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Examining the Impact of Supervisors on Evidence-Based Clinical Decision-Making in Youth
Mental Health Settings

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy in Psychology

by

Kendal Brianne Reeder Leary

2026

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ABSTRACT OF THE DISSERTATION

Examining the Impact of Supervisors on Evidence-Based Clinical Decision-Making in Youth Mental Health Settings

by

Kendal Brianne Reeder Leary

Doctor of Philosophy in Psychology

University of California, Los Angeles, 2026

Professor Bruce Frederick Chorpita, Chair

Despite the existence of a large evidence base for youth psychotherapy (Becker & Chorpita, 2023), evidence is inconsistently applied in practice, leading to suboptimal treatment outcomes (Weisz et al., 2013). One approach to bridging the science-to-practice gap is *evidence-based practice* (EBP), which refers to the integration of psychotherapy evidence, client-specific evidence, and clinical expertise to inform practice (Spring, 2007). EBP is achieved through a process of intentionally using evidence to make decisions about care; decision-making is considered the “lynchpin” of EBP (Spring, 2008). Clinical supervision, or ongoing consultation between a therapist and supervisor to ensure safe and effective practice, has been found to play a key role in determining how care is delivered (e.g., Schoenwald et al., 2009; Bearman et al., 2013); thus, supervision offers a promising avenue for facilitating decision-making that can support EBP—or in other words, EBP-aligned decision-making. However, there has been little

research to date on any form of decision-making in supervision. This dissertation aimed to examine how supervisors' behaviors and characteristics influence the extent that distinct decisions made in supervision (i.e., selection of problems to target, consideration of practices to deliver, and selection of practice to deliver) align with EBP. Results indicated that the proportion of variance in EBP-aligned decision-making was largely attributable to supervisors. Further, results showed that supervisor topic initiation positively predicted the extent that some decisions aligned with EBP (e.g., decisions about which problems to target and which practices to consider), but that supervisor use of questions did not significantly predict the extent that any decisions aligned with EBP. Supervisor knowledge of psychotherapy evidence was found to positively predict the extent that all examined decision types aligned with EBP, whereas supervisor openness to innovative and evidence-based interventions was found only to predict the extent that one type of decision (i.e., selection of a practice to apply in the next treatment session) aligned with EBP. By providing preliminary insight into how supervisors can support EBP-aligned decisions in supervision, this study lays groundwork for future work examining how supervision can support EBP in public settings.

The dissertation of Kendal Brianne Reeder Leary is approved.

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Introduction

In the United States, the youth mental health burden is staggering and growing, with recent estimates suggesting nearly 7.7 million youth could benefit from mental health services (Whitney & Peterson, 2019). Rates of youth mental health disorders have risen steadily over the past two decades; the prevalence of common disorders of childhood and adolescence—including anxiety, depression, post-traumatic stress, and conduct disorder—have all seen notable increases in recent years (Ghandour et al., 2019; Xiang et al., 2024; Yang et al., 2022). These concerning trends have been characterized as a “youth mental health crisis” and have led to calls for increased availability of effective youth mental health services (McGorry et al., 2025; Office of the Surgeon General, 2021).

The delivery of psychotherapy that is informed by scientific research evidence holds promise for effectively addressing the youth mental burden, as such care has been shown to enhance youth mental health outcomes (Weisz et al., 2013). *Evidence-based practice (EBP)* has become a widely accepted framework for improving the quality and effectiveness of youth psychotherapy (Roberts et al., 2017). In psychology, EBP is defined as the integration of the psychotherapy evidence base (i.e., knowledge emerging from psychotherapy research), client-specific evidence (e.g., client demographics, preferences, and scores on standardized measures), and clinical expertise (i.e., provider knowledge gained through experience) to inform care (APA, 2005; Spring, 2007). This integration is achieved through deliberate decision-making, which is considered the “lynchpin” of EBP (Spring, 2008). Indeed, pioneers of the EBP framework in the field of medicine originally outlined EBP as a decision-making process to shift how clinicians were making decisions in care settings; it was recognized that relying on intuition and experience alone when making decisions was often insufficient to ensure high quality and effective care

(Guyatt et al., 1992). Thus, the EBP approach includes a flow of decisions that promote the application of evidence to care, including 1) selecting a problem to target, 2) considering potential strategies from the evidence base to address the problem, 3) identifying and selecting the optimal intervention, 4) applying the intervention in practice, and 5) evaluating application of the intervention (Sackett, 1997). Translated to the field of psychology, when psychotherapy evidence, client-specific evidence, and clinical expertise are effectively applied to these decisions, these decisions may work to support EBP and thus may be viewed as *EBP-aligned decisions*. In this paper, the terms “EBP-aligned decisions” and “EBP-aligned decision-making” are used to refer to the application of EBP-relevant evidence (i.e., psychotherapy evidence and client-specific evidence) to decisions.

Conceptualizations of EBP from Sackett (1997) and Spring (2007) distinguish the EBP *process* from the *content* of empirically-supported treatments (ESTs; Duncan & Reese, 2012; Spring, 2007; Verbist et al., 2020). ESTs are an important component of EBP in that they emerge from the psychotherapy evidence base, and are thus a form of psychotherapy evidence (Spring, 2007). However, the application of ESTs alone is insufficient to be indicative of EBP (Chorpita & Daleiden, 2018; Verbist et al., 2020). ESTs may be a component of EBP in mental health services, but ESTs must be decided upon with strategic expertise and in concordance with case- or population-specific evidence to be considered part of EBP (Chorpita & Daleiden, 2018). In other words, neither the use of ESTs nor decision-making alone is sufficient to indicate EBP. This conceptualization of EBP also aligns with frameworks of evidence use (Graham et al., 2006), which specify that knowledge is translated to action through a series of decisions, typically informed by tools that summarize relevant evidence. In essence, both EBP and

evidence use frameworks offer systematic approaches to decision-making that can increase the quality and effectiveness of care.

Despite the recognized utility of EBP and broader evidence use paradigms, as well as calls to integrate EBP into “usual care” (Garland et al., 2013), the application of EBP in public youth-serving settings remains limited (Borntrager et al., 2013; Garland et al., 2010; Higa-McMillan et al., 2017). Across settings, a notable challenge of EBP is the integration of the psychotherapy evidence base into decision-making (Gyani et al., 2014; Safran et al., 2011). The integration of psychotherapy evidence into decisions may be particularly challenging in public youth-serving settings, where access to the psychotherapy evidence base is often low (Barwick et al., 2008; Hoagwood & Olin, 2002), putting the onus on providers to acquire and maintain knowledge of such evidence. Additionally, although access to some client-specific evidence (i.e., demographics, preferences) may be more readily available, use of and access to standardized, validated measures of youth presenting problems and treatment progress are low in community settings (Cho et al., 2021; Jensen-Doss et al., 2018; Whiteside et al., 2016). When access to client-specific evidence and the psychotherapy evidence base is low, the extent that decisions align with EBP may also be reasonably expected to be low.

Given these barriers to accessing and integrating evidence into decision-making in an EBP-aligned manner, the question arises of whether there are effective approaches for supporting EBP-aligned decision-making in usual care. In a large survey of providers, the most frequently relied upon support for decision-making was clinical supervision (Gyani et al., 2014). Concurrently, research from the field of implementation science has identified factors that may support EBP (or at a minimum, the delivery of ESTs) in youth-serving settings (Novins et al.,

2013; Williams et al., 2019)—one factor that has consistently shown to support the application of psychotherapy evidence is clinical supervision (Kirchner et al., 2020; Zukerman et al., 2023).

The Role of Supervision in Promoting Evidence Use and EBP

Clinical supervision (hereafter, supervision) refers to regular meetings between a therapist and supervisor to ensure the delivery of safe and effective care (Bernard & Goodyear, 2019; Falender et al., 2004; Milne, 2018). Supervisors are often more “senior” therapists with moderate-to-expert level skill in clinical care who support supervisees (often less-experienced therapists) in developing their clinical skills (Bernard & Goodyear, 2019; Milne, 2018).

Supervision is considered a key competency in psychology (Falender et al., 2004) and is widely employed in public youth mental health settings—nearly 90% of private and public children’s mental health agencies provide weekly supervision to therapists (Schoenwald et al., 2008).

Studies characterizing supervision in the community have found that supervision meetings are typically held weekly for one hour (Bailin et al., 2018; Bailin & Bearman, 2021), although some studies have indicated that less frequent supervision is also common (Dorsey et al., 2017, 2018).

Supervision meetings often involve a variety of tasks, including clinical decision-making, reviewing client progress, and administrative tasks (Bailin et al., 2018; Bailin & Bearman, 2021; Dorsey et al., 2017). Due to supervisors’ assumed expertise in clinical care, supervision has been recognized as a feasible, preexisting avenue for supporting the implementation of ESTs and the delivery of EBP more broadly (Schriger et al., 2023).

Theoretical characterizations of supervision offer explanations for how supervision might serve to support EBP-aligned decisions. Myriad frameworks have been proposed to describe supervision, including developmental models (Stoltenberg & Delworth, 1987), therapy-based models (Padesky, 1996), and functional models (Kadushin, 1976). Developmental models

emphasize the supervisor's role as an expert and facilitator of therapist development. Therapy-based models, on the other hand, highlight the parallel processes between supervision and therapy, such as the supervisor leading the therapist toward insight in the same way a therapist may lead a client toward insight. Functional models focus on the functions of supervision, which are thought to fall in one of three categories: normative, formative, or restorative. Normative functions are those that a supervisor undertakes to ensure practice is safe, ethical, and in line with regulatory requirements (e.g., observing therapist intervention delivery). Formative functions relate to therapist skill development and preparing a provider to use skills in practice (e.g., modeling intervention delivery in supervision). Lastly, restorative functions aim to support the therapist in terms of well-being (e.g., providing emotional support to the therapist).

These models, while helpful in providing numerous ways to conceptualize supervision, have been criticized on grounds that they are inaccurate in fully describing the activities of supervision (Ellis, 2010) and that they lack specific guidance on how supervisors can behave in the moment to achieve the larger goal of supervision, which is to ensure safe and effective care (Milne, 2018). To address these criticisms, Milne and colleagues have proposed models that aim to integrate the aforementioned models as well as specify effective and concrete supervision processes that promote EBP. To represent the dynamic nature of supervision, as well as potential moderators, mediators, and mechanisms of supervision, Milne and Westerman (2001) proposed a circumplex model of supervision. Proposed mechanisms through which supervisors support EBP include summarizing case information, gathering information, intervention planning, and managing the flow of these processes within supervision sessions (Milne et al., 2002). Milne and James (2005) expanded on the circumplex model by proposing the more dynamic tandem model of supervision. According to the tandem model, the supervisor leads supervision, as would one in

the front seat of a tandem bicycle. Ultimately, the supervisor is the expert who “steers” the activities, decisions, and larger processes within supervision. The therapist is “pedaling” behind the supervisor, and thus also engaging in activities, decisions, and processes initiated by the supervisor. By actively leading and directing supervision sessions, supervisors can facilitate EBP-aligned decisions and thus positively impact the quality of care. By engaging in these processes, therapists also deepen their own expertise.

Although research on how supervision can support EBP-aligned decision-making is still limited, a modest body of literature has begun to examine how supervision can promote the delivery of ESTs (Zukerman et al., 2023). Results have generally aligned with the tandem model’s hypothesis that supervision directly impacts care. For example, Meza and colleagues (2023) found that compared with therapists who receive supervision that is supportive only, therapists receiving supervision that is both supportive and directive (e.g., including more frequent suggestions and didactic instructions) regarding an EST had a higher likelihood of delivering the EST in following sessions. Additionally, Bearman and colleagues (2013) found that therapists who engage in supervision with active, supervisor-led learning activities (e.g., modeling, role-playing) for a specific EST are more likely to use that EST in a subsequent session. It has also been found that a supervisor’s focus on an EST in supervision (e.g., discussing the specific elements of the EST) not only predicts a therapist’s adherent delivery of the EST, but also positive client outcomes (Schoenwald et al., 2009). More recently, a review of supervision outcomes found that processes like discussing and role-playing ESTs are associated with increased therapist application of ESTs (Bradley & Becker, 2021). Although these findings suggest that supervision that includes active, supervisor-led processes contributes to the delivery of ESTs in youth-serving settings, there have been mixed findings. For example, Dorsey and

colleagues (2025) recently reported on a randomized controlled trial testing supervision-as-usual for an EST against supervision that explicitly included supervisor-led processes of EST fidelity monitoring and role-playing. Their findings indicated that therapist adherence to the EST did not differ across supervision conditions, suggesting that these supervisor-led processes may not be critical to EST implementation in certain circumstances (Dorsey et al., 2025).

Which Supervisor Behaviors Might Contribute to EBP-Aligned Decision-Making?

Although these findings corroborate supervision’s hypothesized ability to contribute to the application of evidence in practice, important knowledge gaps remain. First, despite important contributions from the studies and frameworks described above, recommendations about supervision continue to focus on “macro” issues of supervision (Bailin et al., 2018), such as overall supervisor competence (American Psychological Association, 2015; Falender, 2018). Although competence is an important goal, there is little concrete guidance on in-the-moment behaviors that supervisors can use in supervision to support effective care. Additionally, although some studies have begun to characterize strategies that supervisors use to promote the delivery of pre-determined ESTs (e.g., Bearman et al., 2013; Bradley & Becker, 2021; Meza et al., 2023), there is a lack of research on how supervisors support EBP-aligned clinical decision-making in contexts where interventions have not been pre-determined (A. L. Park et al., 2020). These gaps have led to calls for two intersecting lines of research: 1) investigation into the more granular behaviors that supervisors engage in to support EBP, and 2) investigation into how supervisors support clinical decision-making (Ahuna & Becker, 2025; Bailin et al., 2018; Nadeem et al., 2013).

James and colleagues (2008) laid a strong foundation for addressing both of these gaps. They introduced the term “*microskills*” to refer to the moment-to-moment behaviors—such as

platforming and *questioning*—that supervisors engage in to carry out the broader processes of supervision and drive effective treatment decisions (James et al., 2008). They posit that microskills are key to supporting therapist learning and the eventual application of evidence to clinical decisions. Milne and colleagues’ (2005) tandem model of supervision and James and colleagues’ (2008) theories of supervision microskills provide insight into which microskills may be most important in supporting EBP-aligned decision-making. In line with models of EBP, the tandem model of supervision specifies that supervisors make instantaneous judgments about how to draw on the psychotherapy evidence base to inform clinical decision-making in supervision (Milne & James, 2005). James and colleagues (2008) hypothesize that these instantaneous judgments result in the use of microskills that may not only prepare therapists to deliver selected interventions but also engage therapists collaboratively in the decision-making process. Two microskills are hypothesized to be of particular importance in facilitating decisions: “platforms” and “questions” (James et al., 2008). James and colleagues (2008) posit that platforms—defined as statements that scaffold or focus a supervisee on a particular topic—allow a supervisor to guide supervision sessions to important decision points. By providing platforms, supervisors actively direct the sequence of activities within supervision to best support therapist learning and decision-making. A type of platform that may be particularly relevant in the context of effective clinical decision-making is *topic initiation*. For instance, by initiating decisions relevant to EBP, a supervisor can provide structure to the session, prompt the therapist to describe concrete treatment targets and interventions (e.g., “Let’s spend some time discussing which problems you are going to address based on your assessment of the client”), and collaborate with the therapist to make an EBP-aligned decision (James et al., 2008). Similarly, questions allow a supervisor to support therapist learning, clinical thinking, and decision-making. For example, supervisors may

use questions to prompt therapists to reflect upon their knowledge of client-specific evidence and the psychotherapy evidence base while deciding which interventions to employ (e.g., “So based on the presenting problems we discussed, what do you think you will do with the client in the next session?”). Indeed, research has found that the use of questions in supervision positively relates to therapists’ active learning, which in turn may promote their application of psychotherapy evidence (Caron et al., 2021).

Insights from Decision-Making Research

Although the relationships between topic initiation and questions with EBP-aligned decision-making in clinical supervision have not been directly investigated, research on decision-making in other fields may shed light on how these microskills might contribute to such decision-making. The fields of social and organizational psychology have long sought to characterize leader behaviors that relate to effective outcomes in the workplace (Yukl, 2012). Leader behaviors that impact decision-making, and particularly the quality of decisions, have been a major topic of interest (Vroom, 2000). From an organizational perspective, clinical supervisors may be viewed as workplace leaders (Aarons et al., 2011), and indeed have been studied as such (Birken et al., 2018). Findings from organizational research relevant to the microskills of topic initiation and questions are summarized below.

Topic Initiation

Within organizational psychology, it has been found that leaders often initiate and maintain focus on particular topics in order to lead groups to effective outcomes (Allen & Lehmann-Willenbrock, 2023). For example, within the context of team meetings aimed at problem-solving, leaders have been found to play a crucial role in maintaining focus on the topic at hand and curbing off-topic discussions (Lehmann-Willenbrock et al., 2015). Similarly,

meeting leaders' abilities to initiate decision-making and sequence meeting topics (i.e., “move the meeting along”) significantly relate to attendees' ratings of meeting satisfaction and productivity (Malouff et al., 2012). Classical research on problem-solving has also shed light on how leaders prompt topics of discussion to guide groups to high-quality decision outcomes. For example, Bales and colleagues (1951) found that in small group meetings aimed at decision-making, the group leader initiated the most topics of conversation. Further, Maier and Solem (1952) found that when compared with groups that were “unled,” groups that were “led”—i.e., groups that had a leader initiating topics of conversation—arrived at higher-quality decisions. In sum, evidence suggests that when leaders guide meetings by initiating topics relevant to the decision, meeting effectiveness and decision quality increases. Within the context of clinical supervision, supervisor initiation of decision-making activities may lead to more high-quality—or EBP-aligned—decisions (Milne, 2018).

Questions

In organizational research, questions have been defined as utterances that solicit “information, confirmation, or action,” or that prompt a response from another person (Freed & Ehrlich, 2010). Leaders' question-asking behaviors have been found to relate to decision-making outcomes (Aritz et al., 2017). Early research on leaders' influence on decision quality suggests that in settings where the leader is aware of the highest quality decision, leaders often use questions to “guide” groups to the best decision (Maier, 1950). More recently, Meyer and colleagues (2016) found that the volume of questions asked by a group leader was positively related to the quality of the final decision made during a group decision-making task. Additionally, in emergency settings, leaders' questions can be an important structuring behavior to support team effectiveness (van der Haar et al., 2017). Integrating these findings with the

hypothesized relationship between questions and effective outcomes in clinical supervision, it may be plausible to posit that supervisors' use of questions in supervision positively relates to the extent that decisions align with EBP.

Supervisor Characteristics

Although the work of James and colleagues (2008) has centered on understanding supervisor *behaviors* that contribute to EBP, other conceptualizations of supervision and implementation frameworks have emphasized the importance of supervisor *characteristics*, such as practice orientation, knowledge, and attitudes toward evidence or specific interventions (Aarons et al., 2011; Falender et al., 2004). For instance, it is widely agreed that supervisors must possess particular knowledge (e.g., of the psychotherapy evidence base), skills (e.g., ability to translate research to practice), and values (e.g., commitment to lifelong learning) to effectively carry out supervision (Falender et al., 2004). Within the context of EST delivery, implementation frameworks generally posit that these characteristics have notable impact on whether a provider delivers a specific EST. Research has demonstrated support for this theory in regards to knowledge of and attitudes towards ESTs. Provider attitudes toward ESTs, and specifically their *openness* to interventions from the psychotherapy evidence base, affects their application of ESTs in practice. Numerous studies have found that more positive attitudes toward ESTs predicts their increased delivery (Becker-Haimes et al., 2017; Beidas et al., 2015; Kolko et al., 2009; Nelson & Steele, 2007). Conversely, negative attitudes toward an EST, such as low appeal, have been found to predict providers' discontinued use of that EST (Horwitz et al., 2019).

Research has also suggested the importance of *knowledge* of the psychotherapy evidence base—or more often, a particular EST—on its application in treatment. Indeed, Powell and colleagues (2017) noted that provider knowledge is a vital “precursor” to the use of evidence in

practice (i.e., necessary, but not sufficient). For example, training in a specific EST (and through extension, specific knowledge of the psychotherapy evidence base) relates not only to use of the EST in practice (Frank et al., 2020), but also to the application of specific evidence to clinical decision-making in situations where such evidence is relevant (Baker-Ericzén et al., 2015; Nelson & Steele, 2007; Verbist et al., 2020); thus, a supervisor's knowledge of the psychotherapy evidence base more broadly may promote EBP-aligned decisions in supervision.

To date, most studies investigating knowledge and openness have centered on therapists specifically, and only a small body of research has investigated how supervisor characteristics impact the application of evidence (Choy-Brown et al., 2022). In line with the hypothesized importance of supervision in preparing providers to apply ESTs in practice (Aarons et al., 2011), literature on this topic suggests that supervisor characteristics and behaviors do indeed impact supervision processes and the application of ESTs (Bradley & Becker, 2021). For example, supervisor knowledge of an EST is associated with greater therapist application of that EST in practice (Henggeler et al., 2002), suggesting that supervisor knowledge of specific evidence from the psychotherapy evidence base may impact decisions about how such evidence can be applied in treatment. Further, research has shown a positive relationship between supervisor openness and the implementation of ESTs (Guerrero et al., 2014). Although these studies support the idea that supervisor knowledge and openness can facilitate EST implementation, the influence of supervisor characteristics on EBP-aligned decision-making remains unknown.

The Present Study

Despite the promise that supervision holds in promoting EBP-aligned decision-making, little remains known about how supervisor microskills and characteristics contribute to EBP-aligned decisions in the “black box” of supervision (Nadeem et al., 2013). As discussed, one

major gap is the lack of research on supervisor microskills that contribute to EBP-aligned decisions, particularly in community settings (Bailin et al., 2018). A second gap is the relative dearth of research on how supervisor characteristics contribute to EBP-aligned decisions (Bailin & Bearman, 2021; Choy-Brown et al., 2022; Verbist et al., 2020); given the demonstrated influence of supervisors on clinical decisions, calls have been made to address this gap in the research (Ahuna & Becker, 2025).

Across supervision research more broadly, a third notable gap is the relative focus on the EST implementation paradigm as opposed to the EBP paradigm. Within implementation research, the application of evidence has typically been operationalized as the high-fidelity use of a specific EST (Proctor et al., 2011), thus limiting the field's understanding of how evidence is applied to clinical decisions in an EBP-consistent manner (A. L. Park et al., 2020). Of note, research suggests that this operationalization may not map onto the realities of clinical care in community settings (Chorpita et al., 2011). In order to meet the diverse and multifaceted needs of youth in such settings, providers often draw on strategies across the psychotherapy evidence base and adapt intervention delivery in lieu of following specific EST protocols (Brookman-Frazee et al., 2021; Palinkas et al., 2013; Yu et al., 2022). It has also been argued that adapting ESTs in light of youths' and families' unique characteristics, such as cultural identities, can improve care quality (Lau, 2006); indeed, multiple studies have found that cultural adaptations can improve care effectiveness and outcomes (Griner & Smith, 2006; Pan et al., 2011). Thus, implementation frameworks' use of EST fidelity as a proxy for evidence use or EBP fails to capture the complex decision-making processes about how evidence is actually applied and how ESTs, if used, are to be coordinated in practice to facilitate the delivery of personalized and high-quality care.

Similarly, measures of knowledge and openness have generally been collected in the context of single-EST implementation, although research suggests that attitudes vary across ESTs (Reding et al., 2014) and differ between ESTs and EBP more broadly (Borntrager et al., 2009). Overall, this focus on ESTs has led to a dearth of research on decision-making, despite it being the crucial facilitator of EBP (Ahuna & Becker, 2025; Becker et al., 2024; A. L. Park et al., 2020; Spring, 2008; Verbist et al., 2020). Additionally, although findings from organizational research on decision-making are readily applicable to clinical supervision, such applications have not yet been made. To harness the promise of supervision for supporting high-quality, evidence-based care, it is crucial to understand what factors contribute to EBP-aligned decisions that are made within supervision.

The present study aimed to address these gaps and estimate effects of supervisors' within-supervision microskills (i.e., topic initiation and questions) and supervisor characteristics (i.e., knowledge and openness) on the extent that clinical decisions made in supervision align with EBP. This study specifically sought to answer the following questions: 1) What proportion of variance in EBP-aligned decisions is accounted for by supervisors? 2) Which supervisor microskills impact the extent to which decisions align with EBP? and 3) Which supervisor characteristics impact the extent to which decisions align with EBP? Toward these aims, this study applied theories of supervision microskills (James et al., 2008), implementation theories (Aarons et al., 2011), and frameworks of EBP and evidence use (Graham et al., 2006; Sackett, 1997). Operationalizing EBP-aligned decision-making as a continuous construct as opposed to a dichotomous construct allowed for an examination of how supervisor behaviors and characteristics support the *extent* decisions made in supervision aligned with EBP, as it has been recognized that decision-making alone is not sufficient to indicate EBP (Guyatt et al., 1992).

This study was conducted in the context of a project aiming to improve youth engagement in school-based mental health services, the most common setting where youth receive mental health care (Duong et al., 2021). Thus, this study not only addresses gaps in the literature on decision-making processes in supervision but also sheds light on how evidence related to treatment engagement can be leveraged effectively within supervision. Given the low rates of care engagement (Aguilar Silvan et al., 2025; Kim et al., 2012; Merikangas et al., 2011), and the high rates of youth who prematurely disengage from treatment (Nock & Ferriter, 2005), an increased understanding of how supervisors facilitate EBP-aligned decisions that can address engagement challenges is crucially needed (Becker & Chorpita, 2023). Furthermore, the engagement evidence base includes practices that have been shown to be effective across the most common youth presenting problems, including anxiety, depression, conduct problems, attention challenges, and trauma (Becker et al., 2018). Thus, the engagement evidence base includes practices that span across the larger psychotherapy evidence base. As such, findings from this study may translate more readily into settings where presenting problems vary and where ESTs are not pre-determined but can be applied flexibly in an EBP-consistent manner.

Aim 1

The first aim was to find the proportion of variance in the extent that decisions align with EBP that was attributable to supervisors. Models of supervision posit that supervisors are the primary actors and initiators of processes in supervision that support EBP (Milne & James, 2005; Milne & Westerman, 2001), and that these processes are achieved through microskills (James et al., 2008). More broadly, research in implementation science has supported the theory that supervisors “drive” supervision in the context of EST implementation; for example, Dorsey and colleagues (2017) found that supervisors accounted for over 30% of the variance in time spent on

EST-related activities (e.g., selecting EST elements to deliver) in supervision. ***Hypothesis 1:***

Thus, it was hypothesized that the proportion of variance in the extent of decision alignment with EBP that was attributable to the supervisor would be large as evidenced by intraclass correlation coefficients (ICCs) of three-level models (i.e., youth nested within therapist, therapist nested within supervisor). Per supervision theory, it was also hypothesized that the magnitude of explained variance at the supervisor level would be higher than that of the therapist level. These hypotheses were expected to be true across all examined decisions in this study.

Aims 2A and 2B

The second aim was to characterize proximal predictors (i.e., supervisor microskills) of EBP-aligned decisions in supervision and to find the effect of such microskills on the extent that decisions align with EBP. Theories of supervision postulate that supervisors are the primary drivers of dyadic processes within supervision sessions (Milne, 2018; Milne & James, 2005). Research in youth-serving settings supports that supervisors engage in actions within supervision that affect intervention delivery in subsequent psychotherapy sessions (Bearman et al., 2013; Schoenwald et al., 2009), suggesting that supervisors may use “microskills” (James et al., 2008) to affect decisions about which interventions will be delivered. Further, research in organizational psychology has pointed to the importance of leaders initiating and guiding topics of conversation to make effect and high-quality decisions (Bales et al., 1951; Maier & Solem, 1952). ***Hypothesis 2A:*** In line with James and colleagues’ (2008) postulation that supervisors’ use of “platforms” to structure supervision is crucial to supporting EBP, it was hypothesized that the frequency with which supervisors *initiate* decision-making activities would positively predict the extent that decisions align with EBP. James and colleagues (2008) also hypothesized that supervisors’ use of questions are crucial in prompting effective clinical thinking and decisions. In

organizational settings, the volume of leader questions has been found to positively relate to decision quality (Meyer et al., 2016). **Hypothesis 2B:** Thus, it was further hypothesized that the number of supervisor questions asked during decision-making activities in supervision would positively predict the extent to which such decisions align with EBP. These hypotheses were expected to be true across all examined decisions in this study.

Aim 3

Turning to supervisor characteristics, the third aim was to find the effect of supervisor knowledge of psychotherapy evidence on EBP-aligned decision-making in supervision.

Hypothesis 3: It was hypothesized that supervisor knowledge of context-specific psychotherapy evidence would positively relate to the extent that decisions in supervision align with EBP. This aligns with frameworks of EST implementation (Aarons et al., 2011) and evidence use (Graham et al., 2006; Wulczyn et al., 2015), which posit that awareness of psychotherapy evidence is a critical precursor to the application of such evidence in practice (Powell et al., 2017). This hypothesis also aligns with current literature on clinical decision-making, which suggests that provider experience with psychotherapy evidence informs clinical decisions (Baker-Ericzén et al., 2015; Verbist et al., 2020). This hypothesis was expected to be true across all examined decisions in this study.

Aim 4

The fourth aim was to find the effect of supervisor openness to interventions from the psychotherapy evidence base on the extent that decisions align with EBP. In line with research demonstrating that openness to innovative and evidence-based approaches, such as ESTs, affects the application of ESTs in practice (Becker-Haimes et al., 2017; Beidas et al., 2015), and that supervisor openness specifically predicts the implementation of ESTs (Guerrero et al., 2014), it

was hypothesized that supervisor openness would relate to the extent to which decisions align with EBP. **Hypothesis 4:** It was further hypothesized that higher supervisor openness would predict higher alignment of decisions with EBP. This was expected to be true across all examined decisions.

Aim 5

The fifth and final aim was to estimate the interaction effect of supervisor knowledge and openness on the extent that decisions in supervision align with EBP. In line with implementation frameworks (Aarons et al., 2011) and models of EBP and evidence use (Graham et al., 2006), knowledge of the psychotherapy evidence base is a prerequisite to the application of such evidence (Powell et al., 2017). Thus, although openness and positive attitudes toward ESTs predict their delivery in care settings (Beidas et al., 2015; Guerrero et al., 2014), it is expected that knowledge moderates this effect of openness. For example, Wulczyn and colleagues (2015) found a positive interaction effect of experience with psychotherapy evidence, familiarity with locating psychotherapy evidence, and attitudes toward psychotherapy evidence on the likelihood of evidence being acquired, such that individuals with high experience, high familiarity, and positive attitudes were the most likely to use evidence in their work compared with individuals who did not fall into this category. **Hypotheses 5:** Taken together, a significant interaction effect of knowledge and openness on the extent that decisions align with EBP was hypothesized. It was specifically hypothesized that knowledge would moderate the effect of openness on the extent that decisions align with EBP such that when knowledge was low, there would be a weaker relationship between openness and decision alignment with EBP. This hypothesis was expected to be true across all examined decisions in this study.

Methods

Study Context

Data came from the Reaching Families study, a cluster-randomized trial examining how a coordinated knowledge system (CKS) for integrating evidence into care through the EBP process can improve youth and family engagement in school-based treatment settings (Chorpita et al., 2025). This study was conducted in partnership with two school-based mental health systems: the Los Angeles Unified School District in Los Angeles, California (CA) and the South Carolina Department of Mental Health in the Pee Dee and Santee-Wateree regions of South Carolina (SC). At the time of the study, both systems provided services in public schools and in community mental health clinics where youth and families could access services for a wide range of mental health needs. Study procedures were approved by all relevant Institutional Review Boards. Study data was collected between 2018 and 2020.

Participants

Mental health professionals were recruited from sites within both CA and SC. Participants were eligible if they held a role as a direct provider of psychotherapy to youth and families (i.e., therapist) or clinical supervisor of such services. Participants were recruited through local, in-person events in which study procedures were fully described. Written and informed consent was obtained from all participants prior to their engagement in study activities.

Supervisors

Supervisor characteristics are reported in full in Chorpita et al. (2025). Supervisors ($N=29$) were predominantly middle-aged women of color, and all had obtained a master's degree or higher (i.e., Ph.D.). Supervisors were distributed approximately evenly across states ($n=17$ in CA vs. $n=12$ in SC). Most supervisors endorsed a cognitive-behavioral practice orientation. As

reported by Chorpita and colleagues (2025), there were differences in provider characteristics between states. In SC, significantly more supervisors identified as Black/African American (83% in SC compared to 24% in CA). Education also differed by state, with significantly more supervisors in CA endorsing an MSW as their highest degree (94% in CA vs. 8% in SC) and significantly more supervisors in SC endorsing an MA or MS degree in as their highest degree (83% in SC vs. 0% in CA). Within CA, supervisors were also significantly more likely to have obtained state licensure (100% in CA vs. 8% in SC), likely due to state policy differences.

Therapists

Therapist characteristics are also reported in full in Chorpita et al. (2025). Similar to supervisors, therapists ($N=91$) were predominantly middle-aged women of color. Across states, most therapists (i.e., 98%) had obtained a master's degree or higher, and most endorsed a cognitive-behavioral orientation (i.e., 64%). Similar site differences emerged for therapists (Chorpita et al., 2025), with significantly more therapists in CA holding MSW degrees (94% in CA vs. 20% in SC) and significantly more therapists in SC holding MA or MS degrees in fields other than social work (80% in SC vs. 0% in CA). Significantly more therapists identified as Black/African American in SC (80% in SC vs. 6% in CA), whereas significantly more therapists in CA identified as Latine (80% in CA vs. 2% in SC). Therapists in CA were also significantly more likely to speak Spanish compared to therapists in SC (88% in CA vs. 29% in SC). Again, likely due to state policy differences, significantly more therapists were licensed in CA compared to SC (55% in CA vs. 24% in SC). Notably, client caseloads significantly differed between sites, with SC therapists having almost twice as many cases as CA therapists (SC caseload mean=35.71, CA caseload mean=15.40).

Youth Clients

Clients of participating mental health professionals were invited to participate in the study if they met the following criteria: 1) they were actively enrolled in therapy at one of the study sites and had completed approximately four weeks of therapy, 2) the youth client or a caregiver completed the My Thoughts about Therapy (MTT) measure to screen for possible challenges with engaging in treatment (Chorpita & Becker, 2022), and 3) at least one completed MTT indicated a possible engagement challenge (i.e., score lower than 14 on a 0-21 scale) across any of the five assessed engagement domains (i.e., Relationship, Expectancy, Attendance, Clarity, or Homework; Becker et al., 2018). MTT measures were administered by administrative support staff across sites (e.g., school staff). Youth were eligible to participate regardless of their clinical presenting problem. Clients who met criteria were invited by their therapist, who reviewed consent procedures with the youth client and, if applicable, participating caregivers—thus, clients had no interactions with the research team. Approximately two-thirds of invited clients consented to participate.

Supervision sessions pertaining to 217 youth were included in this study (see *Study Procedures* for details on supervision sessions). For each youth, the first supervision meeting between their therapist and their therapist's supervisor after the youth's consent was included. Clients' ages ranged from 5 to 21 ($M=12.78$, $SD=3.44$), and grades ranged from pre-school to 12th grade. Slightly more clients were identified as male based on school records (i.e., 53.8%). Between sites, differences emerged in the reported race/ethnicity of clients. CA served primarily Latine youth, while SC served mostly Black/African American youth. Across both sites, reported races/ethnicities were as follows: 44% Latine, 35% Black/African American, 19% White, and 0.9% Asian, and 0.4% unknown.

Study Conditions

Participants were randomized to one of two conditions, the coordinated knowledge system (CKS) or the practice guidelines (PG) condition. Randomization occurred at the supervisor level; therapists were subsequently assigned to the same study condition as their supervisor. Random assignment resulted in $n=16$ supervisors in the CKS condition ($n=9$ in CA and $n=7$ in SC) and $n=13$ supervisors in the PG condition ($n=8$ in CA and $n=5$ in SC). Supervisors in the CKS condition supervised $n=48$ therapists ($n=20$ in SC and $n=28$ in CA), and those in the PG condition supervised $n=43$ therapists ($n=20$ in SC and $n=23$ in CA). In-person training for both conditions (described below) included a review of study procedures, including youth screening and eligibility criteria, youth consent procedures, and instructions for recording treatment and supervision sessions. Further details on these conditions and study procedures are described in Chorpita et al. (2025).

Coordinated Knowledge System (CKS)

The CKS was designed to promote EBP by providing a structured process for applying evidence in supervision and treatment settings. The CKS was developed in line with classic EBP frameworks (Sackett, 1997), general evidence use and decision-making frameworks—such as the Knowledge-to-Action framework and Plan-Do-Study-Act cycles (Deming, 1982; Graham et al., 2006; Shewhart & Deming, 1986)—and frameworks specifically outlining the coordination and application of evidence in mental health service systems (Chorpita & Daleiden, 2018). These models outline a flow of decisions that promote the application of relevant evidence, including 1) selecting a problem to target, 2) considering potential strategies from the evidence base to address the problem, 3) identifying and selecting the optimal intervention, 4) applying the intervention in practice, and 5) evaluating application of the intervention (Sackett, 1997). To

promote the EBP process in the context of improving youth mental health treatment engagement, the CKS included multiple resources mapping onto each decision point within the EBP process (Chorpita et al., 2025). For example, supervisors and therapists were provided with a visual representation of client MTT scores (i.e., client-specific evidence) to aid in the selection of a problem to target, as well as EBP guides for interventions (i.e., psychotherapy evidence) that may be considered or selected to address the problem. The CKS has demonstrated effectiveness in promoting EBP in the settings of the present study (Chorpita et al., 2025), as well as high feasibility, acceptability, and utility to providers (Becker et al., 2019; Chu et al., 2023).

Supervisors and therapists in the CKS condition attended a two-day, in-person training on using CKS resources and engaging in the EBP process. Specifically, they were trained in employing 1) a graphical display of youth and family presenting problems related to treatment engagement, 2) worksheets with prompts for supervisors and therapists to consider eleven evidence-based strategies for addressing problems from the engagement literature (Becker et al., 2018), and 3) practice guidelines outlining the steps for delivering such strategies in treatment. These CKS resources were developed to be interoperable with larger coordination systems for promoting EBP-aligned decision-making (e.g., Managing and Adapting Practice system, Chorpita & Daleiden, 2018).

Within the CKS condition, training centered on introducing supervisors and therapists to the EBP process and the CKS resources. Supervisors and therapists were encouraged to practice using the tools to engage in the EBP process as they would in clinical supervision meetings—that is, in-training role-plays were focused on the rehearsal of clinical supervision processes as opposed to strategy delivery. Supervisors and therapists received no post-training consultation or follow-up support on CKS procedures.

Practice Guidelines (PG)

Supervisors and therapists in the PG condition attended a one-day, in-person training in which they received didactic instruction on eleven evidence-based strategies for addressing engagement challenges. The only resource provided to participants in this condition was a list of the eleven strategies with their descriptions. As opposed to the CKS condition, this resource did not outline steps for applying such strategies in treatment. The PG condition was not exposed to the EBP process and received no guidance on applying evidence to decision-making in supervision. As with the CKS condition, supervisors and therapists received no post-training consultation or follow-up support on applying training concepts to practice.

Study Procedures

After supervisors and therapists consented to study participation and completed training based on their respective conditions, they were notified by the research team of youth clients that screened positive for engagement challenges. Therapists then obtained informed consent from their eligible clients and client's caregiver(s). Once consent was obtained, supervisors and therapists audio-recorded three supervision sessions, all of which pertained to a specific youth client. Therapists also recorded two therapy sessions with the youth client after the first and second supervision sessions, resulting in the following flow of events: first recorded supervision session, first recorded treatment session, second recorded supervision session, second recorded treatment session, third (and final) recorded supervision session. Recordings were collected and transcribed by the research team (Chorpita et al., 2025).

Measures

Action Cycle and Use of Evidence Behavioral Observation Coding System (ACE-BOCS)

After supervision sessions were recorded and transcribed, the ACE-BOCS (A. L. Park et al., 2020) was applied to code for the presence of decision-making activities within supervision as well as the extent to which decisions aligned with EBP. The ACE-BOCS was developed based on the EBP process framework (Sackett, 1997), as well as models of evidence use and decision-making that are relevant to EBP within psychology (Deming, 1982; Graham et al., 2006; Shewhart & Deming, 1986). The ACE-BOCS was applied to transcriptions of supervision sessions by members of the research team who had been trained on the measure and achieved at least 80% coding agreement on “gold standard” supervision sessions (Becker et al., 2024). The ACE-BOCS has demonstrated reliability and validity in the settings of this study (Becker et al., 2024; A. L. Park et al., 2020)

The ACE-BOCS distinguishes decision-making *activities* from the *content* of those activities. Activities represent discrete decision-making behaviors, such as considering (i.e., identifying possible choices) and selecting (i.e., making a choice). On the other hand, content represents the treatment topic that a decision pertains to. Content can be either a *problem* (i.e., a presenting issue that may be targeted in treatment) or *practice* (i.e., an intervention that may be employed in treatment to address a problem). For example, if a supervisor says “in your next therapy session, do some goal setting with the client,” the content would be the practice of *goal setting*. When coding, coders separated transcripts into excerpts (i.e., discrete chunks of text) that contained an identifiable activity (e.g., selecting) and content (e.g., the problem or practice to which the activity pertained) code. Thus, all excerpts were both activity- and content-specific. For example, an excerpt may be coded as *considers* (i.e., the activity) *practice: goal setting* (i.e.,

the content type and specific content considered). Full descriptions of the possible activity and content codes are available elsewhere (Becker et al., 2024; Chorpita et al., 2025; A. L. Park et al., 2020).

After transcripts were fully excerpted, a session-level code was applied to summarize the extent that all instances of specific activity-content codes (e.g., *considers practice: goal setting*) within the supervision session aligned with EBP. For example, if four excerpts within a session were coded as *considers practice: goal setting*, all four excerpts would be considered when making the session-level extensiveness rating. The ACE-BOCS conceptualizes extensiveness of EBP alignment as the extent that relevant psychotherapy evidence and case-specific evidence are applied to decision activities (Rousseau & Gunia, 2016). Extensiveness was scored in a manner consistent with that proposed by Hogue and colleagues (1996). Six extensiveness ratings were possible for each activity-content code at the session-level: the decision was below detection threshold, or did not occur (i.e., 0); the decision was made with no reference to case-specific or research evidence (i.e., 1); the decision was made with reference to at least one source of relevant evidence (i.e., 3); and the decision was made with reference to two or more relevant sources of evidence (i.e., 5). For example, if a problem (e.g., youth's lack of clarity about treatment) was selected as a treatment target without any reference to evidence (e.g., standardized or idiographic measures of clarity), *selects problem: clarity* would be coded as 1. If a dyad considered using a practice (e.g., psychoeducation about services) while referencing a step-by-step reference guide for the practice (i.e., one source of psychotherapy evidence), *considers practice: psychoeducation about services* would be coded as 3. If a dyad selected to use appointment reminders with a youth and family by reviewing case-specific evidence (e.g., an MTT showing that the youth and family have at-risk attendance) and reviewing psychotherapy

evidence resources (e.g., step-by-step intervention guide) to determine that reminders could improve attendance above and beyond other possible interventions, then *selects practice: appointment reminders* would be coded as 5. Intermediate ratings (i.e., 2 or 4) were possible when the relevancy of a source of referenced evidence was ambiguous.

This study examined the extent that three decision activities aligned with EBP: *selects problem*, *considers practice*, and *selects practice*. These activities refer to the extent that selection of a presenting problem aligns with EBP (selects problem), the extent that consideration of interventions to target the problem align with EBP (considers practice), and the extent that selection of interventions to deliver align with EBP (selects practice). When conducted with reference to relevant evidence (i.e., psychotherapy evidence and client-specific evidence), these activities represent key decisions within the EBP process (A. L. Park et al., 2020; Sackett, 1997). To best capture the extensiveness (i.e., EBP-alignment) of these decision activities across each activity- and content-specific instance, the maximum extensiveness of the decision activity across content type was considered for each session. For example, if *considers practice: appointment reminders* was assigned a session-level extensiveness of 1 and *considers practice: psychoeducation about services* was assigned a session-level extensiveness of 5, the score of 5 was retained for this study as the maximum considers practice extensiveness. This measurement approach was used in effort to best capture the maximum depth of EBP-alignment for the decision within the session, regardless of content. The rationale for this measurement approach was twofold. First, supervision in public youth mental health settings often involves many activities beyond decision-making (e.g., emotional support, administrative tasks; Bailin et al., 2018; Dorsey et al., 2017) that can significantly constrain the amount of time dedicated to clinical decision-making. Bailin and colleagues (2018) and Dorsey and colleagues (2017) have

both found that in such settings, discussion of presenting problems and specific forms of psychotherapy evidence (i.e., ESTs) account for only approximately 20% of a supervision session's time. Thus, it was not expected that supervisors and therapists could exhaustively make decisions for each specific activity-content code. By taking the maximum extensiveness score for each decision activity across content type, this strategy aimed to give supervisors "credit" for making a decision that aligned with EBP, regardless of the content of the decision. Cumulative approaches, such as averaging extensiveness scores across specific content, may have resulted in EBP alignment scores that did not capture a dyad's application of evidence to the most focal decisions. Second, taking the maximum extensiveness score for a decision activity across content aligns with research demonstrating that decision-making in clinical contexts tends to align with theories of naturalistic decision-making (Baker-Ericzén et al., 2015; Chorpita & Daleiden, 2014; Verbist et al., 2020), which posit that decision makers draw on their knowledge and experience as opposed to weighing all possible solutions exhaustively (Klein, 2008).

Supervisor Topic Initiation

To capture supervisors' use of "platforms" to structure, guide, and direct supervision (James et al., 2008), supervisor topic initiation variables were computed for each decision-making activity (i.e., selects problem, considers practice, and selects practice). In this study, supervisor topic initiation was operationalized as the number of times that a supervisor initiated (i.e., uttered the first word of) an instance of the decision-making activity within a supervision session. Thus, supervisor topic initiation variables aimed to capture supervisors' active guiding and prompting of decisions relevant to the EBP process. Three session-level continuous variables (one per each of three examined decision-making activities) were computed for each supervision session. To calculate the supervisor's topic initiation score for each decision-making activity,

excerpts for a decision activity were compiled across content, and the number of excerpts in which the supervisor was the first speaker of (i.e., initiated) the activity was summed. For example, suppose a supervisor and therapist engaged in five identifiable instances (i.e., excerpts) in which they selected interventions to use with a client; specifically, three of these instances were coded as *selects practice: goal setting*, and two were coded as *selects practice: psychoeducation about services*. If the supervisor was the first speaker (i.e., topic initiator) in three of these five instances of practice selection, the selects practice initiation score for this session would be three. As with the measure of decisions' extent of EBP alignment, initiation variables were computed for each activity across content in effort to capture the full breadth of supervisor initiation across the session. That is, even if the practices discussed within the five instances of selects practice differed (as in the example given above), all instances were counted to produce a selects practice initiation score. Again, this approach was taken to best capture and give "credit" to supervisors for initiation of decision-making activities.

Supervisor Questions

The other supervisory microskill of hypothesized importance, "questions" (James et al., 2008), was represented by supervisor questions variables. As with topic initiation, three questions variables were computed, one for each decision-making activity examined (i.e., selects problem, considers practice, and selects practice). Supervisor questions were operationalized as the number of times that a supervisor asked a question during a decision-making activity, pertaining the specified content type, within a supervision session. Three event-level continuous variables (one per each of three examined activity codes) were computed for each supervision session. To calculate the question score for each decision-making activity, excerpts for an activity were compiled across content, and the number of times the supervisor asked a question

(as indicated by “?” in their transcribed speech) was summed. For instance, take a supervisor and therapist who engaged in four identifiable instances (i.e., excerpts) in which they considered interventions to use with a client. Two of these instances were coded as *considers practice: motivational enhancement*, and two were coded as *considers practice: accessibility promotion*. If the supervisor asked a total of 12 questions across all these instances of considers practice, the considers practice questions score for the session would be 12. As with previously described variables, questions were summed across all excerpts that matched an activity and content type in effort to capture the full breadth of supervisor question use across the session.

Engagement Knowledge Test (EKT)

The EKT was utilized to evaluate supervisors’ declarative knowledge of evidence-based engagement strategies and thus aimed to capture supervisor knowledge of the psychotherapy evidence base in the context of the Reaching Families study (Chorpita et al., 2025). The EKT consists of 14 multiple choice items derived from a comprehensive review of effective engagement strategies in children’s mental health services (Becker et al., 2018). The EKT measures familiarity with treatment engagement as a concept, as well as knowledge about empirically supported strategies for promoting youth treatment engagement. Example items include, “When helping a family understand the importance of regular attendance, one of the LEAST effective strategies would be...” and “When considering what could affect the ability of families to access services, you should...” The EKT is scored by summing the number of correct answers. The maximum possible score is 14, the minimum possible score is zero, and random responding would result in an expected score of 3.5. Supervisors completed the EKT after attending the training that aligned with their randomized condition (i.e., either the CKS or PG training). Thus, supervisors’ post-training EKT score was used to capture supervisors’ proximal

knowledge of the psychotherapy evidence base as it relates to engagement. The EKT has demonstrated reliability and an ability to distinguish between high and low performance in this study's context (post-training KR-20=.70; Reeder et al., 2024).

Evidence-Based Practice Attitudes Scale (EBPAS)

Supervisor openness to interventions from the psychotherapy evidence base was measured using the EBPAS-50 (Aarons et al., 2012), which is an expanded version of the original EPBAS measure (Aarons, 2004). The EBPAS is widely used in mental health service settings and has demonstrated validity and reliability in these settings (Aarons et al., 2010, 2012). On the EBPAS-50, the openness subscale is comprised of four items regarding provider perspectives on evidence-based and innovative treatment approaches (which stand in contrast to “usual practice” that does not coordinate the application of evidence to care; Aarons, 2004). Providers indicate their agreement with items using a 5-point Likert scale (0 = “Not at all,” 1 = “Slight extent,” 2 = “Moderate extent,” 3 = “Great extent,” 4 = “Very great extent”). Example items include “I am willing to use new and different types of therapy/interventions developed by researchers” and “I would try a new therapy/intervention even if it were very different from what I am used to doing.” Responses to the four items were averaged to produce an openness score. The reliability of the openness subscale in this sample approached acceptability (Cronbach's α = .64); this lower observed reliability may be due to the small sample size and low number of items included in the scale (Tavakol & Dennick, 2011).

Potential Covariates

Supervisor state (i.e., CA or SC) and study condition (i.e., CKS or PG) were examined as possible binary covariates, as these variables have been determined to produce main effects on evidence use activities in prior research on this dataset (Chorpita et al., 2025). Additionally, in

line with social psychology literature suggesting word count can be an indicator of engagement and influence in a conversation (Tausczik & Pennebaker, 2010)—and thus may impact other text-based measures such as initiation and questions—supervisor word count was examined as a possible session-level covariate. Supervisor word count was calculated similarly to supervisor initiation and supervisor questions. For each decision-making activity (i.e., selects problem, considers practice, and selects practice), supervisor word count was computed by summing the total number of words uttered by a supervisor across all excerpts matching the decision activity and content type. In line with common practice, the natural logarithm of the raw supervisor word count was taken prior to analysis to reduce the impact of skewness and outliers (West, 2022).

Data Analytic Plan

To characterize supervisor microskills (i.e., supervisor initiation and supervisor questions), supervisor characteristics (i.e., knowledge of and openness to interventions from the psychotherapy evidence base), and the extent to which decision-making activities aligned with EBP, descriptive statistics were computed for all continuous variables. All descriptive analyses were conducted in R (version 4.4.3).

To account for the nested structure of the data (i.e., supervision sessions pertaining to a youth nested within therapists, therapists nested within supervisors), multilevel modeling was employed to address Aims 1-5. All multilevel models were estimated within the Bayesian framework. The Bayesian approach to statistics differs from the classical frequentist approach in important ways (Flores et al., 2022). In classical frequentist approaches (e.g., maximum likelihood estimation), parameters are viewed as unknown but fixed and data samples are seen as random representations of these fixed parameters. Conversely, Bayesian approaches view parameters as existing on a distribution and data samples as fixed knowledge that can be applied

to update beliefs about parameters (Etz et al., 2022). Bayesian models produce posterior distributions of likely parameter values based on observed data and prior information about parameters. Although the originally proposed methods for this dissertation specified the use of traditional frequentist analyses, the choice to ultimately use Bayesian methods was made due to missing data on supervisor knowledge (i.e., EKT scores) from two supervisors. One attended the training but did not complete the EKT measure; follow-up attempts were unsuccessful, and the supervisor left the study shortly after consenting to take medical leave. The other joined the study after the initial training and did not complete the measure. This data was assumed to be missing completely at random (MCAR). To avoid using listwise deletion of cases that were supervised by these supervisors, and thus retain as much data as possible, it was desirable to use Bayesian computational architecture that integrates multiple imputation for missing data in multilevel analyses (Enders, 2025). Thus, all multilevel analyses were computed in Blimp version 3.2.22 via Blimp Studio (Keller, 2025). Blimp employs a Markov Chain Monte Carlo (MCMC) Gibbs sampler to produce parameter estimates (Keller & Enders, 2023). Software default non-informative prior distributions (i.e., normal distributions with means of zero and infinite variance) and unstructured variance-covariances matrices were used for estimation due to the limited prior research on parameters of interest in this study. Correlations between all predictors and proposed covariates within levels were examined to check for potential collinearity prior to running models, as high collinearity can still bias parameter estimation even when using Bayesian methods (Dormann et al., 2013). Correlations were also computed in Blimp version 3.2.22. For final random intercept models, posterior distribution plots of significant effects were generated in R using the rblimp package (version 0.2.26). Q-Q plots for residuals across all levels were also generated using the rblimp package to assess the assumption of

normality. Syntax for multilevel modeling analyses addressing Aims 1-5 is available in Appendix A.

Model Building Approach

A traditional, bottom-up model building approach (Hox et al., 2017; Raudenbush & Bryk, 2002) was used to construct the hypothesized models for Aims 1-5. First, for Aim 1, unconditional models (Equations 1-3) were constructed to estimate the proportion of variance in the extent of EBP-alignment per decision-making activity that was attributable to therapists (level 2) and supervisors (level 3). All unconditional models included three levels:

Level 1 (supervision session pertaining to a youth):

$$Y_{ijk} = b_{0jk} + \varepsilon_{ijk}$$

Level 2 (therapist):

$$b_{0jk} = \beta_{00k} + \zeta_{0jk}$$

Level 3 (supervisor):

$$\beta_{00k} = \gamma_{000} + V_{00k}$$

Composite models:

$$SelectsProblem_{ijk} = \gamma_{000} + V_{00k} + \zeta_{0jk} + \varepsilon_{ijk} \quad (1)$$

$$ConsidersPractice_{ijk} = \gamma_{000} + V_{00k} + \zeta_{0jk} + \varepsilon_{ijk} \quad (2)$$

$$SelectsPractice_{ijk} = \gamma_{000} + V_{00k} + \zeta_{0jk} + \varepsilon_{ijk} \quad (3)$$

where Y_{ijk} = EBP alignment extensiveness (per the ACE-BOCS, range 0-5) of a decision-making activity (i.e., selects problem, considers practice, or selects practice) in the first supervision meeting about a specific youth (i) seeing a therapist (j) under supervisor (k), γ_{000} = intercept (i.e., grand mean of extensiveness per activity), V_{00k} = supervisor-level residual (i.e., effect of

supervisors), ζ_{0jk} = therapist-level residual (i.e., effect of therapists), ε_{ijk} = session-level residual (i.e., residual error term), $\varepsilon_{ijk} \sim iid N(0, \sigma_\varepsilon^2)$, $\zeta_{0jk} \sim iid N(0, \sigma_\zeta^2)$, and $V_{00k} \sim iid N(0, \sigma_V^2)$.

In each model, level 1 represents the supervision session pertaining to a particular youth ($N=217$), level 2 represents the therapist ($N=91$), and level 3 represents the supervisor ($N=29$). The three models are distinguished by their outcome: the extent that problem selection aligned with EBP (Equation 1), the extent that practice consideration aligned with EBP (Equation 2), or the extent that practice selection aligned with EBP (Equation 3). To address Aim 1, intraclass correlation coefficients (ICCs)—or the estimated proportions of variance accounted for by each level—for both therapist and supervisor levels were computed for Equations 1-3. Through Blimp software, ICCs were estimated in line with the approach specified by Rights and Sterba (2019, 2023) (see Appendix B for formulas). Effect sizes of ICCs were interpreted consistent with the application of traditional guidelines (Cohen, 1992) to multilevel contexts (Lorah, 2018).

After unconditional models were run to examine the proportion of variance in outcomes attributable to each level, level 1 variables of supervisor initiation ($SupInit_{W1}$) and supervisor questions ($SupQS_{W1}$) were entered into the corresponding models (i.e., supervisor initiation and supervisor question variables computed for the selects problem activity were entered into the selects problem model, etc.). Level 1 variables were group-mean centered to isolate the within-cluster effects of supervisor behaviors on the extent that decisions aligned with EBP (Enders, 2013; Enders & Tofighi, 2007). Next, group-mean contextual effects for supervisor initiation ($SupInit_{B2}$) and supervisor questions ($SupQS_{B2}$) were entered at level 2; these variables were group-mean centered to isolate between-therapist effects on EBP alignment. Finally, level 3 variables of supervisor knowledge (EKT_k), supervisor openness ($Open_k$), and their interaction ($EKT_k * Open_k$) were entered. Knowledge and openness were centered at the grand mean to

enhance interpretability. Also included at this step were level 3 covariates, including supervisor site ($Site_k$) and contextual means for supervisor initiation ($SupInit_{B3}$) and questions ($SupQs_{B3}$). Consistent with prior analyses of this data (Chorpita et al., 2025), site was left in binary form to enhance interpretability (i.e., 0 = SC, 1 = CA). Contextual means for supervisor initiation and questions were grand-mean centered to isolate between-supervisor effects of these variables. The model building process resulted in the following levels for each model:

Level 1 (supervision session pertaining to a youth):

$$Y_{ijk} = b_{0jk} + b_{1jk}SupInit_{W1} + b_{2jk}SupQs_{W1} + \varepsilon_{ijk}$$

Level 2 (therapist):

$$b_{0jk} = \beta_{00k} + \beta_{01k}SupInit_{B2} + \beta_{02k}SupQs_{B2} + \zeta_{0jk}$$

$$b_{1jk} = \beta_{10k}$$

$$b_{2jk} = \beta_{20k}$$

Level 3 (supervisor):

$$\beta_{00k} = \gamma_{000} + \gamma_{001}SupInit_{B3} + \gamma_{002}SupQs_{B3} + \gamma_{003}Site_k + \gamma_{004}EKT_k + \gamma_{005}Open_k +$$

$$\gamma_{006}EKT_k * Open_k + V_{00k}$$

$$\beta_{01k} = \gamma_{010}$$

$$\beta_{02k} = \gamma_{020}$$

$$\beta_{10k} = \gamma_{100}$$

$$\beta_{20k} = \gamma_{200}$$

And full random intercept models for each decision-making activity were as follows:

$$SelectsProblem_{ijk} = \gamma_{000} + \gamma_{100}SProb_SupInit_{W1} + \gamma_{200}SProb_SupQs_{W1} + \quad (4)$$

$$\gamma_{010}SProb_SupInit_{B2} + \gamma_{020}SProb_SupQs_{B2} + \gamma_{001}SProb_SupInit_{B3} +$$

$$\gamma_{002}SProb_SupQs_{B3} + \gamma_{003}Site_{00k} + \gamma_{004}EKT_k + \gamma_{005}Open_k$$

$$+ \gamma_{006} EKT_k * Open_k + \varepsilon_{ijk} + \zeta_{0jk} + V_{00k}$$

$$ConsidersPractice_{ijk} = \gamma_{000} + \gamma_{100} CPrac_SupInit_{W1} + \gamma_{200} CPrac_SupQs_{W1} + \quad (5)$$

$$\gamma_{010} CPrac_SupInit_{B2} + \gamma_{020} CPrac_SupQs_{B2} + \gamma_{001} CPrac_SupInit_{B3} +$$

$$\gamma_{002} CPrac_SupQs_{B3} + \gamma_{003} Site_{00k} + \gamma_{004} EKT_k + \gamma_{005} Open_k$$

$$+ \gamma_{006} EKT_k * Open_k + \varepsilon_{ijk} + \zeta_{0jk} + V_{00k}$$

$$SelectsPractice_{ijk} = \gamma_{000} + \gamma_{100} SPrac_SupInit_{W1} + \gamma_{200} SPrac_SupQs_{W1} + \quad (6)$$

$$\gamma_{010} SPrac_SupInit_{B2} + \gamma_{020} SPrac_SupQs_{B2} + \gamma_{001} SPrac_SupInit_{B3} +$$

$$\gamma_{002} SPrac_SupQs_{B3} + \gamma_{003} Site_{00k} + \gamma_{004} EKT_k + \gamma_{005} Open_k$$

$$+ \gamma_{006} EKT_k * Open_k + \varepsilon_{ijk} + \zeta_{0jk} + V_{00k}$$

Where $SupInit_{W1} = SupInit_{ijk} - \overline{SupInit}_{.jk}$, $SupQs_{W1} = SupQs_{ijk} - \overline{SupQs}_{.jk}$, $SupInit_{B2} = \overline{SupInit}_{.jk} - \overline{SupInit}_{..k}$, $SupQs_{B2} = \overline{SupQs}_{.jk} - \overline{SupQs}_{..k}$, $SupInit_{B3} = \overline{SupInit}_{..k} - \overline{SupInit}_{...}$, and $SupQs_{B3} = \overline{SupQs}_{..k} - \overline{SupQs}_{...}$, and where $SPrac$, $CPrac$, and $SPrac$ differentiate the supervisor initiation and supervisor question variables that are unique to each model.

To address Aims 2A and 2B, level 1 coefficients for supervisor initiation and supervisor questions (i.e., γ_{100} and γ_{200} , respectively) were examined for Equations 4-6. To assess Aims 3 and 4, the level 3 coefficients for supervisor knowledge (i.e., γ_{004}) and supervisor openness (i.e., γ_{005}) were examined for Equations 4-6. To address Aim 5, the coefficient for the interaction effect of supervisor knowledge and openness (i.e., γ_{006}) was examined for Equations 4-6. These key coefficients are interpreted in the Results; full interpretations for all coefficients in Equations 4-6 are included in Appendix C.

Convergence diagnostics and model fit statistics were examined at all model building steps for Equations 4-6. In line with software recommendations (Keller & Enders, 2023), MCMC

burn-in periods were run starting with 10,000 iterations and were increased iteratively by 10,000 iterations until convergence was reached. In line with recommendations from the literature, convergence was considered achieved when split-chain potential scale reduction factors (PSRFs) of less than 1.05 were reached (Du et al., 2022; Gelman et al., 2014). Similarly, post burn-in iterations were run starting at 10,000 iterations and increased iteratively by 10,000 iterations until the effective sample size for all parameter estimates was greater than 100, the minimum recommended by Gelman and colleagues (2014). Throughout the model building process, Watanabe–Akaike Information Criterion (WAIC) and a version of Deviance Information Criterion specified for multilevel models with missing data (DIC₂; Du et al., 2024) were examined to assess model fit. Consistent with recommendations from the literature, marginal likelihood-based WAIC and DIC₂ statistics were examined as opposed to those based on conditional likelihoods.

Bayesian analyses produce credible intervals (CIs), which estimate the most likely values of a parameter; for instance, if an interval is 95% credible, then there is a 95% chance that the true effect lies in the interval, given the observed data (Hespanhol et al., 2019). As such, quantile-based CIs were examined to determine whether estimated effects significantly differed from zero, as evidenced by the lack of zero within the 95% CI. Posterior distribution medians were used as point estimates.

Originally Proposed Models and Variables

The models tested differed slightly from those originally proposed in the prospectus of this dissertation (see Appendix D for models originally proposed). First, the level 1 predictor of supervisor questions was added to include a theoretically important variable that may explain variance in the outcomes of interest. Next, all level 1 variables were group-mean centered to

isolate the within-cluster effects of supervisor behaviors on evidence use extensiveness (Enders, 2013; Enders & Tofighi, 2007). Additionally, contextual effects for each level 1 variable were entered at level 2 and level 3 to allow for the investigation of group-level effects of these variables (Brincks et al., 2017). Changes were also made to increase the parsimony of models and reduce risks of biased estimates or overfitting in accordance with model building recommendations (Bates et al., 2018; Raudenbush & Bryk, 2002). In line with literature cautioning against complex multilevel models (and particularly the inclusion of numerous random effects) when sample sizes are small (van de Schoot & Miočević, 2020), and in line with previous analyses of this dataset (Chorpita et al., 2025), random slopes were not included in final models. Although Bayesian modeling approaches can be more robust to small sample sizes, Bayesian models perform very similarly to frequentist methods when uninformative priors are used, as was the case with this study (McNeish, 2016; Smid et al., 2020). For three-level multilevel models in particular, bias for random effects can be very high (Kerckhoff & Nussbeck, 2019). Additionally, there was not strong theoretical justification for the inclusion of random slopes (Hox et al., 2017), as aforementioned theories of supervision center more on the overall impact of microskills rather than how this impact differs across supervisors. Finally, due to observed collinearity between supervisor knowledge (i.e., EKT score) and study condition (see Results), study condition was not included as a level 3 covariate in final models.

Of note, there was also a change in how supervisor knowledge was measured. Supervisor knowledge was originally proposed to be measured as supervisor experience with ESTs (i.e., the self-reported number of formal trainings in ESTs completed by each supervisor). A prior study on this dataset found that supervisors' number of completed EST trainings did not positively relate to their knowledge of context-specific psychotherapy evidence (Reeder et al., 2024),

suggesting that EST training history may not be an adequate measure of supervisor knowledge of psychotherapy evidence. In effort to best capture supervisors' true knowledge of the evidence base, the approach to measuring supervisor knowledge was thus updated.

Transparency and Openness

The design and analyses conducted in this study were not preregistered, and the larger Reaching Families study from which this data came (Chorpita et al., 2025) was also not preregistered. Although the syntax for the final models used to assess the central aims of this study are available in Appendix A, the dataset is not publicly available.

Results

Descriptives

Table 1 displays the means and standard deviations for session-level outcome variables (i.e., the maximum extensiveness of EBP alignment for selects problem, considers practice, and selects practice decisions). Means range from 2.00 to 2.23 on a scale with a maximum of 5, suggesting that across all activities, decisions were made, at most, somewhat in alignment with EBP. Standard deviations ranged from 1.63 to 2.07, suggesting considerable variability in how decisions aligned with EBP across sessions. Specific frequencies of observed values for these session-level outcomes are listed in Table 2. A visual inspection of frequency distributions revealed non-normal distributions; as displayed in Table 2, all outcomes showed high frequencies of zero as the maximum session-level score, suggesting that in many sessions, the respective activity did not occur, or the activity occurred but alignment with EBP was below the threshold for detection.

The means and standard deviations for session-level (i.e., level 1) predictors (i.e., supervisor initiation and supervisor questions) and the proposed covariate (i.e., supervisor word

count) across all decision-making outcomes are displayed in Table 3. Across all decision-making activities, the supervisor initiation count average ranged from 0.60 to 1.78, the supervisor question count average ranged from 0.86 to 3.81, and the natural logarithm of supervisor word count average ranged from 1.95 to 3.00. High variability was observed in supervisor behaviors across all decision-making activities, with standard deviations ranging from 0.79 to 6.08. Distributions for these variables are displayed in Figures 1-9; as with the session-level outcomes, predictor variables exhibited non-normal distributions with high frequencies of zero.

Descriptive statistics for supervisor-level (i.e., level 3) predictors (i.e., supervisor knowledge and supervisor openness) are displayed in Table 4, and distributions for these variables are displayed in Figures 10 and 11, respectively. The mean supervisor knowledge score on the EKT was 8.15 ($SD=3.01$) out of 14, indicating that on average supervisors had moderate knowledge of engagement-related treatment evidence, although such knowledge varied considerably across the sample. On average, supervisors reported being open to interventions from the psychotherapy evidence base to a great extent ($M=3.14$, $SD=0.61$).

Correlations

Correlations were used to examine the relationships between variables and proposed covariates within levels. Tables 5-7 display correlations between session-level (i.e., level 1) predictors and covariates for each activity (i.e., selects problem, considers practice, and selects practice). All examined predictors showed significant and positive correlations with the extent that decisions aligned with EBP. Across outcomes, predictors (i.e., supervisor initiation and supervisor questions variables) and proposed covariates (i.e., supervisor word count variables) also showed significant positive correlations. Notably, supervisor word count variables exhibited correlations with supervisor initiation variables that were greater than $r=.70$ for all activities.

This is the highest suggested threshold for collinearity in the literature, as correlations of this magnitude (i.e., .70 or greater) can bias effect estimates (Dormann et al., 2013). In addition to this high collinearity, when supervisor word count variables were entered into the models, convergence issues arose. The selects problem model (Equation 4) did not converge, and the considers practice (Equation 5) and selects practice (Equation 6) models only converged after an unexpectedly high number of burn-in (e.g., 60,000) and post burn-in periods (e.g., 110,000), suggesting less stable models. In line with the aims of this dissertation, and to promote model stability and parsimony given the relatively low sample size (Gelman & Hill, 2007), supervisor word count variables were thus not included in final models addressing central aims.

Correlations were also computed for supervisor-level (i.e., level 3) predictor variables and potential covariates. As displayed in Table 8, the only significant correlation observed was between the study condition to which a supervisor was assigned (i.e., CKS or PG) and their knowledge of engagement-related psychotherapy evidence (i.e., supervisor EKT score; $r=.79$, 95% CI [.54, .91]). Convergence issues arose when including study condition in models as well; across models, an unusually high number of post burn-in periods (e.g., 110,000) was required to reach convergence, again suggesting less stable models. In effort to reduce the potential biases of collinearity on aim-consistent estimates, and again to promote parsimony and stability in full models, study condition was thus not included as a covariate in final models.

Model Diagnostics

As discussed in the Model Building Approach section (p. 34), model convergence diagnostics and model fit statistics were computed at each step of the model building process for all three models. Convergence and fit results for the selects problem (Equation 4), considers practice (Equation 5), and selects practice (Equation 6) models are displayed in Tables 9, 10, and

11, respectively. At all model-building steps, the highest PSRFs at the final iteration were confirmed to be <1.05 , and the effective sample sizes for all parameter estimates were confirmed to be >100 . As indicated by marginal likelihood WAIC and DIC_2 statistics, model fits increased for random intercept models as predictors were added across levels.

Q-Q plots of residuals across all models and levels were also examined to assess the assumption of normal residuals, as shown in Figures 12-20. Visual inspections of Q-Q plots suggested that residual distributions were approximately normal with some minor deviations as is expected for small sample sizes (Loy et al., 2016).

Aim 1: Proportion of Variance in EBP Alignment Explained by Supervisors

Aim 1 was to estimate the proportion of variance in extensiveness of EBP alignment per decision activity that was attributable to supervisors. For each unconditional random intercept model, ICCs for both therapist (level 2) and supervisor (level 3) levels are reported below.

Selects Problem (Equation 1)

In line with Hypothesis 1, the proportion of variance attributable to the supervisor level was greater in magnitude than that attributable to the therapist level (i.e., a “large” vs. “small” effect; Cohen, 1992; Lorah, 2018). The therapist level ICC for selects problem extensiveness was estimated to be .02 (95% CI [.001, .08]), suggesting that approximately 2% of variance in the extent that problem selection aligned with EBP was attributable to nesting at the therapist level. The ICC at the supervisor level was estimated to be .62 (95% CI [.46, .76]), suggesting that approximately 62% of variance in the extent that problem selection aligned with EBP was attributable to supervisors.

Considers Practice (Equation 2)

The therapist level ICC for considers practice extensiveness of EBP alignment was estimated to be .01 (95% CI [0, .06]), suggesting that 1% of the variation in the extent that practice consideration aligned with EBP was attributable to therapist-level nesting. The supervisor level ICC was estimated to be .68 (95% CI [.54, .81]), suggesting that 68% of the variation in the extent that practice consideration aligned with EBP was attributable to supervisors. These results also aligned with Hypothesis 1, as the proportion of variance attributable to the supervisor level was greater in magnitude (i.e., large) than attributable to the therapist level (i.e., small) (Cohen, 1992; Lorah, 2018).

Selects Practice (Equation 3)

The therapist level ICC for selects practice extensiveness of EBP alignment was estimated to be .18 (95% CI [.05, .34]), indicating that approximately 18% of variance in practice selection alignment with EBP was attributable to nesting at the therapist level. The supervisor level ICC was estimated to be .37 (95% CI [.19, .56]), suggesting that 37% of variance in practice selection alignment with EBP was attributable to supervisor-level nesting. These results also support Hypothesis 1 as therapist- and supervisor-level nesting demonstrated medium and large effect sizes, respectively (Cohen, 1992; Lorah, 2018).

Aims 2A and 2B: Effects of Supervisor Microskills on EBP Alignment

Aims 2A and 2B were to estimate the effects of supervisor initiation and supervisor questions on the extent to which decisions aligned with EBP across the three decision activities.

Selects Problem (Equation 4)

Table 12 displays all estimated coefficients and variances for the selects problem full random intercept model. In line with Hypothesis 2A, supervisor initiation positively predicted

the extent that problem selection aligned with EBP. Specifically, a within-therapist effect was observed, such that in sessions within a given therapist (who was nested under a specific supervisor), a one-unit increase in the supervisor's initiation was associated with a 1.12-point increase in the extent that problem selection aligned with EBP ($\hat{\gamma}_{100}=1.12$, 95% CI [0.77, 1.46]). The posterior distribution for this estimate is shown in Figure 21. Between-therapist and between-supervisor effects of supervisor initiation were not significant, suggesting that average therapist- and supervisor-level differences in initiation did not meaningfully contribute to differences in extensiveness. Contrary to Hypothesis 2B, there were no significant within-therapist, between-therapist, or between-supervisor effects of supervisor questions on the extent that problem selection aligned with EBP.

Considers Practice (Equation 5)

Regression coefficients and variance estimates for the considers practice full random intercept model are displayed in Table 13. In line with Hypothesis 2A, supervisor initiation positively predicted the extent to that practice consideration aligned with EBP within a given therapist. In particular, in sessions nested under a given therapist, a one-unit increase in the supervisor's initiation was associated with a 0.13-point increase in the extent that practice consideration aligned with EBP ($\hat{\gamma}_{100}=0.13$, 95% CI [0.02, 0.23]). The posterior distribution for this estimate is shown in Figure 22. As for selects problem, between-therapist and between-supervisor effects of supervisor initiation were not significant. Hypothesis 2B was not supported, as results did not indicate a significant within-therapist, between-therapist, or between-supervisor effect of supervisor questions on the extent that practice consideration aligned with EBP.

Selects Practice (Equation 6)

For the selects practice full random intercept model, coefficients and variance estimates are included in Table 14. Contrary to findings for selects problem and considers practice, Hypothesis 2A was not supported by results of this model; there were no significant within-therapist, between-therapist, or between-supervisor effects of supervisor initiation on the extent that practice selection aligned with EBP. Similarly, Hypothesis 2B was not supported, as no significant within-therapist, between-therapist, or between-supervisor effects of supervisor questions on selects practice extensiveness were observed.

Aims 3-5: Effects of Supervisor Characteristics on EBP Alignment

Selects Problem (Equation 4)

As indicated in Table 12, supervisor knowledge of context-specific psychotherapy evidence was found to significantly predict the extent that problem selection aligned with EBP; these results aligned with Hypothesis 3. For a one-unit increase in a supervisor's knowledge, the extent that instances of problem selection aligned with EBP was expected to increase by 0.22 points ($\hat{\gamma}_{004}=0.22$, 95% CI [0.06, 0.38]), holding all other covariates constant. The posterior distribution for this estimate is displayed in Figure 23. Results did not support Hypothesis 4, as no significant effect of supervisor openness on the extent that problem selection aligned with EBP was observed. Similarly, there was no significant interaction effect of supervisor knowledge and supervisor openness on the extent that problem selection aligned with EBP, and thus there was no support for Hypothesis 5.

Considers Practice (Equation 5)

Results for the full random intercept model for considers practice (displayed in Table 13) also supported Hypothesis 3. Similarly to the effect observed for selects problem, results

suggested that a one-unit increase in a supervisor's knowledge was associated with a 0.24-point increase in the extent that instances of practice consideration aligned with EBP ($\hat{\gamma}_{004}=0.24$, 95% CI [0.05, 0.40]), holding all other covariates constant. The posterior distribution for this estimate is shown in Figure 24. Results did not support Hypothesis 4; no significant effect of supervisor openness on the extent that practice consideration aligned with EBP was observed. There was also no significant interaction effect of supervisor knowledge and supervisor openness on the extent of practice consideration EBP alignment, which did not support Hypothesis 5.

Selects Practice (Equation 6)

Results for the selects practice full random intercept model also supported Hypothesis 3. As shown in Table 14, supervisor knowledge was also found to significantly predict the extent that practice selection aligned with EBP. Results suggested that for a one-unit increase in supervisor knowledge, the extent to which practice selection aligned with EBP increased by 0.27 points ($\hat{\gamma}_{004}=0.27$, 95% CI [0.15, 0.40]), holding all other covariates constant. The posterior distribution for this estimate is shown in Figure 25. In contrast to results of the selects problem and considers practice models, results for selects practice did indeed support Hypothesis 4. There was a significant effect of supervisor openness on the extent that practice selection aligned with EBP, such that for a one-unit increase in supervisor openness, there was an expected increase of 0.73 points in selects practice extensiveness ($\hat{\gamma}_{005}=0.73$, 95% CI [0.06, 1.44]), holding all other covariates constant. The posterior distribution for this estimate is shown in Figure 26. Again, Hypothesis 5 was not supported, as there was no significant interaction effect of supervisor knowledge and supervisor openness on the extent that practice selection aligned with EBP.

Follow-Up Analyses

Supervisor Word Count and Initiation

Follow-up analyses were performed to further assess the observed correlation between supervisor initiation and the natural logarithm of supervisor word count for each decision activity. Supervisor initiation was operationalized in this study as the total number of times a supervisor was the first speaker in instances (i.e., excerpts) of a specific decision activity across a supervision session, and supervisor word count was measured as the natural logarithm of the total number of words spoken by a supervisor across all instances of the decision activity. Thus, although initiation is concerned only with the number of times a supervisor uttered the first word across excerpts, word count is based on the number of words a supervisor spoke across all excerpts of the activity. Because it may be reasonable to expect that supervisor initiation often precedes their word count in excerpts, supervisor initiation was explored as a predictor of word count. For each activity (i.e., selects problem, considers practice, and selects practice), multilevel models were constructed to predict the effect of supervisor initiation on the natural logarithm of supervisor word count while accounting for nesting at both the therapist and supervisor levels. Consistent with prior analyses, contextual means were included at the therapist and supervisor levels. Session-level and therapist-level supervisor initiation variables were group-mean centered and supervisor-level means were grand-mean centered to isolate within-therapist, between-therapist, and between-supervisor effects of initiation. Also consistent with prior analyses, supervisor site, knowledge, and openness were included as level 3 covariates. The composite models were:

$$\begin{aligned} SProb_SupWordCount_{ijk} = & \gamma_{000} + \gamma_{100}SProb_SupInit_{W1} + \gamma_{010}SProb_SupInit_{B2} + \\ & \gamma_{001}SProb_SupInit_{B3} + \gamma_{002}Site_{00k} + \gamma_{003}EKT_k + \gamma_{004}Open_k + \varepsilon_{ijk} + \zeta_{0jk} + V_{00k} \end{aligned} \quad (7)$$

$$CPrac_SupWordCount_{ijk} = \gamma_{000} + \gamma_{100}CPrac_SupInit_{W1} + \gamma_{010}CPrac_SupInit_{B2} + \quad (8)$$

$$\gamma_{001}CPrac_SupInit_{B3} + \gamma_{002}Site_{00k} + \gamma_{003}EKT_k + \gamma_{004}Open_k + \varepsilon_{ijk} + \zeta_{0jk} + V_{00k}$$

$$SPrac_SupWordCount_{ijk} = \gamma_{000} + \gamma_{100}SPrac_SupInit_{W1} + \gamma_{010}SPrac_SupInit_{B2} + \quad (9)$$

$$\gamma_{001}SPrac_SupInit_{B3} + \gamma_{002}Site_{00k} + \gamma_{003}EKT_k + \gamma_{004}Open_k + \varepsilon_{ijk} + \zeta_{0jk} + V_{00k}$$

Where $SupInit_{W1} = SupInit_{ijk} - \overline{SupInit}_{.jk}$, $SupInit_{B2} = \overline{SupInit}_{.jk} - \overline{SupInit}_{..k}$, and

$SupInit_{B3} = \overline{SupInit}_{..k} - \overline{SupInit}_{...}$, and where $SPrac$, $CPrac$, and $SPrac$ differentiate the supervisor word count and supervisor initiation variables that are unique to each model.

The same model building approach outlined for analyses related to key aims was used for these models (p. 34). Convergence diagnostics and model fit statistics were computed at each step of the model building process; for the final models, the highest PSRFs at the final iteration were confirmed to be <1.05, and the effective sample sizes for all parameter estimates were confirmed to be >100. Model results are displayed in Tables 15-17. For each activity, visual depictions of supervisor word count for sessions in which the supervisor engaged in no initiation compared with session in which the supervisor initiated at least once are displayed for each activity in Figures 27-29. Results were interpreted in line with recommendations from Gelman and Hill (2007) on how to interpret coefficients when the outcome is a natural logarithmic transformation; that is, interpretations are made in terms of a percentage-based relationship.

Results from the selects problem model (Equation 7) indicated significant within-therapist, between-therapist, and between-supervisor effects of supervisor initiation on supervisor word count relative to a specific decision activity. Within supervision sessions nested under the same therapist, for each additional time a supervisor initiated problem selection, the number of words spoken by the supervisor during problem selection was expected to increase by 479% ($\hat{\gamma}_{100}=1.76$, 95% CI [1.47, 2.04]). Between therapists nested under the same supervisor,

for therapists with whom the supervisor initiated one unit higher on average, the expected increase in the average number of words spoken by the supervisor was 447% ($\hat{\gamma}_{010}=1.70$, 95% CI [0.67, 2.73]). Finally, between supervisors, for supervisors who initiated one unit higher on average across all supervision sessions, the average number of words spoken by the supervisor across all sessions increased by 1,021% ($\hat{\gamma}_{001}=2.42$, 95% CI [1.67, 3.21]). There were no significant effects of supervisor site, knowledge, or openness.

Within the considers practice model (Equation 8), results suggested significant within-therapist and between-supervisor effects of supervisor initiation on supervisor word count. Within supervision sessions nested under the same therapist, for each additional time a supervisor initiated practice consideration, the number of words spoken by the supervisor during problem selection was expected to increase by 95% ($\hat{\gamma}_{100}=0.67$, 95% CI [0.55, 0.79]). Additionally, for supervisors who initiated one unit higher on average across all supervision sessions, the average number of words spoken by the supervisor across all sessions increased by 499% ($\hat{\gamma}_{001}=1.79$, 95% CI [1.30, 2.46]). There were no significant effects of supervisor site, knowledge, or openness.

Finally, the selects practice model (Equation 9) indicated significant within-therapist, between-therapist, and between-supervisor effects of supervisor initiation on supervisor word count. Within supervision sessions nested under the same therapist, for each additional time a supervisor-initiated problem selection, the number of words spoken by the supervisor during problem selection was expected to increase by 210% ($\hat{\gamma}_{100}=1.13$, 95% CI [0.88, 1.38]). Between therapists nested under the same supervisor, for therapists with whom the supervisor initiated one unit higher on average, the expected increase in the average number of words spoken by the supervisor in sessions increased by 589% ($\hat{\gamma}_{010}=1.93$, 95% CI [1.10, 2.81]). Finally, between

supervisors, for supervisors who initiated one unit higher on average across all supervision sessions, the average number of words spoken by the supervisor across all sessions increased by 210% ($\hat{\gamma}_{001}=1.13$, 95% CI [0.48, 1.72]). Again, there were no significant effects of supervisor site, knowledge, or openness.

Study Condition and Supervisor Knowledge

Follow-up analyses were also performed to assess the observed correlation between study condition and supervisor knowledge of engagement-related treatment evidence. Because supervisors completed the EKT after engaging in the training in their assigned condition (i.e., CKS or PG), study condition was tested as a predictor of EKT score. A Bayesian linear regression was run to predict the effect of study condition on supervisors' EKT score. Consistent with prior analyses, supervisor site was included as a covariate. The final model is displayed below:

$$EKT_i = \gamma_0 + \gamma_1 StudyCondition_i + \gamma_2 Site_i + \varepsilon_i \quad (10)$$

Previously described steps for examining convergence diagnostics and model fit statistics were carried out. As displayed in Table 18, both study condition and site were significant predictors of supervisor knowledge. Results suggest that supervisors in the CKS condition achieved knowledge scores that were on average 4.69 points higher than the PG condition, controlling for site ($\hat{\gamma}_1=4.69$, 95% CI [3.41, 5.93]). Supervisors in the CA site scored, on average, 2.16 points higher than those in the SC site, controlling for condition ($\hat{\gamma}_2=2.16$, 95% CI [0.84, 3.49]).

Discussion

Clinical supervision holds immense promise for enhancing EBP in youth mental health services. Although clinical decision-making is considered the cornerstone of EBP, little research

to date has investigated supervisor characteristics and behaviors that might predict whether decisions made in supervision align with EBP. This dissertation aimed to estimate the effects of supervisor factors—namely, microskills (i.e., supervisor initiation and supervisor questions) and characteristics (i.e., knowledge of evidence, openness to evidence)—on the extent to which treatment decisions made in supervision align with EBP. The examined decision-making activities were the selection of a problem to focus on in treatment (i.e., selects problem), the consideration of practices to apply in treatment (i.e., considers practice), and the selection of practices to apply in treatment (i.e., selects practice).

In line with the hypothesis that the extent that decisions align with EBP would cluster at the supervisor level, results indicated strong clustering at the supervisor level across all activities. This is consistent with supervision theories positing that supervisors are the main drivers of supervision activities (Milne, 2018) and with prior findings that many supervision activities tend to cluster at the supervisor level (Dorsey et al., 2018). Of note, clustering was also observed at the therapist level, most strongly for practice selection. This suggests that therapists may take a relatively more active role in practice selection compared to other decisions.

Supervisor Microskills

This study found that when problems were selected to target in treatment, and when practices to address such problems were considered, the frequency with which supervisors initiated these decisions positively predicted the extent that the decisions aligned with EBP. There are multiple possible explanations for this observed relationship. For one, these findings are consistent with the theory that supervisors' structuring of supervision sessions is key to promoting effective and evidence-based care (James et al., 2008). It may be that as experts in clinical care (Milne, 2018), supervisors' initiation may “scaffold” decisions by serving as a

precursor to other important “platforms,” such as summaries, prompts, and information-sharing (James et al., 2008). These platforms may likely include reference to research or case-specific evidence, which may in turn increase the likelihood that the resulting decision aligns with EBP. This is consistent with broader theories of learning and development which suggest that scaffolding supports less-expert individuals (in this context, therapists) in achieving high-quality solutions (Vygotsky, 1978; Wood et al., 1976).

These findings also align with studies from other disciplines that have shown that meeting leaders’ initiation of topics and decisions positively impacts decision outcomes (Allen & Lehmann-Willenbrock, 2023). From an organizational perspective, the underlying driver of the relationship between initiation and decisions may be that this supervisor behavior exhibits an aspect of transformational leadership. Leaders that are transformational inspire and encourage their followers to achieve their highest potential and develop in their own ability to lead (Bass & Riggio, 2006). One key component of transformational leadership is intellectual stimulation. Transformational leaders “stimulate” followers’ critical thinking and encourage creative problem-solving and decision-making (Bass & Riggio, 2006). By initiating problem selection or practice consideration, supervisors may prompt intellectual stimulation, thus corresponding to higher-quality (i.e., more EBP-aligned) decisions. This possible explanation is consistent with findings from the organizational literature that transformational leadership positively relates to rational (Rehman & Waheed, 2012), effective (Bouwman et al., 2017), and high-quality decisions (Davidaviciene & Al Majzoub, 2022).

Of note, despite the positive impact of supervisor initiation on the extent that problem selection and practice consideration aligned with EBP, the frequency of initiation across these activities was low. More than half of supervision sessions did not include any supervisor

initiation of problem selection, and more than a quarter of sessions did not include supervisor initiation of practice consideration. The results of this study suggest that to better support EBP in supervision, supervisors should initiate problem selection and practice consideration more frequently. This raises the question of whether there are effective strategies for supporting supervisors' initiation of these decisions within supervision. Graham and colleagues (2006) emphasize the importance of "knowledge tools" for enhancing the integration of evidence into decisions. In particular, studies have found that decision support tools, such as computerized or even paper reminders, can be effective at prompting providers to make decisions and integrate evidence into those decisions (Goldner et al., 2014; Grimshaw et al., 2012; Grol & Grimshaw, 1999). Thus, supervision-specific decision-making guides, such as those described by Chorpita et al. (2025), may provide a salient reminder to supervisors to prompt decisions and may also increase the odds that resulting decisions align with EBP.

Contrary to the observed relationships between supervisor initiation and EBP alignment of problem selection and practice consideration, supervisor initiation did not significantly predict the extent that practice selection aligned with EBP. It may be that supervisor initiation is more critical to supporting decisions' alignment with EBP at earlier phases in the EBP process. Once supervisors have prompted problem selection and practice consideration, therapists may follow their example by taking a more active role in initiating later decisions within the EBP process, such as practice selection. Thus, although supervisors may scaffold earlier decisions by directly initiating them, these earlier initiations may themselves model and scaffold later decisions in the EBP process. This would align with social learning theories of supervision and social learning theory more broadly (Bandura, 1977; Hosford & Barmann, 1983). As an example, a supervisor may initiate practice consideration and provide a menu of interventions from the psychotherapy

evidence base to address a client’s presenting problem. After an in-depth discussion considering various practices, a therapist may select a practice without needing further prompting from a supervisor; the consideration of various practices may itself be sufficient prompting, and therapists may in turn be more successful at selecting a practice in a manner that aligns with EBP. Indeed, the present results suggest that the proportion of variance in EBP-alignment extensiveness that was attributable to therapists was highest for practice selection. This is consistent with the tandem model of supervision; Milne (2018) notes that supervisors’ “moment-to-moment” use of microskills in supervision can result in a therapist’s in-vivo experiential learning and development. As Milne points out, this development naturally begets more autonomy and leadership and thus creates natural opportunities for a therapist to appropriately drive supervision processes (Milne, 2018).

In this vein, supervision literature has acknowledged—and even recommended—that supervisors adjust their supervisory behaviors as therapists develop (Rønnestad et al., 2019; Stoltenberg et al., 1994), but this development has typically been thought of as a process that unfolds over the full timeline of a supervisor-therapist relationship (Stoltenberg et al., 2014). Although previous work has generally focused on changes in supervisors’ behaviors *between* supervision sessions to support therapists’ development, results of this study suggest that there also may be important changes to supervisors’ behaviors *within* supervision sessions. This idea of co-occurring cycles of development aligns with developmental theories of mental health systems. For instance, Chorpita and Daleiden (2014) specified that both clients and providers within mental health systems exist on developmental trajectories both within and between treatment episodes. They note that intersecting developmental trajectories must be considered in order to build effective mental health systems (Chorpita & Daleiden, 2014). Applying this logic

to the present results, supervisors may need to consider the developmental processes that therapists are undergoing both within and between supervision sessions and adjust their behaviors accordingly to best support EBP.

Across all decision activities, supervisor question count did not significantly predict the extent that decisions aligned with EBP. This finding stands in contrast with the hypotheses of this study and those of James and colleagues (2008), who posited that supervisor questions can be key in prompting therapists to reflect upon psychotherapy and case-specific evidence when making clinical decisions. This also contrasts with research showing that the use of questions in supervision positively relates to therapists' active learning in the context of evidence-based treatment implementation (Caron et al., 2021). There are many possible reasons for this finding. From a developmental perspective, the supervision sessions included in this study were the first sessions following supervisors and therapists undergoing training in their respective study conditions and then receiving notification of a potential engagement challenge for a youth. This novelty may have contributed to supervisors taking a more active and directive role in these initial sessions and eliciting less input from therapists. Although supervisor questions did not relate to the extent that decisions aligned with EBP in the context of these early sessions, questions may play a more important role in supporting EBP-aligned decisions in supervision sessions that occur in later phases of therapist development.

Additional reasons for this finding may relate to the operationalization of questions in this study. The measurement of questions was limited to transcribed text that included a question mark ("?"). This likely led to the exclusion of statements that served a similar function to questions. As noted by James and colleagues (2008) and Milne and colleagues (2002), questioning styles can vary widely. For example, to prompt practice selection in this dataset, one

supervisor asked “which ones are you going to focus on in your next session with her?”, whereas another stated “so let's talk about what we are gonna do next week.” Although both utterances were followed by a therapist’s engagement in clinical decision-making, only one was counted as a question under this study’s operationalization. Furthermore, this study did not differentiate between types of questions. Although previous research on effective supervision has emphasized questions in general (James et al., 2008; Milne et al., 2011), it is likely that not all questions in supervision are equally effective in promoting EBP. The supervision literature—as well as the broader psychotherapy literature—has pointed to the importance of Socratic questions in particular (Padesky, 1993; Vyskočilová & Praško, 2012; Wong & Lee-Piggott, 2022). Socratic questioning in supervision is viewed as a systematic approach to guiding therapists’ development of their clinical judgment, and thus as an important mechanism through which supervisors support therapists’ decision-making (Overholser, 1991; Vyskočilová & Praško, 2012). Because this study did not discriminate between types of questions, many of the questions included in this study may not have been pertinent to decision-making. For instance, some supervisor questions included in this dataset that may have had less influence on therapist development and decision-making are “right?”, “you know?”, and “you understand what I'm saying?”

It is worth noting that supervisor questions may serve other important functions in supervision. For instance, clinical supervision literature and the broader leadership literature point to the importance of questions in establishing positive working relationships and alliance between supervisors and supervisees (Enlow et al., 2019; Van Quaquebeke & Felps, 2018). In fact, strong supervisory working alliance has been referred to as “the supreme common factor” of effective supervision (Watkins, 2014), and supervisory working alliance has been found to positively relate to the therapist-client relationship and client treatment adherence (E. H. Park et

al., 2019; Patton & Kivlighan, 1997). Thus, although supervisor questions as operationalized here did not directly relate to the extent that decisions aligned with EBP in this study, they may be important in setting a broader context in which effective decisions can be made.

Supervisor Characteristics

Across all decision activities, supervisor knowledge of engagement-related psychotherapy evidence positively predicted the extent that decisions aligned with EBP. This aligns with theories of EBP implementation in mental health settings (e.g., Aarons et al., 2011) and models of supervisor competencies necessary for effective supervision (e.g., Falender et al., 2004). More broadly, the present findings support Powell and colleagues' (2017) hypothesis that knowledge of evidence precedes its application.

Although this finding aligns with theoretical premises about the relationship between knowledge and the application of evidence to clinical decisions, its consistency with the few previous studies on this topic is mixed. For instance, Henggeler et al. (2002) showed that supervisor knowledge of specific treatment evidence (i.e., an EST) positively predicted a therapists' application of that EST in treatment, and the present study similarly demonstrated that supervisor knowledge positive predicted the application of evidence to decisions in supervision. However, not all studies examining the effect of supervisor knowledge of evidence on the application of evidence have found this to be true. In examining the impact of supervisor knowledge of an EST on therapist use of that EST, DeNard and colleagues (2017) found no significant relationship. These conflicting findings may relate to the format of supervision used across studies. In Henggeler et al. (2002)—and for supervisors in the CKS condition in the present study—supervisors were trained in processes for supporting the delivery of effective care through supervision. Supervisors in Henggeler and colleagues' (2002) study were trained in the

“do-loop” process for implementing Multisystemic Therapy. The “do-loop” process includes steps such as reviewing presenting problems, examining evidence for intervention “fit,” and selecting specific evidence-based strategies to apply in sessions (Henggeler & Schoenwald, 1998), thus demonstrating consistency with EBP principles (Sackett, 1997; Spring, 2007). Supervisors in the CKS condition of the present study were similarly trained in the EBP process (Chorpita et al., 2025), and these supervisors were found to have significantly higher knowledge of context-specific psychotherapy evidence in this study. On the other hand, DeNard and colleagues’ (2017) study used data from an implementation effort in which supervisors were trained only in the EST being implemented. Taken together, these findings may suggest that supervisors’ knowledge of specific psychotherapy evidence alone is not sufficient to support EST implementation or EBP more broadly; rather, supervisors must also be knowledgeable about the evidence application process in order to support EBP-aligned treatment. This aligns with conclusions of Reeder et al. (2024)—in finding that prior training in ESTs did not predict provider knowledge of the engagement evidence base, but that training in the CKS system did, the authors concluded that efforts to improve provider knowledge of evidence must go beyond outlining “what” effective interventions are and also must specify “how and when” such interventions may be applied.

Contrary to this study’s hypotheses, supervisor openness to interventions from the psychotherapy evidence base was found only to predict decision alignment with EBP in the context of practice selection. This finding suggests that the influence of supervisor openness on the extent that decisions align with EBP differs based on the decision type. Although the hypotheses of this study draw on literature suggesting that supervisor characteristics impact the delivery of ESTs or EBP in a broader sense (Aarons et al., 2011), it may be that supervisor

characteristics uniquely influence different decisions within the EBP process. This is plausible considering that the decision activities measured in this study serve distinct functions. Problem selection, for instance, is not concerned with practices or interventions—from this lens, it is not surprising that supervisors’ attitudes related to practices and interventions do not significantly influence problem selection. The lack of relationship between supervisor openness and practice consideration is more unexpected from this view. One possible explanation for this may be that behaviors and characteristics not captured in this study contribute to the extent that practice consideration aligns with EBP. In particular, therapist characteristics, like their own knowledge of and openness to innovative interventions from the psychotherapy evidence base, may contribute to practice consideration. For instance, the extent that practice consideration aligns with EBP may be highest when the knowledge and openness of both supervisors *and* therapists is high. When this is the case, it may be more likely that practices are considered in terms of their representation in the evidence base and their ability to target a selected problem.

Although supervisor openness did not predict EBP alignment in the context of problem selection or practice consideration, it did in the context of practice selection. Results suggest that when supervisors are more open to interventions from the psychotherapy evidence base, the selection of practices to apply in the next session is more aligned with EBP. This finding may enhance the field’s understanding of the observed relationship between supervisor openness and the delivery of evidence-based care (Guerrero et al., 2014). Based on the present results, it may be that supervisor openness influences EBP delivery through EBP-aligned practice selection in supervision. In other words, EBP-aligned practice selection may mediate the relationship between supervisor openness and the actual delivery of EBP. Another possible explanation of both findings is that supervisor openness may create a positive climate toward EBP in general,

thus promoting its use both in supervision and treatment. Indeed, implementation science theories have noted that middle managers such as clinical supervisors are often central in establishing a positive climate for evidence use and the ultimate delivery of ESTs or EBP-aligned treatment (Birken et al., 2018).

Other Notable Findings

Follow-up analyses indicated that the number of times a supervisor initiated a decision activity positively predicted the number of words they spoke during the activity. This may shed light on how supervisor initiation relates to the extent that decisions align with EBP. More initiation may prompt more discussion; discussing decisions more thoroughly may in turn increase the extent that final decisions align with EBP. This would be consistent with classic social psychology literature showing that discussion positively relates to high-quality decisions and solutions (Maier, 1950; Thorndike, 1938). Maier (1950) found that when discussion leaders provided information, summaries, and encouragement, the quality of a group's decision improved. This also fits with supervision literature positing that supervisors contribute to high-quality care through numerous microskills such as providing information, summarizing, and providing feedback (James et al., 2008; Milne et al., 2002). Thus, it may be that initiation relates to supervisors' use of other microskills that support high-quality and evidence-based care.

Alternatively, the relationship between supervisor initiation and word count could be the result of a third variable. It could be that a supervisor's knowledge positively relates to both their initiation and their word count during decision activities—if supervisors are more knowledgeable about psychotherapy evidence, it is plausible that they would be more prone to initiate and verbally contribute to the decision-making process. Alternatively, the relationship may be a result of other factors. Leadership literature suggests that individuals in leadership roles talk

more during meetings (Flinchum et al., 2023; MacLaren et al., 2020; Rogelberg, 2019); thus, it may be that supervisors are more likely to initiate and talk more during decision making based on their supervisory role and its inherent social expectations.

Additional follow-up analyses suggested that study condition significantly predicted supervisor knowledge. This is consistent with previous work examining study condition and knowledge in the same context as the present study (Reeder et al., 2024). However, study condition had a relatively larger effect on the present sample of supervisors only, compared with the sample in Reeder et al. (2024), which included both therapists and supervisors. This suggests that it may be more important to intervene on supervisor knowledge than therapist knowledge, an idea that has been widely discussed within the EBP implementation literature (Nakamura et al., 2014; Triplett et al., 2020). Although study condition was not included in the final models for assessing central aims due to concerns of potential collinearity, condition has been found to strongly predict decision extensiveness in the context of this study (Chorpita et al., 2025). Of note, supervisor knowledge may mediate the effect of study condition on decision EBP-alignment; in other words, study condition may affect decision EBP-alignment through supervisor knowledge.

Limitations

This study is one of very few to examine granular supervisor behaviors that may contribute to the provision of evidence-based care. Additionally, the examination of therapists and supervisors in diverse school and community settings enhance generalizability of findings to common settings where youth receive mental health services (Duong et al., 2021). Despite these strengths, there are important limitations to note. For one, the complexity of the data nesting structure and the small sample size may have limited statistical power and thus the ability to

detect tested effects. Potential cases of collinearity and issues with convergence also limited the number of predictors that were included in final models; it is likely that other unaccounted for factors influence decision-making in supervision. Perhaps most notably, this study did not explicitly examine the effects of therapist factors on the extent that decisions in supervision align with EBP. Although supervision theories emphasize the role of the supervisor, these frameworks also point to the many ways in which therapists may contribute to decision-making processes in supervision (Milne, 2018). The choice to focus solely on supervisors was made in effort to include the most theoretically important variables while also balancing practical limitations of the dataset. However, given the findings, there may be important explanatory factors at the therapist level that are not captured in these models, such as therapists' initiation of decision-making activities and their own knowledge and openness to EBP.

Limitations also stem from measurement approaches used in this study. For one, the approach used to measure the extent of decisions' EBP alignment did not directly account for the content of decisions—in other words, the specific problems or practices discussed in decisions were not examined. Although the ACE-BOCS scores used to measure extensiveness reflect the extent that problem or practice decisions align evidence, the actual content of these decisions may be another important facet of evidence use and EBP alignment. Other approaches to measuring EBP alignment while also accounting for content could have been employed. For instance, Chorpita and colleagues (2025) measured the effect of the CKS on whether the decision content was relevant to the engagement evidence base (i.e., domain-focused) and whether the decision content was relevant to the engagement evidence base *and* client-level evidence (i.e., precision-focused). The latter approach would have allowed for the integration of rich content data; for instance, if this approach had been applied to selects practice, the selection of practices

that were both evidence-based and a match for an identified presenting problem based could have been detected. A drawback of this approach for this study is that dichotomously coding for the presence or absence of precision-focused decisions does not capture decisions that did apply evidence but less than necessary to be coded as such. Ultimately, the approach taken in this study was chosen to best address the aims and capture the greatest amount of variance in EBP alignment across activities. An additional measurement issue relates to supervisor questions. Supervisor questions were computed by summing the number of question marks within supervisor utterances made during the activities. As previously noted, this method did not account for the nature of the questions used. The form, content, and purpose of questions may be more important in supporting EBP-aligned decisions than their presence alone. Furthermore, the measure of supervisor knowledge in this study was limited to supervisors' knowledge of the treatment engagement evidence base. Although the engagement evidence base extends across a wide range of youth presenting problems and includes practices that have transdiagnostic applications (Becker et al., 2018), many practices that are often part of EBP in youth settings were not represented on the EKT measure (e.g., exposure for anxiety; Chorpita et al., 2005). Broader measures of provider knowledge of EBP as it relates to youth mental health, such as the Knowledge of Evidence-Based Services Questionnaire (Stumpf et al., 2009), may have better captured a supervisor's full range of knowledge of the psychotherapy evidence base and how it may be applied to support EBP.

Lastly, this study focused only on the first supervision session pertaining to a particular youth. The decision to only include the first supervision session was made in effort to best capture decisions that are expected to be made early in the EBP process once a problem is detected (A. L. Park et al., 2020; Sackett, 1997) and to reduce model complexity (i.e., to prohibit

the need for four-level models). However, because all supervision sessions included in this study were the first session after a supervisor and therapist were notified that the youth screened positive for an engagement problem, these findings may not generalize to clinical decision-making as it happens across episodes of supervision. Additionally, it was not tested whether EBP-aligned decisions actually translated into the application of such decisions in treatment. Thus, although findings inform which supervisor behaviors and characteristics predict EBP-aligned decisions, the current study cannot answer whether these behaviors and characteristics also predict the actual provision of EBP in treatment.

Future Directions

Although this study sheds light on supervisors' influence on EBP-aligned decision-making (and thus the EBP process more broadly) in supervision, many questions remain. There are many more avenues to explore related to supervisor behaviors that contribute to EBP. The field would benefit from the further examination of microskills that may be important drivers of the EBP process. Although James and colleagues (2008) hypothesized that the “scaffolding” microskills of questions and platforms are most crucial to supporting EBP and therapist learning, other microskills have also been posited to be important, such as listening, informing, and evaluating (Milne et al., 2002). It may also be worthwhile to employ more specific measures of the microskills examined in this study. As previously noted, questions were measured regardless of their type. The use of questions that are hypothesized to support learning and EBP—such as Socratic questions and open-ended questions (Milne et al., 2002; Neimeyer et al., 2016; Overholser, 1991)—may uniquely contribute to the extent that decisions align with EBP. To understand how the “types” of questions supervisors ask relates to EBP-aligned decision-making, future work may involve coding supervisor questions by their type (e.g., closed- vs. open-ended,

Socratic vs. non-Socratic) and examining whether type is a predictor of decisions' resulting EBP alignment. Additionally, although supervisor topic initiation was taken as a measure of supervisors' provision of "platforms," there are other important components of platforms to explore. In the present study, supervisor word count likely captured many of these platforms. However, word count was not parsed into distinct behaviors, and ultimately convergence issues led to it not being included in the final models addressing key aims. Future research should further explore word count, and in particular, if there are other microskills embedded within supervisors' utterances during decision making. Per James and colleagues (2008), platforms may also include summaries, information, or reminders that prompt the therapist to respond in a certain way. Further exploration of how platforms are employed, and whether the use of specific types of platforms relates to the EBP alignment of an ultimate decision, is warranted.

Future research should also investigate the role that therapists play in clinical decision-making in supervision. Research suggests therapist characteristics impact care delivery; for instance, therapists who have more positive attitudes toward ESTs are more likely to deliver such interventions (Becker-Haimes et al., 2017; Beidas et al., 2015; Kolko et al., 2009; Nelson & Steele, 2007). As such, future studies should consider how therapist factors, such as knowledge of and attitudes toward EBP, impact the extent that decisions align with EBP. Additionally, future studies should find the effect of therapist behaviors in supervision on clinical decisions. In identifying supervisor and therapist behaviors that may contribute to EBP, Milne and colleagues (2002) posit that therapist behaviors such as conceptualizing, reflecting, and planning may support EBP and clinical decision-making. This may be especially important given that the literature suggests supervisors adapt supervision as therapists further develop (Rønnestad et al.,

2019; Stoltenberg et al., 1994), and therapists may begin to “drive” more decisions over time (Milne, 2018).

Relatedly, because this study only examined the first supervision session pertaining to each youth, the impact of microskills across time remains unknown. In line with calls from others to pursue longitudinal research on supervision (Watkins et al., 2021), it is recommended that future studies examine the use of microskills across phases of supervision. In line with aforementioned supervision models, it may be that supervisor initiation becomes less important in subsequent sessions as therapists gain experience. Research on EBP in medical training contexts suggests that supervisors are also on learning trajectories and developing alongside therapists (Welink et al., 2021). Hence, supervisors may also adjust their behaviors over time in response to their own learning and development. Studies examining the impact of both supervisor and therapist microskills on EBP-aligned decisions across time can shed further light on how time may moderate the relationship between microskills and EBP-aligned decisions.

Beyond supervisor and therapist behaviors, many unanswered questions remain about how supervisor-therapist dyad characteristics or broader organizational factors impact clinical decisions in supervision. As previously described, the working alliance between a supervisor and therapist is suggested to be one of the most important drivers of effective supervision (E. H. Park et al., 2019; Patton & Kivlighan, 1997; Watkins, 2014). Although this study did not take working alliance into account, it is plausible that working alliance may impact the extent that decisions align with EBP. Indeed, working alliance has been found to mediate supervision outcomes (Li et al., 2021; Morrison & Lent, 2018). Thus, it may be important for subsequent research on EBP processes within supervision to consider supervisory working alliance as a contributing factor. Beyond this dyad-level factor, organizational factors, such as climate, may have notable effects

on clinical decisions and the extent that they align with EBP. Implementation climate in particular may have a strong impact on this. Implementation climate refers to the extent that innovative approaches to treatment are expected, supported, and awarded within an individual's workplace (Klein & Sorra, 1996; Powell et al., 2021); it has been found to be a strong predictor of clinician use of ESTs (Beidas et al., 2015) and supervisor discussion of ESTs in supervision (Dorsey et al., 2017; Pullmann et al., 2018). Thus, future research should consider organizational impacts on the extent that EBP-aligned decisions are reached in supervision.

To increase the field's understanding of how supervision can best support EBP more broadly, future research should also look beyond the clinical decisions examined in this study. Other crucial decisions within the EBP process that may occur in supervision should be examined. For example, evaluation of intervention delivery is a key step in EBP and evidence use processes (Graham et al., 2006; A. L. Park et al., 2020; Sackett, 1997). Evaluating intervention delivery is the sole way to know whether the intervention had its intended effect—in other words, whether it was “worth it” (Graham et al., 2006). Both supervisor and therapist factors may contribute to decisions around whether interventions were effective or not; elucidating these factors would help deepen the field's understanding of how supervision can promote EBP.

Finally, future work should aim to examine how decisions made in supervision impact what actually happens in treatment sessions, and in turn, client outcomes. Although it was outside of the scope of this study, this is an important and noted gap in the supervision literature (Watkins et al., 2021). With the overall goal of supervision being to provide safe and effective care (Bernard & Goodyear, 2019), understanding how supervision decisions impact actual treatment and client outcomes is a high priority. Although some literature has explored the

impact of supervision on what therapists do in treatment sessions in youth-serving settings (Dorsey et al., 2025; Henggeler et al., 2002; Meza et al., 2023) and how supervision impacts client outcomes (Schoenwald et al., 2009), future research should aim to more clearly link decisions—especially EBP-aligned decisions—made in supervision, therapists’ application of decisions in treatment, and youth outcomes.

Conclusion

This study demonstrated that, within youth mental health settings, both supervisor characteristics and their behaviors within supervision sessions (i.e., microskills) relate to the extent that decisions made in supervision align with EBP. Findings showed that although supervisors’ initiation of decisions positively related to the extent that some decisions (i.e., problem selection and practice consideration) aligned with EBP, it did not predict extensiveness for other decisions (i.e., practice selection). This study also verified the importance of supervisor knowledge of context-specific psychotherapy evidence; across all examined decisions, supervisor knowledge positively predicted the extent that decisions aligned with EBP. Although supervisor openness to interventions from the psychotherapy evidence base did not relate to the extensiveness of all decisions as hypothesized, it did relate to the extent that practice selection aligned with EBP. Overall, these findings offer support for hypotheses posited by frameworks of EBP and evidence use (Graham et al., 2006; Sackett, 1997; Spring, 2007), as well as theories of clinical supervision’s role in promoting effective and evidence-based care (Milne, 2018). Although this study offers some initial insights into how supervisors can facilitate EBP-aligned clinical decisions in youth settings, continued research is warranted. Efforts should be made to further understand both supervisor and therapist behaviors in supervision that support EBP-aligned decisions across the entire EBP process and across full episodes of supervision.

Additionally, future work should explore the most effective ways to facilitate supervisors and therapists engaging in the EBP process in supervision. In the context of this study, a coordinated-knowledge system holds promise for supporting this process in youth-serving settings (Chorpita et al., 2025). Ultimately, future work in this area should be carried out with the goal of understanding how supervision can be utilized more effectively to enhance clinical decisions, and, through this, support the delivery of effective and individualized care for youth.

Figures

Figure 1

Frequency Distribution of Natural Logarithm of Supervisor Word Count for Selects Problem

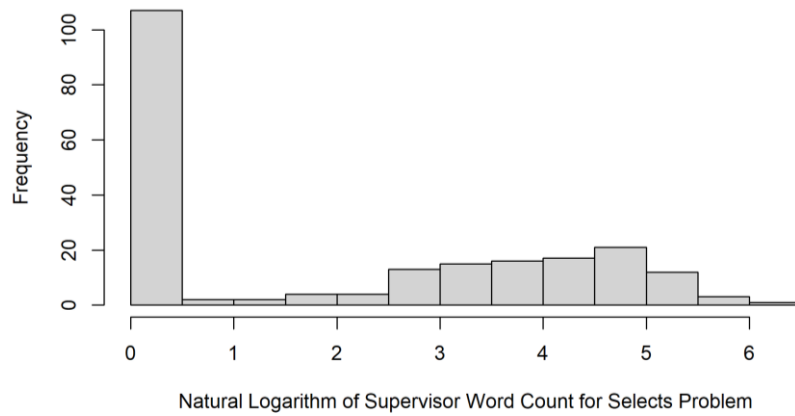


Figure 2

Frequency Distribution of Supervisor Question Count for Selects Problem

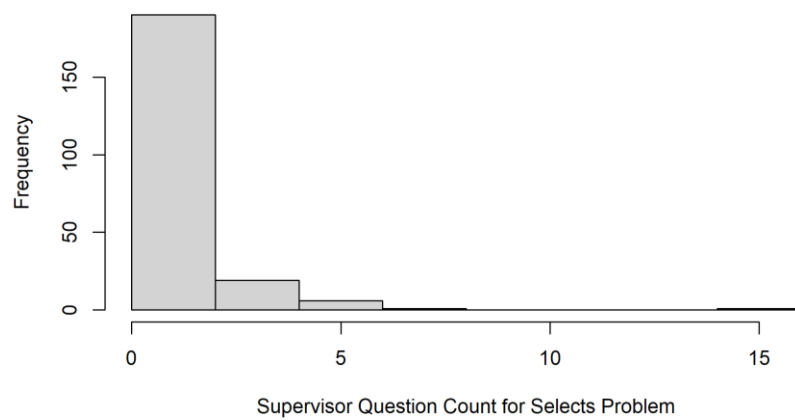


Figure 3

Frequency Distribution of Supervisor Initiation Count for Selects Problem

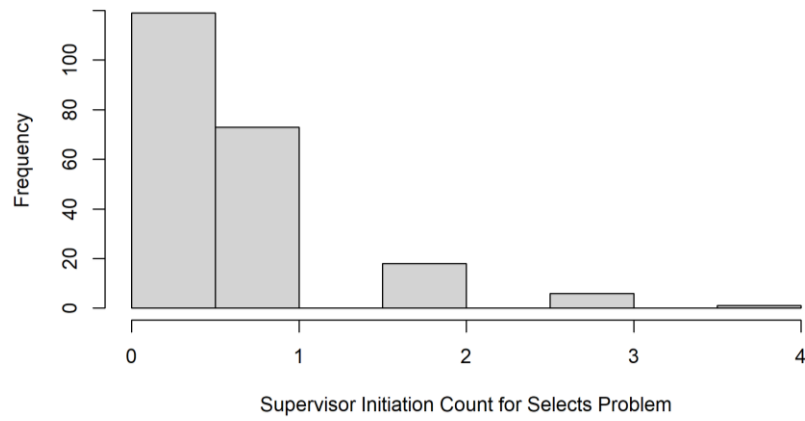


Figure 4

Frequency Distribution of Natural Logarithm of Supervisor Word Count for Considers Practice

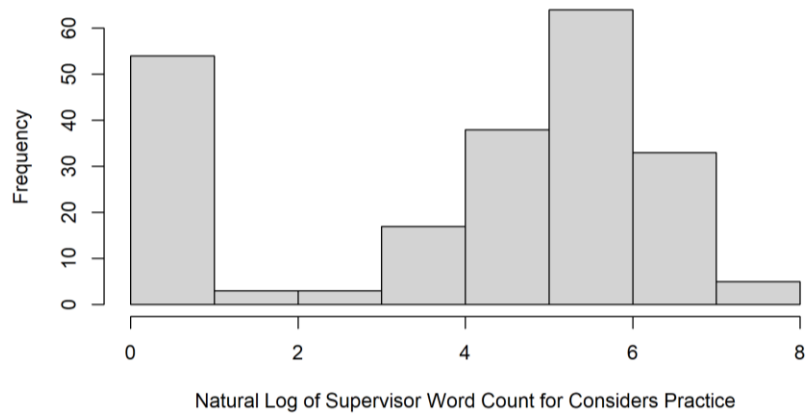


Figure 5

Frequency Distribution of Supervisor Question Count for Considers Practice

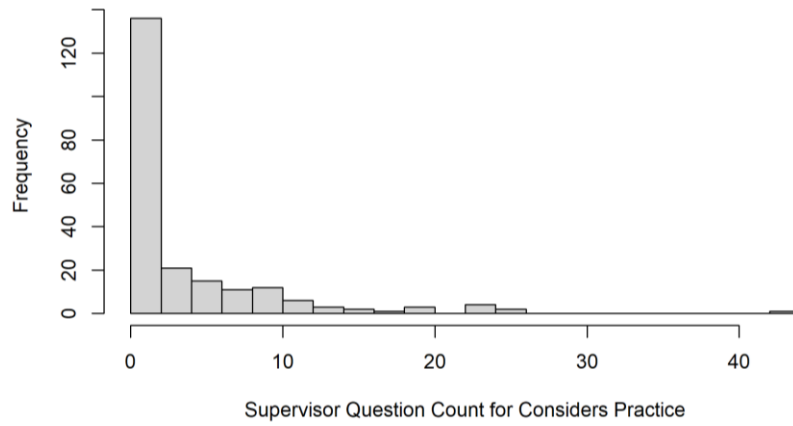


Figure 6

Frequency Distribution of Supervisor Initiation Count for Considers Practice

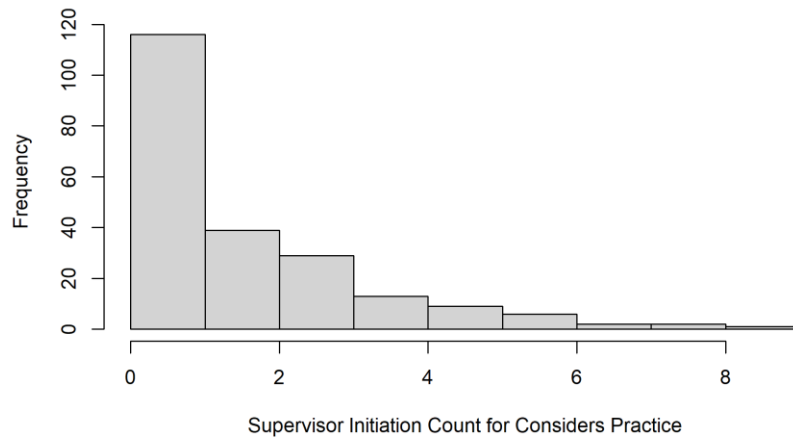


Figure 7

Frequency Distribution of Natural Logarithm of Supervisor Word Count for Selects Practice

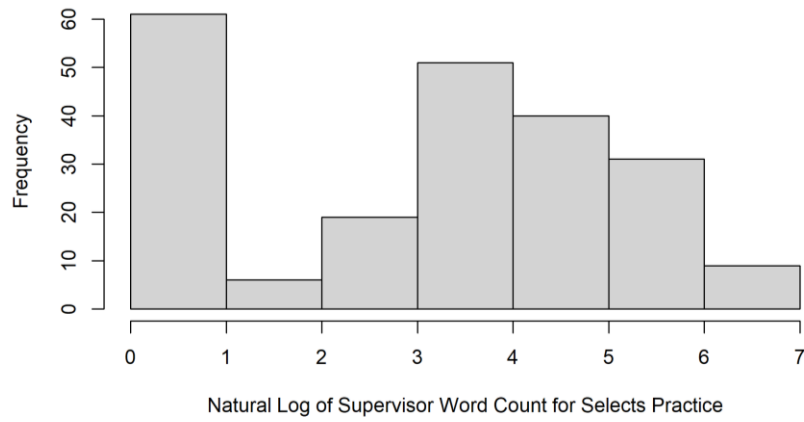


Figure 8

Frequency Distribution of Supervisor Question Count for Selects Practice

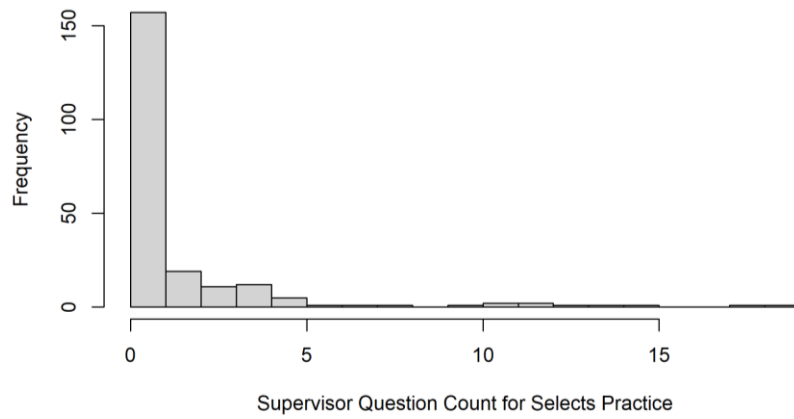


Figure 9

Frequency Distribution of Supervisor Initiation Count for Selects Practice

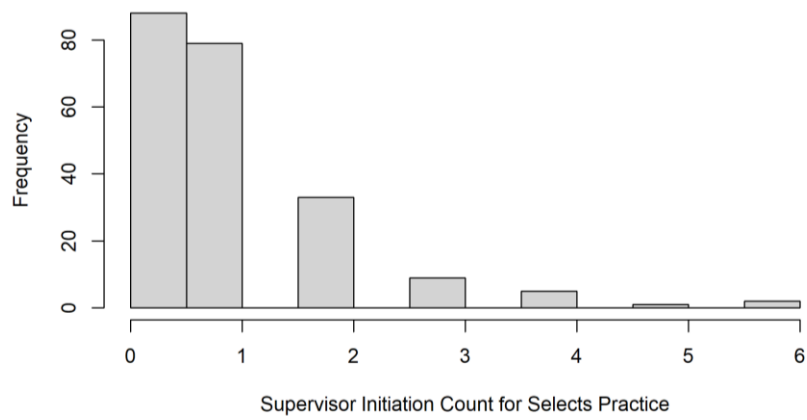


Figure 10

Frequency Distribution of Supervisor Knowledge Test Scores

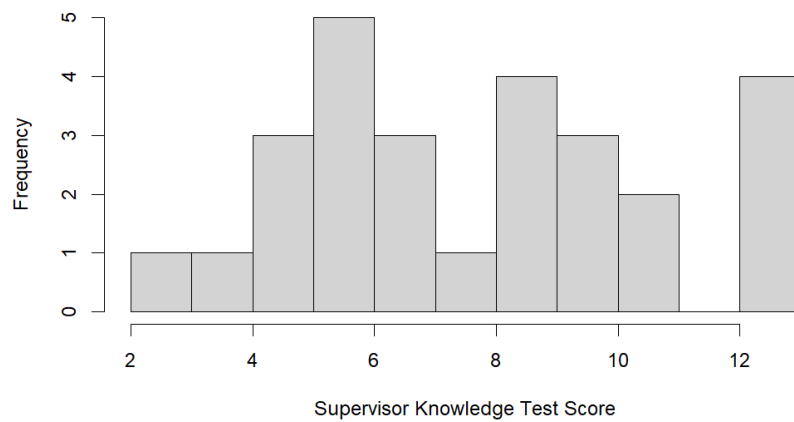


Figure 11

Frequency Distribution of Supervisor EBPAS Openness Scores



Figure 12

Q-Q Plot of Selects Problem Model Level-1 Residuals

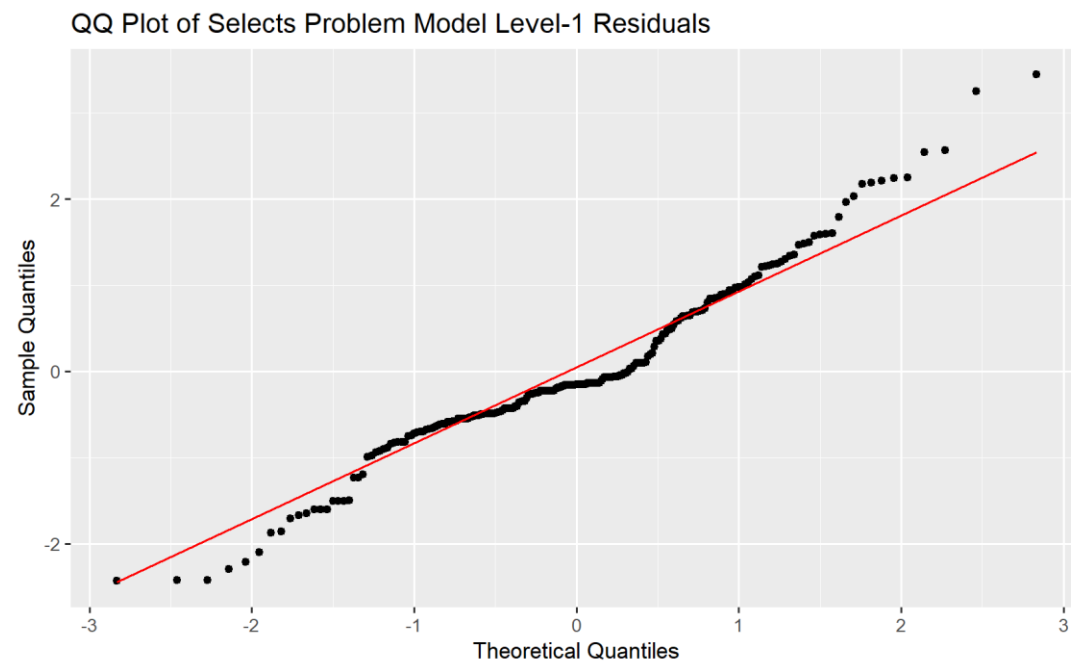


Figure 13

Q-Q Plot of Selects Problem Model Level-2 Residuals

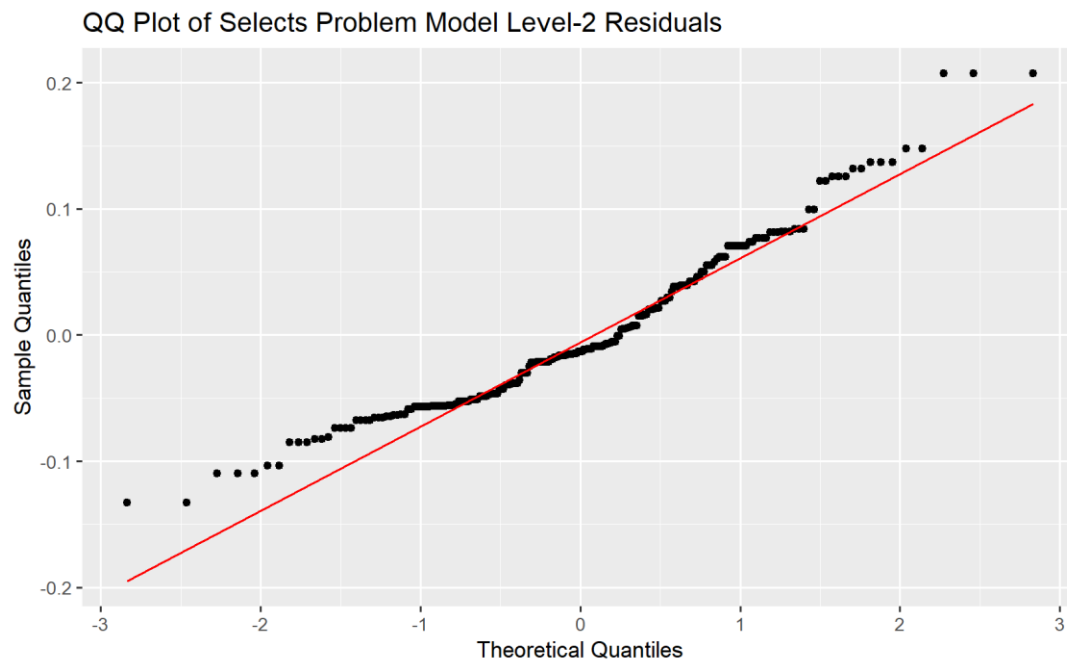


Figure 14

Q-Q Plot of Selects Problem Model Level-3 Residuals

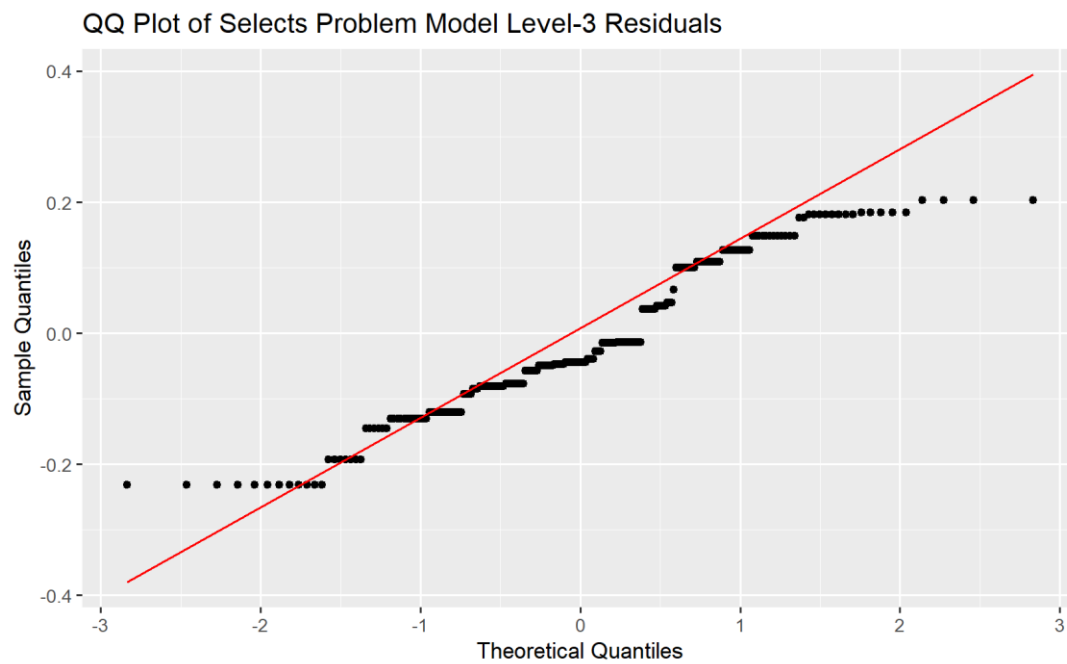


Figure 15

Q-Q Plot of Considers Practice Model Level-1 Residuals

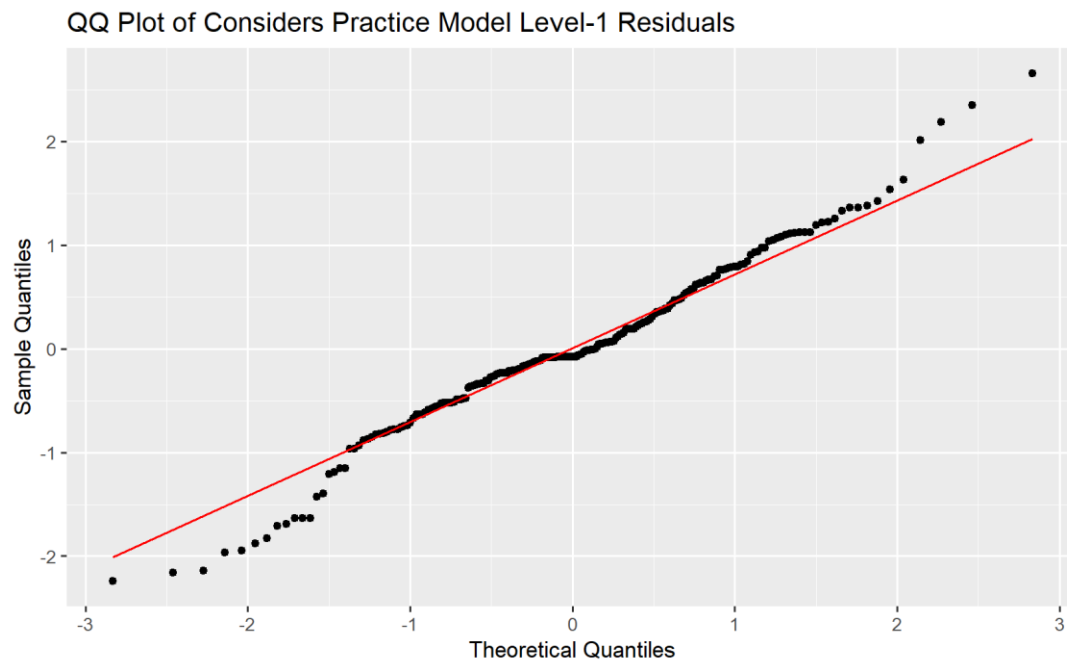


Figure 16

Q-Q Plot of Considers Practice Model Level-2 Residuals

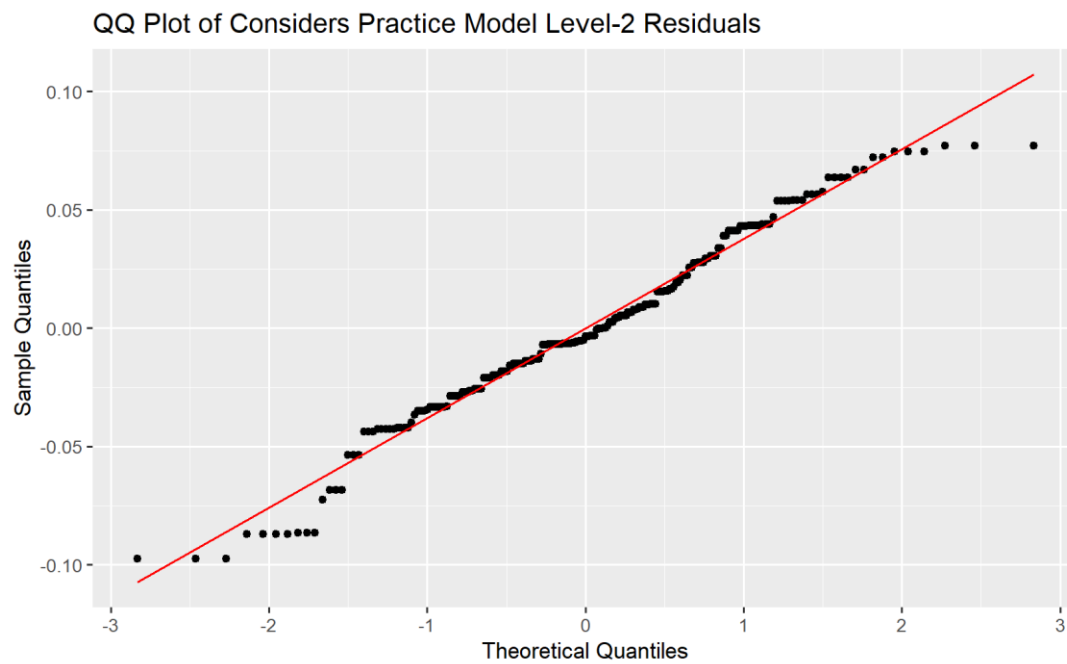


Figure 17

Q-Q Plot of Considers Practice Model Level-3 Residuals

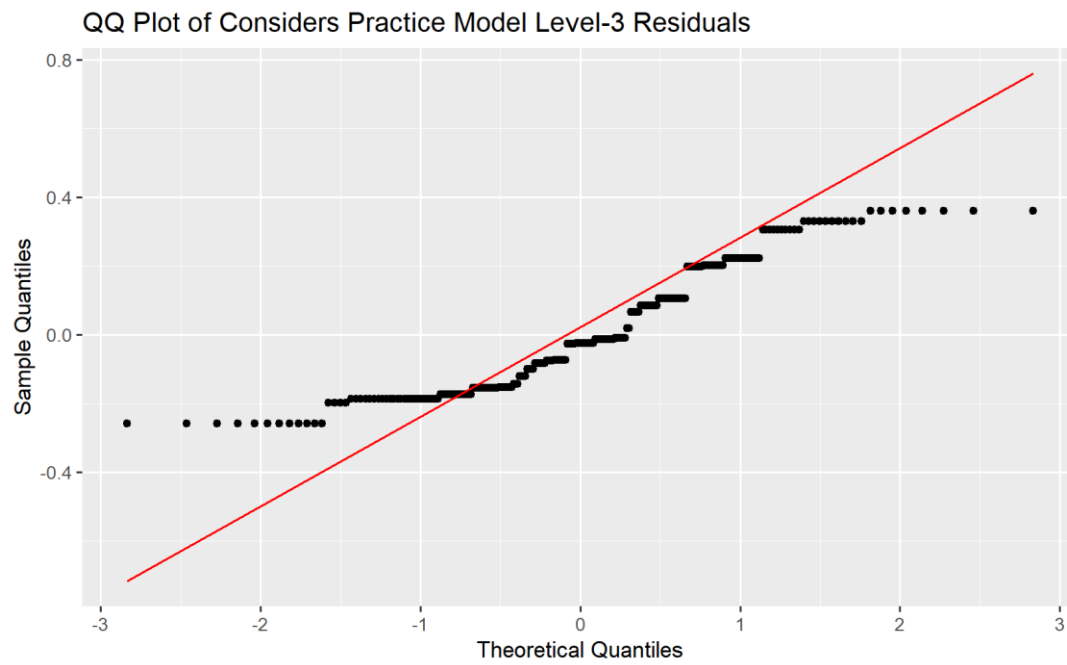


Figure 18

Q-Q Plot of Selects Practice Model Level-1 Residuals

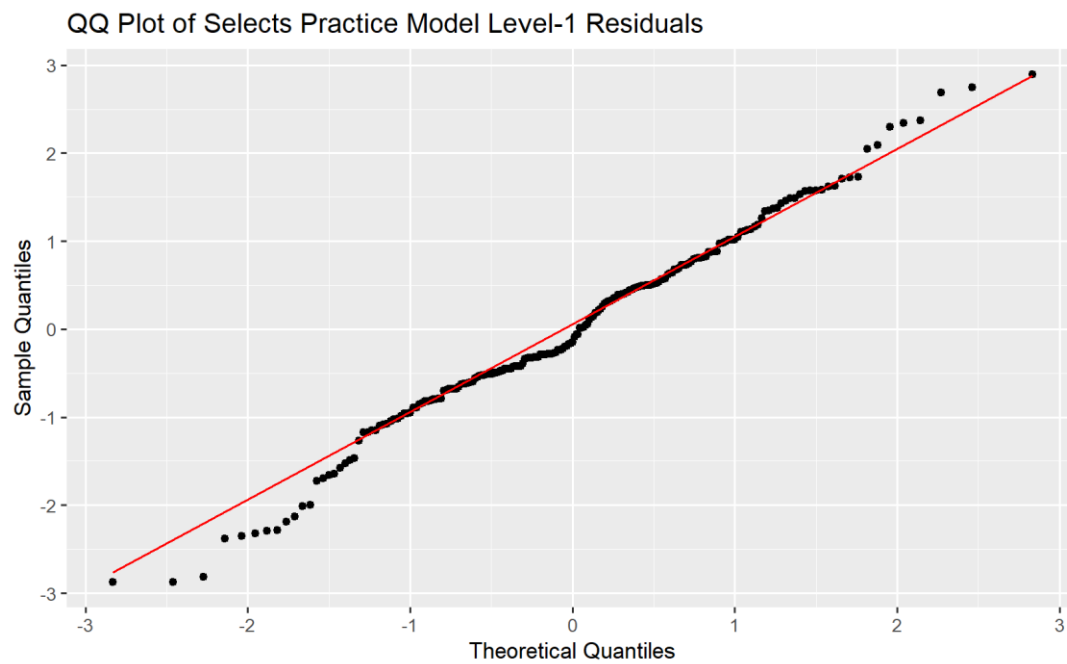


Figure 19

Q-Q Plot of Selects Practice Model Level-2 Residuals

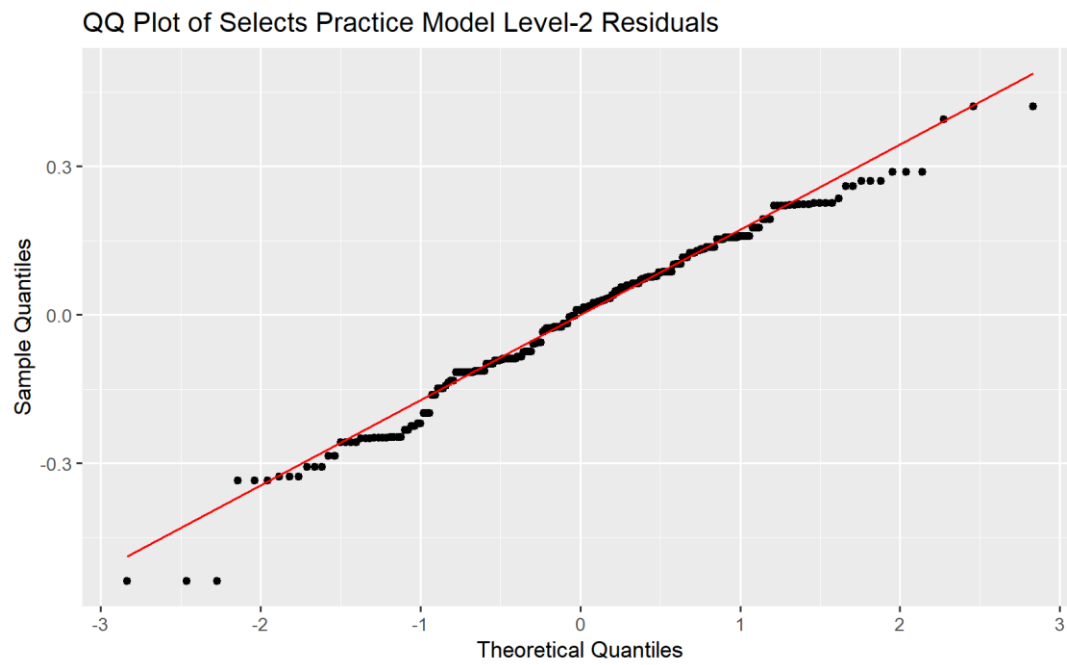


Figure 20

Q-Q Plot of Selects Practice Model Level-3 Residuals

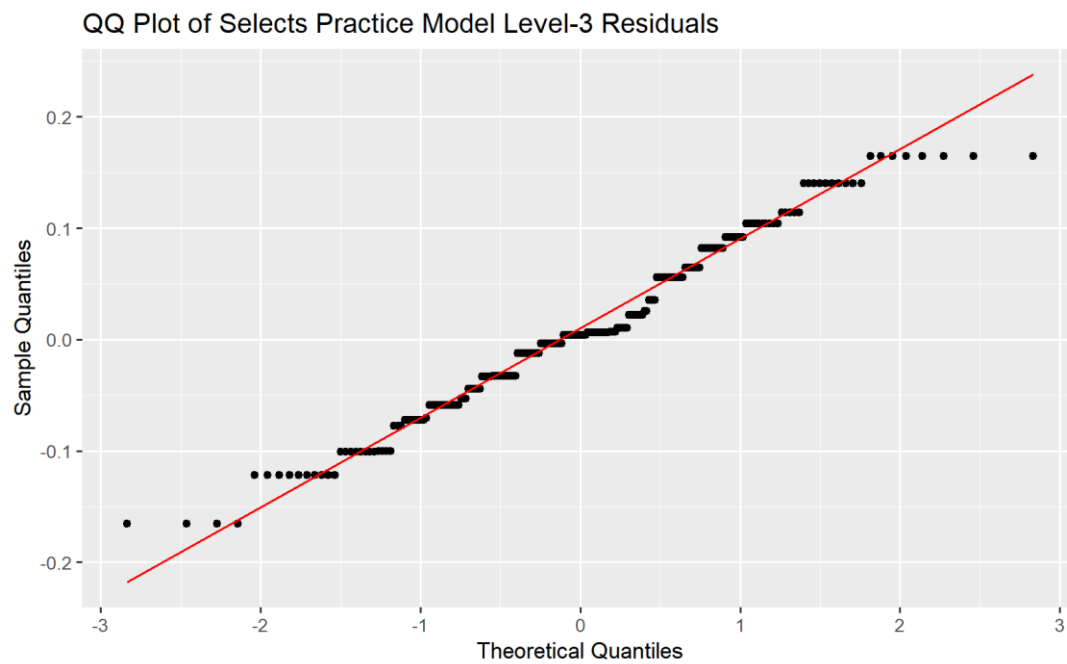
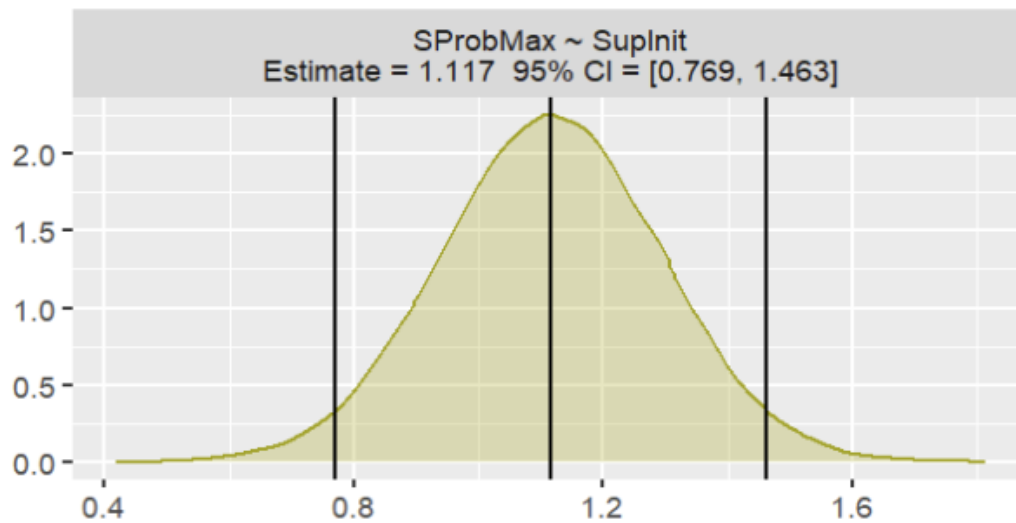


Figure 21

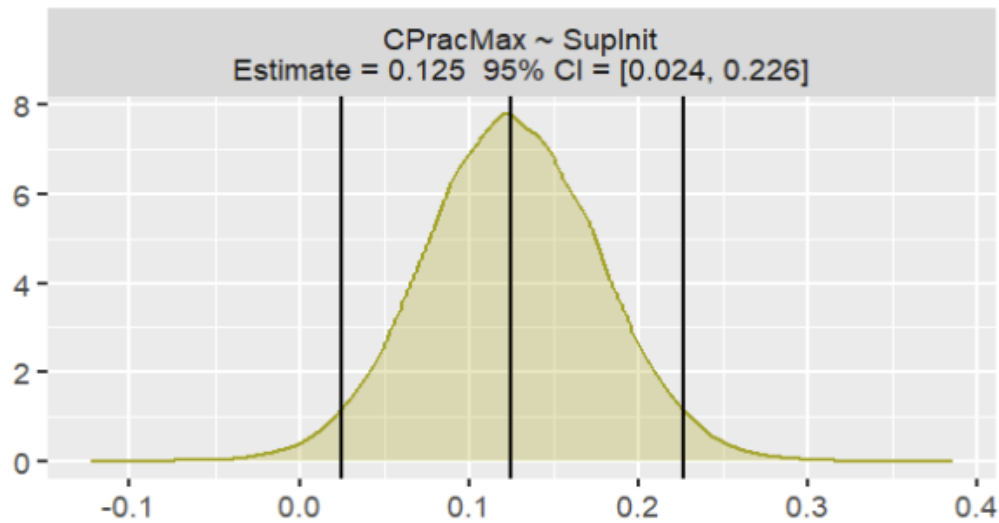
Posterior Distribution of the Effect of Supervisor Initiation on Selects Problem EBP Alignment



Note. SProbMax = selects problem maximum EBP alignment. Suplnit = supervisor initiation. The listed estimate is the posterior median.

Figure 22

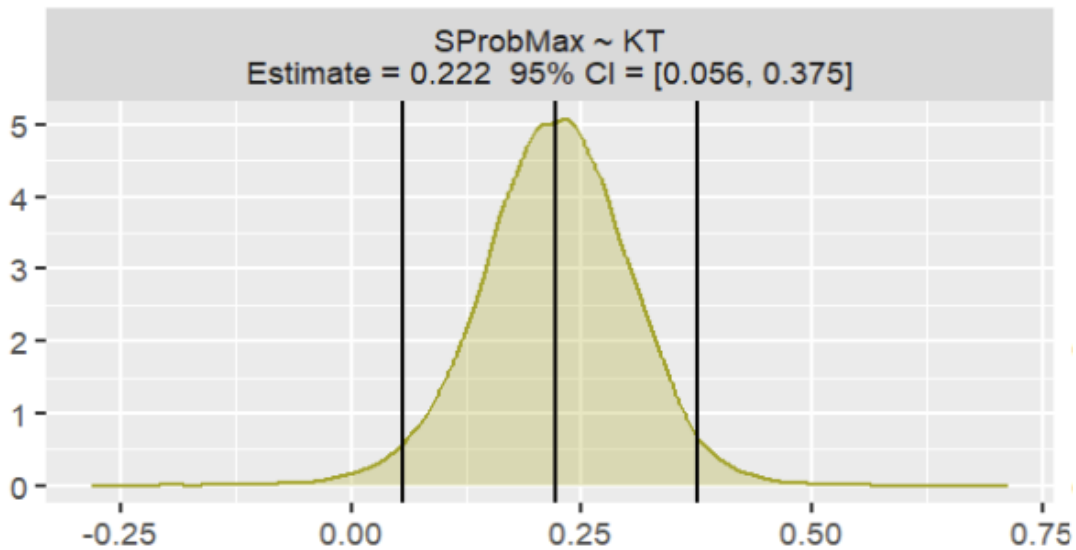
Posterior Distribution of the Effect of Supervisor Initiation on Considers Practice EBP Alignment



Note. CPacMax = considers practice maximum EBP alignment. Suplnit = supervisor initiation. The listed estimate is the posterior median.

Figure 23

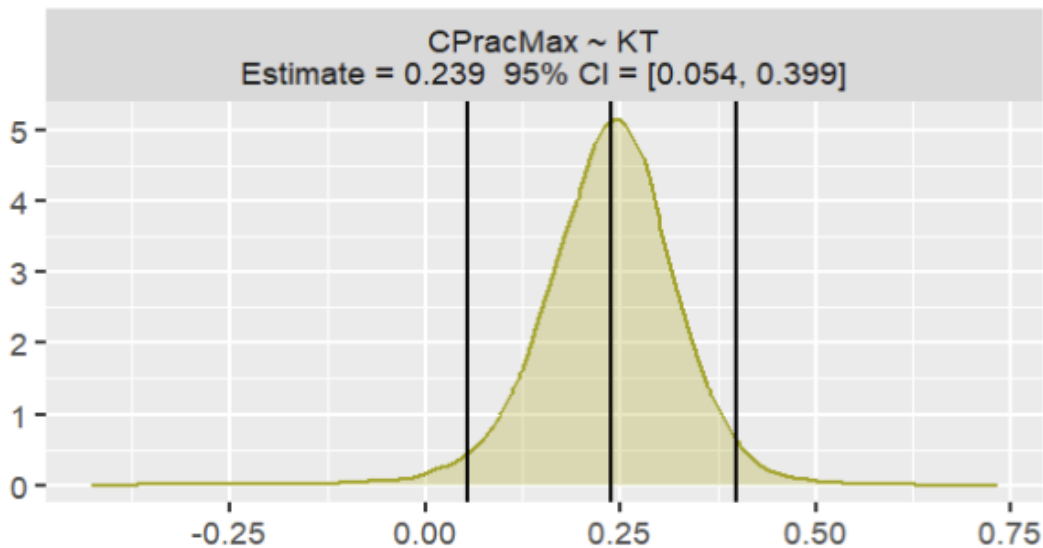
Posterior Distribution of the Effect of Supervisor Knowledge on Selects Problem EBP Alignment



Note. SProbMax = selects problem maximum EBP alignment. KT = supervisor knowledge. The listed estimate is the posterior median.

Figure 24

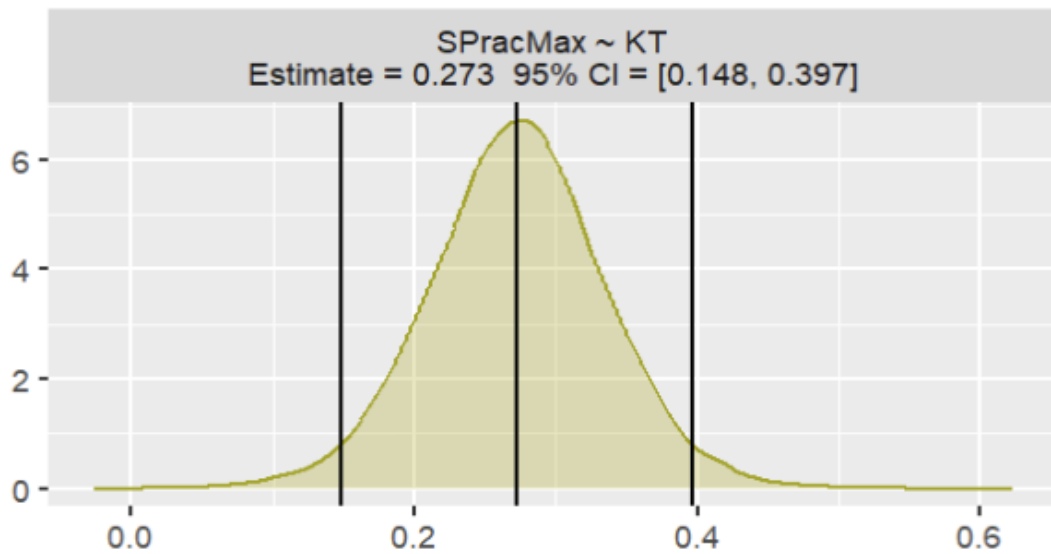
Posterior Distribution of the Effect of Supervisor Knowledge on Considers Practice EBP Alignment



Note. CPracMax = considers practice maximum EBP alignment. KT = supervisor knowledge. The listed estimate is the posterior median.

Figure 25

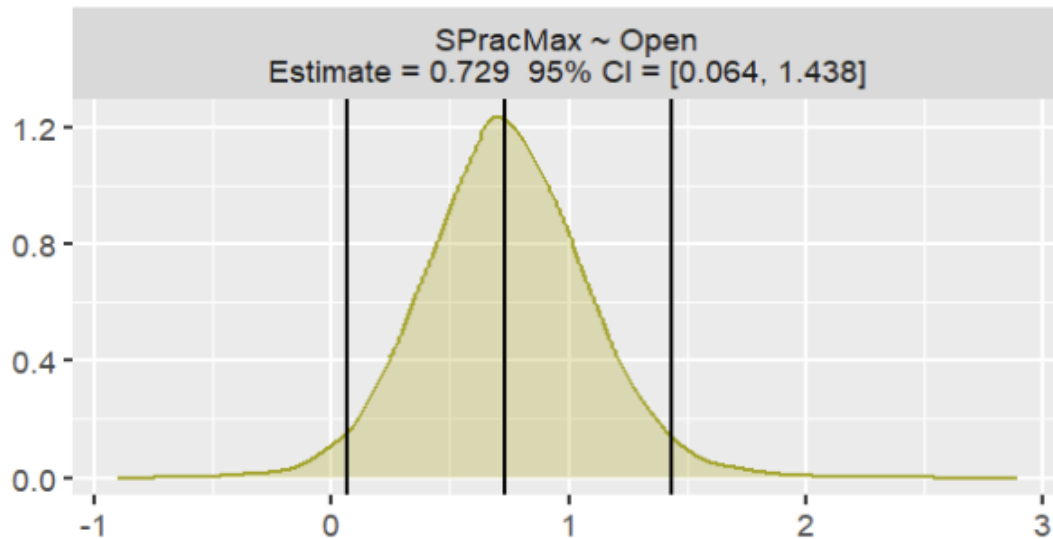
Posterior Distribution of the Effect of Supervisor Knowledge on Selects Practice EBP Alignment



Note. SPracMax = selects practice maximum EBP alignment. KT = supervisor knowledge. The listed estimate is the posterior median.

Figure 26

Posterior Distribution of the Effect of Supervisor Openness on Selects Practice EBP Alignment



Note. SPracMax = selects practice maximum EBP alignment. Open = supervisor openness. The listed estimate is the posterior median.

Figure 27

Supervisor Word Count by Initiation for Selects Problem

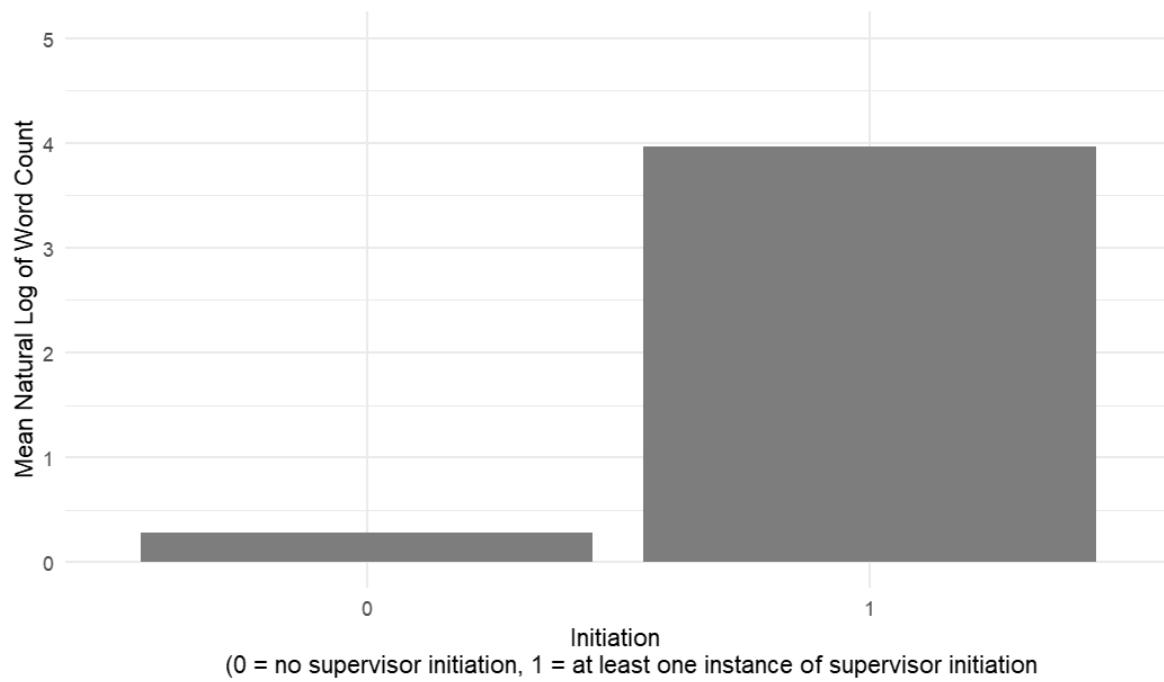


Figure 28

Supervisor Word Count by Initiation for Considers Practice

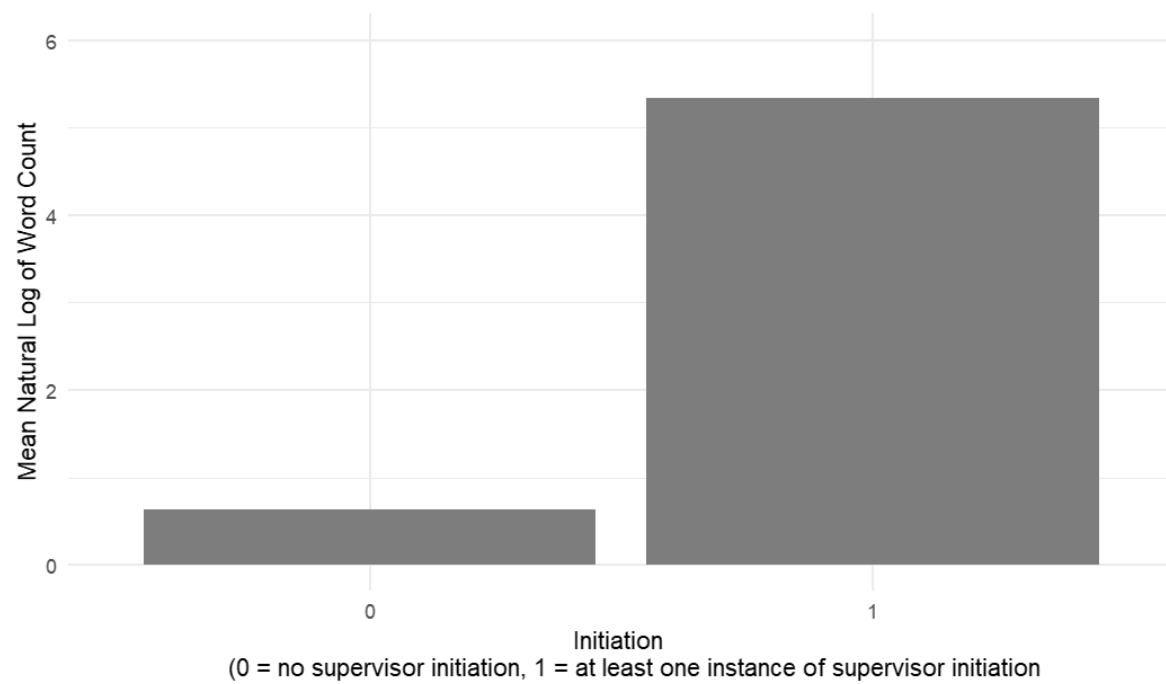
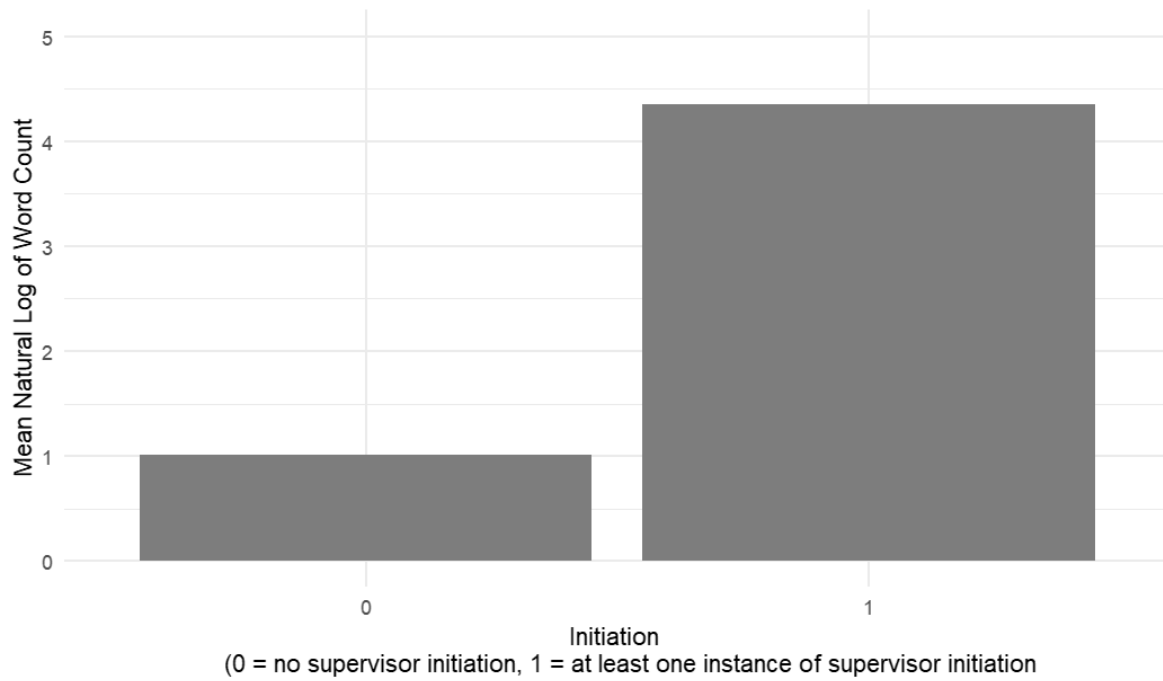


Figure 29

Supervisor Word Count by Initiation for Selects Practice



Tables

Table 1

Descriptive Statistics for Session-Level Outcome Variables

Outcome Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Selects Problem Maximum Extensiveness	217	2.00	2.07
Considers Practice Maximum Extensiveness	217	2.06	1.63
Selects Practice Maximum Extensiveness	217	2.23	1.79

Table 2

Frequencies of Maximum Extensiveness Score for Each Session-Level Outcome Variables

Outcome Variable	Frequency of Observed Values					
	0	1	2	3	4	5
Selects Problem Maximum Extensiveness	100	11	9	22	36	39
Considers Practice Maximum Extensiveness	54	43	28	46	31	17
Selects Practice Maximum Extensiveness	56	38	15	44	36	18

Table 3*Descriptive Statistics for Session-Level Predictor Variables and Potential Covariates Across Models*

Session-Level Variable	<i>N</i>	<i>M</i>	<i>SD</i>
Selects Problem Supervisor Initiation Count	217	0.60	0.79
Selects Problem Supervisor Question Count	217	0.86	1.67
Selects Problem Supervisor Word Count (Natural Log)	217	1.95	2.09
Considers Practice Supervisor Initiation Count	217	1.78	1.84
Considers Practice Supervisor Question Count	217	3.81	6.08
Considers Practice Supervisor Word Count (Natural Log)	217	3.90	2.44
Selects Practice Supervisor Initiation Count	217	0.96	1.11
Selects Practice Supervisor Question Count	217	1.55	3.09
Selects Practice Supervisor Word Count (Natural Log)	217	3.00	2.12

Table 4*Descriptive Statistics for Continuous Supervisor-Level Predictor Variables*

Supervisor-Level Variable	<i>n</i>	<i>M</i>	<i>SD</i>
Supervisor Knowledge Test Score	27	8.15	3.01
Supervisor Openness to Evidence and Innovative Practice	29	3.14	0.61

Table 5*Correlations for Session-Level Predictor Variables and Potential Covariates for Selects Problem Model*

Session-Level Variable	1.	2.	3.	4.
	[95% CI]			
1. Selects Problem Supervisor Initiation Count	—			
2. Selects Problem Supervisor Question Count	.69 [.62, .76]	—		
3. Selects Problem Supervisor Word Count (Natural Log)	.82 [.77, .86]	.65 [.57, .72]	—	
4. Selects Problem Extensiveness	.71 [.63, .77]	.55 [.45, .64]	.82 [.77, .86]	—

Note. CI = credible interval.**Table 6***Correlations for Session-Level Predictor Variables and Potential Covariates for Considers Practice Model*

Session-Level Variable	1.	2.	3.	4.
	[95% CI]			
1. Considers Practice Supervisor Initiation Count	—			
2. Considers Practice Supervisor Question Count	.60 [.50, .68]	—		
3. Considers Practice Supervisor Word Count (Natural Log)	.75 [.68, .80]	.57 [.47, .66]	—	
4. Considers Practice Extensiveness	.45 [.34, .56]	.39 [.27, .50]	.70 [.62, .76]	—

Note. CI = credible interval.

Table 7*Correlations for Session-Level Predictor Variables and Potential Covariates for Selects Practice Model*

Session-Level Variable	1.	2.	3.	4.
	[95% CI]			
1. Selects Practice Supervisor Initiation Count	—			
2. Selects Practice Supervisor Question Count	.56 [.46, .64]	—		
3. Selects Practice Supervisor Word Count (Natural Log)	.72 [.65, .78]	.56 [.46, .65]	—	
4. Selects Practice Extensiveness	.34 [.22, .46]	.23 [.09, .35]	.59 [.50, .67]	—

Note. CI = credible interval.**Table 8***Correlations for Supervisor-Level Predictor Variables and Potential Covariates*

Session-Level Variable	1.	2.	3.	4.
	[95% CI]			
1. Site	—			
2. Study Condition	-.06 [-.47, .38]	—		
3. Supervisor Knowledge (EKT Score)	.34 [-.10, .67]	.79 [.54, .91]	—	
4. Openness to Innovative/Evidence-Based Practice (EBPAS Openness Score)	-.05 [-.47, .38]	.28 [-.17, .63]	.15 [-.31, .54]	—

Note. CI = credible interval.

Table 9*Convergence Diagnostics and Model Fit Statistics for Selects Problem Random Intercept Models*

Variables Included	Burn-In Iterations	Final Iterations	Highest PSRF	Lowest <i>N</i> Effective	Marginal Likelihood DIC ₂	Marginal Likelihood WAIC
Unconditional Model	10,000	20,000	1.03	200.36	810.86	811.41
Level 1 Variables Entered	10,000	20,000	1.01	306.45	755.00	759.26
Level 2 Variables Entered	10,000	20,000	1.02	224.25	753.40	756.25
Level 3 Variables Entered	20,000	40,000	1.02	150.23	694.52	700.10

Note. PSRF = Potential Scale Reduction Factor, DIC₂ = Deviance Information Criterion specified for multilevel models with missing data, and WAIC = Watanabe–Akaike Information Criterion. The highest PSRF reported corresponds to the highest PSRF at the final burn-in iteration.

Level 1 variables include: supervisor initiation count, supervisor question count (both group-mean centered)

Level 2 variables include: therapist means of supervisor initiation count and supervisor question count (both group-mean centered)

Level 3 variables include: EKT score, EBPAS openness score, and supervisor means of supervisor initiation count and supervisor question count (all grand-mean centered); study site (in binary form)

Table 10*Convergence Diagnostics and Model Fit Statistics for Consider Practice Random Intercept Models*

Variables Included	Burn-In Iterations	Final Iterations	Highest PSRF	Lowest <i>N</i> Effective	Marginal Likelihood DIC ₂	Marginal Likelihood WAIC
Unconditional Model	10,000	20,000	1.04	189.56	664.14	664.48
Level 1 Variables Entered	10,000	20,000	1.04	215.49	658.84	659.52
Level 2 Variables Entered	20,000	40,000	1.04	160.68	660.31	661.35
Level 3 Variables Entered	20,000	60,000	1.02	107.18	609.88	615.06

Note. PSRF = Potential Scale Reduction Factor, DIC₂ = Deviance Information Criterion specified for multilevel models with missing data, and WAIC = Watanabe–Akaike Information Criterion. The highest PSRF reported corresponds to the highest PSRF at the final burn-in iteration.

Level 1 variables include: supervisor initiation count, supervisor question count (both group-mean centered)

Level 2 variables include: therapist means of supervisor initiation count and supervisor question count (both group-mean centered)

Level 3 variables include: EKT score, EBPAS openness score, and supervisor means of supervisor initiation count and supervisor question count (all grand-mean centered); study site (in binary form)

Table 11*Convergence Diagnostics and Model Fit Statistics for Selects Practice Random Intercept Models*

Variables Included	Burn-In Iterations	Final Iterations	Highest PSRF	Lowest <i>N</i> Effective	Marginal Likelihood DIC ₂	Marginal Likelihood WAIC
Unconditional Model	10,000	10,000	1.01	366.33	827.35	828.06
Level 1 Variables Entered	10,000	10,000	1.02	206.44	820.50	822.20
Level 2 Variables Entered	20,000	30,000	1.02	181.87	804.38	817.09
Level 3 Variables Entered	20,000	30,000	1.02	154.09	768.87	779.33

Note. PSRF = Potential Scale Reduction Factor, DIC₂ = Deviance Information Criterion specified for multilevel models with missing data, and WAIC = Watanabe–Akaike Information Criterion. The highest PSRF reported corresponds to the highest PSRF at the final burn-in iteration.

Level 1 variables include: supervisor initiation count, supervisor question count (both group-mean centered)

Level 2 variables include: therapist means of supervisor initiation count and supervisor question count (both group-mean centered)

Level 3 variables include: EKT score, EBPAS openness score, and supervisor means of supervisor initiation count and supervisor question count (all grand-mean centered); study site (in binary form)

Table 12*Final Random Intercept Model for Selects Problem EBP Alignment (Equation 4)*

Effect	Estimate	95% CI	
		LL	UL
Variances			
$(\hat{\zeta}_{0jk})$ Level 2 Intercept Variance	0.05	0.002	0.23
$(\hat{V}_{00k})$ Level 3 Intercept Variance	0.10	0.004	0.50
$(\hat{\epsilon}_{ijk})$ Residual Variance	1.22	0.99	1.52
Coefficients			
$(\hat{\gamma}_{000})$ Intercept	2.26	1.22	3.32
$(\hat{\gamma}_{100})$ SProb_SupInit _{W1}	1.12	0.77	1.46
$(\hat{\gamma}_{200})$ SProb_SupQs _{W1}	0.03	-0.14	0.20
$(\hat{\gamma}_{010})$ SProb_SupInit _{B2}	0.56	-0.75	1.94
$(\hat{\gamma}_{020})$ SProb_SupQs _{B2}	0.22	-0.32	0.75
$(\hat{\gamma}_{001})$ SProb_SupInit _{B3}	1.91	-0.11	3.71
$(\hat{\gamma}_{002})$ SProb_SupQs _{B3}	0.13	-0.91	1.28
$(\hat{\gamma}_{003})$ Site	-0.31	-1.05	0.39
$(\hat{\gamma}_{004})$ EKT Score	0.22	0.06	0.38
$(\hat{\gamma}_{005})$ Openness Score	0.27	-0.37	0.87
$(\hat{\gamma}_{006})$ EKT * Openness	0.15	-0.04	0.34
Proportion of Variance Explained			
By Coefficients	.69	.60	.75
By Level 2 Random Intercepts	.01	.00	.05
By Level 3 Random Intercepts	.02	.001	.10
By Residual Variation	.27	.21	.34

Note. CI = credible interval, LL = lower limit, UL = upper limit, $\text{SupInit}_{w1} = \text{SupInit}_{ijk} - \overline{\text{SupInit}}_{jk}$, $\text{SupQs}_{w1} = \text{SupQs}_{ijk} - \overline{\text{SupQs}}_{jk}$, $\text{SupInit}_{B2} = \overline{\text{SupInit}}_{jk} - \overline{\text{SupInit}}_{..k}$, $\text{SupQs}_{B2} = \overline{\text{SupQs}}_{jk} - \overline{\text{SupQs}}_{..k}$, $\text{SupInit}_{B3} = \overline{\text{SupInit}}_{..k} - \overline{\text{SupInit}}_{...}$, $\text{SupQs}_{B3} = \overline{\text{SupQs}}_{..k} - \overline{\text{SupQs}}_{...}$

Table 13*Final Random Intercept Model for Considers Practice EBP Alignment (Equation 5)*

Effect	Estimate	95% CI	
		LL	UL
Variances			
$(\hat{\zeta}_{0jk})$ Level 2 Intercept Variance	0.03	0.001	0.13
$(\hat{V}_{00k})$ Level 3 Intercept Variance	0.15	0.008	0.61
$(\hat{\epsilon}_{ijk})$ Residual Variance	0.81	0.66	1.01
Coefficients			
$(\hat{\gamma}_{000})$ Intercept	2.57	1.68	3.59
$(\hat{\gamma}_{100})$ CPrac_SupInit _{W1}	0.13	0.02	0.23
$(\hat{\gamma}_{200})$ CPrac_SupQs _{W1}	0.003	-0.03	0.03
$(\hat{\gamma}_{010})$ CPrac_SupInit _{B2}	-0.06	-0.82	0.71
$(\hat{\gamma}_{020})$ CPrac_SupQs _{B2}	0.06	-0.30	0.41
$(\hat{\gamma}_{001})$ CPrac_SupInit _{B3}	0.69	-0.23	1.52
$(\hat{\gamma}_{002})$ CPrac_SupQs _{B3}	0.10	-0.23	0.48
$(\hat{\gamma}_{003})$ Site	-1.01	-2.05	0.06
$(\hat{\gamma}_{004})$ EKT Score	0.24	0.05	0.40
$(\hat{\gamma}_{005})$ Openness Score	0.28	-0.38	0.93
$(\hat{\gamma}_{006})$ EKT * Openness	-0.007	-0.27	0.25
Proportion of Variance Explained			
By Coefficients	.64	.50	.73
By Level 2 Random Intercepts	.009	.00	.04
By Level 3 Random Intercepts	.05	.003	.19
By Residual Variation	.29	.22	.37

Note. CI = credible interval, LL = lower limit, UL = upper limit, $\text{Suplnit}_{W1} = \text{Suplnit}_{ijk} - \overline{\text{Suplnit}}_{.jk}$, $\text{SupQs}_{W1} = \text{SupQs}_{ijk} - \overline{\text{SupQs}}_{.jk}$, $\text{Suplnit}_{B2} = \overline{\text{Suplnit}}_{.jk} - \overline{\text{Suplnit}}_{..k}$, $\text{SupQs}_{B2} = \overline{\text{SupQs}}_{.jk} - \overline{\text{SupQs}}_{..k}$, $\text{Suplnit}_{B3} = \overline{\text{Suplnit}}_{..k} - \overline{\text{Suplnit}}_{...}$, $\text{SupQs}_{B3} = \overline{\text{SupQs}}_{..k} - \overline{\text{SupQs}}_{...}$

Table 14*Final Random Intercept Model for Selects Practice EBP Alignment (Equation 6)*

Effect	Estimate	95% CI	
		<i>LL</i>	<i>UL</i>
Variances			
$(\hat{\zeta}_{0jk})$ Level 2 Intercept Variance	0.19	0.009	0.64
$(\hat{V}_{00k})$ Level 3 Intercept Variance	0.08	0.003	0.45
$(\hat{\epsilon}_{ijk})$ Residual Variance	1.51	1.20	1.92
Coefficients			
$(\hat{\gamma}_{000})$ Intercept	1.95	1.11	2.79
$(\hat{\gamma}_{100})$ SPrac_SupInit _{W1}	0.19	-0.06	0.45
$(\hat{\gamma}_{200})$ SPrac_SupQs _{W1}	0.02	-0.07	0.11
$(\hat{\gamma}_{010})$ SPrac_SupInit _{B2}	1.41	-0.41	3.024
$(\hat{\gamma}_{020})$ SPrac_SupQs _{B2}	-0.14	-1.05	0.82
$(\hat{\gamma}_{001})$ SPrac_SupInit _{B3}	0.64	-0.47	1.80
$(\hat{\gamma}_{002})$ SPrac_SupQs _{B3}	-0.24	-0.78	0.28
$(\hat{\gamma}_{003})$ Site	0.59	-0.39	1.58
$(\hat{\gamma}_{004})$ EKT Score	0.27	0.15	0.40
$(\hat{\gamma}_{005})$ Openness Score	0.73	0.06	1.44
$(\hat{\gamma}_{006})$ EKT * Openness	0.009	-0.21	0.23
Proportion of Variance Explained			
By Coefficients	.48	.35	.59
By Level 2 Random Intercepts	.05	.003	.17
By Level 3 Random Intercepts	.02	.03	.12
By Residual Variation	.43	.32	.54

Note. CI = credible interval, *LL* = lower limit, *UL* = upper limit, $\text{SupInit}_{W1} = \text{SupInit}_{ijk} - \overline{\text{SupInit}}_{.jk}$, $\text{SupQs}_{W1} = \text{SupQs}_{ijk} - \overline{\text{SupQs}}_{.jk}$, $\text{SupInit}_{B2} = \overline{\text{SupInit}}_{.jk} - \overline{\text{SupInit}}_{..k}$, $\text{SupQs}_{B2} = \overline{\text{SupQs}}_{.jk} - \overline{\text{SupQs}}_{..k}$, $\text{SupInit}_{B3} = \overline{\text{SupInit}}_{..k} - \overline{\text{SupInit}}_{...}$, $\text{SupQs}_{B3} = \overline{\text{SupQs}}_{..k} - \overline{\text{SupQs}}_{...}$

Table 15*Natural Logarithm of Supervisor Word Count by Supervisor Initiation for Selects Problem (Equation 7)*

Effect	Estimate	95% CI	
		LL	UL
Variances			
$(\hat{\zeta}_{0jk})$ Level 2 Intercept Variance	0.05	0.004	0.22
$(\hat{V}_{00k})$ Level 3 Intercept Variance	0.11	0.006	0.46
$(\hat{\epsilon}_{ijk})$ Residual Variance	1.17	0.95	1.44
Coefficients			
$(\hat{\gamma}_{000})$ Intercept	2.15	1.40	3.01
$(\hat{\gamma}_{100})$ SProb_SupInit _{W1}	1.76	1.47	2.04
$(\hat{\gamma}_{010})$ SProb_SupInit _{B2}	1.70	0.67	2.73
$(\hat{\gamma}_{001})$ SProb_SupInit _{B3}	2.42	1.67	3.21
$(\hat{\gamma}_{002})$ Site	-0.23	-0.77	0.31
$(\hat{\gamma}_{003})$ EKT Score	0.10	-0.40	0.22
$(\hat{\gamma}_{004})$ Openness Score	0.08	-0.39	0.49
Proportion of Variance Explained			
By Coefficients	.70	.62	.76
By Level 2 Random Intercepts	.01	.001	.05
By Level 3 Random Intercepts	.02	.001	.09
By Residual Variation	.26	.20	.32

Note. CI = credible interval, LL = lower limit, UL = upper limit, Suplnit_{w1} = $\text{Suplnit}_{ijk} - \overline{\text{Suplnit}}_{.jk}$, Suplnit_{B2} = $\overline{\text{Suplnit}}_{.jk} - \overline{\text{Suplnit}}_{..k}$, Suplnit_{B3} = $\overline{\text{Suplnit}}_{..k} - \overline{\text{Suplnit}}_{...}$.

Table 16*Natural Logarithm of Supervisor Word Count by Supervisor Initiation for Considers Practice (Equation 8)*

Effect	Estimate	95% CI	
		LL	UL
Variances			
$(\hat{\zeta}_{0jk})$ Level 2 Intercept Variance	0.08	0.007	0.34
$(\hat{V}_{00k})$ Level 3 Intercept Variance	0.15	0.009	0.74
$(\hat{\epsilon}_{ijk})$ Residual Variance	1.53	1.25	1.91
Coefficients			
$(\hat{\gamma}_{000})$ Intercept	4.35	3.37	5.40
$(\hat{\gamma}_{100})$ CPrac_Suplnit _{w1}	0.67	0.55	0.79
$(\hat{\gamma}_{010})$ CPrac_Suplnit _{B2}	0.56	-0.46	1.63
$(\hat{\gamma}_{001})$ CPrac_Suplnit _{B3}	1.79	1.30	2.46
$(\hat{\gamma}_{002})$ Site	-0.68	-1.71	0.20
$(\hat{\gamma}_{003})$ EKT Score	0.11	-0.07	0.26
$(\hat{\gamma}_{004})$ Openness Score	0.26	-0.45	0.95
Proportion of Variance Explained			
By Coefficients	.71	.60	.77
By Level 2 Random Intercepts	.01	.001	.06
By Level 3 Random Intercepts	.03	.001	.12
By Residual Variation	.25	.20	.31

Note. CI = credible interval, LL = lower limit, UL = upper limit, Suplnit_{w1} = $\text{Suplnit}_{ijk} - \overline{\text{Suplnit}}_{.jk}$, Suplnit_{B2} = $\overline{\text{Suplnit}}_{.jk} - \overline{\text{Suplnit}}_{..k}$, Suplnit_{B3} = $\overline{\text{Suplnit}}_{..k} - \overline{\text{Suplnit}}_{...}$.

Table 17*Natural Logarithm of Supervisor Word Count by Supervisor Initiation for Selects Practice (Equation 9)*

Effect	Estimate	95% CI	
		<i>LL</i>	<i>UL</i>
Variances			
$(\hat{\zeta}_{0jk})$ Level 2 Intercept Variance	0.15	0.007	0.53
$(\hat{V}_{00k})$ Level 3 Intercept Variance	0.11	0.004	0.50
$(\hat{\epsilon}_{ijk})$ Residual Variance	1.74	1.41	2.19
Coefficients			
$(\hat{\gamma}_{000})$ Intercept	2.70	2.01	3.40
$(\hat{\gamma}_{100})$ SPrac_Suplnit _{w1}	1.13	0.88	1.38
$(\hat{\gamma}_{010})$ SPrac_Suplnit _{B2}	1.93	1.10	2.81
$(\hat{\gamma}_{001})$ SPrac_Suplnit _{B3}	1.13	0.48	1.72
$(\hat{\gamma}_{002})$ Site	0.50	-0.15	1.22
$(\hat{\gamma}_{003})$ EKT Score	0.08	-0.02	0.18
$(\hat{\gamma}_{004})$ Openness Score	0.49	-0.02	1.03
Proportion of Variance Explained			
By Coefficients	.57	.46	.65
By Level 2 Random Intercepts	.03	.001	.11
By Level 3 Random Intercepts	.02	.001	.10
By Residual Variation	.37	.29	.46

Note. CI = credible interval, *LL* = lower limit, *UL* = upper limit, $\text{Suplnit}_{w1} = \text{Suplnit}_{ijk} - \overline{\text{Suplnit}}_{.jk}$, $\text{Suplnit}_{B2} = \overline{\text{Suplnit}}_{.jk} - \overline{\text{Suplnit}}_{..k}$, $\text{Suplnit}_{B3} = \overline{\text{Suplnit}}_{..k} - \overline{\text{Suplnit}}_{...}$.

Table 18*Linear Regression for Supervisor Knowledge (EKT Score) by Study Condition*

Effect	Estimate	95% CI	
		<i>LL</i>	<i>UL</i>
Variances			
($\hat{\epsilon}_i$) Residual Variance	2.57	1.48	4.96
Coefficients			
($\hat{\gamma}_0$) Intercept	4.36	3.13	5.57
($\hat{\gamma}_1$) Study Condition	4.69	3.41	5.93
($\hat{\gamma}_2$) Site	2.16	0.84	3.49
Proportion of Variance Explained			
By Coefficients	.72	.52	.83
By Residual Variation	.28	.17	.48

Note. CI = credible interval, *LL* = lower limit, *UL* = upper limit.

Appendix A

Blimp Syntax for Central Aims

Aim 1

Selects Problem

DATA: Blimp_SelectsProb_CORRECTED.csv;
MISSING: 999;
CLUSTERID: Thp Sup;
MODEL:
SProbMax ~ 1;
SEED: 90291;
BURN: 10000;
ITERATIONS: 20000;

Considers Practice

DATA: Blimp_ConsidersPrac_CORRECTED.csv;
MISSING: 999;
CLUSTERID: Thp Sup;
MODEL:
CPracMax ~ 1;
SEED: 90291;
BURN: 10000;
ITERATIONS: 20000;

Selects Practice

DATA: Blimp_ConsidersPrac_CORRECTED.csv;
MISSING: 999;
CLUSTERID: Thp Sup;
MODEL:
CPracMax ~ 1;
SEED: 90291;
BURN: 10000;
ITERATIONS: 10000;

Aims 2-5

Selects Problem

DATA: Blimp_SelectsProb_CORRECTED.csv;
MISSING: 999;
CLUSTERID: Thp Sup;
NOMINAL: Site;

CENTER:
groupmean = Suplnit SupQs Suplnit.mean SupQs.mean;
grandmean = KT Open;
MODEL:
SProbMax ~ Suplnit SupQs Suplnit.mean SupQs.mean KT Open Site KT*Open;
SEED: 90291;
BURN: 20000;
ITERATIONS: 40000;

Considers Practice

DATA: Blimp_ConsidersPrac_CORRECTED.csv;
MISSING: 999;
CLUSTERID: Thp Sup;
NOMINAL: Site;
CENTER:
groupmean = Suplnit SupQs Suplnit.mean SupQs.mean;
grandmean = KT Open;
MODEL:
CPracMax ~ Suplnit SupQs Suplnit.mean SupQs.mean KT Open Site KT*Open;
SEED: 90291;
BURN: 20000;
ITERATIONS: 60000;

Selects Practice

DATA: Blimp_SelectsPrac_CORRECTED.csv;
MISSING: 999;
CLUSTERID: Thp Sup;
NOMINAL: Site;
CENTER:
groupmean = Suplnit SupQs Suplnit.mean SupQs.mean;
grandmean = KT Open;
MODEL:
SPracMax ~ Suplnit SupQs Suplnit.mean SupQs.mean KT Open Site KT*Open;
SEED: 90291;
BURN: 20000;
ITERATIONS: 30000;

Appendix B

Intraclass Correlation Coefficient (ICC) Formulas

Level 2 ICC (i.e., the proportion of total variance in the outcome that can be attributed to the therapist level):

$$ICC_2 = \frac{\sigma_{\zeta}^2}{\sigma_{\varepsilon}^2 + \sigma_{\zeta}^2 + \sigma_V^2}$$

Level 3 ICC (i.e., the proportion of total variance in the outcome that can be attributed to the supervisor level):

$$ICC_3 = \frac{\sigma_V^2}{\sigma_{\varepsilon}^2 + \sigma_{\zeta}^2 + \sigma_V^2}$$

Appendix C

Coefficient Interpretations for Equations 4-6

γ_{000} = estimated intercept (i.e., extent of decision alignment with EBP) when supervisor initiation, supervisor questions, supervisor knowledge, and supervisor openness are at their mean (i.e., 0) and when a supervisor's site is SC (i.e., 0)

γ_{100} = the within-therapist effect of supervisor initiation on the outcome (i.e., extent of decision alignment with EBP)

γ_{200} = the within-therapist effect of supervisor questions on the outcome (i.e., extent of decision alignment with EBP)

γ_{010} = the between-therapist effect of supervisor initiation on the outcome (i.e., extent of decision alignment with EBP)

γ_{020} = the between-therapist effect of supervisor questions on the outcome (i.e., extent of decision alignment with EBP)

γ_{001} = the between-supervisor effect of supervisor initiation on the outcome (i.e., extent of decision alignment with EBP)

γ_{002} = the between-supervisor effect of supervisor questions on the outcome (i.e., extent of decision alignment with EBP)

γ_{003} = the effect of supervisor site on the intercept—when holding all other covariates constant, this is the expected difference in EBP-alignment extensiveness between a supervisor in SC vs. CA

γ_{004} = the effect of supervisor knowledge on the intercept—when holding all other covariates constant, this is the expected difference in EBP-alignment extensiveness for a one-unit increase in EKT score

γ_{005} = the effect of supervisor openness on the intercept—when holding all other covariates constant, this is the expected difference in EBP-alignment extensiveness for a one-unit increase in EBPAS openness score

γ_{006} = the effect of supervisor knowledge on the relationship between openness and expected extent of decision alignment with EBP

V_{00k} = supervisor-level intercept residual (i.e., effect of supervisors on the intercept)

ζ_{0jk} = therapist-level intercept residual (i.e., effect of therapists on the intercept)

ε_{ijk} = session-level residual (i.e., level-1 residual error term)

Appendix D

Originally Proposed Models

Level 1 (first supervision meeting about each youth, $N=217$):

$$Y_{ijk} = b_{0jk} + b_{1jk}SupInit_{ijk} + \varepsilon_{ijk}$$

Level 2 (therapist, $N=91$):

$$b_{0jk} = \beta_{00k} + \zeta_{0jk}$$

$$b_{1jk} = \beta_{10k} + \zeta_{1jk}$$

Level 3 (supervisor, $N=29$):

$$\beta_{00k} = \gamma_{000} + \gamma_{001}Cond_{00k} + \gamma_{002}Site_{00k} + \gamma_{003}SupExperience_k + \gamma_{004}SupOpenness_k + \gamma_{005}SupExperience_k * SupOpenness_k + V_{00k}$$

$$\beta_{10k} = \gamma_{100} + \gamma_{101}Cond_k + \gamma_{102}Site_k + \gamma_{103}SupExperience_k + \gamma_{104}SupOpenness_k + \gamma_{105}SupExperience_k * SupOpenness_k + V_{10k}$$

Where $\varepsilon_{ijk} \sim iid N(0, \sigma_\varepsilon^2)$, $\zeta_{0jk} \sim iid N(0, \sigma_\zeta^2)$, and $V_{00k} \sim iid N(0, \sigma_V^2)$

Composite Model:

$$Y_{ijk} = \gamma_{000} + \gamma_{001}Cond_{00k} + \gamma_{002}Site_{00k} + \gamma_{003}SupExperience_k + \gamma_{004}SupOpenness_k + \gamma_{005}SupExperience_k * SupOpenness_k + \gamma_{100}SupInit_{ijk} + \gamma_{101}Cond_k * SupInit_{ijk} + \gamma_{102}Site_k * SupInit_{ijk} + \gamma_{103}SupExperience_k * SupInit_{ijk} + \gamma_{104}SupOpenness_k * SupInit_{ijk} + \gamma_{105}SupExperience_k * SupOpenness_k * SupInit_{ijk} + \varepsilon_{ijk} + (\zeta_{0jk} + \zeta_{1jk} * SupInit_{ijk}) + (V_{00k} + V_{10k} * SupInit_{ijk})$$

Appendix E

Examples of Supervisor Topic Initiation and Questions

ACE-BOCS Code	Supervisor Initiation	Supervisor Questions
Selects Problem	"Okay so um definitely Relationship. It sounds like that might be a good place to start."	"What should we focus on? ... Relationship building?"
Considers Practice	"We could look at Attendance. We could look at Goal Setting but I think this kind of encompasses that..."	"So, do you feel at all you need to spend more time addressing some of the cultural issues that could come up for him, his values or any of that or no?"
Selects Practice	"I absolutely think you need to... Absolutely need to go over PsychoEd on his development."	"So... would you want to look at Addressing Barriers to Treatment first?"

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