Collaborative Training and Practice among Applied Behavior Analysts who Support Individuals with Autism Spectrum Disorder

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Abstract: Increasingly, practicing behavior analysts play an integral role as interdisciplinary team members to develop instructional programs for students with autism spectrum disorder. However, there is a lack of research on collaborative training and practice as it relates to professionals in the field of ABA. In this study, 302 behavioral professionals, 95% of whom worked with individuals with ASD, were surveyed regarding what training they received in collaboration, the type and extent of collaborative interactions with other professionals, variables they perceive to inhibit and facilitate collaboration, and the extent to which they view collaboration as a valuable component of their practice. Results indicate that while applied behavior analysts frequently collaborate with a variety of professionals and view collaboration as important, on average they received little or no formal training in collaboration, were more likely to provide than to adopt programming recommendations from professionals except for those with similar training, and reported lower ratings with respect to the experience and value of collaboration in their practice. Collectively, results highlight a need to increase collaborative training of practicing behavior analysts, particularly in relation to providing recommendations to and adopting recommendations from non-behavioral professionals, and to conduct research on modes of collaboration that lead to best outcomes.

Research shows that strategies incorporating in the concepts and principles of applied behavior analysis (ABA) are consistently effective for teaching children with autism spectrum disorder (ASD) at a variety of ages and functioning levels (Levy, Mandell, & Shultz, 2009; Vismara & Rogers, 2010; Virués-Ortega, 2010). In recent years, the field of ABA has grown to accommodate the need for qualified professionals to develop ABA programs in response to increasing numbers of children with ASD receiving special education services (Travers, Tincani, & Krezmien, 2011). One measure of the field's growth is increasing membership in the Association for Behavior Analysis International (ABAI), the discipline's flagship professional and scholarly organization. As of August 2010, the organization re-

ported a membership of nearly 13,500 members, 5,800 in U.S. chapters and over 7,000 in non-U.S. chapters in 30 countries with an average annual growth rate of 6.5% over the past 10 years. The Behavior Analyst Certification Board (BACB), which has been credentialing Board Certified Behavior Analysts (BCBAs) and Board Certified Assistant Behavior Analysts (BCaBAs) since 1998, has also documented substantial growth. The number of certificants increased from approximately 500 in 2000 to nearly 6,000 in 2007 (Shook & Favell, 2008; Shook & Neisworth, 2005). Furthermore, a number of states have passed legislation to license behavior analysts to work primarily with consumers with ASD. As one example, Nevada Revised Statute Chapter 641 provides for applied behavior analysts who work with children with autism in that state to be licensed (Nevada Legislature, 2012). Seventeen states now have laws mandating insurance coverage for treatment of children with autism which includes ABA (National Conference of State Legislatures, 2011).

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Collaboration and Applied Behavior Analysis

Practicing behavior analysts are increasingly recognized as pivotal related services providers who serve on multidisciplinary teams to develop and evaluate special education programs for students with ASD in public schools (Boutot & Hume, 2010). This means helping general and special education teachers, related services providers, and administrators to imbed behavioral teaching techniques within inclusive settings. Consequently, collaboration is integral in upholding the Behavior Analyst Certification Board's (BACB) Guidelines for Responsible Conduct (2010). For example, Guideline 2.04 (Consultation) states that, "when indicated and professionally appropriate, behavior analysts cooperate with other professionals in order to serve their clients effectively and appropriately." To underscore the importance of collaboration in professional training, the BACB's Third Edition Behavior Analyst Task List, Content Area 10–6, indicates that practicing behavior analysts should, "provide behavior analysis services in collaboration with others who support and/or provide services to one's clients."

It is evident that collaboration between practicing behavior analysts and professionals with whom they work is essential for effective behavioral programming in public education and other settings. Conversely, lack of successful collaboration may inhibit the educational team's ability to develop and implement interventions with high fidelity. However, because the practice of ABA is a relatively new discipline that evolved separately from the mainstream fields of education and special education, research on collaboration as it specifically applies to ABA is lacking.

What is Collaboration?

There is no standard operational definition for collaboration (Noell & Witt, 1999), hence the construct is conceptualized differently across disciplines. In the field of special education, collaboration is emphasized as it relates to many activities (e.g., co-teaching, problem solving, and consultation) with a focus on the interaction between the general educator and special educator. Collaboration is suggested in the field to be an essential element in service delivery that results in improvement in student outcomes as well as teacher knowledge and skill (Caron & McLaughlin, 2002; Santangelo, 2009; Shannon & Bylsma, 2004).

In education more generally, collaboration is emphasized as it relates specifically to the activity of consultation with a focus on the interaction between consultant (e.g., school psychologist) and consultee (e.g., teacher). Collaboration is noted as a common characteristic of a variety of consultation models (e.g., mental health, organizational and systems, behavioral, and collaborative models) that result in desirable client outcomes (Heron & Harris, 2001). A common theme emerging from research on consultation is that a collaborative approach involving shared decision making between professionals leads to improved consumer outcomes (Hunt, Soto, Maier, & Doering, 2003; Hunt, Soto, Maier, Liboiron, & Bae, 2004; Kelleher, Riley-Tillman, & Power, 2008; Ray, Skinner, & Watson, 1999), although some studies show little difference between collaborative and direct consultation approaches (e.g., Ratzon et al., 2009; Wickstrom, Jones, LaFleur, & Witt, 1998).

One model of consultation, behavioral consultation, embraces a four-stage problem solving process in which numerous dimensions of collaboration are involved: problem identification, problem analysis, treatment implementation, and treatment evaluation (Bergan, 1977; Bergan & Kratochwill, 1990). This model has been distinguished from other models due to its rigor in regards to methodology (Sheridan, Welch, & Orme, 1996). In a literature review from 1985 to 1995 by Sheridan et al. (1996), behavioral consultation and its variants (e.g., conjoint behavioral consultation) produced the most consistent desirable results of the various consultation models in regards to client achievement and social behavior. Targets for improvement included clients' behavioral (48%) and academic (33%) concerns followed by consultee skills (22%) and attitudes (15%), changes in referral patterns (13%), and other system-related concerns (4%). Various measures were used to assess consultation outcomes including direct observations, ratings, tests, and referrals (with 52% using multiple measures). Of all behavioral consultation outcomes reported, 89%

were in the positive direction. Conjoint behavioral consultation (a variant that parallels in practice to traditional behavioral consultation) further supports the use of a collaborative problem-solving approach to consultation across environments (Sheridan & Colton, 1994; Sheridan, Kratochwill, & Elliott, 1990; Galloway & Sheridan, 1994). A major goal of conjoint behavioral consultation is to facilitate parent-teacher communication and a shared responsibility in educational decision making (Sheridan & Colton, 1994). For example, Sheridan et al. (1990) found an increase in social initiations in both the home and school setting when both the parent and teacher were actively involved in the consultation process. In addition, Galloway and Sheridan investigated the effects of an intervention with and without conjoint behavior therapy and found that gains were greater when the consultation process was implemented with teachers and parents together. Findings also suggested greater treatment integrity, maintenance of gains, and greater consumer acceptability.

Despite the apparent importance of collaborative strategies as part of the consultation process in education, the field of applied behavior analysis has conducted only limited research on this construct. Studies in the field of applied behavior analysis that have applied "collaborative" strategies as part of an intervention have specified the elements of the intervention, but have not lead to conclusive results (Hundert & Hopkins, 1992; Putnam, Handler, Ramirez-Platt, & Luiselli, 2003). For example, in the Hundert and Hopkins study it was unclear which of three components (supervisory training, consultation by resource teachers with classroom teachers, or the collaborative planning process) increased teacher behavior toward children with disabilities. In addition, in the study by Putnam et al., a bus-riding program that decreased disruptive behaviors simultaneously applied collaborative procedures, applied the invention (positive reinforcement contingent on defined appropriate behaviors) to all students, and applied preventative strategies; therefore, no conclusion about collaboration's influence on the outcome as a separate variable could be made.

While collaboration is regarded as an important component of practice in ABA, the degree to which behavioral professionals are trained in collaboration is poorly understood. Given substantial recent growth in the field and increasing numbers of behavioral professionals working on interdisciplinary teams serving individuals with ASD, more information is needed on the type and extent of collaborative training and collaborative practices among ABA practitioners. Therefore, the goal of this descriptive study is to survey behavioral professionals to identify (a) what, if any, training they have received in collaboration; (b) the type and extent of collaborative interactions with other professionals; (c) variables that facilitate and inhibit collaboration; and (d) the extent to which they view collaboration as a valuable component of their practice. It is hoped that this information will inform the training of practicing behavior analysts, and will provide preliminary descriptive information for subsequent studies on how to improve behavior analysts' collaborative interactions, which will in turn lead to enhancements in consumer outcomes.

Method

Participants

Participants were recruited through membership in an affiliated chapter or special interest group (SIG) of the Association for Behavior Analysis International (ABAI). Criteria for eligibility to participate in the research as stated in the consent form included: (a) holding a certification and/or license related to the field of applied behavior analysis, education, or human services (e.g., behavior analyst, special education teacher, psychologist) and (b) holding a current position working directly with consumers in the field. Participants were not compensated for their participation.

Consent to distribute the survey was obtained through approval of the contact person of chapters and SIGs affiliated with ABAI. Recruitment for the study consisted of a telephone call by the first author to each contact person of the 39 United States associated chapters and four SIGs (i.e., Autism, Behavior Analyst Online, Positive Behavior Support, and Practitioner Issues in Behavior Analysis) affiliated with ABAI. Initial contact informa-

tion for each organization was obtained from the ABAI website (www.abainternational.org). If the person contacted was not responsible for decisions regarding research solicitations to be distributed to members, the contact person forwarded the solicitation email to the leadership of the organization, or the first author was provided with an e-mail and/or phone contact of the organization's leader to seek permission to distribute the survey.

Following verbal agreement through telephone or email, the first author sent an email to the contact person containing information about the research with an embedded link to the consent form and survey. Contact persons consented by forwarding the email to all members and the first author to confirm participation. Responses for the survey were collected from September 28, 2010 through October 22, 2010 through SurveyMonkey™, a web-based, commercial survey tool.

The following 20 state and regional affiliated chapters of ABAI participated in the study: Alabama ABA, Behavior Analysis Association of Michigan, California ABA, Delaware Valley ABA, Four Corners ABA, Georgia ABA, Hawai'ian ABA, Iowa ABA, Lone Star ABA, Louisiana ABA, Maryland ABA, Minnesota Northland ABA, Nevada ABA, Oregon ABA, Pennsylvania ABA, South Carolina ABA, Tennessee ABA, Utah ABA, Virginia ABA, and Wisconsin ABA. The authors were not able to obtain information regarding the number of emails sent to members of each organization; therefore, an exact response rate could not be calculated. However, twenty of 44, or 45% of ABAI affiliated chapters distributed the survey, representing Northeast, Mid Atlantic, Southeast, Midwest, Southwest, and Northwest regions of the U.S.

In addition, the Behavior Analyst Online Special Interest Group (SIG) and Practitioner Issues in Behavior Analysis SIG were contacted to distribute the survey. The contact person of Practitioner Issues in Behavior Analysis SIG forwarded the survey to members of the following four special interest groups: Behavioral Medicine SIG, Crime, Delinquency, and Forensic Behavior Analysis SIG, Military and Veteran SIG, and Policy SIG. Therefore, the final sample consisted of respondents from 26 affiliated chapters and SIGs throughout the United States.

Approximately one week prior to the deadline stated for survey responses (October 22, 2010), a reminder email was sent to each organization or special interest group for the designated contact person to distribute. Reminder emails were only sent to those chapters and groups that had distributed the survey at least one week earlier.

Measures

Content validation. A questionnaire was used as the measurement instrument for this study. For the purpose of content validation, a pending version of the survey was first sent to nine doctoral-level professionals with expertise in applied behavior analysis and consultation. Five out of nine professionals assessed the survey items for accuracy in measuring the content (e.g., current collaborative behavior, variables that facilitate and inhibit collaborative behavior, and professionals' perspectives on collaborative behavior). Criterion for keeping a survey item was agreement by three or more experts and no experts indicating the item should be removed. One out of five experts suggested three items for removal. Given suggestions for modification, the three items were revised rather than removed. All 23 survey items were retained in the final survey with 18 modified given suggestions for modification from experts in the field.

Survey. Prior to sending out the final survey to participants, the primary investigator piloted the survey through SurveyMonkey™ to assure that the settings and functions were operating effectively. Participants had the option to complete any, all, or none of the survey items as well as re-enter the survey to change answers or complete it at another time up until the stated deadline. Participants were not able to complete the survey twice from the same IP address. Participants were not required to record any potentially identifying information (e.g., email address) and encryption was added to transmit information privately over the Internet.

The survey was designed to take participants 10–15 minutes to complete. Prior to accessing the survey, a consent form was presented immediately upon clicking the hyperlink contained in the email sent to participants. Participants consented to the study by clicking

the "Next" button at the end of the consent form and were then granted access to the survey items. The survey comprised four sections: (a) demographics, (b) current collaborative behavior, (c) variables that inhibit and facilitate collaborative behavior, and (d) perspectives on collaborative behavior.

In the first section, demographics, respondents were asked to indicate their current position(s), highest degree, certification(s)/license(s), work setting(s), age range(s) of those being served, diagnoses of those being served, and number of college/university course credits and workshops/trainings with the word "collaboration" in the title or description. Participants responded to questions by clicking one or more boxes to the left of text answers when given the direction to check all that apply or responded by clicking one of the circles to the left of text answers when given the direction to check one. For five out of eight questions, participants were also given the opportunity to select an answer of "other" and insert text.

The second section, current collaborative behavior, defined collaboration for respondents before presenting the opportunity to respond to questions regarding the construct. Collaboration was defined as the following: "A component of consultation involving voluntary, interpersonal interactions comprising of two or more professionals engaging in communication modalities (face-to-face meetings, e-mail, alternate means of feedback, etc.) for the purposes of shared decision-making and problem solving toward a common goal. Collaboration results in changes to tasks and solutions that would not have been achieved in isolation" (adapted from Friend & Cook, 2010; Idol, Paolucci-Whitcomb, & Nevin, 1995). Respondents were asked to use this specific definition of collaboration to answer questions that followed. Participants were asked how often they collaborated with professionals, by what mode, to identify each of the professionals with whom they collaborated with on a routine basis, how likely they were to provide a behavioral programming recommendation to each of 12 specified professionals, how likely they were to adopt (resulting in changes to tasks and solutions) a behavioral programming recommendation made by each of 12 specified professionals, and to consider

the degree to which they agreed with statements regarding collaboration resulting in major, minor, or no changes to tasks and solutions. The 12 specified professionals were as follows: board certified behavior analyst (BCBA), board certified associate behavior analyst (BCaBA), non-certified behavior analyst, psychologist, school psychologist, general education teacher, special education teacher, occupational therapist (OT), physical therapist (PT), speech and language pathologist (SLP), administrator (principal, supervisor, director, etc.), and health care provider. Participants responded to questions in the same way as specified in the first section; however, participants rated the likelihood of providing and adopting a recommendation on a 5-point Likert-scale where 1 = *very unlikely* and 5 = *very likely* via clicking on the corresponding circle to the right of each specified profession. In addition, participants reported the degree to which they agreed with three statements concerning the results of collaborative interactions on a 5-point Likert scale where 1 = *strongly disagree* and 5 = *strongly agree* via a drop-down menu.

The third section, variables that inhibit and facilitate collaborative behavior, asked respondents the degree to which they agreed with six specified variables as inhibiting or facilitating the collaborative process for themselves and others. The variables measured were ideology, perspectives, training of self, training of others, current contingencies, and time. Participants responded using a 5-point Likert scale where 1 = *strongly disagree* and 5 = *strongly agree* via a drop-down menu. Using the same scale and response mode, respondents considered the degree to which they agreed with four statements regarding collaboration being modeled and expected throughout their internship and/or practicum experience and the degree to which they agreed with four statements regarding their perspective on collaboration as part of ethical responsibility and professional development. No "other" responses were made available for this section.

The final section, perspectives on collaborative behavior, asked participants to rate importance (the degree to which collaboration results in desirable outcomes and/or prevents undesirable outcomes), their experience (the quality of recommendations provided and ad-

opted), and the value (the degree to which the tasks and/or solutions have changed) of collaborating with each of 12 specified professionals. An "other" option and field to insert text were available for all three questions in this section. Participants responded using a 5-point Likert scale for importance where 1 = *very unimportant* and 5 = *very important*. A 5-point Likert-scale was used for responding for both experience and value where 1 = *very unproductive* and 5 = *very productive* and where 1 = *no value at all* and 5 = *very valuable*, respectively.

Responses were collected at the end of the survey by clicking the "Done" button at the end of the last section of the survey.

Results

Demographics

In total, 302 participants completed the survey. Over half of participants reported being a board certified behavior analyst (BCBA) (56%). Participants also reported holding the following positions: special educator (22%), non-certified behavior analyst (19%), higher education (17%), psychologist (16%), board certified associate behavior analyst (BCaBA) (6%), general educator (3%), and/or school psychologist (3%). In addition, most participants held a master's degree (57%). Thirty percent of participants held a doctoral degree and 13% held a bachelors degree.

The largest group of participants worked in the public school (38%) or private home (36%) setting and served those diagnosed with autism spectrum disorder (95%) and/or intellectual disability (74%). Participants also reported serving those with attention deficit hyperactivity disorder (55%), emotional or behavioral disorder (54%), oppositional defiance disorder (42%), anxiety (41%), obsessive compulsive disorder (39%), and/or depression (36%). Participants also reported to be currently working in the university (27%), residential (25%), private school (21%), clinic/hospital (15%), supported employment (6%), and/or charter school (3%) settings. Most participants reported serving school aged children and youth 5 to 21 years old (67%) with a smaller group of participants reporting serv-ing those 21 years old or older (45%) and 0 to 3 years old (32%).

Training in Collaboration

Overall, respondents reported little formal pre-service or in-service collaborative training as per the study's definition. The majority of participants (67%) had taken 0 courses toward a degree and/or certification with the word "collaboration" in the title or course description. In addition, the largest group of participants (45%) had taken 0 workshops and/or trainings toward professional development units with the word "collaboration" in the title or description of the training or workshop. Participants were more likely to have attended at least one workshop or training (57%) than have taken at least one course (33%) on the topic of collaboration.

Conversely, participants moderately agreed that collaboration was modeled throughout their internship experience ($M = 3.58$, $SD = 1.22$). However, participants also modestly agreed that they would have appreciated more modeling of collaboration throughout ($M = 3.26$, $SD = 1.25$). On average, respondents disagreed that collaboration was expected but not modeled ($M = 2.52$, $SD = 1.03$) and that collaboration was neither expected nor modeled ($M = 2.05$, $SD = 1.01$).

Type and Extent of Collaborative Interactions with Other Professionals

In general, respondents indicated that collaborative interactions were a frequent part of their behavioral practice. The majority of participants (62%) reported that collaboration with other professionals occurred on a daily basis. Twenty three percent reported they collaborated on a weekly basis, 10% reported they collaborated on a bi-weekly basis, 2% reported they collaborated every other week, and 3% reported they collaborated on a monthly basis. The primary modes by which professionals reported they collaborated were face-to-face (98%), e-mail (91%), and phone (71%). 27% reported they collaborated via texting/instant messaging, 11% reported they collaborated via video chat, and 3% reported they collaborated via blogs. The majority of respondents collaborated with a BCBA (78%),
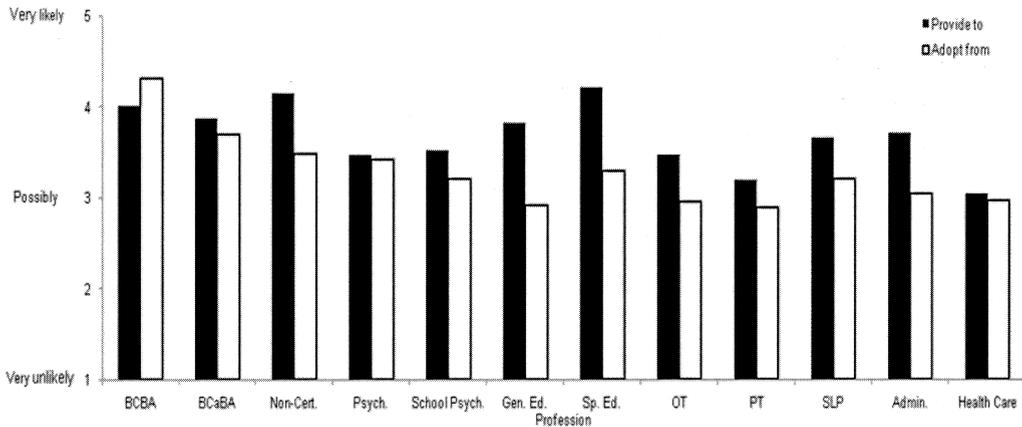
Figure 1. Comparison of the average likelihood of participants to provide or adopt a behavioral programming recommendation to/from each professional. BCBA = Board Certified Behavior Analyst; BCaBA = Board Certified Associate Behavior Analyst; Non-Cert. = Non-Certified Behavior Analyst; Psych. = Psychologist; School Psych. = School Psychologist; Gen. Ed. = General Educator; Sp. Ed. = Special Educator; OT = Occupational Therapist; PT = Physical Therapist; SLP = Speech and Language Pathologist; Admin. = Administrator; Health Care = Health Care Provider.

administrator (69%), special educator (63%), and/or speech language pathologist (55%) on a routine basis.

Overall, as shown in Figure 1, professionals reported that they were more likely to provide a behavioral programming recommendation to a professional ($M = 3.71$, $SD = 1.18$) than to adopt a behavioral programming recommendation from a professional ($M = 3.29$, $SD = 1.11$), $t(2337) = 15.5$, $p < .001$, $d = .37$. The exception to this was the BCBA. Participants were more likely to adopt a recommendation from the BCBA ($M = 4.31$, $SD = 1.12$) than to provide a recommendation to the BCBA ($M = 4.01$, $SD = .89$) $t(241) = -4.20$, $p < .001$. $d = -.30$. The degree of likelihood in providing ($M = 4.24$, $SD = 1.01$) versus adopting ($M = 3.31$, $SD = .99$) was the most pronounced for the special educator, $t(189) = 10.98$, $p < .001$. $d = .93$. Participants were least likely to adopt a recommendation from the physical therapist (PT) ($M = 2.90$, $SD = 1.11$), general education teacher ($M = 2.92$, $SD = .98$), occupational therapist (OT) ($M = 2.95$, $SD = 1.08$), and health care provider ($M = 2.97$, $SD = 1.13$).

BCBA responses for providing recommendations to versus adopting recommendations from other BCBAs compared to persons who are not BCBAs are illustrated in Figure 2.

BCBAs reported that they were more likely to provide a recommendation to another BCBA ($M = 4.26$, $SD = .96$) than to provide a recommendation to a non-BCBA ($M = 3.85$, $SD = .66$), $t(135) = 5.21$, $p < .001$. $d = .50$. BCBAs reported that they were substantially more likely to adopt a recommendation from another BCBA ($M = 4.24$, $SD = .87$) than to adopt a recommendation from a non-BCBA ($M = 3.16$, $SD = .69$), $t(133) = 14.83$, $p < .001$. $d = 1.38$.

Participants agreed that collaborative interactions with other professionals resulted in minor changes to tasks and solutions ($M = 3.89$, $SD = .94$). However, participants were less likely to agree that collaboration resulted in major changes to tasks and solutions ($M = 3.52$, $SD = 1.02$). Participants disagreed that collaboration with other professionals resulted in no changes to tasks and solutions ($M = 2.04$, $SD = .97$).

Variables that Inhibit and Facilitate Collaborative Behavior

Participants were more likely to rate ideology, perspectives, training of self, training of others, contingencies, and time as inhibitors for others ($M = 3.57$, $SD = .68$) than for themselves ($M = 3.05$, $SD = .68$), $t(223) = -11.78$,
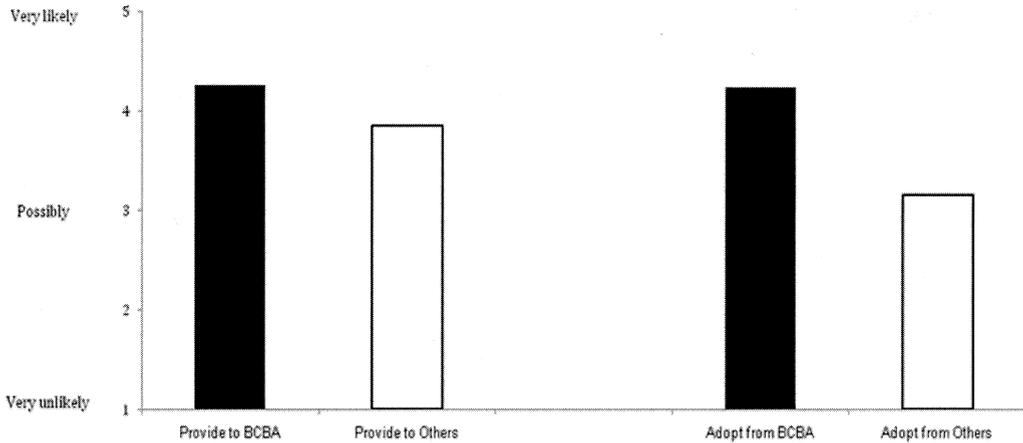
Figure 2. Likelihood of BCBAs providing recommendations to BCBAs compared to others (non-BCBAs) and likelihood of BCBAs adopting recommendations from BCBAs compared to others (non-BCBAs). BCBA = Board Certified Behavior Analyst.

$p < .001$. $d = .76$. For example, participants reported perspectives as possible inhibitors for others ($M = 3.19$, $SD = 1.09$), but not for themselves ($M = 2.16$, $SD = 1.27$), $t(222) = 11.51$, $p < .001$. $d = .87$, and reported training of self as a possible inhibitor for others ($M = 3.04$, $SD = 1.09$) but not for themselves ($M = 2.00$, $SD = 1.08$), $t(222) = 11.23$, $p < .001$. $d = .96$.

Participants were less likely to rate ideology, perspectives, training of self, training of others, contingencies, and time as facilitators for others ($M = 3.64$, $SD = .79$) than for themselves ($M = 3.84$, $SD = .70$), $t(217) = -4.94$, $p < .001$. $d = -.27$; however, in most instances differences in ratings were small.

Extent to Which Participants View Collaboration as a Valuable Component of Practice

Participants strongly agreed that collaboration is an ongoing process and part of ethical practice ($M = 4.62$, $SD = .60$) and that collaboration contributes to skill building and professional development ($M = 4.61$, $SD = .58$). Participants agreed, although less strongly, that collaboration is a training tool for non-certified practitioners ($M = 3.69$, $SD = 1.27$). Respondents disagreed that collaboration is only necessary when one is not able to solve a problem on his or her own ($M = 1.86$, $SD = .83$).

Finally, participants rated the importance (the degree to which collaboration results in desirable outcomes and/or prevents undesirable outcomes) of collaborating with other professionals higher ($M = 4.00$, $SD = .86$) than ratings of the experience ($M = 3.22$, $SD = .76$), $t(238) = 11.89$, $p < .001$. $d = .96$ or value ($M = 3.02$, $SD = .86$), $t(236) = 15.54$, $p < .001$. $d = 1.14$ of collaborating with other professionals. Importance of collaborating with each professional was rated greater than experience or value of collaborating with each professional with the exception of the BCBA and BCaBA.

Discussion

The goal of this survey of behavioral professionals was to identify (a) what, if any, training behavioral professionals have received in collaboration; (b) the type and extent of collaborative interactions with other professionals; (c) variables that facilitate and inhibit collaboration; and (d) the extent to which behavioral professionals view collaboration as a valuable component of their practice.

The majority of participants had little to no formal training in the area of collaboration as indicated by survey responses. Sixty seven percent reported no coursework with collaboration in the title or description and 45% reported attending no workshops with collab-

oration in the title or description. This indicates an overall lack of college and university coursework addressing collaboration as a content area, even though 62% of respondents reported collaborating with other professionals on at least a daily basis. Furthermore, collaborative skills are required as part of the task list by the BACB to obtain certification as a BCBA or BCaBA (Content Area #10: Systems Support: 10–6 "Provide behavior analysis services in collaboration with others who support and/or provide services to one's clients."). Therefore, this finding highlights a possible need to increase collaborative coursework for professionals practicing in the field. Respondents were more likely to have attended at least one training or workshop on collaboration (57%) than have taken at least one course (33%). This suggests that professional development providers are allocating relatively more workshops on collaboration; however, both pre-service and in-service training on collaboration appears to be lacking.

Participants moderately agreed that that collaboration was modeled throughout their practicum experience ($M = 3.58$), suggesting that collaborative interactions may have been formally or informally taught during field experiences. However, they also modestly agreed that they would have appreciated more modeling on collaboration ($M = 3.26$). This result indicates that many professionals view collaboration as an intrinsic part of behavioral practice, but would appreciate more modeling of collaboration as part of their training. As the majority of participants reported that they collaborated on a daily basis, it is evident that practitioners are being required to collaborate often as part of service delivery to consumers. Given that respondents were most likely to collaborate on a routine basis with the BCBA, administrator, special education teacher, and speech and language pathologist, this highlights the need for collaboration as a skill set especially among these individuals. Successful collaboration with administrators is especially important given that administrators' granting or restricting resources may affect the success of interventions (Santangelo, 2009).

Overall, as reflected in Figure 1, respondents (with the exception of the BCBA) were consistently more likely to *provide* ($M = 3.71$)

than to *adopt* ($M = 3.29$) behavioral programming recommendations from other professionals. In general, these data suggest that collaboration among practicing behavior analysts and non-behavioral professionals is a unidirectional process, in which behavior analysts provide recommendations with or without team input. This finding is unsurprising given that behaviorally trained professionals tend to have more expertise in behavioral procedures than those from traditionally non-behavioral disciplines (e.g., general education). However, most noteworthy is the degree of difference between *providing to* (likely) and *adopting from* (less likely) the special educator. Research indicates that behavioral interventions developed without teacher input may not be implemented, may be implemented inaccurately, or may be abandoned prematurely (Peck, Killen, & Baumgart, 1989). Involvement of those who will implement the intervention in its development may be an important factor in whether the recommended intervention is actually implemented (Burgio, Whitman, & Reid, 1983). In addition, low ratings for the degree of likelihood of adoption of recommendations from the physical therapist, general educator, and occupational therapist, indicate that collaboration is occurring at lower levels across these professionals and their respective areas, at least in terms of behavioral programming recommendations. As individualized educational programs (IEPs) for students with disabilities require coordination of services across multiple service providers and team decision making, this could have deleterious effects with respect to student achievement when teamwork among these professionals is required.

On the other hand, there may be consultative situations in which a collaborative-directive approach is most beneficial (Tysinger, Tysinger, & Diamanduros, 2009). A collaborative-directive approach is one in which the consultant (e.g., BCBA) employs shared decision making and respects others' rights to reject interventions, while making prescriptive recommendations where appropriate. For instance, a BCBA might allow the special education teacher to select behavior targets for intervention and accept input on which interventions are most feasible given the teacher's skills, classroom resources, and

time constraints (Tincani, 2007), yet prescribe specific strategies that are supported by empirical evidence (e.g., story-based intervention package) and not others (e.g., facilitated communication) (National Autism Center, 2009).

On average, BCBAs were more likely to provide and to adopt recommendations from other BCBAs than non-BCBAs. Most noteworthy is the difference between the likelihood of adopting from a BCBA ($M = 4.24$) versus a non-BCBA ($M = 3.16$). This finding is not surprising given that participants were more likely to provide than to adopt recommendations from professionals in other disciplines, generally. However, it suggests that when BCBAs are working with a professional with similar behavioral expertise, they are more likely to incorporate his or her recommendations into practice.

One survey question asked respondents directly about outcomes of collaboration (i.e., to what degree does collaboration result in major, minor, or no changes in tasks and solutions). Although most disagreed with the statement *collaboration results in no changes* ($M = 2.04$), they did not agree strongly that collaboration resulted in major ($M = 3.52$) or minor changes (M = 3.89). The generally neutral response to this item may indicate that professionals may view their efforts as "collaboration" even when such efforts result in no changes to approaches or interventions, suggesting that the functional definition of collaboration per this study's definition (that which results in changes to tasks and solutions) is not being implemented in actual practice.

On average, participants felt more strongly that ideology, perspectives, training, contingencies, and time were inhibitors for others ($M = 3.57$) than themselves ($M = 3.05$). While speculative, in situations where collaboration does not result in positive consumer outcomes, this finding illustrates a possible, "It's not my problem; it's theirs" perspective among behavioral professionals. In other words, they may be more likely to attribute lack of a successful collaborative outcome to skill deficits of the consultee, rather than a collective failure of the collaborative interaction. Collaboration (as an aspect of consultation) is a skill that requires persons to elicit responses from others and initiate the prob-

lem-solving process (i.e., identify the problem) (Bergan & Tombari, 1975). In addition, the other party specifies what the problem is and plays a major role in the development and implementation of solutions. Bergan and Tombari found that lack of consultant skill (e.g., interviewing) was likely associated with the failure to initiate the problem-solving process (i.e., starting with identifying the problem). This supports a call for more training in the area of collaboration as a bi-directional process to better serve consumers and promote successful outcomes.

Overall, participants strongly agreed with the statement that *collaboration is ongoing and part of ethical practice* ($M = 4.62$), indicating that participants do not have a resistance to addressing better collaboration methods and approaches as part of ethical practice. Respondents also rated the importance of collaboration with other professionals as important ($M = 4.07$), furthering the argument that participants view collaboration as part of best practice. However, although participants rated collaboration with other professionals as important, they did not indicate that the use of collaboration gained them much when used (experience) or that it had dramatic results when applied (value) when interacting with professionals other than the BCBA, BCaBA, and non-certified behavior analyst.

Limitations

There are three limitations of this study. The first limitation is that the survey is an indirect measure of professionals' collaboration. It is unclear to what extent the reports reflect actual practice. While collaboration was defined for respondents as, "a component of consultation involving voluntary, interpersonal interactions comprising of two or more professionals engaging in communication modalities for the purposes of shared decision-making and problem solving toward a common goal and resulting in changes to tasks and solutions that would not have been achieved in isolation" (adapted from Friend & Cook, 2010; Idol et al., 1995), it is possible that participants responded differently based their own subjective definitions of collaboration. Related, the survey did not evaluate respondents' specific collaborative behaviors. For instance, while the

survey asked respondents to rate the likelihood of adopting recommendations from other professionals, it did not ask them to define how they would adopt a recommendation (e.g., seek input on target behaviors, modify an intervention to meet another professional's preferences). Finally, it is unclear how well this sample represents that larger sample of professionals working in the field of applied behavior analysis. While the survey sample (302 respondents) is relatively large and was recruited from organizations representing all major demographic regions of the U.S., the recruitment procedures did not allow the researchers to establish the number of non-responders, introducing the possibility of sampling bias in the survey (i.e., those who chose to participate responded in a manner unrepresentative of the target population). It is therefore possible that only participants with favorable views of collaboration took the time and effort to complete the survey.

Future Directions

Given the frequency with which behavioral professionals collaborate and the dearth of research on modes of collaboration that lead to best outcomes, an important direction for future research is to explore effects of collaborative strategies on professional's adoption of behavioral interventions (i.e., treatment integrity) and changes in consumer's target behaviors. Specifically, researchers could compare effects of directive versus collaborative consultation on critical outcome variables. Importantly, most of the survey's respondents reported little to no formal collaborative training. Given the apparent importance of collaboration for practicing behavior analysts, future research should examine the most effective ways to teach collaboration skills, including the array of professionals identified in the current study, and to explore modes of collaboration that incorporate technology (e.g., email, video-based) beyond traditional face-to-face interaction formats.

References

Association for Behavior Analysis International. *Affiliated Chapters*. Retrieved August 20, 2010, from http://www.abainternational.org/chapters.asp

BCBA and BCaBA Behavior Analyst Task List. *Behavior Analyst Certification Board*. Retrieved November 27, 2010, from http://www.bacb.com/index.php?page=100248

Behavior Analyst Certification Board Guidelines for Responsible Conduct. *Behavior Analyst Certification Board*. Retrieved August 20, 2010, from http://www.bacb.com/consum_frame.html

Bergan, J. R. (1977). *Behavioral consultation*. Columbus, OH: Merrill.

Bergan, J. R., & Kratochwill, T. R. (1990). *Behavioral consultation in applied settings*. New York: Plenum.

Bergan, J. R., Tombari, M. L. (1975). The analysis of verbal interactions occurring during consultation. *Journal of School Psychology, 13*, 209–226.

Boutot, E. A., & Hume, K. (2010). *Beyond time out and table time: Today's applied behavior analysis for students with autism. Position paper of the Council of Exceptional Children, Division on Autism and Developmental Disabilities*. Retrieved from http://daddcec.org/Portals/0/CEC/Autism_Disabilities/Research/Position_Papers/Critical-Issues-Brief-Beyond-Time-Out-and-Table-Time-Todays-Applied-Behavior.pdf

Burgio, L. D., Whitman, T. L., & Reid, D. H. (1983). A participative management approach for improving direct-care staff performance in an institutional setting. *Journal of Applied Behavior Analysis, 16*, 37–53.

Caron, E. A., & McLaughlin, M. J. (2002). Indicators of beacons of excellence schools: What do they tell us about collaborative practices? *Journal of Educational and Psychological Consultation, 13*, 225–229.

Friend, M., & Cook, L. (2010). *Interactions: Collaboration skills for school professionals* (6th ed.). Upper Saddle River, New Jersey: Pearson.

Galloway, J., & Sheridan, S. M. (1994). Implementing scientific practices through case studies: Examples using home-school interventions and consultation. *Journal of School Psychology, 32*, 385–413.

Heron, T. E., & Harris, K. C. (2001). *The educational consultant: Helping professionals, parents, and students in inclusive classrooms* (4th ed.). Austin, TX: Pro-Ed.

Hundert, J., & Hopkins, B. (1992). Training supervisors in a collaborative team approach to promote peer interaction of children with disabilities in integrated preschools. *Journal of Applied Behavior Analysis, 25*, 385–400.

Hunt, P., Soto, G., Maier, J., & Doering, K. (2003). Collaborative teaming to support students at risk and students with severe disabilities in general education classrooms. *Exceptional Children, 69*, 315–332.

Hunt, P., Soto, G., Maier, J., Liboiron, N., & Bae, S. (2004). Collaborative teaming to support preschoolers with severe disabilities who are placed

in general education early childhood programs. *Topics in Early Childhood Special Education*, *24*, 123–142.

Idol, L., Paolucci-Whitcomb, P., & Nevin, A. (1995). The collaborative consultation model. *Journal of Educational and Psychological Consultation*, *6*, 329–346.

Kelleher, C., Riley-Tillman, T., & Power, T. J. (2008). An initial comparison of collaborative and expert-driven consultation on treatment integrity. *Journal of Educational and Psychological Consultation*, *18*, 294–324.

Levy, S. E., Mandell, D. S., & Shultz, R. T. (2009). Autism. *Lancet*, *374*, 1627–1638.

National Autism Center. (2009). *National Standards Project-Addressing the need for evidence based practice guidelines for autism spectrum disorders*. Randolph, MA: National Autism Center.

National Conference of State Legislatures. (2011). *Insurance coverage for autism*. Denver, CO: Author. Retrieved from National Conference of State Legislatures website: http://www.ncsl.org/?tabid=18246

Nevada Legislature. (2012). Chapter 641 – Psychologists, licensed behavior analysts, licensed assistant behavior analysts and certified autism behavior interventionists. Retried from the Nevada Legislature website: http://www.leg.state.nv.us/nrs/NRS-641.html

Noell, G. H., & Witt, J. C. (1999). When does consultation lead to intervention implementation? Critical issues for research and practice. *The Journal of Special Education*, *33*, 29–35.

Peck, C. A., Killen, C. C., & Baumgart, D. (1989). Increasing implementation of special education instruction in mainstream preschools: Direct and generalized effects of nondirective consultation. *Journal of Applied Behavior Analysis*, *22*, 197–210.

Putnam, R. F., Handler, M. W., Ramirez-Platt, C. M., & Luiselli, J. K. (2003). Improving student bus-riding behavior through a whole-school intervention. *Journal of Applied Behavior Analysis*, *36*(4), 583–590.

Ray, K. P., Skinner, C. H., & Watson, T. (1999). Transferring stimulus control via momentum to increase compliance in a student with autism: A demonstration of collaborative consultation. *School Psychology Review*, *28*, 622–628.

Ratzon, N. Z., Lahav, O., Cohen-Hamsi, S., Metzger, Y., Efraim, D., & Bart, O. (2009). Comparing different short-term service delivery methods of visual-motor treatment for first grade students in mainstream schools. *Research in Developmental Disabilities*, *30*, 1168–1176.

Santangelo, T. (2009). Collaborative problem solving effectively implemented, but not sustained: A case study for aligning the sun, the moon, and the stars. *Exceptional Children*, *75*, 185–209.

Shannon, G. S., & Bylsma, P. (2004). *Characteristics of improved school districts: Themes for research*. Olympia, WA: Office of the Superintendent of Public Instruction, retrieved August 20, 2010, from http://www.k12.wa.us/research/pubdocs/District Improvementreport.pdf

Sheridan, S. M., & Colton, D. L. (1994). Conjoint behavioral consultation: A review and case study. *Journal of Educational and Psychological Consultation*, *5*, 211–228.

Sheridan, S. M., Kratochwill, T. R., & Elliott, S. N. (1990). Behavioral consultation with parents and teachers: Delivering treatment for socially withdrawn children at home and school. *School Psychology Review*, *19*, 33–52.

Sheridan, S. M., Welch, M., & Orme, S. F. (1996). Is consultation effective? A review of outcome research. *Remedial and Special Education*, *17*, 341–354.

Shook, G. L., & Favell, J. E. (2008). The Behavior Analyst Certification Board and the profession of behavior analysis. *Behavior Analysis in Practice*, *1*, 44–48.

Shook, G., & Neisworth, J. (2005). Ensuring Appropriate Qualifications for Applied Behavior Analyst Professionals: The Behavior Analyst Certification Board. *Exceptionality*, *13*, 3–10.

Tincani, M. (2007). Beyond consumer advocacy: Autism spectrum disorders, effective instruction, and public schooling. *Intervention in School and Clinic*, *43*, 47–51.

Travers, J., Tincani, M., Krezmien, M. (2011). A multiyear national profile of racial disparity in autism identification. *The Journal of Special Education*. Advance online publication. doi: 10.1177/0022466911416247

Tysinger, P., Tysinger, J. A., & Diamanduros, T. (2009). Teacher expectations on the directiveness continuum in consultation. *Psychology in the Schools*, *46*, 319–332.

Virués-Ortega, J. (2010). Applied behavior analytic intervention for autism in early childhood: Meta-analysis, meta-regression and dose–response meta-analysis of multiple outcomes. *Clinical Psychology Review*, *30*, 387–399.

Vismara, L. A., & Rogers, S. J. (2010). Behavioral treatments in autism spectrum disorder: What do we know? *Annual Review of Clinical Psychology*, *6*, 447–468.

Wickstrom, K. F., Jones, K. M., LaFleur, L. H., & Witt, J. C. (1998). An analysis of treatment integrity in school-based behavioral consultation. *School Psychology Quarterly*, *13*, 141–154.