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Supervision Practices and Predictors of Supervision Satisfaction for Clinicians Providing
Behavioral Services for Individuals with ASD

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

by

Katerina Charlotte Ford

Committee in charge:

Professor Mian Wang, Chair

Associate Professor Ty W. Vernon

Teaching Professor Andrew M. Fedders

December 2020

The dissertation of Katerina Charlotte Ford is approved.

Andrew M. Fedders

Ty W. Vernon

Mian Wang, Committee Chair

December 2020

Supervision Practices and Predictors of Supervision Satisfaction for Clinicians Providing
Behavioral Services for Individuals with ASD

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Katerina Charlotte Ford

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VITA OF KATERINA CHARLOTTE FORD

December 2020

EDUCATION

- 2020 (expected) Ph.D., Education, with an emphasis in Special Education, Disability, and Risk Studies, University of California, Santa Barbara
- 2018 M.A., Education, with an emphasis in Special Education, Disability, and Risk Studies, University of California, Santa Barbara
- 2010 B.A., Psychology, minor in Education and Applied Psychology, with highest honors, University of California, Santa Barbara

PROFESSIONAL EMPLOYMENT

- 2015-2016 Lab Assistant, Ed 214 A-C: Introduction to Statistics series: Department of Education, University of California, Santa Barbara
- 2012-present Office Manager, Koegel Autism Consultants
- 2011-present Program Supervisor, Koegel Autism Consultants
- 2010-2011 Literacy Tutor, AmeriCorps, Santa Barbara County
- 2009-present Clinician, Koegel Autism Consultants

TEACHING EXPERIENCE

- 2018 Instructor of Record, Education 176B: Practicum in Individual Differences, University of California, Santa Barbara
- 2016-2020 Teaching Assistant and Guest Lecturer, Education 176B: Practicum in Individual Differences, University of California, Santa Barbara
- 2015-2016 Teaching Assistant and Guest Speaker, Psychology 1: Introduction to Psychology, University of California, Santa Barbara

PUBLICATIONS

Manuscripts

Ford, K., Wang, M., Koegel, L. K., Koegel, R. L., & Fedders, A. (2020). Use of a videoconferencing intervention and systematic hierarchy to teach daily living skills to young adults with autism spectrum disorder. *Journal of Positive Behavior Interventions*. <https://doi.org/10.1177/1098300720921214>

Book Chapters

Ashbaugh, K., Engstrom, E., Koegel, L.K., & Ford, K (2019). Improving outcomes in higher education for adults with ASD. In R. Koegel & L.K. Koegel (Eds.), *Pivotal response treatment for autism spectrum disorders, second edition* (pp. 223-246). Baltimore, MD: Paul H. Brookes Publishing Co., Inc.

Engstrom, E., Ashbaugh, K., Koegel, L.K., & Ford, K (2019). Supporting individuals with ASD in employment settings. In R. Koegel & L.K. Koegel (Eds.), *Pivotal response treatment for autism spectrum disorders, second edition* (pp. 247-268). Baltimore, MD: Paul H. Brookes Publishing Co., Inc.

CONFERENCE PRESENTATIONS

- 2017 “Using Video-Conferencing Technology to Increase Independent Living Skills in Adults with ASD.” Presenter, 11th Annual UC Special Education, Developmental Disability, and Risk Studies (SPEDDR) Conference, Santa Barbara, CA
- 2014 “Improving Social Conversation Skills in Adults with ASD.” Co-presenter, 7th International Pivotal Response Treatment (PRT) Conference for ASD, Santa Barbara, CA

CAMPUS AND COMMUNITY INVOLVEMENT

- 2016-2017 Local Arrangements Chair, Doctoral Student Advisory Committee (DSAC), University of California Special Education, Developmental Disability, and Risk Studies (UC SPEDDR)
- 2015-2016 Vice-Conference Chair, DSAC, UC SPEDDR
- 2015 Panelist, Department of Psychological & Brain Sciences graduate school presentation, UC Santa Barbara
- 2014-2016 Volunteer, International PRT Conference for ASD, Santa Barbara, CA
- 2011-present Leader/volunteer, Santa Barbara Community Church
- 2010 Intern, InterVarsity Global Urban Trek, Lima, Peru
- 2009-2010 Volunteer, Santa Barbara Community Development Center, Isla Vista
- 2009 Intern, Healthy Eating and Living Program, UC Santa Barbara
- 2009 Intern, InterVarsity Fresno Institute for Urban Leadership and Fresno Interdenominational Refugee Ministries (FIRM), Fresno, California
- 2009 Treasurer/Co-founder, Associated Students Commission on Student Well Being, UC Santa Barbara
- 2008-2011 Leader, InterVarsity Christian Fellowship, UC Santa Barbara

AWARDS AND HONORS

- 2010 Exceptional Academic Performance, Department of Psychology
- 2010 Academic Excellence, College of Letters and Science Honors Program

PROFESSIONAL AFFILIATIONS

- 2009-present Member, Psi Chi International Honor Society of Psychology

ABSTRACT

Supervision Practices and Predictors of Supervision Satisfaction for Clinicians Providing Behavioral Services for Individuals with ASD

by

Katerina Charlotte Ford

Applied behavior analysis (ABA) interventions are delivered using a tiered-service model, in which supervisors with higher levels of experience, education, and certification oversee clinicians who provide direct intervention for individuals with Autism Spectrum Disorder (ASD). Despite the base of empirical support for ABA constructed over several decades, little attention has been paid to the ways in which supervision is implemented among service providers. The majority of current standards have been issued by the Behavior Analyst Certification Board (BACB) with additional recommendations from researchers in the field, yet most of these guidelines have not been empirically validated. The small body of existing research on supervision practices indicates that supervision implemented within the context of university-based research centers leads to improvements in clinician fidelity as well as social communication behaviors for children with ASD, and clinicians report high overall satisfaction with supervision. Findings from previous correlational studies suggest that the amount of supervision provided and supervisor characteristics (i.e., certification and level of experience) predict client outcomes over time, and that Perceived Supervisor Support

(PSS) serves as a protective factor against clinician burnout and turnover intention. Yet little is known about specific practices or supervisor behaviors correlated with ratings of PSS, which is an important step for understanding how supervision can be improved in both efficiency and efficacy. Furthermore, with the exception of findings indicating that newer clinicians need more frequent supervision in order to reach or maintain fidelity, there is a dearth of research indicating how supervision should be individualized according to characteristics of clinicians and clients and other contextual factors.

The primary goal of the current study was to build upon the current body of literature regarding supervision of ABA services for individuals with ASD by examining the relationship between practices used for supervision sessions and clinician satisfaction with supervision. To address this research question, a cross-sectional survey was designed based on BACB- and researcher-developed guidelines for supervision and supervisory practices. 125 clinicians working in clinic- and community-based ABA service agencies in California were recruited to complete an online two-part survey, inquiring about (1) supervision practices and satisfaction with “typical” sessions, and (2) supervision practices and satisfaction with sessions delivered through videoconferencing (VC) during the Coronavirus Disease 2019 (COVID-19) pandemic. Two separate exploratory factor analyses were conducted using variables from part 1, resulting in a three-factor model for supervision practice (i.e., supervision activities, supervisor proficiency, and clinician evaluation processes) and supervision satisfaction (i.e., satisfaction with supervision content, satisfaction with perceived level of support, and dissatisfaction with supervisory relationship). Similar composite variables were created using data from part 2 to assess changes with practices and satisfaction during the transition to agency-wide VC-delivered

supervision sessions. The predictive nature of select demographic and work-related variables were assessed using Multivariate Analysis of Variance (MANOVA) and multiple regression analysis. Several variables were significant predictors of supervision practice. Supervision hours per month and frequency of individual and group supervision meetings predicted higher supervision practice scores for part 1, while frequency of individual meetings predicted higher supervision practice scores for part 2. Supervisor performance evaluation in a high number of specific categories predicted higher supervision activities and supervisor proficiency scores for parts 1-2. Weekly/semi-weekly supervision frequency predicted higher supervisor proficiency scores for part 2. In addition, a few variables were significant predictors of clinician satisfaction for parts 1-2. Supervision practice scores predicted higher satisfaction scores, and having at least 3 years of experience predicted higher satisfaction with perceived level of support. A number of common themes from open-ended comments were identified with suggestions for improving supervision sessions, supervisor behavior, and training/supervision topics in each delivery format.

In absence of experimental validation for many of the established supervision guidelines and recommendations, these research findings provide a preliminary foundation of correlational evidence supporting the importance of specific supervision practices and how they predict clinician satisfaction with supervision, which can help prevent burnout and turnover intention. In addition to supervision intensity, supervisor preparation, communication, performance feedback, evaluation, and use of activities that provide opportunities for self-assessment, collaboration, and continued training were associated with higher-quality supervision practice. Ratings of supervision activities and supervisor proficiency increased when supervisors solicited detailed evaluation of their own

performance from the perspective of their supervisees. Greater use of these supervision practices was associated with higher clinician satisfaction with supervision sessions. Also, while clinicians with higher levels of experience were more satisfied with the perceived level of support from their supervisors, greater use of supervision practices identified in the current model predicted higher satisfaction scores for clinicians regardless of experience level. Thus, modification of specific supervision practices may help prevent levels of increased burnout and turnover among newer clinicians. These results also show the effectiveness of widespread VC-delivered supervision and offer insight into which practices are particularly important for remote supervision (e.g., conducting sessions on a weekly basis), limitations of VC sessions (e.g., lower ratings of helpfulness and engagement with supervision activities), and aspects of remote supervision that require further study.

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I. Introduction

The prevalence of Autism Spectrum Disorder (ASD) in the U.S. has increased dramatically in the last decade (Pickard et al., 2016), from a reported estimate of 1 in 150 children in 2007 to 1 in 59 children in 2018 (Centers for Disease Control and Prevention, 2007, 2018). Cases of ASD have also been reported in many low- and middle-income countries, with a similar range of estimated prevalence compared to Western and other high-income countries (Ghanizadeh, 2008; Hastings et al., 2012; Zhang & Ji, 2005). The combination of increased prevalence of ASD and the detrimental effects of the disorder on children and families has led to a sharp increase in demand for effective interventions with strong empirical evidence (Fisher et al., 2014; National Autism Center, 2009).

The National Research Council (NRC) recommends that children with ASD should receive at least 25 hours per week of specialized intervention services (NRC, 2001). Great progress has been made in establishing a number of evidence-based intervention approaches for individuals with ASD. The National Professional Development Center conducted two reviews of the literature on evidence-based practices (EBPs) for ASD (Wong et al., 2015), with 24 and 27 EBPs identified in the 2009 and 2014 review, respectively. Out of the 21 interventions identified as established treatments by the National Standards Project, 12 were classified under behavioral interventions, while nine were classified under other categories of established treatment including Cognitive Behavioral Intervention, natural teaching strategies, Pivotal Response Training (PRT), parent/peer training, schedules, self-management, social skills packages, and story-based interventions. Applied behavioral analysis (ABA) is the treatment with the most empirical support (Eikeseth, 2009; Eldevik et

al., 2009; Fisher et al., 2014; Higbee et al., 2016; Howlin et al., 2009). Children with ASD receiving ABA services make significantly greater gains on standardized measures of IQ, language, and adaptive functioning compared to children with ASD in comparison groups (Hayward et al., 2009).

However, the effectiveness of ABA and other evidence-based interventions for individuals with ASD relies on the assumption that their clinicians are implementing interventions with fidelity. Within ABA provider agencies, services are typically implemented using a tiered model of intervention, in which a professional or expert supervises multiple lower-level employees or students who provide one-to-one direct intervention (Fisher et al., 2014). For the purposes of this study, “clinician” (i.e., Registered Behavior Technician [RBT], Board Certified Assistant Behavior Analyst [BCaBA], interventionist, technician, tutor, behavioral clinician, senior tutor/behavioral clinician, Level 1-2 therapist, trainee, supervisee, caseworker, staff member, practitioner, instructor, program supervisor, or analyst) will be used to describe an individual that provides one-to-one direct intervention. Clinicians may also conduct parent training or assist a supervisor with specific supervisory tasks, such as treatment planning or training of newer clinicians. “Supervisor” will be used to describe an expert in behavior analysis (i.e., Board Certified Behavior Analyst [BCBA], trainer, coach, clinical director, consultant, or researcher) who typically has obtained a graduate degree or completed graduate coursework, and may also be a certified or licensed professional. According to the Consolidated Framework for Implementation Research (CFIR), clinician characteristics that influence implementation of intervention include knowledge, beliefs about the intervention, degree of identification with the organization, individual stage of change, personality traits, and self-efficacy (Damschroder et

al., 2009; Wainer et al., 2017). Higher self-efficacy is correlated with greater likelihood of embracing change and maintaining use of a novel intervention, even when encountering obstacles (Damschroder et al., 2009; Wainer et al., 2017). Adequate training to increase self-efficacy must be provided in order to increase the likelihood that community providers will implement a novel intervention in their typical practice setting (Beidas & Kendall, 2010; Brookman-Frazer et al., 2012; Vismara et al., 2009; Wainer et al., 2017). Additional variables, including cost and clinician's history of education and experience, should assist with determining what type of training to conduct for individual clinicians (Nosik et al., 2013). In addition to initial training, provision of follow-up consultation in the "real world" appears to be an important component of clinician training effectiveness (Wainer et al., 2017). Quality training can minimize the need for extended supervision (Hamad et al., 2010), but continued supervision is important for sustaining new skills (Vismara et al., 2013), as well as ensuring that clinicians can generalize skills for use with different individuals with ASD. Given the highly individualized nature of behavioral intervention in terms of working with different clients and adapting programs, supervisor support will always be needed in some capacity (Hamad et al., 2010).

However, there continues to be a shortage of trained clinicians to provide services (Granpeesheh et al., 2010; Kobak et al., 2011), as well as behavior analysts trained specifically to work with the growing population of individuals with ASD (Hartley et al., 2016). In 2015, the Behavior Analyst Certification Board (BACB) estimated that 75,000 BCBA's were needed to meet the need for behavior analytic services for individuals with ASD, mental health disorders, pediatric behavior disorders, and traumatic brain injury (Carr, 2016; Hartley et al., 2016). While the number of BCBA's increased by 75% over the

preceding two years (Courtney et al., 2016), there were less than 20,000 total certificants in 2015 (Carr, 2016), falling far short of meeting this demand. This deficit specially concerns emerging findings on the importance of supervision for children with ASD. Intensity of supervision has been reliably associated with improved outcomes for children receiving Early Intensive Behavioral Intervention (EIBI), although supervisor competency may serve as a moderator between supervision intensity and child outcomes (Eikeseth et al., 2009). Thus, it is more important than ever to develop quality training and supervision systems that result in exceptional behavior analyst practitioners (Hartley et al., 2016).

Clinician Training and Supervision Practices

Chen (2014) defines supervision as a tool provided by an organization to train and provide both support and feedback for clinicians (as cited in Paquet et al., 2017). Supervision includes a broad set of activities used to oversee a clinician's work, such as observing implementation of interventions with clients, modeling behavior analytic practices (e.g., data-driven decisions), and training in new skill sets (LeBlanc & Luiselli, 2016). Ongoing supervision is vital for maintaining skill performance (Vismara et al., 2013). Beidas & Kendall (2010) suggest that training and supervision quality can be assessed across the domains of (1) content, (2) delivery method, (3) availability, and (4) contextual variables, described briefly below.

First, supervisors must create a system for assessing the effectiveness of training and supervision content, such as measuring clinician fidelity and rate of intervention procedures across sessions, or measuring client progress on treatment goals as an indirect measure of intervention quality (CASP, 2020; Sellers, Valentino, & LeBlanc, 2016; Turner, et al., 2016). Behavioral Skills Training (BST) is one of the most widely-used evidence-based models for

teaching clinicians to perform behavioral interventions with fidelity (Pollard et al., 2014). The four components of BST include: (1) instructions for how to complete a procedure, (2) modeling of the procedure, (3) role-play, in which the clinician attempts to implement the procedure with someone playing the role of an individual with ASD, and (4) feedback on the clinician's performance, including praise and corrective feedback (Karsten et al., 2015). BST can be implemented in a group or one-to-one training format. Use of BST has been studied largely within the context of initial training for new clinicians, but it is also a recommended supervision practice that is required by the BACB. While intervention fidelity is one of the most common and important goals of supervision sessions, clinicians must also become adept at skills such as case conceptualization, involving mastery of behavioral principles, application of these principles in practice, and the ability and willingness to use critical thinking (Turner et al., 2016). Supervisors may consider developing additional individualized goals for clinicians to address any persistent issues with professional or interpersonal skills, such as the meeting of deadlines, using appropriate assertiveness in other professional settings (e.g., Individualized Education Program (IEP) meetings), or accepting and applying supervisor feedback (Sellers, LeBlanc, & Valentino, 2016).

Second, supervision has traditionally been delivered in a face-to-face format, with supervisors leading clinic-based meetings or providing observation with feedback during client sessions through "in-vivo" supervision. During clinic-based meetings without the client present, BST would be conducted using instruction, modeling, and role-play with a confederate (i.e., someone playing the role of the client with ASD). During in-vivo sessions, BST would be conducted using practice with feedback, with the supervisor interjecting to provide instruction and modeling as needed. More recently, researchers have been focusing

on alternative delivery methods to increase the efficiency and availability of training and supervision. Emergent methods that have minimized or eliminated the necessity of initial face-to-face clinician training include self-instruction manuals, interactive computer training (ICT), and video modeling (Pollard et al., 2014). Additionally, interventions that involve clinician-supervisor interaction can be conducted remotely through videoconferencing (VC) or telehealth software (Karsten et al., 2015). Distance trainings have sometimes been delivered through a “hybrid” delivery model, in which clinicians receive instructions and modeling through a self-instruction program with opportunities for role-play through VC sessions, with repeated sessions as needed to meet fidelity. In place of role-play, supervisors can observe clinicians working with clients through video feedback, in which clinicians submit video clips of themselves working with an individual with ASD for the supervisor to review before or during VC sessions. Ongoing supervision can also be provided remotely to new practitioners in rural communities (Wood et al., 2005) or clinicians in underserved, geographically-distant locations, such as developing countries (Barkaia et al., 2017). Remote delivery methods have become particularly salient for increasing availability of supervision during the Coronavirus Disease 2019 (COVID-19) pandemic, with supervisors, clinicians, and families in the same geographic area needing to limit face-to-face contact. Additional benefits of remote supervision include reduced provider expenses (i.e., travel and facility costs) and versatility to conduct supervision sessions in multiple client settings (Barkaia et al., 2017).

Third, given the high demand for ABA services, training and supervision availability is likely to be an ongoing focus of practice and research. In addition to increasing availability through remote delivery methods, supervisors must consider the amount of supervision

needed to ensure successful outcomes for clinicians and clients. Studies have shown that clinicians are unable to implement procedures with high levels of fidelity without receiving additional feedback on their performance (Downs & Downs, 2013; Karsten et al., 2015). Quality of implementation should be monitored on a continual basis, and even more frequently for new clinicians, new clients, clients with challenging behavior, and clients with complex treatment plans (CASP, 2020). The optimal level of supervision for a specific child with ASD likely depends on a combination of factors, such as child characteristics, parent involvement, and clinician fidelity, and this level may change after the first year of treatment (Eikeseth et al., 2009). Supervisors may also need to increase supervision intensity for clinicians learning to implement more advanced intervention skills, such as parent- and clinician-training procedures.

Fourth, availability or frequency of training and supervision will also be affected by contextual variables within a service agency, such as the size of the organization or service area. For example, organizations which employ a high number of clinicians or serve families across a large geographic area may have difficulty providing a sufficient level of supervision in an individual format. These agencies may choose to conduct sessions in group formats for greater efficiency. During client team meetings, supervisors can observe more than one clinician working with the same client during each session, either with the client present or through video feedback. Similarly, during clinician group meetings, supervisors can conduct trainings, discussions, and other activities with several clinicians at a time. On the other hand, one-on-one meetings enable supervisors to give clinicians their undivided attention, provide individualized feedback, and discuss sensitive topics without clients, family members, or other clinicians present. Thus, in addition to the content, delivery format, and intensity of

supervision, supervisors must take into consideration the meeting format(s) used when assessing the quality of supervision provided to each clinician.

Clinician Satisfaction with Supervision

A more recent area of study includes the relationship between clinicians and supervisors, particularly in regards as to how it may help protect clinicians from experiencing burnout in a challenging job position. Stressors such as low wages, traveling between clients, dealing with intensive challenging behavior (especially when directed at the clinician in an aggressive manner), working with a large client caseload, or even working many hours per week with one client may contribute to burnout. In related clinical fields, self-report data indicates that clinicians who experience a poor relationship with their supervisor experience increased burnout, a decreased willingness to share relevant information, and decreased motivation to follow through with supervisor recommendations (Turner et al., 2016). A recent study of behavioral clinicians found that Perceived Supervisor Support (PSS) was significantly predictive of turnover intention, or the likelihood of leaving one's job if another became available (Kazemi et al., 2015). High rates of turnover are of particular concern for services provided to young children with ASD, as any gap in services or time required to train new clinicians can inhibit progress made during a narrow and sensitive window of language development. Still, disruptions to services for individuals with ASD of any age will have a negative impact on their progress. Thus, establishing and maintaining a meaningful and sustained relationship between supervisors and clinicians is a functional component of effective supervision (LeBlanc & Luiselli, 2016), whereas limited use of effective supervisory skills leads to increased rates of clinician dissatisfaction and turnover (Reed & Henley, 2015; Scott et al., 2006; Sellers, LeBlanc, & Valentino, 2016).

Unfortunately, many supervisors do not receive instruction on the means to provide high-quality supervision (Sellers, Valentino, & LeBlanc, 2016). Gibson et al. (2009) propose that supervisors show support and encouragement through observable skills: active listening, positive reinforcement, and demonstration of empathy with clinicians' experiences. Kazemi et al. (2015) suggest that supervisors can be trained explicitly to use behaviors that can reduce rates of clinician turnover, such as conducting check-ins with clinicians to see how they are doing and learning to provide performance feedback in a specific manner. Furthermore, supervisor performance can be evaluated on a regular basis, using both employer feedback (e.g., live observations or video feedback from supervision sessions) as well as subjective feedback from clinician and family evaluation forms. This collective feedback can provide insight into the supervision practices that are most beneficial in general, as well as those preferred by specific clinicians and clients' families. In addition, anonymous evaluations can be used to encourage clinicians to provide honest feedback that they might feel uncomfortable mentioning in a verbal evaluation or written evaluation with their name on it.

Statement of the Problem and Research Questions

While clinicians who have been trained using EBPs should be well-equipped to begin working with individuals with ASD, limited evidence exists about effective supervision practices that ensure that clinicians continue to feel supported and to gain expertise over time. Furthermore, there remains a high demand for behavioral services that cannot be met by the current number of clinicians, and traditional methods for delivering training and supervision are time- and trainer-intensive. As a result, many clinicians are not experiencing an optimal level of professional growth or satisfaction, and their clients may not be

benefiting fully from services received. High levels of clinician burnout and turnover further increase the service-need gap and negatively affect individuals with ASD and their families. Primary obstacles to effective supervision are further described below.

First, despite the large base of research showing the benefits of ABA for individuals with ASD and a sizeable body of literature regarding clinician training, there is a paucity of research regarding effective practices for clinician supervision (Dixon et al., 2016; LeBlanc & Luiselli, 2016; Sellers, Valentino, & LeBlanc, 2016). While BACB guidelines are the most widely-used standard, the set of recommendations issued by this board has not been validated by existing research (Dixon et al., 2016). Sellers, Valentino, & LeBlanc (2016) acknowledge that their set of recommendations for supervision has also not been empirically validated, and request that other researchers and professionals develop and share resources in order to strengthen the literature on effective supervision practices. Similarly, studies comparing the effectiveness of different formats and delivery models have yet to be conducted (Leaf et al., 2018; Wainer et al., 2017). Meanwhile, researchers disagree on the validity of current standards regarding characteristics that qualify an individual to supervise clinicians in behavioral intervention programs; some argue that the process of obtaining a BCBA credential alone does not guarantee competency in the treatment of individuals with ASD, as no studies have been conducted demonstrating superior outcomes for supervisors credentialed in behavior analysis as compared to those without such credentials (Eikeseth et al., 2009; Love et al., 2009). Also, little research has been conducted investigating potential variables that affect intervention quality or supervisor competency (Gibson et al., 2009). Continued training and professional development workshops for supervisors are often conducted in a didactic format: however, previous research has shown that these trainings are

less satisfactory for supervisors, and that verbal and written instructions alone do not produce desired improvements in performance (Reed & Henley, 2015). Supervisors who are not properly prepared to supervise others are also more likely to experience work-related stress and burnout, increasing the likelihood of both clinician and supervisor turnover (Reed & Henley, 2015). Therefore, in addition to potential benefits of increased rapport with clinicians and increased job satisfaction, the cost of effectively preparing supervisors pales in comparison to the collective cost of staff turnover and the recruiting, hiring, and training of new clinicians and supervisors (Reed & Henley, 2015).

Second, initial results of translational research have shown that early intervention programs result in less improvement for children with ASD when implemented in typical public community-based settings, as compared to controlled, university-based research settings (Vismara et al., 2009). Reported organizational-level barriers to providers implementing new interventions include difficulties in obtaining materials and resources, finding the time to use the intervention, lack of support from the administration, and competing responsibilities and priorities (Langley et al., 2010; Massey et al., 2005; Wainer et al., 2017). Other barriers include the challenge of training clinicians with diverse training backgrounds and levels of experience as well as high rates of turnover in community-based settings (Wainer et al., 2017). Additionally, community- and home-based models require clinicians and supervisors to be spread out across different locations and spend more money and time traveling between clients (Leaf et al., 2018). Geographical barriers may prevent supervisors from spending an adequate amount of time training, supervising, and providing general support to clinicians to ensure that they implement interventions with high degrees of treatment fidelity (Leaf et al., 2018). As a result, service providers may have to choose

between limiting the number of clients they work with, which is problematic given the already-high demand for ABA services and number of families on waitlists, and providing less than an ideal amount of supervision with potential sacrifices to the quality of intervention provided. Thus, further research is needed evaluating models, formats, and activities of supervision that can transcend geographic barriers and increase efficiency of supervision.

Given the gaps identified in the evidence base for supervision of ABA services for individuals with ASD, the purpose of this study is to build upon the literature by examining the relationship between practices used during supervision sessions and clinician levels of satisfaction with their supervision. In particular, several research questions described below will be examined, along with their implications for research, practice, and policy.

The following research questions were addressed regarding supervision practice and satisfaction with supervision for clinicians providing ASD interventions: (1) What are the important components of supervision practice from the perspective of clinician supervisees, (2) What are the key aspects of clinician satisfaction with supervision received, (3) What are the significant predictors of high-quality supervision practice from the clinicians' perspective, (4) What are the significant predictors of clinician satisfaction with supervision, and (5) Which components of supervision have remained the most useful and satisfactory in clinicians' routine practice during the COVID-19 pandemic?

Significance of Study

Just as the field has long called for use of evidence-based practices for ASD interventions, there is a need to increase the literature base for supervision practices that are effective beyond the initial period of training and short-term follow-up, particularly when

implemented in community-based settings and through remote delivery methods. Many of the reviewed empirical studies on ABA supervision consisted of experiments in which the primary independent variables consisted of the delivery method and session formats used to conduct supervision for a specific ABA intervention model. A few recent correlational studies have examined supervision practices in community-based settings, including supervisor qualifications and supervision practices for EIBI providers (Love et al., 2009), and the training and supervision received by professionals certified by the BACB (Reed & Henley, 2015). Dixon et al. (2016) and Eikeseth et al. (2009) examined the effect of supervision practices (i.e., supervision intensity and supervisor qualifications) on treatment outcomes for children receiving services from the Center for Autism and Related Disorders (CARD) and the United Kingdom Young Autism Project (UK YAP), respectively. A few other studies have focused on the relationship between supervisory practices and clinician outcomes, investigating the relationship between PSS and feelings of burnout (Gibson et al., 2009) and turnover intention (Kazemi et al., 2015) for clinicians employed by ABA providers. However, no studies to date have examined how specific supervision practices may predict clinicians' overall level of satisfaction with their supervision experience, particularly for clinicians implementing a variety of behavioral interventions for ASD. It is important to discover these variables and their influence on service provision so that providers can focus their training and supervision efforts accordingly.

Therefore, the current study seeks to contribute to the literature by evaluating the relationship between specific components of supervision (i.e., meeting/delivery format, content, activities, supervisor behaviors, and evaluation procedures) and levels of satisfaction with supervision for ASD clinicians. The purposes of this study are to develop reliable

psychometric measures for supervision practice and satisfaction and identify important influential variables predicting each measure. Both measures are based upon previous works, with the majority of survey questions derived or adapted from the Supervision Monitoring and Evaluation Form (Turner et al., 2016), the Supervisor Training Curriculum Outline 2.0 (BACB, 2018), and the 8-item PSS scale (Eisenberger et al., 2002). The Supervision Monitoring and Evaluation Form (SMEF) is a 34-item questionnaire developed to address guidelines from the original Supervisor Training Curriculum Outline (BACB, 2012) and the Professional and Ethical Compliance Code for Behavior Analysts (CASP, 2020), evaluating supervision arrangement, supervisor behavior, and supervision content. Fifteen survey items assessing additional supervision practices (i.e., delivery methods, session formats, components of BST, and evaluation practices) were adapted from the Supervisor Training Curriculum Outline (2.0) guidelines for ongoing supervision, sections 4-6. The PSS scale has been used in previous surveys of clinicians in ABA schools in Ireland (Gibson et al., 2009) and community-based agencies in Southern California (Kazemi et al., 2015), as well as a diverse, international sample of BACB certificants (Dounavi et al., 2019). All items from the 8-item survey form were rated using the original 0-6 Likert scale. The PSS scale has high internal consistency, with previously-reported Cronbach's alpha coefficients of .81 and .90 (Gibson et al., 2009), and an alpha of .997 in the current study.

Novel contributions of this study include the following: first, based upon a recent review of the literature, the SMEF has not been used in previous experimental or correlational research. Likewise, while BST has been evaluated empirically, other BACB recommendations for supervision practice (i.e., delivery method, session format, and evaluation practices) have not been evaluated through research. Thus, this study appears to

be the first to attempt to create a psychometric measure of practices associated with high-quality supervision, addressing a major gap in the literature on ABA supervision. Second, while the PSS scale has been evaluated as a predictor of clinician outcomes (i.e., burnout and turnover intention), no previous studies have examined PSS or other satisfaction-related variables as an outcome variable predicted by use of specific supervision practices. Additional questions were developed to measure other aspects of satisfaction with supervision discussed in the field, such as the potential benefits of group supervision and peer support (Valentino et al., 2016). Findings from each measure developed for the current study provide implications for future research, clinical practice, and policy on supervision requirements for ABA providers.

Methodological Considerations

A primary objective in determining the current study design was the identification of the best method for bridging these independent areas of research focus in one study, with a secondary objective of examining how the relationship between supervision practice and satisfaction may be impacted by COVID-19. A cross-sectional survey of behavioral clinicians from different types of service agencies (i.e., clinic- and community-based providers) using a variety of intervention models (e.g., ABA, EIBI, PRT) was reasoned to be the most suitable method for simultaneously collecting data on supervision practice and supervision satisfaction, with findings applicable to the wider population of behavioral clinicians and supervisors. Online surveys have increasingly becoming the preferred method for survey distribution, with the advantages of being able to reach a larger number of participants, cost-efficiency, and the dynamic and responsive qualities that increase precision and participant motivation to complete the questionnaire (Schmidt, 1997). This distribution

method was also determined to be the most feasible for conducting a survey during a pandemic.

Seventeen demographic questions were adapted from prior surveys of ABA clinicians and BACB certificants (i.e., Gibson et al., 2009; Kazemi et al., 2015; Plantiveau et al., 2018; Reed & Henley, 2015). A three-factor model was proposed for each of the overarching conceptual categories of supervision practice and supervision satisfaction (see Figure 1). For supervision practice, labels for factors were adapted from the SMEF, including supervision structure/arrangement, supervision content, and supervisor behavior. Questions from the SMEF and items developed from the Supervisor Training Curriculum Outline 2.0 were assigned to each category. Seven researcher-developed questions were added to the category of supervision content for practices not specified in the SMEF or Supervisor Training Curriculum (e.g., discussing client cases, conducting video feedback sessions). For supervision satisfaction, the first two factors (i.e., clinical confidence and engagement with supervision) were labeled based on common themes from question items, including nine items from the SMEF measuring more subjective aspects of supervision practice (e.g., “My supervisor shows energy and enthusiasm”) as well as six researcher-developed questions. The third factor (i.e., level of perceived support) included eight items from the PSS scale, three items from the SMEF (e.g., “My supervisor shows support and positive regard”), and two researcher-developed questions concerning social support received from supervisors and supervision group members.

II. Literature Review

This study seeks to understand the various supervision practices used by ABA providers working with individuals with ASD as well as the effect of these practices on clinician satisfaction with supervision. Given the limited scope of the current evidence base for supervision for this population, a review was conducted of the literature on clinician training and supervision, investigating all of the available information on EBPs as well as current recommendations from researchers in the field of ABA and related fields. Findings and conceptual frameworks were organized into several domains of supervision and continued training that are central to the research questions. First, findings for supervision practices were categorized under supervision structure (i.e., tiered-service models, session formats, delivery models, and frequency/intensity of supervision provided for each clinician and client), supervision content (i.e., training activities, performance feedback, and goals for supervision sessions), and supervisor behavior (i.e., specific techniques that enhance or detract from the effectiveness of supervision sessions). Second, findings related to supervision satisfaction were categorized under supervisory behaviors influencing clinician satisfaction and supervisory relationship quality, and (2) PSS scale ratings.

Search Process and Selection Criteria

Searches were conducted through PsycINFO, PubMed, and Web of Science using three search terms (i.e., autism, applied behav* analysis, and training or supervision). Peer-reviewed articles published from 2009-2019 were included if they met the following criteria: first, experimental studies in which a training or supervision intervention was conducted with the target population (i.e., clinicians who provide behavioral services for individuals with ASD through a clinic- or community-based service agency) were included. Studies

conducted with parents or school employees were excluded, with the exception of those working in a clinical ABA school setting (i.e., Gibson et al., 2009; Nosik et al., 2013). Second, experimental studies in which the supervisor(s) provided feedback on interventions conducted with a client on the clinician's caseload were included. Third, correlational studies with findings relevant to the research questions were included, along with narrative articles providing contextual information and recommendations for practice and research.

Progress has been made in recent years developing conceptual frameworks for training and supervision practices for clinicians working with individuals with ASD. The BACB has published a number of recommendations that have been adopted by both service and insurance providers as standards for practice, even for clinicians who are not enrolled in a graduate program or seeking board certification. Meanwhile, training and supervision practices have been empirically evaluated for a number of different intervention models, including ABA, CARD, Discrete Trial Training (DTT), EIBI, the Early Start Denver Model (ESDM), Incidental Teaching, Parent Child Interaction Therapy (PCIT), Project ImPACT, Reciprocal Imitation Training (RIT), and UK YAP. Supervisors in these studies reported a wide range of experience in the field, but the vast majority had obtained a graduate degree and certification as a BCBA. The majority of clinicians were pursuing or had obtained a bachelor's degree; many had no prior experience working with individuals with ASD, while some had decades of experience. Interventions were implemented with children with ASD ages 1-12.

Findings for specific components of supervision, including supervision structure, supervision content, supervisor behavior, and clinician satisfaction with supervision are further described below.

Supervision Structure

The majority of guidelines for supervision practice have been issued with regards to the hierarchy of supervision within service agencies as well as the structure of individual supervision sessions. Recommendations, guidelines, and effectiveness of practices are organized under four aspects of supervision structure, including tiered-service models, session formats, delivery models, and supervision intensity.

Tiered-Service Models

Tiered models are advantageous for providing cost-effective treatment, as they increase service availability and the provider's ability to increase intensity of treatment and supervision as needed to ensure that clients with complex needs are able to meet their treatment goals. Two types of tiered-service models are commonly used to deliver ABA services: a BCBA can supervise clinicians who implement direct interventions with clients with ASD, or a BCBA and BCaBA together can provide clinical and case-management support for multiple clinicians (CASP, 2020). In both models, the supervisor is responsible for all aspects of clinical direction, supervision, and case management for each clinician and the assistant supervisor, if applicable. The BCBA must also be familiar with the needs of each client and regularly observe clinicians implementing interventions from the client's treatment plan.

State laws vary, but professionals typically qualified to provide supervision for behavioral clinicians include BCBAs as well as individuals licensed as clinical psychologists, marriage and family therapists (MFTs), speech-language pathologists (SLPs), occupational therapists (OTs), or audiologists (Dixon et al., 2016). In order to apply to become a BCBA, one must first possess a master's or doctoral degree in an acceptable field of study, including

behavior analysis, education, or psychology (BACB, 2019c). A BCaBA must possess a bachelor's degree in any field of study prior to pursuing certification (BACB, 2019b). The Autism Special Interest Group of the Association for Behavior Analysis International (ABAI) recommends that EIBI supervisors should have a postgraduate education in ABA and certification as a BCBA (Love et al., 2009). EIBI supervisors should also have at least 1 year of supervised practical experience (Eikeseth, 2010), implementing programs for a variety of skill domains for clients with differing skill levels and unique individual characteristics (Eikeseth et al., 2009). In the YAP model, accredited program consultant supervisors must have a minimum of a bachelor's degree in addition to other requirements (Eikeseth et al., 2009), such as completion of a course on advanced principles of ABA and at least 3 years of experience working as a clinician and senior clinician (Hayward et al., 2009). Clinicians must have at least 1 year of experience working with three or more clients in order to become a senior clinician (Hayward et al., 2009). In an apprenticeship model of supervision, developed to ensure that clinicians receive high-quality training and meet BCBA supervision requirements during their first two years of employment, clinicians are eligible to apply for an assistant supervisor position if they are enrolled in a graduate program and credentialed as an RBT (Hartley et al., 2016). Clinicians must also have completed 1 year of supervisory experience through the service agency with at least 750 hours of supervised direct implementation before becoming an apprentice (Hartley et al., 2016).

In most of the empirical studies identified in the literature review, behavioral services were conducted through a tiered-service model with one supervisor. Yet, two studies specified that assistant supervisors were included in the supervision model. A third study assessed outcomes for supervision sessions conducted by assistant supervisors, including two

graduate students with 1 year of behavior analytic coursework and 1 year of experience implementing ABA (Neely et al., 2019). Of the eight studies that reported certification and licensing levels, the majority of supervisors (63.8%) met BACB guidelines as a BCBA or clinical psychologist. Of the remaining supervisors, most were certified as a BCaBA (1.73%) or a supervisor for a specific intervention model, including CARD or UK YAP (29.6%). Altogether, only 4.3% of supervisors were not certified by an agency.

One study evaluated the effect of supervisor experience level and certification on mastered goals for 638 children with ASD receiving CARD services (Dixon et al., 2016). Supervisors had varying levels of experience, from less than 1 (1%), 1-5 (14%), 5-10 (49%), and 10-25 (36%) years of experience ($M = 8.9$). Supervisor experience was significantly correlated with mastered client goals. For every additional year of supervisor experience, the number of mastered goals increased by 4%. Certification level was also significantly correlated with mastered client goals. Clients of BCBA supervisors had 73.7% greater mastery of client goals per hour compared to non-BCBA supervisors. However, both of these supervisor characteristics together accounted for a relatively low proportion of variance in goal mastery compared to the number of direct treatment and supervision hours received.

Session Format

Supervision sessions take place in individual and group formats. Individual supervision can be conducted through clinic meetings or in-vivo sessions. Group supervision can be implemented in two ways: (1) client team meetings attended by all of the clinicians working with an individual client, with or without the parent(s) and client present, or (2) clinician group meetings comprising of clinicians who work with different clients but are grouped together according to skill level, client population, geographic location, and/or

scheduling availability. Supervision for EIBI providers occurs mostly through client team meetings with the parent and child present, but occasionally takes place during client sessions, meetings with parents, or meetings with outside professionals (Eikeseth, 2010). In the apprenticeship model, first-year clinicians are supervised through in-vivo sessions. Second-year clinicians receive supervision in three formats, including client team meetings, individual meetings to discuss client materials, and in-vivo sessions to receive feedback on supervision procedures implemented with a first-year clinician (Hartley et al., 2016).

According to the BACB, supervision should ideally be provided in a one-to-one setting, with at least half of supervision hours conducted in an individual format (BACB, 2019a). However, group supervision is permitted as long as there are no more than 10 clinicians participating (BACB, 2019a). Nonetheless, well-structured group supervision sessions can provide unique mentoring opportunities not available during individual supervision, such as: social networking, peer feedback on professional skills, observational learning, participation in active group dialogue about ethical issues, and development of professional repertoires needed to be successful in clinical practice (Valentino et al., 2016). In order to maximize the benefits of group supervision, Valentino et al. (2016) recommend that supervisors should model positive and productive discussions by actively managing interpersonal dynamics to ensure balanced participation during the meeting. Supervisors should also produce an agenda for each meeting detailing the schedule, activities, and assigned responsibilities (Valentino et al., 2016).

Out of eight empirical studies that described the format of supervision sessions, the majority ($N = 6$) met BACB guidelines by conducting supervision primarily through individual sessions, while two studies conducted supervision sessions in client team and

clinician group formats. While the number of attendees for client team meetings was not reported, clinician group meetings met guidelines for group size with only 2-3 clinicians participating in supervision sessions. Across all eight studies, supervision effectiveness was evident through increased clinician fidelity and client social communication behaviors.

Delivery Method

In addition to being provided in multiple formats, supervision sessions can be conducted using a variety of delivery methods. Supervision has typically been implemented in a face-to-face format, but VC has become an increasingly common delivery method for providing supervision remotely, with widespread use during COVID-19 even with clinicians who live locally. In order to prevent technical challenges and protect client confidentiality during VC supervision sessions, clinicians and supervisors should use high-quality equipment and HIPAA-compliant software (Turner et al., 2016). Rios et al. (2018) recommend that service providers should purchase the highest-quality equipment allowed by their budget, and provide a list of hardware, software, network, and data transfer/storage options to choose from.

Delivery models were used with equal frequency across intervention studies, with sessions delivered face-to face ($N = 4$), through VC ($N = 4$), or using both models ($N = 2$). Half of the studies using VC-delivered supervision conducted sessions through Skype, while others were conducted through VSee or telehealth studio software (i.e., HIPAA-compliant programs). Three out of four studies that conducted video feedback sessions specified that HIPAA-compliant procedures were used to upload video probes, including a password-protected clinic external hard drive or Dropbox file transfer program. Across studies using VC, clinicians received supervision through laptop computers, iPads, or telehealth

equipment; there were no reported issues with device processing speed, quality of videotaped client sessions, or video quality during VC sessions. Barkaia et al. (2017) noted that internet connection quality varied between sessions, but all supervision sessions were completed as scheduled, despite being conducted with clinicians in another country. The supervisor and clinicians used a free phone app (Viber) and headphones to increase quality of the audio connection during sessions and reported minimal technological interference. These findings suggest that commonly-used equipment and software programs are sufficient for conducting VC sessions; however, supervisors who frequently supervise clinicians in home/community settings, remote areas, or other countries may consider purchasing more sophisticated equipment to ensure that sessions run smoothly.

Two studies compared the effectiveness of methods for delivering supervision sessions. Pantermuehl & Lechago (2015) alternated between supervision provided through covert observation (i.e., a mounted camera in the clinic room), face-to-face in-vivo sessions, and VC in-vivo sessions. While fidelity scores were lower during covert observations, there was no difference in clinician fidelity during face-to-face or VC sessions. Vismara et al. (2009) conducted clinician group meetings using both delivery methods, with clinicians from two intervention sites attending face-to-face and clinicians from the other two intervention sites attending via a local telehealth clinic. There were no significant group differences by delivery method, with a maximum difference of 10% between mean group scores at each of six time points. Likewise, there were no significant differences between groups on self-report measures, including clinician satisfaction with training and supervision, understanding of ESDM techniques, and comfort with performing intervention procedures.

Three out of four supervision interventions conducted entirely through VC collected data on adequacy and satisfaction, finding that clinicians overall were highly satisfied with VC supervision sessions. Two clinicians from Barkaia et al. (2017) strongly agreed that they were comfortable with supervision received through Skype and Viber, while one clinician provided a neutral rating for comfortability with the technology. Similarly, two clinicians from Neely et al. (2016) provided the highest possible rating for acceptability of supervision procedures, while one clinician provided a neutral rating, commenting that they would have preferred to receive face-to-face feedback.

Supervision Intensity

Supervision intensity, or the amount of supervision received, is measured using three variables: hours of supervision provided per month, frequency of supervision sessions, and supervisor caseload size. BACB guidelines for the minimum amount of supervision a clinician should receive vary by supervision experience type, ranging from 1-2 hours per month, weekly to biweekly, and from 5%-10% of total treatment hours (BACB, 2019). In practice, these guidelines for supervision intensity are often applied to individual clients as well. Regarding caseload size, the BACB recommends that supervisors of focused treatment programs (i.e., 10-25 direct treatment hours per client per week) limit their caseload to 10-15 clients; however, those who work jointly with a BCaBA can work with a larger caseload of 16-24 clients (CASP, 2020). Likewise, supervisors of comprehensive treatment programs (i.e., 30-40 hours of direct treatment per client per week) should maintain a caseload of 6-12 clients, or 12-16 clients if working with a BCaBA (CASP, 2020). For both program types, modest increases in caseload size are permitted with the support of additional assistant

supervisors, while supervisors are encouraged to decrease caseload size when providing focused treatment for clients with severe challenging behavior (CASP, 2020).

Out of eight intervention studies that reported the number of direct treatment and supervision and hours provided, the majority of agencies (75%) met guidelines by providing an average of at least 1 hour of supervision per month and at least 1 hour of supervision per 10 treatment hours. Since the majority of interventions were conducted over the course of 1-12 weeks, findings may not be reflective of typical supervision intensity for services in community-based settings. Regarding supervision frequency, five studies met guidelines by conducting supervision at least twice per month, while the other three conducted supervision once every 3-6 weeks. In terms of reported caseload size, supervisors in each intervention study met guidelines with a caseload of 15 or fewer clients. Additionally, the majority of community-based CARD supervisors (91.4%) also maintained a caseload of 15 or fewer clients (Dixon et al., 2016). At most, 8.6% of supervisors had a larger caseload size than recommended for a comprehensive treatment program.

Dixon et al. (2016) evaluated the predictive effect of supervision hours per month and supervisor caseload size on mastered client goals. While caseload size was not a significant predictor of goal mastery, an increase in supervision intensity was significantly predictive of an increased rate in goal mastery. The interaction of treatment and supervision intensity accounted for only a slightly higher proportion of variance in mastered goals (34%) compared to treatment intensity alone (32%), which was unsurprising given that supervision was provided at a ratio of 1-2 hours per 10 direct treatment hours for all clients in the dataset ($M = 1.98$).

Eikeseth et al. (2009) examined the predictive effect of supervision hours per month on three assessment scores for 20 young children with ASD, including IQ, visual-spatial IQ, and Vineland Adaptive Behavior Scales (VABS) overall composite score. Supervision intensity was significantly correlated with client change in overall IQ, with gains in IQ over 14 months for children who received at least 60 hours of supervision (i.e., $M = 1$ hour per week). The child who received 40 hours of supervision experienced a decrease of 5 IQ points, while the child who received 55 hours of supervision had no change in IQ score. Children who received 60-110 supervision hours ($M = 1-1.8$ hours per week) gained 5-30 IQ points. Interestingly, all clients who experienced gains above the regression line (range = 15-30 IQ points) received only 60-70 hours of supervision ($M = 1-1.2$ hours per week), while clients receiving 80-110 supervision hours ($M = 1.3-1.8$ hours per week) experienced smaller gains (range = 8-12 IQ points). Thus, supervision provided at an average intensity greater than 1.2 hours per week did not appear to result in additional gains in IQ compared to supervision provided at an average intensity of 1-1.2 hours per week.

One study evaluated the effect of supervision frequency on clinician rate of fidelity during client sessions. Pantermuehl & Lechago (2015) found that three clinicians quickly met fidelity for an error-correction procedure during sessions in which they were supervised, with fidelity scores ranging from 63%-100%. In contrast, fidelity scores were much lower during covertly observed sessions (ranging = 35%-70%). Neither of the Level 1 clinicians demonstrated an increasing trend in fidelity during covert observations, whereas the Level 2 clinician showed a trend toward convergence across covert, face-to-face, and VC supervision conditions. The authors postulate that more experienced clinicians are able to implement new procedures with relatively high levels of fidelity during non-supervised client sessions,

whereas newer clinicians require frequent in-vivo supervision to ensure they maintain fidelity for intervention procedures.

Supervision Content

In comparison to supervision structure, fewer guidelines have been issued regarding the content of supervision sessions. However, researchers have developed a conceptual framework for clinician training and supervision phases, along with additional recommendations for goals and activities to use during sessions. The field has also made advancements in adapting supervision activities typically conducted in a face-to-face format for use in self-paced and remotely-delivered interventions. Meanwhile, there is a growing evidence base demonstrating how supervision facilitates improvement in clinician fidelity of implementation as well as client progress with treatment goals. These findings are further described below.

Three-Phase Clinician Training Continuum

Hamad et al. (2010) examined the process by which clinicians begin to learn about and implement behavioral intervention procedures, proposing that learning takes place across a three-phase training continuum. Phase 1 consists of knowledge acquisition, during which clinicians obtain a conceptual foundation in behavior procedures and principles to aid them in proper implementation of an intervention. Academic knowledge of ABA is critically important in guiding the overall training process, as clinicians are unable to implement interventions with fidelity or generalize techniques to other clients, settings, or contexts without a thorough understanding of behavioral principles and procedures (Granpeesheh et al., 2010). Phase 2 consists of supervised skill acquisition, in which clinicians learn to select interventions, engage in problem-solving, and perform interventions correctly with guidance

from a supervisor. Phase 3 involves skill implementation, with clinicians demonstrating that they are able to implement interventions independently that result in positive and adaptive behavior change for individuals with ASD. Trainings are conducted at all three levels of the training continuum, with individual programs and interventions sometimes targeting skills from one phase and others targeting skills from all three phases. For example, common formats for initial clinician training include didactic lectures and self-instruction programs, which provide Phase 1 training using the first two components of BST (i.e., instructions and modeling). Opportunities for role-play or practice and performance feedback are not always provided, particularly in delivery formats that lack trainer-clinician interaction such as in self-paced or large group trainings (Karsten et al., 2015). Phase 2 trainings incorporate all four BST components with opportunities for clinicians to practice intervention procedures through role-play with peers, a trainer, or a confederate and to receive feedback on their performance. Alternatively, clinicians may have the opportunity to practice implementing the intervention with an individual with ASD in a clinic, home, or community setting. Phase 3 trainings and supervision demonstrate that improvements in the behavior of the individual with ASD (e.g., increased verbal utterances) are co-occurring with improvements in clinician fidelity of implementation. Supervisors use all four components of BST used to teach new and more advanced skills, and ensure that clinicians maintain fidelity with each client across settings, activities, and treatment goals.

Supervisors must create a system for assessing supervision outcomes, which can be measured through progress on clinician and client goals (CASP, 2020; Sellers, Valentino, & LeBlanc, 2016). Simultaneous evaluation of rates of clinician behavior (e.g., frequency of communication probes) and client behavior (e.g., frequency of initiations) is important for

ensuring that clinician-implemented interventions are resulting in positive client outcomes. Turner et al. (2016) suggest two primary skill domains for measuring clinicians' professional growth across supervision sessions. First, goals should be selected to evaluate both conceptual understanding of interventions and performance fidelity. Specific target skills may be identified according to baseline levels of knowledge and fidelity, which can be determined through record review (e.g., task lists, performance evaluations, course syllabi) as well as behavioral observations (Turner et al., 2016). Second, the supervisor should evaluate a clinician's level of case conceptualization, which involves mastery of behavioral principles, application of these principles in practice, and the ability and willingness to use critical thinking. Since ABA is rooted in a problem-solving framework, supervisors should focus on the development of decision-making and problem-solving abilities as part of supervision. These skills can be developed further by allowing clinicians to work more autonomously as the supervision experience progresses, while supervisors can confirm their conclusions and provide feedback as needed.

Supervision Activities

While BCBA's are required to demonstrate knowledge of EBPs for supervision, the BACB does not provide a clinical protocol requiring use of specific content or techniques during supervision sessions (BACB, 2019a; Sellers, Valentino, & LeBlanc, 2016; Turner, et al., 2016). Rather, supervisors are given autonomy in determining the specific activities needed to teach and mentor a clinician (BACB, 2019a). However, the BACB does require that clinicians engage in both indirect and direct activities, with at least half of their experience hours spent conducting indirect tasks (CASP, 2020). These can include a variety of tasks conducted without the client present, such as reviewing data on client progress and

developing new treatment goals. Indirect tasks can also be conducted with the client present as long as the clinician is not implementing direct intervention, such as when conducting assessments, parent training sessions, or clinician observations. Supervision of indirect tasks often takes place in clinic-based meetings through discussion of client progress, video feedback, and training on topics relevant to client goals. Supervisors may also provide written feedback on case notes, treatment plans, or results reported from a functional behavior assessment. Additionally, feedback can be provided through in-vivo sessions; for example, in the apprenticeship supervision model, second-year apprentices receive in-vivo feedback on two supervision skills (i.e., observation style and learning opportunities provided) implemented with a first-year clinician (Hartley et al., 2016).

Direct activities include tasks conducted during client treatment sessions. Supervision of these activities often takes place through in-vivo feedback sessions; when this is not feasible, supervision can also take place through video feedback. Video feedback can also be advantageous in several ways (Karsten et al., 2015). First, it can be conducted during clinician group meetings, allowing clinicians to learn from each other and see the intervention being implemented with different clients and behaviors. Second, it is more efficient than in-vivo supervision, allowing the supervisors to provide feedback to a large number of clinicians without requiring travel time. Third, clinicians can solicit feedback on interventions for behaviors that occur infrequently or during routines when a supervisor is not present. Also, video feedback is useful for discussing a clinician's performance objectively without the client or family present (Turner, Fischer, & Luiselli, 2016), since the supervisor can revisit moments of an intervention session needed to identify specific behaviors or responses (Karsten et al., 2015). Video feedback is also sometimes conducted in

conjunction with video self-monitoring (VSM), in which clinicians rate their own performance from video clips of client sessions. Little research has been conducted examining the effectiveness of VSM, but this activity would allow clinicians to receive consistent feedback on their performance and use such to improve upon their skills during their next client treatment session, even if they have not yet met with their supervisor. VSM may increase efficiency of video feedback sessions, as clinicians would be familiar with the content of their video clip and reminded of any questions they had for their supervisor from that client session. VSM could also increase efficacy of supervisor feedback by priming clinicians for corrective feedback received during supervision sessions.

Outcomes from Supervision Intervention Studies

All of the reviewed intervention studies reported that supervisors conducted observations with feedback, either through in-vivo supervision (70%) or delayed video feedback (30%). The majority of supervisors reported reviewing data and discussing client cases during supervision meetings. Additional activities included discussion of topics related to case conceptualization, including problem-solving of barriers and concerns (Wainer et al., 2017) and additional ways to arrange the environment and provide communication opportunities (Neely et al., 2016). Four studies taught clinicians to conduct VSM prior to video feedback sessions. One study reported that follow-up training was conducted during group supervision sessions, with ESDM supervisors providing training on both clinician- and supervisor-selected topics. In both studies with group supervision sessions, clinicians were able to observe the supervisor modeling performance feedback through in-vivo and video feedback sessions.

Clinician fidelity of implementation was evaluated as the primary measure of supervision efficacy for each study. A few studies measured clinician progress on multiple domains of fidelity, while others also assessed the rate of specific skills associated with direct implementation. Two studies conducted a two-phase training, measuring fidelity of direct procedures as the primary goal for phase 1 and fidelity of parent training (PT) procedures as the primary goal for phase 2. Four studies evaluated client frequency of social communication behaviors (i.e., verbal utterances, initiations, attention, and imitation) as a secondary outcome measure, while one study assessed parent fidelity during the PT intervention phase.

Clinician Fidelity and Rate of Intervention Skills. Across studies, clinician fidelity of implementation increased following supervision sessions. Five studies reported the mastery criterion and individual fidelity scores. Clinicians implementing Incidental Teaching ($N = 11$) and ABA error-correction procedures ($N = 3$) met the 90% mastery criterion within 4-10 supervision sessions. Two clinicians who completed 2- and 4-month follow-up probes continued to meet fidelity for Incidental Teaching at these time points. All but one clinician implementing ESDM ($N = 9$) met the 80% mastery criterion following one clinician group supervision meeting. In contrast, just over half of clinicians implementing Project ImPACT met the 80% mastery criterion (i.e., score of 4) following three supervision sessions, with fidelity scores ranging from 3.0-5.0 ($M = 4.1$, $SD = 0.57$). Interestingly, clinicians who completed a second training phase met fidelity at a different rate compared to the first training phase. Project ImPACT clinicians met the mastery criterion for PT following one supervision session ($M = 87\%$), and fidelity scores further increased during sessions 2-3 ($M = 92\%$). On the other hand, ESDM clinicians struggled to meet fidelity for PT procedures.

Clinicians significantly improved fidelity following supervision, but only one clinician met the mastery criterion for PT procedures.

Barkaia et al. (2017) evaluated two components of fidelity for three clinicians learning to implement PCIT. From baseline to supervision, clinicians increased the percentage of session intervals containing correct commands ($M = 6.3\%$ and $M = 31.2\%$, respectively) and positive consequences ($M = 4\%$ and $M = 19.1\%$, respectively), although there was a high level of variability between sessions. Downs & Downs (2013) calculated fidelity for three support skills (i.e., work preparation, technical skills, and student engagement) as well as three specific technical skills (i.e., discriminative stimulus, reinforcers, and prompting) for eight clinicians learning to implement DTT. Scores increased from the first to sixth supervision session for work preparation ($M = 77.5\%$ and $M = 86.7\%$, respectively) and technical skills ($M = 56.6\%$ and $M = 80.7\%$, respectively) and increased slightly for student engagement ($M = 70.8\%$ and $M = 72.3\%$, respectively). Similarly, scores increased from the first to last supervision session for discriminative stimulus ($M = 75\%$ and $M = 93.8\%$, respectively), reinforcers ($M = 60\%$ and $M = 93.3\%$, respectively), and prompting skills ($M = 52\%$ and $M = 77.7\%$, respectively), although scores were much higher for the first two technical skills. The authors conclude that some skills needed for successful implementation of DTT are unlikely to improve in preschools and other community-based settings without continued supervision, as more advanced components (i.e., student engagement, prompting skills) take longer to master in a setting with a lower level of structure and supervisory support.

Neely et al. (2016, 2019) evaluated clinician frequency of communication opportunities or probes provided during each 5-minute session as a secondary measure of

supervision effectiveness. Clinicians implementing Incidental Teaching increased frequency of communication probes from baseline ($M = 3.3$) to supervision ($M = 6.6$). Two clinicians completed follow-up probes: clinician 1 increased communication probes from supervision ($M = 4$) to 2- and 4-month follow-up ($N = 5$ and $N = 10$, respectively), while clinician 2 decreased communication probes from supervision ($M = 5.6$) to follow-up ($N = 4$ and $N = 3$, respectively). Thus, supervision over a longer time period may be needed to ensure that clinicians maintain or increase levels of skills other than fidelity that are associated with improved child outcomes.

Client Goals. Children with ASD increased frequency of verbalizations and other social communication behaviors following supervision. Children receiving ESDM intervention ($N = 29$) significantly increased their rate of verbal utterances following supervision. Children receiving PCIT intervention ($N = 3$) increased the percentage of intervals with a target mand from baseline ($M = 0.3\%$) to supervision ($M = 5.1\%$). Likewise, children receiving Incidental Teaching ($N = 11$) improved frequency of target mands per 5-minute session from baseline ($M = 1.0$) to supervision ($M = 5.4$). Two children who participated in follow-up probes increased manding from supervision ($M = 4.1$) to follow-up ($M = 5.3$).

Rates of imitation for children receiving PCIT improved from baseline ($M = 2.5\%$) to supervision ($M = 8.9\%$). Rates of child attention and initiations also significantly increased for children receiving ESDM following supervision. In contrast, children receiving ESDM did not improve rates of imitation following supervision in phase 1, but imitation rates began to improve during phase 2. Parents also significantly increased fidelity of ESDM during

phase 2, despite clinicians failing to meet fidelity for PT procedures. Scores for parent fidelity and PT fidelity were not significantly correlated.

Supervisor Behavior

Few guidelines exist regarding how supervisors can ensure that they are being effective in their role, particularly for supervisors who are self-employed or do not receive consistent feedback from their employer. Likewise, experimental evaluation of the effectiveness of different supervisor behaviors has not been conducted. Regardless, researchers have issued recommendations for supervisory practices that can improve the quality of supervision sessions and relationships between supervisor and supervisees. Guidelines and recommendations for supervisor practices are discussed below.

The BACB (2018) recommends four supervisor practices for building positive, committed relationships with clinicians: (1) use of positive body language (i.e., posture, eye contact, and affirmative gestures), (2) regular communication (i.e., check-ins, responses to questions/concerns, and follow-up), (3) timely review and feedback on documents (e.g., treatment notes, emails, and training materials), and (4) undivided attention during supervision meetings (i.e., taking notes and engaging in active listening strategies). Supervisors can establish a positive supervisory relationship by asking clinicians about previous supervision experiences, generating a list of agreed-upon goals to include in the supervision contract, and clearly defining roles and expectations, particularly in situations when the clinician is paying the BCBA for supervision (Turner et al., 2016). In subsequent supervision sessions, supervisors should have a dedicated check-in time at the beginning of each meeting to address any concerns proactively and maintain a collaborative relationship (Sellers, LeBlanc, & Valentino). Supervisors can further increase rapport by using warm

demeanor and professional behavior, as well as disclosing that specific corrective feedback will be used along with positive feedback during supervision sessions (Sellers, Valentino, & LeBlanc, 2016). Turner et al. (2016) recommend that the field should develop a task analysis of core competencies for supervisors, focusing on professional and ethical behaviors and effective methods for teaching maintainable and generalizable skills (particularly for more complex procedures).

Empirical data on supervisor behavior is very limited. Each intervention study provided some level of detail on supervisor delivery of performance feedback. Supervisors in all seven studies used both praise and corrective feedback delivered verbally ($N = 7$) and through writing ($N = 4$). Prior to each video feedback session, Project ImPACT supervisors sent clinicians written feedback by email. Clinicians and supervisors discussed the written feedback during the following supervision meeting. Two studies collected data on supervisor procedural fidelity, finding that procedures for video feedback sessions (i.e., reviewing the video clip, step-by-step review of the VSM checklist with the clinician, and discussion of additional strategies for providing communication opportunities) were conducted with 100% fidelity across supervision sessions (Neely et al., 2016, 2019). Supervisors began sessions with a positive statement about overall performance, used a neutral voice and provided a rationale when discussing disagreements, and asked the clinician if they had any questions before moving on to the next step of the VSM checklist (Neely et al., 2016, 2019).

All three interventions conducting supervision through in-vivo sessions used different procedures for providing performance feedback. Down & Downs (2013) collected fidelity data during observations and provided written and verbal feedback during client breaks to minimize potential disruptions during DTT sessions. Pantermuehl & Lechago (2015)

provided praise using a continuous schedule of reinforcement and issued verbal corrective feedback immediately following each incorrectly-implemented step of the error-correction procedure. Barkaia et al. (2017) provided feedback at an average rate of 1.5 comments per minute, including descriptive praise ($M = 0.4$), non-descriptive praise ($M = 0.6$), behavior descriptions ($M = 0.1$) and higher-order comments ($M = 0.03$). The exact rate of direct commands was not specified, but the supervisor used direct commands more frequently with less-experienced clinicians. Over time, the supervisor decreased frequency of direct commands, increased frequency of higher-order comments, and provided similar levels of praise and behavior description. The frequency of non-descriptive praise was increased for the current study, as the authors noted that it was more difficult to provide brief specific praise in the Georgian language.

Clinician Satisfaction with Supervision

Research on satisfaction with supervision for clinicians in the ABA field is very limited. Few recommendations have been issued by researchers or the BACB regarding evaluation of supervision effectiveness through non-behavioral measures. While most of the reviewed intervention studies included a social validity measure to evaluate clinician satisfaction with training and supervision, there is no data to show how this satisfaction increases or decreases over time. However, a few correlational studies have investigated the link between clinician satisfaction with the supervisory relationship and satisfaction with their job. Recommendations and findings on clinician satisfaction are described below.

Recommendations for Increasing Clinician Satisfaction with Supervision

Evaluation of clinician performance can be an area of distress for both clinicians and supervisors (Turner et al., 2016). In order to minimize negative effects of performance

evaluation, the BACB recommends that supervisors provide feedback in multiple formats (e.g., verbal, written, modeled, formal/informal, delivered individually and to a group) and incorporate self-monitoring practices for clinicians (CASP, 2020). When providing negative or corrective feedback, supervisors should use empathetic statements and provide descriptive information on how to improve (CASP, 2020). Supervisors should also refer to the list of mutually agreed-upon performance expectations and provide corrective feedback in private to maintain confidentiality (Turner et al., 2016). Also, supervisors in related fields self-report hesitancy in providing corrective feedback on subjective or personal performance areas, such as social interaction, inflexibility, and insensitivity (Turner et al., 2016). Thus, supervisors are encouraged to first solicit advice from peers before providing feedback on sensitive topics (Turner et al., 2016).

In addition to ensuring that they deliver performance feedback effectively, supervisors can attempt to increase clinician satisfaction by asking clinicians to evaluate the effectiveness of supervision sessions and their supervisory role. Clinician feedback can be solicited in several ways: verbal discussions during individual meetings, semi-structured surveys, and anonymous surveys (Sellers, Valentino, & LeBlanc, 2016). Ideally, supervisors will also receive frequent feedback on their performance from their supervisor or agency director (Reed & Henley, 2015). If this is not feasible, supervisors can conduct self-evaluations using a fidelity or VSM checklist. Supervisors can also compare the results of their self-evaluation with results from clinician evaluations in order to identify appropriate goals for professional development (Garza et al., 2018). Further research is needed to develop objective definitions for indicators of professional behavior and quality of supervisory relationships, such as displaying empathy and having good rapport, as well as

how the best way to evaluate these characteristics (Turner et al., 2016). Once behaviors have been defined in observable, measurable terms, supervisors should collect data on performance before, during, and after specific skill interventions, and collect satisfaction data through a social validity measure for use in applied research (Turner et al., 2016).

Findings on Clinician Satisfaction from Empirical Studies

The majority of intervention studies (71%) asked clinicians to evaluate intervention quality by rating their satisfaction with the content and structure of supervision sessions, understanding of intervention procedures, and self-efficacy in implementing the intervention. Overall, clinicians were highly satisfied with supervision sessions conducted using a variety of session formats (i.e., individual meetings, group meetings, and in-vivo sessions), delivery methods (i.e., face-to-face and VC), and supervision activities (i.e., live observation with feedback, video feedback, VSM, discussion, and continued training). However, no follow-up probes were conducted to evaluate changes in clinician satisfaction over time.

Two correlational studies investigated clinician satisfaction with supervision using the PSS scale. First, 76 clinicians providing ABA services completed five self-report measures, including commitment to ABA philosophy, perceived work demands (PWD), perceived therapeutic self-efficacy (PTSE), Maslach Burnout Inventory (MBI) subscales for depersonalization, emotional exhaustion, and personal accomplishment, and the 8-item PSS scale (Gibson et al., 2009). Months of clinician experience and PSS were significant predictors of PTSE, while PWD and PSS were significant predictors of emotional exhaustion. In addition, there was a significant main effect of PSS and significant interaction of PWD and PSS on personal accomplishment. Clinicians with low to medium levels of PSS experienced significantly reduced personal accomplishment when PWD was high (i.e., 1 SD

above the mean), while clinicians with high PSS did not experience reduced personal accomplishment due to high PWD. Subsequently, 96 clinicians providing ABA services completed five self-report measures, evaluating their (1) intention to turnover and satisfaction with (2) training, (3) supervision, (4) pay, and (5) different aspects of their job (Kazemi et al., 2015). Turnover intention was evaluated through two items (i.e., “I will leave my job if another job becomes available” and “I will stay at my job for as long as I can”) rated on a 1-5 Likert scale, ranging from highly likely to highly unlikely. Supervision satisfaction was measured through five items from the PSS scale (i.e., my supervisor cares about my well-being, opinions, and general satisfaction at work; my supervisor shows very little concern for me; even if I did the best job possible, my supervisor would fail to notice. All four satisfaction measures were significantly predictive of clinician turnover intention, with the final regression model accounting for 37.9% of the variance in turnover intention. Supervision satisfaction uniquely predicted 5.5% of the variance in turnover intention, while satisfaction with both training and supervision uniquely predicted 14.3% of the variance in turnover intention.

Overall, these findings demonstrate that evaluating clinician satisfaction with supervision is an important aspect of providing high-quality supervision. In addition to building upon the current base of literature for effective supervision practices, there is a need for further research on evaluation procedures as well as the role of perceived support to ensure that clinicians are able to implement high-quality interventions in the face of difficult work circumstances.

III. Method

Participants

Participants included 125 clinicians providing evidence-based behavioral services for individuals with ASD in California. Recruitment was conducted in two rounds. First, the researchers emailed relevant contacts listed on the websites for California (1) regional centers, (2) university autism centers, including those listed on the Association of University Centers on Disabilities (AUCD) website, and (3) large ABA organizations (i.e., the California Association for Behavior Analysis (CalABA) and the BACB). Second, individual ABA providers identified through relevant research articles, lists of local vendors provided by regional centers, and a Google search of behavioral service agencies for individuals with ASD in the state were contacted by emailing the relevant contact(s) listed on their website or Facebook page. Email invitations consisted of short cover letter detailing the purpose of the study, eligibility criteria, and potential benefits, as well as an offer to send a shortened version of the final results to any interested agencies or providers. Invitations also included a message/flyer with the link to the online survey to distribute to potential participants.

Participants were invited to complete the survey if they met all of the following criteria: first, clinicians' self-reported highest level of education included a bachelor's degree, associate degree, or high-school diploma. Second, clinicians had either not been certified by the BACB or were certified as an RBT or BCaBA. Third, clinicians had been providing services for one or more clients with ASD through an ABA service agency in California for at least three months in the past year. Fourth, clinicians received supervision from an individual within their service agency with the qualifications deemed necessary to provide supervision by the organization (e.g., BCBA, director, licensed professional,

researcher, graduate student, or higher-level clinician who has completed coursework with behavior-analytic content). Clinicians were excluded from participation if they met any of the following criteria: (1) a master's or doctoral degree, (2) certification as a BCBA or BCBA-D, or (3) employment at an agency that did not provide behavioral services for individuals with ASD.

A total of 151 clinicians consented to participate in the survey. Responses in which participants answered less than 39% of survey questions ($N = 26$) were excluded from analysis. Thus, responses from a total of 125 participants, including 72 participants who completed parts 1-2, were analyzed in the current study.

Measures

Survey Development and Distribution

The final draft of a survey developed through Qualtrics was reviewed by two doctoral candidates in unrelated programs (i.e., materials and physics), a BCBA supervisor, a research director with a BCBA-D, two professors in special education, and the BACB research board. Feedback was applied to the final 98-item survey. A second version with 94 items was developed upon request from the BACB to minimize potential response bias for participants receiving the invitation through their listserv. Four questions (i.e., overall supervision frequency and frequency of sessions in an individual meeting, in-vivo, and face-to-face format) were eliminated to ensure that certificants would not feel pressured to avoid responses such as “never” or “rarely” when answering questions about BACB-required practices.

Once the human subjects protocol submitted to the Internal Review Board (IRB) at the University of California, Santa Barbara was approved, the researcher began contacting

relevant agencies to distribute the survey invitation. Many agencies requested a copy of the IRB approval form, and some elected to preview the survey and consent form (see Appendix A) using the link provided in the invitation. A shortened version of the consent form was also included in the email message and flyer for potential study participants. Participating agencies electronically distributed the survey invitation to local community providers, students, employees, or individuals on their email list; some agencies advertised the invitation by including it in their organization's newsletter, posting on their Facebook page, or adding it to the list of research opportunities on their website. The flyer or email message sent to potential participants specified the study objective, researcher contact information, participant eligibility criteria, and approximate time required to complete the survey, and advertised that participants would be eligible to enter a drawing for one of five \$25 gift cards from a widely-used online retailer. Participants who met the inclusion criteria were directed to the study consent form and consented to participate by clicking on the appropriate button.

Participants were prompted to answer questions from the first part of the survey based on their job responsibilities, supervision received, and satisfaction with supervision received through February of 2020. Participants had the option to select "decline to state" or "not applicable" for any demographic or satisfaction questions that they did not want to answer; at the end of each page, participants were reminded if there were any blank responses and were given the option to return to answer or proceed to the next page. Question formats included fill in the blank and multiple choice. Questions were worded both positively and negatively; negatively-worded items were coded using reverse scoring. A progress bar displayed at the bottom of the page. At the end of part one, clinicians responded to four open-ended questions about participation in any supervision activities not yet mentioned in the survey, suggestions

for supervision sessions, suggestions for supervisor performance, and any topics on which they would like to receive more training/supervision. Participants who indicated that they had provided services after California issued the COVID-19 stay-at-home mandate in March of 2020 were directed to part two. A number of questions from part one were repeated to collect information on work-related (e.g., caseload, job responsibilities) and supervision-related items that may have changed during this time period. Participants then answered several multiple-choice and four open-ended questions regarding supervision with VC supervision (e.g., “I believe that my supervisor could improve delivery of telehealth supervision in the following areas”).

Participants who had completed applicable survey sections and were interested in entering the \$25 gift card drawing were redirected to a separate survey in which they provided their name and email address. Gift cards were distributed to the five randomly-selected winners by email after both versions of the supervision survey were closed for response collection.

Predictor Variables

Supervision practice was also evaluated primarily through a proposed 3-factor model, with questionnaire items categorized under supervision structure, supervision content, and supervisor behavior (see Table 1). A total of 18 items from the SMEF were included, with 4-5 items in each subscale. The original response options for the four items assessing supervision structure (i.e., “yes” and “no/not always: explain,”) were modified to the 1-5 Likert scale used for all other items on the SMEF. 15 additional questions related to supervision practice were developed from observable, measurable guidelines from the Supervisor Training Curriculum 2.0 (BACB, 2018) deemed appropriate for clinician self-

Table 1*Conceptual Categories for Supervision Practice*

Factor	Item	Question
Structure	1	I receive supervision in a client team format
	2	I receive supervision in a clinician group format
	3	I receive supervision through individual meetings with my supervisor
	4	I receive individual supervision during client sessions
	5	I receive supervision in face-to-face format
	6	I receive supervision through telehealth
	7	Supervision sessions are led by only 1 supervisor
	8	Supervision sessions are scheduled ahead of time
	9	Supervision sessions are free of distractions
	10	Supervision sessions can be re-scheduled as warranted
	11	I am able to correspond with my supervisor between supervision sessions
Content	1	Supervisor provides verbal or written instructions when teaching new skills
	2	Supervisor demonstrates new skills through live modeling
	3	Supervisor demonstrates new skills by showing video models
	4	Supervisor requires clinicians to practice new skills (e.g., role-play, with client)
	5	Supervisor leads discussion about client cases
	6	Supervisor provides observation with feedback
	7	Supervisor conducts video feedback sessions
	8	Supervisor instructs clinicians to conduct video self-monitoring
	9	Supervisor instructs clinicians to calculate fidelity of others' performance (e.g., parents, other clinicians)
	10	Supervisor reviews my written work (e.g., data sheets, reports)
	11	Supervisor delivers feedback in a variety of ways (e.g., verbal, written, graphic)
	12	Supervisor suggests and/or assigns up-to-date readings and other materials
	13	Supervisor uses training presentations (e.g., PowerPoint slides, webinars)
	14	Supervisor instructs clinicians to complete computer-based trainings
	15	Supervisor conducts small-group activities
Supervisor	1	Supervisor provides a verbal and/or written evaluation of clinician performance
	2	Supervisor requires clinicians to complete a self-evaluation of their performance
	3	Clinicians provide a verbal and/or written evaluation of supervisor performance
	4	Clinicians have the opportunity to provide an anonymous written evaluation of supervisor performance
	5	My supervisor gives behavior-specific positive feedback about my strengths
	6	My supervisor gives behavior-specific corrective feedback about my weaknesses
	7	My supervisor models professional behavior (i.e., clinical decision making, ethics, confidentiality)
	8	My supervisor is able to shift focus during sessions as warranted
	9	My supervisor provides or requests a meeting agenda prior to supervision sessions
	10	My supervisor is prepared for supervision sessions
	11	My supervisor advises about my professional development
	12	My supervisor teaches clinicians about evidence-based practices
	13	My supervisor discusses matters of diversity and inclusion
	14	My supervisor maintains and reminds clinicians about client confidentiality

report, with 3-5 questions included in each subscale. Seven items were developed for the supervision content subscale to assess supervision activities believed to be commonly used during supervision sessions but not included on the SMEF or supervisor training curriculum (i.e., discussion about client cases, video feedback, VSM, calculating fidelity, training presentations, computer-based trainings, and small-group activities). Items 3-5 from the supervision structure subscale were eliminated from the BACB-distributed survey, and therefore only 45% of survey participants responded to these questions. Thus, these items were also eliminated from the supervision practice scale during data analysis. However, they were evaluated along with 12 items measuring clinician and supervisor demographics as potential predictors of supervision practice in subsequent data analysis.

Outcome Variables

Supervision satisfaction was evaluated primarily through a proposed 3-factor model, with subscales of clinical confidence, engagement with supervision, and supervisor support (see Table 2). All eight items from the PSS scale were included in the category of supervisor support. Items from the SMEF prompting clinicians to rate more subjective aspects of supervisor behavior and supervision content (e.g., supervision is a collaborative experience) were assigned to the satisfaction subscales of clinical confidence ($N = 6$), engagement ($N = 3$), and supervisor support ($N = 3$). Response options for the 1-5 Likert scale were modified from the original form (i.e., “rarely” to “always”) to match other satisfaction questions (i.e., “strongly disagree” to “strongly agree”) for the purpose of consistency within and across subscales. The remaining items from each subscale were developed by the researcher based on a review of the literature and clinical experience (i.e., 11 years providing behavioral services to individuals with ASD) Questions 6-8 from the “engagement with supervision”

Table 2*Conceptual Categories for Clinician Satisfaction with Supervision*

Factor	Item	Question
Confidence	1	I am satisfied with the amount of supervision that I receive
	2	My supervisor is able to answer all of my questions during or after supervision sessions
	3	My supervisor is able to answer my most urgent questions during/after sessions
	4	I would like more supervision than what is currently offered (R)
	5	Supervision expands my knowledge base
	6	Supervision encourages my professional development
	7	Supervision builds and enhances my clinical skills
	8	Supervision advises helpfully about my clinical interactions with clients, family members, and other service providers
	9	Supervision enhances my ability to make clinical decisions and solve problems
	10	My supervisor is attentive to my current abilities and training needs
Engagement	1	Supervision is a collaborative experience
	2	My supervisor facilitates my critical thinking
	3	My supervisor shows energy and enthusiasm
	4	I enjoy attending supervision sessions
	5	My supervisor enjoys conducting supervision sessions
	6	This supervision activity is helpful
	7	I am engaged during this supervision activity
	8	I wish that more time was spent on this supervision activity
Support	1	My supervision group serves as a source of social support when I feel stressed at work
	2	My supervisor serves as a source of social support when I feel stressed at work
	3	My supervisor is approachable
	4	My supervisor shows support and positive regard
	5	My supervisor listens well
	6	My supervisor values my contribution
	7	My supervisor fails to appreciate any extra effort from me (R)
	8	My supervisor would ignore any complaint from me (R)
	9	My supervisor really cares about my well-being
	10	Even if I did the best job possible, my supervisor would fail to notice (R)
	11	My supervisor cares about my general satisfaction at work
	12	My supervisor shows very little concern for me (R)
	13	My supervisor takes pride in my accomplishments at work

Note. Items with an (R) were reverse coded prior to analysis.

category were displayed for each activity that a participant indicated was used during supervision sessions (see Table 1). As these questions were specific to each supervision activity, they were reported descriptively but excluded from analyses conducted with the other 25 items measuring supervision satisfaction.

Analyses

Multiple analyses were conducted through two software programs, with Mplus 8 used for exploratory factor analysis (EFA) and SPSS 27 used for data preparation, reliability analysis, multivariate analysis of variance (MANOVA), and multiple regression analysis. In the first stage of analysis, two separate EFAs were performed to determine the factor structure of the constructs for supervision practice and supervision satisfaction. Factor analysis was conducted using maximum log-likelihood with Geomin oblique rotation (Browne, 2001), with parallel analysis used to guide comparison of model fit indices consisting of Chi-square (χ^2), the root mean square error of approximation (RMSEA), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and standardized root mean square residual (SRMR). Preliminary reliability analysis was conducted in SPSS 27, examining the correlation matrix for all variables and Cronbach's alpha for each scale and subscale. Items were assessed for fit using the .40-.30-.20 rule (Howard, 2016), with satisfactory variables loading on their primary factor above .40, loading onto alternative factors below .30, and with a difference of at least .20 between the primary and alternative factor loadings. Additionally, factors assessed for statistical and conceptual fit using simple structure, with each factor having a set of several highly-loading variables that are "simple and clear" (Thurstone, 1947).

In the second stage of analysis, MANOVA was used to assess the predictive nature of categorical variables on composite scores for each scale, while multiple regression was used to assess the predictive nature of dichotomous and continuous variables for each scale as well as the proportion of variance in supervision satisfaction predicted by the supervision practice scale. Analyses were repeated with composite scores for VC supervision practice and VC supervision satisfaction.

IV. Results

The current study examined the relationship between practices used to conduct supervision sessions and clinician level of satisfaction with supervision. Data was collected on participant demographics, supervision practices used during typical and VC supervision sessions, ratings of satisfaction with typical and VC supervision, and suggestions for improving supervision sessions. Descriptive statistics were analyzed to evaluate how supervision practices for this population reflect existing guidelines and recommendations in the field, as well as how ratings of supervision practices and satisfaction compare for sessions received in the typical format and through VC. Three types of statistical analysis were employed to identify key components of supervision practice and satisfaction as well as significant predictors of each variable. Effect sizes for scales and subscales (i.e., multivariate eta-squared and Cohen's f) were reported according to the guide on magnitudes of effect sizes from the University of Cambridge (2020). These results will be presented in the following sections.

Participant Demographics

Descriptive statistics for demographics of clinicians and their supervisors are displayed in Table 3. The majority of clinicians were 24-33 years old with a bachelor's degree, RBT certification, and less than 2 years of experience providing behavioral services to individuals with ASD ($M = 3.0$, range = 0.3-20.8). Most worked primarily in home-based settings with preschool- or elementary-age children. The majority of clinicians maintained a caseload of 1-4 clients (65.8%), while others maintained caseloads of 5-9 (27.5%), 10-15 (3.3%), and 20-25 clients (3.3%). About half of surveyed clinicians provided services on a full-time basis (i.e., at least 30 direct treatment hours per week. Part-time clinicians worked

Table 3*Demographics of Clinicians (N = 125)*

	<i>N</i>	<i>%</i>		<i>N</i>	<i>%</i>
Age			Supervisor certification level		
18-23	26	20.8	RBT	2	1.6
24-33	72	57.6	BCaBA	1	0.8
34-44	16	12.8	BCBA/BCBA-D	111	88.8
45+	11	8.8			
			Supervisor degree level		
Ethnicity			Associate degree	1	0.8
Hispanic/Latino	40	32.0	Bachelor's degree	14	11.2
White	40	32.0	Master's degree	99	79.2
Multiple (i.e., American Indian)	19	15.2	Doctoral degree	9	7.2
Asian	18	14.4			
Black/African American	6	4.8	Agency type		
Middle Eastern/North African	1	0.8	Community-based provider	100	80.0
Native Hawaiian/Pacific Islander	1	0.8	Clinic-based provider	16	12.8
			Clinic- and community-based provider	3	2.4
Highest degree level			University-based research center	3	2.4
High school diploma	11	8.8	Other	3	2.4
Associate degree	15	12.0			
Bachelor's degree	95	76.0	Typical intervention setting		
			Home	107	85.6
Certification level			School	48	38.4
RBT	105	91.2	Community	34	27.2
BCaBA	6	4.8	Clinic	26	20.8
None	14	4.0	Telehealth/VC	19	15.2
Experience level			Intervention model		
≤ 1 year	29	23.2	ABA only	29	23.2
≤ 2 years	31	24.8	DTT	82	65.6
≤ 3 years	21	16.8	Incidental Teaching	54	43.2
Between 3-6 years	24	19.2	Functional Communication Training	52	41.6
> 6 years	19	15.2	PRT	35	28.0
			Naturalistic Language Intervention	25	20.0
Primary client age group			Verbal Behavior Intervention	23	18.4
Baby/toddler (0-2)	2	1.6	EIBI	21	16.8
Preschool (3-5)	57	45.6	Parent-Implemented Intervention	11	8.8
Elementary (6-11)	51	40.8	Floortime	10	8.0
Adolescent (12-17)	6	4.8	SCERTS	8	6.4
Young adult (18-35)	8	6.4	ESDM	7	5.6
Adult (36+)	1	0.8	PCIT	6	4.8
			RIT	5	4.0
Job responsibilities			TEACCH	5	4.0
Direct intervention only	42	33.6	CARD	4	3.2
Parent training	57	45.6	Project ImPACT	3	2.4
Clinician training/observation	31	24.8	YAP	2	1.6
Report writing	27	21.6	Enhanced Milieu Teaching	1	0.8
Assessments	25	20.0	Natural Environment Teaching	1	0.8
Other administrative tasks	13	10.4	Relationship Development Intervention	1	0.8

Note. Some percentages do not add up to 100 due to item response options (i.e., select all, decline to state,

unsure, none of the above).

with clients for 20-30 (26.2%), 10-20 (14.8%), or less than 10 (9.8%) hours per week ($M = 25.8$). Over 20 different intervention models were implemented across service agencies, with most clinicians using multiple models in daily practice.

Within 2.5-5 months of California's initial COVID-19 stay-at-home mandate, 81.9% of clinicians reported that they were currently providing services, while the remaining clinicians were on paid (4.3%) or unpaid (13.8%) leave. Seventeen VC software programs and applications were used for client and/or supervision sessions. The most commonly-used programs included Zoom ($N = 52$), Google Hangouts ($N = 21$), and Microsoft Teams ($N = 10$), followed by FaceTime ($N = 5$), Skype ($N = 4$), Cisco WebEx, Google Duo, and Google Hangouts Meet ($N = 3$), Adobe Connect, GoToMeeting, and iMessages ($N = 2$), and Fuze, Lifesize, Slack, thera-Link, Viber, and WhatsApp ($N = 1$). While insurance providers and authorizing agencies modified requirements for VC programs used during the pandemic, allowing for services to be provided through non-HIPAA compliant software, ABA services typically must be delivered through HIPAA-compliant programs. Eight of the aforementioned VC programs claim or appear to be fully HIPAA-compliant by default in 2020 (i.e., Adobe Connect, WebEx, Fuze, Google Meet, GoToMeeting, Lifesize, Teams, and Zoom). Clinicians reported conducting similar tasks compared to their pre-COVID job responsibilities, but with a smaller client caseload (see Table 4). In addition, while the number of clinicians working primarily with babies and toddlers and older groups of individuals with ASD did not change much following COVID, the percentage of clinicians working primarily with preschool-age clients decreased to from 45.6% to 32.5%, whereas the percentage of clinicians working primarily with elementary-school age clients increased from 40.8% to 51.9%.

Table 4*Changes in Supervision Practices During COVID-19 Pandemic*

	Typical (<i>M</i>)	COVID (<i>M</i>)
Supervision intensity		
Number of clients on caseload	4.0	3.6
Average hours per month	8.6	9.0
Supervision structure (0-4 scale, never-always)		
Client team format	1.1	1.2
Clinician group format	1.0	1.4
Individual meetings	2.3	2.6
In-vivo sessions	3.0	3.0
Sessions through VC/telehealth	1.9	4.0
Sessions are led by only 1 supervisor	3.3	3.5
Able to correspond with supervisor between sessions	3.4	3.5
Sessions are free of distractions	2.8	2.6
Supervision content (0-4 scale)		
Modeling	2.8	2.1
Video modeling	1.4	1.2
Practicing new skills	2.6	2.5
Observation with feedback	3.3	3.2
Calculating fidelity	1.6	1.4
Up-to-date readings/materials	1.8	1.4
Training presentations	1.7	1.4
Computer-based trainings	1.6	1.5
Small-group activities	1.5	1.2
Video feedback	1.1	1.5
Supervisor behavior (1-5 scale, strongly disagree-strongly agree)		
Gives positive behavior-specific feedback about my strengths	3.0	3.1
Gives corrective behavior-specific feedback about weaknesses	2.8	2.9
Provides/requests a meeting agenda prior to sessions	1.8	2.3
Maintains/reminds clinicians about client confidentiality	3.1	3.2
Shows energy and enthusiasm	4.4	4.5
Listens well	4.3	4.5
Approachable	4.4	4.6
Shows support and positive regard	4.3	4.6
Facilitates my critical thinking	4.1	4.4
Attentive to my current abilities and training needs	4.2	4.5
Able to answer my most urgent questions	4.5	4.4
Supervision satisfaction (1-5 scale)		
My supervision group serves as a source of social support at work	3.5	3.7
I am satisfied with the amount of supervision I receive	3.9	4.1
I would like more supervision than I currently receive (R)	2.6	3.1
Supervision is a collaborative experience	4.2	4.1
I enjoy attending supervision sessions	4.0	3.6
Supervision enhances my ability to make decisions/solve problems	4.4	3.9
Supervision advises helpfully about clinical interactions	4.4	4.0

Note. Highest mean ratings for each questionnaire item are highlighted in bolded text.

In general, the results from part 1 (i.e., typical supervision practices) demonstrate that ABA providers are meeting BACB guidelines and recommended practices for supervision. Clinicians typically received an average of 8.6 hours of supervision per month; supervision intensity increased during COVID ($M = 9.0$), despite the slight decrease in average caseload size. All but one clinician received at least 3 hours of supervision per month (range = 0.5-34.0), exceeding the 1 hour minimum recommended by the BACB. Most clinicians (76.3%) received more than 5 hours per month, or more than 1 hour per week, on average; about one-third of clinicians received an average of more than 2 hours per week (36.1%), and a small percentage of clinicians (13.4%) received an average of 3-8 hours of supervision per week. The ratio of supervision to client treatment hours per clinician was calculated by first multiplying client hours per week by 4.3 (the average number of weeks per month) and then dividing supervision hours by treatment hours per month. On average, clinicians received the recommended ratio of 1:10 supervision to treatment hours ($M = 0.1$), but there was considerable variability (range = .01-.62). Most clinicians (65.3%) received a ratio less than 1:10, while over a quarter (26.3%) received a ratio less than 1:20. In contrast, 10.5% of clinicians received a ratio of at least 1:5 supervision to treatment hours, including four “outliers” between .28-.62. Glancing at other demographics that may account for the high level of supervision provided, these four clinicians had 0.5-2 ($M = 1.2$) years of experience and worked 3-30 ($M = 9$) hours per week. Three worked primarily with preschool-age clients; two of these clinicians received supervision on a weekly basis, and the clinician with the highest ratio (.62) received supervision in a client team format in addition to individual supervision. The fourth clinician worked primarily with young adults and received supervision multiple times per week, all delivered through VC. Thus, it seems that the higher

intensity of supervision provided may have been due to clinicians having lower levels of experience, working with clients who typically receive a high number of treatment hours, and/or receiving supervision sessions in a more time-efficient format for supervisors.

In terms of supervision frequency, while more than half of participants were unable to answer this question on the BACB-distributed survey, the majority of clinicians who responded (87.5%) met BACB guidelines by receiving supervision at least twice per month, with a typical frequency of semi-monthly (10.7%), once per week (55.4%), or multiple times per week (21.4%). Other clinicians received supervision once per month (8.9%), quarterly (1.8%), or annually (1.8%). In the second part of the survey (i.e., VC/COVID supervision practices), average supervision frequency increased; one clinician reported that they had not received supervision since COVID-19 restrictions began, but we also do not know how long they had been conducting client sessions during this time. Other clinicians reported receiving supervision monthly (11.3%), semi-monthly (11.3%), once per week (66.0%), or multiple times per week (45.3%). It is unclear if the increase in supervision intensity and frequency during the COVID-19 pandemic resulted from an effort by service providers to facilitate the transition to remote and/or socially-distanced client sessions, supervisors simply having more availability, with no travel time required for VC supervision sessions, or both. In terms of supervision format, just under half of participants (45.7%) stated that they received some group supervision, with client team and clinician group formats being used in relatively equal frequency. While clinicians who completed the BACB-distributed survey were not able to answer questions about individual meeting formats, the majority of clinicians who responded stated that they frequently (40.4%) or always (33.3%) received in-vivo supervision during client sessions. The frequency of one-on-one meetings was much more variable, with similar

numbers of clinicians reporting that they always (26.3%), frequently (19.3%), sometimes (22.8%), or rarely (21.1%) received supervision in an individual meeting format. Therefore, while the percentage of supervision sessions received in an individual format cannot be calculated for all participants in this sample, over half of clinicians received 100% of supervision in an individual format, and many are being frequently observed and receiving feedback on their implementation of intervention with clients.

Regarding recommended supervisory practices, 86% of clinicians stated that their primary supervisory had a graduate-level degree, including an M.A. (79.2%) or Ph.D. (7.2%). Of the 12% who received supervision primarily from a supervisor without a graduate degree, one-third of those supervisors had completed some graduate school. Similarly, 88.8% of clinicians stated that their supervisor was a BCBA or BCBA-D; 3.2% reported that they held other certifications (i.e., RBT, BCaBA, AMFT), and 10% of clinicians were unsure. Regarding frequency of supervision models with one supervisor versus models with lead and assistant supervisors, over half of clinicians (56.7%) said that sessions were never led by more than one supervisor, while approximately 18% said that sessions were frequently (3.2%) or sometimes (15.0%) led by multiple supervisors. However, providers may be more likely to use assistant supervisors in the capacity of providing in-vivo observation or other indirect tasks, rather than assisting a supervisor in the context of a supervision meeting. In terms of evaluation, the vast majority of clinicians were evaluated on a quarterly basis ($M = 4.3$ times per year), while a few were evaluated more than 20 times per year. Only 4% did not receive performance evaluations at least annually. The most common areas of performance evaluation included program implementation (69.6%), data collection (64.8%), professionalism (59.2%), receiving performance feedback (55.2%), organization (55.2%),

ethics (54.4%), time management (52.8%), coordination with team members (46.4%), and participation in supervision sessions (12.0%), respectively. In contrast, over half of clinicians (54%) stated that they did not evaluate their supervisor's performance at least annually. Approximately 4% evaluated their supervisor monthly, while 42% evaluated their supervisor 1-5 times per year ($M = 1.2$ times per year). The most common areas of supervisor performance evaluation included professionalism (30.4%), providing performance feedback (29.6%), conducting supervision sessions (25.6%), effectiveness (22.4%), time management (21.6%), organization (20%), and ethics (20%).

Factor Structure of Supervision-Related Variables

EFA was adopted to run analyses on two separate scales developed for the current study, including supervision practice and supervision satisfaction.

Supervision Practice Scale

An EFA was performed on 37 survey items evaluating supervision practice. There was a participant response rate of at least 75% for each item ($M = 91.2\%$). Distributions of the variables were examined for skewness; most were negatively skewed, while the remaining variables were positively skewed. One case was excluded from analysis due to outlier responses on six of the nine variables with substantial skewness. Examination of pairwise scatterplots of variables with strong negative and positive skewness showed a departure from linearity, although there were no outliers or evidence of true curvilinearity. The minimum amount of data for factor analysis was satisfied, with a final sample size of 124, providing a ratio of 3.4 cases per variable. Alphas were high for overall supervision practice (.91), as well as the categories of supervision content (.87) and supervisor behavior (.88). In contrast, alpha was quite low for the category of supervision structure (.47).

Five rounds of analysis were conducted, eliminating 14 items due to the following violations (see Appendix B): (1) correlations $<.3$ with at least 80% of variables and/or negative corrected item total correlation (i.e., items 1-6, 10, 13, 15, 18, and 35), (2) correlation $>.7$ with another variable in both the overall and subscale-specific correlation matrices (i.e., items 22 and 30), or (3) correlations $>.5$ with a higher percentage of variables compared to other items remaining in the dataset (i.e., item 34). The two remaining items related to supervision structure (i.e., items 7-8) were re-categorized under supervisor behavior, due to greater conceptual fit and levels of correlation with items on this factor. Reliability was sufficient for the final set of 23 indicators, with high alphas for supervision content (.84), supervisor behavior (.85), and overall supervision practice (.90).

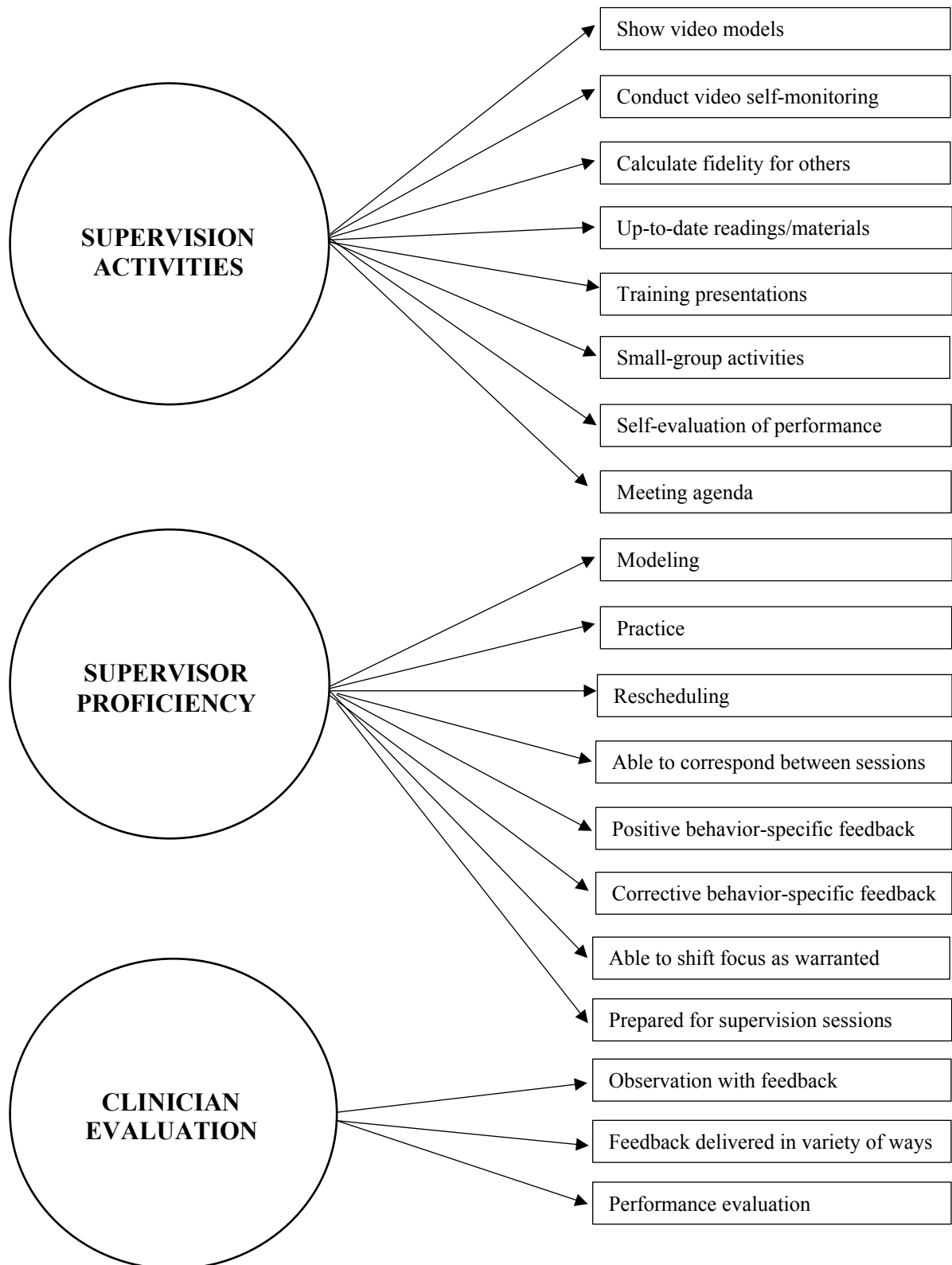
An EFA was then conducted with the final set of 23 variables for supervision practice. The results of parallel analysis indicated a 2-3 factor solution, with five eigenvalues greater than 1.0 in the sample (see Figure 2). Given that indices of model fit also showed reasonable fit for the 3-5 factor models, the 2, 3, 4, and 5-factor models were evaluated as competing model solutions. One variable (i.e., confidentiality) was eliminated due to loadings $<.4$ in the 2-4 factor solutions and poor conceptual fit with other items on the same factor, while a second variable (i.e., diversity/inclusion) was eliminated solely due to poor conceptual fit with other variables on the same factor. In the second analysis with 21 variables, indices of model fit improved for the 2-5 factor models, showing good or reasonable fit for each model. However, based on the number of items loading onto each factor, it was determined that the 2-factor and 5-factor models would not be viable, and focused on the 3- and 4-factor models for subsequent analysis. Each variable loaded $>.4$ on one factor, although several variables cross-loaded onto a second factor in the 3-factor ($N =$

6) and 4-factor ($N = 7$) models. One item (i.e., supervisor evaluation) was eliminated due to cross-loading and poor conceptual fit with other factor items in both models. The third EFA with 20 variables showed further improvement of model fit indices for each model, with fewer items cross-loading in the 3-factor ($N = 4$) and 4-factor ($N = 6$) models. However, in the 4-factor model, one variable (i.e., reschedule) loaded $<.4$, and only two items loaded $>.4$ on the fourth factor. Thus, the 3-factor model was determined to be the best solution. Still, one item (i.e., anonymous evaluation) did not fit well conceptually with other items on the first factor, and this was eliminated for the fourth and final analysis.

The final 3-factor solution demonstrated good model fit: $\chi^2(117) = 153.68, p = .01$; RMSEA = .05, CFI = .95, TLI = .93, and SRMR = .04. The analysis yielded three factors, labeled supervision activities, supervisor proficiency, and clinician evaluation (see Figure 3), with eigenvalues of 6.90, 2.63, and 1.43, respectively. All 19 variables loaded onto one factor $>.4$, with two variables cross-loading $>.4$ onto a second factor (see Table 5). Internal consistency was examined using Cronbach's alpha. The alpha for supervision practice was high (.88), indicating acceptable internal consistency; alphas were also relatively high for supervision activities (.85), supervisor proficiency (.81), and clinician evaluation (.78). No substantial increases in alpha could have been achieved for any factor by eliminating more items. Composite scores were created based on the mean of the items with primary loadings on each factor, and the score for supervision practice was created based on the mean of the three factor scores. All composite variables followed an approximately normal distribution, including (1) supervision activities ($M = 1.47, SD = .95, skewness = .66, kurtosis = -.18$), (2) supervisor proficiency ($M = 2.92, SD = .76, skewness = -.58, kurtosis = .28$), (3) clinician

Figure 3

Final Three-dimension Factor Structure for Supervision Practice



evaluation ($M = 2.76$, $SD = .94$, skewness = $-.37$, kurtosis = $-.58$), and (4) supervision practice ($M = 2.39$, $SD = .71$, skewness = $.04$, kurtosis = $-.64$).

Supervision Satisfaction Scale

A second EFA was performed on 27 survey items evaluating clinician satisfaction with supervision, using the same methods of estimation, rotation, extraction, and systematic elimination of variables described for supervision practice. There was a participant response rate of at least 75% ($M = 82.1\%$) for 27 of the original 28 items included in this category. In contrast, as less than half of participants indicated that they received group supervision, there was a response rate of only 46% for the item “my supervision group serves as a source of social support” and this variable was excluded from analysis. All five negatively-framed items were reverse-scored prior to analysis. Preliminary analysis revealed that all of the variables were negatively skewed. In addition to the case excluded from the previous EFA, five cases were excluded from analysis due to outlier responses on between 7-10 of 19 items with substantial skewness. Examination of pairwise scatterplots of variables with strong and minor negative skewness did not show outliers or evidence of true curvilinearity. The minimum amount of data for factor analysis was satisfied, with a final sample size of 119, providing a ratio of 4.4 cases per variable.

Cronbach’s alpha was high for the overall dataset (.95) and each factor, including clinical confidence (.86), engagement (.83), and perceived support (.93). One variable (i.e., would like more supervision) was eliminated due a negligible corrected item total correlation (.19) and correlations $<.3$ with at least 80% of items (see Appendix C). To reduce possible multicollinearity, two additional variables (i.e., shows support, listens well) were eliminated due to correlations $>.8$ with multiple items in the dataset. In the second analysis with 24

items, no variables were correlated $<.3$ with at least 80% of items or $>.8$ with multiple items in the dataset. Alpha were acceptable for the modified factors (i.e., clinical confidence (.77) and perceived support (.92) and did not change for the overall dataset. Thus, an EFA was conducted with 24 variables measuring clinician satisfaction with supervision.

The results of parallel analysis indicated that a 2-factor solution was slightly better than a 3-factor solution, with four eigenvalues greater than 1.0 (see Figure 4). However, a high number of variables ($N=18$) loading onto one factor in the 2-factor solution, and the 3-factor solution had better indices of model fit, so the 2- and 3-factor models were evaluated as competing model solutions. All variables loaded $>.4$ on one factor in both models. One variable (i.e., I enjoy attending supervision sessions) was eliminated due to having the lowest loading in the 2-factor (.39) and 3-factor (.43) models and poor conceptual fit with other items loading on the same factor. In the second analysis with 23 variables, there was little improvement in fit indices, but all variables loaded $>.4$ on one factor. In the 3-factor model, only two variables (i.e., answers all questions, urgent questions) loaded $>.4$ on the second factor. Given that these variables also appeared to be closely related conceptually, the latter was eliminated based on it having the lowest corrected item total correlation and number of correlations $>.3$ with other items out of the pair. The third analysis with 22 variables showed improvement in model fit for both solutions, although three variables continued to cross-load in the 3-factor model. Two items loaded somewhat similarly on factors 2 and 3 (i.e., my supervisor values my contribution; my supervisor cares about my general satisfaction at work). Therefore, for the fourth analysis, two 21-variable EFAs were conducted, each with one item eliminated. The EFA with “supervisor cares about my general satisfaction at work” eliminated demonstrated better model fit and slightly reduced cross-loading for the 3-factor

model. Given that indices of fit were not improving for the 2-factor model, and 15 items loaded on factor 2, additional analysis focused on the 3-factor model only. In comparing the three items loading similarly on factors 2 and 3 (i.e., approachable, values my contribution, pride in my accomplishments), the first two had better conceptual fit with other items loading primarily on the same factor. Thus, “takes pride in my accomplishments” was eliminated.

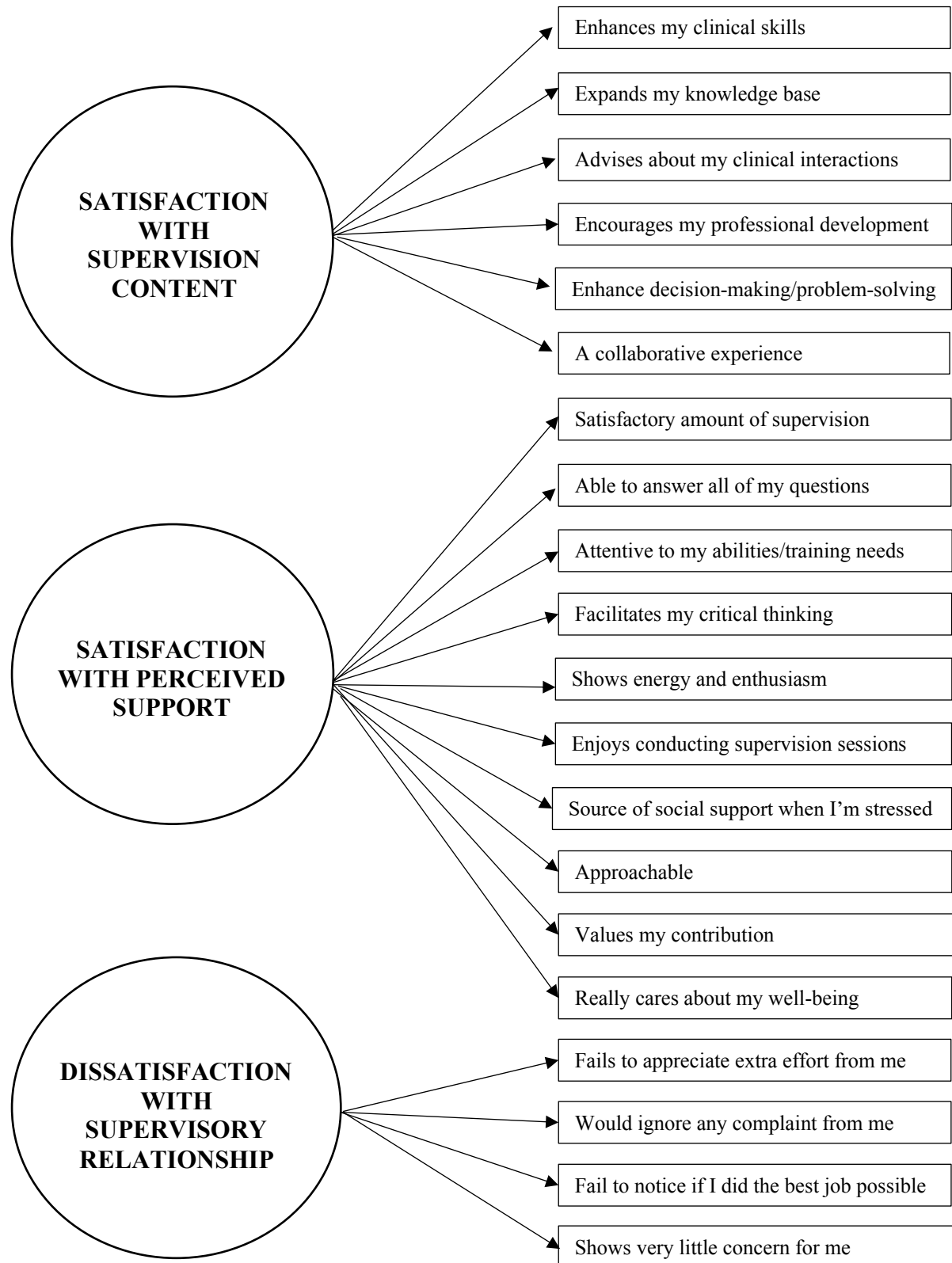
The fifth and final analysis demonstrated reasonable model fit: $\chi^2(133) = 209.90, p < .001$; RMSEA = .07; CFI = .93; TLI = .90; SRMR = .04. The analysis yielded three factors, labeled satisfaction with supervision content, satisfaction with level of perceived support, and dissatisfaction with supervisory relationship (see Figure 5), with eigenvalues of 10.45, 2.19, and 1.14, respectively. While two variables slightly cross-loaded onto factor 3, no variables loaded $>.4$ onto a second factor (see Table 6). Cronbach’s alpha was high for the overall satisfaction model (.94) as well as factors 1-3 (.91, .91, and .88, respectively). Composite variables were all negatively skewed, but followed a relatively normally distribution, including satisfaction with (1) supervision content ($M = 4.47, SD = .52, skewness = -1.12, kurtosis = 1.92$) and (2) level of perceived support ($M = 4.31, SD = .83, skewness = -1.14, kurtosis = .85$), (3) dissatisfaction with supervisory relationship ($M = 5.01, SD = 1.27, skewness = -1.15, kurtosis = .32$), and (4) overall satisfaction with supervision ($M = 4.51, SD = .80, skewness = -1.11, kurtosis = 1.05$). All four items from the third factor were reverse-coded prior to analysis, and therefore the subscale for dissatisfaction with supervisory relationship did not need to be reverse-coded for further analysis.

Influencing Factors of Variables Related to Supervision Practice and Satisfaction

MANOVAs were conducted to evaluate potential group differences in supervision practice and satisfaction scores, using seven demographic items as predictor variables.

Figure 5

Final Three-Dimension Factor Structure for Satisfaction



Additionally, MANOVAs were conducted for two composite outcome variables from part 2 of the survey, labeled “VC supervision practice” and “VC supervision satisfaction.” Each outcome variable contained many of the same items and subscales as the equivalent variable from part 1, with scores calculated from questions that were repeated in part 2 to assess practices and satisfaction for supervision received through VC during the COVID-19 pandemic. Specifically, VC supervision practice included 16 of the 19 items from supervision practice, as three items were not repeated in part 2 (i.e., self-evaluation, varied feedback, supervisor evaluation of clinician performance). Thus, the subscale for VC supervision activities included seven out of eight original variables, VC supervisor proficiency included all eight original items, and no subscale was created for VC clinician evaluation. VC satisfaction included nine out of the 20 items from the original satisfaction scale; 11 items that were not expected to change substantially within a few months of transitioning to VC supervision were not repeated in part 2 (i.e., builds skills, expands knowledge, encourages professional development; supervisor enjoys conducting sessions, serves as a source of social support, values my contribution, cares about my well-being, fails to appreciate extra effort, ignore complaint, fail to notice best job possible). Therefore, three items were missing from VC satisfaction with content, and four items were missing from VC satisfaction with perceived level of support. There was no subscale for dissatisfaction with supervisory relationship, as all four items were not included in part 2.

The seven predictor variables included age, ethnicity, experience level, supervisor level of education, supervisor areas of performance evaluation, supervision frequency, and clinician job responsibilities. Job responsibilities was compiled from a checklist question, with clinicians divided into three categories, including: (1) direct intervention only, (2) parent

training (typically in addition to direct intervention), and (3) clinician training (typically in addition to parent training and direct intervention). While this variable was not a significant predictor of supervision practice or satisfaction, the other six items significantly predicted one or more outcome variables (see Table 7). There was a significant effect of age on supervision satisfaction ($F(6, 170) = 2.29, p = .04$; Wilk's $\Lambda = 0.86$, partial $\eta^2 = .08$, medium effect size); however, post-hoc tests revealed that the difference in satisfaction with perceived level of support between clinicians ages 18-23 ($M = 3.83$) and 24-33 ($M = 4.53$) was not significant. Similarly, there was a significant effect of ethnicity on supervision practice ($F(9, 258.13) = 1.96, p = .04$; Wilk's $\Lambda = 0.85$, partial $\eta^2 = .05$, small effect size), but supervision activity scores were not significantly different between clinicians who identified as Hispanic/Latino ($M = 1.82$) and those who identified as White ($M = 1.29$), Asian/Pacific Islander ($M = 1.36$), or multiple ethnicities ($M = 1.23$).

In contrast, there was a significant effect of experience on satisfaction for both typical supervision practice ($F(12, 219.89) = 1.99, p = .03$; Wilk's $\Lambda = 0.76$, partial $\eta^2 = .09$, medium effect size) and VC supervision practice ($F(8, 122) = 2.69, p = .009$; Wilk's $\Lambda = 0.72$, partial $\eta^2 = .15$, large effect size), and post-hoc tests revealed statistically significant differences between clinician groups with different levels of experience providing behavioral services to individuals with ASD (see Figure 6). For supervision practice, there was a significant difference in mean scores for satisfaction with perceived level of support between clinicians with > 6 years of experience (group 5) and groups 1-3, including clinicians with ≤ 1 year of experience ($p = .01$), between 1-2 years of experience ($p = .002$), and between 2-3 years of experience ($p = .03$), respectively. There were also significant differences in scores between clinicians with 3-6 years of experience (group 4) and groups 1-2 ($p = .04$ and $p =$

Table 7*Multivariate Effects for Demographic Variables on Supervision Practice and Satisfaction*

Source	<i>p</i>	Wilks' Lambda	Partial η^2	Subscale	<i>Sum of Squares</i>	<i>df</i>	Mean square	<i>F</i>	<i>p</i>	Partial η^2
Ethnicity	.04	.85	.05	Activities	7.38	3	2.46	2.88	.04	.07
Sup. Ed.	.02	.86	.07	Activities	6.32	2	3.16	3.51	.03	.06
Sup. Eval.	<.001	.72	.15	Activities	16.33	2	8.17	12.16	<.001	.21
				Proficiency	5.36	2	2.68	6.12	.003	.12
				VC activities	15.96	2	7.98	10.51	<.001	.24
				VC proficiency	4.85	2	2.43	6.06	.004	.15
Frequency	.01	1.38	.13	VC proficiency	3.78	1	3.78	9.41	.003	.12
Age	.04	.86	.08	Support	5.98	2	2.99	5.81	.004	.19
Experience	.03	.76	.09	Support	10.09	4	2.52	5.27	.001	.20
				VC support	4.56	4	1.14	4.54	.003	.23

.02, respectively). Scores were not significantly different between groups 1-3 or groups 4-5.

Similar differences were found between groups for VC satisfaction with perceived level of support. Mean scores were statistically significantly different between group 5 and groups 2-3 (each $p = .03$) as well as between group 4 and groups 2-3 (each $p = .03$). However, unlike in the MANOVA for typical satisfaction, scores were not significantly different between group 5 and group 1 ($p = .62$) or group 4 and group 1 ($p = .84$) for VC satisfaction.

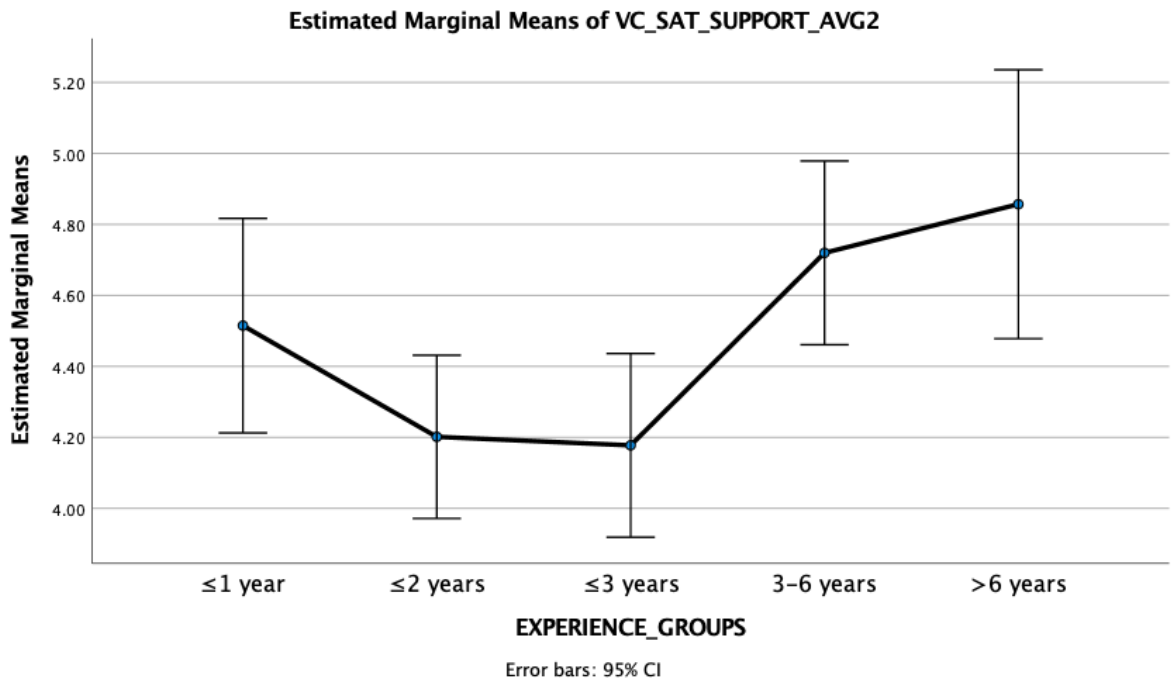
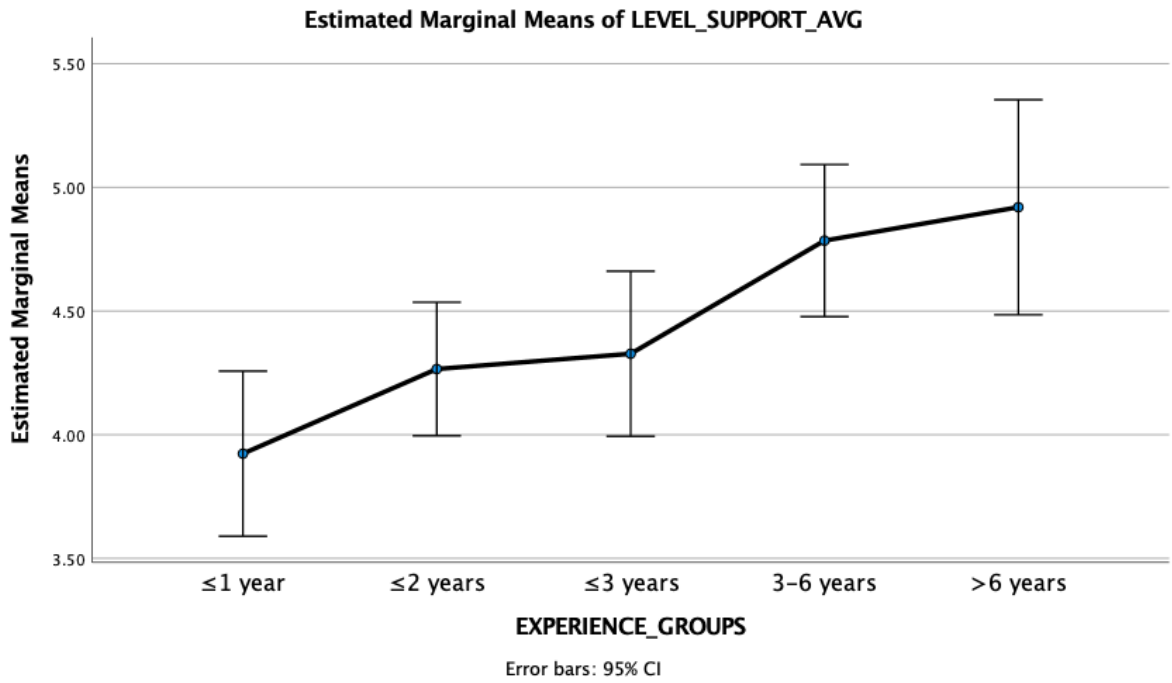
Interestingly, mean scores for typical satisfaction with perceived support were incrementally higher for experience groups 1-5. However, during VC supervision, mean satisfaction scores decreased by at least .05 points for groups 2-5, while mean satisfaction decreased by only .01 points for group 1 (see Figure 6).

There was a significant effect of supervisor level of education on supervision practice: $F(6, 212) = 2.71, p = .02$; Wilk's $\Lambda = 0.86$, partial $\eta^2 = .07$, medium effect size).

Mean scores for supervision activities were statistically significantly different between

Figure 6

Estimated Marginal Means for Satisfaction with Perceived Support on Experience

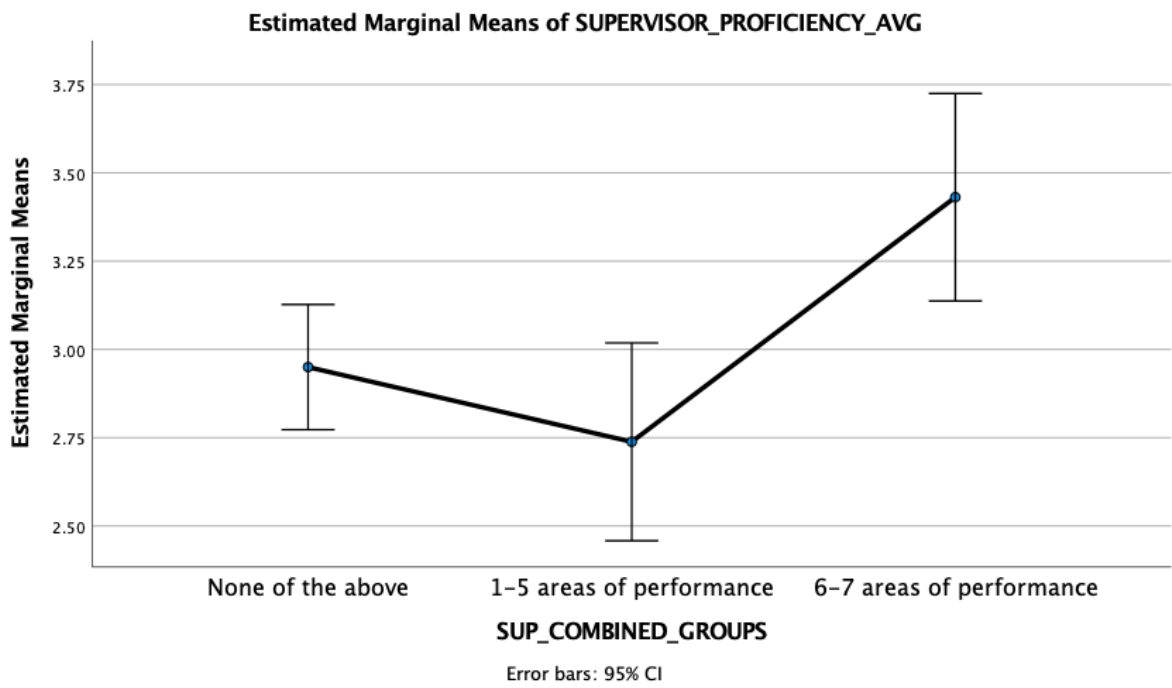
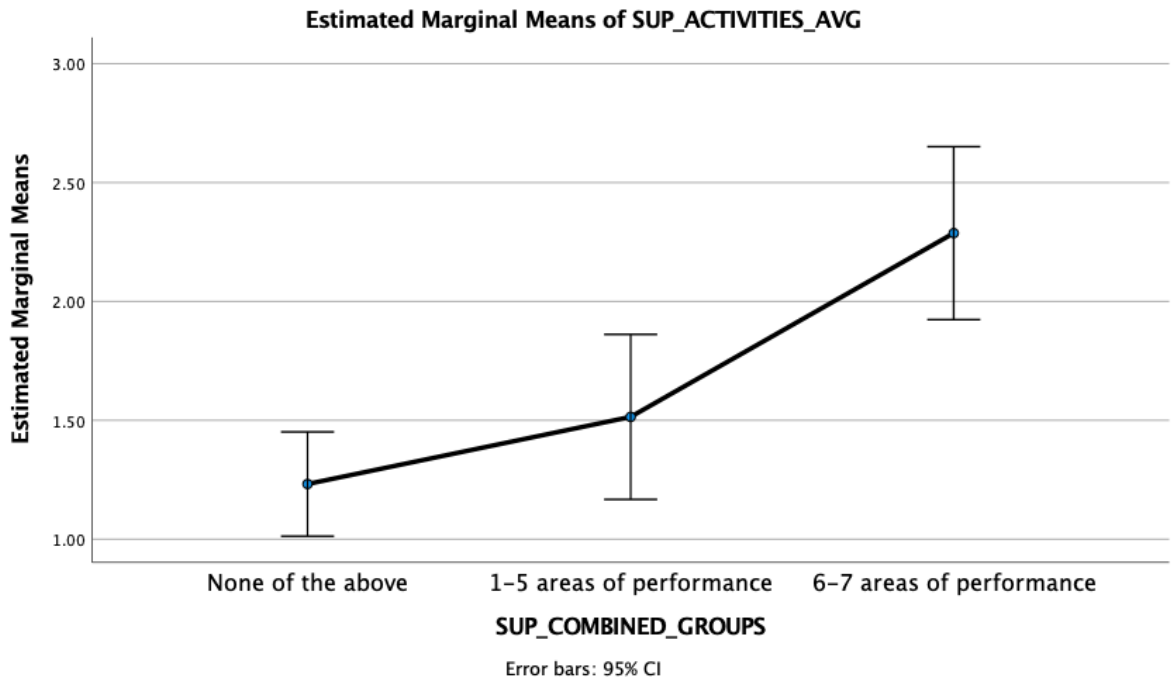


clinicians with a Ph.D.-level supervisor versus M.A.-level supervisor ($p = .03$). Specifically, Ph.D.-level supervisors were more likely to frequently/always show video models, have clinicians conduct video self-monitoring and calculate fidelity of other's performance, use training presentations, and require clinicians to complete a self-evaluation of performance; they were also more likely to always assign up-to-date reading and other materials, conduct small-group activities, and use a meeting agenda. However, this finding must be interpreted with caution, given the small percentage of Ph.D.-level supervisors ($N = 9$) represented in our dataset; unfortunately, any differences in VC supervision activity scores could not be examined due to insufficient cases at each supervisor degree level.

There was also a significant effect of supervisor performance evaluation on supervision practice: $F(6, 184) = 5.40, p < .001$; Wilk's $\Lambda = 0.72$, partial $\eta^2 = .15$, large effect size). Mean scores for supervision activities were statistically significantly different between clinicians who evaluated their supervisors on 6-7 performance areas (group 3) compared to clinicians who evaluated their supervisors on 1-5 areas of performance (group 2), $p = .008$, as well as between group 3 and clinicians who did not evaluate their supervisor on any specific performance areas (group 1), $p < .001$ (see Figure 7). Additionally, ratings of supervisor proficiency were significantly different between group 3 and group 2 ($p = .005$) and group 3 and group 1 ($p < .001$). Scores were not significantly different for either subscale between groups 1 and 2 ($p = .36$ and $p = .42$, respectively). The same differences between groups were observed for each subscale in part 2. There was a significant effect of supervisor performance evaluation on VC supervision practice: $F(4, 132) = 5.80, p < .001$; Wilk's $\Lambda = 0.72$, partial $\eta^2 = .15$, (large effect size). Mean scores for VC supervision activities were

Figure 7

Estimated Marginal Means for Supervision Practice on Supervisor Performance Evaluation



different between group 3 and group 2 ($p = .005$) and group 3 and group 1 ($p < .001$) (see Figure 7). Likewise, mean scores for VC supervisor proficiency were significantly different between group 3 and group 2 ($p = .007$) and group 3 and group 1 ($p = .008$).

Lastly, there was a significant effect of supervision frequency on COVID/VC supervision practice: $F(2, 66) = 4.99, p = .01$; Wilk's $\Lambda = 0.87$, partial $\eta^2 = .13$, medium, close to large effect size). Mean scores for supervisor proficiency were statistically significantly different between clinicians who received supervision on a weekly basis (group 1) compared to clinicians who were supervised 1-2 times per month (group 2), $p = .003$.

Variables Predicting Supervision Practice and Satisfaction Scores

Multiple linear regression analyses were conducted to assess the predictive nature of variables related to supervision format and intensity on supervision practice scores, as well as the predictive nature of these variable in addition to supervision practice on supervision satisfaction scores. Similar regression equations were then conducted for VC supervision practice and VC satisfaction.

Supervision Practice Scale

Supervision practice scores were predicted from the following variables: (1) supervision hours per month, (2) agency type (coded 1 = clinic-based, 2 = community-based), (3) sessions in group format (coded 0 = no, 1 = yes), (4) sessions in an individual meeting format, (5) sessions provided in-vivo during client sessions, and (6) sessions delivered face-to-face. The total N for this sample was 54, as the last three items were not included in the BACB-distributed version of the supervision survey. Preliminary data screening was conducted including examination of histograms, normality plots, and boxplots for each variable, histograms and scatterplots for supervision practice score on each

predictor, and correlations for all pairs of variables. Agency type was eliminated from analysis, as only four of the 16 clinicians from clinic-based agencies were included, and all were extreme values. Three additional cases were dropped due to missing data on at least one variable, with 49 cases included in the regression analysis. Univariate distributions were reasonably normal; only one variable (i.e., supervision hours per month) had outliers, showing two outliers at 25 and 30 hours and one extreme value at 34 hours per month. Bivariate distributions were fairly linear and normal, and there were no bivariate outliers. Standard multiple regression was performed for supervision practice with all five predictor variables entered in one step. Standardized residuals were plotted against the standardized predicted values from this regression to assess whether there were any multivariate outliers; the homoscedasticity of residuals and absence of any clear outliers indicates that the assumptions for multiple regression were reasonably well met (see Figure 8). The overall regression was statistically significant: $R = .59$, $R^2 = .34$, adjusted $R^2 = .27$, $F(5, 43) = 4.50$, $p = .002$, medium, close to large effect size. Approximately 27% of the variance in supervision practice could be accounted for by the regression. Three of the five predictors were significantly predictive of supervision practice scores, including group meeting format, individual meeting format, and supervision hours per month (see Table 8). The predictive nature of supervision hours per month is as expected; receiving a higher number of hours of supervision per month was predictive of higher supervision practice scores. The nature of the predictive relation of both group and individual meeting formats is interesting; receiving some amount of supervision in a group format was predictive of higher scores for supervision practice, while receiving supervision more frequently in an individual meeting format was also predictive of higher supervision practice scores. This seems to indicate that activities and

Table 8*Regression Results for Typical and VC Supervision Practice and Satisfaction*

	Supervision Practice	Satisfaction	VC Supervision Practice	VC Satisfaction
Constant	1.744 (0.330)	3.332 (0.345)	1.704 (0.283)	3.006 (0.254)
Supervision hours per month	0.026* (0.013)	0.019 (0.015)	0.007 (0.011)	-
Group meetings	0.355* (.0173)	-0.361 (0.195)	0.051 (0.154)	-
Individual meetings	0.199** (0.067)	0.020 (0.074)	0.151** (0.057)	0.060 (0.051)
In-vivo sessions	0.034 (0.102)	-	0.113 (0.088)	-
Face-to-face sessions	-0.093 (0.076)	-	-	-
Supervision practice	-	0.429** (0.166)	-	0.429*** (0.102)
R-squared	0.343	0.533	0.158	0.276

Note. Predictors of supervision practice and satisfaction are based on responses from part 1 of the survey (i.e., typical supervision); predictors of VC supervision practice and satisfaction are based on responses from part 2 (i.e., VC supervision during COVID-19 pandemic).

supervisor behaviors represented in the composite supervision practice score are used more frequently during sessions provided in a meeting format (i.e., group and individual) compared to in-vivo sessions, which was not significantly related to supervision practice when other predictors were statistically controlled. The proportions of variance uniquely explained by each predictor were as follows: $sr^2 = .06$ for supervision hours per month, $sr^2 = .06$ for group format, and $sr^2 = .13$ for individual meeting format. Thus, in this sample and in the context of these predictors, individual meeting format was the strongest predictor of supervision practice.

Supervision Satisfaction Scale

A second multiple regression analysis was conducted for supervision satisfaction, predicted from the three significant predictors of supervision practice as well as supervision practice score (see Table 8). The total N for this sample was 49. The univariate distribution for supervision satisfaction was reasonably normal, with no outliers; likewise, bivariate distributions were fairly linear and normal with no outliers. The plot of standardized residuals against standardized predicted values showed that the assumptions for multiple regression were reasonably well met; residuals were homoscedastic, and there appeared to be only one outlier (see Figure 9). The overall regression was statistically significant: $R = .53$, $R^2 = .28$, adjusted $R^2 = .22$, $F(4, 44) = 4.37$, $p = .005$, medium effect size. Approximately 22% of the variance in satisfaction could be accounted for by the regression. One variable (i.e., supervision practice) was significantly predictive of clinician satisfaction with supervision ($p = .01$). As expected, a higher score for supervision practice was predictive of a higher score for satisfaction with supervision. In this sample and in the context of these predictors, supervision practice uniquely accounted for 11% of the variance in supervision satisfaction

($sr^2 = .11$) Interestingly, although not significant ($p = .07$), group supervision format was predictive of a lower satisfaction score, despite being significantly predictive of a higher supervision practice score.

VC Supervision Practice Scale

VC supervision practice scores were predicted using four of the variables used to predict supervision practice score; one variable (i.e., face-to-face format) was not applicable for part 2 of the survey. The other predictors were repeated in part 2, asking specifically about hours of VC supervision per month and frequency of VC sessions provided in group, individual, and in-vivo formats. The total N for this sample was 64. Preliminary data screenings showed that univariate distributions were reasonably normal. One item (i.e., in-vivo sessions) had four outliers, while another item (i.e., supervision hours per month) had four outliers and one extreme value. This extreme value was determined to be a probable entry mistake and eliminated from analysis, with 63 cases included in the regression analysis. Bivariate distributions were also fairly linear and normal, with no outliers. The plot of standardized residuals against standardized predicted values showed that the assumptions for multiple regression were reasonably well met, with no outliers and homoscedasticity of residuals (see Figure 10).

The overall regression was statistically significant: $R = .40$, $R^2 = .16$, adjusted $R^2 = .11$, $F(4, 64) = 3.00$, $p = .03$, small effect size. Approximately 11% of the variance in VC supervision practice could be accounted for by the regression. One variable (i.e., individual meeting format) was significantly predictive of VC supervision practice score (see Table 8). As expected, more frequent use of a one-on-one meeting format was predictive of a higher score for VC supervision practice. In this sample and the context of these predictors, VC

individual meeting uniquely accounted for 14.5% of the variance in supervision practice ($sr^2 = .15$). Unlike typical supervision practice, group meeting format and supervision hours per month were not significant predictors of VC supervision practice ($p = .74$ and $p = .50$, respectively).

VC Satisfaction Scale

Finally, VC satisfaction scores were predicted using VC individual meeting format and VC supervision practice scores. The total N for this sample was 70. Preliminary data screenings showed that the univariate distribution for VC satisfaction was relatively normal, although there were six outliers between 2.5 and 3.0. However, there were no extreme values; there were also no outliers in the bivariate distributions, which were fairly linear and normal. The plot of standardized residuals against standardized predicted values showed that the assumptions for multiple regression were reasonably well met, with only 1-2 potential outliers and homoscedasticity of residuals (see Figure 11). The overall regression was statistically significant: $R = .53$, $R^2 = .28$, adjusted $R^2 = .25$, $F(2, 67) = 12.77$, $p < .001$, small, close to medium effect size. Approximately 25% of the variance in VC satisfaction could be accounted for by the regression. One variable (i.e., VC supervision practice) was significantly predictive of VC satisfaction (see Table 8). As predicted, a higher score for VC supervision practice was predictive of a higher score for VC satisfaction. In this sample and the context of these predictors, VC supervision practice uniquely accounted for approximately 19% of the variance in VC satisfaction ($sr^2 = .19$).

Additional Comparisons of Responses from Survey Parts 1-2

In order to attempt to understand the unique contribution of specific supervision activities towards clinicians' satisfaction with supervision, clinicians were asked to rate any

activity used at least occasionally during their supervision sessions by indicating their agreement with three statements: (1) this supervision activity is helpful, (2) I am engaged during this supervision activity, and (3) I wish that more time was spent on this supervision activity (see Table 9). In general, clinicians agreed or strongly agreed that each activity was helpful and engaging, and agreed that they wish more time was spent on that activity. Across the three satisfaction categories, the seven most highly rated activities were also used most frequently, while activities that received slightly lower mean ratings (i.e., training and video-based activities) were used least often during sessions. For all but four items that were not expected to change much when delivered face-to-face or through VC (i.e., delivers feedback in variety of ways, reviews written work, verbal/written instruction, discusses client cases), clinicians provided separate ratings for each activity received during VC/telehealth supervision during the pandemic. Given that clinicians received more supervision on average during COVID (see Table 4), it is unsurprising that they were also slightly less likely to wish that more time was spent on each activity. It is fairly surprising, however, that ratings of helpfulness and engagement were also lower during COVID supervision (ranging from neutral to agree), even for activities that were assumed not be greatly affected by the delivery method used for supervision sessions (i.e., computer- and video-based activities). Three open-ended questions were analyzed for parts 1 and 2, with responses from at least half of participants (range = 50.0%-69.4%). Given the amount of crossover in topics and suggestions, responses to questions 1 and 2 (i.e., “I believe that supervision could be improved by the following” and “I believe that my supervisor could improve in the following areas”) were combined for analysis. Responses to the third question prompt (i.e., “I would like to receive more training/supervision on the following topics” were analyzed separately.

Table 9*Mean Ratings of Satisfaction with Supervision Activities by Delivery Format*

	Helpfulness		Engagement		Want more time	
	Typical	COVID	Typical	COVID	Typical	COVID
Deliver feedback in variety of ways	4.67	-	4.64	-	3.92	-
Observation with feedback	4.71	4.30	4.56	4.23	3.88	3.66
Live modeling	4.54	3.82	4.60	4.10	3.79	3.58
Practice new skills	4.50	4.08	4.52	4.16	3.88	3.59
Reviews my written work	4.54	-	4.60	-	3.75	-
Verbal/written instruction	4.34	-	4.68	-	3.75	-
Discussing client cases	4.54	-	4.28	-	3.79	-
Suggests/assigns readings/materials	4.17	3.62	4.24	3.74	3.75	3.55
Computer-based trainings	4.04	3.55	4.04	3.67	3.63	3.29
Small-group activities	4.00	3.39	4.12	3.61	3.58	3.34
Calculate fidelity	4.17	3.41	4.04	3.36	3.46	3.21
Video modeling	3.92	3.40	3.96	3.80	3.54	3.33
Training presentations	3.92	3.54	3.92	3.69	3.54	3.32
Video feedback	3.88	3.57	3.84	3.58	3.54	3.21
Video self-monitoring	3.79	2.92	3.56	3.31	3.42	3.00

A grounded theory approach was used to identify common themes (see Table 10).

First, it is noteworthy that at least 20% of participants in part 1 and part 2 replied to the first two questions stating that nothing could be improved, particularly given the likelihood that some participants who believed nothing could be improved would simply leave the question blank. Some specific comments included: “I personally love the supervision I receive;” “the supervision I receive is sufficient and helpful;” “it’s already going well for my company;” “I couldn’t imagine it being any better;” “my supervisor gives plenty of useful supervision during and after my client sessions;” “I like my supervisors a lot;” “my supervisor is perfect/amazing.” Despite having specific suggestions for how VC supervision could be improved, one clinician demonstrated empathy in response to the

question about how their supervisor(s) could improve delivery of VC sessions, stating: “I feel they are doing the best [that] they can, but we are still problem-solving.”

Suggestions for improvement were categorized under five themes, including (1) “I would like more...”, (2) “Supervisors could improve...” and (3) “Agency could improve...” (see Table 10). Clinicians generally indicated that they would like more supervision, particularly in individual meetings and formats that allow for individualized attention and feedback. Many clinicians also stated that they would like more group supervision in a client team format or clinician group format with peers with similar experiences (e.g., other clinicians working at the same school site). In both formats, many clinicians requested more time for clinicians to ask questions and engage in collaborative discussion. A number of clinicians also requested more frequent use of specific activities, including trainings, relevant readings/materials, and modeling. One clinician requested use of video models specifically related to feedback being given. The most common complaint for how supervisors conducted sessions was that the supervisor was not engaged or attentive, either because they were multitasking (e.g., catching up on notes) or because they were not providing enough feedback during their observations (e.g., only commenting if the client was displaying challenging behavior). With regards to delivery of feedback, clinicians shared that they wished their supervisor was more “open,” or positive and encouraging (as opposed to “picky and judgmental,” as one clinician claimed), providing higher levels of positive and specific/direct feedback. Clinicians believed that supervisors could show more support in three different ways: (1) recognition of clinicians’ accomplishments or initiative, (2) compassion/checking in on clinician well-being, and (3) listening. Finally, a number of clinicians recognized that their supervisor was overworked, or had too many clients/clinicians on their caseload in order

to be able to provide satisfactory supervision. While some methods of working around this were unpopular (e.g., using rotating graduate students to conduct group supervision, or staff that were not “properly qualified” to provide supervision), several clinicians suggested assisting supervisors by delegating some of their responsibilities to lower-level staff (e.g., researching relevant articles, administrative tasks), even though these tasks are “not always billable” when performed by clinicians not certified as supervisors.

Many suggestions from part 2 were similar to part 1, particularly with regards to areas of supervision they would like more of, and how supervisors could improve methods of conducting sessions and providing feedback. A few expressed frustration with COVID-19 restrictions limiting supervision, such as one agency in which supervisors were limited to visiting four homes per week. In terms of suggestion for improvement for VC sessions, two clinician expressed a preference for face-to-face supervision. One responded: “I’m not sure – I just don’t prefer it.” Another said, “I would prefer more in person supervision, but I understand our ethical responsibility to keep our clients safe.” Others did not express a preference for face-to-face sessions, but reported problems with in-vivo sessions provided through VC. The most common issues were technical issues (i.e., quality of audio/video, internet connection, equipment provided) and issues with environmental arrangement during in-vivo observations (e.g., moving with equipment, needing an additional person present to prevent the client from touching or being distracted by the device, difficulty modeling, needing designated times for receiving feedback and asking questions without the client present, or during breaks from active intervention).

Themes from the third question “I would like more training/supervision on...” are displayed in Table 10. The most common requests for both typical and VC supervision

included parent training and specific aspects of direct intervention (e.g., data collection, error correction, activities to use with clients). For part 1, additional common requests included dealing with challenging behavior (dealing with aggressive and self-injurious behavior, in particular), learning more about specific ABA intervention models that may or may not be used at their service agency, and training on indirect tasks (i.e., developing treatment plans, conducting assessments). For part 2, additional common requests included more training on conducting sessions through VC (i.e., motivating/engaging with clients, activities, dealing with challenging behavior, session efficiency) and targeting specific skills (e.g., stereotypy, self-help skills with task-list items).

IV. Discussion

The current study examined the relationship between supervision practices and satisfaction with supervision from the perspective of clinicians providing behavioral services to individuals with ASD. The results revealed 20 key components of supervision practice (i.e., supervision activities, supervisor proficiency, and evaluation of clinician performance) and 19 key components of supervision satisfaction (i.e., satisfaction with supervision content, satisfaction with level of perceived support, and dissatisfaction with the supervisory relationship). Further analysis demonstrated that supervision practice is a significant predictor of supervision satisfaction for both “typical” sessions (i.e., supervision-as-usual, delivered primarily face-to-face) and sessions delivered through VC. In addition, several variables related to clinician and supervisor demographics, supervision format, and supervision intensity were found to be significantly predictive of scores for supervision practice and supervision satisfaction. Furthermore, comparisons of ratings for specific supervision practices, satisfaction-related variables, and open-ended comments revealed which components of practice continued to be useful and satisfactory when clinicians received supervision through VC. Further analysis of these results will be presented in the following sections, beginning with the limitations of the current study, followed by in-depth interpretation of major findings and implications for future research, practice, and policy.

Limitations

The current study had several methodological limitations. First, the participant sample was a convenience sample. While contact was made with a large number of university-based research programs and clinic- and community-based providers across the state of California, including organizations of varying sizes and implementing a number of different ABA

intervention models, the researcher was dependent on several rounds of self-selection into participation in the research study: including (1) representatives from a larger organizations to distribute the survey to relevant service agencies, (2) representatives from service agencies and organizations to distribute the survey to employees and certificants, and (3) prospective participants to complete the survey. This was particularly complicated in light of the COVID-19 pandemic, as many university research centers were closed and other employees (e.g., regional center employees) were often working from home and dealing with an increased workload. Also, a number of supervisors and agency directors replied indicating that they would like to participate, but they did not currently have any lower-level employees. While clinicians were eligible to participate as long as they had provided services for at least three months in the previous year, there was no means for contacting former employees or research assistants, or RBT/BCaBA certificants who had not self-selected into the BACB email list. As a result, only three participants were recruited through university-based centers, and a lower number of participants than expected were able to complete the survey. A smaller sample size affects the power to detect significant relationships and construct models for relevant variables. In the current sample, there were small effect sizes for the multiple regression equations for VC supervision practice and VC satisfaction, as well as the multivariate analysis of ethnicity on supervision practice. Also, post-hoc tests failed to detect significant differences between groups for two significant predictor variables (i.e., age and ethnicity), as well as between specific subgroups for two additional significant predictor variables (i.e., supervisor education level and VC supervision frequency) due to small or unequal subgroup sizes (Chen et al., 2018). Future research should be conducted with a larger number of participants to see if the current findings can be replicated, verifying the

level of impact for statistically significant predictors of each outcome variable. Studies that are not limited to clinicians without a graduate degree or BCBA certification will yield a much higher response rate.

Regarding the measurement models, the resulting indicators present some areas of concern. Because the items on the supervision practice scale and supervision satisfaction scale originated from different sources, while the mean communality value was greater than 0.5 for both scales, there were a number of variables with communalities lower than 0.5. However,. Additionally, while eight items for the supervision satisfaction scale were drawn from an existing measure with high reliability (i.e., the PSS scale), the four negatively-framed items were grouped onto their own factor despite having been reverse-coded prior to analysis. This resulted in the subscale for dissatisfaction with supervisory relationship. If future research is conducting using a scale with items in the final satisfaction model, the researcher may consider revising negatively-framed items by either reducing the negativity of the wording or changing the wording to positive framing, and conducting further exploratory factor analysis to assess any changes in indicator loadings or factor groupings.

As previously described, the outcome variable for VC supervision practice contained 16 out of 19 variables from the supervision practice scale, and the outcome variable for VC satisfaction contained 9 out of 20 variables from the satisfaction scale. The excluded items were not repeated in the second part of the survey to reduce survey fatigue, as the questions asked about practices or satisfaction-related variables that were not expected to change due to the change in deliver method for supervision sessions. However, this also means that any findings regarding differences in significant predictors of typical compared to VC supervision practice and satisfaction must be interpreted with caution, as these scales are not

directly comparable. Future studies comparing delivery methods for supervision sessions should make sure that any variables of interest are included in both survey sections to increase the validity of direct comparisons.

Interpretation of Major Findings

Major findings from the current study are further described in the following sections. First, a comparison of supervision practices and satisfaction from responses to multiple-choice and open-ended questions was conducted for part 1 (i.e., typical supervision) and part 2 (i.e., VC supervision during the COVID-19 pandemic). Next, implications of significant findings from the three statistical analyses (i.e., EFA, MANOVA, and multiple regression analysis) are discussed in further detail.

Findings from Analysis of Descriptive Statistics and Open-Ended Comments

Participant responses to specific items from parts 1-2 were compared to see how supervision practices and satisfaction changed after the abrupt transition to VC supervision. While the number of clients on each clinician's caseload decreased slightly during COVID, the amount of supervision received increased from an average of 8.57 to 9.01 hours per month (see Table 4). This finding likely accounts for the slight increase in supervision received in all types of formats, as well as the expected increase in sessions delivered through VC/telehealth (from a mean of "sometimes/rarely" to "always"). Clinicians also reported higher satisfaction with the amount of supervision received and were less likely to indicate a desire for more supervision. In both contexts, clinicians reported that supervision sessions were frequently scheduled ahead of time ($M = 3.0$) and rescheduled as warranted ($M = 2.7$). They also reported that they were equally satisfied with their supervisor's ability to shift

focus as warranted ($M = 3.2$), ability to answer all of their questions during/after sessions ($M = 4.3$), and preparedness for supervision sessions ($M = 3.3$).

Interestingly, frequency of most supervision activities decreased slightly during VC sessions, despite clinicians receiving more supervision overall (see Table 4). The frequency of VSM remained stable: this activity was rarely used during typical and VC sessions ($M = 0.7$). The frequency of live observation with feedback also remained stable; supervisors simply switched from conducting in-vivo sessions face-to-face to conducting them through VC. Not surprisingly, the use of video feedback increased slightly in part 2 ($M = 1.5$). In part 1, video feedback was used infrequently ($M = 1.1$), but it was a more common activity for clinicians who received higher levels of supervision through VC. Clinicians did not report participating in any additional activities not mentioned in the survey. Therefore, it is plausible that more time was spent on activities not included in part 2 (i.e., verbal/written instructions, discussing client cases, receiving feedback in a variety of ways, and reviewing written work) during VC sessions. However, it was surprising that average ratings of helpfulness and engagement for each supervision activity decreased from part 1 to part 2 (see Table 9). This difference was expected for activities that have traditionally been conducted face-to-face, such as live modeling and observation with feedback: open-ended comments indicated that activities used during in-vivo sessions were more difficult to implement through VC due to technological issues (e.g., poor video/audio quality), distractions (i.e., clients being distracted by devices and clinicians being distracted while attempting to multitask), and supervisors being unable to model skills with clients, and distractions from clients. However, clinicians expressed decreased satisfaction even with activities that have often been used in remote training and supervision sessions. For example, ratings of

helpfulness decreased from part 1 to part 2 for computer-based trainings ($M = 4.0$ and $M = 3.6$, respectively) and VSM ($M = 3.8$ and $M = 2.9$, respectively). Likewise, levels of engagement decreased for both computer-based trainings ($M = 4.0$ and $M = 3.7$, respectively) and VSM ($M = 3.6$ and $M = 3.1$, respectively). Clinicians did not provide any comments indicating why these types of activities were less helpful or engaging through VC. Anecdotal reports from graduate students and employees who began participating in VC meetings during the pandemic suggest that many individuals do not feel as connected or engaged when attending meetings virtually from their home compared to typical lab or work meetings. Similarly, clinicians may not feel as encouraged or supported by supervision activities during VC sessions when others are not physically present. As COVID restrictions begin to be lifted, one solution may be to allow pairs or small groups of clinicians to attend VC meetings in the same office space (e.g., Vismara et al., 2009), with use of face masks and social distancing as needed. Regardless, further research is needed examining how activities can be implemented through VC during one-on-one meetings, in-vivo sessions, and group meetings without sacrificing supervision quality.

Another surprising finding was that mean ratings for 5 out of 6 items related to supervisor behavior from the satisfaction with perceived level of support subscale were higher in part 2 (see Table 4). Supervisors were perceived to be more energetic and enthusiastic and demonstrating behaviors associated with perceived level of support (i.e., listening well, being approachable, showing support and positive regard, being attentive to clinicians' abilities and training needs) at a higher level during VC sessions. Supervisors were equally likely to be able to answer all of the clinicians' questions during typical and VC supervision, although they were slightly more likely to answer their most urgent questions

during typical supervision sessions. Clinicians were also slightly more likely to agree that their supervision group serves as a source of social support in part 2. Further research is needed to assess whether clinicians continue to experience high levels of perceived support through VC when supervision is provided at the same level of intensity compared to typical supervision sessions. In contrast, mean ratings for all three items from the satisfaction with content subscale were slightly higher for typical supervision sessions. Clinicians were more likely to agree that supervision is a collaborative experience, enhances their ability to make decisions and solve problems, and advises helpfully about clinical interactions in part 1. They were also more likely to report enjoying attending supervision sessions when delivered in the typical format. These results are consistent with the ratings of individual supervision activities indicating that the content of supervision is less satisfactory to clinicians when sessions are conducted entirely through VC.

Responses to open-ended questions indicate that a number of surveyed clinicians would prefer more supervision in an individual meeting format in order to receive more individualized attention and feedback, with a few specifically commenting that they wanted less group supervision. However, similar numbers of clinicians stated that they would prefer more group supervision, particularly for training, collaborative/interactive sessions, and being able to meet with other clinicians on the same client team or in the same setting (see Table 10). These findings seem to suggest that the non-significant negative relationship between group format and supervision satisfaction observed in the multiple regression analysis may be accounted to group supervision being provided in larger groups primarily for efficiency, with the benefit of efficiency offset by the cost of clinicians receiving impersonal, less interactive, less supportive supervision. This may also explain why the delivery method

used for supervision sessions (i.e., frequency of face-to-face sessions) was not a significant predictor of supervision practice score, as one would expect that activities and behaviors used during face-to-face meetings could be more easily used or adapted for remote meetings delivered through VC compared to in-vivo sessions through VC.

Findings from Statistical Analyses of Supervision Practice

Model building through EFA demonstrated that high-quality supervision practice consists of a combination of factors, including supervision activities, supervisor proficiency in leading sessions and implementing components of BST, and evaluating clinicians on performance. Several variables were found to significantly predict supervision practice scores for part 1: receiving supervision in a group format, more frequent supervision in an individual meeting format, and a higher number of hours of supervision per month was associated with higher supervision practice scores. The amount of supervision provided in-vivo or in a face-to-face format was not significantly predictive of supervision practice score. This indicates that high-quality supervision can be provided when sessions are delivered face-to-face, remotely, or through a combination of face-to-face and remote sessions. For part 2, only one variable (individual meeting format) was significantly predictive of VC supervision practice scores. Greater frequency of supervision received in an individual meeting format was predictive of higher supervision practice scores.

Four categorical variables significantly predicted scores for subscales of supervision practice in part 1 and/or part 2, including ethnicity, supervisor education level, supervisor performance evaluation, and supervision frequency. Ethnicity was a significant predictor of supervision activity score: while post-hoc tests were not statistically significant, clinicians who identified as Hispanic/Latino had higher mean scores compared to clinicians who

identified as white, Asian, or having multiple ethnicities. No studies were identified in the review of the literature discussing differences in training and supervision practices for clinicians of different ethnicities. Nonetheless, given the results of the current study, future research should investigate potential differences in both supervision practice and satisfaction by clinician ethnicity. Another limitation of the current study is a lack of information on supervisor ethnicity, as all of the data was collected through clinician self-report. Thus, future studies should also investigate the role of supervisor ethnicity, particularly with regards to supervisory relationship satisfaction when supervisors and clinicians are of the same ethnicity versus different ethnic backgrounds.

Supervisor education level was also a significant predictor of supervision activity score. Clinicians who reported having a primary supervisor with a Ph.D. had significantly higher supervision activity scores compared to clinicians with an M.A.-level supervisor. Scores were also much higher for Ph.D.-level supervisors compared to B.A.-level supervisors, although this difference was not statistically significant due to group size limitations. Likewise, potential differences in VC supervision activity scores could not be examined due to insufficient cases at each level. Nonetheless, clinicians with Ph.D.-level supervisors were more likely to report that their supervisor would frequently or always ask clinicians to calculate fidelity of others' performance as well as use video models, VSM, training presentations, and clinician self-evaluations during supervision sessions. Ph.D.-level supervisors were also reported to be more likely to always assign up-to-date readings and other materials, conduct small-group activities, and use a meeting agenda. Given that almost all of the supervisors represented in the current dataset were certified as a BCBA or BCBA-D, differences in supervision activities by education level may be attributed to the fact that

supervisors with a doctoral degree are also likely to have greater experience in the field. A higher level of experience with both research and supervision may provide Ph.D.-level supervisors with a greater understanding of different tools for evaluating fidelity and providing continued training during supervision sessions.

Supervisor performance evaluation was a significant predictor of both supervision activity and supervisor proficiency scores in parts 1-2. Clinicians were asked to select each area of performance in which their supervisor was evaluated: the most common areas of evaluation included professionalism, providing performance feedback, conducting supervision sessions, effectiveness, time management, and ethics/organization, respectively. Clinicians who reported evaluating their supervisor in at least 6 of the 7 specific areas of performance (group 3) had significantly higher supervision activity scores compared to clinicians who evaluated their supervisor in 1-5 areas of performance (group 2) and clinicians who reported that they did not evaluate their supervisor in any of the listed performance areas (group 1). Group 2 had a slightly higher mean score compared to group 1, but this difference was not significant. With regards to supervisor proficiency, group 3 had a significantly higher mean score compared to groups 1-2. Surprisingly, while the difference was not significant, group 2 had a slightly lower mean score compared to group 1. Ratings for frequency of individual items on the supervisor proficiency subscale were compared for supervisor performance evaluation groups. On all eight items, ratings were highest for group 3, followed by group 1 and group 2. Given the expectation that supervisors who were evaluated in at least one specific area of performance would have higher proficiency scores compared to supervisors not evaluated in any specific area of performance, the researcher hypothesized that this finding may be attributable to differences in demographics of clinician

respondents. For example, younger, inexperienced participants who are less engaged in the supervision process and less critical of supervisor proficiency may not pay as much attention to the performance areas listed on evaluation forms and select “none of the above.” On the other hand, older, more experienced clinicians who are more engaged in the supervision process may pay greater attention to performance areas on evaluation forms, and provide lower ratings for aspects of supervisor proficiency for supervisors who do not solicit detailed evaluations from their supervisees. To investigate this hypothesis, scores for supervisor performance evaluation (i.e., 0, 1, and 2 for groups 1-3, respectively) were compared for clinician age group and experience level. Mean evaluation scores were lower for clinicians ages 18-23 ($M = 0.2$) compared to clinicians ages 24-33 ($M = 0.8$) and clinicians age 34 and higher ($M = 0.6$). Similarly, clinicians in group 1 had fewer years of experience providing ABA services for individuals with ASD ($M = 2.9$) compared to clinicians in group 2 ($M = 3.6$) and group 3 ($M = 3.9$). Clinicians with ≤ 1 year and ≤ 2 years of experience had mean scores below 0.5 ($M = .37$ and $M = .46$, respectively). Altogether, these findings seem to indicate that clinician age and experience level may be a confounding factor for selecting specific areas of performance evaluation, with younger, less experienced clinicians being more likely to report that they did not evaluate their supervisor in specific areas of performance. Regardless, clinicians who reported that their supervisor was evaluated in 6-7 of the listed areas of performance had significantly higher scores for supervision activities and supervisor proficiency. While causation cannot be inferred from correlational data, it does appear that proficient supervisors ask their supervisees to provide detailed evaluations of their performance, and it is possible that this feedback in turn provides supervisors the

opportunity to increase their use of helpful activities and proficient behaviors during supervision sessions.

Lastly, frequent supervision (i.e., at least one session per week) was predictive of higher supervisor proficiency scores for part 2 only. It is surprising that session frequency was not also predictive of supervisor proficiency for typical sessions. However, given the number of subscale items related to suggestions for improving VC in-vivo sessions, such as demonstrating new skills through live modeling and providing positive and corrective feedback (see Table 10), it is possible that clinicians who received more frequent supervision through VC received more in-vivo modeling and feedback across sessions. Another possibility is that clinicians typically receive some amount of “informal” supervision outside of supervision sessions by spending more time around other clinicians. For example, they may overlap briefly with more experienced clinicians during client sessions, observing how these clinicians handle a problem behavior, record data, or respond to questions from family members before they wrap up their session. This transition can also provide opportunities for the clinician who has just arrived to ask the other clinician about how their session went and make a plan for how to structure their own session. During the pandemic, clinicians likely had few opportunities to observe or interact with other clinicians, relying entirely on their supervisors for modeling and feedback.

Findings from Statistical Analyses of Satisfaction

Supervision practice was significantly predictive of supervision satisfaction, with higher supervision practices scores predicting higher satisfaction scores across delivery methods. In addition, clinician age and experience level were significant predictors of supervision satisfaction scores. Age was significantly predictive of scores on the satisfaction

with level of perceived support subscale. While post-hoc tests did not find significant differences between groups, clinicians ages 18-23 had lower satisfaction with perceived support ($M = 3.83$) compared to those ages 24-33 ($M = 4.53$) and age 34+ ($M = 4.47$). In previous surveys, Plantiveau et al. (2018) found that age was a protective factor against burnout, with younger clinicians and supervisors experiencing significantly higher levels of burnout; Gibson et al. (2009) found that clinician scores on the PSS scale were significantly predictive of lower levels of burnout. Therefore, further research is needed to determine how supervisors can increase levels of perceived support for younger clinicians, as this population is more likely to experience burnout and turnover intention.

Clinician experience level was also significantly predictive of scores for the satisfaction with perceived level of support subscale in part 1 and part 2. Clinicians with 3-6 years of experience and more than 6 years of experience had significantly higher scores for both typical and VC supervision sessions compared to clinicians with 0.5-3.0 years of experience. However, it is encouraging that clinicians with less than 1 year of experience did not experience a decrease in satisfaction with perceived support when supervision was received through VC, particularly since these clinicians were younger on average than in other experience groups. In fact, scores increased for group 1 from part 1 ($M = 3.9$) to part 2 ($M = 4.5$). This may be attributed to the increased intensity and frequency of supervision received during COVID, which would be particularly beneficial to newer clinicians. On the other hand, all other groups of clinicians (i.e., those with >1 year of experience) experienced decreased satisfaction with level of perceived support from part 1 to part 2. This may indicate that clinicians who have more established supervisory relationships perceive their supervisor to be less supportive when supervision is provided from a distance. Yet this difference should

be interpreted with caution, given that the subscale for part 2 did not include all of the questions from the subscale developed using data from part 1.

While the potential role of social support from other coworkers on clinician satisfaction could not be evaluated in the current study due to the percentage of participants receiving group supervision, the item “my supervisor serves as a source of social support when I feel stressed at work” was included in the final subscale for satisfaction with level of perceived support. The act of providing social support may need to be more clearly defined for future research, given one clinician’s comment: “[my supervisors] don’t typically provide social support, but I’m not sure that I would want them to.” Interestingly, only one item on the subscale for satisfaction with perceived level of support was not related to a practice that may be agency-specific rather than supervisor-specific (i.e., “I am satisfied with the amount of supervision I receive.”) Given the number of open-ended comments suggesting that supervisors could improve by showing more support (see Table 10), these findings suggest that supervisors can increase levels of perceived support through their behavior, even when it is not possible to increase the amount of supervision provided. Thus, continued research is needed to develop definitions of subjective aspects of supervisor support (e.g., being approachable) based on observable, measurable behaviors (e.g., using specific active listening strategies during meetings and conducting mid-week check-ins) as well as develop interventions to increase supervisor proficiency in these skills.

Implications and Future Directions

In order to further enhance the validity of these findings, we recommend the following directions for supervision of behavioral clinicians working with individuals with

ASD. Additional implications for future research as well as implications for clinical practice and policy are described below.

Implications for Future Research

First, and perhaps most obviously, continued research is needed on the effectiveness of supervision provided through VC. Many of the suggestions for improving VC supervision related to conducting in-vivo sessions, both in terms of issues with technology (i.e., internet connection, audio/video quality, devices used) and figuring out how to best conduct sessions with participants in different locations. A survey similar to the current study should be conducted with supervisors, asking specifically about how they have managed common technical issues, modified how they conduct sessions, and their level of satisfaction with conducting sessions through VC. Considering that perceived enjoyment with conducting supervision was part of the final model for clinician supervision satisfaction, supervisor satisfaction with remote supervision may boost morale and help prevent burnout for both supervisors and clinicians.

Consistent with findings from the reviewed experimental studies, the majority of clinicians in the current study who received supervision remotely reported high levels of satisfaction with VC sessions, although a few provided neutral ratings of comfortability with the technology and receiving feedback through VC. Continued research in this area during the COVID-19 pandemic could shed light on whether decreased use of and satisfaction with specific supervision activities may be due simply to the period of transition to remote supervision, or if these findings are indicative of continued lower levels of satisfaction with supervision received through VC. When feasible, supervisors might consider using a combination of VC and face-to-face sessions so that supervisors and clinicians have the

opportunity to build rapport and develop the supervisory relationship in-person, while still allowing for supervision to be conducted in an efficient manner for providers serving families across a large geographic distance.

Interestingly, while the percentage of clinicians working primarily with babies/toddlers, adolescents, and adults did not change much from part 1 to part 2, the percentage of clinicians working with preschool-age clients decreased, while the percentage working with elementary-school-age clients increased. It is possible that the demand for support with online school and facilitating the transition to elementary-school children being home full-time partly accounts for this change; yet, given the decrease in the total number of clients served, this also seems to indicate that fewer families of preschool-age children received services post-COVID. Further research may be needed to determine how preschool-age clients and their families can be best supported through remote or socially-distanced intervention sessions.

Additionally, given the findings supporting individualization of supervision for clinicians of different levels, it is recommended that researchers include data on clinicians' behavioral goals, responses to self-report questionnaires, and demographics for individual participants or groups (e.g., clinicians with less than or more than one year of experience) in their writeup or an appendix. Likewise, any information about supervisor demographics, procedural fidelity, and materials used for supervision sessions (e.g., task analyses for specific activities, sample meeting agenda, evaluation form template) should be included to further explore the relationship between supervisor qualifications and methods of conducting supervision sessions on clinician satisfaction levels.

Finally, the current study should be replicated with a larger sample of clinicians. Given that the majority of states have imposed restrictions due to COVID-19, participants should be recruited on a national level to ensure that the experiences and perspectives of clinicians working outside of California are represented in the data.

Implications for Practice

Parent training was one of the two most commonly-requested topics for additional training and supervision in both part 1 and part 2. Supervisors may consider teaching basic parent training skills as part of their initial training on direct intervention procedures, considering that many clinicians will be interacting with parents on a routine basis during client sessions and that these skills may take time to master. For example, supervisors could conduct video feedback sessions on parent training during group meetings, which would provide modeling of parent training procedures and supervisor feedback for newer clinicians as well as higher intensity of supervision to clinicians implementing parent training interventions. To address questions about how to best conduct parent training and support families of preschool-age clients through VC, providers may consider conducting an anonymous survey of current and former clients to see what suggestions they may have for improving in-vivo and parent education sessions through VC (e.g., changing environmental arrangement or session scheduling) as well as areas in which they feel less supported (e.g., targeting certain skills, not having babysitters available).

While the current study yielded limited information on how tiered service-delivery models with assistant supervisors are used in practice, several clinicians indicated both helpful and unhelpful tasks completed by assistant supervisors: having sessions constantly being led by different supervisors and not receiving supervision from the lead supervisor or

director was negatively perceived, while having assistant supervisors conduct indirect tasks to lighten the supervisor's workload was perceived as helpful and even something that clinicians would like to participate in for their own professional development. Supervisors may also consider how assistant supervisors can help increase the efficiency and effectiveness of supervision sessions, such as having an assistant supervisor on-site during VC in-vivo sessions to assist with modeling, moving equipment, and preventing distractions for the client. Assistant supervisors could also help with group sessions by leading smaller groups of clinicians for training and discussion-based activities while the lead supervisor rotates between groups or observes the assistant supervisors in order to evaluate their performance. Given clinician requests to have more time for both client team meetings, with time for questions and collaborative discussion, as well as requests for more trainings and group-activities, providers might consider dividing group supervision meetings into two or more "sections" to allow for some time for each task.

Results from factor analysis and open-ended comments suggest that being able to communicate with one's supervisor on a regular basis and having lots of time for questions are important aspects of high-quality supervision. While emails and in-person meetings are helpful, whether supervision is provided face-to-face or through VC, supervisors may consider an additional method of communicating with clinicians between sessions. For example, a clinician group or client team could communicate through a group chat or forum, posting any questions from their client session that need to be answered before the next supervision session. Given that some clinicians found there was limited time to discuss client progress during in-vivo VC sessions, supervisors could schedule a video chat or phone call

sometime after the supervised client session to debrief as well as check in with the clinician in general.

Many clinicians indicated difficulty receiving feedback during in-vivo sessions through VC due to technical issues and disruptiveness during client sessions. Supervisors may also face difficulties providing specific, timely feedback to clinicians through VC, particularly if sessions are being conducted in a non-English language (e.g., Barkaia et al., 2017). One way to circumvent these issues would be increased use of delayed video feedback to supplement in-vivo feedback. This combined method would allow clinicians to receive some immediate feedback during client sessions and provide opportunities for more thorough feedback during video feedback sessions. Additionally, supervisors may consider using video feedback during individual client meetings to provide private, individualized feedback that would not be feasible during face-to-face client sessions or group supervision meetings.

Implications for Policy

The results from this study demonstrate that ABA providers on average are meeting BACB guidelines and other recommended supervision practices. Findings from subsequent analyses provide some additional support for the validity of recommended practices, with variables such as supervision intensity and frequency of supervision in an individual meeting format predicting higher supervision practice scores, which are in turn predictive of higher satisfaction scores for clinicians. Specifically, a higher number of supervision hours per month was predictive of higher scores for typical supervision practice, while conducting sessions frequently in an individual meeting format was predictive of higher supervision practice scores for both typical and VC supervision. Also, supervision sessions provided at least once per week were predictive of higher supervisor proficiency scores for VC

supervision sessions. While this work is no doubt in progress, there is a need for agencies determining policies for VC/telehealth services (i.e., the BACB, insurance providers, regional centers, and other authorizing agencies) to issue guidelines and recommendations for supervision sessions provided remotely. Many of the current guidelines were issued in haste to ensure that families could receive services through VC, and providers will continue to receive updates about recommended VC programs for client and supervision sessions (such as free, HIPAA-compliant platforms made available for providers contracted with specific insurance companies). However, clinicians, supervisors, and parents are less likely to be informed or have expertise with regards to other technical considerations (e.g., network security, speed required for quality audio/video, optimal devices, HIPAA-compliant programs for communication and data transfer). Agencies might consider issuing a list of guidelines and/or suggestions in these areas for different supervision activities (e.g., in-vivo observations versus one-on-one meetings), different devices (e.g., computer versus mobile device), and locations (e.g., family homes in remote areas).

Results from the current study also suggest potential modifications to existing guidelines for group supervision. These findings do support the recommendation for providing individual supervision, but also show that group supervision may provide opportunities for activities and collaborative discussion associated with higher-quality supervision practice, provided that sessions are conducted well (i.e., not self-guided, or offering few opportunities for questions, individualized feedback, or continued training). Additional guidelines for how group supervision is conducted, in addition to group size and frequency, will support BCBA's in providing more effective group supervision as the literature base continues to grow. For example, supervisors could be required to ensure that

each participating clinician receives individualized feedback for a certain percentage of the meeting, or that at least half of the meeting is spent discussing topics that are directly relevant to clients on the clinician's caseload.

Lastly, findings from the current study indicate that supervisor evaluation in specific areas of performance is significantly predictive of higher supervision practice scores, and several clinicians commented that they wished that their supervisor solicited their feedback as part of supervision sessions. The BACB could further encourage use of evaluations for supervisors by requiring that BCBAs submit evaluations conducted before each credential renewal period. In addition, given that many BCBAs and higher-level supervisors are independently employed or do not have access to regular observations from a superior, the BACB could provide resources for these supervisors. For example, the website could provide resources for self-evaluation, such as a task analysis for conducting VSM and templates for procedural fidelity checklists and clinician evaluation forms. In addition, they could provide an option for BCBAs to be added to a registry of self-employed supervisors who can evaluate each other. For example, they could request to partner with another BCBA, and share video clips of supervision sessions so that each supervisor could take turns conducting a video feedback session. Also, all BCBAs may benefit from being able to participate in a forum for posting issues that have come up with supervisees or structuring supervision sessions and advice for how to approach the situation (e.g., receiving negative feedback on evaluation form, providing suggestions to a clinician for how to better engage with their client during VC sessions).

Conclusion

The current study has added to the literature on supervision for behavioral clinicians working with individuals with ASD in several ways. The findings show that existing guidelines for supervision practice are being met in the vast majority of service agencies in clinic- and community-based settings across California. The newly developed scales for supervision practice and satisfaction appear to be reliable indicators of supervision quality from the perspective of the clinicians receiving supervision, and scores on the supervision practice scale were significantly predictive of scores on the satisfaction scale for participants in this sample. Higher intensity and frequency of supervision in specific formats was associated with higher-quality supervision practice. Other characteristics of clinicians and supervisors influencing supervision practice and satisfaction scores were identified. We learned that the quality of supervision activities and supervisor proficiency varies based on the supervisor's education level and evaluation processes, supervision frequency, and even clinician ethnicity. We also learned that age and experience level predict higher levels of satisfaction with perceived support, indicating that younger, less-experienced clinicians are more likely to experience lower levels of support from their supervisors. Additionally, this study identified ways in which typical supervision practices were modified for delivery through VC during the COVID-19 pandemic. Clinicians who had received supervision both face-to-face and through VC indicated their satisfaction with different aspects of supervision sessions and provided a number of suggestions for how supervision could be improved when delivered through each method. Overall, supervisors were able to successfully adapt typical supervision practices for remote supervision sessions. Clinicians reported similar frequency of supervision activities and ratings of satisfaction across delivery formats. They indicated that supervisors were able to show high levels of support through VC and that their

supervision group served as a source of social support during the pandemic. However, clinicians indicated lower levels of satisfaction with supervision activities conducted remotely, expressed frustration with technological issues and distractions during VC in-vivo sessions, and requested additional training and supervision on how to interact with clients and target specific skills through VC. Overall, results from the current study demonstrate that use of high-quality supervision practices will increase levels of satisfaction and perceived support and may help reduce rates of burnout and turnover among behavioral clinicians. Efforts to improve supervision practices will have positive outcomes for clinicians, supervisors, service agencies, and families of individuals with ASD.

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Table

Geomin-Rotated Loadings for Supervision Practice EFA Model

Item	Loadings			Communality
	Supervision Activities	Supervisor Proficiency	Clinician Evaluation	
Supervisor demonstrates new skills by showing video models	.791	.096	-.298	.567
Supervisor instructs clinicians to conduct video self-monitoring	.709	-.006	-.352	.401
Supervisor instructs clinicians to calculate fidelity of others' performance	.610	.048	-.220	.325
Supervisor suggests or assigns up-to-date readings and other materials	.692	.090	-.053	.543
Supervisor uses training presentations (e.g., PowerPoint slides, webinars)	.827	-.290	.058	.573
Supervisor conducts small-group activities	.939	-.373	-.009	.681
Supervisor requires clinicians to complete a self-evaluation of their performance	.604	-.073	.096	.384
Supervisor provides or requests a meeting agenda prior to supervision sessions	.514	.291	-.006	.488
Supervisor demonstrates new skills through live modeling	.069	.696	-.026	.522
Supervisor requires clinicians to practice new skills (e.g., role-play, with client)	.219	.415	.189	.433
Supervision sessions can be re-scheduled as warranted	.027	.484	-.123	.220
I am able to correspond with my supervisor between supervision sessions	-.045	.648	.018	.402
Supervisor gives behavior-specific positive feedback about my strengths	.087	.518	.294	.532
Supervisor gives behavior-specific corrective feedback about my weaknesses	-.008	.522	.476	.659
Supervisor is able to shift focus during sessions as warranted	-.025	.803	.014	.633
Supervisor is prepared for supervision sessions	-.003	.646	.064	.447
Supervisor provides observation with feedback	-.006	.419	.476	.532
Supervisor delivers feedback in a variety of ways (e.g., verbal, written, graphic)	.215	.279	.563	.712
Supervisor provides a verbal and/or written evaluation of clinician performance	.106	.021	.667	.531

Table 6*Geomin-Rotated Loadings for Satisfaction EFA Model*

Item	Loadings			Communality
	Satisfaction with Content	Level of Support	Dissatisfactory Relationship	
Supervision builds and enhances my clinical skills	.804	.096	-.005	.750
Supervision expands my knowledge base	.767	.076	-.137	.711
Supervision advises helpfully about my clinical interactions with clients, families, providers	.827	-.045	-.001	.749
Supervision encourages my professional development	.852	-.017	.048	.741
Supervision enhances my ability to make clinical decisions and solve problems	.849	.029	.126	.690
Supervision is a collaborative experience	.522	.296	.040	.374
I am satisfied with the amount of supervision that I receive	-.154	.762	-.005	.453
My supervisor is able to answer all of my questions during or after supervision sessions	-.072	.541	.137	.365
My supervisor is attentive to my current abilities and training needs	-.016	.933	-.006	.844
My supervisor facilitates my critical thinking	-.002	.960	-.122	.766
My supervisor shows energy and enthusiasm	.092	.580	.249	.703
My supervisor enjoys conducting supervision sessions	.009	.681	.147	.638
My supervisor serves as a source of social support when I feel stressed at work	.095	.627	.059	.539
My supervisor is approachable	.079	.538	.319	.721
My supervisor values my contribution	-.071	.480	.390	.587
My supervisor really cares about my well-being	.051	.568	.050	.408
My supervisor fails to appreciate any extra effort from me (R)	-.027	.108	.630	.486
My supervisor would ignore any complaint from me (R)	-.068	-.007	.875	.703
Even if I did the best job possible, my supervisor would fail to notice (R)	.040	.133	.809	.866
My supervisor shows very little concern for me (R)	.101	.079	.756	.757

Table 10

Suggestions for Improvement for Typical and VC Supervision Sessions

I would like more...	Typical (N = 89)	VC (N = 51)	Comments
Supervision, period	5	4	
Individualized attention/feedback	16	5	
1:1 meetings	7	6	
Group meetings	7	2	"So we can share our experiences and practice"
Frequent sessions	5	3	"More frequent [supervision when] beginning new cases AND skill applications"
Face-to-face sessions	1	2	
Time for questions/collaborative discussion	11	7	"Listening to RBTs... more time answering questions without being in a rush"
Modeling/video models	8	3	For VC: supervisors could "[show] their screen as they draw visuals/steps."
Training presentations	8	0	
Readings/materials	4	0	
Small-group activities	2	0	
Supervisors could improve...	Typical (N = 89)	VC (N = 51)	Comments
Performance feedback (positive, specific)	17	6	"Limiting constructive feedback to one thing that you can improve per session."
Showing support	12	3	
Engagement during sessions	9	2	"Being present in the moment." "Not catching up on notes."
Communication skills (timely, email)	5	0	
Time management/organization	4	0	
Sharing/reviewing data	3	0	"Updating me on parent training goals"
Providing a meeting agenda	2	3	
Taking notes during sessions	2	0	
Asking clinicians to evaluate them	2	1	
Scheduling ahead of time	0	2	
Maintaining confidentiality	0	1	
Agencies could improve...	Typical (N = 89)	VC (N = 51)	Comments
Support to relieve supervisor workload	7	0	"Allowing RBTs to do more administrative roles that a BCBA does (even though those are not always billable)"
More sessions from higher-level supervisor	4	0	
Resolving in-vivo technical issues	0	19	"Supervisor [could] switch off video during program and switch back on during child breaks to reduce distractions"

I would like more training/supervision on...	Typical (N = 81)	VC (N = 38)	
Parent training	17	8	“Talking with/explaining programs to family members”
Direct intervention/data collection	17	9	
Dealing with problem/aggressive behavior	11	1	“I get flustered in the face of aggression, and would like more in-the-moment feedback.”
Specific ABA intervention models	10	3	
Conducting assessments	5	1	
Reports/treatment planning	5	0	
Everything!	3	1	"Anything and everything. I would love to be a more well-rounded clinician."
Diversity	3	0	“How to manage [cultural diversity] with clients [with] different backgrounds”
Training clinicians/aides	2	0	
Ethics	2	1	
Supervisory preparation	2	0	“More clinical work, so I am better prepared for when I become a supervisor.”
Mental health	1	0	
Policy	1	0	
Perspective of Autistic people on ABA	1	0	
Trauma from client death/injury	1	0	
Use of technology	1	0	
Interactions with clients through VC	0	4	
Targeting specific skills through VC	0	6	

Figure 1

Proposed Satisfaction with Supervision Practice Logic Model

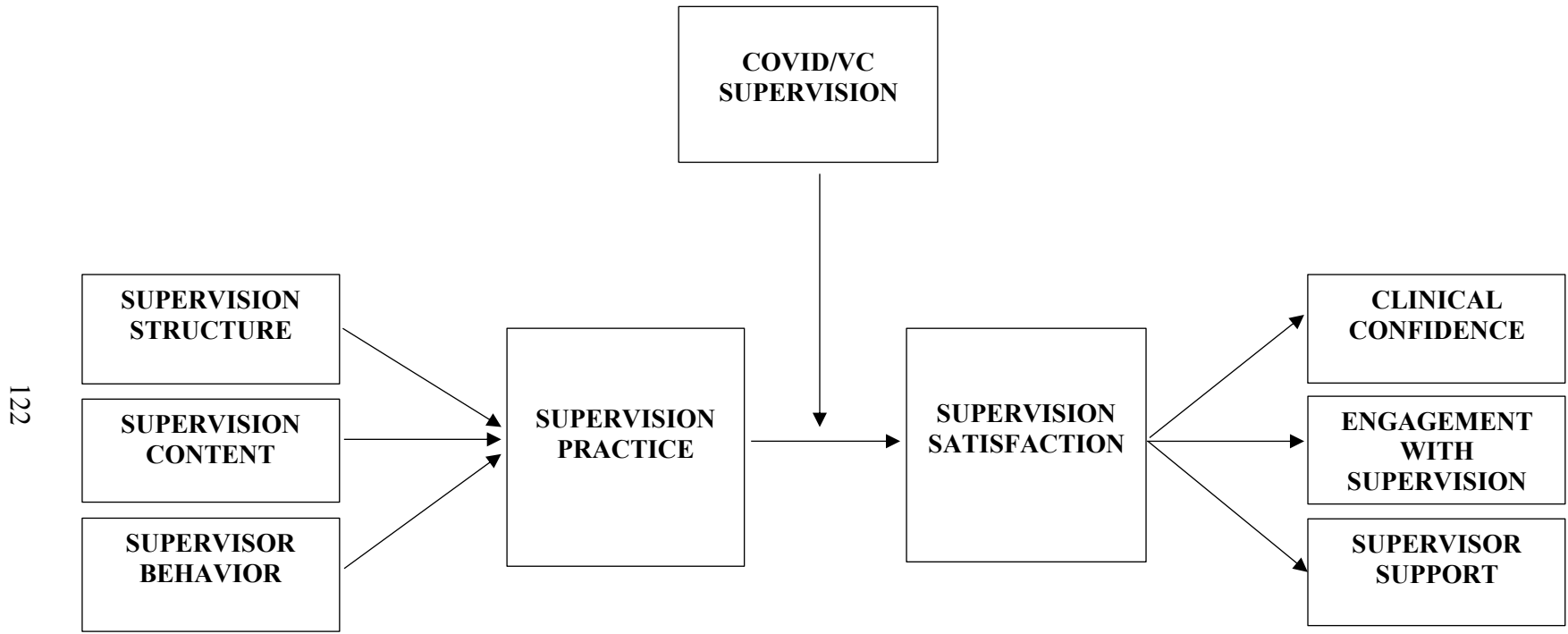


Figure 2

Scree Plot with Parallel Analysis for Supervision Practice

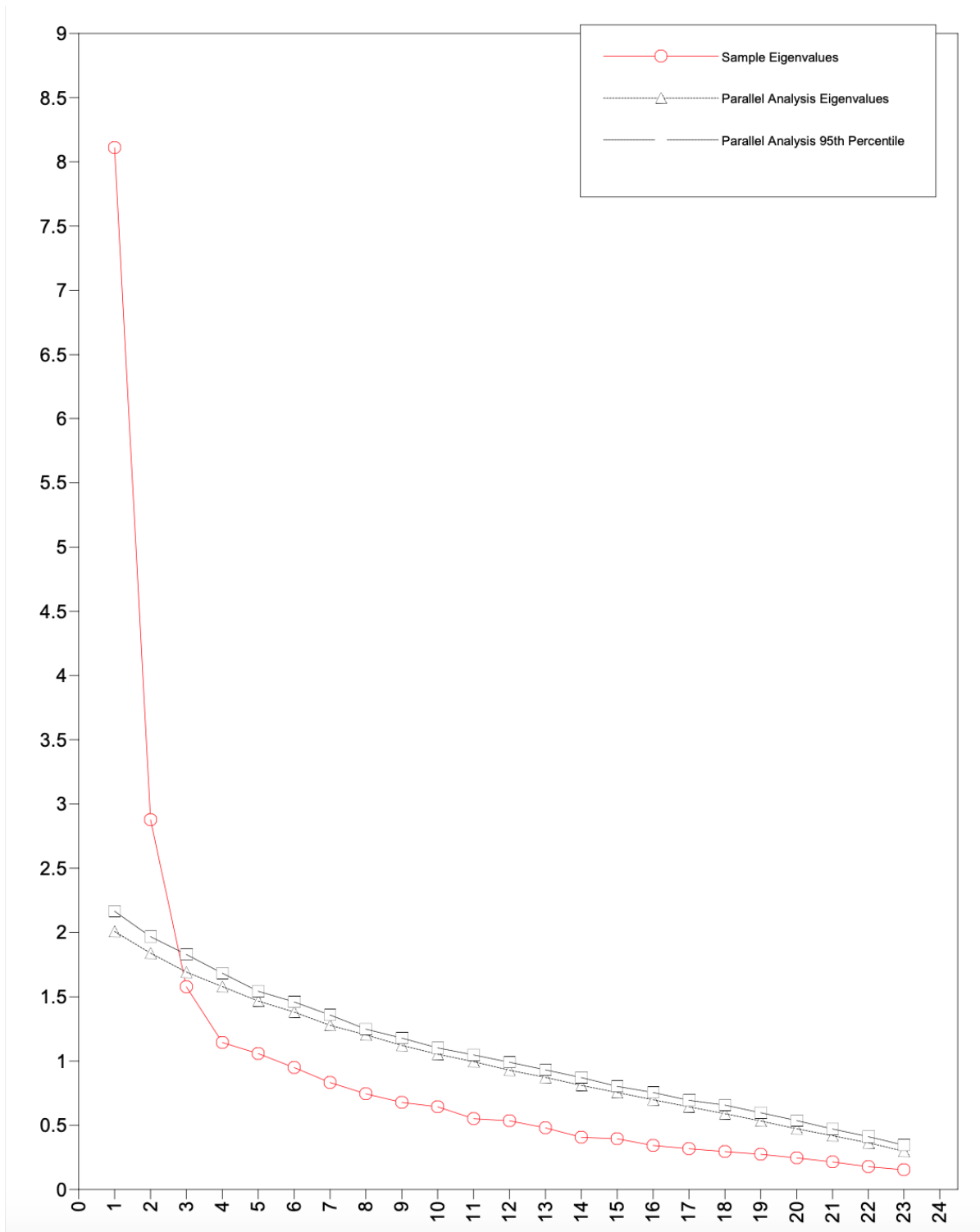


Figure 4

Scree Plot with Parallel Analysis for Supervision Satisfaction

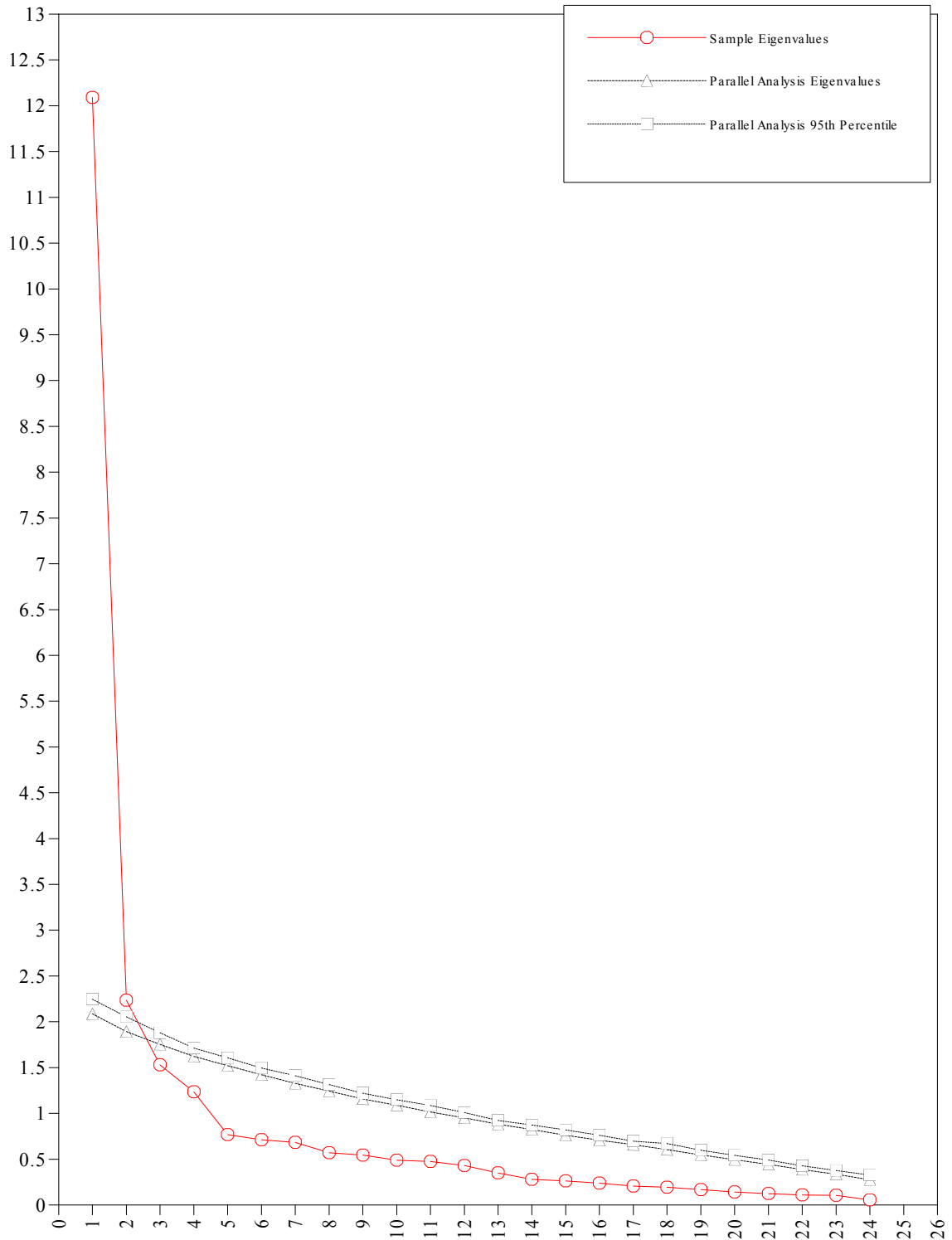


Figure 8

Scatterplot of Residuals for Supervision Practice Regression Equation

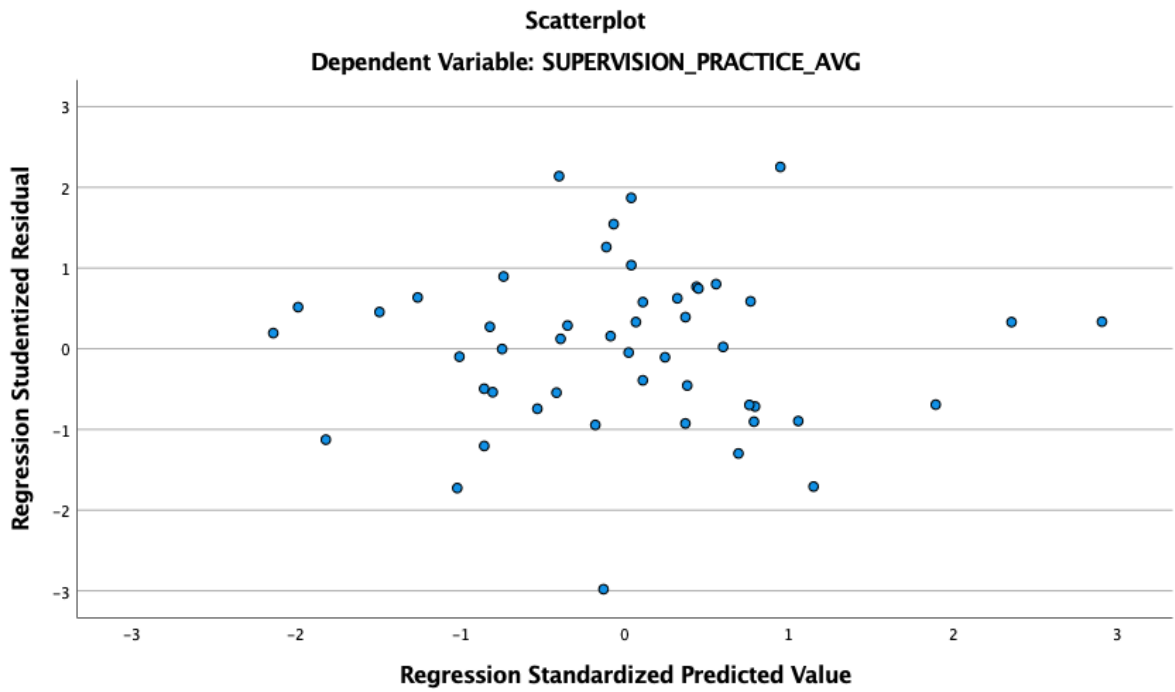


Figure 9

Scatterplot of Residuals for Satisfaction Regression Equation

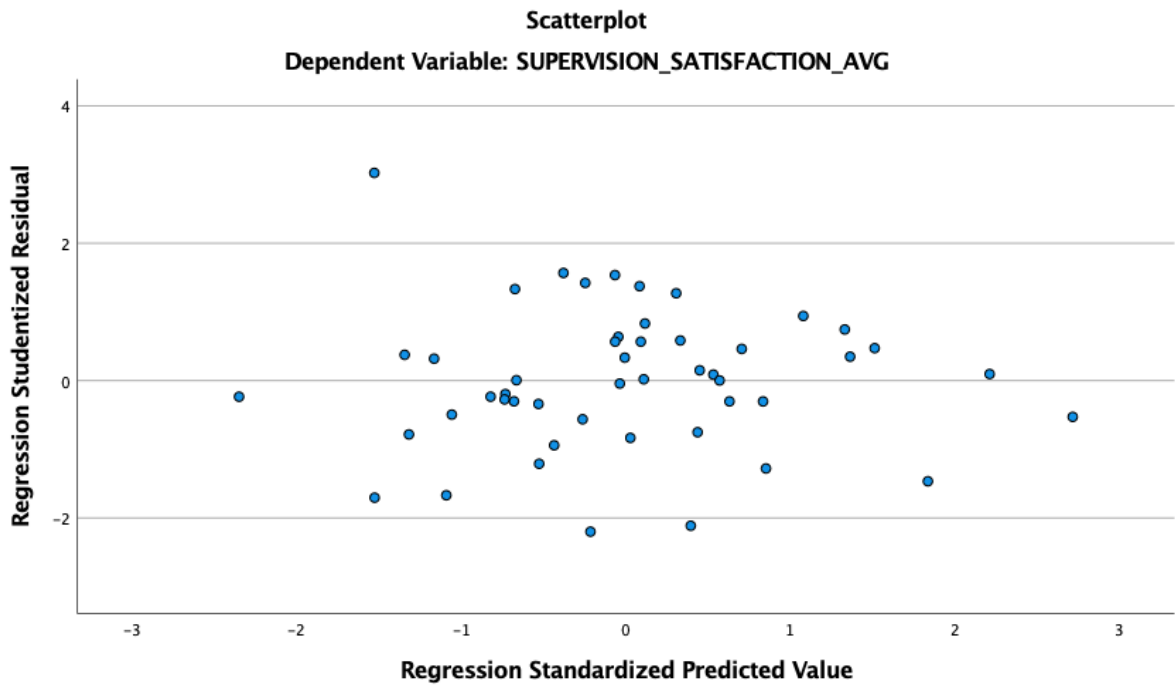


Figure 10

Scatterplot of Residuals for VC Supervision Practice Regression Equation

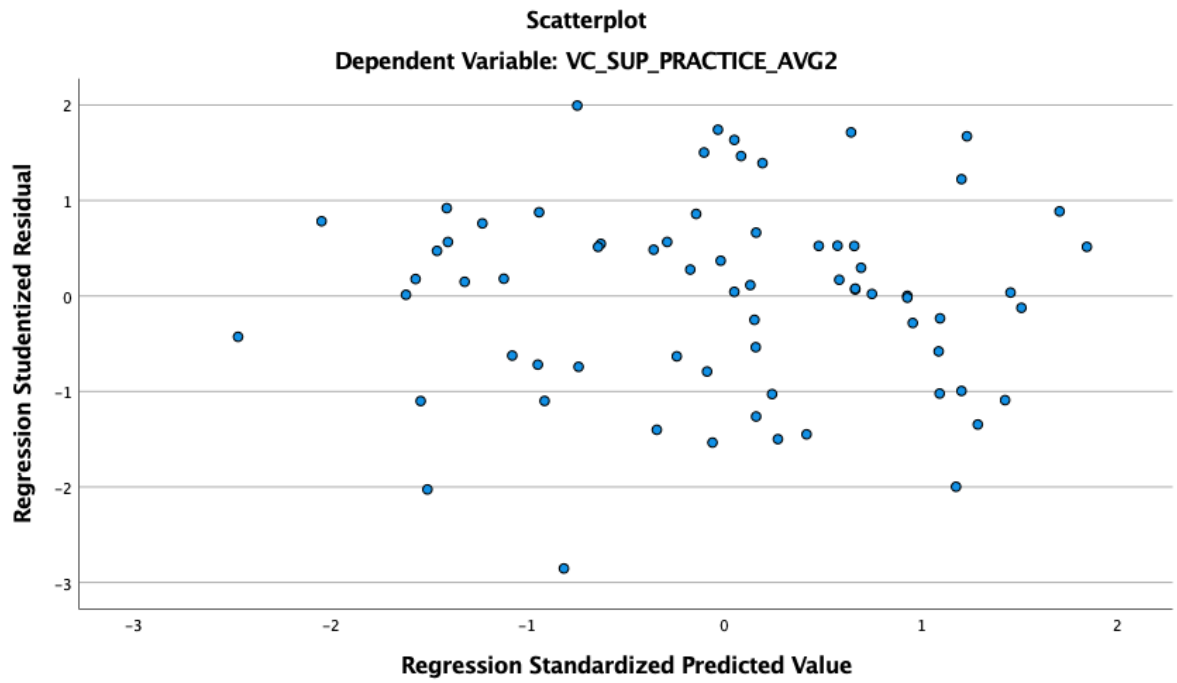
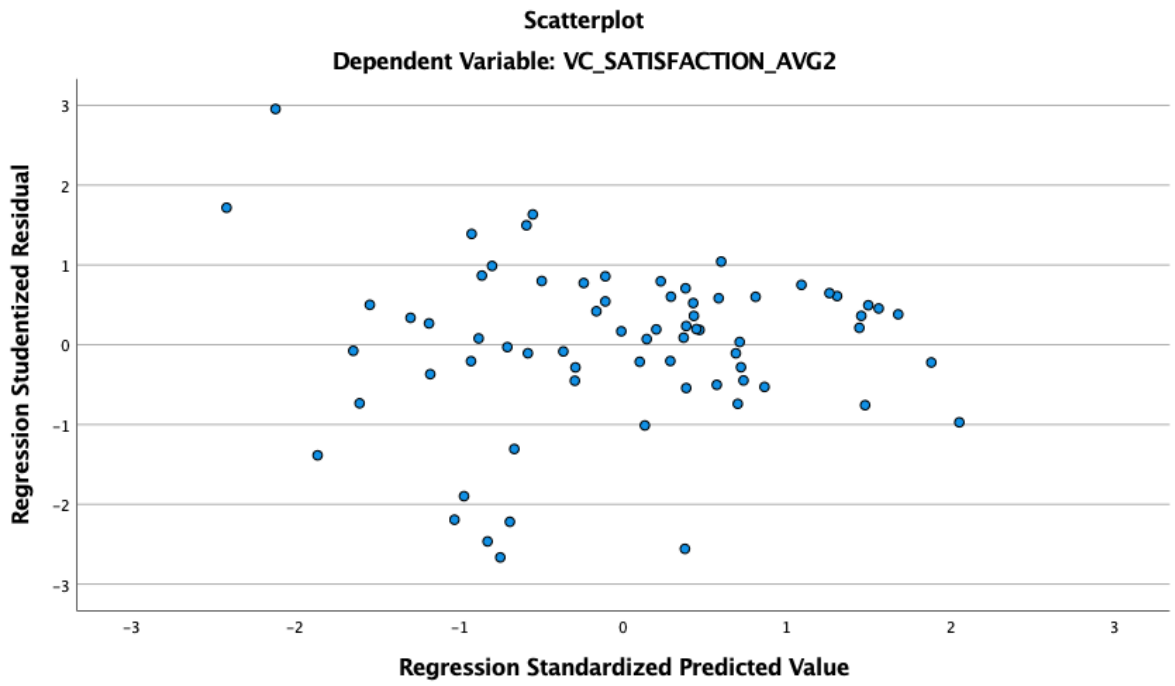


Figure 11

Scatterplot of Residuals for VC Satisfaction Regression Equation



Appendix A

Informed Consent

Purpose of the study: You are being asked to participate in a research study regarding supervision for providing behavioral services for individuals with Autism Spectrum Disorder (ASD). This online survey examines supervision practices used by your service agency, such as the format of supervision sessions, supervision activities, and other supervisory practices. In order to participate in this study, you must meet the following criteria: 1) you are at least 18 years of age; 2) you provided behavioral services for individuals with ASD for at least 3 months during the past year; 3) services were provided in the state of California; 4) you have not obtained a master's or doctoral degree; and 5) you are not certified as a Board Certified Behavior Analyst (BCBA).

Study procedures: If you decide to participate, you will be asked to complete a survey through Qualtrics regarding both "typical" and current supervision practices (i.e., under COVID-19 restrictions). The number of questions you will be asked and the time it takes to complete the survey depends upon your supervision experience. The average time to complete the survey should be approximately 20-30 minutes. Please complete the survey in one sitting, as progress cannot be saved. A progress bar will be shown on each page for your reference. Upon completion of this survey, you will have the opportunity to enter a drawing for one of five \$25 Amazon gift cards.

Potential risks: There are no anticipated risks to participating in this study.

Potential benefits: While benefits are not guaranteed, the results of this study will help researchers and supervisors understand how clinicians benefit from supervision and provide suggestions for improving supervision practices and guidelines. This survey may benefit you directly by increasing your satisfaction with supervision received in the future.

Statement of confidentiality: Your participation in this research is confidential. No identifying information about yourself, your supervisor(s), or your service agency will be requested in the survey. Survey responses will be furnished to the investigators and research assistants for the purpose of data collection. These materials will not be shared with others for any purpose not specified on this consent form. Contact information for the optional drawing will be collected in a separate survey, thereby protecting the anonymity of your survey responses regarding supervision practices.

Cost/payment: There is no cost or payment for this study. However, upon completion of this survey, you will have the opportunity to enter a drawing for one of five \$25 Amazon gift cards. There is approximately a 1 in 40 chance of winning a gift card.

Right to refuse or withdraw: Your decision to participate in this research is voluntary. You may refuse to participate in this study. You may refuse to answer specific questions in this study by selecting options such as "other," "not applicable," or "decline to state." You may change your mind about being in the study and quit after the study has started. If you decide to withdraw from the study before you complete it, you may contact Katerina Ford (Katerina.ford@ucsb.edu) to be entered into the drawing and/or if you would like more information about the purpose of the study.

Questions: If you have any questions or concerns about this research project, you may contact Katerina Ford (Katerina.ford@ucsb.edu) or my faculty advisor, Dr. Mian Wang, at (805) 893-5605 or miwang@ucsb.edu. If you have any questions regarding your rights and participation as a research subject, please contact the Human Subjects Committee at (805) 893-3807 or hsc@research.ucsb.edu.

Agreeing to complete this survey indicates that you have read the information in this form and consent to take part in the research. Please print this form for your records or future reference.

Appendix B

EFA Item Correlations for Supervision Practice

	1	2	3	4	5	6	7	8	9	10	11	12
(1) Client team	1.00											
(2) Clinician group	0.71	1.00										
(3) VC	0.10	0.04	1.00									
(4) Supervisor	-0.27	-0.12	0.09	1.00								
(5) Scheduled	0.27	0.38	0.14	0.17	1.00							
(6) Distractions	0.21	0.11	-0.06	0.03	0.48	1.00						
(7) Reschedule	0.06	0.06	-0.06	-0.06	0.47	0.42	1.00					
(8) Correspond	0.06	-0.06	-0.11	-0.03	0.30	0.31	0.40	1.00				
(9) Instructions	0.03	-0.05	0.09	0.14	0.17	0.20	0.06	0.18	1.00			
(10) Modeling	0.12	0.04	-0.16	-0.04	0.35	0.42	0.43	0.39	0.51	1.00		
(11) Video models	0.12	0.13	-0.14	-0.12	0.20	0.15	0.24	0.32	0.15	0.45	1.00	
(12) Practice	0.04	-0.09	-0.11	-0.16	0.10	0.21	0.34	0.26	0.20	0.44	0.44	1.00
(13) Discussion	0.28	0.34	0.11	-0.01	0.45	0.27	0.26	0.11	0.26	0.27	0.17	0.26
(14) Observation	0.12	-0.08	0.19	-0.01	0.27	0.07	0.13	0.41	0.43	0.33	0.20	0.40
(15) Video feedback	0.28	0.30	0.40	0.01	0.25	0.30	0.12	0.03	0.11	0.22	0.38	0.25
(16) VSM	0.22	0.35	0.14	0.01	0.18	0.14	0.09	0.02	0.06	0.11	0.38	0.22
(17) Fidelity	0.49	0.39	0.10	-0.09	0.25	0.44	0.15	0.19	0.21	0.26	0.28	0.17
(18) Writing	0.01	-0.12	0.06	0.08	0.03	0.03	0.19	0.29	0.26	0.29	0.23	0.29
(19) Varied feedback	0.27	-0.03	0.24	-0.03	0.28	0.07	0.32	0.33	0.50	0.40	0.26	0.40
(20) Readings	0.26	0.04	0.12	-0.17	0.20	0.16	0.26	0.37	0.11	0.26	0.45	0.32
(21) Trainings	0.15	0.11	0.09	-0.11	0.20	-0.01	0.19	0.11	0.06	0.09	0.48	0.24
(22) Computer	0.22	0.05	0.28	-0.08	0.31	0.16	0.25	0.29	0.05	0.09	0.44	0.22
(23) Small group	0.40	0.29	0.03	-0.32	0.11	0.02	0.02	0.06	0.08	0.06	0.43	0.20
(24) Clinician eval.	0.18	-0.11	0.21	-0.09	0.05	0.02	0.25	0.39	0.24	0.24	0.14	0.28
(25) Self-evaluation	0.25	0.17	0.19	-0.11	0.06	0.16	0.18	0.13	0.19	0.23	0.45	0.31
(26) Supervisor eval.	0.34	0.16	0.14	-0.20	0.12	0.12	0.19	0.28	0.22	0.25	0.31	0.22
(27) Anonymous eval.	0.19	0.08	-0.12	-0.15	0.02	0.17	0.05	0.16	0.08	0.13	0.39	0.24
(28) Positive feedback	0.01	-0.19	-0.08	-0.08	0.03	0.11	0.23	0.45	0.21	0.31	0.34	0.34
(29) Corrective feedback	0.04	-0.13	0.15	0.07	0.21	0.17	0.34	0.48	0.40	0.41	0.15	0.40
(30) Professional	0.00	0.05	-0.02	-0.03	0.34	0.18	0.28	0.50	0.14	0.40	0.26	0.31
(31) Shift focus	-0.08	-0.12	-0.10	-0.05	0.18	0.20	0.34	0.52	0.18	0.46	0.31	0.34
(32) Agenda	0.17	-0.02	0.09	-0.07	0.29	0.43	0.27	0.28	0.37	0.45	0.42	0.33
(33) Prepared	-0.01	-0.12	0.08	0.07	0.30	0.24	0.30	0.53	0.31	0.40	0.23	0.34
(34) Advise PD	0.18	-0.12	0.02	-0.15	0.14	0.23	0.34	0.56	0.35	0.39	0.33	0.48
(35) Teach EBP	0.10	0.06	0.01	-0.04	0.23	0.31	0.14	0.39	0.05	0.23	0.22	0.19
(36) Diversity/inclusion	0.15	0.05	-0.06	-0.21	0.12	0.22	0.28	0.33	0.08	0.37	0.55	0.42
(37) Confidentiality	0.19	0.18	-0.18	-0.06	0.38	0.27	0.28	0.33	0.16	0.38	0.32	0.38

(continued)

	13	14	15	16	17	18	19	20	21	22	23	24	25
(13) Discussion	1.00												
(14) Observation	0.35	1.00											
(15) Video feedback	0.23	0.11	1.00										
(16) VSM	0.30	-0.11	0.58	1.00									
(17) Fidelity	0.20	0.00	0.41	0.47	1.00								
(18) Writing	0.04	0.15	-0.05	-0.03	0.13	1.00							
(19) Varied feedback	0.32	0.57	0.08	0.03	0.17	0.45	1.00						
(20) Readings	0.26	0.31	0.27	0.34	0.34	0.22	0.46	1.00					
(21) Trainings	0.21	0.24	0.26	0.18	0.16	0.12	0.38	0.53	1.00				
(22) Computer	0.33	0.32	0.30	0.38	0.28	0.15	0.47	0.70	0.61	1.00			
(23) Small group	0.30	0.19	0.31	0.42	0.37	0.02	0.31	0.55	0.60	0.57	1.00		
(24) Clinician eval.	0.10	0.49	0.01	-0.06	0.16	0.28	0.60	0.33	0.27	0.30	0.21	1.00	
(25) Self-evaluation	0.18	0.19	0.32	0.44	0.25	0.24	0.42	0.37	0.37	0.40	0.51	0.39	1.00
(26) Supervisor eval.	0.27	0.31	0.16	0.16	0.37	0.23	0.42	0.29	0.30	0.32	0.29	0.57	0.40
(27) Anonymous eval.	0.15	0.09	0.08	0.24	0.38	0.14	0.22	0.18	0.27	0.20	0.37	0.28	0.50
(28) Positive feedback	0.09	0.32	-0.11	0.06	0.12	0.35	0.39	0.35	0.20	0.28	0.07	0.41	0.31
(29) Corrective feed.	0.30	0.49	-0.01	0.09	0.13	0.26	0.61	0.38	0.15	0.37	0.07	0.42	0.34
(30) Professional	0.19	0.37	-0.08	0.05	0.17	0.28	0.36	0.27	0.06	0.23	0.11	0.33	0.16
(31) Shift focus	0.21	0.32	0.00	0.06	0.24	0.28	0.33	0.30	0.06	0.16	0.12	0.24	0.16
(32) Agenda	0.23	0.28	0.28	0.28	0.45	0.21	0.41	0.47	0.26	0.31	0.40	0.31	0.53
(33) Prepared	0.35	0.44	0.01	0.16	0.16	0.22	0.42	0.36	0.07	0.35	0.15	0.23	0.18
(34) Advise PD	0.21	0.53	0.01	0.11	0.31	0.29	0.60	0.56	0.18	0.40	0.30	0.60	0.46
(35) Teach EBP	0.23	0.15	0.19	0.09	0.23	0.13	0.21	0.28	0.28	0.24	0.33	0.21	0.13
(36) Diversity/inclusion	0.32	0.20	0.20	0.40	0.33	0.22	0.34	0.44	0.31	0.44	0.50	0.32	0.49
(37) Confidentiality	0.34	0.35	0.05	0.27	0.25	0.12	0.39	0.40	0.35	0.33	0.33	0.34	0.29

(continued)

	26	27	28	29	30	31	32	33	34	35	36	37
(26) Supervisor evaluation	1.00											
(27) Anonymous evaluation	0.44	1.00										
(28) Positive feedback	0.36	0.26	1.00									
(29) Corrective feedback	0.34	0.20	0.64	1.00								
(30) Professional	0.13	0.12	0.47	0.45	1.00							
(31) Shift focus	0.19	0.15	0.56	0.53	<i>0.71</i>	1.00						
(32) Agenda	0.29	0.45	0.37	0.43	0.29	0.37	1.00					
(33) Prepared	0.11	0.13	0.42	0.54	0.55	0.58	0.39	1.00				
(34) Advise PD	0.44	0.34	<i>0.58</i>	<i>0.61</i>	<i>0.58</i>	<i>0.58</i>	<i>0.53</i>	<i>0.57</i>	1.00			
(35) Teach EBP	0.05	0.11	0.27	0.19	0.39	0.36	0.27	0.42	0.31	1.00		
(36) Diversity/inclusion	0.50	0.42	0.50	0.39	0.31	0.45	0.47	0.31	0.50	0.30	1.00	
(37) Confidentiality	0.33	0.24	0.60	0.46	0.47	0.45	0.35	0.42	0.45	0.41	0.54	1.00

Note. For eliminated variables, correlations <.3 are in bold text; correlations >.5 and >.7 are bolded and italicized.

Appendix C

EFA Item Correlations for Satisfaction

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
(1) Satisfied amount	1.00																		
(2) Answers all questions	0.51	1.00																	
(3) Urgent questions	0.46	0.70	1.00																
(4) Would like more (R)	0.48	0.15	0.08	1.00															
(5) Collaborative	0.17	0.07	0.07	-0.07	1.00														
(6) Builds skills	0.23	0.36	0.31	0.00	0.51	1.00													
(7) Expands knowledge	0.36	0.43	0.49	0.14	0.40	0.77	1.00												
(8) Advises interactions	0.29	0.33	0.33	0.17	0.42	0.73	0.77	1.00											
(9) Encourages my PD	0.34	0.34	0.22	0.18	0.54	0.73	0.68	0.76	1.00										
(10) Enhances decisions	0.24	0.32	0.33	0.05	0.57	0.68	0.62	0.72	0.76	1.00									
(11) I enjoy sessions	0.37	0.33	0.21	0.00	0.38	0.35	0.35	0.43	0.38	0.36	1.00								
(12) Approachable supervisor	0.46	0.51	0.36	0.09	0.36	0.59	0.56	0.56	0.55	0.50	0.51	1.00							
(13) Attentive to my needs	0.62	0.50	0.38	0.33	0.45	0.55	0.59	0.56	0.55	0.52	0.48	0.74	1.00						
(14) Facilitates thinking	0.56	0.44	0.42	0.15	0.43	0.54	0.58	0.50	0.49	0.46	0.54	0.66	0.82	1.00					
(15) Shows support	0.48	0.50	0.38	0.12	0.44	0.61	0.56	0.60	0.51	0.56	0.50	0.76	0.79	0.74	1.00				
(16) Listens well	0.42	0.49	0.34	0.11	0.37	0.55	0.50	0.51	0.41	0.48	0.49	0.82	0.71	0.66	0.84	1.00			
(17) Shows energy	0.48	0.50	0.43	0.10	0.34	0.60	0.62	0.54	0.52	0.55	0.44	0.80	0.70	0.67	0.84	0.85	1.00		
(18) Values my contribution	0.42	0.50	0.31	0.19	0.25	0.49	0.41	0.44	0.37	0.29	0.44	0.66	0.61	0.55	0.68	0.71	0.63	1.00	
(19) Fails to appreciate (R)	0.35	0.35	0.32	0.13	0.09	0.31	0.41	0.41	0.32	0.24	0.30	0.53	0.43	0.49	0.48	0.50	0.49	0.45	1.00
(20) Ignore complaints (R)	0.27	0.36	0.27	0.16	0.15	0.35	0.36	0.38	0.37	0.31	0.25	0.66	0.51	0.42	0.54	0.59	0.56	0.52	1.00
(21) Cares about well-being	0.37	0.36	0.29	0.03	0.32	0.41	0.40	0.44	0.43	0.41	0.33	0.54	0.55	0.58	0.66	0.57	0.59	0.41	1.00
(22) Fail to notice best job (R)	0.44	0.51	0.42	0.21	0.27	0.53	0.55	0.53	0.54	0.38	0.33	0.70	0.67	0.57	0.73	0.70	0.71	0.70	1.00
(23) Cares about satisfaction	0.31	0.34	0.19	0.06	0.37	0.47	0.40	0.48	0.44	0.35	0.47	0.63	0.61	0.60	0.74	0.71	0.59	0.59	1.00
(24) Shows little concern (R)	0.40	0.43	0.50	0.25	0.28	0.44	0.60	0.57	0.48	0.45	0.30	0.68	0.64	0.53	0.66	0.61	0.62	0.59	1.00
(25) Pride in accomplishments	0.41	0.49	0.33	0.19	0.26	0.48	0.45	0.53	0.47	0.43	0.48	0.62	0.64	0.58	0.72	0.69	0.65	0.72	1.00
(26) Enjoys leading sessions	0.46	0.50	0.42	0.13	0.33	0.54	0.50	0.46	0.41	0.44	0.53	0.68	0.72	0.65	0.73	0.69	0.72	0.59	1.00
(27) Source of social support	0.37	0.41	0.28	0.07	0.41	0.48	0.49	0.49	0.45	0.50	0.49	0.61	0.66	0.63	0.67	0.66	0.63	0.55	1.00

	19	20	21	22	23	24	25	26	27
(19) Fails to appreciate (R)	1.00								
(20) Ignore complaints (R)	0.67	1.00							
(21) Cares about well-being	0.38	0.36	1.00						
(22) Fail to notice best job (R)	0.60	0.76	0.51	1.00					
(23) Cares about satisfaction	0.45	0.57	0.58	0.67	1.00				
(24) Shows little concern (R)	0.58	0.68	0.50	0.83	0.61	1.00			
(25) Pride in accomplishments	0.44	0.52	0.48	0.68	0.71	0.60	1.00		
(26) Enjoys leading sessions	0.31	0.50	0.47	0.64	0.68	0.57	0.68	1.00	
(27) Source of social support	0.44	0.53	0.52	0.53	0.57	0.48	0.73	0.57	1.00

Note. For eliminated variables, correlations <.3 are in bold text; correlations >.8 are bolded and italicized.