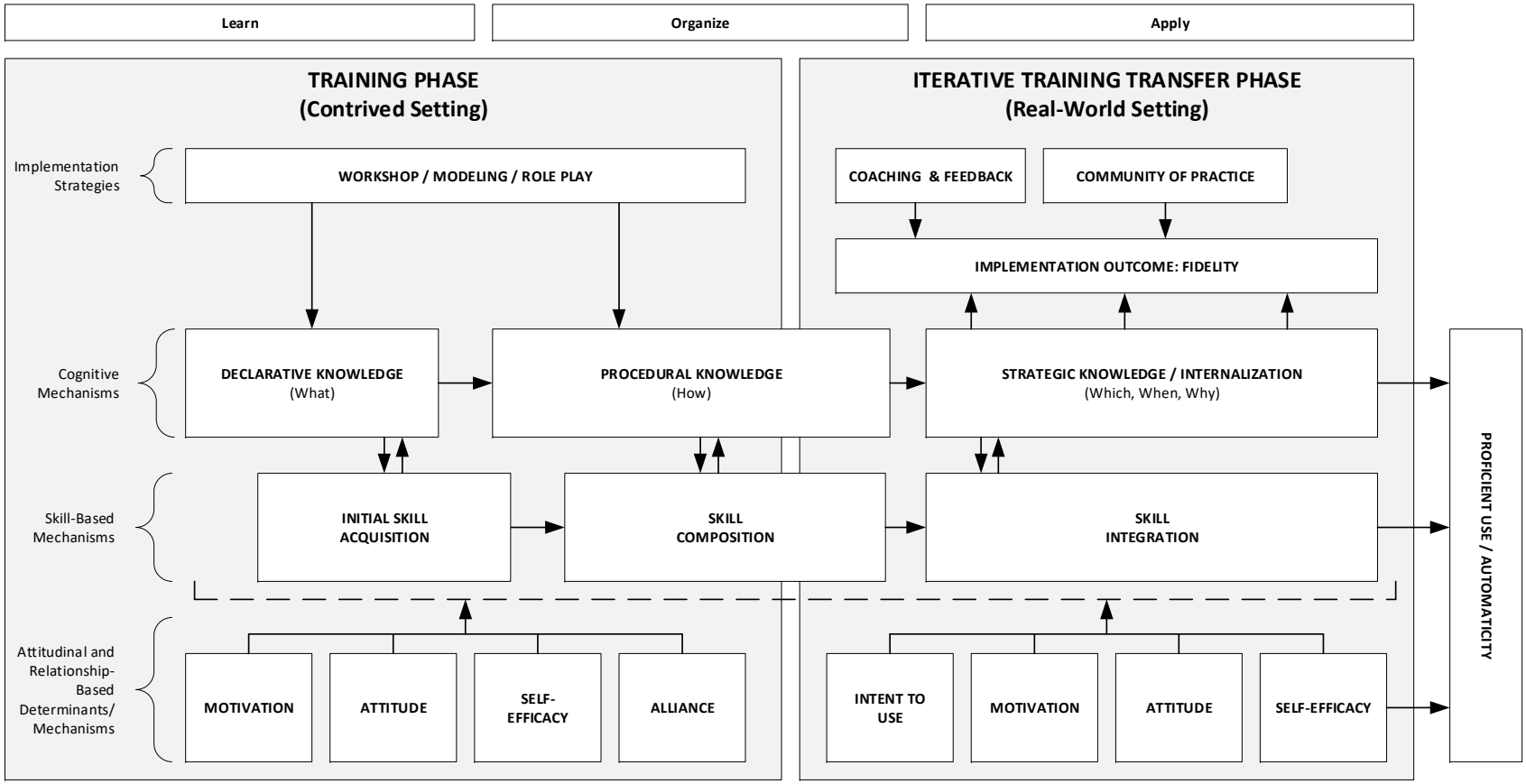

Figure 1. An Integrated Model of Training Transfer.

Training and Training Transfer within Implementation Science

The Expert Recommendations for Implementing Change (ERIC) Project identified eleven implementation strategies under the category of "train and educate stakeholders" (Kirchner et al., 2018; Powell et al., 2015). The School Implementation Strategies, Translating ERIC Resources (SISTER) Project subsequently adapted these for school-based settings but made only surfaces changes to the strategies specific to training (Cook et al., 2019). Nine of the eleven strategies are relevant to knowledge and skill transfer.[2] The taxonomy literature does not organize the strategies by function but the nine relevant strategies pertain broadly to (a) training content, (b) training delivery, and (c) training maintenance. Two strategies refer to *training content*: develop educational materials and distribute educational materials. Three strategies refer to *training delivery*: Work with educational institutions, conduct ongoing training, and make training dynamic. The final four strategies refer to *training maintenance*: Use train-the-trainer strategies, provide ongoing consultation/coaching, shadow other experts, and create a professional learning collaborative. Definitions of each of these strategies and proposed functions of each of these strategies are available in Table 2.

In a recent paper, Lyon et al. (2022) focused on two "cornerstone" and "complementary" implementation strategies: *initial training* and *post-training consultation* (p. 2). They described initial training as a combination of didactic and interactive content (e.g., role play or demonstrations). They defined post-training consultation as "practice-specific" support provided within the delivery setting (e.g., school) by an individual with expertise in the intervention (p. 2). This emphasis on initial training and post-training consultation as cornerstone strategies to support implementation of EBPs aligns with (a) the two-phases within the training transfer literature (i.e., training phase and training transfer phase) and (b) the Active Implementation Research Network's (AIRN) competency drivers.

[2] The other two strategies refer to pre-implementation activities that precede training: conduct educational meetings and conduct educational outreach visits.

Table 2. Implementation strategies pertaining to training and training transfer.

Domain Strategy	Definition[†]	Function
Training Content		
• Develop educational materials	• "Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about new practices and for school personnel to learn how to deliver the new practices with fidelity."	• Support knowledge transfer • Support implementation with high fidelity
• Distribute educational materials	• "Distribute educational materials (including guidelines, manuals and toolkits) in person, by mail, and/or electronically."	• Make education materials accessible to program implementers
Training Delivery		
• Work with educational institutions	• "Encourage educational institutions to train school personnel in new practices on a pre- and/or in-service basis."	• Increase training quality
• Conduct ongoing training	• "Plan for and conduct training in new practices in an ongoing way."	• Initial knowledge and skill transfer • Ongoing training to support penetration and fidelity
• Make training dynamic	• "Vary the information delivery methods to cater to different learning styles, structures for professional development, and shape the training in new practices to be interactive."	• Increase engagement • Increase likelihood of knowledge and skill transfer
Training maintenance		
• Use train-the-trainer strategies	• "Train designated school personnel to train others in new practices."	• Build "on-site" capacity to ensure sustained use • Enable training of new staff

Domain Strategy	Definition[†]	Function
• Provide ongoing consultation/coaching	• "Provide ongoing consultation/coaching with one or more experts in the strategies used to support implementing new practices."	• Support skill practice • Promote skill refinement
• Shadow other experts	• "Provide ways for key individuals to directly observe experienced people engage with or use new practices."	• Refine knowledge and understanding of skill application
• Create a professional learning collaborative	• "Facilitate the formation of groups of school personnel within or between school systems to foster a collaborative learning environment to improve implementation of new practices."	• Information sharing • Skill refinement

[†]Definitions are from Cook et al. (2019; p. 925)

The AIRN (2024) describes training and coaching as "the principal implementation methods by which behavior change is brought about" ("Coaching" section). The AIRN makes a number of recommendations with respect to training and coaching. First, a content expert who is also a highly skilled teacher should deliver training. Second, training should emphasize skill development, include opportunities for trainees to practice, and should include positive, constructive feedback. They note, for example, that during training "skills are practiced and re-practiced until criteria for competence are reached" ("Training" section). Third, coaching is essential because staff develop and refine their skills on the job. Finally, an effective coach is able to engage trainees, facilitate skill use and practice, and offer advice and feedback to enhance further skill development.

Although the ERIC and SISTER taxonomies facilitate broad classification across studies, they lack a much-needed level of specificity to enable clear differentiation between training approaches and techniques at a granular level and to promote consistent use of terminology. For example, Lyon et al. (2011) identified nine shared training techniques across six training approaches (i.e., academic detailing, inter-professional education, problem-based learning, coaching, reminders, self-regulated learning) that provide greater specificity but are not differentiated within the existing taxonomy. The nine training techniques included use of "interactive didactics" (e.g., role play), goal identification, small group discussion, critical thinking, self-reflection, peer collaboration, independent access to information, direct feedback, and follow-up.

As another example, Valenstein-Mah et al. (2020) conducted a systematic review of training methods for delivery of evidence-based psychotherapies. They identified a range of training formats (e.g., online training, in-person training, in-person workshop) and included additional add-on components not captured in the taxonomy such as supportive calls, booster sessions, and in-person peer consultation. Frank et al. (2020), in a systematic review of training approaches, distinguished between training approaches by modality. They distinguished between five approaches: workshop

only, workshop and consultation, online training, train-the-trainer, and intensive training, which they defined as 20+ hours of training and inclusion of at least two additional training components (e.g., consultation, a learning collaborative, direct observation of practice, etc.). As a final example, Vamos et al. (2023) identified 15 "techniques" that they defined as "an implementation strategy" (p. 1). In their paper, they defined "train the trainer" as a technique as opposed to a separate strategy and described variations of a professional learning collaborative as separate techniques (e.g., journal club, lunch and learn, grand rounds). As the above examples highlight, this lack of specificity translates into varied use of terminology when discussing different training approaches and limits – as one example – the ability to compare costs and to identify cost-effective training techniques and modalities. In addition, further granularity would be useful to harmonize terminology use and facilitate future research about which training methods work, for whom, and when.

MI Training Transfer

As a communication-based approach to behavior change, proficient use of MI requires a practitioner to listen skillfully, respond strategically, and – at a minimum – modulate their tone of voice appropriately in response to client statements so that they generate, as one example, accurate and meaningful reflections (e.g., inflect voice downward to change a question to a simple reflection). Miller and Rollnick (2023) have described this verbal exchange within MI as a dance led by a practitioner who must guide different partners. Similarly, Manuel et al. (2022) have likened MI to improvisational jazz. It involves "a complex mixture of group collaboration, creativity, and interaction" which leads – in the context of MI – to a co-constructed conversation (p. 8). These metaphors highlight the important role the practitioner plays and the effect a practitioner's skill can have on the process. A practitioner must be able to implement MI adeptly and consistently with a range of clients, who may enter the behavior change process at different starting points, with varied levels of engagement, and – at times – different opinions about why they are even having a

conversation about their values, beliefs, and behavior. These metaphorical depictions of MI use also align with the AIRN's (2024) claim that "practitioners *are* the intervention" in human services ("Coaching" section). As they note, a practitioner uses their words and actions to deliver an intervention, doing so within a "transactional interplay between practitioner and recipient" with each affecting the other "in complex ways" ("Coaching" section). This emphasis on the contextual and interactional complexity of intervention delivery is intended to highlight the need for practitioners during training transfer to have time (for reflection) and support (via coaching and consultation) to (a) refine their skills and (b) "become themselves" within the process (Manuel et al., 2022; p. 8).

There is ample evidence to suggest MI proficiency varies with respect to practitioner, client, and contextual factors. Researchers have described this variation in proficiency as it relates to sources of variability in the quality of MI delivery. Dunn et al. (2016), for example, have discussed sources of variability pertaining to the characteristics of the practitioner, the client, and the interaction between the two. Imel et al. (2011) found therapists' MI skills were not consistent across clients served and discussed the "mutual influence" (i.e., interactional variability) between a practitioner and client. They suggested variability in MI quality was attributable to the influence of "client effects" and "relationship effects." Finally, Hallgren et al. (2018) examined variability at the provider-level (e.g., education level, past exposure to MI training sessions), session-level (e.g., severity of a client's needs, motivation for change), and site-level. They reported higher levels of within-provider than between-provider variability and noted even highly competent providers struggled to implement MI consistently with fidelity depending on the circumstances (e.g., extraneous contextual stimuli).

In combination, the interplay between practitioner characteristics, client characteristics, and context, speak to a myriad of factors that not only influence the quality of MI delivery but also complicate the training transfer process. Well-designed MI trainings promote the development of procedural knowledge through, for example, opportunities to engage in repeated practice of

technical skills (e.g., reflections) via behavioral rehearsal (e.g., role play) and feedback. Yet, within a training context, contextual factors are controlled and scenarios are contrived. When transitioning to actual use of MI in authentic (i.e., real-world) settings, practitioners must negotiate the increased cognitive load associated with *actually* using MI. Setting aside contextual factors, at a minimum a newly trained practitioner when using MI must attend to the client's words and negotiate their own use of specific technical skills in response to the client's words. Perhaps more importantly, they must negotiate these acts of listening and strategic communicating in "real time," which is no easy task when considered within the context of language production theory. Below I briefly discuss Cognitive Load and Language Production as they relate to training transfer and the use of MI in real-world contexts.

Cognitive Load. Cognitive load theory (CLT) is a psychological theory originally developed to explain the effects of instructional design on cognitive load and learning during acquisition of domain-specific knowledge in learning settings such as classrooms (Moreno & Park, 2010; Sweller, 2023; Sweller, 2024). The theory provides a framework for explaining how structured, intentionally designed content can help reduce the burden of incoming, novel information on participants who may have limited knowledge of a content area. CLT builds upon models of human memory that conceptualize the development of "knowledge networks" or cognitive schemata as a multi-step, iterative process where information moves via sound and image into working memory where it is then encoded and stored in long-term memory (Leppink et al., 2015; Young et al., 2014). Once a cognitive schema exists in long-term memory it can then be retrieved or pulled back into working memory and can be expanded upon or refined before, again, being encoded and stored in long-term memory. In CLT, the limited capacity of working memory can result in overload if a novice learner has insufficient schema to draw upon from long-term memory or if a trainer does not present novel

information in a way that scaffolds the learning process and facilitates the development, expansion, and refinement of knowledge networks.

CLT focuses primarily on the balance of two sources of cognitive load: intrinsic and extraneous. *Intrinsic load* is a function of the complexity of the information presented and the learner's pre-existing knowledge (i.e., how much they know about a specific domain). If the complexity of the information is low or if the learner's pre-existing knowledge is high, intrinsic load will be low. If the information is complex (i.e., has a number of interacting elements) or if the learner has limited experience with the content (i.e., minimal information stored in long-term memory), intrinsic load will be high. *Extraneous load* – when situated in a learning setting – refers to the instructional procedures used to teach domain-specific knowledge and the extent to which instructional design choices facilitate or hinder learning. For example, extraneous load is lower if instructional design choices facilitate or scaffold learning. Conversely, extraneous load is higher if instructional design choices make learning more difficult (e.g., presenting information verbally that can be more clearly depicted visually) or if instructional design choices interfere with learning and force the learner to expend additional cognitive effort on processing information that does not contribute directly to learning.

Although used historically within instructional settings, on a conceptual level CLT is equally applicable to training contexts and to the transfer of training to real-world contexts (Beckman et al., 2021). As detailed within the training transfer literature, learning begins within a training setting but continues – ideally with the support of consultation – after a trainee returns to work and strives to apply what they learned. As depicted in Figure 2 (Scenario A), intrinsic load is higher in a training setting because the trainee has limited experience with MI (i.e., little or no declarative and procedural

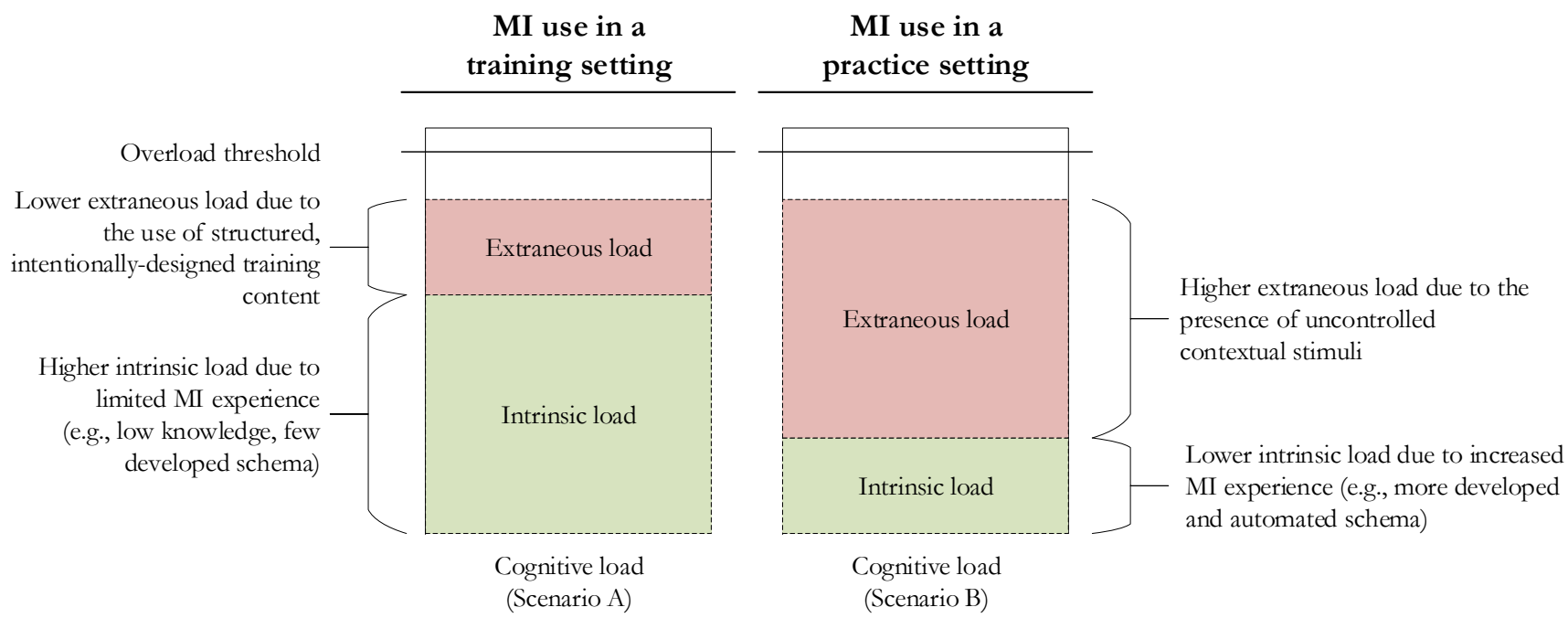

Figure 2. Cognitive Load Theory applied to MI use in training and real-world settings (adapted from Leppink [2015]).

knowledge of MI in long-term memory). Extraneous load, in contrast, is lower in a training setting because the trainer minimizes extraneous load through provision of intentionally designed content that anticipates and offsets the higher intrinsic load on the trainee. In contrast, in a real-world context (e.g., a school), the trainee's intrinsic load is reduced because they have developed some declarative and procedural knowledge to use MI during the training phase (Scenario B). However, extraneous load increases because it is no longer controlled (i.e., practice no longer occurs in a contrived setting). When practicing in a real-world setting, the attendee must negotiate uncontrolled contextual stimuli (i.e., client effects, relationship effects, or session-level effects). A practitioner will not reach a state of overload if they are highly skilled (e.g., able to quickly and adeptly respond in real time to the verbal utterances of the client) or have been using MI with enough people and within enough situations to anticipate and thereby mitigate the effects of uncontrolled contextual stimuli. In contrast, if the practitioner has limited proficiency in MI or insufficient experience responding to a range of responses, overload in the form of poorly delivered MI (i.e., low fidelity) is likely if not inevitable.

Language Production. Pickering and Garrod's (2013) integrated theory of language production and comprehension posits that language production ("a form of action") and language comprehension ("a form of action perception") are interwoven processes that, within dialogic exchanges, interact to enable listeners to predict a speaker's upcoming utterance. Dialogue is not a linear process where one individual speaks, another listens, and then the listener formulates and utters a response (i.e., moving from production to comprehension and back again). Instead, these processes occur concurrently and the listener – often unconsciously and automatically – is simultaneously processing what is being said, anticipating what has not yet been said (e.g., the end of the utterance), and formulating a response to that utterance. Recent research on conversational turn taking supports the overlap of these processes. As Levinson and Torreira (2015) note, the gap

between turn taking ranges from 100 to 500 milliseconds (ms) and is, on average, 200ms long. In contrast, latencies in speech production are roughly 600ms long, suggesting there is a predictive component to verbal exchanges and that "speech act detection is a precondition to response preparation" (p. 18).

In the context of verbal exchanges involving MI, the literature on cognitive load and language production highlight the complexity of MI use in real-world settings, particularly for newly trained practitioners who may have limited knowledge and a rudimentary grasp of the necessary skills. A practitioner who is using MI is responding in real time to the speech act of the client. There is not sufficient time for a practitioner – especially one who may be newly trained in MI – to consciously weigh, for example, how framing their response in different ways (e.g., open-ended question, reflection, etc.) may elicit a specific response from a client or promote (or possibly hinder) subsequent behavior change. Instead, the practitioner must be skilled enough in their knowledge, understanding, and use of MI to respond seamlessly to an utterance, do so repeatedly and appropriately within a session, and do so consistently across sessions and clients. This complexity highlights the importance of utilizing rigorous MI training models. It also highlights the need for consultation and coaching models that support skill refinement as school-based personnel transfer their use of MI to real-world contexts. Alternatively, incorporation of MI into manualized interventions using structured prompts to scaffold use may help reduce practitioner's cognitive load as they develop a more refined skill set through continued application. Finally, this complexity speaks to the need for collection of formative data to support feedback in practice settings (Báez et al., 2020) and fidelity data within research contexts to ensure practitioners consistently deliver high-quality MI.

Training School-Based Personnel to Fidelity in MI

The extent to which researchers document how they train personnel in MI is highly variable in the school-based literature. A recent scoping review (Small et al., under review) examined 62 school-based articles that included MI as an intervention component and reported use of an experimental design, quasi-experimental design, single-subject design, or described a training outcome study. With respect to training, the authors detailed how frequently researchers reported (a) trainers' qualifications, (b) training components, (c) post-training support, and (d) use of a training criterion. Just under one-third of the studies (32%) reported if the trainer had previously received training in MI and only 20% reported if the trainers had certification from the Motivational Interviewing Network of Trainers (MINT). The majority of studies reported delivering MI training in a workshop (i.e., didactic) format (65%). Less than half of the studies (43%) described the use of behavioral rehearsal (i.e., role play) within the workshop and even fewer (22%) described the inclusion of behavioral rehearsal *and* feedback. Only 30% of the studies collected a post-training criterion measure to determine whether attendees had attained at least a minimum level of competence in core MI skills. Post-training support in school-based settings was also infrequent. Only one-third of the studies reported the provision of consultation following initial training.

To date, there are 12 published MI-training studies conducted in school-based settings. These studies, in general, provide more detail than the broader school-based MI literature about how researchers have conducted MI trainings in school-based settings. They also highlight the range of training components and techniques in use in school-based settings to facilitate MI training transfer. In general, the majority of these studies tend to combine didactic content with role play and feedback. Many also include some form of consultation though the timing (i.e., how long after initial training) and format (i.e., individual versus group) vary widely from study to study. Below I summarize the school-based training approaches reported in these studies.

Two studies combined didactic content with role play and booster sessions (Burke et al., 2005; Simon et al., 2014). Two months prior to training, Burke et al. (2005) provided trainees with a copy of Miller and Rollnick's (2002) book on Motivational Interviewing. Trainees then participated in a one-day training focused on the Principles of MI. During training, participants received didactic content and participated in facilitated role play in small groups. Six months following training, participants attended a final session to ask questions and discuss their application of skills during the preceding period. Simon et al. (2014) trained academic advisors in MI. They received "16 hours of training," participated in "two 2-hour booster sessions," and attended "five 2-hour group supervision sessions" (p. 258). The workshop component included didactic lectures and role play sessions. During group supervision sessions, the trainer provided feedback on video-recorded sessions of contrived and real sessions.

Five studies combined didactic content with role play or other group activities and feedback (Cook et al., 2012; Gance-Cleveland et al., 2017; Lyons et al., 2017; Robbins et al., 2012; Rochat et al., 2019). Cook et al. (2012) described delivery of a two-day training (8 hours total) to school staff. The training combined didactic presentations with group exercises, and role play with feedback that involving scripted dialogues and practice scenarios. Six months following initial training, they offered trainees a 1.5 hour booster session. Gance-Cleveland et al. (2017) provided health educators with a two-hour training that included "case-based video vignettes" (p. 121). Trainees also had an opportunity to join conference calls with trainers to receive feedback. Lyons et al. (2017) delivered a 3-day training (18 hours total). During training, participants received didactic lessons, participated in small-group activities, and received direct feedback. The authors reported 39% of training time was "spent practicing MI" (p. 556). Robbins et al. (2012) trained school nurses in MI via a two-day training. During training the nurses role played techniques demonstrated by the trainer, received feedback, and continued to do so "until the consultant and first author noted proficiency" (p. 73).

Rochat et al. (2019) delivered a two-day workshop (16 hours total) to school counselors during which participants listened to "didactic lectures" and engaged in "experiential exercises based on role-play" (p. 284). Trainees also participated in a consultation session during which they received individualized feedback during an audio-recorded session.

Two studies described more rigorous and extensive training models (Iachini et al., 2018; O'Brennan et al., 2019). Iachini et al. (2018) trained attendees across five workshops (15 hours total) and invited them to participate in a group discussion about MI. Trainees also participated in two audio-recorded practice sessions during which they used MI with a standardized client. They then received individual feedback with a trainer after each practice session. O'Brennan et al. (2019) described use of a rigorous training model that included a 2.5-day workshop, individualized coaching on three practice cases, and on-going 30-minute individualized performance feedback sessions. The authors noted that, after completing the three practice sessions, all participants were trained to proficiency based on the Motivational Interviewing Treatment Integrity tool (MITI; described in the next section), the "gold standard" measure for MI fidelity.

Two trainings included MI as part of a broader training (Cross et al., 2018; Renko, 2020). Cross et al. (2018) offered school counselors and other staff a 3-day training. It included two-days of training on MI Spirit and skills followed by a third day during which they workshopped "how to apply MI with students who bully" (p. 471). Following training, attendees submitted audio-recordings and received consultation from the research team on their use of MI. Renko et al. (2020) provided a one-day (4 hour) training to school staff blending elements of MI and Self Determination Theory. The brief training included the use of "practical examples, interactive exercises, and discussions."

In the most recent and least orthodox MI training study, Albright et al. (2022) detailed an online MI training for secondary teachers. During training, teachers role-played with virtual students.

Within the simulation, teachers communicated with the virtual students "by selecting from a dynamic menu of dialogue options" and received "real-time positive feedback" from a virtual coach (p. 279). According to the study's authors, the conversations built on previously learned MI strategies to scaffold learning. As this range of studies suggests, the combinations of training components and techniques as well as the intensity, sequencing, duration and timing of trainings varies widely within just this small sampling of school-based training studies.

Measuring MI Fidelity

Despite the role fidelity data play in documenting important dimensions of intervention delivery such as adherence, quality, and dosage, many research studies still fail to collect and report it (Jelsma et al., 2015; Miller & Rollnick, 2014). In the context of MI, collection of fidelity data typically focuses on quality, conceptualized as the proficiency with which the practitioner delivers MI. A recent systematic review of MI assessment tools (Hurlocker et al., 2020) identified 16 observer-rated measures for assessing MI quality. The most frequently used measures were the Motivational Interviewing Skills Code (MISC) and the MITI. The MITI was used in 55.5% of the 200 studies included in the review and the MISC was used in 15.5% of studies. The most recent version of the MITI, version 4.2 (Moyers et al., 2014) is arguably considered the "gold standard" for assessing MI proficiency (Jelsma et al., 2015). Particular strengths of the MITI include its (a) alignment with MI theory, (b) focus on practitioner behaviors unique to MI, (c) documented reliability (Moyers et al., 2016), and (d) preliminary cutoffs; though, notably, these cutoffs are not empirically derived but, instead, based on expert opinion (Moyers et al., 2014).

The MITI is a behavioral coding system used to examine a practitioner's verbal behavior while delivering MI with a client. The MITI is used as a measure of MI fidelity and as a tool to provide formal, structured feedback on a practitioner's use of MI (Moyers et al., 2014). The MITI consists of four global scores and 10 behavior counts. Typically, a trained coder uses the MITI to review a 20-

minute audio- or video-recorded segment randomly extracted from a session between a practitioner and client. During a single listen through of a recording (i.e., the first "pass"), the coder tallies counts for each of the ten behavior categories. The coder then provides global ratings either at the end of the first pass through or after listening to the entire 20-minute segment a second time (i.e., the second "pass"). The coder tallies counts of ten verbal behaviors: questions, affirmations, simple reflections, complex reflections, seeking collaboration, emphasizing autonomy, giving information, persuading, persuading with permission, and confronting. The coder rates the practitioner on four globals: (a) cultivating change talk, (b) softening sustain talk, (c) partnership, and (d) empathy. The observer scores each global on a 5-point scale with higher scores indicating higher quality use of MI skills. The globals have unique verbal anchors for each point on the scale. For example, a practitioner who receive a score of *1* on the partnership scale "actively assumes the expert role for the majority of the interaction" (Moyers et al., 2014; p. 9), whereas a practitioner who receive a score of *5* "actively fosters and encourages power sharing" so that the "client's contributions substantially influence the nature of the session" (p. 9). A sample scoring sheet and definitions of each of the behavior count and global variables are available in Appendix A.

The MITI's scoring procedures support the computation of six summary scores, four of which have associated competence and proficiency thresholds. The *relational global* is the average of the partnership and empathy scores. The *technical global* is the average of cultivating change talk and softening sustain talk. The *percent of complex reflections* is calculated by dividing the number of complex reflections by the total number of tallied reflections. Finally, the *reflection-to-question ratio* is – as the name suggests – the ratio of the total number of tallied reflections to the total number of tallied questions. The MITI also provides instructions for calculating an *MI-adherent* score (i.e., the sum of seeking collaboration, affirm, and emphasizing autonomy) and an *MI Non-adherent* score (i.e., the sum of confront and persuade) but there are no associated cutoffs for these two scores. The MITI's

proficiency thresholds are summarized in Table 3. As Moyers et al. (2014) have noted, these cutoffs are based on expert opinion, are specific to MI use in a clinical setting, and have neither normative nor psychometric data to support their use. Yet, despite these limitations, they are used across clinical and other settings as a gold standard for determining proficient use of MI (Hurlocker et al., 2020; Jelsma et al., 2015).

Table 3. The MITI's Proficiency Thresholds.

Summary Score	Calculation	Basic proficiency† (Fair)	Advanced proficiency (Good)
Globals			
Relational	(Partnership + Empathy) / 2	3.5	4.0
Technical	(Cultivating Change Talk + Softening Sustain Talk) / 2	3.0	4.0
Behavior Counts			
Percent Complex Reflections	Complex Reflections / (Simple + Complex Reflections)	40%	50%
Reflection-to-Question Ratio	Total Reflections / Total Questions	1:1	2:1
Total MI-Adherent	Seeking Collaboration + Affirm + Emphasizing Autonomy	--	--
Total MI Non-Adherent	Confront + Persuade	--	--

† Version 3 of the MITI specified cutoffs as "basic proficiency" and "competency." Version 4 specifies the cutoffs as "fair" and "good." The terms basic and advanced proficiency will be used here to distinguish "fair" from "good" cutoffs and to distinguish initial competency and skill development typically demonstrated in contrived settings from proficient use demonstrated in real-world contexts (Small et al., 2021).

MI Fidelity in School-Based Settings

The extent to which school-based researchers have collected and reported MI fidelity varies widely in terms of frequency, type, and quality. Returning to the scoping review referenced above (Small et al., under review), the authors also examined the collection of fidelity data among 62 school-based MI studies. Just over half of the studies (53%) provided information on one or more dimensions of MI fidelity (e.g., quality, dose, etc.). However, despite the fact that MI is a complex

communication-based intervention requiring on-going practice and use to master, surprisingly few studies (31%) reported data on how well practitioners used MI (i.e., quality). Ten of the 12 MI training studies in the review (83%) reported collection of fidelity data, a much higher percentage than the overall sample (53%). Yet, even these studies varied with respect to method, measures, and data shared. Three studies reported use of self-reported measures (Albright et al., 2022; Cook et al., 2012; Gance-Cleveland et al., 2017). Cook et al. (2012) reported collection of various dimensions of fidelity, including trainees self-report on their "use of MI-consistent interactions in their counseling interactions with parents" (p. 7 in Cook et al.'s Appendix A). Gance-Cleveland et al. (2017) collected a measure of "self-reported proficiency" that included two variables "relevant to MI" (p. 123). Following training, Albright et al. (2022) asked participants to rate their preparedness "to motivate a student exhibiting signs of psychological stress to seek help" (p. 284).

Four studies (Cross et al., 2018; Iachini et al., 2018; O'Brennan et al., 2019; Simon et al., 2014) collected data on initial MI competence using a version of the Video Assessment of Simulated Encounters-Revised (VASE-R; Rosengren et al., 2005) or the school-based version of the Written Assessment of Simulated Encounters (WASE-SBA; Lee et al., 2013). The VASE and WASE are brief measures typically administered prior to and following MI trainings to assess initial skill acquisition (Small et al., 2014). For both measures, participants provide written responses to either written client statements or video-based vignettes. The VASE assesses MI skills such as reflective listening and eliciting change talk. The WASE measures accurate empathy and trainees' ability to infer a mock client's thoughts and feelings. Cross et al. (2018) used a version of the VASE adapted to a New Zealand context and reported 64% of trainees "scored in the MI-proficient range" following initial training. Iachini et al. (2018) used the WASE-SBA and a school-based version of the VASE (Lee et al., 2013). They reported change from pre- to post-training and calculated a measure of reliable change. O'Brennan et al. (2019) collected the school-based versions of the WASE and

VASE but did not report any data from the measures. Simon et al. (2014) collected the VASE-R. They reported mean scores at each training time point and the percentage of trainees who made significant reliable change on the VASE-R total score and each subscale.

Five studies used the MISC or MITI to measure the quality of MI use (Lyons et al., 2017; O'Brennan et al., 2019; Robbins et al., 2012; Rochat et al., 2019; Simon et al., 2014). Lyons et al. (2017) used the MITI and reported frequencies for each behavior count. They reported only 13% of trainees' utterances were MI consistent. O'Brennan et al. (2019) reported collection of MITI data at multiple time points but did not report MITI data in their manuscript. Robbins et al. (2012) reported mean global scores, behavior counts, and proficiency levels for summary scores. They reported data by session rather than coach. For example, mean scores at session 1 were the average ratings for the two trained coaches' MI delivery with 34 different girls during session 1 of the intervention. In alignment with Hallgren et al.'s (2018) aforementioned findings, the authors reported that MI skill proficiency varied from session to session. For example, on average the percent of open questions used during sessions 2 and 3 were above cutoffs but not session 1. Conversely, mean scores for the ratio of reflections-to-questions were above cutoffs during sessions 1 and 2 but not during session 3. Across all three sessions, average scores were above cutoffs for all of the global measures but did not meet the cutoff for use of complex reflections for any of the sessions. Rochat et al. (2019) used the MISC to assess fidelity. They, too, reported mean scores across coaches in the study. They reported mean scores prior to and following training for MI-consistent and MI-inconsistent behaviors and reported mean scores on client change talk. Finally, Simon et al. (2014) used the MITI in their study. They reported mean scores and the percent of trainees reaching MITI cutoffs for global scores, reflections-to-questions, the percent of open questions, percent of complex reflections, and MI-adherent behaviors.

As the above summary suggests, variation in measurement choice, timing, and reporting (e.g., at the trainee or session level) complicate comparability across studies and how fidelity is defined. For example, the VASE is collected within contrived settings and requires trainees to provide written responses to video vignettes. Yet, some researchers described trainees as "proficient" in their use of MI based solely on their VASE scores (Cross et al., 2018). The MITI is the gold standard but researchers can use it to code sessions in contrived and real-world settings. Thus, cutoffs can be generated for either setting but are unlikely to convey similar meanings with respect to proficiency given differences in what is controlled within a contrived setting and the variation in contextual stimuli in a real world setting. Even the MITI itself has limitations. From one version to the next, the summary scores have changed (due in part to changes in how MI is conceptualized). MITI version 3 and 4 share only two common summary measures (reflections-to-questions and complex reflections). Additionally, version 3 of the MITI specified cutoffs as "basic proficiency" and "competency" with "competency" being a higher level despite the fact competency typically precedes proficiency in the literature (Moyers et al., 2010). Then in version 4 the cutoffs were changed to "fair" and "good." The authors flipped the terminology used in version 3 to bring it into alignment with a progression from competency to proficiency. Specifically, they aligned the cutoff of "fair" with the demonstration of "basic competence" and the cutoff of "good" with the demonstration of "proficiency" (Moyers et al., 2014).

Cost Evaluation in Implementation Science

Implementation cost is one of eight identified implementation outcomes (Proctor et al., 2011) and a primary factor influencing the adoption, use, and sustainment of EBPs (Eisman et al., 2020). Yet, despite the role cost plays in organizational decision-making and the budgetary pressures on service providers to deliver more with less, there are relatively few studies documenting the cost and cost effectiveness of implementation strategies (Bowser et al., 2021; Hoomans & Severens, 2014). In

a recent scoping review documenting ten years of implementation outcome research, Proctor and her colleagues (2023) identified 400 articles referencing their seminal paper on implementation outcomes (Proctor et al., 2011) and examined – in part – the extent to which each outcome had received empirical attention within the Implementation Science literature. Cost was the least reported of all the outcomes. Researchers reported it in only 31 articles (7.8%). In comparison, researchers reported acceptability data in 210 articles, nearly seven times more frequently than cost. Researchers included data on sustainability in 15.8% of articles. It finished seventh out of the eight implementation outcomes but was still addressed more than twice as many times (n = 63) as cost. Additionally, nearly 80% (n = 24) of the 31 cost studies included in Proctor et al.'s (2023) review reported on implementation cost in healthcare (41.9%) or behavioral health (35.5%) settings. Only three studies (9.7%) examined implementation costs within school-based settings (Proctor et al., 2023).

Although historically so few studies have focused on implementation cost, it arguably holds a place of prominence among the implementation outcomes. Cost is salient across all stages of implementation (e.g., Exploration, Preparation, Implementation, and Sustainment [EPIS; Aarons et al., 2011]) and is associated with a number of other implementation outcomes across these stages (Proctor et al., 2023; Saldana et al., 2022). For example, during exploration and preparation, implementation cost factors into decisions about adoption, feasibility and, in turn, acceptability. During implementation, cost is often a primary consideration when deciding what interventions to implement, how to implement them, and whether it is feasible to monitor fidelity. Finally, during mid-to-late phases of implementation, cost factors into penetration (i.e., service saturation) and sustainability. There is a greater likelihood that service providers (a) will continue over time to use an intervention (i.e., sustainability) if it is not only effective but also affordable and (b) will use it with *more* eligible and potential recipients (i.e., greater penetration) as well.

Intervention versus Implementation Cost

As their respective names imply, intervention costs pertain to the intervention-specific costs incurred during delivery of an EBP, whereas implementation costs are costs incurred when developing and using implementation strategies in support of EBP delivery (Gold et al., 2022; Saldana et al., 2022). Intervention costs increase with uptake. As additional service recipients (i.e., patients, students, or families) receive intervention supports, EBP delivery costs increase naturally due to the increase in personnel and material resources required to deliver the intervention. Documentation of implementation costs is important because they increase the cost of delivering EBPs. As Malhotra et al. (2022) note, the *actual* cost of EBP delivery should include the costs associated with adapting, launching, and maintaining an EBP; otherwise, overall costs will be underestimated.

Although use of an implementation strategy (e.g., training or consultation) in support of EBP delivery requires service providers to expend additional resources not accounted for under intervention costs and thereby increases an EBPs overall cost, implementation costs are not strictly additive. From a cost analysis standpoint, cost evaluations of implementation strategies address questions such as: "How much *more* will it cost to use implementation strategy *X* to support delivery of intervention *Y*?" and "To what extent will strategy *X offset* costs associated with intervention *Y*?" Implementation costs can vary depending on the strategy, implementation stage, and targeted outcome. As well, the effectiveness of an implementation strategy results in (a) efficiency gains and losses and in (b) increases or decreases in the quality and efficiency of service delivery (Gold et al., 2022). As an example, if implementation strategies such as training and on-going coaching improve the quality of service delivery (i.e., fidelity), and – in turn – increase the effectiveness of an EBPs use, some of the additional cost associated with these strategies may be defrayed through increased efficiency and the optimization of impact.

Cost evaluation

Cost evaluation pertains to the methods used to examine the relationship between the costs and consequences of delivering competing interventions or implementation strategies (Eisman et al., 2020; Roberts et al., 2019). A number of methods fall under the broader umbrella of economic evaluation, including cost analysis, cost-benefit analysis, cost-consequence analysis, cost-effectiveness analysis, and cost-utility analysis. The decision about which method to use depends on (a) the decision makers for whom the data are being gathered, (b) what information is needed to inform the decision-making process, and (c) tradeoffs between the demands and complexity of obtaining data (Angevine & Berven, 2014; Hoomans & Severens, 2014). Within implementation science as well as the health, behavioral health, and education fields, cost analysis and cost-effectiveness analysis are the primary cost evaluation methods used to examine the relationship between cost and consequences.

Cost analysis (CA) is the foundational component of all other cost evaluation methods given that it is the process through which resource utilization is calculated. CA entails identifying the resources (or ingredients) needed, valuing each resource, and calculating the total, marginal, and incremental costs required to deliver an intervention or use an implementation strategy. Different costing approaches exist, varying with respect to how accurately they can estimate resource use and unit costs. Gross costing methods typically take a top-down approach, allocating resources via disaggregation from a total budget to specific cost categories. Gross costing is often simpler and less costly but also generates less accurate estimates (Raftery, 2000; Tan et al., 2009). In contrast, microcosting is a bottom-up approach that involves documenting and costing changes in resource use at the activity level and then aggregating costs to calculate more precisely cost estimates. Although microcosting approaches improve accuracy, they require additional time and economic resources to obtain data (Chapel & Wang, 2019).

Cost-effectiveness analysis (CEA) is one approach to examine the consequence side of cost evaluation. CEA is appropriate for the comparison of two or more interventions or implementation strategies. Competing interventions or implementation strategies are compared based on the ratio of their costs to their effects (Levin et al., 2018). Information obtained from CEAs can serve multiple purposes. They provide decision-makers with information to (a) guide resource allocation decisions; (b) understand the value of investing in implementation activities; and (c) optimize scalability and sustainability (Bambha & Kim, 2004; Krebs & Nosyk, 2021).

For implementation strategies, CEA outcomes are those specified by Proctor et al. (2011) and would include – for example – measures to examine acceptability, fidelity, or sustainability. Within CEA, effects are reported in natural units (e.g., the number of trainees meeting post-training fidelity cutoffs) and the outcomes must be comparable across strategies (Hoomans and Severens, 2014). The incremental cost effectiveness ratio (ICER) is the primary measure calculated within CEA. It is the ratio of the difference in costs to the difference in outcomes for two or more implementation strategies:

$$\text{ICER}_{IS} = \frac{C_{IS2} - C_{IS1}}{E_{IS2} - E_{IS1}} = \frac{\Delta C}{\Delta E}$$

As detailed in the equation above, the numerator of the ICER for an implementation strategy is the difference between the costs (C) of two implementation strategies (*IS1 and IS2*), which represents the change in cost (ΔC). The denominator of the CER is the difference in the effectiveness (E) of two implementation strategies, which represents change in effectiveness (ΔC). The ratio is expressed in monetary terms and represents the cost per unit for choosing one implementation strategy over another (Bambha & Kim, 2004).

Perspective

In cost evaluation, perspective refers to the viewpoint taken when conducting a cost analysis. Perspective is of primary importance to the cost evaluation process because it guides which costs

will be included or excluded from an analysis (Eisman et al., 2023). Reviews of the Implementation Science literature suggest the extent to which researchers report and justify their choice of a perspective is highly variable. Across six systematic and scoping reviews conducted between 2007 and 2022, the percentage of publications *not reporting* a perspective ranged from 4% (Malhotra et al., 2022) to 71% (Micaud et al., 2022). Even if authors reported a perspective, few provided justification. For example, Hoomans et al. (2007) noted that although most publications in their review specified a perspective, none justified the choice of perspective. Roberts et al. (2019) and Reeves et al. (2019) reported only 28% and 50% of papers in their respective reviews included justification for the chosen perspective.

Historically, economic evaluations have focused on the societal perspective for sake of comparability (Neumann et al., 2017). The societal perspective takes broad public interest into consideration, and – at least in theory – accounts for costs across levels within organizations (including service providers and recipients); across sectors within society (e.g., health, education, human services, criminal justice, etc.); and over time (e.g., time horizon), accounting for short-term and longer-terms costs and consequences (Bowser et al., 2021). Although a societal perspective is beneficial given its broad focus on population-level consequences, there are concerns it is impractical, burdensome, and less relevant for decision makers who must make decisions about resource allocation at an organizational level. Neumann et al. (2017) noted two further limitations of a societal perspective. First, researchers seldom document *all* of the costs and consequences from a societal perspective, even if reported as such within the CEA literature. Second, and perhaps more importantly, there is not one single societal perspective. Instead, the social values of researchers – and the priorities of the decision makers for whom they are conducting CEAs – define not only which resources are prioritized and captured within economic models but also how specific resources are valued.

These shifting perceptions on the value of the societal perspective led the *Second Panel on Cost-Effectiveness in Health and Medicine* to recommend inclusion of a societal perspective *and* a healthcare sector perspective in CEAs conducted in the health and behavioral health fields (Neumann et al., 2017). Similarly, Crowley et al. (2018) aligned their recommendations for the field of Prevention Science with the *National Academies of Science, Engineering, and Medicine*, noting that the societal perspective has value but that researchers should report costs and benefit from the perspective of program participants, taxpayers, *and* society as a whole. They also noted the importance of providing to program planners and policymakers "additional detail about who bears the costs and who receives the benefits" (p. 274). In the field of education, Levin et al. (2018) have recommended taking a societal perspective and then specifying additional perspectives within it. In addition to the societal perspective, they recommended considering costs and consequences from (a) the perspective of the student or their household and (b) the taxpayer or a specific government agency.

Within Implementation Science, Eisman et al. (2021) and others (Gold et al., 2022, Saldana et al., 2022) have recommended taking a pragmatic, multi-perspective approach given the field's primary focus on organizational outcomes (e.g., feasibility, fidelity, etc.) and on the application of implementation strategies to support the adoption, implementation, and sustainment of EBPs. As Eisman et al. (2021) have noted, local organizations and decision-makers bear the burden of implementation costs but may not possess *a priori* knowledge of what resources are needed to support implementation or how costs are distributed across stakeholders within systems. Detailed knowledge of these costs are necessary to support informed decision-making during program adoption and to reduce the likelihood of implementation failure over time. Eisman et al. (2021) recommended mapping costs across five levels: (1) policy and economic environment, (2) organization, (3) management team/supervisory staff, (4) provider team/frontline delivery staff, and (5) individual participant/patient. It may be necessary, however, to disaggregate or aggregate these

levels further depending on the sector (e.g., health, education) and the purpose and focus of the cost evaluation. For example, Eisman et al. (2023), as part of an economic evaluation of implementation strategies within a school-based setting, stratified costs across multiple perspectives at the (a) state agency, (b) regional education service agency, (c) district, (d) school, and (e) teacher (e.g., implementer) levels to account for variation in costs and consequences at each level.

Time-Driven Activity-Based Costing

Time-Driven Activity-Based Costing (TDABC) is a bottom-up, micro-costing approach used to generate accurate cost estimates at the process level. TDABC is used frequently within the health, behavioral health, and education fields (e.g., ingredient approach) to cost activities primarily driven by personnel time and is a primary method for costing implementation strategies. (Gold et al., 2022; Keel et al., 2017; Xu et al., 2021). Cidav et al. (2020) have detailed steps for costing implementation strategies aligned with Kaplan and Anderson's (2003) and Kaplan and Porter's (2011) earlier work on TDABC. Within Implementation Science, the TDABC process has six steps: (1) specify a strategy, (2) develop process maps, (3) obtain time estimates, (4) obtain price per hour estimates, (5) identify non-personnel costs, and (6) calculate cost. Below I briefly describe each step.

At step 1, the researcher names, defines, and specifies the chosen implementation strategy (or strategies). Drawing on Proctor et al.'s (2013) and Presseau et al.'s (2019) work, this initial step involves aligning the language used to describe the strategy with existing literature (e.g., name it) and operationalizing its discrete components (e.g. define it). The researcher then provides detailed specification of the strategy with respect to the actors and action involved (i.e., who does what?), the target (i.e., who is targeted and how are they involved?), the context (i.e., where does it occur?), and temporality (i.e., when, for how long, and at what intensity does it occur?). Finally, the researcher provides empirical, pragmatic, or theoretical justification for the strategy and specifies outcomes the strategy affects (Proctor et al., 2013).

Step 2 requires the development of one or more process maps to document how – with respect to the implementation strategy defined in step 1 – various implementers (e.g., actors) interact with one another as they engage in the actions necessary to use the specified implementation strategy across time and activities. In general, process maps are useful for visually documenting interactions between actors and activities within complex processes and systems; identifying system gaps; and guiding improvement processes with respect to efficiency and effectiveness (Antonacci et al., 2018; Kononowech et al., 2020). In TDABC, process mapping is a necessary and fundamental component (Keel et al., 2017). The process map helps guide subsequent costing procedures, such as determining what to measure and specifying appropriate data collection procedures (O'Leary et al., 2022). Process maps can take various forms. In general, the map should include (a) all of the actors involved in a process and (b) all of the actions involved in delivery of the strategy broken down across activities and linked with respect to how they connect temporally across time and settings. Process maps are often depicted as "swim lane" diagrams with actors in each "lane" (or row) and the flow of actions detailed via flowchart diagramming across and within each lane (Waterhouse, 2021). Additional details on process mapping steps are available in Antonacci et al. (2021) and Salvati et al. (2023).

Step 3 involves the collection of data to understand how much time is required for each actor to complete each action with respect to frequency (e.g., how many times) and duration (e.g., how long). The researcher uses information from the process map to operationalize each action and identify feasible and practical cost capture methods. Data collection methods vary in terms of relevance, rigor, replicability, resources requirements, and rapidity (Huebschmann et al., 2022). Direct observation (e.g., time motion study) is the gold standard but it is time and resource intensive for research staff (Chapel & Wang, 2019). Use of activity logs also can provide reliable prospective data but shift the time burden from the researcher to the participant (e.g., the actor). Retrospective data

collected directly following completion of an action or activity using standardized surveys or structured interviews also can generate reliable time estimates, though they are subject to increasing recall bias as the time between completing an action and reporting on it increases (Chapel & Wang, 2019; Huebschmann et al., 2022; O'Leary et al., 2022). As Huebschmann et al. (2022) have noted, decisions about which data collection method (or combination of methods) to use involves finding an appropriate balance between optimization (i.e., collection of rigorous and reliable data) and efficiency (i.e., the rapid return of reliable data). Yet, as Gold et al. (2022) have noted, researchers must consider *when* accuracy and precision are necessary. Accuracy (e.g., the extent to which an estimate reflects "true" opportunity costs) is more important when "measuring large and highly variable costs" and precision (e.g., how finely – to the decimal point – resources are measured) is more important "when comparing close substitutes and when estimating subgroup effects" (p. 7).

Steps 4 and 5 of TDABC involve calculating personnel (step 4) and non-personnel costs (step 5). At step 4 of the TDABC process, the researcher determines the price per hour – or price per minute depending on the scale of the activity – for each actor identified during process mapping. The price per hour (e.g., wage rate) is the total cost associated with an actor (e.g., salary and benefits) divided by the total hours the actor contributes to an activity. Researchers can obtain wage data from project budgets or from national-level databases (e.g., Bureau of Labor Statistics) depending on what is available or accessible for a given project (Cidav et al., 2020; Cronin et al., 2023; Gold et al., 2022). At step 5, the researcher specifies non-personnel costs. Non-personnel costs are expenses that are *not* time-driven (e.g., fixed). Non-personnel costs should be limited to the "support resources" (Kaplan & Anderson, 2003) specifically associated with use of the implementation strategy or delivery of the intervention. Support resources can include materials, space, technology or other resources needed to use an implementation strategy or to deliver an intervention. When

cost evaluation studies are conducted as part of a larger trial, research costs should be excluded from these cost calculations (Cronin et al., 2023; Gold et al., 2022).

At step 6, the researcher uses information collected across steps 3 to 5 to calculate various measures of cost, including total, average, and incremental cost. Total cost is the sum of all cost categories. Within TDABC, total costs can be calculated at the actor level, activity level, or within implementation phase. Total costs involve summing personnel costs by activity (i.e., the total time spent on an action [i.e., frequency of action x duration of action] multiplied by the personnel costs for the actor [i.e., wage rate]). Total costs for an implementation strategy then involve summing across all personnel and non-personnel costs either within or across implementation phases (Cidav et al., 2020). Average costs provide a per-participant or per-site estimate (e.g., Total cost/# of units). In contrast, incremental cost provides a cost estimate for using an implementation strategy or delivering an intervention to *one additional participant* when the strategy or intervention is already in place and in use within a system (Chapel et al., 2019). So, for example, incremental costs would exclude costs associated with initial training and program adoption and would be limited to the costs associated with delivering one additional unit to one additional participant (e.g., training one additional staff member to fidelity).

Literature on MI Training Cost

To date, cost studies on previously referenced interventions that incorporate MI (e.g., FCU, CCU, and SBIRT) are limited and cost evaluations of MI trainings are nearly non-existent. Although some studies incorporated training into cost estimates, other studies described training but did not include it as a cost. Additionally, none of the intervention studies described training and consultation as implementation strategies. Notably, as well, the extant cost studies on FCU and SBIRT are not for school-based implementation of the intervention. Below I briefly describe studies that include cost evaluations of the FCU, CCU, and SBIRT.

Kuklinski et al. (2020) conducted a cost analysis of FCU implementation using a societal perspective. FCU was delivered over four years to 731 families recruited from WIC programs between January 2003 and March 2005. The article identified training as a major cost driver but did not disaggregate training for MI (i.e., time spent providing explicit training in MI skills) from intervention training (i.e., time spent providing training in FCU procedures and protocols). At the start of the study, staff (e.g., PIs, site coordinators, lead clinicians, and interventionists) attended a 4-day training where they received training "in the Family Check-Up and intervention protocols" (p. 260). Then, each study site received two additional days of training "to further train key personnel to deliver the FCU with fidelity" (p. 260). The average cost of training per family was $345.02 (*SD* = $56.12), representing 8.1% of the total cost of per family FCU implementation. Kuklinski et al. (2020) also provided training costs by year. They reported that costs ranged from 0% to 15% of total cost. Costs were higher in year one ($215 per family), lowest in year three ($0 per family), and comparable in years two and four ($63 and $67 per family, respectively).

Pas et al. (2022) reported the cost of delivering Double Check (an adaptation of the CCU) as an individual or paired coaching model. For their cost analysis, they applied a "government perspective" (p. 354). Four coaches delivered the CCU. Prior to implementation, coaches "read the book outlining the CCU model (Reinke et al., 2011), viewed training videos, and participated in didactic trainings led by a trained CCU coach and the CCU developers" (p. 348). The coaches also participated in bi-weekly supervision meetings. Although the authors described coach training, they did not include it as a fixed cost in their cost evaluation.

Barbosa et al. (2016) conducted a cost analysis of SBIRT implementation from a service provider perspective. Estimates were from ten programs receiving SAMHSA funding to implement SBIRT across a range of in-patient, outpatient, and emergency settings. Barbosa et al. (2016) treated training as a "quasi-fixed cost, incurred on a per staff member basis" (p. 56). They obtained data on

training costs from program administrators (a top-down approach). They reported an average program-level training cost of $2732; however, only 40% of the programs reported training costs. As well, annual training costs varied widely from program-to-program (i.e., from $300 to $11,639). Barbosa et al. (2016) did not describe training procedures nor did they provide an explanation for why the majority of programs reported an estimate of $0 for annual training costs. Bray et al. (2014) also conducted a cost analysis of SBIRT implementation across seven SAMHSA programs. They noted that training varied from program-to-program but do not report training costs or describe training costs within the paper. Finally, Cowell et al. (2017) conducted a time and motion study of SBIRT. Their study generated estimates for delivery of each SBIRT component (e.g., 1:19 for a pre-screen) but the paper did not discuss or report SBIRT training costs.

Only three cost evaluation studies were tangentially relevant to the current study with respect to (a) focusing on MI training and (b) examining the cost and cost-effectiveness of implementation strategies. Olmstead et al. (2020) compared three implementation strategies for training in-patient medical providers (i.e., physicians, physician's assistants, nurses) to use MI. The study applied a healthcare provider perspective. The incremental cost effectiveness ratio (ICER) for the study was "the incremental cost of using a given intervention, compared to the next least costly intervention, to obtain an additional patient receiving a motivational interview" (p. 6). All participants in the study received training in MI via a one-day workshop. Then, research staff randomized providers to workshop only, apprenticeship, and consult conditions. The workshop only condition received no additional training in MI. Providers randomized to the apprenticeship condition received two coaching and feedback sessions in addition to the base MI training. Providers in the consult condition – interestingly – had the option to opt-out of MI use and, instead, request for a clinician with in-depth MI training to deliver the motivational interview with their patient. Average costs per patient to deliver a motivational interview were $804.53 for the workshop only condition, $606.52

for the apprenticeship condition, and $185.65 for the consult condition. The study's findings seem counterintuitive (i.e., workshop-only was most expensive); however, their outcome was whether a patient *received* a motivational interview. More patients in the consult condition (100 of 450; 21.8%) received an interview as compared to patients in the workshop-only condition (3 of 336; 0.9%) or apprenticeship condition (11 of 379; 2.9%) thereby dramatically reducing the average per patient cost. Overall, the authors concluded that from a healthcare provider perspective, none of the options was viable because costs exceeded maximum allowable reimbursement amounts.

In another study, Martino et al. (2016) examined the cost and cost-effectiveness of two MI supervision models from a program perspective. In the study, 66 clinicians working in outpatient community treatment programs were randomized to either an enhanced supervisor condition or a supervision-as-usual condition. Clinicians in the enhanced condition received up to seven competency-based clinical supervision sessions from a supervisor using the *Motivational Interviewing Assessment: Supervisory Tools for Enhancement* (MIA:STEP; Martino et al., 2006). Data on "10 MI consistent items for adherence and competence and five MI inconsistent items for adherence" guided the supervisor's individualized, data-driven feedback in the enhanced condition (p. 15). The supervisor coded the clinician's audio-recorded MI intake session to obtain the data on MI consistent and inconsistent behavior. The supervisor-as-usual condition was a standard, informal supervision model. The supervisor did not listen to or code sessions and did not provide data-driven feedback. Supervisors were asked to "meet as they typically would to supervise intake sessions" (p. 15). Clinicians in the enhanced supervision condition had significantly greater improvement from baseline to 16-week follow-up in "fundamental MI competence" and "advanced MI strategy competence" (p. 18). However, at the client level, the enhanced condition did not result in improved attendance, retention, or days abstaining from substance use. For the cost analysis, the authors provided a detailed breakdown of overall training costs by (a) workshop type, (b) post-workshop

practice cases completed by supervisors (c) supervisors consulting with an MIA:STEP expert, (d) supervisors providing supervision to clinicians, (d) self-study of MI materials, and (e) other miscellaneous costs. Total cost for the enhanced condition was $174,599. Total cost for the standard condition was $28,825. Given that the enhanced program did not result in improved client outcomes, the authors concluded that use of the enhanced supervision model was "questionable" given the intensity and expense of the enhancements.

Finally, Olmstead et al. (2011) evaluated the cost and cost-effectiveness of three MI training models: self-study, expert-led training, and train-the-trainer. They conducted the analysis from a program perspective. Their effectiveness outcome was "the number of clinicians meeting *a priori* MI performance standards…in actual client sessions at 12-week follow-up" (p. 197). They defined the ICER for the study as "the incremental cost of using a given training strategy, compared to the next least costly strategy, to produce an additional clinician meeting MI performance standards" (p. 197). Twenty-two clinicians were in the self-study (SS) condition. They received MI training materials (i.e., Miller & Rollnick's book, training videos, and a treatment manual), met with an expert for 1-hour to review the materials, and were asked to review the training content for an additional 20 hours. Seventeen clinicians were in the expert condition (EX). They received the same training materials, participated in a 15-hour MI workshop, submitted audio-recorded practice sessions, received individualized feedback on the sessions, and received on-going monthly supervision for three months. Nineteen clinicians were in the train-the-trainer (TT) condition. The received the same materials as the SS condition, the same training as the EX condition, and participated in an additional 15-hour workshop during which they learned how to deliver the MI workshop and provide rating-based supervision. They also received monthly consultation for three months while they trained and supervised, delivering the expert model to other clinicians. The percent of clinicians meeting proficiency standards varied considerably by condition. In the EX condition 53% met

performance standards. In contrast, only 18% of the clinicians in the SS condition and 32% in the TT condition met performance standards. EX was the most expensive and SS was the least expensive. EX was the most cost-effective at a decision-making threshold of $2870 or higher. Below that threshold, SS was the most cost-effective option.

Purpose of the Current Study

To date, little is known about the costs required to train school-based personnel in MI despite its increased use in school-based settings over the last decade. For MI to bridge the research-to-practice gap and be broadly integrated into interventions and processes in school-based settings, decision-makers need detailed cost and cost-effectiveness data to understand (a) whether school-personnel can develop the knowledge and skills necessary to proficiently use MI and (b) the costs required to achieve proficiency. The purpose of the current study is to document in detail the training costs required to train school-personnel in MI and examine the cost and cost-effectiveness of training (i.e., the incremental cost to train one additional staff member to fidelity in MI).

The research questions for this study are as follows:

RQ1: What are the total and average costs needed to implement three strategies used to support MI knowledge development and skill transfer: training, post-training consultation, and professional learning communities?

RQ2: What are the incremental and dissemination costs required to train school-based personnel to use MI and how sensitive are these estimates to fluctuations in trainees' characteristics and implementation factors?

RQ3: What is the incremental cost required to train one additional person working in a school-based setting to use MI proficiently?

CHAPTER II

METHOD

Setting

This study took place in two school districts in two U.S. States. School-based personnel and teachers working in K-12 schools were recruited from Fayette County Public School (FCPS) District in Lexington, Kentucky and Jefferson City Public School (JC Schools) in Jefferson City, Missouri. FCPS has an estimated student population of nearly 41,000 students. According to the most recent data available, the FCPS student population is 51% White, 20% Black or African American, 4% Asian and 9% multi-racial. Nearly 16% of the student population has a reported ethnicity of Hispanic or Latino (NCES, 2017-2021a). Thirteen percent of FCPS's student population receives special education services (FCPS, 2024). JC School's estimated student population is just under 9,000 students. The population of students enrolled in public schools is 68% White, 16% Black or African American, 2% Asian and 8% multi-racial. Five percent of the student population has a reported ethnicity of Hispanic or Latino (NCES, 2017-2021b). In JC Schools, 12.5% of students receive special education services (Missouri Department of Elementary and Secondary Education, 2023).

Recruitment, Consent, and Randomization of Instructional Support Personnel

This study examined data collected during interactions between instructional coaches and teachers. Thus, participants in this study included (a) instructional support personnel (ISP; e.g., instructional coaches, behavior interventionists, school counselors, school social workers) whose job responsibilities included coaching and (b) teachers from FCPS and JC Schools who participated in coaching sessions with an ISP. Across the two districts, 31 ISP were recruited to participate in the study. Research staff recruited districts and schools during meetings with administrators. They then recruited ISP during educational meetings arranged with district administrators. Each educational

meeting included information about the project, the two intervention arms, a brief overview of what participation entailed, and information on how districts would benefit. The goal of the preliminary meetings with administrators was to gain access to potential participants so that research staff could formally invite them to participate. At the end of the meeting with ISP, a member of the research team provided the audience with instructions for contacting a member of the research team to complete the consent process. A member of the research team completed consent with interested ISP via Zoom. ISP were eligible if a component of their job description was coaching teachers to improve their instructional practices. A member of the research team who was not involved with recruitment or implementation randomized ISP to either the CBP condition or to the CBP + MI condition. The two conditions received comparable training in CBP coaching procedures. In turn, the only difference between the two conditions was that the CBP + MI condition received training in MI, whereas the CBP condition did not. Participating teachers were blind to condition. In other words, they did not know if their coach received training in CBP *and* MI or just CBP.

Coaching Best Practice Intervention

The CBP model is an evidence-informed, data-driven, adaptable coaching framework. Coaching sessions were structured across four steps (i.e., engage, assess current practices, focus, and plan) and are typically completed in 3 or more sessions, depending on the teacher's interest in writing and continuing to work on goals they create during the planning process. Thus, the ISP can either deliver sessions separately or in combination to support the teacher's needs. Table 4 documents the CBP intervention steps and activities. Below I describe each of the steps in the CBP intervention and their associated procedures for this study.

Step 1. Engage

During the initial CBP meeting, the coach engaged in a purpose interview and a value discovery activity with the teacher. The purpose interview helped the coach learn about the teacher's

classroom management practices, their ideal classroom culture, what they like about teaching, and areas they consider strengths or weaknesses. The interview contained five open-ended questions. The values discovery activity provided a structure for learning about the teacher's values, both generically and in relation to their role as an educator. During value discovery, the coach provided the teacher with a stack of value cards. The coach then encouraged the teacher to sort through the stack and identify values that aligned with their teaching style or approach. The coach asked the teacher to elaborate on why they chose each value. The coach was able to individualize and tailor the value discovery activity to the needs of a teacher. For example, use of value cards was optional. If the teacher preferred (or the coach considered it more appropriate), the coach and teacher engaged in an interactive discussion about how their values related to their teaching style and classroom. The coach was encouraged to keep detailed notes to reference during subsequent sessions.

Table 4. CBP Steps and Session-Level Activities and Objectives.

Step	Session	Activities, Strategies, and Objectives
Engage	1	• Introductions and overview of coaching model steps/session • Complete *Teacher purpose interview* • Complete *Values Discovery Activity* • Prepare for Step 2/Session 2
Assess current practices	2	• Discuss *OTRs and Positive Feedback handout* • Discuss *teacher observation graphs*
Focus	3 (can combine with session 2)	• Identify possible goals • Discuss possible goals
Plan	4 (can combine with session 3)	• Identify targeted goals • Discuss targeted goals • Write *plan*
On-going support	Additional as requested	• Review plan progress • Modify as needed • Provide support as needed

Step 2. Assess Current Practices

During the assessment of current practices, the coach collected data on the teacher's practice in the classroom setting. In authentic practice settings, the instructional coach would collect the data and generate a visual representation of it (e.g., a graph) to discuss with the teacher. However, for this study, data were collected by independent observers and reports were generated by research staff and shared with coaches. Trained data collectors conducted three observations on three separate occasions during instructional time in the classroom. Observations were conducted during the instructional time that aligned with what the teacher chose as the target of their coach support (e.g., reading lessons, math lessons, etc.). Observations began when the teacher initiated a lesson and continued for 15 minutes. This data was summarized into a brief report for each teacher that included their data and normative cutoffs (See Appendix B for example graphs).

Step 3. Focus

During the data review step, the coach reviewed data from step 2 with the teacher. The data review targeted two outcomes: the teacher's ratio of positive-to-negative feedback and the teacher's use of opportunities to respond (OTRs). Data reports were individualized for each teacher and included information on normative cutoffs by school level to facilitate a conversation about the teacher's use of feedback and OTRs as compared to other teachers. The performance feedback session was strengths-based and began with the coach obtaining feedback from the teacher about their impressions of the data. The structure and duration of the debriefing interview varied from teacher to teacher.

Step 4. Plan

During the planning step, the coach and teacher discussed: (a) the teacher's specific goals, (b) their level of confidence and perceptions of what they consider important going forward, and (c), what assistance the coach could provide. Each teacher self-selected among options to support

improvement in their use of OTRs and positive feedback. Following planning, the teacher was encouraged to self-monitor their progress and request additional support from the coach as needed. Extended coach support beyond the aforementioned steps included educational strategies such as conferencing, modeling, and role-playing, in addition to problem solving barriers to implementation. Extended coach support continued as necessary based on the requests of individual teachers.

Implementation Strategies

This study utilized three implementation strategies to train instructional personnel (referred to below as trainees). Trainees (a) participated in workshops, (b) received individualized consultation following initial training, and (c) participated in a community of practice (COP). As noted above, the only difference between the two conditions was their training in MI. Trainees in both conditions were exposed to the three implementation strategies (i.e., workshops, consultation, and COPs) but the intensity and content covered in each of these was tailored to each condition. Below, I describe each of these strategies.

Initial CBP Training Workshop

Trainees from both conditions participated (separately) in the CBP training. The CBP training was a two-hour workshop that focused on how to implement the procedures associated with each of the CBP steps described above (i.e., initial meeting, assessment, feedback, planning); however, trainees in the CBP condition were not trained on what to discuss during the sessions. For example, trainers did provide ISP in the CBP condition with specific guidance on how to facilitate a discussion of the data during feedback. The CBP training workshop also included didactic content on best practices used in school-based coaching and content on the importance of providing positive feedback and OTRs in the classroom. Trainees also had opportunities to engage in role-play and discussion.

Initial MI Training Workshop

Trainees randomized to the CBP+MI condition attended a series of workshops delivered over multiple days (7 – 8.5 hours total across two to three days) to develop foundational knowledge in MI and to begin developing initial competence in using MI's core relational and technical skills (Frey et al., 2017). A trainer, who was a member of the Motivational Interviewing Network of Trainers (MINT), delivered the workshop components of the training. Table 5 provides an overview of the workshop training content.

Table 5. Workshop Training Content for the CBP+MI Condition.

Content	Time
• Coaching process (including discussion of positive feedback and OTRs)	2 hours
• Module A: Introduction to MI	2-3 hours
• Module B: Engaging	2 hours
• Module C: Focusing and evoking	2 hours
• Module D: Planning	1-1.5 hours

The workshop sessions included didactic content delivered via lecture and interactive content, including modeling (via live and video demonstration), role-play, and discussion. Workshop content included (a) an Introduction to MI; (b) conversational skills and values; (c) focusing and evoking; (d) responding to sustain talk; (e) evoking confidence; (f) sharing information; and (g) planning for change. Didactic content focused on imparting initial declarative knowledge about the history of MI, the core relational strategies and technical skills, and the four MI tasks (at a definitional level). For example, the trainer introduced MI's relational (i.e., MI Spirit) component, discussed its importance in relation to engagement and relationship-building and provided definitions of key relational strategies (compassion, acceptance, partnership, and empowerment). The same was done for MI's technical component with a focus on providing participants with a foundational understanding of the OARS. Interactive content included opportunities to identify and practice the use of core

relational strategies and technical skills. For example, trainees had opportunities to identify OARS within verbatim transcripts and practiced generating OARS in response to a "client" during role play exercises.

Individualized Consultation and Feedback

Following the workshop training, trainees in the CBP+MI condition participated in two consultation sessions during which they received feedback on their use of MI within a "standardized teacher" scenario. During simulated practice sessions, trainees functioned in the role of the coach and practiced using MI with a "standardized teacher." A member of the research team played the role of the "standardized teacher." The consultation sessions aligned with the four MI tasks (engage, focus, evoke, and plan). For example, the trainee focused on the use of MI strategies and skills to promote engagement during a values discovery exercise; practiced the focusing task during session 2; and then practiced the evoking and planning tasks. Prior to each session, the trainee reviewed a brief description of the purpose and structure of the session. Each session was audio-recorded. Following the session, a member of the research team reviewed the audio-recorded session. Then, within one to two days of the session, the trainer provided performance feedback to the trainee via Zoom. Feedback was strengths-based, growth-oriented and used the Ask-Offer-Ask framework (A-O-A; Miller & Rollnick, 2023). The A-O-A approach is a strategy used within MI to provide feedback and promote reflection. Specifically, the trainer elicited the trainee's perception of the audio recording; shared a limited sample of the trainee's data; and elicited their reaction to the data.

Trainees randomized to the CBP condition (i.e., non-MI condition) also participated in two consultation sessions during which they implemented the CBP intervention with a "standardized teacher." During the sessions, they received feedback from a trainer who did not have training in MI. Thus, they received procedural feedback but not feedback on the use of specific MI-based communication techniques.

Community of Practice

Trainers facilitated meetings to enable trainees randomized to the CBP+MI condition to share, discuss, and reflect upon their *actual* use of MI in their day-to-day work. During these meetings, trainees were invited to bring audio-recordings of authentic coaching sessions with teachers to share with others who were learning to use MI proficiently. During these meetings, attendees discussed the successes and challenges of implementation. Again, trainees in the CBP (i.e., non-MI) condition were invited to participate in a separate COP facilitated by a trainer who did not have training in MI. The COP focused on troubleshooting procedural issues pertaining to CBP implementation.

Cost Evaluation (RQ1 and RQ2)

The cost evaluation component of this study addressed RQ1 (i.e., calculation of total and average costs needed to implement the three training strategies used to support MI knowledge development and skill transfer) and RQ2 (i.e., calculation of incremental and dissemination costs required to train school-based personnel to use MI proficiently). The procedures for this cost evaluation, as well as the analysis and reporting of findings, were aligned with (a) recommendations from the *Second Panel on Cost-Effectiveness in Health and Medicine* (Neumann et al., 2017), (b) the standards of evidence for Prevention Science (Crowley et al., 2018), and (c) Husereau et al.'s (2013) Consolidated Health Economic Evaluation Reporting Standards (CHEERS). Below I describe the study perspectives, costing approach, and the data sources and collection methods used to address RQ1 and RQ2.

Study Perspectives

This study applied a multi-perspective approach given its focus on implementation outcomes and the field of Implementation Science's focus on providing actionable information to relevant stakeholders to inform decisions pertaining to the uptake and use of EBPs (Eisman et al., 2021; Gold et al., 2022; Saldana et al., 2022). Specifically, this economic evaluation presents disaggregated cost data at the level of actor and activity to inform district-level and school-level decision-making. Additionally, presentation of

time estimates at the trainer and trainee level enable individual actors to assess time contributions and opportunity costs associated with implementation of the CBP and CBP+MI training models. Use of a multi-perspective approach acknowledges that each actor functions as a decision maker within the process and, in turn, enables estimation of cost at the individual (e.g., ISP) and component level to inform decision-making processes.

Costing Approach

A TDABC (i.e., ingredients-based) micro-costing approach was utilized to generate cost estimates for this project. Costing steps aligned with procedures specified in Cidav et al. (2020). The actors for this study included trainers, ISP (also referred to as trainees throughout), and research staff. Although teachers were involved in intervention delivery as recipients of the intervention, the costs associated with their involvement was not be factored into cost estimates for this study given the focus on training strategies. Instead, teacher costs will be considered in a subsequent cost analyses examining *intervention delivery* costs. Time contributed by members of the research team to conduct training-specific activities were included in cost estimates if the activity was considered necessary and if the activity was part of actual implementation in a school-based setting. Other research-specific costs were excluded as recommended in the literature (Cronin et al., 2023; Gold et al., 2022). Thus, for the aforementioned actors, personnel and labor associated with delivering, participating in, facilitating delivery of, or facilitating participation in the training components were included in cost estimates. The cost of equipment, materials, and supplies also were tracked and included when appropriate. Equipment was only included if it was training specific. For example, a laptop was not included as an equipment expense because it was not a cost unique to the delivery of the training. Given the studies focus on implementation cost, intervention cost were excluded at this stage. As noted above, these will be accounted for in a subsequent analysis. For example, although fidelity data were reviewed to examine proficiency in a real-world setting, the coach's time spent *actually* delivering coaching sessions were logged as intervention rather than implementation costs and were not

included within the current cost estimates. Below I describe the data sources and data collection methods for this study.

Data Sources and Collection

At a micro-costing level, data on (a) the frequency of an action, (b) the duration of the action, (c) and the wage rate of the actor involved in the action were collected to calculate the total, average, and incremental cost of each activity. Data were collected from actors directly after they completed an activity. Trainers maintained activity logs for all training activities and completed attendance sheets to record who attended training, consultation, and COP sessions and for how long. ISP also completed activity logs for each training component and reported the amount of time spent preparing for each session. Table 5 provides a breakdown of data collection sources and methods used to inform cost estimates.

For research staff time, an hourly wage and fringe rate was obtained from personnel records. At the University of Louisville, fringe rates for research staff ranged from 28.5% to 30%. At the University of Missouri, the fringe rate for all research staff was 32%. For ISP, an hourly wage including fringe was calculated based on national estimates obtained from the Bureau of Labor Statistics (BLS) Occupational Employment Statistics (United States Department of Labor, 2024). Salary estimates were based on ISP's self-reported job title. BLS occupation codes were matched to self-reported job title. When an exact match was not available, a similar occupation code based the description of the job was identified in consultation with the implementation team. For example, code 21-1091 (i.e., health education specialist) was used to estimate salaries for participants who reported their job as mental health specialist given that an exact job code was not available. Fringe benefit rates were derived from BLS Employer Costs for Employee Compensation (United States Department of Labor, 2023). Fringe rates for personnel delivering educational services in elementary and secondary setting was 35.2% of total compensation. Annual salaries were converted to hourly and per minute rates using 1440 annual

hours (8/hr x 180 days) for ISP and 2080 annual hours for school administrators based on recommendations from Shand and Bowden (2022).

Table 6. Data Collection Methods and Sources for Cost Evaluation.

Training component	Data collected[†]	Informant	Method
CBP Training	• Trainer prep time • Length of session • Trainee attendance	Trainer	Participant attendance form
CBP Training	• Trainee prep time	ISP randomized to both conditions	Qualtrics survey following training
MI Training	• Trainer prep time • Length of session • Trainee attendance	Trainer	Participant attendance form
MI Training	• Trainee prep time	ISP randomized to the CBP + MI condition	Qualtrics survey following training
Individualized Consultation	• Trainee prep time	ISP randomized to both conditions	Qualtrics survey following consultation sessions
COPs	• Trainer prep time • Length of session • Trainee attendance	Trainer	Excel spreadsheet

[†]Respondents reported all time estimates in minutes.

Information on supply costs (e.g., training materials, lunch and snacks for trainings, etc.) were obtained from project expense reports. When applicable, travel time was included. For example, research staff traveled to schools to conduct educational meetings and workshop trainings. Conversely, no travel was required for consultation and COPs because these activities were all conducted remotely via Zoom or a similar platform. Finally, overhead captured the cost of resources used – in this case – for training purposes but not paid as a direct expense specific to training. Overhead costs included the use of meeting space, office supplies, and video-conferencing equipment. For this study, overhead was estimated as 20%

of personnel cost, an approach used in other school-based cost analyses (Frey et al., 2019; Kuklinski et al., 2020).

Analysis Plan

Total and average costs needed to conduct educational meetings and implement the three training strategies were calculated to address RQ1. To address RQ2, incremental and dissemination costs were calculated for each training condition. Below I describe the analysis plan for the calculation of (a) total and average cost, (b) incremental cost, and (c) dissemination cost.

Total Cost and Average Cost. Total and average cost estimates to train participants in CBP and CBP+MI were calculated in 2023 U.S. dollars for the 27 participants in the study. Total and average cost were calculated separately for each training condition (i.e., CBP and CBP+MI). Estimates of total cost for the CBP training were based on data from 14 trainees, whereas estimates for the CBP+MI training were based on data from 13 trainees. Data were collected at the activity level for each trainer and trainee. Data were summed within and across activities to calculate total cost (a) by activity, (b) by actor, and (c) overall. For the CBP training, average cost was calculated by dividing the total cost to deliver the CBP training by the number of trainees in the CBP-only condition (n = 14). Average cost was computed in the same way for the CBP+MI training using the number of trainees in the CBP+MI condition (n = 13).

Incremental Cost. Incremental cost represents the cost required to train one additional ISP in the CBP or CBP+MI coaching models after a school or district has adopted a training model and is using it within a school. To determine the activities to include in the estimate of incremental cost, assumptions were specified to distinguish between costs that would not be necessary when training an additional school-based staff member and costs that would be necessary. Four assumptions informed calculations of incremental cost. First, it was assumed that educational meetings would not be necessary given that a district or school would already be delivering the coaching model. Second, it was assumed that a local trainer within the building would deliver the training (be it CBP or CBP+MI), thereby eliminating the

trainer's travel and mileage costs from the incremental cost estimate. Third, equipment costs were excluded since the trainer was assumed to be part of the school or district (i.e., these nominal costs would be subsumed within overhead). Finally, it was assumed that COP meetings would already be established and running within a district or school and, in turn, trainer time associated with delivery of COP meetings would not increase when adding an additional trainee. In other words, the incremental cost of COP meetings would be limited to trainee time but not trainer time.

Trainer activities required to train additional ISP would include trainers' (a) time to prepare and deliver the CBP workshop, (b) time to prepare and deliver the MI workshop (CBP+MI only), and (c) time to prepare and deliver consultation and feedback sessions. Trainee activities required to train one additional ISP would include trainees' time to prepare for and attend the CBP workshop, MI workshop (CBP+MI only), and consultation and feedback sessions, and trainees' time attending COP meetings. Material costs as well as overhead – calculated at 20% of personnel cost – were also included in estimates of incremental cost. Incremental costs were calculated by actor (i.e., trainer and trainee) and by training activity. The total incremental cost per trainee was estimated by summing across the incremental cost estimates of all requisite training activities. The share of cost (i.e., the percent of cost attributable to a given actor or activity) was also calculated within and across activities and within and across actors. A further distinction was made between fixed cost (i.e., trainer cost) and variable cost (i.e., trainee cost) given that calculation of incremental training cost in real-world settings would involve one trainer providing training to multiple trainees. For example, the incremental cost of training 10 ISP would include the fixed cost of one trainer plus the variable costs associated with training 10 ISP (i.e., fixed cost + [10*variable cost]). Thus, the average incremental cost to train one additional ISP includes the variable cost attributed to each trainee in terms of time and materials as well as the fixed trainer costs distributed across the number of participants trained.

Dissemination cost. Specification of a dissemination model enables estimation of cost if districts or schools disseminate the training strategies within actual educational settings at scale. Dissemination costs were calculated for the CBP+MI training model but not for the CBP-only training model given that CBP+MI was the active condition for this study (i.e., intervention condition) and the focus of the study was on implementation of an MI-infused training and coaching model for school-based settings. The estimated incremental costs were used as the foundation for the dissemination model. The dissemination model scenario was based on delivery of the CBP+MI training to 50 ISP working in 10 schools within the same district (i.e., 5 ISP per school). Dissemination model assumptions are specified in Table 7.

Sensitivity Analysis. Scenario-based sensitivity analysis were conducted to examine how variation in factors might impact cost estimates from the dissemination model. As summarized in Table 8, four scenarios were examined. Scenario 1 examined variation in training modalities. Scenario 2 examined variation in training size. Scenario 3 examined variation in the professional role of trainees. Finally, scenario 4 examined variation in trainee support. Each scenario is discussed in detail below.

Scenario 1: Training Modality. The CBP+MI training model on which the dissemination model was based utilized a hybrid training delivery model with (a) in-person delivery of the CBP and MI workshops and (b) online synchronous delivery of consultation and feedback sessions and COP meetings. Scenario 1 examined the extent to which remote (i.e., synchronous online) and in-person delivery of the CBP+MI training components influenced dissemination cost estimates. For the remote delivery model, estimates for travel time and mileage were removed from the model. For the in-person delivery model, estimates for travel time and mileage were incorporated into the cost estimates to account for the additional cost associated with the trainer traveling to schools to deliver consultation and feedback and COP meetings.

Table 7. Dissemination Model Assumptions.

Cost component	Assumption
Actors	
Schools	• ISP working in 10 schools within the same district were trained in the CBP+MI coaching model
Trainer	• The trainer was a district-level staff member who had completed training in Motivational Interviewing
ISP	• Fifty ISP (i.e., 5 per school) participated in each training activity.
Activities	
CBP+MI workshop	• The trainer delivered each CBP+MI workshop over three days to groups of 10 ISP. Thus, in total, the trainer delivered five CBP+MI workshops.
C&F sessions	• The trainer conducted two individualized virtual (i.e., via Zoom) C&F sessions with each ISP. Thus, in total, the trainer held a total of 100 C&F sessions.
COP meetings	• The trainer facilitated four virtual COP meetings with ISP from each school. In total, the trainer held 40 COP meetings.
Travel	
Trainer travel time	• The trainer traveled from a district office to a training site to deliver each session of the 3-day CBP+MI workshop. • For each day of the CBP+MI workshop, travel time was estimated at 30 minutes round trip. Thus, for each 3-day workshop a trainer traveled a total of 90 minutes. One day of travel time was attributed to the CBP portion of the workshop (training day 1) and two days of travel time were attributed to the MI portion of the workshop (training days 2 and 3). Over 5 workshops, total trainer travel time was 450 minutes.
Mileage	• The trainer traveled 20 miles round trip (i.e., 10 miles each direction) each day of a 3-day workshop. Total mileage for each three-day workshop 60 miles. Total mileage across 5 workshops was 300 miles. Mileage was based on a 2023 reimbursement rate of 65.5¢ per mile.

Table 8. Sensitivity analysis scenarios.

	Low	High	Description
Scenario 1: Training modality	All training components delivered virtually	All training components delivered in person	Extent to which variation in travel time and mileage influence dissemination cost
Scenario 2: Training size	Single CBP+MI workshop delivered to all trainees	Separate CBP+MI workshop delivered to each school	Extent to which variation in the number of workshops influences dissemination cost
Scenario 3: Trainee role	All trainees are teachers	All trainees are administrators	Extent to which variation in school personnel trained influences dissemination cost
Scenario 4: Trainee support	No C&F sessions or COP meetings	Double C&F sessions and COP meetings	Extent to which variation the intensity of on-going training supports influences dissemination cost

For in-person delivery, it was assumed that the trainer would hold a consultation and feedback session with each ISP within a school (n = 5) on the same day. Thus, travel for consultation and feedback sessions involved trainer travel time on two occasions to each of the 10 school in the dissemination model (i.e., n = 20 trips for C&F sessions). The same assumptions were applied to COP meetings. Cost estimates were based on trainer travel to each school on four occasions to facilitate COP meetings with all ISP in a school (i.e., n = 40 trips for COP meetings). Mileage was based on 20 miles per trip (i.e., 10 miles each direction) and 30 minutes of travel time (i.e., 15 minutes each direction) per trip.

Scenario 2: Training size. The base dissemination model specified a workshop training size of 10 participants per workshop. Scenario 2 examined the extent to which variation in the size of the workshop component of the training impacted dissemination model estimates. For the low-cost option, a model was specified with the trainer providing a single three-day workshop to all participants (n = 50) followed by individual consultation and feedback sessions and group COP meetings (as delivered in the base model). For the high-cost option, a model was specified with the

trainer providing a separate three-day workshop for each school (i.e., 10 workshops with 5 ISP in each workshop) followed by individual consultation and feedback sessions and group COP meetings (as delivered in the base model).

Scenario 3: Trainees' professional role. Cost estimates for the base dissemination model were based on salary estimates from ISP who participated in the study, which included a range of school-based personnel including administrators, school social workers, school counselors, and behavior interventionists. Scenario 2 examined the extent to which variation in trainees' professional role within a school influenced dissemination cost estimates. At the low end, a model was estimated for training teachers in CBP+MI. At the high end, a model was estimated for training administrators in CBP+MI. Salaries were based on the national average for administrators ($111,060) plus fringe and the national average for elementary and middle school general and special education teachers ($71,913). For teachers, an average national estimated salary was calculated across the four occupation codes for special education teachers in elementary and middle school (i.e., 25-2052 and 25-2057) and for general education teachers in elementary and middle school (i.e., 25-2021 and 25-2022). Average national salaries across these four categories ranged from $70,790 to $73,650. A fringe rate of 35.2% was added to estimated administrator and teacher salaries (United States Department of Labor, 2023). Salaries were converted to an hourly rate using 2080 hours for administrators and 1440 hours for teachers in accordance with Shand and Bowden's (2022) recommendation. Hourly rates were converted to a per-minute rate of $1.2032 for administrators and $1.1253 for teachers.

Scenario 4: Post-Workshop Training Support. Base dissemination model estimates were computed using a training model that included two post-workshop consultation and feedback sessions with each trainee and four COP meetings. Scenario 4 examined the extent to which dissemination cost varied based on variation in post-workshop support. The low support model

excluded any post-workshop support (i.e., trainers did not provide consultation and feedback or facilitate COP meetings). The high support model doubled base level support. Trainees in each school received four consultation and feedback sessions and eight COP meetings.

Cost-Effectiveness Analysis (RQ3)

Exploratory cost-effectiveness analyses were conducted to identify the incremental cost required to train one additional person working in a school-based setting to use MI proficiently (RQ3). Within CEA, effects are reported in natural units. Thus, given this study's focus on training outcomes, effects were examined in terms of the number of trainees meeting an *a priori* post-training fidelity cutoff. This metric (e.g., post-training fidelity) was chosen because it is (a) an intuitive way of assessing effectiveness, (b) aligns with past research (Olmstead et al., 2011), and (c) provides decision makers with cost effectiveness information on actual MI use with fidelity in school-based settings. The MITI 4.2 was used to define effectiveness. The ICER was defined as the cost required to train one additional school-based staff member to basic MI proficiency (when using the MITI 4.2 in a school-based setting). The comparator for this study was ISP randomized to the CBP-only condition. In the case of this study, the ICER provides a decision maker with information on the additional cost required to develop basic MI proficiency (i.e., CBP+MI condition) as compared to the cost of receiving training in a best-practice coaching model (i.e., CBP).

Effectiveness Outcome

Below I describe the measures used to define the performance standards for this study and the *a priori* threshold applied to identify the number of participants reaching performance standards in each setting.

MI Fidelity. Coaches randomized to both conditions were provided with a digital recording device (e.g., iPad) and asked to audio record the CBP sessions they conducted with a teacher. Participating coaches were asked to submit recordings capturing their implementation of CBP

sessions and – for those in the CBP + MI condition – demonstrating their use of MI within CBP sessions. Audio-recorded sessions for coaches in both conditions were coded for MI fidelity using the MITI 4.2 (Moyers et al., 2014). As described previously, the MITI, which consists of four global scores and 10 behavior counts is the "gold standard" measure for MI fidelity.

An independent team of coders who were blind to condition coded the audio-recordings in accordance with the MITI 4.2 coding manual. The MITI coding team was based at the University of Washington and was managed by Dr. Margaret Sibley, an Associate Professor at the University of Washington's School of Medicine and Seattle Children's Hospital. All members of Dr. Sibley's coding team completed MITI 4 training and reached 90% reliability on the MITI behavior counts and 100% reliability on the global scores. The independent team of coders randomly sampled a 20-minute segment of each audio recording in accordance with the MITI's procedural guidelines. If a CBP session was shorter than 20 minutes, they coded the entire session. Dr. Sibley conducted IRR checks on 20% of the sessions. IRR was assessed via 2-way mixed effects, absolute agreement, average measures intraclass correlations (ICCs). Cichetti and Sparrow's (1981) recommendations were used to categorize the quality of the ICC. Dr. Sibley's team of coders have demonstrated IRR in the good to excellent range on previous studies (Small et al., 2021) and IRR scores comparable to those reported by the MITI developers (Moyers et al., 2016).

Fidelity Thresholds

Fidelity thresholds (i.e., performance standards) for this study aligned with recommended cutoffs specified by the developers of the MITI. MITI 4.2 cutoffs were reported previously in Table 2. As noted earlier, the MITI has two sets of cutoffs: basic proficiency (i.e., "fair") and advanced proficiency (i.e., "good"). For this study, MITI's basic proficiency cutoffs were used to establish the performance standard for demonstration of basic proficiency in a real world (i.e., school-based) setting. It was not anticipated that coaches randomized to the CBP+MI condition would achieve the

MITI's advanced proficiency cutoffs based on past research (Small et al., 2021) and because proficient use is typically achieved through sustained use and practice (Manuel et al., 2022; Miller & Rollnick, 2023).

Table 9 summarizes primary and secondary outcomes for this study and the thresholds applied to define basic proficiency. To establish the specific performance standard for basic proficiency in a school-based setting, an "and rule" was applied to the MITI's technical and relational globals. Specifically, a trainee demonstrated basic proficiency if they met the MITI's basic proficiency (i.e., "fair") cutoffs for global relational skills *and* for global technical skills. A combined cutoff was chosen as the primary fidelity outcome because it represents broad initial proficiency across MI's two primary mechanisms and the two summary scores have evidence of excellent IRR in previous studies (Moyers et al., 2016; Small et al., 2021). This primary fidelity outcome was examined for (a) each trainee's first coaching session with a teacher (i.e., during the engagement step of the CBP coaching model) and for the trainee's first complete case (i.e., implementation of CBP steps 1 to 3). Step 4 of the CBP coaching model was optional. In turn, it was not included as part of the cost-effectiveness analysis.

Table 9. A Priori Basic Proficiency Thresholds.

	Primary Outcome		Secondary Outcomes	
	Measure	Threshold	Measure	Threshold
Basic Proficiency	MITI 4.2, Technical and Relational Globals	Technical ≥ 3.0 *and* Relational ≥ 3.5	% CR; R:Q ratio	%CR ≥ 40%; R:Q ≥ 1:1

Note: %CR = Percent of complex reflections; R:Q = Ratio of reflections-to-questions.

For each trainee's first case, the percentage of complex reflections (%CR) and the ratio of reflections-to-questions (R:Q) were examined as secondary outcomes because preliminary evidence suggests the skills captured within the two measures may emerge more slowly within school-based settings and IRR for these two summary scores were lower in previous school-based research (Small

et al., 2021). Additionally, further exploratory cost effectiveness analyses were conducted, examining two combinations of MITI summary scores. First, an 'or' rule was applied to the primary and secondary outcomes specified in Table 9 to identify trainees who met at least one of the basic proficiency cutoffs. Second, an 'and' rule was applied to the primary and secondary outcomes to identify trainees who met basic proficiency across all three measures (i.e., the primary outcome and two secondary outcomes).

For the examination of fidelity across sessions, thresholds were computed at the session level. Across sessions (i.e., sessions 1-3), a trainee was identified as meeting the basic proficiency cutoff if they scored above a cutoff for at least two of their three fidelity sessions (i.e., 66.7% of observed sessions). To date, there are no recommendations for establishing cross-session fidelity with the MITI. This benchmark (i.e., 2 of 3 sessions) – which should be considered exploratory – was chosen because it accommodated within-session variability while also requiring that a majority of sessions met a given fidelity standard.

Session level audio recordings were missing for some trainees (who were tasked with recording and submitting their own recordings as part of the study). Additionally, available audio recordings varied by step and condition. For the purposes of computing cost-effectiveness estimates (i.e., the percentage of trainees meeting cutoffs), trainees without audio recordings for a given session received a fidelity score of "0" for each summary score. Although this approach assumed that the absence of data implied the absence of fidelity, this conservative approach was taken to (a) enable complete-case analysis of the cost-effectiveness data and (b) ensure that the percentage of attendees meeting each fidelity cutoff was not inflated by missing data.

Additional Measures

To assess the comparability of ISP and teachers randomized to condition, demographic and professional characteristic data were collected at baseline. Prior to participating in the CBP or

CBP+MI training, ISP also completed a measure of coaching self-efficacy. Prior to participating in coaching sessions with an ISP, teachers reported on their motivation to participate in the study, their self-efficacy, and their level of burnout. Each of these measures is described briefly below.

ISP Demographic and Professional Characteristics. ISP reported their date of birth which was used to calculate their age at baseline. They also provided information on their gender, race, ethnicity, professional role, and highest level of education completed. ISP were also asked about previous MI training and MI use. For previous MI training, respondents were asked to indicate their level of previous exposure based on eight categories ranging from "very limited exposure" to having received "training and supervision." Current MI use was reported on a 4-point frequency scale ranging from "never" to "always."

ISP Self Efficacy. The 16-item coaching process self-efficacy scale (CPSS) was an adapted and abbreviated version of Guiney and Zibulsky's (2017) 19-item process-oriented self-efficacy scale. The CPSS assesses the coach's belief in their ability to establish a collaborative and productive working relationship with the teacher during coaching and work effectively during the coaching process with teachers and students from cultural backgrounds that differ from the coach. Wording changes were made to increase respondents' understanding (e.g., changing consultation to coaching or consultee to teacher) and to align processes with those used within the CBP coaching model. For example, an item in the original version asked respondents to rate how confident they were guiding "the consultation process through stages from contracting through termination" (p. 61). This item was changed to assess how confident ISP were guiding "the *coaching* process through stages *from engagement through planning* to align with the four MI tasks used to structure the CBP process. Additional wording changes and omitted items are summarized in Appendix C. For each of the items, ISP were asked to report the extent to which they were confident with each statement on a 9-

point scale ranging from 1 (Not at all confident) to 9 (Extremely confident). Cronbach's alpha for the adapted 16-item scale based on data from this sample was .93.

Teacher Professional Characteristics. Teachers reported their date of birth which was used to calculate their age at baseline. They provided information on their gender, race, ethnicity, and highest level of education completed and reported the number of years they had been teaching and had taught special education.

Teacher Motivation. Teachers completed the Teacher Motivation Inventory (TMI), an adaptation of the Parent Motivation Inventory (Nock & Photos, 2006). The TMI consists of 11 items rated on a 5-point Likert scale. Revised items are consistent with a MI approach, reflecting teachers' desire, ability, reason, need and commitment to change their teaching behavior. For the current sample, coefficient alpha was .87, which is comparable to estimates reported in other studies using the measure (Frey et al., 2022).

Teacher Self-Efficacy. Teachers completed the 24-item Teacher's Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfork Hoy, 2001). The TSES assesses the teacher's perception of their classroom management skills, instructional practices, and ability to engage students. Teachers rated the items on a nine-point Likert-type scale. For the current sample, coefficient alpha was .947 for the overall scale; .835 for the student engagement subscale; .891 for the instructional strategies subscale; and .921 for the classroom management subscale. Sample alpha estimates at the scale and subscale were comparable to those reported for the original scale.

Teacher Burnout. Teachers completed the Maslach Burnout Inventory - Educators Survey (MBI-ES, Maslach, Jackson, & Schwab, 1986). The MBI-ES is a 22 item self-reported survey that measures patterns and levels of burnout. The MBI-ES consists of three subscales: Emotional Exhaustion (9 items), Depersonalization (5 items) and Personal Accomplishment (8 items). Items are rated on 7-point frequency scale. Coefficient alpha estimates were comparable to previously-

reported research (Iwanicki & Schwab, 1981). For the current sample, coefficient alpha for the MBI-ES total score was .92.

CHAPTER III

RESULTS

ISP Demographics

Fifteen ISP were randomized to the CBP+MI condition and 16 were randomized to the CBP-only condition. Two ISP dropped prior to training (one in each condition) and two ISP dropped after training (one in each condition), reducing the sample of participating ISP to 27 (CBP+MI = 13, CBP-only = 14). The professional characteristics of participating ISP are reported in Table 10 below. ISP in the two conditions did not differ on collected demographic variables, including education level and professional role. Additionally, the two groups were comparable with respect to previous MI training, current use of MI, and coaching self-efficacy at baseline.

Teacher Demographics

For all 27 ISP, two teachers were recruited to participate in the study. One teacher dropped out of the study during wave 2 citing that she did not have time to participate. Thus, in total 53 teachers participated (26 working with ISP randomized to CBP+MI and 27 working with ISP randomized to CBP-only). Professional characteristics for the first teacher with which each coach worked are reported in Table 11. There were no statistically significant differences between teachers in the CBP+MI and CBP-only conditions.

Time Preparing for and Participating in Educational Meetings

Educational meetings provided school-based instructional personnel with information about the project. This included information on the CBP model and CBP+MI coaching models as well as how training and implementation would benefit them, their district, and the teachers and students in their school. Research staff arranged educational meetings with district administrators. In total, research staff held nine educational meetings. The number of meetings varied by study wave. Research staff held three educational meetings during wave 1, one meeting with administrators (n = 5) and two

Table 10. Demographic Characteristics of Participating ISP by Training Condition.

	Total (n = 27)	CBP (n = 14)	CBP+MI (n = 13)	Test statistic	*p*-value
Age *M(SD)*	39.8 (8.7)	38.3 (8.4)	41.5 (9.1)	-0.94	.356
% Female	17 (63.0)	9 (64.3)	8 (61.5)	0.02	.883
% Caucasian	23 (85.2)	12 (85.7)	11 (84.6)	0.01	.936
Education Level				1.61	.448
% BS/BA degree	1 (3.7)	0 (0.0)	1 (7.7)		
% MS/MA degree	17 (63.0)	10 (71.4)	7 (53.8)		
% Ed.S degree	9 (33.3)	4 (28.6)	5 (38.5)		
Professional Role				5.46	.141
% Coach	4 (14.8)	0 (0.0)	4 (30.8)		
% Behavior Interventionist	6 (22.2)	3 (21.4)	3 (23.1)		
% ISP	11 (40.7)	7 (50.0)	4 (30.8)		
% Administrator	6 (22.2)	4 (28.6)	2 (15.4)		
MI Exposure and Current Use					
% No previous MI training	24 (88.9)	12 (85.7)	12 (92.3)	0.30	.586
% No current use of MI	20 (74.1)	10 (71.4)	10 (76.9)	0.11	.745
WASE *M(SD)*	13.3 (3.9)	13.8 (3.8)	12.8 (4.0)	0.63	.537
Coaching Self-Efficacy Process Scale *M(SD)*	107.3 (14.5)	108.0 (16.2)	106.5 (13.0)	0.26	.798

Note. Ed.S. = Education Specialist degree (i.e., MA/MS + 1 year); WASE = Written Assessment of Simulated Encounters. Reported test statistics are *t* for continuous and χ^2 for dichotomous measures.

Table 11. Demographic Characteristics of Participating Teacher by Training Condition.

	Total (n = 27)	CBP (n = 14)	CBP+MI† (n = 13)	Test statistic	*p*-value
% Female	22 (84.6)	12 (85.7)	10 (83.3)	0.03	.867
Teacher Race				4.06	.131
% Black	3 (11.5)	0 (0.0)	3 (25.0)		
% White	21 (80.8)	13 (92.9)	8 (66.7)		
% Multi-racial	2 (7.7)	1 (7.1)	1 (8.3)		
Education Level				2.08	.149
BS/BA degree	18 (69.2)	8 (57.1)	10 (83.3)		
MS/MA or Ed.S.	8 (30.8)	6 (42.9)	2 (16.7)		
Teaching Experience					
% Teaching 5+ years	7 (25.9)	4 (28.6)	3 (23.1)	.106	.745
% Teaching SPED 5+ years	6 (22.2)	3 (21.4)	3 (23.1)	.011	.918
Teacher Motivation *M(SD)*	47.3 (5.5)	46.6 (5.1)	48.2 (6.0)	-0.74	.469
Teacher Sense of Self-Efficacy *M(SD)*					
Efficacy in student engagement	53.0 (7.2)	53.4 (7.4)	52.6 (7.2)	0.27	0.79
Efficacy in instructional practices	51.7 (7.6)	51.6 (8.5)	51.7 (6.6)	-0.01	.994
Efficacy in classroom management	53.5 (8.0)	53.4 (8.2)	53.5 (8.2)	-0.02	.982
Teacher Burnout *M(SD)*	40.2 (14.1)	40.0 (11.7)	40.3 (17.1)	-0.06	.954

Note. Ed.S. = Education Specialist degree (i.e., MA/MS + 1 year). Reported test statistics are *t* for continuous and χ^2 for dichotomous measures.

meetings with ISP (n = 34). Research staff held four educational meetings during wave 2, one meeting with administrators (n = 3) and three meetings with ISP (n = 50). Finally, research staff held two educational meetings during wave 3, one meeting with administrators (n = 2) and one with ISP (n = 20). Delivery of educational meetings required personnel time to conduct (a) pre-meeting activities including tailoring materials to each district and audience, (b) travel time to and from where educational meetings were held, and (c) the time the presenter, administrators, and instructional support staff spent in the meetings.

Presenter Time

The time needed to complete pre-meeting activities ranged from one to six hours (*M* = 3.22 hours). For all meetings, presenters spent at least 50% of their pre-meeting preparation time tailoring materials to a specific audience. On average, presenters spent roughly 1.25 hours tailoring materials for each meeting. Presenters travelled a minimum of 31 miles (i.e., travel to JC Schools educational meetings) and a maximum of 85 miles to deliver presentations (i.e., travel to FCPS educational meetings). Presenters' total travel time ranged from 86 to 180 minutes. For the nine meetings, the average travel time to and from a destination was nearly 2.5 hours (148.9 minutes). Each educational meeting was 60 minutes. For five of the nine meetings, two presenters (both members of the research team) conducted the meetings. For these five meetings, presenter time was 120 minutes (60 minutes per presenter).

Attendee Time

Educational meeting time for administrators and ISP was estimated at 60 minutes, the estimated duration of each educational meeting. Thus, in total, 10 administrators each committed an hour of their time and 104 school personnel committed an hour of their time to attend an educational meeting.

Time Preparing for and Participating in CBP and MI Workshops

Trainer Time

Trainers delivered six CBP workshops over the course of the project, three for trainees in the control condition and three for trainees in the intervention condition. On average, trainer preparation time, training time, and travel time was 11.73 hours (704 minutes) for CBP workshops provided to the control condition and 7.28 hours (437 minutes) for workshops provided to the intervention condition. The differences by condition in total and average trainer preparation and delivery time for CBP trainings were due to variation in preparation time and the number of trainers. As detailed in Table 12, average prep time for CBP training sessions was higher for control sessions (M = 260 minutes) than for intervention sessions (M = 180 minutes). In addition, two trainers delivered the CBP workshops to trainees in the control condition during wave 1 and 2, whereas only one trainer delivered the CBP workshop to trainees in the intervention condition. The use of two trainers doubled travel time and time in CBP workshops for two of the three CBP control group workshops thereby increasing average travel time (244 minutes) and time in CBP workshops (200 minutes) for this condition.

Trainers conducted 3 MI workshops over the course of the project. The wave 1, MI workshop consisted of three sessions and, in total, was 8.5 hours long (510 minutes). A trainer also provided two brief MI trainings (90 minutes each) to a participant who was unable to attend part of the three-session workshop. Training and preparation time for these additional individual trainings were included in time estimates for the wave 1 MI workshop and, in turn, increased the trainer's total training time for wave 1 from 510 to 690 minutes. For wave 2, the MI workshop consisted of three sessions and was 8.5 hours long (510 minutes). For wave 3, the MI workshop consisted of two session and, in total, was 7 hours long (420 minutes). As reported in Table 12, average trainer prep time for each MI workshop (n = 3) was just over five hours (340 minutes). Average round-trip travel

Table 12. Total and Average Trainer Time per Implementation Strategy.

	Total Time per Activity (in minutes)			Average Time per Activity (in minutes)		
Training Activity	Control	Intervention	Total	Control	Intervention	Total
CBP Workshops (n = 6)						
Time preparing before workshops	780	540	1320	260.00	180.00	220.00
Time in CBP workshops	600	360	960	200.00	120.00	160.00
Travel time	731	411	1142	243.67	137.00	190.33
Total	2111	1311	3422	703.67	437.00	570.33
MI Workshops (n = 3)						
Time preparing before workshops	0	1020	1020	0.00	340.00	340.00
Time in MI workshops	0	1620	1620	0.00	540.00	540.00
Travel time	0	1462	1462	0.00	487.33	487.33
Total	0	4102	4102	0.00	1,367.33	1,367.33
Consultation and Feedback sessions (n = 55)						
Time preparing for C&F sessions	335	510	845	11.96	18.89	15.36
Time in C&F sessions	537	1115	1652	19.18	41.30	30.04
Total	872	1625	2497	31.14	60.19	45.40
Community of Practice meetings (n = 44)						
Time preparing for COP meetings	370	195	565	15.42	9.75	12.84
Time in COP meetings	535	445	980	22.29	22.25	22.27
Total	905	640	1545	37.71	32.00	35.11
Total	3888	7678	11566	70.69	144.87	107.09

C&F = Consultation and Feedback (CBP condition = 28 sessions; CBP+MI condition = 27 sessions); COP = Community of Practice (CBP condition = 24 sessions; CBP+MI = 20 sessions).

time was just over three hours (i.e., 487.33 minutes) due to repeated travel to and from each workshop session (i.e., 2-3 sessions per workshop). Finally, trainers' average time delivering each MI workshop (across 2 to 3 sessions) was 9 hours (540 minutes).

Trainee Time

All participating trainees (n = 27) from both conditions attended a CBP workshop, which lasted 120 minutes. Trainees reported the time they spent preparing for the CBP workshop. Estimates of trainee time in CBP and MI training workshops were obtained from trainer attendance sheets. Trainee-reported preparation time for the CBP workshops ranged from 0 to 90 minutes for trainees in the control condition and from 0 to 60 minutes for trainees in the intervention condition. As reported in Table 13, average preparation time for CBP workshops was 33.6 and 36.2 minutes, respectively, for trainees in the control and intervention conditions. Total time spent preparing for *and* attending a CBP workshop was comparable for trainees in the control (*M* = 153.6 minutes) and intervention (*M* = 156.2 minutes) conditions. Trainee preparation time for MI workshops was comparable to trainee preparation time for the CBP workshops. Trainees in the intervention condition completed just over 8 hours of MI training (*M* = 486.9 minutes), on average, and spent just over 30 minutes (*M* = 33.2 minutes) preparing for the MI training workshops.

Time Preparing for and Participating In Consultation and Feedback

Trainer Time

As reported in Table 12, trainers participated in 55 consultation and feedback sessions over the project. On average, trainers spent less time preparing for consultation and feedback sessions with trainees in the control condition (*M* = 12 minutes) than with trainees in the intervention condition (*M* = 19 minutes). On average, trainer time delivering consultation and feedback to trainees in the intervention condition (*M* = 41 minutes) was more than twice as long as trainer time delivering consultation and feedback to trainees in the control condition (*M* = 19 minutes). Overall, trainees

Table 13. Total and average time trainees participated in each training activity by condition.

Training Activity	Total Time per Activity (in minutes)			Average Time per Activity (in minutes)		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
CBP Workshops						
Time preparing before workshop	470	470	940	33.57	36.15	34.81
Time in CBP workshop	1680	1560	3240	120.00	120.00	120.00
Total	2150	2030	4180	153.57	156.15	154.81
MI Workshops						
Time preparing before workshop	0	432	432	0.00	33.23	16.00
Time in MI workshop	0	6330	6330	0.00	486.92	234.44
Total	0	6762	6762	0.00	520.15	250.44
Consultation and Feedback sessions						
Time preparing for C&F sessions	382	218	600	27.29	16.77	22.22
Time in C&F sessions	537	950	1487	38.36	73.08	55.07
Total	919	1168	2087	65.64	89.85	77.30
Community of Practice meetings						
Time in COP meetings	674	1125	1799	48.14	86.54	66.63
Total	674	1125	1799	48.14	86.54	66.63
Total	3743	11085	14828	267.36	852.69	549.19

C&F = Consultation and Feedback; COP = Community of Practice. All trainees attended two C&F sessions; one trainee attended a third session by request (CBP condition = 28 sessions; CBP+MI condition = 27 sessions). For the CBP condition, average C&F prep time was 13.64 minutes (i.e., 382/28 = 13.64) and an average C&F session was 19.18 minutes (i.e., 537/28 = 19.18). For the CBP+MI condition, average C&F prep time was 8.07 minutes (i.e., 218/27 = 8.07) and an average C&F session was 35.19 minutes (i.e., 950/27 = 35.19). Trainees in the CBP condition attended 2.07 COP sessions (i.e., average COP meeting length = 48.14/2.07 = 23.26 minutes) and trainees in the CBP+MI condition attended 3.77 COP sessions, on average (i.e., average COP meeting length = 86.54/3.77 = 22.95).

spent one hour on average preparing for *and* delivering each consultation and feedback session with trainees in the intervention condition. In contrast, trainers spent only 31 minutes on average preparing for and delivering consultation and feedback sessions with trainees in the control condition.

Trainee Time

All trainees participated in two consultation and feedback sessions. One trainee (in the intervention condition) also participated in a third consultation and feedback session by request. Thus, in total, trainees participated in 55 sessions across the study (i.e., 27 sessions for trainees in the control condition and 28 for trainees in the intervention condition). As reported in Table 13, trainees in the control condition, on average, spent 27.3 minutes preparing for their consultation and feedback sessions, whereas trainees in the intervention condition spent 16.8 minutes preparing. Although trainees in the intervention spent less time preparing, they spent more time in their consultation and feedback sessions (M = 73.1 minutes), on average, as compared to trainees in the control condition (M = 38.4 minutes). Overall, trainees in the control condition spent just over one hour (65.6 minutes) preparing for and attending consultation and feedback sessions and trainees in the intervention condition spent nearly 1.5 hours (89.9 minutes) preparing for and attending consultation and feedback sessions.

Time Preparing for and Participating In Community of Practice Meetings

Trainer Time

Trainers facilitated 44 community of practice (COP) meetings across the study. Trainers held 24 COP meetings with trainees in the control condition and 20 COP sessions with trainees in the intervention condition. Prep time for these sessions, on average, was 15.4 minutes for trainers supporting trainees in the control condition and 9.8 minutes for trainees in the intervention condition. As reported in Table 12, average meeting length was nearly identical for both conditions

(~ 22 minutes). Total trainer time across preparation and facilitation activities was slightly higher for COP meetings with trainees in the control condition (*M* =37.7 minutes) as compared to trainees in the intervention condition (*M* = 32 minutes).

Trainee Time

On average, trainees in the control condition attended two COP sessions (*M* = 2.07), whereas trainees in the intervention condition attended four COP sessions (M = 3.77). Thus, trainees in the intervention condition spent nearly twice as much time attending COP meetings as compared to trainees in the control condition. Trainees receiving support with their use of MI within the CBP coaching framework (i.e., intervention condition trainees) spent an average of 86.5 minutes in COP meetings, whereas trainees in the control condition spent an average of 48.1 minutes in COP meetings. For trainees in the control condition, the amount of time spent in COP meetings ranged from 0 to 120 minutes. For trainees in the intervention condition, the amount of time spent in COP meetings ranged from 0 to 140. More trainees in the intervention condition (i.e., 10 of 13 trainees) spent an hour or more attending COP meetings than did trainees in the control condition (i.e., 6 of 14 trainees).

Total and Average Cost

Table 14 provides a breakdown of total and average costs by implementation strategy, actor, and condition. The total cost across all implementation activities to deliver the CBP training to trainees in the control condition was $15,787.07 without overhead and $18,805.73 with overhead. The total cost across all implementation activities to deliver the CBP+MI training was $28,100.14 without overhead and $33,470.33 with overhead. The average per trainee cost (excluding overhead) was $1,127.65 for the CBP training and $2,161.55 for CBP+MI training. When including overhead, the average per trainee cost increased to $1,343.27 and $2,574.64 for the CBP and CBP+MI trainings, respectively.

Table 14. Total and average cost by implementation strategy and condition.

Implementation Strategy	Total Cost			Average Cost		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
Educational Meetings						
Presenter	$2,419.81	$2,246.97	$4,666.78	$172.84	$172.84	$172.84
Attendee	$4,154.48	$3,857.74	$8,012.22	$296.75	$296.75	$296.75
Materials	$118.22	$109.78	$228.00	$8.44	$8.44	$8.44
Total (excluding overhead)	$6,692.52	$6,214.48	$12,907.00	$478.04	$478.04	$478.04
CBP Workshops						
Trainer	$2,576.66	$1,388.33	$3,964.99	$184.05	$106.79	$146.85
Trainee	$2,558.17	$2,441.08	$4,999.25	$182.73	$187.78	$185.16
Materials	$70.00	$65.00	$135.00	$5.00	$5.00	$5.00
Refreshments	$210.00	$195.00	$405.00	$15.00	$15.00	$15.00
Total (excluding overhead)	$5,414.83	$4,089.42	$9,504.24	$386.77	$314.57	$352.01
MI Workshops						
Trainer	$0.00	$4,323.23	$4,323.23	$0.00	$332.56	$160.12
Trainee	$0.00	$8,084.43	$8,084.43	$0.00	$621.88	$299.42
Materials	$0.00	$65.00	$65.00	$0.00	$5.00	$2.41
Refreshments	$0.00	$540.00	$540.00	$0.00	$41.54	$20.00
Total (excluding overhead)	$0.00	$13,012.66	$13,012.66	$0.00	$1,000.97	$481.95
Consultation & Feedback Sessions						
Trainer	$725.43	$1,206.76	$1,932.19	$51.82	$92.83	$71.56
Trainee	$1,093.70	$1,393.65	$2,487.35	$78.12	$107.20	$92.12
Total (excluding overhead)	$1,819.13	$2,600.41	$4,419.54	$129.94	$200.03	$163.69
Community of Practice Meetings						
Trainer	$752.88	$594.15	$1,347.04	$53.78	$45.70	$49.89
Trainee	$812.15	$1,314.58	$2,126.73	$58.01	$101.12	$78.77

Implementation Strategy	Total Cost			Average Cost		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
Total (excluding overhead)	$1,565.04	$1,908.73	$3,473.76	$111.79	$146.83	$128.66
Overhead[1]	$3,018.66	$5,370.18	$8,388.84	$215.62	$413.09	$310.70
Equipment[2]	$295.56	$274.44	$570.00	$21.11	$21.11	$21.11
Total	$18,805.73	$33,470.33	$52,276.06	$1,343.27	$2,574.64	$1,936.15
Total without overhead	$15,787.07	$28,100.14	$43,887.21	$1,127.65	$2,161.55	$1,625.45

[1]Overhead = 20% of personnel costs. Personnel costs include all facilitator, attendee, trainer, and trainee time spent preparing for or engaging in implementation activities. [2]Equipment includes the cost of trainers' projectors and laptops necessary to conduct implementation strategies. See Appendix D, Table D.2 for additional details on the calculation of equipment cost.

Educational Meetings

Total and average costs for educational meetings are summarized in Table 14. The average cost of educational meetings was $478.04 per participant when distributed across the 27 ISP who participated in the study. Appendix D, Table D.1 provides a detailed breakdown of this information by activity and meeting type (i.e., meetings with administrators versus ISP). Presenter costs included pre-meeting activities, time in educational meetings, travel time, and mileage. Attendee costs included administrators' and ISP's time in the educational meetings.

CBP Workshops

Total average per trainee cost for the CBP workshop was $386.77 for the control condition and $314.57 for the intervention condition when excluding overhead (see Table 14). When including overhead, average per trainee cost for the CBP workshop was $453.65 and $369.68 for the control and intervention conditions, respectively (see Appendix D, Table D.3).

Trainer cost. Average trainer cost was $184.05 for the control condition and $106.79 for the intervention condition. For trainers delivering CBP trainings to the control condition, 30.8% of their cost ($56.66) was attributable to preparation and 24% of their cost ($44.16) was attributable to time delivering the CBP workshop. For trainers delivering CBP trainings to the intervention condition, 35.3% of cost ($37.74) was attributable to preparation and 23.6% ($25.16) to delivering the CBP trainings (see Appendix Appendix D, Table D.3). Differences in preparation time and the number of trainers delivering training to the control condition drove the differences in trainer costs for the two conditions.

Trainee cost. Average trainee cost for the CBP workshops was similar but slightly higher for the intervention condition. Slightly higher estimates of preparation time by trainees in the intervention condition drove these differences in average trainee costs. As reported in Table 14, average cost was $182.73 for the control condition and $187.78 for the intervention condition. The

average costs for materials ($5/person) and refreshments ($15/person) were based on estimates the implementation team provided and, in turn, were identical across conditions.

MI Workshops

Total average cost for the MI workshop was $1,000.97 per trainee in the intervention condition when excluding overhead (see Table 14). When including overhead, the total average per trainee cost was $1,177.91 for the MI workshop (see Appendix D, Table D.4).

Trainer cost. Average trainer cost for the MI workshops was $332.56 per trainee. Twenty-five percent of trainer cost ($83.01) was attributable to preparation activities and 31% of trainer cost ($103.17) was attributable to time spent delivering workshop sessions (Appendix D, Table D.4).

Trainee cost. The average cost for trainees in the intervention condition to attend a MI workshop was $621.88. Since trainees in the control condition did not attend MI workshops, they did not accrue any cost for MI-related training activities. As reported in Appendix D, Table D.4, 93.4% of attendee cost ($580.74) was attributable to time spent in the MI workshops. Training materials for the MI workshops were estimated at $5 per person based on information from the implementation team. Refreshments were estimated at $15 per trainee; however, the average refreshment costs per trainee ($41.54) reported in Table 14 exceeded $15 due to variation in the number of sessions per MI workshop. For MI workshops completed across two sessions, refreshments were provided on two days, whereas for MI workshops completed across three sessions, refreshments were provided for three days.

Consultation and Feedback Sessions

When excluding overhead, the total average cost of the consultation and feedback sessions was $129.94 for the control condition and $200.03 for the intervention condition (see Table 14). When including overhead, the total average cost of the consultation and feedback sessions was $155.93 for the control condition and $240.04 for the intervention condition.

Trainer cost. Average trainer cost for consultation and feedback sessions were higher for the intervention condition ($92.83 per trainee) than the control condition ($51.82 per trainee) due to the increased length of each consultation and feedback session. As noted previously, the average length of consultation and feedback sessions was 38.4 minutes for trainees in the control condition and 73.1 minutes for trainees in the intervention condition. Despite the difference in session length by condition, the percent of cost attributable to time spent in sessions was comparable by condition. For trainers delivering consultation and feedback sessions with trainees in the control condition, 61.6% of trainer cost ($31.91) was attributable to their time in sessions. For trainers delivering consultation and feedback sessions with trainees in the intervention condition, 64.3% ($59.73) was attributable to their time in sessions (see Appendix D, Table D.5). Trainers held all consultation and feedback sessions virtually via Zoom or another online platform so there were no trainer travel or mileage costs for these sessions.

Trainee cost. Average trainee cost for consultation and feedback sessions was $78.12 for the control condition and $107.20 for the intervention condition. For the intervention condition, average trainee cost for consultation and feedback primarily was attributable to their time in the feedback and consultation sessions. In total, 80.9% of trainee cost ($86.74) was for trainee time spent in the sessions. In contrast, average trainee cost for the control condition was divided more evenly. For control group trainees, 41.3% ($32.29) of average cost was attributable to their preparation for trainings, and only 58.7% ($45.83) was attributable to their time in feedback and consultation sessions (see Appendix D, Table D.5).

Community of Practice Meetings

The total average cost of the COP meetings, when excluding overhead, was $111.79 for trainees in the control condition and $146.83 for trainees in the intervention condition (see Table 14). When

including overhead, total average cost for COP meetings was $134.15 and $176.19 for the control and intervention conditions, respectively (see Appendix D, Table D.6).

Trainer cost. Total average cost for trainer time was higher for the control condition ($53.78) than the intervention condition ($45.70). For the control condition, 59.1% of trainer cost ($31.79) was attributable to time in COP meetings. For the intervention condition, 65.6% of trainer cost ($29.98) was attributable to time in COP meetings. Trainers held all COP sessions virtually via Zoom or another online platform so there were no trainer travel or mileage costs for these meetings.

Trainee cost. As reported previously, trainees in the intervention condition spent nearly twice as much time in COP meetings as compared to trainees in the control condition. On average, trainees in the control condition participated in 2.07 COP meetings, whereas trainees in the intervention condition participated in 3.77 COP meetings. Estimates of average cost reflected these differences as well. Average cost for trainee time in COP meetings was $58.01 for the control condition as compared to $101.12 for the intervention condition.

Incremental Cost

Incremental costs are reported in Tables 15 and 16 for the CBP training condition and in Tables 17 and 18 for the CBP+MI training condition.

Incremental cost for the CBP-Only training

For the CBP training, the incremental cost to train one additional ISP was $1,093.46 when including overhead and $912.05 when excluding overhead. Personnel costs comprised the majority of incremental cost for the CBP training. Personnel cost attributable to the trainer ($590.70) was more than double personnel cost attributable to the trainee ($265.35). As reported in Table 15, trainer time made up 64.8% of incremental cost and trainee time made up 34.7% of total incremental cost for the CBP training. For both trainer and trainee, the largest share of incremental cost was for the CBP workshop. Just over 88% of trainers' incremental cost ($520.26) was for the

Table 15. Incremental Cost of CBP-Only Training by Actor (i.e., Trainer and Trainee).

Actor Activity	Unit Cost[†]	Units	Prep Time (per unit)	Training Time (per unit)	Total Time (per unit)	Time x Unit	Incremental Cost	Share of cost[±]
Trainer Time	$67.86/hour							
CBP Workshops	$1.1310	1	260.00	200.00	460.00	460.00	$520.26	88.1%
MI Workshops	$1.1310	0	0.00	0.00	0.00	0.00	$0.00	0.0%
C&F Sessions	$1.1310	2	11.96	19.18	31.14	62.28	$70.44	11.9%
Subtotal (excluding overhead)						522.28	**$590.70[a]**	**64.8%**
Trainee Time	$71.43/hour							
CBP Workshops	$1.1905	1	33.57	120.00	153.57	153.57	$182.83	57.8%
MI Workshops	$1.1905	0	0.00	0.00	0.00	0.00	$0.00	0.0%
C&F Sessions	$1.1905	2	13.64	19.18	32.82	65.64	$78.14	24.7%
COP Meetings	$1.1905	2	0.00	23.26	23.26	46.52	$55.38	17.5%
Subtotal (excluding overhead)						265.73	**$316.35[b]**	**34.7%**
Materials								
CBP Workshops	$5.00	1					$5.00	100.0%
MI Workshops	$5.00	0					$0.00	0.0%
Subtotal (excluding overhead)							**$5.00[b]**	**0.5%**
Overhead							$181.41	
Total (including overhead)							$1,093.46	
Total (excluding overhead)							$912.05	

[†]Hourly rate based on the average salary (including fringe) for trainers who delivered the CBP training and trainees in the CBP condition.
[±]Percent within strategy is not in bold; percent across strategies (i.e., percent of total is in bold). [a] Fixed cost. [b] Variable cost.

Table 16. Incremental Cost of CBP-Only Training by Implementation Strategy.

Strategy Actor	Unit Cost[†]	Units	Prep Time (per unit)	Training Time (per unit)	Total Time (per unit)	Time x Unit	Incremental Cost	Share of cost[±]
CBP Workshops								
Trainer	$1.1310	1	260.00	200.00	460.00	460.00	$520.26	73.5%
Trainee	$1.1905	1	33.57	120.00	153.57	153.57	$182.83	25.8%
Materials	$5.00	1					$5.00	0.7%
Subtotal (excluding overhead)						844.21	**$708.09**	**77.6%**
MI Workshops								
Trainer	$1.1310	0	0.00	0.00	0.00	0.00	$0.00	0.0%
Trainee	$1.1905	0	0.00	0.00	0.00	0.00	$0.00	0.0%
Materials	$5.00	0					$0.00	0.0%
Subtotal (excluding overhead)						0.00	**$0.00**	**0.0%**
C&F Sessions								
Trainer	$1.1310	2	11.96	19.18	31.14	62.28	$70.44	47.4%
Trainee	$1.1905	2	13.64	19.18	32.82	65.64	$78.14	52.6%
Subtotal (excluding overhead)						127.92	**$148.58**	**16.3%**
COP Meetings								
Trainee	$1.1905	2	0.00	23.26	23.26	46.52	$55.38	100.0%
Subtotal (excluding overhead)						46.52	**$55.38**	**6.1%**
Overhead							$181.41	
Total (including overhead)							$1,093.46	
Total (excluding overhead)							$912.05	

[†]Hourly rate based on the average salary (including fringe) for trainers who delivered the CBP training and trainees in the CBP condition.
[±]Percent within strategy is not in bold; percent across strategies (i.e., percent of total) is in bold.

Table 17. Incremental Cost of CBP+MI Training by Actor (i.e., Trainer and Trainee).

Actor Activity	Unit Cost[†]	Units	Prep Time (per unit)	Training Time (per unit)	Total Time (per unit)	Time x Unit	Incremental Cost	Share of cost[±]
Trainer Time	$65.40/hour							
CBP Workshops	$1.0900	1	180.00	120.00	300.00	300.00	$327.00	23.1%
MI Workshops	$1.0900	1	340.00	540.00	880.00	880.00	$959.20	67.7%
C&F Sessions	$1.0900	2	18.89	41.30	60.19	120.38	$131.21	9.3%
Subtotal (excluding overhead)						1300.38	**$1,417.41**[a]	**57.9%**
Trainee Time	$71.70/hour							
CBP Workshops	$1.1950	1	36.15	120.00	156.15	156.15	$186.60	18.3%
MI Workshops	$1.1950	1	33.23	486.92	520.15	520.15	$621.58	60.9%
C&F Sessions	$1.1950	2	8.07	35.19	43.26	86.52	$103.39	10.1%
COP Meetings	$1.1950	4	0.00	22.95	22.95	91.80	$109.70	10.7%
Subtotal (excluding overhead)						854.62	**$1,021.27**[b]	**41.7%**
Materials								
CBP Workshops	$5.00	1					$5.00	50.0%
MI Workshops	$5.00	1					$5.00	50.0%
Subtotal (excluding overhead)							**$10.00**[b]	**0.4%**
Overhead							$487.74	
Total (including overhead)							$2,936.42	
Total (excluding overhead)							$2,448.69	

[†]Hourly rate based on the average salary (including fringe) for trainers who delivered the CBP+MI training and trainees in the CBP+MI condition. [±]Percent within strategy is not in bold; percent across strategies (i.e., percent of total) is in bold. [a] Fixed cost. [b] Variable cost.

Table 18. Incremental cost of CBP+MI training by implementation strategy.

Strategy Actor	Unit Cost[†]	Units	Prep Time (per unit)	Training Time (per unit)	Total Time (per unit)	Time x Unit	Incremental Cost	Share of cost[±]
CBP Workshops								
Trainer	$1.0900	1	180.00	120.00	300.00	300.00	$327.00	63.1%
Trainee	$1.1950	1	36.15	120.00	156.15	156.15	$186.60	36.0%
Materials	$5.00	1					$5.00	1.0%
Subtotal (excluding overhead)						2220.82	**$518.60**	**21.2%**
MI Workshops								
Trainer	$1.0900	1	340.00	540.00	880.00	880.00	$959.20	60.5%
Trainee	$1.1950	1	33.23	486.92	520.15	520.15	$621.58	39.2%
Materials	$5.00	1					$5.00	0.3%
Subtotal (excluding overhead)						4230.64	**$1,585.78**	**64.8%**
C&F Sessions								
Trainer	$1.0900	2	18.89	41.30	60.19	120.38	$131.21	55.9%
Trainee	$1.1950	2	8.07	35.19	43.26	86.52	$103.39	44.1%
Subtotal (excluding overhead)						4230.64	**$234.61**	**9.6%**
COP Meetings								
Trainee	$1.1950	4	0.00	22.95	22.95	91.80	$109.70	100.0%
Subtotal (excluding overhead)						91.80	**$109.70**	**4.5%**
Overhead							$487.74	
Total (including overhead)							$2,936.42	
Total (excluding overhead)							$2,448.69	

[†]Hourly rate based on the average salary (including fringe) for trainers who delivered the CBP+MI training and trainees in the CBP+MI condition. [±]Percent within strategy is not in bold; percent across strategies (i.e., percent of total) is in bold.

CBP workshop. For the trainee, 57.8% of incremental cost ($182.83) was for the CBP workshop. When examining incremental cost by implementation strategy for the CBP-only training condition (see Table 16), the CBP workshop represented 77.6% of total incremental cost, including personnel cost and a nominal materials cost. Consultation and feedback sessions represented 16.3% of total incremental cost and COP meetings represented 6.1% of total incremental cost for the CBP training condition.

Incremental cost for the CBP+MI training

Incremental cost for the CBP+MI training condition are reported in Tables 17 and 18. For the CBP+MI training, the incremental cost to train one additional ISP was $2,936.42 when including overhead and $2,448.69 when excluding overhead. Personnel costs comprised the majority of incremental cost for the CBP+MI training. Personnel cost attributable to the trainer ($1,417.41) exceeded personnel cost attributable to the trainee ($1,021.27). Trainer time made up 57.9% of total incremental cost and trainee time made up 41.7% of total incremental cost. For both trainer and trainee, the largest share of incremental cost was for the MI workshop. As reported in Table 17, 67.7% of trainers' incremental cost ($959.20) was attributable to preparing for and delivering the MI workshop portion of the CBP+MI training. For the trainee, 60.9% of their incremental cost ($621.58) was for the MI workshop portion of the CBP+MI training. When examining incremental cost by implementation strategy for the CBP+MI training (see Table 18), the CBP workshop represented only 21.2% of total incremental cost ($518.60), whereas the MI workshop represented 64.8% of total incremental cost ($1,585.78). Consultation and feedback sessions represented 9.6% of total incremental cost ($234.61) and COP meetings represented 4.5% of total incremental cost ($109.70) for the CBP+MI training.

Dissemination cost for the CBP+MI Training

Tables 19 and 20 summarize total and average dissemination cost by actor and implementation strategy, respectively. The total cost (in 2023 U.S. dollars) to train 50 ISP in 10 schools in the CBP+MI coaching model was $71,182.57 excluding overhead and $85,279.79 including overhead. Average dissemination cost per participant was $1,423.65 excluding overhead and $1,705.60 including overhead. From a personnel standpoint (see Table 19), trainee time comprised the majority of dissemination cost (71.7%) and trainer time made up most of the additional dissemination cost (27.3%). For trainees, participation in the MI workshop component of the CBP+MI drove the majority of cost (60.9%). In contrast, participation in consultation and feedback (44.1%) followed by delivery of MI workshops (34.4%) comprised the majority of dissemination cost for trainers.

As reported in Table 20, just over half (53.4%) of CBP+MI dissemination cost was specific to the MI workshops. Consultation and feedback sessions comprised 19.3% of dissemination cost; CBP workshops comprised 16.8%; and COP meetings made up 10.3%.

Sensitivity analyses

Four cost drivers were varied to assess the implications on total and average dissemination costs. As reported in Table 21, variation in training modality (scenario 1) and trainee role (scenario 3) resulted in minimal fluctuation in average and total dissemination costs for low and high cost model estimates. Online delivery of all training components resulted in just over a one percent reduction (-1.13%) in the average per trainee cost, whereas in-person delivery of all training components resulted in a 4.53% increase in average per trainee cost (when including overhead). Variation in trainee role (i.e., training teachers versus training administrators) also resulted in minimal fluctuation. The low-cost model (i.e., training teachers) resulted in a 4.19% reduction in cost, whereas the high-cost model (i.e., training administrators) resulted in less than a one percent (0.49%) average per trainee increase in cost from the base model.

Table 19. Dissemination Cost to Deliver CBP+MI Training to 50 ISP in 10 Schools (by Actor).

Strategy Actor	Cost[†]	Units	Per unit time Prep Time	 Travel Time	 Training Time	 Total Time	Time x Unit	Total Cost	Average Cost	Share of cost[±]
Trainer Time										
CBP Workshops	$1.4230	5	180.00	30.00	120.00	330.00	1650.00	$2,347.95	$46.96	12.1%
MI Workshops	$1.4230	5	340.00	60.00	540.00	940.00	4700.00	$6,688.10	$133.76	34.4%
C&F Sessions	$1.4230	100	18.89	0.00	41.30	60.19	6019.00	$8,565.04	$171.30	44.1%
COP Meetings	$1.4230	40	9.75	0.00	22.25	32.00	1280.00	$1,821.44	$36.43	9.4%
Subtotal (excl. overhead)							13649.00	**$19,422.53**	**$388.45**	**27.3%**
Trainee Time										
CBP Workshops	$1.1950	50	36.15	0.00	120.00	156.15	7807.50	$9,329.96	$186.60	18.3%
MI Workshops	$1.1950	50	33.23	0.00	486.92	520.15	26007.50	$31,078.96	$621.58	60.9%
C&F Sessions	$1.1950	100	8.07	0.00	35.19	43.26	4326.00	$5,169.57	$103.39	10.1%
COP Meetings	$1.1950	200	0.00	0.00	22.95	22.95	4590.00	$5,485.05	$109.70	10.7%
Subtotal (excl. overhead)							42731.00	**$51,063.55**	**$1,021.27**	**71.7%**
Materials										
CBP Workshops	$5.00	50						$250.00	$5.00	50.0%
MI Workshops	$5.00	50						$250.00	$5.00	50.0%
Subtotal (excl. overhead)								**$500.00**	**$10.00**	**0.7%**
Mileage	$0.655	300						**$196.50**	**$3.93**	**0.3%**
Overhead								$14,097.21	$281.94	
Total (including overhead)								$85,279.79	$1,705.60	
Total (excl. overhead)								$71,182.57	$1,423.65	

[†]Hourly rate for trainer based on the national salary estimate (plus fringe) for a school psychologist (occupation code, 19-3034). Hourly rate for trainees based on the average national estimate for trainees in the CBP+MI training condition. [±]Percent within strategy is not in bold; percent across strategies (i.e., percent of total) is in bold.

Table 20. Dissemination Cost to Deliver CBP+MI Training to 50 ISP in 10 Schools (by Implementation Strategy).

Strategy Actor	Cost[†]	Units	Per unit time Prep Time	 Travel Time	 Training Time	 Total Time	Time x Unit	Total Cost	Average Cost	Share of cost[±]
CBP Workshops										
Trainer	$1.4230	5	180.00	30.00	120.00	330.00	1650.00	$2,347.95	$46.96	19.7%
Trainee	$1.1950	50	36.15	0.00	120.00	156.15	7807.50	$9,329.96	$186.60	78.2%
Materials	$5.00	50						$250.00	$5.00	2.1%
Subtotal (excl. overhead)							9457.50	**$11,927.91**	**$238.56**	**16.8%**
MI Workshops										
Trainer	$1.4230	5	340.00	60.00	540.00	940.00	4700.00	$6,688.10	$133.76	17.6%
Trainee	$1.1950	50	33.23	0.00	486.92	520.15	26007.50	$31,078.96	$621.58	81.8%
Materials	$5.00	50						$250.00	$5.00	0.7%
Subtotal (excl. overhead)							30707.50	**$38,017.06**	**$760.34**	**53.4%**
C&F Sessions										
Trainer	$1.4230	100	18.89	0.00	41.30	60.19	6019.00	$8,565.04	$171.30	62.4%
Trainee	$1.1950	100	8.07	0.00	35.19	43.26	4326.00	$5,169.57	$103.39	37.6%
Subtotal (excl. overhead)							10345.00	**$13,734.61**	**$274.69**	**19.3%**
COP Meetings										
Trainer	$1.4230	40	9.75	0.00	22.25	32.00	1280.00	$1,821.44	$36.43	24.9%
Trainee	$1.1950	200	0.00	0.00	22.95	22.95	4590.00	$5,485.05	$109.70	75.1%
Subtotal (excl. overhead)							5870.00	**$7,306.49**	**$146.13**	**10.3%**
Mileage	$0.655	300						**$196.50**	**$3.93**	**0.3%**
Overhead								$14,097.21	$281.94	
Total (including overhead)								$85,279.79	$1,705.60	

Total (excl. overhead)	$71,182.57	$1,423.65

[†]Hourly rate for trainer based on the national salary estimate (plus fringe) for a school psychologist (occupation code, 19-3034). Hourly rate for trainees based on the average national estimate for trainees in the CBP+MI training condition. [±]Percent within strategy is not in bold; percent across strategies (i.e., percent of total) is in bold.

Table 21. Sensitivity Analysis for Dissemination Model.

	Low Cost Model		High Cost Model		Difference from Base[†]			
	Total	Average	Total	Average	Low Cost Model		High Cost Model	
Scenario	cost	cost	cost	cost	$	%	$	%
1. Training modality								
including overhead	$84,314.87	$1,686.30	$89,139.47	$1,782.79	$19.30	-1.13%	$77.19	4.53%
excluding overhead	$70,345.72	$1,406.91	$74,529.97	$1,490.60	$16.74	-1.18%	$66.95	4.70%
2. Training size								
including overhead	$76,605.18	$1,532.10	$121,372.36	$2,427.45	$173.50	-10.17%	$721.85	42.32%
excluding overhead	$63,953.73	$1,279.07	$101,259.72	$2,025.19	$144.58	-10.16%	$601.54	42.25%
3. Trainee role								
including overhead	$81,705.77	$1,634.12	$85,700.26	$1,714.01	$71.48	-4.19%	$8.41	0.49%
excluding overhead	$68,204.22	$1,364.08	$71,532.97	$1,430.66	$59.57	-4.18%	$7.01	0.49%
4. Trainee support								
including overhead	$60,030.47	$1,200.61	$110,529.10	$2,210.58	$504.99	-29.61%	$504.99	29.61%
excluding overhead	$50,141.48	$1,002.83	$92,223.67	$1,844.47	$420.82	-29.56%	$420.82	29.56%

[†]Base model (including overhead): Total = $85,279.79; Average = $1,705.60.
Base model (excluding overhead): Total = $71,182.57; Average = $1,423.65.

Changes in training size and support introduced greater variability in average dissemination costs. Conducting a single training for all 50 trainees (i.e., low-cost model) reduced average per trainee cost by just over 10%. In contrast, conducting a separate training for each school (n = 10 workshops) increased average per trainee cost by more than 42%. Scenario 4, which either eliminated (i.e., low-cost model) or doubled (i.e., high-cost model) the post-workshop training supports, resulted in roughly a 30% increase or decrease in average per trainee cost.

Cost Effectiveness Analysis

MITI data

Each ISP provided coaching support to two teachers. Cost effectiveness analysis for this study focused on the first teacher with whom the ISP worked. ISP delivered up to four sessions with a teacher; however, the fourth session was optional. Available MITI data varied by step and condition. Session 1 data were available for 12 CBP trainees (85.7%) and 11 CBP+MI trainees (84.6%). Session 2 data were available for 12 CBP trainees (85.7%) and nine CBP+MI trainees (69.2%). Session 3 data were available for 11 CBP trainees (78.6%) and eight CBP+MI trainees (61.5%). Just over half of the ISP (51.9%) completed a fourth session with their first teacher. Eight CBP trainees (57.1%) and six (46.2%) CBP+MI trainees completed session 4. Examination of fidelity focused only on the first three sessions. IRR data for the MITI and correlations among MITI summary scores are reported in Appendix E. ICCs were in the excellent range for all four globals (ICCs = .85 to 1.00), eight of ten behavior counts (ICCs = .53 to .94), and all summary measures (ICCs = .77 to .94).

Table 22 summarizes mean MITI global and behavior summary scores by session and condition. Session 1 (i.e., engagement) mean relational and technical global scores were comparable for the two training conditions. ISP in the CBP+MI condition used complex reflection more frequently (69% vs. 60%), though mean scores for both conditions were above advanced proficiency cutoffs (i.e., ≥ 50%). ISP in the CBP+MI condition, on average, reached a 1:1 ratio of reflections to questions

during session 1, whereas ISP in the CBP condition asked roughly two questions for each reflection (R:Q = .51) on average, during session 1. Mean differences were more pronounced during sessions 2 and 3, which were aligned with MI's focusing and evoking tasks. During these sessions, mean scores for ISP in the CBP+MI condition were higher across all global and behavior count summary scores. Notably, however, mean scores for ISP in the CBP condition were above the basic cutoff for global technical skills (i.e., ≥ 3.0) and percent complex reflections for all three sessions. Mean scores for ISP in the CBP+MI condition were above the basic proficiency cutoff for global technical skills, percent of complex reflections, and reflections-to-questions ratio for all three sessions, but for global relational skills were only above the basic proficiency cutoff (i.e., ≥ 3.5) for session 2.

Trainees Meeting MITI Basic Proficiency Cutoffs

Table 23 details the percentage of trainees in each condition who met basic proficiency cutoffs by and across sessions for (a) global relational skills, (b) global technical skills, (c) percent complex reflections, and (d) ratio of reflections-to-questions. It details the number and percentage of trainees who met the global relational and technical skills cutoffs after session 1 and across the three sessions (i.e., met cutoff for 2+ sessions) and the number and percent of ISP who met basic proficiency on at least one summary score and across all scores.

Basic Proficiency at Session 1. For session 1 data, the number of attendees who met the basic proficiency cutoff for global relational skills *and* technical skills (i.e., the primary cost effectiveness outcome) was identical. Five ISP in the CBP condition (35.7%) and five ISP in the CBP+MI condition (38.5%) met the cutoff. More than 60% of trainees in both conditions met basic proficiency cutoffs for complex reflections. For the ratio of reflections-to-questions, no ISP from the CBP condition met basic proficiency, whereas four trainees from the CBP+MI condition (30.8%) met the cutoff. Nine ISP in the CBP condition (64.3%) and nine ISP in the CBP+MI (69.2%) condition reached basic proficiency on *at least one* MITI summary score at session 1. Three

Table 22. Descriptive Statistics for MITI Summary Scores by Session.

Training Outcome	Session 1		Session 2		Session 3		Sessions 1-3	
	CBP (n = 12) *n (%)*	CBP+MI (n = 11) *n (%)*	CBP (n = 12) *n (%)*	CBP+MI (n = 9) *n (%)*	CBP (n = 11) *n (%)*	CBP+MI (n = 8) *n (%)*	CBP (n = 11) *n (%)*	CBP+MI (n = 8) *n (%)*
Globals								
Relational Skills	3.00 (0.74)	3.23 (1.10)	2.75 (0.78)	3.67 (0.83)	2.41 (0.38)	3.36 (0.70)	2.73 (0.70)	3.41 (0.91)
Technical Skills	3.42 (0.42)	3.28 (0.61)	3.17 (0.62)	3.72 (0.57)	3.32 (0.64)	3.64 (0.38)	3.30 (0.56)	3.52 (0.56)
Behavior Counts								
% Complex Reflections	60.30 (36.41)	69.43 (34.74)	46.13 (41.52)	62.38 (29.79)	51.67 (37.45)	86.51 (23.10)	52.73 (37.88)	71.51 (30.85)
R:Q Ratio	0.51 (0.33)	1.00 (0.55)	0.71 (0.96)	1.72 (0.78)	0.69 (0.52)	1.17 (0.75)	0.63 (0.65)	1.30 (0.74)

MITI cutoffs for basic proficiency: Relational Skills ≥ 3.5; Technical Skills ≥ 3.0; % Complex Reflections ≥ 40%; R:Q Ratio ≥ 1:1. Advanced proficiency: Relational Skills ≥ 4.0; Technical Skills ≥ 4.0; % Complex Reflections ≥ 50%; R:Q Ratio ≥ 2:1.

Table 23. Number and Percent of Trainees by Condition Meeting MITI Basic Proficiency Cutoffs.

Training Outcome	Session 1		Session 2		Session 3		Sessions 1-3[±]	
	CBP (n = 14) *n (%)*	CBP+MI (n = 13) *n (%)*	CBP (n = 14) *n (%)*	CBP+MI (n = 13) *n (%)*	CBP (n = 14) *n (%)*	CBP+MI (n = 13) *n (%)*	CBP (n = 14) *n (%)*	CBP+MI (n = 13) *n (%)*
Globals								
Relational	5 (35.7)	5 (38.5)	3 (21.4)	7 (53.8)	0 (0.0)	4 (30.8)	3 (21.4)	6 (46.2)
Technical	11 (78.6)	9 (69.2)	9 (64.3)	9 (69.2)	9 (64.3)	7 (53.8)	10 (71.4)	9 (69.2)
Relational & Technical	5 (35.7)	5 (38.5)	3 (21.4)	7 (53.8)	0 (0.0)	4 (30.8)	3 (21.4)	6 (46.2)
Behavior Counts								
% Complex Reflections	9 (64.3)	9 (69.2)	6 (42.9)	7 (53.8)	6 (42.9)	7 (53.8)	9 (64.3)	8 (61.5)
R:Q Ratio	0 (0.0)	4 (30.8)	2 (14.3)	7 (53.8)	1 (7.1)	3 (23.1)	1 (7.1)	4 (30.8)
Combined cutoffs								
Met 1+ basic cutoff	9 (64.3)	9 (69.2)	7 (50.0)	8 (61.5)	6 (42.7)	7 (53.8)	9 (64.3)	8 (61.5)
Met all basic cutoffs	0 (0.0)	3 (23.1)	1 (7.1)	6 (46.2)	0 (0.0)	2 (15.4)	0 (0.0)	4 (30.8)

Available data varied by step and condition. Session 1 data were available for 12 CBP trainees (85.7%) and 11 CBP+MI trainees (84.6%). Session 2 data were available for 12 CBP trainees (85.7%) and 9 CBP+MI trainees (69.2%). Session 3 data were available for 11 CBP trainees (78.6%) and 8 CBP+MI trainees (61.5%). If missing, MITI data were scored as not meeting basic proficiency.
[±]Percent meeting basic proficiency cutoff on 2 or more sessions.

ISP in the CBP+MI condition (23.1%) and no ISP in the CBP condition met basic proficiency across *all* summary measures.

Basic Proficiency across Sessions 1 to 3. Six CBP+MI trainees (46.2%) and three CBP trainees (21.4%) met basic proficiency cutoffs for relational *and* technical skills across the three sessions (i.e., met on 2+ sessions). The percent of trainees meeting basic proficiency across session were comparable for both training conditions on the percent of complex reflections and meeting the basic cutoff for one or more summary score (64.3% vs. 61.5%). For reflections-to-questions (7.1% vs. 30.8%) and meeting basic proficiency on *all* summary scores (0% vs. 30.8%), a higher percentage of trainees in the CBP+MI demonstrated basic proficiency.

Cost Effectiveness

Table 24 reports the incremental gains and cost effectiveness for the CBP+MI training. There was no incremental gain at session 1 for the CBP+MI training condition when using basic proficiency in relational *and* technical skills as a fidelity threshold (the *a priori* training outcome for this study). In other words, during the initial CBP session focused on engaging with a teacher, trainees in the CBP and CBP+MI conditions demonstrated comparable use of relational *and* technical MI skills directly following training and nearly identical percentages of trainees in each condition (35.7% versus 38.5%) reached basic proficiency levels on both global scores. Across sessions 1-3, there was no incremental gain for the CBP+MI condition when using basic proficiency in complex reflections as a fidelity threshold. There was also no incremental gain for the CBP+MI condition when using basic proficiency on *one or more* summary measures as a fidelity threshold. For both of these summary measures, no additional trainees from the CBP+MI condition were trained to fidelity when compared to the CBP condition (i.e., the difference in the percentage trained is near zero).

Table 24. Cost-Effectiveness of CBP+MI Training to Train ISP in MI.

	Cost effectiveness of each training program						Incremental Gain	
	CBP (n = 10)			CBP+MI (n = 10)			Change in % trained	Change in # trained
	% [1]	*n* [2]	C/E [3]	% [1]	*n* [2]	C/E [3]	%	*n*
Session 1								
Relational & technical	35.7%	4	$951.00	38.5%	4	$2,932.53	2.6%	0
Sessions 1-3								
Relational & technical	21.4%	2	$1,902.00	46.2%	5	$2,346.02	24.8%	2
Pct. complex reflections	64.3%	6	$634.00	61.5%	6	$1,955.02	-2.8%	0
Met R:Q ratio	7.1%	1	$3,804.00	30.8%	3	$3,910.03	23.7%	2
1+ basic cutoff	64.3%	6	$634.00	61.5%	6	$1,955.02	-2.8%	0
All basic cutoffs	0.0%	0	*NC*	30.8%	3	$3,910.03	30.8%	3

Calculations based on normalized incremental cost for ten participants. Total normalized cost for CBP = $3,804.20 to train 10 participants ($590.79*[$321.35*10]); Total normalized cost for CBP+MI = $11,730.11 to train 10 participants ($1,417.41*[$1,031.27*10]). Note that the variable trainee cost in each equation includes trainee and material costs as reported in Tables 15 and 17.

[1]Percent of trainees in each condition meeting basic proficiency cutoff.

[2]Number of participants meeting basic proficiency cutoff based on a normalized sample of ten trainees per condition.

[3]Cost-effectiveness ratio for each training condition (i.e., the cost to train one additional trainee to fidelity).

Three exploratory fidelity thresholds did differentiate – to some extent – between CBP and CBP+MI trainees with respect to incremental gains. First, incremental gains favoring the CBP+MI condition were evident when considering use of relational *and* technical skills across sessions (i.e., above basic proficiency on 2+ sessions). Second, incremental gains were evident when considering trainees' ratio of reflections-to-questions. Finally, incremental gains were evident when applying stringent criteria that required the trainee to demonstrate basic proficiency across *all* MITI summary measures across two or more sessions. These thresholds resulted in an additional 24% to 31% of trainees in the CBP+MI condition demonstrating fidelity as compared to the CBP condition. Twice as many trainees in the CBP+MI condition met basic proficiency on global relational *and* technical scores *across* sessions (i.e., 6 versus 3 trainees). Four CBP+MI trainees (30.8%) met the basic proficiency cutoff for reflections-to-questions *across* sessions as compared to one trainee (7.1%) in the CBP condition. Finally, none of the trainees in the CBP condition met all basic cutoffs *across* sessions (i.e., the most stringent approach), whereas four trainees in the CBP+MI condition (30.8%) met this cutoff.

When considering basic proficiency in relational *and* technical skills during the first post-training session as the fidelity threshold (i.e., the *a priori* training outcome), the CBP+MI condition was not cost-effective when compared to the CBP training. The cost to train one additional trainee based on this fidelity outcome and threshold was $951 for the CBP condition as compared to $2,933 for the CBP+MI condition. Similarly, the CBP+MI condition was not cost-effective when compared to the CBP training when looking at cross-session fidelity for complex reflections or for meeting one or more basic proficiency cutoff across sessions. For both of these fidelity measures, the cost to train one additional trainee to fidelity was $1,955 for the CBP+MI condition as compared to $634 for the CBP condition.

For the three aforementioned training outcomes, the findings with respect to incremental gains aligned with cost-effectiveness findings because roughly equal percentages of trainees met fidelity criteria and, in turn, the least expensive training option was the most cost effective. In contrast, for two fidelity thresholds – meeting basic proficiency on relational *and* technical *across* sessions and the ratio of reflections-to-questions – incremental gains did not align with cost effectiveness. For basic proficiency on relational *and* technical *across* sessions, trainees in the CBP+MI condition demonstrated greater incremental gains with 46.2% of trainees meeting criteria as compared to 21.4% of trainees in the CBP condition (incremental gain favoring CBP+MI = +24.8%). Despite these favorable incremental gains for the CBP+MI condition, the CBP training was the cost effective option when compared to the CBP+MI training ($1,902 versus $2,346) because the low cost of delivering the CBP intervention offset the incremental gains from the CBP+MI condition, making the two training options almost equally cost effective for this fidelity threshold. Similarly, the CBP+MI condition had a larger effect (incremental gain = +23.7%) when applying the fidelity cutoff for the ratio of reflections-to-questions; however, the CBP training condition was more cost effective than the CBP+MI training when accounting for training cost (i.e., $3,804 vs. $3,910) due, again, to the substantially lower cost of the CBP training.

Cost effectiveness for only one training outcome favored the CBP+MI training condition. The CBP+MI training model was the cost effective option when using the rigorous cutoff that required trainees to meet all four cutoffs across two or more sessions. As reported in Table 24, it would cost $3,910 to train an additional ISP to fidelity using the CBP+MI training model. In contrast, no trainees in the CBP training met this cutoff.

CHAPTER IV

DISCUSSION

To date, relatively little is known about the costs associated with training school-based personnel in MI and the extent to which school-based personnel can transfer the declarative and procedural knowledge and skills gained during training into proficient use within school-based settings. This study provides data on the total, average, incremental, and dissemination costs for training school-based personnel in MI and provides preliminary exploratory data on the incremental cost effectiveness of training school-based personnel to fidelity in MI.

Documentation of MI training models and MI fidelity in school-based settings is limited. Twelve published studies document various combinations of training strategies and techniques used to train school-based personnel in MI (Albright et al., 2022; Burke et al., 2005; Cook et al., 2012; Cross et al., 2018; Gance-Cleveland et al., 2017; Iachini et al., 2018; Lyons et al., 2017; O'Brennan et al., 2019; Robbins et al., 2012; Renko, 2020; Rochat et al., 2019; Simon et al., 2014). Fewer than half of the studies used the MITI to assess fidelity and none of the studies collected data documenting the personnel time and cost associated with delivering and attending MI trainings. Thus, the current study contributes new information to the field on the cost of MI training, the cost of specific training strategies (i.e., workshop, consultation and feedback, COP meetings), how variation in different training factors influences cost, and generates preliminary evidence on cost-effectiveness as it relates to training school-based personnel to fidelity.

Trainer and Trainee Time in MI-related Training Activities

Given the absence of cost data for MI training studies, the literature provides little information on trainer time required to deliver MI trainings in school-based settings. Thus, this study provides initial data on not just trainer delivery time but trainer prep time and how travel can influence total trainer time and cost. For the CBP+MI training condition, the majority of trainer time was spent

engaged in activities related to MI workshops, consultation and feedback sessions, and MI-specific COP meetings. On average, MI trainers spent nine hours delivering MI workshops, just over 60 minutes on each consultation and feedback session (18.89 minutes preparing and 41.30 minutes delivering each session), and an average of 32 minutes on each COP meeting, including prep time. Prep time, particularly for the MI workshop, added substantial time to trainers' time estimates. On average, trainers spent over 5 ½ hours preparing for each MI workshop. MI workshops were delivered across 2-3 days. Thus, the 5 ½ hours of prep time were likely distributed across the 2-3 sessions of a workshop. Trainers' travel time – which factored into estimates of total and average cost – made up a large portion of their overall time. For example, trainers' total travel time to and from MI workshops (1462 minutes) was nearly equivalent to trainers' total time spent delivering MI workshops (1620 minutes). Workshops conducted in Kentucky required trainers to travel from Louisville to FCPS, which on average took 80 to 90 minutes each direction. Travel time for workshops in Missouri was not as long but still took approximately 45 minutes each direction. When comparing the CBP and CBP+MI conditions, the time and cost estimates for travel offset because trainers in both conditions traveled to deliver their respective workshops. However, when considering MI training cost outside the context of the current study, trainers' total and average cost estimates for CBP and MI workshops likely overestimate actual trainer cost if a given setting requires little or no trainer travel time.

Trainee time spent in MI-workshops varies in the school-based MI training literature with trainings ranging from a low of 2 hours (Gance-Cleveland et al., 2017) to a high of 18 hours (Lyons et al., 2017). Four studies included a workshop component of 15 or more hours. The most intensive training model – from a time investment standpoint – took trainees 30 hours to complete. Simon et al.'s (2014) model included 16 hours of workshops, four hours of booster sessions, and 16 hours of group supervision. For the CBP+MI training model documented in this study, trainees spent less

than 12 hours preparing for and engaging in MI-specific training. When incorporating the 2½ hour CBP training component, total training time for the CBP+MI coaching model totaled just over 14 hours. Trainees spent just over 8½ hours engaged in MI workshops (520.15 minutes). They spent an average of 35 minutes in each consultation and feedback session and attended an average of nearly four COP meetings with each session lasting 23 minutes on average.

When comparing the CBP+MI training to other MI training studies in school-based settings, total training time for the MI-specific components of the CBP+MI coaching model fall near the lower end of the range, especially with respect to the MI workshop component. When comparing the MI training components across these studies, a number of questions related to initial and sustained training transfer arise. For example, what is the minimum training length that generates evidence of basic MI proficiency? What is the optimal length and distribution (i.e., number of days) of workshop-based components? Finally, which additional MI training components (i.e., booster sessions, COP meetings) minimize drift over time to ensure sustainment of training transfer? In the literature, Rochat et al. (2019) delivered 16-hours of workshop content across two days, whereas Iachini et al. (2018) delivered 15-hours of workshop content across five days. In the current study, the MI workshop component was delivered across either 2 or 3 days but this variation was not systematic (i.e., trainees were not randomized to different training delivery models) but was instead done to accommodate the schedules and calendars of participating districts. To date, we have limited understanding of how trainees consume and integrate training content distributed in these different ways. For example, do trainees retain more information when it is distributed in smaller chunks across more days? Although the current study does not address this question, it provides further variation in how workshop content is shared with participants; provides one example of the type of detailed time data that could be collected in future studies to help inform future research; and provides data on the cost associated with each training strategy.

Average and Incremental Trainer and Trainee Costs

This study found that the majority of trainers' average and incremental cost estimates were attributable to delivering MI workshops ($332.56 and $959.20 for average and incremental cost estimates, respectively), followed by CBP workshops ($106.79 and $327.00) and then consultation and feedback sessions ($92.83 and $131.21). Average cost estimates provide data on cost based on how the study was implemented (i.e., the actual cost to implement the CBP+MI training). In contrast, incremental cost estimates provide data on the additional cost needed to train an additional ISP in MI after a school or district has adopted and is using a training model such as CBP+MI. In turn – and depending on the model's assumptions – incremental cost estimates can eliminate study-specific cost variation such as the excessive travel time noted previously. From a training standpoint, two primary assumptions[3] built into the incremental cost model distinguish it from the study-specific model used to generate total and average cost. First, it was assumed that trainers were local and located in the same building as trainees, which eliminated travel cost. Second, it was assumed that trainers were already delivering COP meetings because other ISP within the building were already trained and using MI.

Notably, total incremental trainer costs were more than double the amount reported for total average trainer costs due to differences in how trainer time is distributed in the two cost models. Average cost – as the term implies – distributes cost across the number of trainees participating in the training. Incremental cost, however, does not distribute trainer cost across multiple trainees because it provides an estimate of how much it would cost to train *one* additional ISP after a training has been adopted and is in use. This complication with respect to trainer cost seems unique to training studies. Frey et al. (2019), for example, report the incremental cost required to deliver an

[3] The incremental cost model included two additional assumptions that did not directly impact trainer cost in a meaningful way because trainers were not involved in educational meetings (which were eliminated from the incremental cost model) and equipment costs (which were also eliminated) made up less than .01% of total cost.

intervention to *one* additional student but their model presumes that all staff are trained (i.e., trainer costs are excluded from the model), thereby avoiding artificial inflation of the total incremental cost estimate. Olmstead et al. (2011), in their MI training study, treated trainer time as a fixed cost and trainee time as a variable cost when calculating incremental cost, thereby acknowledging that trainer cost (at least for workshop components) is fixed across one or more participating trainees.

High trainer costs in incremental cost models raise questions about the feasibility of providing training to one ISP at a time. They also raise questions about how to minimize these training costs within school-based settings, especially when a new ISP is entering a setting and requires training. As noted previously, the workshop component of trainings are the most expensive and most time consuming for trainers (and trainees). It would be cost prohibitive for a trainer to deliver the workshop components of a training to one person at a time (i.e., to train one additional person as implied within an incremental cost model). In the current study, for example, over 90% of incremental cost attributable to the trainer was for delivery of the CBP workshop ($327.00) and MI workshops ($959.20), whereas less than 10% of trainer time was spent in one-on-one training (i.e., delivery of consultation and feedback sessions). If trainer costs are not distributed across multiple ISP, trainings would not be feasible and the cost of training would not be sustainable. From an incremental cost estimation standpoint, Olmstead et al.'s (2011) recommendation to use a normalized sample of 8 or 10 trainees to calculate incremental cost enables distribution of fixed trainer costs across multiple trainees and generates an average incremental cost estimate akin to an average cost estimate, which may provide a more accurate reflection of trainer costs in real-world implementation.

Unlike trainer costs, average and incremental trainee costs were nearly identical across training components given that many of the assumptions built into the incremental cost model impacted trainer cost rather than trainee cost. Total incremental trainee cost was just over $1,000 with nearly

$200 of that cost attributable to the CBP component. Like trainer cost, the majority of trainee cost was attributable to time in MI workshops ($621.58).

Implementation Strategies

This study's presentation of data by not only actor but also by strategy offers insight into how training costs are distributed across and within strategies. Cost patterns by implementation strategy – not surprisingly – are similar to the patterns observed with trainer and trainee cost. The majority of cost is attributable to workshops. Only a small portion of cost is attributable to consultation and feedback sessions and COP meetings (roughly 10% per implementation strategy). These finding raise important questions about how (and whether) implementation strategies should be adjusted to increase individualized and on-going ISP support over time. The literature on MI has documented how difficult it is to develop MI proficiency and has cited the need for on-going, individualized support to ensure proficient development and use of MI over time (Jones & Atkinson, 2021; Pennell et al., 2020; Svensson et al., 2021; Thomas et al., 2019). Yet, consultation and feedback is used infrequently in school-based MI research due presumably to the perceived time investment and associated costs. As documented within this study, consultation and feedback – inclusive of trainer and trainee costs – ranged from roughly $200 (average cost) to $235 (incremental cost) for *two* consultation and feedback sessions per trainee. Unfortunately, to date, little is known about the incremental gains from individual consultation and feedback as compared to other strategies such as interactive workshops with role-play and experiential content. Presumably, individual contextualized support – especially when delivered in multiple sessions over time – holds the potential to promote greater skill gains and, at a minimum, enable practitioners to obtain feedback, reflect on their own practice, integrate this knowledge into daily practice to refine their own skill development, and then seek additional feedback through iterative on-going sessions. As this study suggests, this individualized support may be less cost prohibitive than presumed and could be a viable option

when used judiciously within real-world settings to promote training transfer and support on-going skill refinement. For example, fidelity checks could be used to identify ISP who would benefit most from additional individualized sessions or workshop content could be shortened in favor of shifting a part of those training costs to additional consultation and feedback sessions.

Dissemination cost

The dissemination model from this study provides insight into how variation in training factors influence cost. Training modality had a relatively small impact on the base model, which entailed large-scale rollout of MI training to 50 ISP across 10 schools. Moving all training components to online delivery reduced cost by just over 1%, whereas in-person delivery of all components increased cost by roughly 5%. Given that the current study used a hybrid model with workshops delivered in person and consultation and feedback and COP meetings conducted online, variation from the base model may not accurately represent movement from one modality to the other. However, when considering the cost differences between the two modalities, average per trainee cost only increased by roughly $100 when moving from online to in-person modality ($1,686.30 vs. $1,782.79) with the additional cost attributable to the trainer's travel time and mileage.

Trainee role (i.e., training teachers versus administrators) also resulted in minimal variation from the base model. A dissemination model in which only teachers were trained resulted in just over a 4% cost reduction. A dissemination model in which only administrators were trained resulted in less than a 1% increase in cost. The minimal increase in cost for the administrator model may be an artifact of trainee composition within the base model. Trainees in the study included ISP with higher salaries including some administrators and school psychologists, which placed average salaries (in both conditions) toward the higher end of the salary scale for school-based personnel. When comparing the low and high cost models for trainee role, however, the average per trainee difference between the models was minimal. The difference in average per trainee cost between the low and

high-cost model was less than $100 ($1,634.12 versus $1,714.01). This nominal difference and the narrow wage range between teachers and administrators was driven largely by the number of hours worked within a year. This study, in accordance with Shand and Bowden's (2022) recommendations for cost research in education, calculated a per minute salary using 1440 annual hours (8/hr x 180 days) for ISP and 2080 annual hours for school administrators. This differential in annual hours reduced the salary gap between ISP and administrators substantially despite more substantial differences in annual salaries between ISP (~$75,000) and administrators (~$111,000).

Trainee size and trainee support had a more substantial impact on cost estimates within the dissemination cost model. Variation in the size of workshop trainings resulted in a 10% reduction in cost when all trainees (i.e., one workshop with 50 trainees) attended the same workshop training and more than a 42% increase when the training size was reduced to five trainees per workshop (i.e., 10 workshops with 5 trainees). Variation in post-workshop trainee support changed model estimates by roughly 30% in either direction when consultation and feedback and COP meetings were either removed from the model (the low-cost option) or were doubled (the high-cost option).

The extent to which these two factors influence training cost raises further important questions about how to optimize MI training delivery within school-based settings. Although larger workshops may be beneficial from a cost standpoint, they can potentially limit trainer-trainee interaction, opportunities for trainee feedback, and may encourage the use of more didactic approaches given the difficulty a single trainer might have managing larger groups of trainees. A move to delivering workshops to larger groups of trainees would necessitate development of effective strategies to increase group interactions during larger trainings (i.e., trainer demonstration followed by peer role-play). The current school-based MI training literature has not documented training techniques that are effective in larger groups though these techniques may exist and be in use within real-world training contexts. The current literature on MI training transfer does not support reducing cost by

eliminating post-workshop supports given the documented need for on-going consultation and feedback to ensure proficient use of MI (Manuel et al., 2022). Again, despite the nearly 30% increase in cost when post-workshop supports are doubled (i.e., from 2 to 4 consultation and feedback sessions) this additional cost may be justifiable, though – to date – empirical evidence is not available that isolates MI consultation and feedback and systematically compares it to the use of other training strategies. As noted earlier, shifting resources from workshops to consultation and feedback could be one method to increase one-on-one supports without increasing cost. Another solution – again untested within the literature – could be the use of asynchronous online training that provides foundational knowledge in core MI components coupled with more intensive consultation and feedback sessions that support reflection and individualized feedback. Moving workshop content online may solve a number of cost related problems. It can help reduce trainer cost. Trainees could "test into" training modules, which would facilitate the individualization of training content to the needs of each trainee and thereby reduce trainee time in workshop trainings. Finally, it would provide a solution for training one ISP at a time. As noted above with respect to incremental cost, it is cost prohibitive to train one ISP at a time given that trainer costs are fixed and, ideally, need to be distributed across more than one trainee. Moving MI workshop trainings online, would circumvent this limitation and allow ISP opportunities to participate in (and revisit as needed) asynchronous MI content.

MI Fidelity

This study utilized the MITI (Moyers et al., 2014) as a measure of MI fidelity and as a training outcome to assess the cost effectiveness of the CBP+MI training as compared to the CBP training. The MITI is the most frequently used measure to assess MI fidelity. The MITI includes four summary scores that align with MI theory, including (a) two global measures assessing use of relational and technical MI skills, (b) a measure of complex reflection use, and (c) a measure of the

practitioner's use of reflections to questions. It has evidence of inter-rater reliability (Moyers et al., 2016) and, within clinical and research settings, is considered the "gold standard" for assessing MI fidelity (Hurlocker et al., 2020; Jelsma et al., 2015). Despite broad use of the MITI within the literature, this study's use of the MITI contributes to the literature in two unique ways. First, the MITI is often used to assess proficient use of MI by those receiving training in MI but – to this author's knowledge – has not been used to assess the use of MI skills by trainees who have *not* been exposed to MI training. Second, previous MI cost training studies have used project-developed measures or the *Independent Tape Rater Scale*, a 10-item measure of MI competence rated on a 7-point Likert scale, as training outcomes (Martino et al., 2016; Olmstead et al., 2011). Thus, this study is unique in its exploratory use of the MITI as a cost-effectiveness outcome measure.

Researchers typically report mean MITI summary scores as evidence of fidelity within MI literature (Dunn et al., 2016). Based on these standards, trainees in the CBP+MI condition – on average – met the minimum MI fidelity requirements across the majority of summary scores. For example, CBP+MI trainees were above the technical skills basic proficiency threshold (i.e., ≥ 3.0) and the reflections-to-questions basic proficiency threshold (i.e., ≥ 1:1) for all three sessions. They were above the complex reflections advanced proficiency threshold (i.e., ≥ 50%) for all three sessions. For one of three sessions, they were above the relational skills basic proficiency threshold (i.e., ≥ 3.5) and nearing basic proficiency on the other two sessions. Yet, when compared to the fidelity scores for the trainees in the CBP condition, these fidelity findings become somewhat tempered. Trainees in the CBP condition did not meet proficiency thresholds for relational skills or their ratio of reflections-to-questions but they did demonstrate – according to MITI cutoffs – basic proficiency in their use of MI technical skills. They also scored above the MITI's complex reflections advanced proficiency cutoffs on two of three sessions and above the complex reflections basic proficiency cutoff for one session, despite no direct exposure to MI training content in the use

of OARS within this study. Although these findings arguably could be a product of group-level variability (i.e., the scores of a few trainees in the CBP condition inflating group means), evidence of proficiency among CBP trainees held when categorical MITI cutoffs were applied to the data. As reported in Table 23, a nearly identical number of trainees met the MITI's categorical cutoffs for technical skills and complex reflections and, in some cases, a higher percentage of CBP trainees met MI proficiency standards as compared to trainees in the CBP+MI condition.

Although these findings complicate examination of cost-effectiveness within the context of this study (as discussed in the following section), they also raise questions about the measures currently available to establish proficient use of MI in school-based settings. As noted previously, researchers typically have not used the MITI to score the verbal interactions of trainees *not* exposed to MI training. The high scores among CBP trainees in this study raise the possibility that current MITI cutoffs – which are based on expert opinion and derived within a clinical setting – may not accurately identify proficient MI use in school-based settings. These findings also raise questions about the psychometric properties of the MITI and the measure's reliance on (a) global impression items and (b) behavior counts. Inter-rater reliability for this study was excellent; however, even if two raters are able to independently code each item accurately, it is possible that the MITI, as currently structured, does not capture the breadth of MI skills in a nuanced enough way to distinguish between subtle differences in proficient MI use.

A further limitation of the MITI evident with this study is the absence of guidance on how, or even if, summary scores should be combined and, to what extent, each summary score represents unique or overlapping dimensions of MI's two presumable constructs (i.e., relational and technical skills). In this study, the most rigorous threshold that discriminated trainees in the CBP condition from trainees in CBP+MI conditions required trainees to meet basic proficiency cutoffs across all four summary measures. Using this rigorous cutoff, no trainees in the CBP condition met the basic

MI proficiency cutoff. However, when applying this cutoff, only 31% of trainees in the CBP+MI condition met this cutoff. This rather low percentage of CBP+MI trainees meeting basic proficiency could be a product of missing data and the decision to treat cases with missing data as not meeting fidelity criteria (as opposed to excluding them from the analysis). It could be evidence that further refinement of the MITI is required, including guidance on how to combine summary scores to identify proficient use accurately. It may be evidence that an alternative fidelity measure is needed for school based settings, one that consists of multiple items (e.g., 20 items) that use the same rating scale across items and clearly distinguish between MI's two underlying constructs. It is also possible that this is a limitation of the CBP+MI training. Finally, it is also important to consider that the MITI, which was designed as a tool to improve the use of MI in clinical settings, may not be well suited to function as a training outcome in research studies.

There are alternative explanations for why CBP trainees performed so well on two of the MITI's four summary scores. It is possible, for example, that ISP possess certain "baseline" verbal skills that overlap with MI's technical skills, such as the use of open-ended questions and reflections. It is possible that these findings are an artifact of the study and the CBP procedures common across both conditions. For example, CBP trainees scored particularly high on the MITI during the initial CBP session that focuses on engagement. During this session, the coach delivers manualized content that includes asking a set of five questions as part of the teacher interview process. Since the MITI was coded by independent coders blind to condition and unfamiliar with the CBP coaching procedures, they would be unaware of times when the coach's verbal responses were guided by manualized prompts as opposed to in-the-moment use of MI. It is worth noting, however, that CBP trainees performed particularly well with complex reflections, which were not part of the CBP manualized procedures. At this time, multiple explanations for the performance of CBP trainees'

performance is possible but, in the absence of additional research, it is not possible to determine which explanation – or which combination of explanations – might explain these findings.

Cost-Effectiveness

The cost-effectiveness findings reported in this study perhaps raise more questions than they answer. As noted in the results, cost-effectiveness varied based on the fidelity measure and the rigor of the cutoff. For the *a priori* fidelity threshold and for four of the five exploratory fidelity thresholds, the CBP training was the cost effective option. For each of these thresholds, CBP was cost effective either because (a) there were an equal number of trainees who met the fidelity threshold when compared to the CBP+MI condition or (b) fewer trainees met the threshold but due to substantially lower costs, CBP was still the cost effective option to train one additional ISP to fidelity. The CBP+MI training was not the cost effective option for the *a priori* fidelity threshold for this study. It was only the cost effective option for one fidelity threshold; though, notably, the one threshold for which it was cost effective required trainees to demonstrate broad, consistent use of all MI skills (i.e., meeting all basic cutoffs across sessions).

There is a range of possible explanations for the lack of clarity with respect to the cost-effectiveness findings for this study. As noted above, the findings may be due to limitations with the measures available to capture MI fidelity and a lack of guidance on how (and if) to combine cutoffs. The lack of clarity may be due to the sample that participated in this study. Although the baseline characteristics of the sample were comparable across conditions, roughly 15% of trainees in the CBP condition and 8% in the CBP+MI condition reported some previous exposure to MI training. This level of exposure would not explain CBP trainees' high proficiency levels on MI's technical skills and use of complex reflections but this previous exposure does complicate interpretation of these findings. Additionally, this study took a conservative approach to missing data. If data were not available at the session level, it was assumed that the trainee did not meet fidelity criteria on any of

the summary score (i.e., fidelity threshold met = 0). This decision rule with respect to fidelity may have affected the CBP+MI condition disproportionately because trainees in the CBP+MI condition had more missing audio recordings than the CBP condition across all sessions. Due to these limitations, it is not possible to draw definitive conclusions above the effectiveness (or cost effectiveness) of the CBP+MI training with respect to MI fidelity, especially given that rigorous exploratory cutoffs do suggest that the CBP+MI training imparts at least basic proficiency across all MI skills and broad consistent use across sessions. Furthermore, it is worth noting that trainees in the CBP+MI condition met or exceeded basic MI proficiency on the majority of MITI measures and across MI sessions. Thus, the question is not so much whether the CBP+MI trainees successfully developed core MI skills. The question, instead, is why the CBP trainees appear to have developed (or already possessed) similar core skills following a training during which they were not directly exposed to training in MI.

Finally, examination of the cost-effectiveness data from this study highlights two important consideration with respect to cost analysis, cost-effectiveness analysis, and decision-making. First, a training (or intervention) that demonstrates the greatest incremental gain may not always be the most cost effective. As this study demonstrated, a training option that is substantially less expensive may be more (or equally) cost effective even if it is less effective (i.e., the incremental gain with respect to the percentage of trainees reaching fidelity favors the other training model). As reported above, roughly an additional 25% of trainees in the CBP+MI condition demonstrated basic proficiency in MI's relational and technical skills across sessions. Yet, despite these seemingly notable incremental gains with respect to the CBP+MI training, the CBP condition was the cost effective option when considering cost effectiveness.

A second consideration the findings from this study highlight is the need to consider not just how expensive a training is but also how effective it is. Although this idea is implicit within cost

effectiveness analysis, it seems worth highlighting from a decision-making standpoint. For this study, for example, the incremental cost to train one additional trainee using the CBP+MI training based on a normalized sample of ten trainees was approximately $1,173.[4] Yet, for the one exploratory threshold that favored the CBP+MI condition, actual per trainee cost to train *to fidelity* was $3,910. The difference in these amounts account for difference in cost associated with simply training another ISP and training another ISP to a level of fidelity that will enable them to take what they have learned in training and transfer it to actual use within a school. Again, this estimate of nearly $4,000 may overestimate the actual cost given the aforementioned limitations with the outcome used in this study and characteristics of the sample but it does highlight the value of considering not only cost but also effectiveness when making decisions.

Implications for Special Education

An important consideration of this study pertains to the use of MI – and the training of school-based personnel to use MI – to support students with disabilities, their teachers, and their families. To date, the use of MI in school-based settings has largely occurred within manualized interventions that utilize structured protocols aligned with MI's four tasks to help guide ISP's use of MI. MI-infused, manualized interventions provide scaffolding that facilitates MI use. This scaffolding potentially can reduce training time and cost, but can also limit how school-based personnel use MI. The CBP coaching model used in this study is one example of this type of structured, MI-infused support. The FCU (Dishion & Stormshak, 2007), CCU (Reinke et al., 2011), and SBIRT (Curtis et al., 2014; Hunt et al., 2022) are other examples of structured, manualized MI-infused approaches used to support families, teachers, and students, respectively. For students with or at risk of developing disabilities, researchers have developed similar structured approaches as noted previously (Forber-Pratt et al., 2024; Frey et al., 2022; Owens et al., 2017; Sheftel et al., 2014).

[4] ($1,417.41 + 10*($1,031.27))/10 = $1,173.01

There are clear benefits to delivering MI within structured, manualized protocols. If, however, school-based personnel can be trained to use MI skillfully (i.e., with fidelity), they then can use MI as a "professional tool" and potentially integrate it into conversations with students as a stand-alone evidence-based practice. This would enable broader use of MI's verbal techniques within school-based settings and potentially would more directly benefit students within special education who are more likely to receive services in small group or one-on-one sessions where less structured use of MI could be beneficial. Additionally, when used as a stand-alone evidence-based practice, MI holds significant potential to benefit students as an autonomy supporting approach, especially within special education as a technique to promote student self-determination and motivation. Research has demonstrated that autonomy-supporting approaches are associated with increasing student motivation and engagement and improving academic outcomes and student well-being (Aelterman et al., 2019; Bureau et al., 2022; Day et al., 2022; Snape & Atkinson, 2016).

Recent qualitative research suggests the use of MI as a professional tool in school-based settings is possible and that the use of MI need not be limited to structured, manualized protocols. Svensson et al. (2021), for example, noted how teachers used MI to build rapport and trust with students and diffuse tense conversations with parents. Pennell et al. (2020) and Pincus et al. (2019) noted how school-based personnel integrated MI into conversations with students to facilitate collaboration and to promote student autonomy. Moving MI outside of structured protocols would also enable expanded use into other areas of special education such as IEP processes and Section 504 planning as discussed previously.

Yet, to truly assess the feasibility of utilizing MI as a professional tool, particularly within the field of Special Education, more information is needed about (a) whether ISP, and teachers in particular, can be trained to fidelity in MI; (b) how much time is required to do so; and (c) the costs associated with requisite training. To that end, this study provides foundational information to begin

to address these questions (albeit with a number of caveats). This study suggests that ISP can be trained to used MI with fidelity and when delivered within a structured protocol. From an incremental cost standpoint, training cost are not prohibitive but may be so if the effectiveness findings from this study are accurate. For example, is an expense of nearly $4,000 per trainee a justifiable expense, especially in light of the limited resources available for special education services? One possible solution – especially with respect to less structured use of MI outside of manualized protocols – would be to incorporate MI into pre-service training or, at a minimum, incorporate core MI skills into pre-service course content that align with engaging students and promoting autonomy and self-determination. This approach would reduce in-service training cost and provide incoming teachers with core skills to help increase collaboration with students and negotiate difficult conversations with parents or even fellow teachers.

This study cannot answer a number of questions that would enable uptake and use of MI more broadly within special education. Although the study was funded by the National Center for Special Education Research, the focus was on training ISP to provide coach support to general education teachers to strengthen their use of positive feedback and opportunities to respond with students in their classroom who were eligible for or receiving special education services (particularly students requiring additional behavior supports). The sensitivity analysis conducted within this study suggests that, from a cost standpoint, it is feasible to train special education teachers in MI. Trainings conducted with teachers rather than administrators were roughly 5% less expensive than the base model. It is important to note however that although it may be less expensive to train teachers, it is not known whether training teachers to fidelity would require more time than training the ISP who participated in this study. If teachers needed additional consultation and support session (beyond what was provided in the base model for ISP in this study), the cost savings of 5% would be offset by an increase of up to 30% depending on the post-workshop supports provided. As the

aforementioned considerations suggest, the data from this study provides foundational information to help guide informed decision-making and promote further consideration with respect to how to integrate MI into special education service provision.

Limitations

This study has a number of limitations. First, the data reported in this study were collected as part of a pilot feasibility study for a Development and Innovation grant. In turn, the sample size is small and based on data from two Midwestern U.S. states. National estimates were used to calculate reported costs (when appropriate); however, it is possible some cost estimates may differ for a larger sample or if data were collected in a different geographic region of the U.S. Second, this study was conducted following the COVID-19 pandemic. Although efforts were made to ensure that participating ISP met all inclusion and exclusion criteria for the study, ISP who had some previous exposure to MI participated in the study. Through randomization, trainees with previous MI exposure were distributed proportionally between the two conditions (i.e., baseline equivalence between conditions on past MI exposure); however, it is possible that this past exposure to MI artificially inflated fidelity scores within the CBP condition and complicated interpretation of the cost-effectiveness analysis. Third, there was substantial missing data on the outcome of interest for this study (> 20%) on at least one occasion and for at least one of the two training conditions. A conservative approach was applied to missing data to enable analysis of the complete sample. This decision, however, may have artificially underestimated the percentage of trainees reaching a given fidelity threshold, particularly for the CBP+MI condition, which had higher rates of missing data. Fourth, the chosen cost effectiveness outcome for this study (i.e., MITI) complicated interpretation of the cost-effectiveness data. Although the MITI is the "gold standard" for assessing MI fidelity, to date it has not been used as a training outcome within a cost-effectiveness study to differentiate between participants who achieved MI fidelity. The MITI's cutoffs were not derived empirically, but

based instead on clinical impression. Additionally, these cutoffs were specified for clinical rather than school-based settings. The MITI's authors also do not provide recommendations on how to combine separate summary measures (or speak to the extent to which it is appropriate). In combination, these limitations make it difficult to draw definitive conclusions with respect to fidelity, especially in light of the high percentage of trainees in the CBP condition who had no direct exposure to MI training but nevertheless achieved basic MI proficiency based on the MITI's recommended cutoffs. Fifth, this study trained ISP to use MI within the context of the CBP coaching model. Data from this study can be extended – as was done within the sensitivity analysis – to teachers to inform estimates of training cost. However, given the composition of the ISP sample (i.e., school psychologists, school social workers, mental health specialists), data on cost effectiveness may not directly translate to teachers given differences in training and experience. Finally, it is unlikely that the factors considered for the sensitivity analyses reported in this study were exhaustive. The factors were chosen to highlight areas of potential variation relevant to school-based trainings in MI; however, other unexamined factors could substantially affect the cost estimates reported herein.

Future Directions for Research

This study identifies a number of areas for future research. First, further research is needed to understand the optimal length of workshops (e.g., number of days), the optimal length of sessions within workshops (e.g., the number of hours per day) and how the sequencing of workshop content within sessions affects trainees' skill development. Workshops make up a disproportionate percentage of overall training costs and are the primary strategy for delivering MI trainings. For example, all of the MI training studies documented in this study – including the CBP coaching model – included a workshop as part of training. Given this reliance on workshops as a primary

training strategy, research on how to organize and optimize their impact could substantially reduce the cost of future training models.

This study examined the use of three implementation strategies pertaining to training transfer. To date, however, little is known about the extent to which different training strategies contribute to overall training transfer. The field would benefit from future studies that disaggregate training components and utilize factorial designs to examine the unique contribution of each training strategy. Collins (2018) Multiphase Optimization Strategy (MOST) provides a framework for guiding optimization efforts. Given the cost associated with effective training, clear information about which strategies are driving training effects will enable the optimization of training models and, ultimately, reduce training cost.

Within the school-based literature on MI, there is limited (if any) data documenting the extent to which MI is an active ingredient within structured intervention protocols. As noted throughout this study, MI is added to multi-component interventions (as is the case with the CBP coaching model) but past research has not systematically randomized participants to separate training conditions and delivered these intervention models with and without MI to document MI's unique effect. Thus, similar to the proposed research on training strategies, the field would benefit from understanding if – and to what extent – MI contributes to the effects reported for evidence-based interventions that include MI as a component. Again, knowledge of MI's unique contribution would be helpful given the cost associated with training school-based personnel in MI. In addition, further research could help inform how much MI training is necessary, especially within intervention models that scaffold the use of MI.

There are clear limitations with the measures available to monitor MI fidelity within school-based settings. Although the MITI is considered the gold standard for MI fidelity monitoring, there is limited psychometric data to support its use outside of clinical contexts and, as suggested within

this study, the current cutoffs and lack of recommendations for how to integrate summary scores severely limit its accuracy as a training outcome. In turn, further research is needed to develop empirically derived cutoffs for the MITI specific to school-based settings and inform recommendations for combining summary scores across measures. Conversely, further research could focus on identifying and validating a more appropriate measure of MI fidelity for school-based settings. Other measures exist that may be more pragmatic options for use in research and real-world contexts. For example, Baez et al. (2020) have developed the Motivational Interviewing Evaluation Rubric (MIER) to evaluate fidelity within community-based settings. Future research could examine the extent to which the MIER could be used as a training outcome in school-based settings and generate school-specific cutoffs that accurately discriminate proficient use of MI's core skills. In additional, global relational scores on the MITI were surprisingly low across both trainee groups in this study. Future research would benefit from understanding whether this finding is sample specific; an artifact of the MITI's scoring thresholds; or whether school-based personnel require more training in relational skills as compared to personnel in clinical settings.

Finally, future studies are needed that extend MI use to special education teachers and other school-based personnel working directly with students with disabilities (i.e., counselor, transition specialists, etc.). This research should include not only manualized, MI-infused models but also the use of MI as a professional tool. To date, research on MI that includes students with disabilities is limited. Given MI's potential as an autonomy-supporting stand-alone intervention, the field of special education would benefit from future research that documents the direct benefits of MI to students with disabilities (as opposed to the indirect benefits of MI mediated through change in teacher or parent behavior). Although research in this area is beginning to emerge, it is primarily qualitative and is not focused specifically on students with disabilities. Furthermore, important steps have been taken to document the ways in which MI can be adapted to support individuals with

Autism, mild intellectual disabilities, and ADHD (Frielink & Embregts, 2013; Gersib, 2023). However, the field would benefit from further research that systematically documents adaptations specific to supporting students in school-based settings and considers if and how adaptations should vary by grade level (e.g., supporting middle school versus high school students).

Conclusion

Research spanning roughly 35 years supports the efficacy of MI use across numerous settings and various populations (Bahafzallah et al., 2020; Lundahl et al., 2009; Miller, 2023). Yet, to date, research that documents MI training cost and the proficient use of MI in school-based settings is limited. This study generated preliminary cost estimates for training school-based ISP in MI. It also explored how different training factors impact cost estimates and provided exploratory analysis of cost-effectiveness as it relates to training school-based personnel to fidelity in MI. Although this study arguably generates more questions than it answers, it provides necessary foundational data to guide future research on the feasibility of MI use in school-based settings and to guide informed decisions about MI training. As well, this study is a step in the direction of bridging the research-to-practice gap for MI use in school-based setting and the broader integration of MI into general and special education services to support students with and without disabilities, their families, and their teachers.

APPENDIX A. MITI GLOBALS AND BEHAVIOR COUNTS

Cultivating Change Talk				
Low				High
1	2	3	4	5
Clinician shows no explicit attention to, or preference for, the client's language in favor of changing	Clinician sporadically attends to client language in favor of change – frequently misses opportunities to encourage change talk	Clinician often attends to the client's language in favor of change, but misses some opportunities to encourage change talk	Clinician consistently attends to the client's language about change and makes efforts to encourage it	Clinician shows a marked and consistent effort to increase the depth, strength, or momentum of the client's language in favor of change

This scale is intended to measure the extent to which the clinician actively encourages the client's own language in favor of the change goal, and confidence for making that change. To achieve higher ratings on the Cultivating Change Talk scale, the change goal must be obvious in the session and the conversation must be largely focused on change, with the clinician actively cultivating change talk when possible. Low scores on this scale occur when the clinician is inattentive to the client's language about change, either by failing to recognize and follow up on it, or by prioritizing other aspects of the interaction (such as history-taking, assessment or non-directive listening). Interactions low in Cultivating Change Talk may still be highly empathic and clinically appropriate.

Care should be taken not to penalize clinicians if clients do not offer change talk or do not respond to efforts to evoke it.

Verbal Anchors
1. Clinician shows no explicit attention to, or preference for, the client's language in favor of changing.

Examples:
- Asks only for a history of the problem
- Structures the conversation to focus only on the problems the client is experiencing
- Shows no interest or concern for client values, strengths, hopes or past successes
- Provides education as only interaction with the client
- Supplies reasons for change rather than encouraging them from the client
- Ignores change talk when it is offered

2. Clinician sporadically attends to client language in favor of change – frequently misses opportunities to encourage change talk.

Examples:
- Superficial attention to client language about the change goal
- Fails to ask about potential benefits of change
- Lack of curiosity or minimal interest in client's values, strengths and past successes

3. Clinician often attends to the client's language in favor of change, but misses some opportunities to encourage change talk.

Examples:

- Misses opportunities to encourage client language in favor of change
- May give equal time and attention to sustain talk and change talk, for example using decisional balance after momentum for change is emerging

4. Clinician consistently attends to the client's language about change and makes efforts to encourage it.

Examples:

- More often than not, acknowledges client reasons for change and explores when they are offered
- Often responds to change talk with reflections that do not encourage deeper exploration from the client
- Expresses curiosity when clients offer change talk
- May explore client's values, strengths, hopes and past successes related to target goal

5. Clinician shows a *marked and consistent* effort to increase the depth, strength, or momentum of the client's language in favor of change.

Examples:

- Over a series of exchanges, the clinician shapes the client's language in favor of change
- Uses structured therapeutic tasks as a way of eliciting and reinforcing change talk
- Does not usually miss opportunities to explore more deeply when client offers change talk
- Strategically elicits change talk and consistently responds to it when offered
- Rarely misses opportunities to build momentum of change talk

Softening Sustain Talk				
Low				High
1	2	3	4	5
Clinician consistently responds to the client's language in a manner that facilitates the frequency or depth of arguments in favor of the status quo.	Clinician usually chooses to explore, focus on, or respond to the client's language in favor of the status quo.	Clinician gives preference to the client's language in favor of the status quo, but may show some instances of shifting the focus away from sustain talk.	Clinician typically avoids an emphasis on client language favoring the status quo.	Clinician shows a marked and consistent effort to decrease the depth, strength, or momentum of the clients language in favor of the status quo.

This scale is intended to measure the extent that the clinician avoids a focus on the reasons against changing or for maintaining the status quo. To achieve high scores, clinicians should avoid lingering in discussions concerning the difficulty or undesirability of change. Although therapists will sometimes choose to attend to sustain talk to build rapport, in general they should spend only as much time as needed to bring the discussion into more favorable territory for building motivation. High scores may also be achieved in the *absence* of sustain talk during a session, if the clinician does not engage in behaviors to evoke it. Low scores in Softening Sustain Talk are appropriate when clinicians focus considerable attention to the barriers of change, even when using MI-consistent techniques (e.g., asking open questions, offers reflections, affirmations and other MI Adherent techniques) to evoke and reflect sustain talk throughout the session.

1. Clinician consistently responds to the client's language in a manner that facilitates the frequency or depth of arguments in favor of the status quo.

Examples:

- Explicitly asks for arguments against change, queries difficulties
- Actively seeks elaboration when sustain talk is offered through questions, reflections, or affirmations
- Preferential attention and reinforcement of sustain talk when it occurs alongside change talk
- Sustained curiosity and focus about reasons not change

2. Usually chooses to explore, focus on, or respond to client's reasons to maintain the status quo.

Examples:

- Often deepens discussion of barriers or difficulties of change when client mentions them
- Asks about barriers to change on more than one occasion during the interview, even if the client does not bring up
- Often reflects benefits of the status quo

3. Clinician gives preference to the client's language in favor of the status quo, but may show some instances of shifting the focus away from sustain talk.

Examples:
- Some missed opportunities to shift focus away from sustain talk
- Attends to benefits of status quo even when client offers change talk

4. Clinician typically avoids an emphasis on client language favoring the status quo.

Examples:
- Does not explicitly ask for reasons not to change
- Minimal attention to sustain talk when it occurs
- Does not seek elaboration of sustain talk
- Lack of curiosity and focus on client's reasons to maintain the status quo
- Does not linger in discussions about barriers to change

5. Clinician shows a *marked and consistent* effort to decrease the depth, strength, or momentum of the client's language in favor of the status quo.

Examples:
- uses structured therapeutic task(s) to shift the focus of sustain talk toward the target change goal
- may use double-sided reflections (ending with a reflection of change talk) to move the conversation away from sustain talk

Partnership				
Low				High
1	2	3	4	5
Clinician actively assumes the expert role for the majority of the interaction with the client. Collaboration or partnership is absent.	Clinician superficially responds to opportunities to collaborate.	Clinician incorporates client's contributions but does so in a lukewarm or erratic fashion.	Clinician fosters collaboration and power sharing so that client's contributions impact the session in ways that they otherwise would not.	Clinician actively fosters and encourages power sharing in the interaction in such a way that client's contributions substantially influence the nature of the session.

This scale is intended to measure the extent to which the clinician conveys an understanding that expertise and wisdom about change reside mostly within the client. Clinicians high on this scale behave as if the interview is occurring between two equal partners, both of whom have knowledge that might be useful in solving the change under consideration. Clinicians low on the scale assume the expert role for a majority of the interaction and have a high degree of influence in the nature of the interaction.

Verbal Anchors
1. Clinician actively assumes the expert role for the majority of the interaction with the client. Collaboration or partnership is absent.

Examples:
- Explicitly takes the expert role by defining the problem, prescribing the goals, or laying out the plan of action
- Clinician actively forces a particular agenda for the majority of the interaction with the client
- Denies or minimizes client ideas
- Dominates conversation
- Argues when client offers alternative approach
- Often exhibits the righting reflex

2. Clinician superficially responds to opportunities to collaborate.

Examples:
- Clinician rarely surrenders the expert role
- Minimal or superficial querying of client input
- Often sacrifices opportunities for mutual problem solving in favor of supplying knowledge or expertise
- Minimal or superficial responses to client's potential agenda items, knowledge, idea, and /or concerns

- Occasionally may correct the client or refutes what the client has said

3. Clinician incorporates client's contributions but does so in a lukewarm or erratic fashion.

Examples:
- May take advantage of opportunities to collaborate, but does not structure interaction to solicit this
- Misses some opportunities to collaborate when initiated by the client
- The righting reflex is largely absent
- Sacrifices some opportunities for mutual problem solving in favor of supplying knowledge or advice
- Seems to be in a stand-off with the client; not wrestling and not dancing

4. Clinician fosters collaboration and power sharing so that client's contributions impact the session in ways that they otherwise would not.

Examples:
- Some structuring of session to ensure client input
- Searches for agreement on problem definition, agenda setting, and goal setting
- Solicits client views in more than a perfunctory fashion
- Engages client in problem solving or brainstorming
- Does not attempt to educate or direct if client "pushes back" with sustain talk
- Does not insist on resolution unless client is ready

5. Clinician actively fosters and encourages power sharing in the interaction in such a way that client's contributions substantially influence the nature of the session.

Examples:
- Genuinely negotiates the agenda and goals for the session
- Indicates curiosity about client ideas through querying and listening
- Facilitates client evaluation of options and planning
- Explicitly identifies client as the expert and decision maker
- Tempers advice giving and expertise depending on client input
- Clinician favors discussion of client's strengths and resources rather than probing for deficits

Empathy				
Low				High
1	2	3	4	5
Clinician gives little or no attention to the client's perspective.	Clinician makes sporadic efforts to explore the client's perspective. Clinician's understanding may be inaccurate or may detract from the client's true meaning.	Clinician is actively trying to understand the client's perspective, with modest success.	Clinician makes active and repeated efforts to understand the client's point of view. Shows evidence of accurate understanding of the client's worldview, although mostly limited to explicit content.	Clinician shows evidence of deep understanding of client's point of view, not just for what has been explicitly stated but what the client means but has not yet said.

This scale measures the extent to which the clinician understands or makes an effort to grasp the client's perspective and experience (i.e., how much the clinician attempts to "try on" what the client feels or thinks). Empathy should not be confused with sympathy, warmth, acceptance, genuineness, support, or client advocacy; these are independent of the Empathy rating. Reflective listening is an important part of this characteristic, but this global rating is intended to capture *all efforts* that the clinician makes to understand the client's perspective and convey that understanding to the client.

Clinicians high on the Empathy scale show evidence of understanding the client's worldview in a variety of ways including complex reflections that seem to anticipate what clients mean but have not said, insightful questions based on previous listening and accurate appreciation for the client's emotional state. Clinicians low on the Empathy scale do not appear interested in the client's viewpoint.

Verbal Anchors
1. Clinician gives little or no attention to the client's perspective.

Examples:
- Asking only information-seeking questions
- Probing for factual information with no attempt to understand the client's perspective

2. Clinician makes sporadic efforts to explore the client's perspective. Clinician's understanding may be inaccurate or may detract from the client's true meaning.

Examples:
- Offers reflections but they often misinterpret what the client had said
- Displays shallow attempts to understand the client

3. Clinician is actively trying to understand the client's perspective, with modest success.

Examples:

- May offer a few accurate reflections, but may miss the client's point
- Makes an attempt to grasp the client's meaning throughout the session

4. Clinician makes active and repeated efforts to understand the client's point of view. Shows evidence of accurate understanding of the client's worldview, although mostly limited to explicit content.

Examples:

- Conveys interest in the client's perspective or situation
- Offers accurate reflections of what the *client has said already*
- Effectively communicates understanding of the client's viewpoint
- Expresses that the client's concerns or experiences are normal or similar to others'

5. Clinician shows evidence of deep understanding of client's point of view, not just for what has been explicitly stated but what the client means and has not said.

Examples:

- Effectively communicates an understanding of the client *beyond* what the client says in session
- Shows great interest in client's perspective or situation
- Attempts to "put self in client's shoes"
- Often encourages client to elaborate, beyond what is necessary to merely follow the story
- Uses many accurate complex reflections

Behavior Code Definitions[5]

Behavior Code	Definition
Giving Information	This category is used when the interviewer gives information, educates, provides feedback, or expresses a professional opinion without persuading, advising, or warning. Typically, the tone of the information is neutral, and the language used to convey general information does not imply that it is specifically relevant to the client or that the client must act on it.
Persuade	The clinician makes overt attempts to change the client's opinions, attitudes, or behavior using tools such as logic, compelling arguments, self-disclosure, or facts (and the explicit linking of these tools with an overt message to change). Persuasion is also coded if the clinician gives biased information, advice, suggestions, tips, opinions, or solutions to problems *without* an explicit statement or strong contextual cue emphasizing the client's autonomy in receiving the recommendation.
Persuade with Permission	Persuade with Permission is assigned when the interviewer includes an emphasis on collaboration or autonomy support while persuading. The condition of permission may be present when 1. The client asks directly for the clinician's opinion on what to do or how to proceed. 2. The clinician asks the client directly for permission to provide advice, make suggestions, give opinion, offer feedback, express concerns, making recommendations, or discuss a particular topic. 3. The clinician uses autonomy supportive language to preface or qualify the advice such that the client may chose to discount, ignore, or personally evaluate that advice.
Questions	All questions from clinicians (open, closed, evocative, fact-finding, etc.) receive the Question code but only one question per volley is coded. Thus, if a clinician asked four separate questions in a single volley, only one question would be tallied. Closed and open questions are not differentiated in the MITI 4.0. Instead, coders attend to the nature of the clinician's questions with the global ratings in mind. For example, many fact-finding questions within an interview *might* result in a lower rating on the Partnership global and reduce opportunities to Sidestep Sustain Talk.
Reflections (Simple)	Simple reflections typically convey understanding or facilitate client–clinician exchanges. These reflections add little or no meaning (or emphasis) to what clients have said. Simple reflections may mark very important or intense client emotions, but do not go far beyond the client's original statement. Clinician summaries of several client statements may be coded as simple reflections *if* the clinician does not use the summary to add an additional point or direction.
Reflections (Complex)	Complex reflections typically add substantial meaning or emphasis to what the client has said. These reflections serve the purpose of conveying a deeper or more complex picture of what the client has said. Sometimes the clinician may choose to emphasize a particular part of what the client has said to make a point or take the conversation in a different direction. Clinicians may add

[5] From Moyers, T. B., Manuel, J. K., & Ernst, D. (2014). Motivational Interviewing Treatment Integrity Coding Manual 4.1. Unpublished manual.

Behavior Code	Definition
	subtle or very obvious content to the client's words, or they may combine statements from the client to form summaries that are directional in nature.
Affirmation (MI-Adherent Behavior)	An affirmation (AF) is a clinician utterance that accentuates something positive about the client. To be considered an Affirm, the utterance must be about client's strengths, efforts, intentions, or worth. The utterance must be given in a genuine manner and reflect something genuine about the client. It does not have to be focused on the change goal and could reflect a "prizing" of the client for a specific trait, behavior, accomplishment, skill, or strength. Affirms are often complex reflections, and when this occurs, the Affirm code should be preferred.
Seeking Collaboration (MI-Adherent Behavior)	This code is assigned when a clinician explicitly attempts to share power or acknowledge the expertise of the client. It can occur when the clinician genuinely seeks consensus with the client regarding tasks, goals or directions of the session. Seeking collaboration may be assigned when the clinician asks what the client thinks about information provided. When permission to give information or advice is sought, Seeking Collaboration is typically assigned.
Emphasizing Autonomy (MI-Adherent Behavior	These are utterances that clearly focus the responsibility with the client for decisions about and actions pertaining to change. They highlight clients' sense of control, freedom of choice, personal autonomy, or ability or obligation to decide about their attitudes and actions. These are *not* statements that specifically emphasize the client's sense of self efficacy, confidence, or ability to perform a specific action.
Confront (MI Non-Adherent Behavior	This code is used when the clinician confronts the client by directly and unambiguously disagreeing, arguing, correcting, shaming, blaming, criticizing, labeling, warning, moralizing, ridiculing, or questioning the client's honesty. Such interactions will have the quality of uneven power sharing, accompanied by disapproval or negativity. Included here are instances where the interviewer uses a question or even a reflection, but the voice tone clearly indicates a confrontation.

Recording #:_____ Coder:_____ Date: ____/____/____

Global Ratings

Technical Components					
Cultivating Change Talk	1	2	3	4	5
Softening Sustain Talk	1	2	3	4	5
Relational Components					
Partnership	1	2	3	4	5
Empathy	1	2	3	4	5

Target Change:_____

Behavior Counts

		Total
Giving Information (GI)		
Persuade (Persuade)		
Persuade with Permission (Persuade with)		
Question (Q)		
Simple Reflection (SR)		
Complex Reflection (CR)		
Affirm (AF)		
Seeking Collaboration (Seek)		
Emphasizing Autonomy (Emphasize)		
Confront (Confront)		

Start time and sentence:_____

End time and sentence:_____

APPENDIX B. SAMPLE CBP GRAPHS

Following are sample graphs of observation data collected during CBP step 2 and shared with the teacher during CBP step 3.

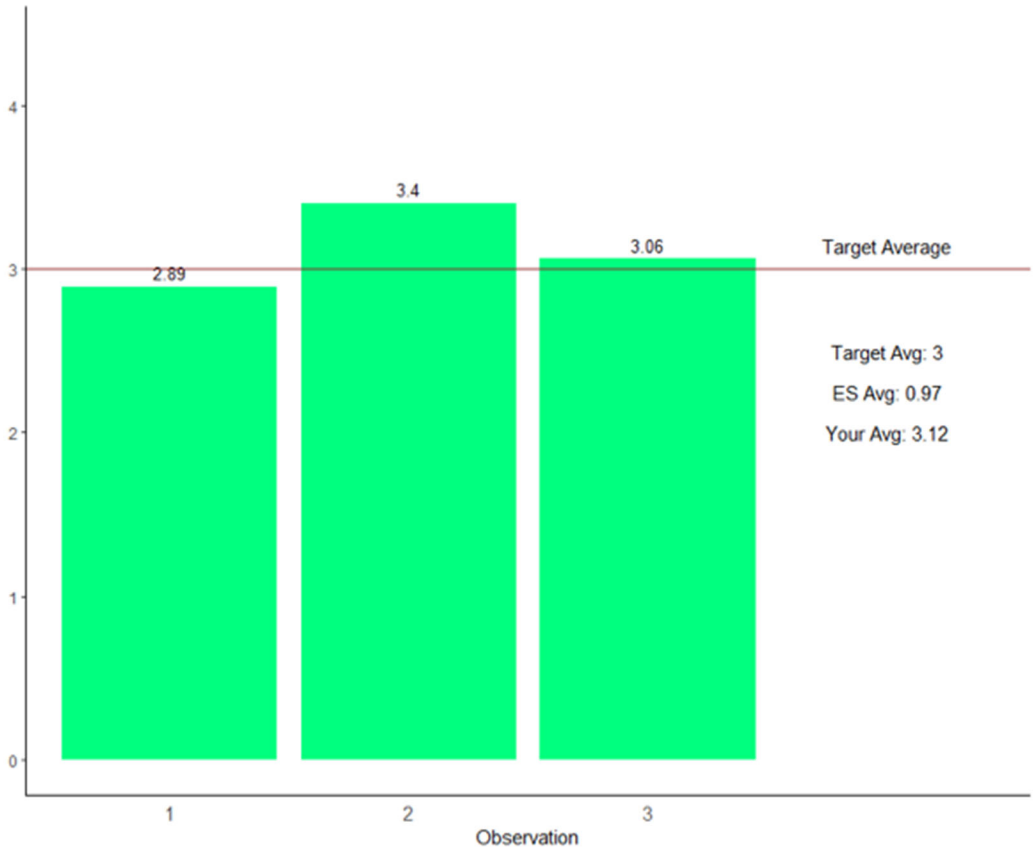

Figure 1. Opportunities to Respond (Example graph).

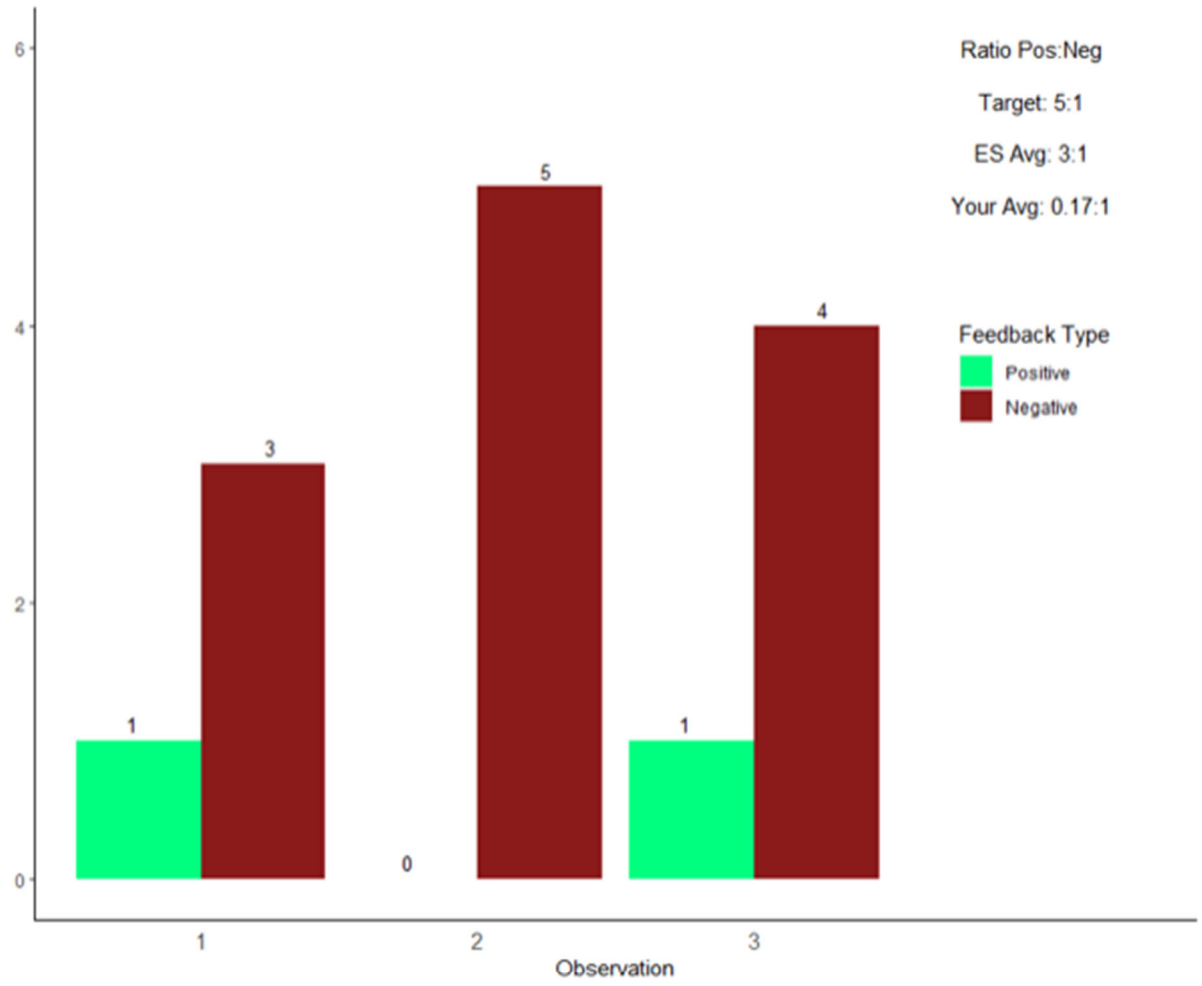

Figure 2. Ratio of Positive-to-Negative Feedback (Example graph).

APPENDIX C. COACHING PROCESS SELF-EFFICACY SCALE

The 16-item coaching process self-efficacy scale (CPSS) was adapted and abbreviated from Guiney and Zibulsky's (2017) 19-item process-oriented self-efficacy scale. As detailed in Table 1 below, wording changes were made to 13 of 16 items to align item language with the CBP coaching process; to replace the use of words such as "resistance" and "problem;" and to increase item clarity and consistency. Additionally, three items were omitted from the CPSS. One item was omitted because it referenced mandated consultation: "Can establish a working relationship with a consultee who is consulting with you only because it is a prereferral requirement." One item were omitted because they referenced directive rather than guiding behavior: (1) "Can restore a consultee's objectivity when necessary or appropriate;" (2) "Can recognize and deal with theme transference from your consultee."

Table C.1. Item edits made to Guiney and Zibulsky's (2017) process-oriented self-efficacy scale.

Items in the adapted coaching process self-efficacy scale	Item in the original process-oriented self-efficacy scale
1. Can remain aware of the potential impact of your personal experiences while **coaching**	Can remain aware of the potential impact of your personal experiences while **consulting**
2. Can establish a strong working relationship with most **teachers**	Can establish a strong working relationship with most **consultees**
3. Can demonstrate nonverbal behaviors that indicate you are attending to **the teacher during coaching**	Can demonstrate nonverbal behaviors that indicate you are attending to **your consultee**
4. Can establish a working relationship with a **teacher who is hesitant to engage in behavior change**	Can establish a working relationship with a **teacher who demonstrates resistance to consultation**
5. Can establish a collaborative relationship that respects **the teacher's** expertise and knowledge	Can establish a collaborative relationship that respects **your consultee's** expertise and knowledge
6. Can redirect the focus when the discussion strays to other topics (such as non-work-related **matters**)	Can redirect the focus **back to the student** when the discussion strays to other topics (such as non-work-related **problems**)
7. Can successfully use reframing (helping **the teacher** see the **situation** from a different perspective)	Can successfully use reframing (helping **your consultee** see the **problem** from a different perspective)
8. Can address **a teacher's** lack of confidence when detected.	Can address a lack of confidence when detected **in your consultee**.

Items in the adapted coaching process self-efficacy scale	Item in the original process-oriented self-efficacy scale
9. Can guide the **coaching** process through stages **from engagement through planning**	Can guide the **consultation** process through stages **from consultation through termination**
10. Can explain the **coaching** process to a **teacher**	Can explain the **process of consultation** to a **new consultee**
11. Can effectively **coach a teacher** from a different cultural background than your own	Can **consult effectively with someone** of a cultural background that is different from yours
12. Can effectively **coach a teacher** when the **student or students being supported are** from a different cultural background than your own	Can **consult effectively with a teacher when the client (student) is** from a different cultural background than your own
13. Can recognize your inherent biases or assumptions based on cultural background	Can recognize your inherent biases or assumptions based on cultural background
14. Can remain aware of how your cultural background may affect the assumptions you make	Can remain aware of how your cultural background may affect the assumptions you make
15. Can recognize how **a teacher's** cultural background may affect the way in which they approach **the coaching process**	Can recognize how **your consultee's** cultural background may affect the way in which they approach **a consultation experience**
16. Can recognize when your personal beliefs are affecting your approach	Can recognize when your personal beliefs are affecting your approach

Table C.2. CPSS Item and Item-Total Statistics

	Item Statistics	Item-Total Statistics			
	M(SD)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Item 1	6.41 (1.50)	100.85	186.67	.527	.917
Item 2	7.78 (1.05)	99.48	193.34	.550	.916
Item 3	7.30 (1.38)	99.96	184.19	.651	.912
Item 4	6.59 (1.01)	100.67	195.00	.514	.916
Item 5	7.30 (1.14)	99.96	188.81	.653	.913
Item 6	6.59 (1.42)	100.67	180.62	.730	.910
Item 7	6.11 (1.52)	101.15	177.59	.751	.909
Item 8	6.81 (1.39)	100.44	181.10	.736	.910
Item 9	5.93 (1.86)	101.33	172.69	.703	.911
Item 10	5.67 (2.32)	101.59	168.56	.607	.920
Item 11	6.85 (1.06)	100.41	193.64	.532	.916
Item 12	6.96 (1.09)	100.30	194.68	.481	.917
Item 13	6.89 (0.80)	100.37	192.40	.787	.912
Item 14	6.89 (1.01)	100.37	188.09	.770	.911
Item 15	6.70 (1.24)	100.56	183.95	.748	.910
Item 16	6.48 (1.01)	100.78	195.03	.510	.916

APPENDIX D. SUPPLEMENTAL TABLES

Table D.1. Total and average cost for educational meetings (pre-training activities).

	Total Cost			Average cost per meeting		
	Admin meetings (n = 3)	ISP meetings (n = 6)	Total (n = 9)	Admin meetings (n = 3)	ISP meetings (n = 6)	Total (n = 9)
Presenter						
Pre-meeting activities	$1,030.13	$576.50	$1,606.63	$343.38	$96.08	$178.51
Time in educational meetings	$274.78	$401.57	$676.35	$91.59	$66.93	$75.15
Travel time[1]	$620.00	$944.66	$1,564.66	$206.67	$157.44	$173.85
Mileage cost	$247.33	$571.82	$819.14	$82.44	$95.30	$91.02
Total	$2,172.24	$2,494.54	$4,666.78	$724.08	$415.76	$518.53
School-based attendees						
Time in educational meetings	$721.89	$7,290.33	$8,012.22	$240.63	$1,215.05	$890.25
Overhead[2]	$20.00	$208.00	$228.00	$6.67	$34.67	$25.33
Materials[3]	$529.36	$1,842.61	$2,371.97	$176.45	$307.10	$263.55
Total	$3,443.49	$11,835.49	$15,278.98	$1,147.83	$1,972.58	$1,697.66
Cost minus overhead	$2,914.13	$9,992.87	$12,907.00	$971.38	$1,665.48	$1,434.11

[1]Presenter travel time for educational meetings was based on the number of miles from the University of Louisville College of Education (for educational meetings held in Kentucky) and from the University of Missouri School of Social Work (for educational meetings held in Missouri) to the site of each educational meeting (i.e., a school or district office in FCPS or JC Schools). The 2023 mileage rate of 0.655¢ per mile was used to estimate mileage cost. Travel time was based on an 8am departure time on a Monday morning. [2]Overhead = 20% of personnel costs. Personnel costs include (a) presenter pre-meeting activities, time in educational meetings, and travel time; and (b) school-based attendees time in educational meetings. [3]Materials included a 10-page printed handout per participant estimated at $2 per handout.

Table D.2. Equipment cost by condition.

Equipment	Total Cost			Average Cost		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
Projector	$62.22	$57.78	$120.00	$4.44	$4.44	$4.44
Computer	$233.33	$216.67	$450.00	$16.67	$16.67	$16.67
Total	$295.56	$274.44	$570.00	$21.11	$21.11	$21.11

Projector = 600 x 2 (1 for each training condition); depreciated over 5 years; 50% research
Laptop = 1500 x 3 (1 for each trainer); depreciated over 5 years; 50% research

Table D.3. Total and average cost for CBP workshops by condition.

CBP Workshop	Total Cost			Average Cost		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
Trainer						
Time preparing before workshops	$793.29	$490.60	$1,283.90	$56.66	$37.74	$47.55
Time in CBP workshops	$618.26	$327.07	$945.32	$44.16	$25.16	$35.01
Travel time[1]	$711.59	$323.33	$1,034.92	$50.83	$24.87	$38.33
Mileage cost	$453.52	$247.33	$700.85	$32.39	$19.03	$25.96
Total	$2,576.66	$1,388.33	$3,964.99	$184.05	$106.79	$146.85
Trainees						
Time preparing before workshop	$558.13	$577.00	$1,135.14	$39.87	$44.38	$42.04
Time in CBP workshop	$2,000.04	$1,864.08	$3,864.12	$142.86	$143.39	$143.12
Total	$2,558.17	$2,441.08	$4,999.25	$182.73	$187.78	$185.16
Overhead[2]	$936.26	$716.42	$1,652.68	$66.88	$55.11	$61.21
Materials[3]	$70.00	$65.00	$135.00	$5.00	$5.00	$5.00
Refreshments[4]	$210.00	$195.00	$405.00	$15.00	$15.00	$15.00
Total	$6,351.09	$4,805.83	$11,156.92	$453.65	$369.68	$413.22
Cost minus overhead	$5,414.83	$4,089.42	$9,504.24	$386.77	$314.57	$352.01

[1]Trainer travel time for CBP workshops was based on the number of miles from the University of Louisville College of Education (for workshops held in Kentucky) and from the University of Missouri School of Social Work (for workshops held in Missouri) to the site of each workshop (i.e., district office in FCPS or JC Schools). The 2023 mileage rate of 0.655¢ per mile was used to estimate mileage cost. Travel time was based on an 8am departure time on a Monday morning. [2]Overhead = 20% of personnel costs. Personnel costs include trainer and trainee time preparing for and delivering workshops. [3]Printed training materials were estimated at $5 per participant. [4]Participant refreshment were estimated at $15 per participant.

Table D.4. Total and average cost for MI workshops.

MI Workshop	Total Cost	Average Cost
Trainer		
Time preparing before workshops	$1,079.07	$83.01
Time MI workshops	$1,341.19	$103.17
Travel time[1]	$995.93	$76.61
Mileage cost	$907.04	$69.77
Total	$4,323.23	$332.56
Trainees		
Time preparing before workshop	$534.75	$41.13
Time in MI workshop	$7,549.68	$580.74
Total	$8,084.43	$621.88
Overhead[2]	$2,300.12	$176.93
Materials[3]	$65.00	$5.00
Refreshments[4]	$540.00	$41.54
Total	$15,312.79	$1,177.91
Total without overhead	$13,012.66	$1,000.97

[1]Trainer travel time for CBP workshops was based on the number of miles from the University of Louisville College of Education (for workshops held in Kentucky) and from the University of Missouri School of Social Work (for workshops held in Missouri) to the site of each workshop (i.e., district office in FCPS or JC Schools). The 2023 mileage rate of 0.655¢ per mile was used to estimate mileage cost. Travel time was based on an 8am departure time on a Monday morning. [2]Overhead = 20% of personnel costs. Personnel costs include trainer and trainee time preparing for and delivering workshops. [3]Printed training materials were estimated at $5 per participant. [4]Participant refreshment were estimated at $15 per participant per day. MI workshops were conducted across 2 or 3 days depending on location.

Table D. 5. Total and average cost for consultation and feedback sessions by condition.

	Total Cost			Average Cost		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
Trainer						
Time preparing for C&F sessions	$278.69	$430.21	$708.90	$19.91	$33.09	$26.26
Time in C&F sessions	$446.74	$776.55	$1,223.29	$31.91	$59.73	$45.31
Total	$725.43	$1,206.76	$1,932.19	$51.82	$92.83	$71.56
Trainees						
Time preparing for C&F sessions	$452.11	$266.06	$718.17	$32.29	$20.47	$26.60
Time in C&F sessions	$641.58	$1,127.60	$1,769.18	$45.83	$86.74	$65.53
Total	$1,093.70	$1,393.65	$2,487.35	$78.12	$107.20	$92.12
Overhead[1]	$363.83	$520.08	$883.91	$25.99	$40.01	$32.74
Total	$2,182.95	$3,120.49	$5,303.45	$155.93	$240.04	$196.42
Cost minus overhead	$1,819.13	$2,600.41	$4,419.54	$129.94	$200.03	$163.69

C&F = Consultation and Feedback. [1]Overhead = 20% of personnel costs. Personnel costs include trainer and trainee time preparing for and attending C&F sessions.

Table D.6. Total and average cost for community of practice meetings by condition.

COP meetings	Total Cost			Average Cost		
	Control (n = 14)	Intervention (n = 13)	Total (n = 27)	Control (n = 14)	Intervention (n = 13)	Total (n = 27)
Trainer						
Time preparing for COP meetings	$307.81	$204.37	$512.18	$21.99	$15.72	$18.97
Time in COP meetings	$445.08	$389.78	$834.85	$31.79	$29.98	$30.92
Total	$752.88	$594.15	$1,347.04	$53.78	$45.70	$49.89
Trainees						
Time in COP meetings	$812.15	$1,314.58	$2,126.73	$58.01	$101.12	$78.77
Overhead[1]	$313.01	$381.75	$694.75	$22.36	$29.37	$25.73
Total	$1,878.04	$2,290.47	$4,168.52	$134.15	$176.19	$154.39
Cost minus overhead	$1,565.04	$1,908.73	$3,473.76	$111.79	$146.83	$128.66

COP = Community of practice. [1]Overhead = 20% of personnel costs. Personnel costs include trainer and trainee time preparing for and attending COP meetings.

APPENDIX E. MITI INTER-RATER RELIABILITY AND SUMMARY SCORE CORRELATIONS

In accordance with Moyers et al. (2016), inter-rater reliability was assessed via a 2-way mixed effects, absolute agreement, average-measures intraclass correlations (ICCs) for global ratings, behavior counts, and summary measures. Cichetti & Sparrow's (1981) benchmarks were used to categorize the quality of each ICC. As reported in Moyers et al. (2016), the benchmarks are as follows: 0.00-0.39 = poor; 0.40-0.59 = fair; 0.60-0.74 = good; 0.75-1.00 = excellent (Cichetti & Sparrow, 1981).

Table E.1 below summarizes ICCs and, for sake of comparability, the ICCs reported in Moyers et al. (2016) for their two best coders based on a sample of 50 reliabilities. For the global items, reliability ranged from .85 to 1.00. Reliability was excellent for all four global items. Reliability for the behavior counts ranged from .53 to .94. Reliability was excellent for eight of 10 behavior counts; fair for one item (i.e., Emphasize Autonomy) and non-calculable for one item due to a lack of variance (i.e., Confront). For the summary scores, ICCs ranged from .77 to .94. Reliability was excellent for all six summary. Table E.2 summarizes correlations among the MITI's four summary scores.

Table E.1. ICCs for MITI globals and behavior counts.

	MISC ICC (n = 28)	ICC as reported in Moyers et al. (2016)
Globals		
Cultivating change talk	.851[a]	.862[a]
Softening sustain talk	1.000[a]	.774[a]
Partnership	.883[a]	.786[a]
Empathy	.876[a]	.799[a]
Behavior counts		
Giving information	.926[a]	.715[b]
Questions	.909[a]	.876[a]
Simple Reflection	.779[a]	.848[a]
Complex Reflection	.930[a]	.714[b]
Affirm	.887[a]	.758[a]
Emphasize Autonomy	.533[c]	.577[c]
Confront	*NC*	.665[b]
Seek Collaboration	.936[a]	.828[a]
Persuade with Permission	.814[a]	.643[b]
Persuade	.907[a]	.786[a]
Summary measures		
Total MI Non-Adherent	.907[a]	.741[b]
Total MI Adherent	.864[a]	.778[a]
Reflection:Question	.944[a]	.919[a]
Technical	.890[a]	.844[a]
Relational	.896[a]	.835[a]
% Complex Reflection	.774[a]	.534[c]

[a] Excellent reliability; [b] Good reliability; [c] Fair reliability. NC = Non-calculable due to a lack of variance.

Table E.2. Correlations among MITI summary scores.

	Relational Global	Technical Global	Complex Reflections
Relational Global	--		
Technical Global	.648	--	
Complex Reflections	.510	.428	--
R:Q Ratio	.374	.084	.158

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