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DISCUSSION AND REVIEW PAPER

Multidisciplinary Teaming: Enhancing Collaboration through Increased Understanding

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Abstract

In an effort to provide clarity about the unique contributions of several professions within the context of multidisciplinary treatment, we reviewed the definitions, philosophical underpinnings, and national requirements pertaining to both scopes of practice (i.e., model licensing acts, legislation, and regulatory boards) and training (i.e., task lists, accreditation standards and course requirements, and exam blueprints) of 4 behavioral health professions. The professions we selected (behavior analysis, psychology, speech-language pathology, and occupational therapy) are likely to provide treatment alongside one another and often to the same clients. In a review of documents pertaining to scopes of practice and training for each profession, we found overlapping content. However, the similarities between professions diminished when we reviewed more specific guidelines such as learning objectives, educational requirements (i.e., coursework), supervised clinical experience (e.g., internships), and national examinations. This was especially true when considering each profession's underlying approach to treatment (i.e., philosophical underpinnings) and, hence, service activities. We discuss our findings in light of service overlap and make a call for greater collaboration between professions, as related to the separate content knowledge and expertise of professionals in each field and the impact on client outcomes.

Keywords Scope of practice · Scope of training · Practice documents · Treatment · Multidisciplinary teams · Collaboration

According to the Centers for Disease Control and Prevention (CDC), the current rate of prevalence for a diagnosis of autism spectrum disorder (ASD) in children is estimated to be approximately 1 in 59 (CDC, n.d.). In a study conducted by Cawthorpe (2017), it was reported that the current literature on the prevalence of ASD reports rates of approximately 1%–4% in the general population (i.e., including children and adults), making it a ubiquitous health concern.

Additionally, comorbidity has been documented as occurring among those with ASD for decades (Matson & Nebel-Schwalm, 2007). For example, Doshi-Velez, Ge, and Kohane (2014) found that individuals diagnosed with ASD have a higher likelihood of comorbidity with seizure and gastrointestinal disorders, as well as with psychiatric illnesses, when compared to the pediatric population in general. In a more recent study, Cawthorpe (2017) examined the comorbidity of ASD with physical, biomedical, and the main disorder classes from the International Classification of Diseases, Ninth Edition. It was found that males with ASD are significantly more likely to have mothers who experienced difficulties of pregnancy and childbirth, to have been diagnosed with perinatal conditions and congenital anomalies, to be diagnosed with diseases of the skin and digestive and respiratory systems, and to manifest symptoms of other ill-defined conditions, as well as be more susceptible to infectious diseases. Similarly, females with ASD are significantly more likely to experience many of the same conditions and disorders (with the exception of pregnancy- and childbirth-related complications) and disorders related to the endocrine, nutritional, and metabolic systems, as well as conditions affecting the immune system, "blood and blood-forming organs" (p. 87). Matson and Williams (2013) also found that a diagnosis of ASD has a higher probability of comorbidity with certain other kinds of disorders typically categorized as psychological in

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nature, such as attention deficit hyperactivity disorder, anxiety, and conduct disorders. Moreover, Weissman and Bates (2010) found that bipolar disorder is prevalent in children diagnosed with ASD and that this may lead to neurocognitive impairment, resulting in elevated rates of aggression, depression, suicidal ideation, obsessive-compulsive disorder, and delinquency in this population.

Thus, the complexity and the ubiquity of comorbidity in this population, as well as the needs associated with treatment, often necessitate interdisciplinary collaboration (e.g., Brodhead, 2015; Cox, 2012; Kelly & Tincani, 2013; Newhouse-Oisten, Peck, Conway, & Frieder, 2017). Additionally, the communication and social deficits associated with ASD, as well as the presence of additional disorders, increase the difficulty of the clinical challenge, complicating assessment and treatment. Yet, nuanced assessment must be conducted, to ensure effective treatment, and cohesive collaboration across service professionals is key. This is especially relevant within the context of multidisciplinary treatment teams, making it essential in the treatment of individuals with ASDs and critical to achieving best outcomes.

Cohesive collaboration is, however, not always easily achieved, and many individuals ultimately receive services from experts who are not effectively communicating about or coordinating treatments across different professions. The spectrum of functionality of these teams can range from disconnected or disjointed care to fully coordinated and integrated interdisciplinary teaming, for instance. Cox (2012) suggested that integrated care necessitates a focus on shared values across key disciplines serving this vulnerable population. Specifically, Cox proposed that all professionals involved be committed to beneficence and to nonmaleficence and that these ethical underpinnings can facilitate coordinated treatment. Further, professionals from all disciplines can commit to demonstrating respect for the other professions and to working toward integrated care. Inherent in this approach is a commitment to understanding the unique expertise associated with each profession. There can be role blurring or dilution of impact with a truly transdisciplinary model, in which cotreating sessions would occur with professionals from several disciplines. However, a functional interdisciplinary treatment-planning model allows for maximal communication, shared goals, frequent updates of progress across professionals, joint problem-solving, and collective progress evaluation. The goal in effective collaboration is to enhance outcomes, and this can be achieved with a foundation of shared ethics and mission, combined with a respect for the unique expertise each discipline offers.

One potential impediment to collaboration among professionals from different disciplines is a lack of understanding about other professions (e.g., their training, focus, and approach). It is important for any professional working with individuals with ASD to understand and recognize the contributions that other disciplines can make to treatment. Perhaps students and trainees in all of the aforementioned fields of study need to acknowledge that they do not, cannot, and will not have all of the answers. In fact, they will need to rely on the expertise available in multidisciplinary teams. It is imperative that all members of a team recognize their own knowledge limitations and value the expertise afforded by professionals who have been trained in other areas. Subscribing to alternative theories or adhering to different philosophies does not make individuals incompatible partners in treatment. On the contrary, it can make the team more effective and more successful in developing comprehensive treatment.

Thus, there is a clear need for a means to compare these professions and understand the roles, responsibilities, and contributions of each, as related to intervention services. In this paper, we summarize the defining features, philosophical underpinnings, scopes of practice, and scopes of training of four pivotal professions (i.e., behavior analysis, psychology, speech-language pathology, and occupational therapy) that often concurrently provide services to individuals diagnosed with ASD. Additionally, we discuss areas of overlap and make a call for improved collaboration in light of maximizing clients' outcomes. It is our hope that illustrating these unique areas of expertise and skill sets will help facilitate broader understanding of an integrative approach to care. It is also our hope that increased cognizance of the challenges to effective collaboration will lead to further discussion on this topic and eventually the incorporation of collaboration into course sequences, training programs, continuing education experiences, conference presentations, and clinical discussions.

Method

Documents and Selection Criteria

We began with the profession of behavior analysis, simply as an artifact of familiarity, and used this as the point of reference for gathering documents across the remaining professions. Thus, we sought and selected each profession's closest approximations to the Behavior Analyst Certification Board's (BACB's) published documentation that pertained to each of the domains of interest (i.e., definition, philosophical approach, scope of practice, and scope of training). We used the BACB's *Model Act* (2012), the Association for Behavior Analysis International's (ABAI's) *Guidelines for Accreditation and Reaccreditation of Programs in Behavior Analysis* (2015), and the BACB's *Fourth Edition Task List* (n.d.), respectively, to define the field and describe the scope of practice and training for behavior analysis. The documents we examined were titled differently depending on the respective profession; therefore, we compared the materials we gathered for psychology,

speech-language pathology, and occupational therapy against those available for behavior analysis and categorized them accordingly. In Tables 1 and 2, we outline the national associations' documents for each profession's scope of practice and training (inclusive of examination content), respectively, along with links to their sources.

Scopes of Practice If a model act was not available to outline a profession's scope of practice, we used any comprehensive document outlining the profession's activities as a stand-in. Specifically, we selected and included documents containing the following: a declaration of policy or variant thereof, definitions of terms, qualifications of professionals for licensure, an explanation of licensure processes, requirements for licensure or temporary licensure, maintenance of licensure, exemptions, penalties, and discipline and sanctions. We considered documents containing this information, or portions of it, analogous to the BACB's *Model Act* (2012) and used them to evaluate scope of practice. We obtained this information primarily by conducting web-based searches using the following keywords: "practice," "practice activities," "practice analysis," "occupation analysis," and "scope of practice." Most of the documents were posted on each profession's professional association website (e.g., American Speech-Language-Hearing Association; ASHA).

Scopes of Training In this section, we used documentation listing or defining learning domains and specific objectives if a "task list" was not available to help outline a profession's scope of training and examination content. Thus, we considered documents that included a comprehensive list of competencies required within the course of a program of study or in preparation for examination to be analogous to the BACB's *Fourth Edition Task List* (BACB, n.d.) and used them to evaluate a profession's scope of training. We found scope-of-training documents by conducting web-based keyword searches for each profession. Keywords included the following terms: "education," "education(al) requirements," "training," "competencies," "skills and knowledge," "knowledge outcomes," and "scope of training." Additionally, we compared documents that described academic accreditation requirements and graduate training across professions.

Making Comparisons

We used the BACB's *Model Act* for the definition of the practice of behavior analysis. We then used the definition as a point of reference; if a profession's primary activities were conducted for the purposes of "identifying functional relations between behavior and environmental factors" (2012, p. 2), we identified these activities as "overlapping areas." We presumed that scope of training would dictate scope of practice (excluding any additional, specialized training) if the

Table 1 National Scope-of-Practice Documents Across Professions

Behavior Analysis	Psychology	Speech-Language Pathology	Occupational Therapy
BACB's *Model Act for Licensing/Regulating Behavior Analysts*	APA's *Model Act for State Licensure of Psychologists*	American Speech-Language-Hearing Association's *Scope of Practice in Speech-Language Pathology*	National Board for Certification in Occupational Therapy's *Professional Practice Standards for OTR - Occupational Therapist® and Candidates Seeking the OTR Designation*
http://www.bacb.com/Downloadfiles/BACB_Model_Act.pdf	http://www.apa.org/about/policy/model-act-2010.pdf	www.asha.org	https://www.nbcot.org/-/media/NBCOT/PDFs/Practice-Standards-OTR.ashx?la=en
		Council for Clinical Certification in Audiology and Speech-Language Pathology's *Standards for the Certificate of Clinical Competence in Speech-Language Pathology*	American Occupational Therapy Association's *Standards of Practice for Occupational Therapy*
		http://www.asha.org/Certification/2014-Speech-Language-Pathology-Certification-Standards/	https://www.aota.org/~/media/Corporate/Files/AboutAOTA/Core/Standards%20of%20Practice%20for%20Occupational%20Therapy%20FINAL.pdf

Table 2 National Scope-of-Training and Exam Content Documents Across Professions

	Behavior Analysis	Psychology	Speech-Language Pathology	Occupational Therapy
Scope of training	BACB's *Fourth Edition Task List* http://www.bacb.com/Downloadfiles/TaskList/BACB_Fourth_Edition_Task_List.pdf ABAI's *Guidelines for Accreditation and Reaccreditation of Programs in Behavior Analysis* https://www.abainternational.org/media/96351/abai_accreditation_manual_2015.pdf	Association of State and Provincial Psychology Boards' *EPPP Candidate Handbook* http://c.ymcdn.com/sites/www.asppb.net/resource/resmgr/EPPP_/EPPP-Cand-Handbook-June_2015.pdf APA's *Guidelines and Principles for Accreditation of Programs in Professional Psychology* http://www.apa.org/ed/accreditation/about/policies/guiding-principles.pdf	Council on Academic Accreditation's *2017 Standards for Accreditation* http://caa.asha.org/reporting/standards/2017-standards/ Council on Academic Accreditation in Audiology and Speech-Language Pathology's *Standards for Accreditation of Graduate Education Programs* http://www.asha.org/uploadedFiles/Accreditation-Standards-Graduate-Programs.pdf Council for Clinical Certification in Audiology and Speech-Language Pathology's *Standards for the Certificate of Clinical Competence in Speech-Language Pathology* http://www.asha.org/Certification/2014-Speech-Language-Pathology-Certification-Standards/	National Board for Certification in Occupational Therapy's *Professional Practice Standards for OTR - Occupational Therapist Registered and Candidates Seeking the OTR Designation* https://www.nbcot.org/-/media/NBCOT/PDFs/Practice-Standards-OTR.ashx?la=en Accreditation Council for Occupational Therapy Education's *2011 Standards and Interpretive Guide* https://www.aota.org/-/media/corporate/files/educationcareers/accredit/standards/2011-standards-and-interpretive-guide.pdf
Exam content	BACB's *Fourth Edition Task List*	Association of State and Provincial Psychology Boards' *EPPP Candidate Handbook*	American Speech-Language-Hearing Association's Speech-Language Pathology Exam (5331) Content http://www.asha.org/Certification/praxis/Speech-Language-Pathology-Exam-5331-Content/ Educational Testing Service's *2017 Praxis Study Companion* https://www.ets.org/s/praxis/pdf/5331.pdf	National Board for Certification in Occupational Therapy's *2012 Practice Analysis of the Occupational Therapist Registered: Executive Summary* http://www.nbcot.org/assets/candidate-pdfs/2012-practice-analysis-executive-otr

EPPP = Examination for Professional Practice in Psychology

descriptions or terminology in documents defining a certain profession's scope of practice was so general as to allow for its application to an unlimited number of potential scenarios or treatment settings. Thus, we cross-referenced scope of training documents to identify overlapping areas across professions.

We also compared scope-of-training documents to ABAI's *Guidelines for Accreditation and Reaccreditation of Programs in Behavior Analysis* (2015), as well as the BACB's *Fourth Edition Task List* (n.d.). More specifically, we compared graduate training requirements across professions. As these requirements differed widely, we focused on identifying training requirements pertaining to behavior analysis solely within each profession. Using the *Guidelines for Accreditation and Reaccreditation of Programs in Behavior Analysis* as the primary reference, we identified any same or similar educational requirements pertaining to behavior-analytic concepts and principles as "overlapping training." Training areas we excluded were coursework in assessment or evaluation, coursework in intervention or treatment, and coursework related to measurement.

With respect to national examination content, we laid these documents out side by side in spreadsheet format. We then compared both general content areas and single task list items to one another. Using the *Fourth Edition Task List* as the primary point of reference, we identified any same (e.g., reinforcement: reinforcement) and similar (e.g., reinforcement: rewards, consequences, contingencies) keywords related to behavior-analytic concepts, principles, and services appearing across task lists as overlapping items. The terms we excluded were "assessment" and "evaluation," "intervention" and "treatment," "treatment evaluation," and references to measures of progress.

Interobserver Agreement (IOA)

The first author reviewed all documents independently and noted areas of overlap, according to the aforementioned definitions. Once this task was completed, she provided the third author with the literature and specific definitions necessary for identifying overlap. The third author independently reviewed the same documents and returned them with her comments to the first author. Initial scores between the primary (first author) and secondary (third author) coders were as follows: 100% IOA (i.e., both authors scored 0 of 3 items as overlapping between content areas) for speech-language pathology scope-of-practice documents, 95.3% IOA for speech-language pathology scope-of-training documents (i.e., the first author scored 2 of 43 items, whereas the third author scored none, as overlapping), 100% IOA for psychology scope-of-practice documents (i.e., both authors scored 0 of 8 items as overlapping between content areas), 98.7% IOA for psychology scope-of-training documents (i.e., the first author scored 2 of 76 items, whereas the third author scored 1 of 76 items, as overlapping), 100% IOA for occupational therapy scope-of-practice documents (i.e., both authors scored 0 of 4 items as overlapping between content areas), and 100% IOA for occupational therapy scope-of-training documents (i.e., both authors scored 3 of 68 items as overlapping). As the nature of the review required extensive evaluation of narrative information across multiple documents, unlike comparisons of raw data in experimental demonstrations, the first and third authors discussed any disagreement until they reached a mutually agreeable conclusion. Thus, final IOA was 100% across all documents reviewed.

Results

In each of the following sections, we provide a brief definition of each profession, which includes information pertaining to its primary area of interest (i.e., subject matter), discuss the philosophical underpinnings of each profession, and tie this information to the profession's approach to treatment. Finally, we examine documents outlining both scopes of practice and scopes of training (including examination content) and provide information pertaining to potential areas of similarity and difference across professions.

Definitions and Philosophical Underpinnings

Behavior Analysis Behavior analysis is defined as a natural-science approach to behavior, in which causal relationships between behavior and the environment are identified. Assessment and treatment are accomplished via systematic manipulation of environmental (i.e., independent) variables and direct observation of changes in behavior (i.e., dependent variable). The science itself can be divided into three distinct branches: its conceptual analysis (radical behaviorism), experimental analysis (basic laboratory and translational research), and applied behavior analysis (ABA; applied research and treatment), which is the only branch to which we will speak within the context of this paper.

In behavior analysis, the unifying philosophical basis is that of radical behaviorism (Skinner, 1974). This approach requires an account of the full constellation of variables occurring both outside of and within the individual's own skin (e.g., private events, such as thoughts and rule following; Skinner, 1957) that come to bear on observable and measurable behavior. Thus, in both science and practice, a deductive model is applied to analyzing problems. This is because in behavior analysis, theories are derived from empirical data, as is characteristic of inductive approaches to science. Moreover, the use of single-case research design and visual analysis are the primary means of investigation (Cooper, Heron, & Heward, 2007; Kazdin, 2011). The rationale underlying this approach pertains to the field's interest in individual

behavior and variance, as well as the use of powerful experimental variables amenable to visual inspection (Sidman, 1960).

ABA, as a practice, is reliant on a very-well-defined approach and may be best recognized by the use and implementation of some popularized teaching strategies and behavior-change technologies (e.g., functional assessment, discrete-trial teaching, task analysis methodology, prompting, fading, shaping, reinforcement). As such, the selection, dose, timing, stimuli used, and responses targeted differ dramatically depending on the functions (or causes) of the behavior in question, as well as the context in which it occurs. In fact, prescribed behavior-change procedures may be contraindicated and have the potential to exacerbate problem behavior if the technology is used without a comprehensive knowledge of the basic science and appropriate identification of the functions of behavior (which, to a behavior analyst, lies in the behavior–environment relationship).

Psychology According to the American Psychological Association's (APA's) *Model Act*, the practice of psychology is defined as "the observation, description, evaluation, interpretation, and modification of human behavior by the application of psychological principles, methods, and procedures" (2010, p. 2). Thus, licensed psychologists seek to "a) prevent, eliminate, evaluate, assess, or predict symptomatic, maladaptive, or undesired behavior, and b) evaluate, assess, and/or facilitate the enhancement of individual, group, and/or organizational effectiveness, or c) assist in legal decision-making" (APA, 2010, p. 2). In some ways, psychology exists at the intersection of many other disciplines, as, by definition, it overlaps with several (e.g., medicine, sociology, biology, history, linguistics, philosophy, business, marketing, and anthropology).

In contrast with behavior analysis, there does not appear to be a single unifying philosophy in psychology. In fact, the philosophies underlying psychological theories and clinical applications are as varied as the number of divisions represented in the APA (e.g., experimental and cognitive, developmental, industrial and organizational, educational). This range includes psychoanalytic and psychodynamic conceptualizations, humanistic psychology, cognitive approaches, and behavioral formulations. Dependent on a student's orientation, the training he or she will receive is driven by the specific philosophy (or philosophies) underlying theory. Generally speaking, however, the differences in philosophies can be distilled into two primary areas of focus across all orientations: applied and scientific.

The applied focus is designed to produce clinicians who make real-world differences with the use of valid and effective psychological techniques. The scientific approach refers to a philosophy consistent with the attitudes and characteristics of science and is designed to produce empirical researchers. It is worthy of mention here that the methods used in this endeavor are diametrically opposed to those characteristic of a science of behavior. That is, as a discipline, psychology, in large part, adheres to a hypothetico-deductive model (Chiesa, 1994). This approach is distinguished by its development of hypotheses and subsequent scientific efforts to support or negate them. Further, the use of group design and statistics are predominantly applied in order to eliminate variability and make determinations about the significance and validity of findings more generally.

Clinical psychology is the closest allied profession to behavior analysis, as the fields share core principles, procedures, and values, and will thus be the main focus of discussion in the following sections examining scopes of practice and training. Within this group, the philosophy and training of behavioral psychologists are perhaps most similar to those provided to behavior analysts, although they may be more rooted in a behavioral therapy approach than in a traditional behavior analysis approach. For example, whereas a behavioral therapist might focus on parent training and altering the contingencies applied for aberrant child behaviors, as well as on the development of coping and problem-solving skills, a behavior analyst might focus more on a functional analysis of the behavior and on the development of a function-based treatment package. Both of these clinicians might develop antecedent-management strategies and replacement-skill plans, and both could collect data to help guide the evaluation of effectiveness. The difference between behavioral therapy and behavior analysis is a source of some confusion, as each group possesses some skills and foundational knowledge that the other lacks, even when there is a shared served population and overlap in mission and goals.

Speech-Language Pathology According to ASHA, speech-language pathology is a profession defined by its overall objective, which is "to optimize individuals' ability to communicate and swallow, thereby improving quality of life" (2007, p. 3). Thus, the profession's subject matter consists of swallowing, speech production, language acquisition, and communication disorders, with an emphasis on the assessment, diagnosis, and treatment of these conditions. Speech-language pathologists (or speech therapists) also address the cognitive aspects of communication (e.g., executive functioning), the voice component of speech, and issues related to sensory awareness (ASHA, 2016). Thus, speech-language pathologists assess and treat disorders pertaining not only to all the physiological aspects of swallowing and language production but also to some of the psychological components of communication, social skills (i.e., pragmatics), and proprioception (i.e., sensory awareness). Intentionality, joint attention, and reciprocity are commonly identified outcomes of interventions, and speech-language pathologists place an emphasis on the use of empirically based treatments (ASHA,

2016; Muma & Cloud, 2008) to achieve these outcomes. ASHA (2007) defines an empirically based treatment as follows: "an approach in which current, high-quality research evidence is integrated with practitioner expertise and the individual's preferences and values into the process of clinical decision making" (pp. 5–6). It is important to note that this differs from the definition used in other professions, most notably behavior analysis.

In researching its underlying philosophy, we found that the profession as a whole derives its philosophy from a combination of approaches, such as monism and dualism, constructionism, and functionalism (Muma & Cloud, 2008). Further, Muma and Cloud (2008) list the five theories they posit have had the greatest influence on the study of language acquisition in the last quarter century. These include relevance theory (Sperber & Wilson, 1986), bootstrapping theory (Bruner, 1981), government and binding theory (Chomsky, 1982), modularity theory (Fodor, 1983), and parallel distributed processing theory (McClelland & Rummelhart, 1986). The reader is encouraged to reference these works for more detail pertaining to each specific theory. However, it should be noted that the profession has had a long history of rejecting behaviorism and Skinner's perspective on verbal behavior with regard to its theories on language acquisition. According to Muma and Cloud (2008),

> The major scholars of cognition and language acquisition have objected to the behavioral accounts because they deny the role of mental states (Searle, 1992; Mandler, 1979), they participate in the delusion of science (Chomsky, 1968), they yield corrosive dogma (Bruner, 1978), and they are unable to account for abstract or symbolic learning (Macken, 1987). (p. 2)

Although the practice may best be known for its treatment of speech, communication, and swallowing disorders, its approach is rooted in the five aforementioned theories, which, combined, compose the profession's philosophical underpinnings. Thus, in speech-language pathology, as in psychology, a more eclectic philosophical basis is adopted, and this stands in sharp contrast to the laser focus of radical behaviorism.

Occupational Therapy Occupational therapy is defined as "the therapeutic use of occupations (everyday life activities) with persons, groups, and populations for the purpose of participation in roles and situations in the home, school, workplace, community, or other settings" (American Occupational Therapy Association [AOTA], 2015, para. 1). Occupational therapists hold the central belief that all individuals have the need and the right to participate in meaningful activities throughout their life span (AOTA, 2011). The focus on individuals' engagement in daily routines to promote their overall health and well-being through modifications or adaptations is therefore a guiding principle of practice. Thus, occupation is the central aspect of therapy and is defined as any activity of care for self or others in work, play, or leisure settings. Overall, occupations that are worked on in therapy should be meaningful or purposeful to clients (i.e., having value for the client and allowing him or her to interact more effectively with others or the environment).

Multiple theories provide the philosophical framework underlying occupational therapy practice. These are often used in conjunction with one another, and occupational therapists are not required to only adhere to one theory. Rather, the relevance of each theory is dictated by the specific client's or population's needs. However, there will likely be themes from more than one theory that are reflected within any single intervention plan. These theories include the following: the person-environment-occupation model (Ramafikeng, 2011b); the ecology of human performance model (Ramafikeng, 2011c), which includes a collection of other theories specifically focused on the client's physicality, such as sensory integration (SI) and neurodevelopmental theories; Piaget's cognitive theory (McLeod, 2009); and the model of human occupation (MOHO; Forsyth & Kielhofner, 2006; Kielhofner, 2008; Ramafikeng, 2011a). This last theory is of particular relevance, as it has some similarity to the assumptions underlying behavior-analytic intervention. More specifically, MOHO consists of a client-centered approach whose aim is to "engage people in occupations that restore, reorganize or maintain their motivation, patterning and performance capacity, therefore their occupational lives" (Ramafikeng, 2011a, para. 19). As a focus on motivation is at the center of this approach, the use of preference assessments is incorporated. Additionally, the theory of motor learning (which MOHO borrows from) is based on the premise that skills can be learned and that these skills then become more "automatic" through practice and feedback. The link to ABA here consists of the use of discrete-trial training procedures in which a target skill is practiced repeatedly (either in isolation or via interspersal), with prompting (e.g., visual or verbal) and feedback provided to the learner with the aim of strengthening the response in the behavioral repertoire. In occupational therapy, feedback is considered as either intrinsic (via proprioception) or extrinsic (via the use of prosthetic reinforcement). Here again, the reader is encouraged to reference these works for more detail pertaining to each specific theory. However, it should be noted that in contrast to speech-language pathology, the profession does not take a stance in opposition to behavior analysis. Indeed, it seems to derive some of its tenets from it.

One of the more controversial philosophical branches of occupational therapy is SI, which has not yet been empirically validated, though it is in wide use. Several occupational therapy resources have cited this absence of data and have provided recommendations regarding limiting the use of these procedures, applying them in narrow and data-based ways, and

ensuring that practices used reflect findings on the effectiveness of interventions (e.g., Pollock, 2016).

Although occupational therapy may be best recognized for its emphasis on increasing clients' independent functioning in the natural environment via engagement in occupations, its approach is grounded in a combination of theories (listed and described previously). Collectively, therefore, these theories form the philosophical basis for the field's practice. Thus, the focus in assessment and treatment is specific to a client's values, environment, and modifications that can be made to decrease barriers to success while simultaneously increasing the individual client's independence. Though, at first blush, this may sound similar to a focus on behavior–environment relations (as in behavior analysis), there is no mandate for occupational therapists to analyze functional relations between these variables.

Scopes of Practice

Behavior Analysis According to the BACB's *Model Act*, which we used as the basis for categorizing all subsequent documents pertaining to scope of practice across professions, ABA means the following:

> the design, implementation, and evaluation of instructional and environmental modifications to produce socially significant improvements in human behavior. It includes the empirical identification of functional relations between behavior and environmental factors, known as functional assessment and analysis. Applied behavior analysis interventions are based on scientific research and the direct observation and measurement of behavior and the environment. Behavior analysts utilize contextual factors, motivating operations, antecedent stimuli, positive reinforcement, and other consequences to help people develop new behaviors, increase or decrease existing behaviors, and emit behaviors under specific environmental conditions. The practice of behavior analysis expressly excludes psychological testing, diagnosis of a mental or physical disorder, neuropsychology, psychotherapy, cognitive therapy, sex therapy, psychoanalysis, hypnotherapy, and long-term counseling as treatment modalities. (2012, p. 2)

This definition is explicit in that it excludes specific strategies, techniques, or service activities related to other professions, which is the hallmark of more eclectic treatment approaches (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Howard, Stanislaw, Green, Sparkman, & Cohen, 2014). In fact, an eclectic approach to treatment is contrary to the basic characteristics or essential dimensions of ABA, as described by Baer, Wolf, and Risley (1968, 1987). Working within the context of a larger team of professionals can, therefore, pose a special challenge to the behavior analyst, because eclectic approaches[1] may be more conventional in other professions (e.g., using a combination of discrete-trial teaching, sensory diet, medication, etc.).

Psychology The APA's *Model Act* (2010) states that the practice of psychology "includes, but is not limited to," (p. 2) the following:

> psychological testing and the evaluation or assessment of personal characteristics, such as intelligence; personality; cognitive, physical, and/or emotional abilities; skills; interests; aptitudes; and neuropsychological functioning; (b) counseling, psychoanalysis, psychotherapy, hypnosis, biofeedback, and behavior analysis and therapy; (c) diagnosis, treatment, and management of mental and emotional disorder or disability, substance use disorders, disorders of habit or conduct, as well as of the psychological aspects of physical illness, accident, injury, or disability; (d) psychoeducational evaluation, therapy, and remediation; (e) consultation with physicians, other health care professionals, and patients regarding all available treatment options, including medication, with respect to provision of care for a specific patient or client; (f) provision of direct services to individuals and/or groups for the purpose of enhancing individual and thereby organizational effectiveness, using psychological principles, methods, and/or procedures to assess and evaluate individuals on personal characteristics for individual development and/or behavior change or for making decisions about the individual, such as selection; and (g) the supervision of any of the above. (p. 2)

This definition is broad and seems to cover virtually all the ways in which practicing professionals could potentially provide therapy. In stark contrast with the definition of behavior analysis, psychology specifically includes strategies, techniques, or service activities related to other professions. For example, psychology's scope of practice encompasses the arenas of law (i.e., "assisting in legal decision-making," p. 2), education (i.e., "psychoeducational evaluation, therapy, and remediation," p. 2), and medicine (i.e., "consultation with

[1] Although we discuss service delivery in the context of collaboration with other professionals with differing training backgrounds, it should be emphasized that we do not support, nor are we making appeals for, the implementation of eclectic intervention. Rather, information about the scopes of practice and training reviewed for each profession in this paper is offered as a means of achieving greater clarity, delineating limitations of competency and expertise, and promoting more effective collaboration to maximize treatment effectiveness. We posit that genuine multidisciplinary collaborative programming is not the same as eclectic intervention. When services are provided collaboratively, seamless programming and more effective outcomes may ensue while the likelihood of intervention strategies being implemented out of context, or in a contraindicated fashion, is simultaneously minimized.

physicians, other health care professionals, and patients regarding all available treatment options, including medication," p. 2). Thus, psychology's scope of practice is much more explicit in utilizing an eclectic approach to treatment. Furthermore, the broad range of applications necessitates specialization, which makes it difficult to define the field.

The field of psychology is enormous, and the populations served span the full variety of human suffering and presenting problems, including eating disorders, conduct disorders and delinquency, drug addiction, severe psychopathology, marital and family problems, learning disabilities, depression and other mood disorders, obsessive compulsive disorder, and anxiety disorders. Thus, the contribution of psychologists to interdisciplinary treatment should not be underestimated. In particular, training in diagnostic procedures enables psychologists to accurately identify individuals who are best described as having an ASD. Broad training in clinical psychology also helps ensure that the family's resources are assessed, that support is provided to families in need, and that any other familial psychological issues can be addressed. Furthermore, familiarity in evidence-based strategies to improve coping skills, problem-solving skills, and interpersonal relationships might help augment the contributios of behavior-analytic strategies.

Speech-Language Pathology In researching documents defining speech-language pathology as a profession, we could not find a model act analogous to that used in behavior analysis. The document most closely approximating a model act was ASHA's *Scope of Practice in Speech-Language Pathology* (2007). According to this document,

> Speech-language pathologists serve individuals, families, and groups from diverse linguistic and cultural backgrounds. Services are provided based on applying the best available research evidence, using expert clinical judgments, and considering clients' individual preferences and values. Speech-language pathologists address typical and atypical communication and swallowing in the following areas: speech sound production (articulation, apraxia of speech, dysarthria, ataxia, dyskinesia), resonance (hypernasality, hyponasality, cul-de-sac resonance, mixed resonance), voice (phonation quality, pitch, loudness, respiration), fluency (stuttering, cluttering), language (comprehension and expression: phonology, morphology, syntax, semantics, pragmatics [language use, social aspects of communication], literacy [reading, writing, spelling], prelinguistic communication [e.g., joint attention, intentionality, communicative signaling], paralinguistic communication), cognition (attention, memory, sequencing, problem solving, executive functioning), feeding and swallowing (oral, pharyngeal, laryngeal, esophageal; orofacial myology [including tongue thrust], oral-motor functions). (ASHA, 2007, pp. 5–6)

The field of speech-language pathology, as defined by its regulatory body (i.e., ASHA), thus appears to be much broader with respect to its potential target treatment areas and individual instructional targets. The focus in assessment and treatment within the practice of speech-language pathology may be specific to form, content, and use (e.g., voice volume, phonemes) of language, as well as corollary cognitive and communicative functions, ancillary issues (e.g., lexical development and pragmatics), and issues of effort and engagement (Bloom & Tinker, 2001; Gerber, 2003), whereas in behavior analysis, assessment and treatment are focused on functions and behavior–environment relations. It is important to note that more currently, in addition to the aforementioned areas, function and use are also areas of training and practice in speech-language pathology and are increasingly considered imperative to comprehensive therapy. In fact, it may be that the narrower interpretation or understanding of the scope of speech-language pathologists' training and expertise (i.e., a lack of training and focus on function) has compounded the challenge of collaboration between behavior analysts and speech-language pathologists.

The *Scope of Practice in Speech-Language Pathology* (ASHA, 2007) provides additional guidance with respect to determining appropriate service activities. More specifically, the following is stated:

> Each practitioner must evaluate his or her own experiences with preservice education, clinical practice, mentorship and supervision, and continuing professional development. As a whole, these experiences define the scope of competence for each individual. Speech-language pathologists may engage in only those aspects of the profession that are within their scope of competence. (ASHA, 2007, pp. 5–6)

Further, ASHA (2007) adds the following: "The professional roles and activities in speech-language pathology include clinical/educational services (diagnosis, assessment, planning, and treatment), prevention and advocacy, and education, administration, and research" (p. 6). Scope of competence is a crucial issue and defines what speech-language pathologists should do from a service-provision perspective. This is no different from other professions reviewed here. Increasingly, human service provision is recognized as highly nuanced and specific to the populations served. Within ABA, this is also emphasized, especially in the *Professional and Ethical Compliance Code for Behavior Analysts* (BACB, 2014).

Occupational Therapy In researching national documents defining occupational therapy's scope of practice, a model act could not be identified. However, AOTA's *Standards of Practice for Occupational Therapy* (2010; 2013; 2015) was found to contain much of the information that would be

delineated in a model act and was therefore used as a stand-in. According to this document, occupational therapy means the following:

> Occupational therapy services are provided for the purpose of promoting health and wellness and to those who have or are at risk for developing an illness, injury, disease, disorder, condition, impairment, disability, activity limitation, or participation restriction. Occupational therapy addresses physical, cognitive, psychosocial, sensory, communication, and other areas of performance in various contexts and environments in everyday life activities that affect health, well-being, and quality of life (American Occupational Therapy Association [AOTA], 2004). The overarching goal of occupational therapy is "to support [people's] health and participation in life through engagement in occupations" (AOTA, 2008, p. 626). (AOTA, 2010, p. 1)

The individual, the environment, and, most importantly, occupations are consequently front and center as the focus of occupational therapy. As such, occupational therapists concern themselves with the task of developing skills that either comprise or facilitate the completion of certain occupations desired by the client (Bruce & Borg, 2002). Within the profession, it is postulated that a client's performance can be interrupted by a variety of factors, including a physical or mental limitation, actual or perceived pain, and environmental obstructions (Satink, Winding, & Jonsson, 2004). Further, client-centered practice has been a prevailing concept for the past 40 years (Sumison & Law, 2006). The profession broadly defines this focus as one that places emphasis on both clients' wishes and priorities in developing and delivering therapy (Jacobs & Jacobs, 2004). Occupational therapy intervention involves the careful consideration and use of each client's values as a guide for practice. As a result, occupational therapists work collaboratively with their clients to analyze their values and the variables posing barriers to the successful performance of occupations and to find solutions that will increase the individuals' likelihood of success within their environment, via the completion of occupational activities. Occupations considered to be meaningful are those found to have value to the client, provide the client with perceived independence, and help to shape a client's identity. For example, an elderly individual affected by illness may desire to return to, or completely fulfill, his or her role as a grandparent, and thus activities related to his or her grandchildren may become a core focus of therapy. For the profession, quality of life is an important factor in human performance (National Board for Certification in Occupational Therapy, 2013). Therefore, the way an individual perceives his or her own performance is considered to be just as important as the way he or she actually performs (Fidler, 1996). It should be noted, however, that this is a factor that can be overlooked when designing interventions. As a result, a client's perceived independence is prioritized, and the therapeutic focus remains on the client's self-selected goals.

Broadly speaking, occupational therapy practice is centered on the use of daily occupations as both an intervention method and an outcome measure. AOTA's *Overview of the OT Practice Framework* documents define occupations and group them into activities of daily living, instrumental activities of daily living, rest and sleep, education, work, play, leisure, and social participation (AOTA, 2014).

As in speech-language pathology, the potential targets and the manner in which goals are worked on in occupational therapy are much more broadly defined when compared to behavior analysis. Although the focus of treatment primarily involves clients' values and modifications to their environment, treatment often also entails the shoring up or teaching of specific skills to assist individuals in successfully navigating their everyday lives. Given that multiple theories drive practice, the field's philosophy and approach may also be characterized as one that is more eclectic in nature. Interestingly, however, the field's approach to treatment overall seems to share some similarities to those tenets guiding intervention in a behavior-analytic framework (e.g., identification of barriers to performance, focus on increasing client independence, environmental and task modifications, client preference, an underlying assumption that all behavior can be learned, and the use of discrete-trial teaching with prompts and consequences).

Scopes of Training

Behavior Analysis In behavior analysis, as in other recognized human service professions, there exist clear national standards dictating the course of training in the development of young professionals. These requirements include both academic and experiential standards, determined by both the profession's accrediting and credentialing bodies, respectively. Further, one must take and pass the BACB's national certification examination in order to assume and legally use the title of behavior analyst.

To become accredited, programs of study must demonstrate alignment and compliance with all of the ABAI's requirements. At the bachelor's level, students are required to complete a total of 240 instruction hours, or a total of 16 credits, with an additional 6 credits of research or practicum experience. Instruction hours are broken down in the following manner: 45 content hours in basic behavior-analytic principles, 45 in research methods (with an emphasis on single-subject research and design), 45 in conceptual systems or the experimental analysis of behavior, 90 in the application of behavior-analytic concepts and principles to research and

practice, 15 in ethics, and an additional 90 in supervised practical experience or research (ABAI, 2015).

At the master's level, instruction consists of an additional 315 instruction hours (i.e., 21 credits), with 6 credits of research, as well as the completion of a thesis. Instruction hours consist of 45 content hours of basic science expertise, 45 in research methods, 45 in conceptual analysis, 90 in application and applied research, 45 in ethics, 45 in the experimental analysis of behavior, and an additional 360 of supervised fieldwork.

In addition to the completion of a master's thesis, at the doctoral level, students must complete 495 more instruction hours (i.e., a total of 33 credit hours), as well as a dissertation and an additional 6 credits of research or practicum experience. These requirements break down in the following manner: 45 content hours of training in concepts and principles, 90 in conceptual analysis and systems, 90 in research methods, 90 in application, 45 in ethics, 90 in the experimental analysis of behavior, and 45 content hours of electives that must be related to behavior analysis.

The BACB is the credentialing body for behavior analysts and dictates experience requirements that must be obtained in order to qualify for certification. Notably, these requirements are in addition to the aforementioned coursework requirements and other scholarly achievements, such as a thesis or dissertation.

Psychology As in behavior analysis, there are clear standards delineating the course of training in clinical psychology, which include academic and experiential requirements, dictated by the field's accrediting and licensing bodies (APA, 2013). Additionally, to practice independently, psychologists must take a licensing examination, administered by a state board of examiners. Finally, distinct credentials are also offered for specialization in certain areas of practice. Unlike behavior analysis, psychology has several branches that are not uniformly labeled, with variation in both naming and content observed to differ regionally and across institutions of higher learning. The APA, for example, has 54 divisions (APA, 2017), with each dedicated to a different specialty or topic area. Thus, some variation in course content is to be expected, dependent on the specific branch or specialization in which a student receives his or her formation. However, there is some consensus about the basic and most common branches, as reflected in the most commonly conferred degree-granting programs (e.g., clinical psychology, cognitive psychology, counseling psychology, developmental psychology, evolutionary psychology, forensic psychology, health psychology, neuropsychology, occupational psychology, and social psychology). Further, within each of these general branches, there exist additional subspecializations.

In psychology, the APA grants accreditation to programs of study only in clinical, counseling, and school psychology (each of which are separate divisions within the APA). The APA does not accredit programs in other areas of professional practice, nor does it confer accreditation to master's degree programs. Guidelines exist for the accreditation of doctoral programs, internship programs, and postdoctoral fellowship training (American Psychological Association Commission on Accreditation, 2015), and these guidelines specify that educational programs must meet rigorous content standards, focus on both science and practice, and include outcome-oriented evaluations of competence.

Accredited doctoral programs in clinical psychology must offer at least 3 years of instruction with a focus on the development of clinical expertise, within areas of theoretical specialization and specified applications (e.g., geropsychology, psychology of women, and assessment).

In clinical psychology, two types of doctoral-level training are offered. One course of study leads to the PhD designation, which is generally regarded as a research degree. These programs typically place a greater emphasis on producing graduates who will engage in productive research careers. The PsyD designation, on the other hand, is a professional degree (similar to an MD in medicine or a JD in law). Programs conferring the PsyD focus heavily on providing a service to individuals or groups. Naturally, the focus is on ensuring that those services are rooted in psychological science and that practitioners are applying the science in appropriate ways to produce meaningful therapeutic outcomes. With respect to experiential training requirements, a 1-year internship (or independent clinical work) must be completed following coursework in a doctoral program, and all professional practicing psychologists must pass the Examination of Professional Practice of Psychology, a 225-item multiple-choice test that spans core areas of psychology (Association of State and Provincial Psychology Boards, 2015).

Speech-Language Pathology There exist clear national standards dictating the course of training for speech-language pathologists. These requirements include both academic and experiential standards, determined by the profession's regulatory body, ASHA (Council on Academic Accreditation, 2017). An aspiring speech-language pathologist must also take and pass the national Praxis examination as a test of minimum competency (ASHA, n.d.). To achieve a Certificate of Clinical Competency in Speech and Language Pathology (Council for Clinical Certification in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2013), which is highly valued in the field, rigorous academic coursework and extensive experiential training are required. However, any further specialization requires an additional examination.

Speech-language pathologists must possess a graduate degree in speech-language pathology to earn a certificate of clinical competence. Such a degree must include at least 36 credit

hours in speech-language pathology, and coursework within the program of study may also include other relevant sciences, including the biological, physical, and social sciences. Coursework in statistics and in research design is required, as is coursework that comprehensively addresses issues in swallowing and communicative disorders. More specifically, the content covered must include articulation, fluency, voice, and resonance (including respiration and phonation); receptive and expressive language (phonology, morphology, syntax, semantics, pragmatics, prelinguistic communication, and paralinguistic communication); reading and writing; hearing (including the impact on speech and language); swallowing (oral, pharyngeal, esophageal, and related functions, including oral function for feeding and orofacial myology); cognitive (attention, memory, sequencing, problem-solving, executive functioning) and social aspects of communication (including challenging behavior, ineffective social skills, and lack of communication opportunities); and augmentative and alternative communication modalities. In addition, knowledge of ethical and professional conduct, competency in interpersonal skills, and experience working with individuals across the life span must all be included in coursework and demonstrated by students. With respect to the experiential requirement, 400 h of supervised fieldwork must be completed, 25 of which comprise observation, and 375 of which consist of actual contact with clients. There must be direct, live supervision for 25% of these hours (Council on Academic Accreditation in Audiology and Speech-Language Pathology, 2014).

To obtain the certificate of clinical competency, it is required that the student pass the Praxis exam (administered by the Educational Testing Service) and have completed a clinical fellowship year (CFY). Without the completion of this CFY, a full-year of professional apprenticeship training, speech-language pathologists cannot independently practice, as the goal of the CFY is to help students transition from learning about their field of study to independent practice. The CFY requires that students work under the close supervision of a licensed, credentialed, and certified speech-language pathologist, and the task requirements are clearly and comprehensively outlined by ASHA. Mentorship is provided to develop a student's clinical skills (Alarcon, Scheer-Cohen, & Sisskin, 2015), and the CFY includes full-time immersion in a training context for 35 weeks. Contingent on the successful demonstration of key skills vital to practice, students are graduated from the apprenticeship (Council for Clinical Certification in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2013). It is worthy of mention here that it is during the CFY that clinicians often begin to develop their scope of competence (e.g., treatment of ASDs), which may well be narrower than their scope of training, dependent on their internship setting and their CFY supervisor's own areas of training and expertise.

Occupational Therapy As with all of the previously discussed professions, national standards delineate the criteria for competency in the training and development of occupational therapists. Requirements include both academic and experiential standards, dictated by both the profession's accrediting (Accreditation Council for Occupational Therapy Education [ACOTE]) and professional (AOTA) regulatory bodies. Additionally, one must take and pass a national board examination (National Board for Certification in Occupational Therapy) in order to practice.

In occupational therapy, ACOTE is the accreditation-granting body. To become accredited, academic programs must ensure they conform to all requirements. ACOTE's April 2017 *Interpretive Guide* (AOTA, 2016) was the only document we found outlining these specific requirements. Unlike the information provided by ABAI, however, neither this document nor a search of ACOTE's website yielded a cogent breakdown of coursework across content areas and credit units. Instead, we have summarized the general academic requirements for occupational therapists here. At all degree levels (i.e., associate's, master's, and doctoral), students are required to complete coursework pertaining to "an educational foundation in the liberal arts and sciences, including a focus on issues related to diversity" (ACOTE, 2011, p. 1); to have general and broad exposure to occupational therapy service-delivery models, systems, and settings; to demonstrate a minimum of entry-level competence via the completion of academic and fieldwork experiences; to demonstrate an understanding of the principles underlying occupational therapy practice via the implementation of intervention strategies; to demonstrate an understanding of the therapeutic use of occupations via increases in clients' participation in their environments; to "apply occupational therapy interventions to address the physical, cognitive, psychosocial, sensory, and other aspects of performance. .. to support engagement in everyday life activities that affect health, well-being, and quality of life" (ACOTE, 2011, p. 1); to uphold the field's adopted ethics, values, and attitudes; to demonstrate an understanding of the distinct roles of both the occupational therapist and the occupational therapist assistant within the context of supervision; to communicate and collaborate in multidisciplinary teams; and to have the necessary preparation to advocate for services and for clients. Additionally, students at the master's level are required to effectively consume current research findings related to practice. Finally, students at the doctoral level are expected to demonstrate all of the aforementioned competencies, in addition to a more in-depth understanding of service-delivery models, policies, systems related to practice, evidence-based practice, and to synthesize both theory and practice pertaining to a specific area via the completion of a "culminating project" (ACOTE, 2011, p. 2).

Although we did not find clear information with respect to timelines of degree-conferring programs of study at the associate's or master's level, the ACOTE (2011) document did stipulate that students at the doctoral level are required to complete a minimum of 6 full-time enrollment (FTE) academic years, such that this constitutes the total time of study leading to the conferred degree. Broadly speaking, coursework across all three degree levels entails the following content requirements: foundational content; basic tenets; theoretical perspectives; screening, evaluation, and referral; intervention planning formulation and implementation; context of service delivery; leadership and management; scholarship; and professional and ethical values and responsibilities.

The academic institution, accredited by ACOTE, must ensure that there is a minimum of 16 full weeks of fieldwork for occupational therapy assistants, 24 full weeks of fieldwork at Level II for occupational therapists at the master's level, and an additional 16 full weeks of Level-II fieldwork for students at the doctoral level (AOTA, 2016). As in behavior analysis, students must take and pass a national certification exam in order to practice independently.

All of the information pertaining to the education, experience, and examination requirements across professions is summarized in Table 3.

Discussion: Enhanced Collaboration across Professions

It is important for professionals in all disciplines to understand the scope of practice and training that members of other professions have and to understand where their expertise might be most relevant for presenting issues. When mutual respect is realized, and when the common views and rationales of disciplines are familiar, real collaboration can occur. Such collaboration can involve multidisciplinary and transdisciplinary work, where professionals from different disciplines work together to identify goals, assess progress, and even cotreat. This may seem like a formidable challenge, but it is achievable. The skill set has been defined and has been successfully taught. Components of collaboration include empathy and other basic interpersonal skills (e.g., Coulehan et al., 2001; Hardee, 2003). These skills have been examined and taught to medical professionals, demonstrating that they can be operationally defined, measured, and examined in terms of their impact in service-provision contexts (e.g., Bonvicini et al., 2009; Coulehan et al., 2001; Epstein, Campbell, Cohen-Cole, Whinney, & Smilkstein, 1993). For example, the capacity to actively listen, to engage in dialogue, and to reflect another person's point of view all lead to people feeling heard and valued.

The absence of these skills may derail an interdisciplinary collaborative effort. Collaboration may also involve feeling respected—feeling that one's unique knowledge base and skill set are recognized and used. Toward this end, collaboration may require helping professionals to understand the unique contributions of professionals trained in other disciplines (Brodhead, 2015). For behavior analysts, collaboration can be fostered by increasing the understanding of the foundations and approaches of each discipline, understanding the contextual and philosophical reasons for the recommendations being made by other professionals, translating those procedures into one's own worldview, and maintaining an openness to the recommendations and procedures suggested by others.

Koenig and Gerenser (2006) have also specifically emphasized the need for such cultural exchange across disciplines, especially between speech-language pathologists and behavior analysts. These authors noted that interdisciplinary communication can increase efficiency, avoid reinvention of the wheel, introduce professionals to innovative strategies, offer ancillary expertise, and increase each professional's knowledge. They also suggested both formal (e.g., reading journal articles from other disciplines) and informal mechanisms of exchange (e.g., going to lunch, discussing collaboration challenges and successes).

Newhouse-Oisten et al. (2017) recently made some suggestions for collaborating with medical professionals, and how such collaboration can be accomplished, within the context of a commitment to evidence-based practice and data-based decision-making. For example, they discussed the use of a decision tree that examines the extent to which a course of action is evidence based and an analysis of the extent to which the procedure might be compatible with current evidence-based treatments. Brodhead (2015) offered similar thoughts and a decision tree that examines the extent to which the proposed procedure might be harmful.

Some have suggested that behavior analysts, in particular, might need to look at the extent to which their language and jargon might serve as a barrier to collaboration (Critchfield et al., 2017). These authors suggest that communication should match the listener and that behavior analysts need to modify their language to be more palatable so that they may be better understood. Indeed, terminology challenges exist within all professions and complicate interdisciplinary collaboration. This could be lessened by some of the cultural-exchange practices recommended across disciplines; if there were an increased understanding of each discipline, and its potential contributions to treatment, there could be better communication across differently trained professionals.

The fact that some of the scopes of practice may be partially shared among these professions heightens sensitivity and underscores the need for collaboration, mutual understanding, and respect for each profession's areas of unique expertise. For example, a Board Certified Behavior Analyst likely has not received formal training in the assessment and treatment of apraxia, or swallowing difficulties. A speech-language pathologist, however, has the training and experience to address

Table 3 Education, Experience, and Exam Requirements Across Professions

		Education Requirements	Experience Requirements	Examination
Behavior Analysis	Bachelor's level	16 credits + 6 credits research or practicum	1,000 h supervised independent fieldwork 670 h practicum 500 h intensive practicum	Behavior Analyst Certification Exam (130 questions, 11 content areas); BCaBA
	Master's level	21 credits + 6 credits research + thesis	1,500 h supervised independent fieldwork 1,000 h practicum 750 h intensive practicum	Behavior Analyst Certification Exam (150 questions, 11 content areas); BCBA
	Doctoral level	33 credits + 6 credits research + thesis + dissertation	Completed all requirements at master's level, BCBA credential in good standing	No exam; application, fee, and demonstration of completion of doctoral degree; BCBA-D
Psychology	Bachelor's and master's levels	–	–	
	Doctoral level	Minimum 3 years of coursework, with two degrees conferred: PhD, PsyD	1-year internship (or independent fieldwork)	EPPP (225 questions, 8 content areas)
Speech-Language Pathology	Bachelor's level	–	–	
	Master's and doctoral levels	Minimum 36 credits in speech-language pathology	400 h supervised fieldwork	Praxis exam (132 questions, 3 content areas)
Occupational Therapy	Associate's level	–	16 weeks Level-1 fieldwork	COTA exam (206 questions, 3 content areas)
	Master's level	Foundation in liberal arts and sciences + broad exposure to occupational therapy practice, systems, and settings	+ 24 weeks Level-II fieldwork; consume and apply research findings	OTR exam (173 questions, 4 content areas)
	Doctoral level	Foundation in liberal arts and sciences + broad exposure to occupational therapy practice, systems, and settings + completion of a minimum of 6 FTE years	+ 16 weeks Level-II fieldwork; demonstrate in-depth understanding of service-delivery models, policies, systems, and evidence-based practice; synthesize theory and practice	OTR exam (173 questions, 4 content areas)

Dashes represent that no information could be obtained. BCaBA = Board Certified Assistant Behavior Analyst; BCBA-D = Board Certified Behavior Analyst–Doctoral Level; EPPP = Examination for Professional Practice in Psychology; COTA = Certified Occupational Therapy Assistant; OTR = Occupational Therapist Registered. Sources for all items are as follows: behavior analysis: ABAI's (2015) *Guidelines for Accreditation and Reaccreditation of Programs in Behavior Analysis*; psychology: the Association of State and Provincial Psychology Boards' (2015) *EPPP Candidate Handbook*; speech-language pathology: the Educational Testing Service Praxis's (2017) *Study Companion*; occupational therapy: the National Board for Certification in Occupational Therapy's (2019) *Certification Exam Handbook*

Table 4 Scopes of Practice Overlap Across Professions

	Behavior Analysis	Psychology	Speech-Language Pathology	Occupational Therapy
Potential overlap		–	–	–
Differentiation	Focus on behavior–environment interactions (analysis) and functional relations	Differential diagnosis, testing of personal characteristics (IQ, personality, aptitudes, etc.), counseling, psychoanalysis, psychotherapy, hypnosis, etc.	Diagnosis, focus on structural (i.e., oral, facial cranial) and cognitive corollary issues related to feeding, swallowing, and communication	Diagnosis, focus on structural (musculoskeletal) issues and skill building related to health and participation in an individual's occupations

Dashes represent no overlap was identified

these issues. A psychologist may be best suited to obtain information about performance on standardized assessments, and an occupational therapist may be best able to troubleshoot issues related to motor planning or coordination. Increased collaborative teaming has been associated with gains for learners with ASD (Hunt, Soto, Maier, & Doering, 2003; Scheibel & Watling, 2016) and has been suggested as a means to improve outcomes and maintain high-quality intervention within and across disciplines (Cox, 2012).

In cases requiring multidisciplinary collaboration, it is difficult to envision what intervention might look like in the absence of such specialized expertise, as certain vital contributions would be lost, which could compromise best outcomes. It therefore becomes paramount for each professional within a multidisciplinary team to have a clear understanding of his or her role, as dictated by professional scopes of training and practice, both to ensure successful collaboration and to provide the most effective treatment possible (Dillenburger et al., 2014).

Conclusion

ASD is a very prevalent disorder in our society today, with the number of new diagnoses increasing progressively. Most individuals with ASD are impacted across the behavioral, cognitive, motoric, and communication domains. Moreover, the high likelihood of comorbidity in this population often necessitates services by professionals from several disciplines. Almost all individuals with ASD receive services from behavior analysts, psychologists, speech-language pathologists, and occupational therapists. Given that ASD is a complex and pervasive disorder that impacts the individual on many levels, with several consequent effects, there is a clear need and justification for interdisciplinary work, cooperation, and team intervention. As evident in the descriptions of each profession, each discipline has a wide, and different, range of content knowledge and a vast array of information that represents unique areas of expertise. Furthermore, the training professionals receive in each profession differs, with little to no overlap in knowledge areas (see Tables 4 and 5).

To ensure services provided by multidisciplinary teams are most cohesive and effective, it is thus necessary for professionals hailing from different disciplines to communicate and collaborate well with one another (Dillenburger et al., 2014). Key to this outcome, we believe, is an increased understanding of the unique contributions each professional stands to make. In this manner, ideas may be shared openly, with the purpose of effectively overcoming barriers and solving problems. Additionally, improved transparency may lead to better teaming. That is, an understanding of the philosophical approach, as well as the scope of practice and training of other

Table 5 Scopes of Training Overlap Across Professions

	Behavior Analysis	Psychology	Speech-Language Pathology	Occupational Therapy
Total no. documents reviewed	2	2	4	3
Total no. content areas/domains	3	8	3	4
Total no. task list items/knowledge statements	162	76	43	68
Overlap		2 task list items (KN29 0429 and KN31 0431)	None	3 task list items (010105, 010203, and 030108)

Sources for all task lists and their items are as follows: behavior analysis: the BACB's (n.d.) *Fourth Edition Task List*; psychology: the Association of State and Provincial Psychology Boards' (2015) *EPP Candidate Handbook*; speech-language pathology: the Educational Testing Service Praxis's (2017) *Study Companion*; occupational therapy: the National Board for Certification in Occupational Therapy's (2018) *Professional Practice Standards*

professionals could help individual team members assist one another in more effectively implementing each component of treatment, while simultaneously guiding decision-making that would capitalize best upon each team member's area of expertise. Ultimately, communication could flow better, and cohesiveness and collaboration between team members would likely lead to maximized client outcomes.

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Compliance with Ethical Standards

This manuscript has not been previously published nor has it been or will be submitted for publication elsewhere during the review process.

Conflict of Interest Danielle LaFrance declares that she has no conflict of interest. Ellie Kazemi declares that she has no conflict of interest. Mary Jane Weiss declares that she has no conflict of interest. Joanne Gerenser declares that she has no conflict of interest. Jacqueline Dobres declares that she has no conflict of interest.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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