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Collaborative Practices of Behavior Analysts in School Settings: Evidence from the Field

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Abstract

Based on the most recent *Ethics Code for Behavior Analysts* Behavior Analyst Certification Board, (2020), board certified behavior analysts (BCBAs) are required to engage in collaborative practices with other related service professionals. However, the extent to which BCBAs are trained in collaborative practices and have opportunities to implement such practices is unknown. We examined training experiences in collaborative practice, and the frequency of collaborative practices for behavior analysts who have been associated with school environments. Using latent class analysis (LCA), three profile models emerged within our results that describe the frequency of collaborative practices. Participating BCBAs reported little to no training in collaborative practices. It should be noted that BCBAs employed by public school districts report engaging in high-level collaborative practices. Future research is needed to determine the quality of training in collaborative practices for behavior analysts and ways to support implementation efforts in accordance with the *Ethics Code*.

Keywords Ethics · Collaboration · Training · Schools · Behavior analyst

Recent increases in children with disabilities who require behavioral services (National Center for Education Statistics, 2022) necessitates an investigation into how behavior analysts are prepared to provide services to children in collaboration with their caregivers and other professionals in school settings. In public and private settings, board certified behavior analysts (BCBAs) may collaborate with a range of professionals, including occupational and physical therapists (Gasiewski et al., 2021; Scheibel & Watling, 2016; Whiting & Muirhead, 2019), speech-language pathologists (Cardon, 2017; Donaldson & Stahmer, 2014; LaRue et al., 2008), paraprofessionals (Giangreco et al., 2010), and special and general education teachers (Giangreco et al., 2021).

Several studies have documented evidence for the success of effective collaboration and its impact on child behavior and caregiver outcomes (Anrig, 2015; Garbacz et al., 2017; Garbacz & McIntyre, 2016; Ronfeldt et al., 2015). Thus, collaborative practice is considered a recommended practice for many special education professions (Division for Early Childhood, 2014) and professionals within the field of applied behavior analysis (ABA; Brodhead, 2015; Kelly & Tincani, 2013).

In fact, the most recent *Ethics Code for Behavior Analysts* (BACB, 2020) indicates that it is a BCBA's ethical responsibility to collaborate with their colleagues and compromise when possible for the benefit of the client (Code 2.10). Further, the Individuals with Disabilities Education Act (IDEA) legally mandates that professionals collaborate across related service providers to ensure students with disabilities receive the services to which they are entitled (IDEA, 2004). However, the extent to which BCBAs engage in collaborative practices is unknown. Given the increasing national demand for behavior analysts (BACB, 2023), identifying the state of collaborative practice in the field of behavior analysis warrants investigation.

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Collaborative Practice as a Process

Collaboration can occur at multiple levels within any organization and can occur in business, research, education, and professional practice (Green & Johnson, 2015). Collaborative practice is described within the field of special education as professional partnerships that are engineered in close working relationships with other professionals and families to serve students with disabilities in the least restrictive environment (LRE; Friend & Cook, 2013; IDEA, 2004). There are many ways to collaborate within the field of behavior analysis. Clinicians have reported interdisciplinary (Gasiewski et al., 2021; Foley, 1990), multi-disciplinary (Boyer & Thompson, 2014; LaFrance et al., 2019), transdisciplinary (King et al., 2009), and interprofessional models of collaboration (Farrell, 2016; Hong & Shaffer, 2015; Lindblad, 2021) as having evidence for success within the field of behavior analysis, including collaborating via providing distance support services in the age of COVID (Frederick et al., 2020). Several of these models of collaboration underscore at least some of the process-oriented features of collaborative practice that result in improved outcomes for children and their families. The most effective features of interprofessional collaborative practice have recently been published as more detailed guides for effective collaboration (Bowman et al., 2021; Slim & Reuter-Yuill, 2021). Inherent within the collaborative process are team members with different expertise and perspectives working together to make joint decisions based on shared goals (Green & Johnson, 2015).

The word collaboration is often used "indiscriminately" (Friend, 2000) and as a "one-size-fits-all" concept (Mayhew, 2012) with no universally recognized definition. In order to be effective and accountable, a team can benefit from discussing and defining their own unique definition of collaboration and their collaborative process while using a range of strategies to do so. A review of core features of collaboration as well as some of the challenges that teams face (Bowman et al., 2021; Slim & Reuter-Yuill, 2021) may prove useful for the team's discussion. Identifying the unique needs and nuances of the collaborative team while understanding the numerous features of effective collaboration will result in shared understanding and stronger team relationships.

Although the process of collaborative practice may differ across agencies as well as public and private school settings, the underlying intent of collaborative practice should be to benefit children and clients. For example, a BCBA working in private agencies or in private practice may develop and supervise services for children while training and monitoring the registered behavior technicians (RBTs) who implement the behavior analytic programs and procedures that ensure progress toward improved functional outcomes (BACB, 2021).

In contrast, a BCBA working in a school setting may have different roles and responsibilities that indirectly support students and teachers (e.g., consultation with school staff and families and partnering with individuals and professionals from non-behavioral professional fields (Kelly & Tincani, 2013; Wahman & Anderson, 2021; Wahman & Lewis, 2021). Working with school personnel will necessitate an understanding of school context and dynamics, valuing differing perspectives and expertise from team members, and the use of strong communication skills that build positive and supportive relationships (Bambara & Chovanes, 2021; Giangreco et al., 2021).

A nuance of school setting collaboration may require all team members to respect the expertise of each team member to work toward a common goal and to promote positive outcomes for students. The BCBA who collaborates in school settings may also need to learn about federal, state, and district requirements for school personnel to better inform decisions, if this information was not included in their BCBA preparation program. Upholding the unique school-specific nuances of collaboration along with the *Task List for BCBAs* (BACB, 2017) and the *Ethics Codes for Behavior Analysts* (BACB, 2020; Menendez et al., 2017) may require professional development training, experience, and mentorship from others.

Requirements for Collaborative Practice

Although the content of behavior analytic training programs varies across institutes of higher education (IHEs), behavior analytic preparation programs are based upon two sets of guiding standards: (1) a task list that details the knowledge and skills that serve as the basis for the BCBA examination created by the BACB; and (2) the verified course sequence (VCS) that is monitored by the Association for Behavior Analysis International (ABAI). Prior to 2017, collaborative practice was not an explicit requirement for BCBAs. However, the most recent ethics code has indicated that BCBAs should be collaborating with colleagues across professional fields (Code 2.10; BACB, 2020, p. 11). Likewise, the *Task List for Behavior Analysts* (5th ed.) includes an item that recommends that BCBAs “collaborate with others who support and/or provide services to clients" (Task Item H-9; BACB, 2017, p. 5). Although the inclusion of language about collaboration is encouraging, specific guidelines related to specific skills and collaborative process have not been provided (BACB, 2021) or remain vague.

Furthermore, even though VCS requirements continue to be updated, currently there is no specific coursework that emphasizes the need for behavior analysts to collaborate with and understand the approaches of other nonbehavioral professionals (ABAI, 2021). In addition, specific guidelines about what the collaborative process should entail and who to collaborate with outside the field of behavior analysis have not

been provided (BACB, 2021). This means that the amount of time focused on working collaboratively even to a generalist credential level is left to the discretion of the supervisor and/or supervisee to determine what collaborative skills are necessary for successful practice within the field.

Training in Collaborative Practice

Likewise, training requirements for collaborative practice within behavior analysis are not always explicit in BCBA preparation programs and disciplines. Following an informal search on a range of university websites, the authors of this article found that BCBA programs were housed in a wide range of disciplines and programs such as applied behavior analysis, special education, education, psychology, speech/language pathology, and pharmacy and health sciences. Individuals seeking the BCBA credential may have a wide range of interests and employment goals (Giangreco et al., 2021). Given the generalist nature of the BCBA credential, preparation to become a BCBA may not address specific skills that may be needed in different employment settings. For example, Giangreco et al. (2021) suggested that even though BCBAs obtain positions in schools, they may not have received coursework, mentorship, or direct experiences that adequately prepares them to be effective collaborators in school settings. A lack of explicit training on core collaborative practices can serve as a barrier for all team members, including BCBAs and may derail partnerships needed to see desired outcomes (LaFrance et al., 2019; Slim & Reuter-Yuill, 2021).

BCBAs working in school settings who do not have prior supervised training in school environments may quickly realize that their understanding of collaboration and the applied skills they learned in their preparation courses and supervision differ substantially from that of other members on a school team. Because school settings employ a range of individuals from differing professional training backgrounds (e.g., teachers, speech language pathologists, licensed social workers, school psychologists) who work together to make decisions based on shared goals, a BCBA will need to consider the viewpoint of all members. The scopes of practice of the team collaborators may differ according to their professions and each may be beholden to different albeit similar ethics codes. For example, upon examination of the ethics codes across disciplines commonly represented in public schools, all were found to have an ethical responsibility to maintain their professional competencies, respect the rights and dignity of people they serve, and practice with integrity (American Speech-Language-Hearing Association [ASHA], 2023; BACB, 2020; Council for Exceptional Children [CEC], 2015; National Association of Social Workers [NASW], 2021). Professions may differ more substantially in responsibilities related to evidence based practice and use of professional judgement. These differences will necessitate an agreed upon set of strategies for working together.

Researchers have demonstrated the effectiveness of explicit opportunities to experience and practice collaborative skills among educational professionals. For example, Sjolie et al. (2021) found collaboration skills within programs that prepare future teachers showed a transfer of those skills in applied situations (Sjolie et al., 2021). In the absence of direct and explicit training in collaborative practice, behavior analysts may not acquire collaborative skills needed to ensure that effective behavioral supports are supported by shared goals and outcomes but also reflect various perspectives. Further, Kelly & Tincani (2013) pointed out that although there is agreement that collaboration is a key element for successful outcomes by many different disciplines, including applied behavior analysis, there is limited information about how BCBAs obtain collaborative skills or how to apply these skills across different types of settings, including schools. For example, in the *Task List for Behavior Analysts* (5th ed.) there is a lack of specificity about what collaborative practice should "look like" and "collaboration" is mentioned only once in previous iterations of the *Task List* (BACB, 2017). It is possible that this critical practice could be interpreted in different ways due to the absence of an operational definition for collaborative practice and specific action items to direct training and implementation needs and/or skills.

Purpose of Study

Given that little is known about how often and the extent to which behavior analysts collaborate, with whom, and in what settings, the purpose of the current study was to examine whether BCBAs who were employed by both private and public schools received preprofessional training in collaborative practice and had opportunities to collaborate with other related service professionals. In particular, our research questions were: (1) To what extent do school BCBAs collaborate with other professionals? (2) Does the intensity of these collaborative practices vary based on whether BCBAs serve children in private or public school settings? (3) To what extent do BCBAs receive specific training related to collaboration with individuals outside of behavior analysis?

Method

Sampling and Administration Procedures

A convenience sampling procedure was used to identify BCBAs who work with children with disabilities in private

and public school settings. After institutional review board approval, the first two authors arranged with the BACB to send out an email invitation to BCBAs or board certified behavior analysts with a doctoral designation (BCBA-Ds) practicing within the United States and who report a range of primary emphases (e.g., behavior analysis, behavior therapy, social work, positive behavior support, psychology, education, precision teaching, direct instruction, language disorders, brain injury rehabilitation, counseling, delinquency), primary areas of work (e.g., autism, developmental disabilities, mental health, education–regular K–12, education–special education), and age groups (e.g., children, adolescents, adults).

The research study was approved by the BACB as an "academic research survey." The email message sent by the BACB on behalf of the authors included an explanation of the purpose of the survey, instructions for completing the survey, and a link to the survey. One follow-up message was sent 1 week after the first message. Anonymity of the participants was preserved by having the BACB send the message to individuals on the BCBA credential registry with specified requirements. Respondents of the survey could also elect to be included in a lottery to receive a $10 gift card. The contact information these participants provided was routed to a different database that could not be tied to the participant's specific responses on the survey.

Survey Instrument

A cross-sectional survey was developed to answer the research questions proposed using Qualtrics Survey Software. The first two authors developed standard demographic questions for the survey and then agreed upon categories of questions that addressed: (1) the extent to which BCBAs collaborate with other professionals in school settings; (2) the difference in collaborative practices across private school settings versus public school settings; and (3) the extent to which BCBAs receive training on collaboration. Questions were given to three BCBAs with experience in schools who provided feedback on readability, relevance, and terminology. Feedback was reviewed by the first two authors and changes were made with full agreement.

A link to the survey was provided in an email invitation that was sent by the BACB on behalf of the authors using the active Certificant Database. Questions were designed as closed-ended (yes/no; yes/no/I'm not sure), multiple choice with one response, checklist with multiple responses (check all that apply), checklist with one option (check the one that applies; check the one that fits best), Likert Scale (e.g., daily, weekly, monthly, every few months, yearly, never) and open-ended questions (if other, describe; define collaboration). In addition to the demographic data items, the survey included an additional 32 questions that could be arranged into six categories: (1) role in the school setting; (2) cross disciplinary regulation awareness; (3) perceived climate and acceptance of BCBAs in school settings; (4) BCBA preparation coursework; (5) BCBA preparation supervision; and (6) collaboration definition. The categories and questions can be found in Table 1.

Data Analysis

We used two primary types of analysis to examine our research questions: (1) an ordinary least squares (OLS) regression model; and (2) a latent class analysis (LCA). Our primary research question examined the extent to which background and training predicted collaborative practices for behavior analysts. An OLS regression model

Table 1 Training in collaboration

Survey Question	Results	
During your coursework, did you ever take a course where the main topic of the course was collaborating with others outside the field of ABA?	Yes	19%
	No	75%
	I am not sure	6%
During your coursework, did you ever take a course where you were taught how to successfully collaborate with others outside the field of ABA?	Yes	29%
	No	64%
	I am not sure	7%
During your coursework, did you learn about the ways other fields use evidence-based practices to benefit students with autism?	Yes	42%
	No	58%
During your supervision, were you specifically trained on how to collaborate with professionals with areas of expertise outside of ABA?	Yes	42%
	No	58%
During your supervision, did you have the opportunity to work collaboratively with those outside of the field of ABA?	Yes	79%
	No	21%
Did you receive guidance and/or feedback from your supervisor about these collaborative interactions?	Yes	69%
	No	31%

was appropriate to address this question because we were interested in measuring the relationship between our core independent variables (e.g., age, gender, field of study, mode of coursework, time credentialed, role in school) and their relationship to our dependent variables (e.g., work-related collaboration behaviors). In particular, we wanted to examine the extent to which the observed variables could predict the occurrence of collaborative practices.

To examine our secondary research question, we used an LCA to examine different types of collaborative practices. An LCA is a statistical model that helps to identify sets of classes or memberships in groups based on categorical variables. Given our interest in examining how BCBAs collaborate with other professionals, this method was appropriate for determining differential practices in the collaborative process. Missing data were handled in two ways. A large number of participants (n = 133) did not complete over 30 % of the survey and were removed from the analysis. There were individual items incomplete across participants, and those were imputed using maximum likelihood.

Results

Data were collected between September 2020 and January 2021. During this time period there were from 33,683 BCBA and BCBA-D certificants on the BACB certificant list.. Based on information provided by the BACB, the survey was sent to 19,256 subscribers. Although there were 2,662 unique opens of the message (13.83% of all recipients), only 441 participants completed the survey. Thus, our response rate was 2.29%.

Statistical Analysis

Of 441 respondents, 302 were usable. Two respondents did not consent to the study and 135 had more than 30% missing data and two were removed. Of the 302 respondents, 178 reported that they had worked in public school settings. A majority of this narrowed group of respondents gender-identified as female at the time of the survey (n= 260, 86.09%), white (n= 249, 82.45) under the age of 50 (n = 241, 79.80%). The years of working as a BCBA ranged from 1 to over 10 years with the majority of the respondents falling within 0–3 years (n=79, ~26.16%) and 5–10 years (n=44, ~14.5%) of holding their BCBA certificate. The majority of the respondents reported their role as practitioner (n= 201, ~66%). Please see Table 2 for detailed specifics on sample demographics. We follow the current recommendations regarding p-values and significance language (see Schreiber, 2020; Wasserstein et al., 2019).

For those respondents currently working in public schools, when asked how often they collaborated with professionals with areas of expertise outside of ABA, 46% reported daily and 32% reported weekly. Despite this frequent collaboration, 75% of these individuals reported that they had never taken a course where the main topic was collaboration with others outside the field of behavior analysis. In addition, 64% of respondents indicated that during their coursework they were not taught how to successfully collaborate with members of an interdisciplinary team and 58% of respondents said that they were not taught about ways other fields use evidence-based practices. Despite not being taught collaboration skills specifically, 62% of respondents said they were given the opportunity to collaborate with individuals outside of the field during their coursework.

Regarding supervision experiences, 58% of respondents said they were not trained specifically on collaboration; however, 79% said that they were given the opportunity to work collaboratively with those outside of the field of behavior analysis during this time. Feedback regarding collaborative practices was provided to 69% of respondents during their supervision as shown in Table 1.

Table 2 Participant demographics

Demographic	Count	% of Total
Binary Gender		
Female	260	86.09 %
Male	42	13.91 %
Age		
under 30	25	8.28 %
30–39	135	44.70 %
40–49	81	26.82 %
50–59	36	11.92 %
60 or Older	25	8.28%
Training		
Applied behavior analysis	140	46.36 %
Behavioral science	4	1.32 %
Education or special education	94	31.13 %
Psychology	51	16.89 %
Other	13	4.30 %
Instruction Mode		
online	133	44.04 %
in person	134	44.37 %
Hybrid	35	11.59 %
Race		
White	249	82.45 %
Hispanic	16	5.30 %
Black or African-American	6	1.99 %
Native American/Indigenous	1	0.33 %
Asian/Pacific Islander	9	2.98 %
Multi-Racial	9	2.98 %
Chose Other	5	1.66 %
Multiple Categories Chosen	7	2.31%

Ordinary Least Squares (OLS) Regression

For the OLS regression, the outcome variable, "collaboration behaviors" lacked symmetry in the data. One of the assumptions of OLS is that your outcome variable is assumed to be symmetrical (i.e., normally distributed). Given that our outcome variable lacked symmetry, we performed a square root transformation to meet the assumption of normality. A near zero, or lower score, result indicates higher collaboration behaviors among participants. We also tested for whether participants were correlated with each other and how accurate the model predicted the outcomes to address the assumption of error correlation in participant data using the Durbin-Watson auto-correlation (Savin & White, 1977). It should be noted that the value was within bounds for nine variables and 302 participants, and the model residuals were normally distributed. Finally, OLS regression results indicate the model had an R-squared of 0.27, thus accounting for 27% of the variability in the collaboration scores.

Working in a school (public or private) was associated with more collaborative behaviors (B = -0.27, t = -3.65, p < 0.001), along with being employed by the district (B = -0.34, t = -5.57, p < 0.001), and identifying as white (B = -0.19, t = -2.09, p = 0.037). Being brought in by the family of the students was associated with fewer collaborative behaviors (B = 0.23, t = 3.00, p = 0.003). Age, time credentialled, course collaboration experience, course mode, and primary field of student all had smaller associations based on the t-values and coefficients and can be seen in Table 3.

Latent Class Analysis (LCA)

The LCA (Schreiber, 2017) was based on the four collaboration variables: (1) When working in the school, how

Table 3 Regression analysis

Predictor	Estimate	SE	t	*p*
Intercept	3.8271	0.1828	20.9384	< .001
Setting				
1–0 (Public/Private School vs. Not)	-0.2686	0.0753	-3.5675	< .001
Time Credentialled				
3–5 years—0–3 years	-0.0001	0.1123	-0.0007	0.999
5–10 years—0–3 years	-0.0502	0.0985	-0.5098	0.611
10+ years—0–3 years	-0.0818	0.1237	-0.6614	0.509
Age Group				
30–39 vs. under 30	0.041	0.1404	0.2921	0.77
40–49 vs. under 30	0.0185	0.1547	0.1195	0.905
50–59 vs. under 30	0.0265	0.1736	0.1529	0.879
60 or Older vs. under 30	0.1535	0.1949	0.7872	0.432
Employment				
Employed by the district—not	-0.335	0.0733	-4.5705	< .001
Reason				
Brought in by the family of the student—0	0.226	0.0754	2.9982	0.003
Course Collaboration				
Provided tools/strategies—Theoretically	-0.1282	0.1108	-1.1572	0.248
Both—Theoretically	-0.1111	0.11	-1.01	0.313
Neither—Theoretically	-0.0639	0.1081	-0.5909	0.555
Course Mode				
in person—online	0.0103	0.0819	0.1259	0.9
Hybrid—online	0.1152	0.1127	1.0221	0.308
Primary Field of Study				
Behavioral science—Applied behavior analysis	-0.414	0.2963	-1.3973	0.163
Education or special education—Applied behavior analysis	-0.0468	0.0821	-0.5703	0.569
Psychology—Applied behavior analysis	-0.161	0.0979	-1.6434	0.101
Other—Applied behavior analysis	0.0344	0.1749	0.1966	0.844
Race				
White—Minority	-0.1950	0.0930	-2.0967	0.037

frequently do you collaborate with professionals with areas of expertise outside of ABA (such as social workers, OTs, PTs, school administrators, SLPs, nurses, etc.)? (2) When working in schools, how often do you attend team meetings with a multidisciplinary team? (3) When writing programming for skill acquisition, how often do you collaborate with team members whose area of expertise is outside of ABA? and (4) When writing behavior intervention plans, how often do you collaborate with team members whose area of expertise is outside of ABA?

The initial analysis of our model focused on the 2, 3, 4 class models. Based on the aforementioned variables, a 3-class model was chosen because it demonstrated the lowest Bayes Information Criterion (BIC; Schreiber, 2017), which is a statistical test that accounts for "goodness of fit." That is, the higher the BIC value, the less "goodness of fit," which indicates the model is not sufficient. Results indicate that the three classes have a 51%, 21%, and 28% split. Class 1 encompasses participants engaging in moderate to high collaborative behaviors meaning that individuals have stable or consistent collaboration. Class 2 involves participants engaging in high collaborative behaviors, closer to everyday collaboration. Finally, Class 3 encompasses participants engaging in moderate to low behaviors meaning individuals are inconsistently engaging in collaboration. Three different LCA models examined can be found in Tables 4 and 5.

Table 4 Estimated class-conditional response probability

Variable	Class	51%	21%	28%
		1	2	3
Q1	daily	0.55	0.80	0.08
	weekly	0.39	0.18	0.30
	monthly	0.06	0.00	0.37
	every few months	0.00	0.00	0.23
	yearly	0.00	0.00	0.02
	never/not	0.00	0.02	0.01
Q2	daily	0.03	0.29	0.00
	weekly	0.50	0.52	0.01
	monthly	0.36	0.15	0.24
	every few months	0.10	0.02	0.47
	yearly	0.01	0.00	0.23
	never/not	0.00	0.03	0.05
Q3	daily	0.00	0.65	0.00
	weekly	0.52	0.14	0.04
	monthly	0.37	0.00	0.12
	every few months	0.05	0.00	0.50
	yearly	0.00	0.01	0.11
	never/not	0.06	0.19	0.22
Q4	daily	0.02	0.63	0.00
	weekly	0.48	0.19	0.03
	monthly	0.41	0.02	0.07
	every few months	0.09	0.00	0.49
	yearly	0.00	0.00	0.16
	never/not	0.00	0.16	0.26

Q1: When working in schools how frequently do you collaborate with professionals with areas of expertise outside of ABA (such as social workers, OTs, PTs, school administrators, SLPs, nurses, etc.)?

Q2: When working in schools how often do you attend team meetings with a multidisciplinary team?

Q3: When writing programming for skill acquisition, how often do you collaborate with team members whose area of expertise is outside of ABA?

Q4: When writing behavior intervention plans, how often do you collaborate with team members whose area of expertise is outside of ABA?

Table 5 Latent class model

Class	AIC	BIC
2	3348.751	3500.879
3	3254.792	3484.839
4	3221.029	3528.994

Discussion

The purpose of this survey was to examine to what extent behavior analysts collaborate with other professionals and whether the intensity of their collaborative practices varied based on their work context. The LCA yielded three profile models that described the intensity of collaborative practices for behavior analysts. This approach moves us beyond an understanding of whether behavior analysts are collaborating or not, but to what extent they are collaborating and in what context. We found that participant profiles demonstrated high-level, mid-level, and low-level collaborative practices. Across all age groups and years of certification, we found that participants report little to no training in collaborative practices. However, behavior analysts employed by public school districts have more "on the job" experience in collaborative practices and engage in high-level collaborative practices. Given these results, there are several points for discussion.

First, our results indicated that participating BCBAs working in school settings collaborate with other professionals, they have little training or preparation in interdisciplinary collaborative practices. These findings are consistent with previous research that shows behavior analysts spend a majority of their time collaborating with caregivers, colleagues, and related service personnel but demonstrate low initial trained competency as it relates to collaborative practice (Kelly & Tincani, 2013). Research shows that prior training in collaboration practices predicts later use of these practices in schools (Pfeiffer et al., 2019). Further, several research teams have documented

the importance of training, preparation, and practice to ensure that collaboration is effective and results in positive outcomes (Anderson, 2013; Dobbs-Oates & Wachter Morris, 2016; Hong & Shaffer, 2015; Salm, 2014).

Due to the relevance of collaboration across the Application portions of the *Task List*, it would seem important to provide a comparable description of essential collaboration skills that all BCBAs should have within each area. For example, the application of collaboration within the Ethics section of the *Task List* is further articulated within the *Ethics Codes* such as Code 2.09 (Involving Clients and Stakeholders), Code 2.10 (Collaborating with Colleagues), Code 3.12 (Advocating for Appropriate Services), and Code 4.06 (Providing Supervision and Training; BACB, 2022). Additional items in other sections of the *Task List* can better articulate collaborative skills. For example, within the Behavior Assessment section of the *Task List,* a possible added item might be "Recruit and incorporate input from key stakeholders related to the method and type of assessment obtained."

Given that a majority of the survey respondents indicated they received no supervision experiences in collaborative practice, the preparation of future BCBAs should articulate more specific competencies for effective collaborative practice. That is, curriculum on collaborative practice should be integrated in preparation programs for BCBAs, explicitly taught during supervision experiences, and opportunities to practice these new skills should be provided. Other professions, such as ASHA (2023), have taken actions to integrate collaborative competencies into their professional responsibilities (ASHA, 2023; Pfeiffer et al., 2019) and may provide a relevant model for the field of applied behavior analysis.

Second, survey results indicate that participants employed by school districts have more opportunities to participate in collaborative practices. It is not surprising that this outcome aligns with the intent of inclusive practices as mandated by IDEA (2004). That is, if children and youth are to receive high-quality services in an inclusive context, the collaborative process should involve team members who can address individuals' support needs through interdisciplinary collaboration. This result is also consistent with previous research that showed that speech and language professionals who received training within an interdisciplinary model of collaboration were more likely to participate in a shared decision making process in the future (Brandel, 2021).

The survey results also show that the context in which behavior analysts work (full-time employment within the school vs. contracted services) and their employer (school vs. agency or family) are factors that determine the intensity of their collaborative engagement irrespective of their educational program and training. That is, the demands of the job determine the extent to which behavior analysts collaborate. For example, if the BCBA is employed by the school district, there would be a higher likelihood of an opportunity to collaborate with the school team. The demands of the job determine the extent to which BCBAs collaborate rather than the amount of explicit training they received. Even though many of the participants indicated they received minimal preparation related to collaboration, they reported spending a large portion of their time in collaborative activities. These findings are consistent with research which documents that related service personnel in schools, including behavior analysts, increase their collaborative practice skills with direct and explicit instruction "on the ground" rather than in collegiate settings (Howell et al., 2016).

Finally, it is important to consider the outcomes for participants in Class 3 who reported lower levels of collaboration. It should be noted that these participants were working within a school setting but were employed directly by families. Families have important reasons for selecting their own behavior analyst. They may feel a greater level of trust with a behavior analyst they know well and who has a documented history of success with their child. In addition, they may feel that a behavior analyst of their choice with whom they have past shared experiences will be more culturally competent (Fong et al., 2017).

There is no literature documenting differential experiences in collaboration with a school-based behavior analyst versus a behavior analyst who is hired by caregivers to work with their child in school. However, it may be reasonable to assert that teachers and other school personnel may trust or accept recommendations from professionals who are employed within the school district than professionals who is from an outside agency. An insider–outsider dynamic could create perceived power differences that may threaten the roles and responsibilities of school personnel and fuel mutual distrust (Coburn et al., 2008). Some research has shown there has been a benefit of including caregivers as equal partners in the collaborative experience (Anrig, 2015; Garbacz et al., 2017; Garbacz & McIntyre, 2016). Incorporating skills within the training preprofessional behavior analysts in promoting equal voice and contribution of team members and as a value for collaborative practice may increase benefits to individuals being served and individual team members.

Table 6 summarizes specific recommendations articulated in this article that may begin a conversation in the field of behavior analysis related to increasing the collaborative competence of BCBAs across a range of employment types and settings, including schools. Behavior analytic work in schools may require a unique or customized set of collaborative skills that include understanding the perspective and expertise of professionals on an interdisciplinary team. In spite of the current generalist nature of a BCBAs preprofessional preparation, the field may consider providing more foundational guidance in collaborative practice within the *Task List* (BACB, 2017) and the *Ethics Code for Behavior Analysts* (BACB, 2020) to enhance partnerships that result in better outcomes for clients.

Table 6 Recommendations for collaborative practice of behavior analysts

Recommendations
1. The Behavior Analyst Certification Board (BACB) should continue to recruit input from practicing behavior analysts who are subject matter experts in collaborative practice in a range of employment settings, including schools, and consider increasing the specificity in the requirements and guidance related to the general collaborative skills needed for BCBAs within the *Task List* and *Ethics Code* in order to expand scope of practice and competence as well as promote positive outcomes to clients across settings.
2. The preparation coursework of BCBAs should include instruction on specific foundational skills for interprofessional collaborative practice that establish an area of competence such as skills recommended by others (Bowman et al., 2021; Slim & Reuter-Yuill, 2021). Additional preparation coursework for BCBAs should focus on collaborative practice and process across employment types and settings, including schools to promote understanding of the perspective and expertise represented on interdisciplinary teams.
3. Supervised experiences of preprofessional behavior analysts should be required to include opportunities to practice and receive feedback from supervisor(s) who are competent in collaborative practices across a range of settings, including schools, if the behavior analyst will have contact with schools in their employment.
4. Professionals and practitioners in the field of applied behavior analysis should continue to discuss and formulate appropriate guidance and direction (e.g., a tiered support model) that will establish, maintain, and/or expand a scope of competence in collaborative practice that are responsive to the differences and similarities across settings and services within which BCBAs are employed (including school settings). Doing so has the potential for facilitating effective partnerships across professional areas, increase positive outcomes for clients, and promote acceptance of the application of applied behavior analysis.

Limitations

There are several limitations to our study. First, the researchers did not operationally define collaboration but instead allowed participants to define collaboration. Without an operational definition, respondents may have conceptualized collaboration differently, which could result in different interpretations and reporting of collaborative practice. Second, we did not provide content validation for the items in our survey. Although the survey was reviewed prior to its implementation by multiple behavior analysts, the content may not have been representative of the entire scope of collaboration. Third, we used convenience sampling, which is not a rigorous sampling technique. Thus, our sample is not representative of a variety of geographic locations and lacks racial and/or ethnic diversity, which limits the generalizability of our findings and may have shown bias that was not reviewed in the data analysis. Fourth, participants may have responded in ways that would be perceived as favorable due to self-report bias so it is difficult to generalize results or ascertain that behavior analysts in schools truly do engage in collaborative practice. Finally, the survey was only available in English, which may have limited the number of individuals who could complete the survey.

Implications for Practice and Future Research

Given that our data indicates that BCBAs who work in school settings are more likely to have opportunities to collaborate on interdisciplinary teams and make shared decisions but have little training in collaborative practice, there is a need to better define collaboration and key features within the *Task List for Behavior Analysts*. Other researchers have proposed an educational framework for building interprofessional practice (Slim & Reuter-Yuill, 2021) and standards for interprofessional collaboration (Bowman et al, 2021) that outline a plethora of skills and activities that could increase competencies and promote team process. Doing so would also address core ethical principles (i.e., benefit others; treat others with compassion, dignity, and respect; behave with integrity; and ensure competency; BACB, 2021).

Operationalizing a general set of collaborative skills within the *Task List for Behavior Analysts* could also bring greater attention and structure to how BCBAs develop their scope of practice in collaboration. The intent of the collaborative process is to maximize the perspectives of all team members and promote better outcomes for individuals receiving services. Hence, the inherent nature of the collaborative process should "benefit others" In addition, BCBAs should be competent in the collaborative processes required within their subfield, which may require learning about best practices in collaboration through participation in professional development activities across disciplines, such as special education, teacher education, and school psychology.

Second, establishing a BCBA's scope of competence in collaborative practice may involve arranged opportunities to collaborate in relevant settings during fieldwork in addition to coursework on collaborative practices. Applying a new definition and set of core collaboration skills may assist the emerging BCBA and their supervisor in tailoring experiences to develop core skills and across situations. Articulating additional applied practice and explicit opportunities to prepare BCBAs in collaboration, has potential for expanding the reach, impact, and acceptance of behavior analysis across settings and with other professional areas.

Third, it may be valuable to approach the development of collaborative behaviors of preprofessional BCBAs using a

tiered model of support from preparation programs, supervisors, and colleagues from various professional fields. "One size will not fit all" and a tiered model will address both generalist training and more nuanced needs of a professional related to specific employment settings. A tiered model of support could underscore the process-oriented features of collaboration and address individual professional needs as well as strategies for working with a team. A tiered model has a strong foundation in applied behavior analysis and may be useful when designing a range of collaborative opportunities within preprofessional programs (Putnam & Kincaid, 2015).

Depending on the settings where behavior analysts will be employed, different types of collaborative skills may be practiced. At the universal level, preprofessional training could focus on access to baseline skills for successful collaboration within their subfield and the environment they intend to practice (e.g., public school, home environment, restricted settings). These skills may be related to understanding professionals' roles, responsibilities, and perspectives, as well as developing more nuanced behaviors (i.e., soft skills) that support positive relationships with families and related-service professionals. At the second level, a more targeted and explicit focus on collaboration for preprofessionals who are not responsive to universally supported instruction may be warranted. That is, preprofessional students may need to engage in small group practice that would involve behavior skills training (BST; Kirkpatrick et al., 2019). Competencies acquired at this level may focus on how to seek buy-in, rally support from the team, provide feedback to other professionals, and make recommendations based on data.

Finally, Tier 3 would require a more intense and targeted collaborative training approach for a subset of preprofessionals who are not responsive to universal and targeted levels of support. A plan with explicit steps would outline goals to achieve competencies needed for proficiency in specific collaborative practices for specific settings and situations. Preprofessionals would move through the tiers of support using data-driven decision making based on their performance of competencies focused on the collaborative process.

Past research on tiered approaches to developing new skills within the context of positive behavioral supports have shown evidence for success (Brock et al., 2021, Horner & Macaya, 2018). We contend that using a similar three-tiered approach that is adult-centered for preparing behavior analysts may have a positive influence on the collaborative relationships developed and on child outcomes. Future research is needed to articulate and evaluate a tiered approach and to determine its impact on collaborative relationships and child outcomes, especially in school environments.

Because this research study only investigated the perspective of behavior analysts who work in schools, future research is needed to investigate the perspective of other school personnel (e.g., teachers, related service providers, school administrators, and other school personnel) and parents related to the collaboration skills of behavior analysts. This type of research can provide the multiple perspectives needed to inform collaboration preparation requirements and training at both the preprofessional level and continuing education level of professional development. Finally, because this study did not provide a standard definition of collaboration for the participants, it is possible that each participant defined collaborative practice in a different way. Future research is needed that operationally defines collaboration to ensure that participants have the same understanding of the concept when responding to questions. Learning how behavior analysts and other professionals define collaboration may inform preparation programs and professionals in the field alike.

Conclusion

Despite having little formal education or preprofessional training in collaboration, the respondents to this survey indicated frequent collaboration with those outside of the field of behavior analysis. Thus, we can conclude that most of a behavior analyst's training in collaboration occurs while on the job. Respondents employed by public schools reported a higher frequency of collaboration than those associated with schools in other ways. Behavior analysts employed by schools are developing a different skill set which is dictated by the need to engage in frequent collaborative practices. To ensure that future behavior analysts collaborate with colleagues successfully as described in ethical code 2.10 (BACB, 2020), additional preservice training may be required in a structured format at the preprofessional and postprofessional levels to ensure behavior analysts are adequately prepared to enter the field.

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Data availability The data that support the findings of this study are available as supplementary materials.

Declarations

Conflict of interest The authors do not have any conflict of interest to disclose.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent All participants provided written informed consent prior to commencement of the study.

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