6-2020

Training Practitioners on the Effects of Psychotropic Medication Via a Web-Based Platform

Anita Li
Western Michigan University, anitli@gmail.com

Follow this and additional works at: https://scholarworks.wmich.edu/dissertations

Part of the Behavioral Medicine Commons, and the Psychology Commons

Recommended Citation
Li, Anita, "Training Practitioners on the Effects of Psychotropic Medication Via a Web-Based Platform" (2020). Dissertations. 3570.
https://scholarworks.wmich.edu/dissertations/3570

This Dissertation-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Dissertations by an authorized administrator of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.
TRAINING PRACTITIONERS ON THE EFFECTS OF PSYCHOTROPIC MEDICATION
VIA A WEB-BASED PLATFORM

by

Anita Li

A dissertation submitted to the Graduate College
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
Psychology
Western Michigan University
June 2020

Dissertation Committee:

Alan D. Poling, Ph.D., Chair
Ronald Van Houten, Ph.D.
Cynthia Pietras, Ph.D.
Steven Ragotzky, Ph.D.
Many individuals diagnosed with autism spectrum disorders (ASD) receive multiple therapeutic services in an attempt to supplement behavioral therapy. These services include pharmacological interventions. Two drugs, risperidone (Risperdal) and aripiprazole (Abilify), are FDA-approved to treat “irritability” in children with ASD. Research shows that the effects of risperidone and aripiprazole on irritability varies greatly across treated individuals. Therefore, individualized monitoring and evaluation must be conducted to provide the physician with data to determine if the medication is resulting in desired changes and effects. Certified behavior analysts are trained in data collection and experience high levels of contact with individuals diagnosed with ASD. However, a recent survey indicated that many behavior analytic practitioners lack formal training and knowledge on the impact of psychotropic medications on behavior. The purpose of this study was to examine the utility and acceptability of a brief online training on psychotropic medications. Participants were randomly assigned to an online training with assessment components group or a control group that read relevant material (a chapter). Participants in the training group scored higher on posttest scores than those the control group, and both groups found the trainings to be highly acceptable. The potential significance of this finding and the results of a qualitative analyses of participants’ self-report and self-evaluations
regarding their knowledge and competency in monitoring psychotropic medications are discussed, as are the limitations of the study.
ACKNOWLEDGEMENTS

I am deeply grateful to my doctoral advisor and mentor, Dr. Alan Poling. He has provided me with unconditional support and unprecedented training in my development as a researcher throughout my academic career. I also thank my committee members, Dr. Ron Van Houten, Dr. Cynthia Pietras, and Dr. Steven Ragotzy for taking the time to review my work.

Deepest thanks to Mason Potter, my undergraduate research assistant, who worked tirelessly to help me build this training, enroll participants, and troubleshoot. I am grateful for your dedication and support in helping me. I also want to thank my other undergraduate research assistants Jenna Schneider and Cristal Cardoso for their assistance on other projects.

Throughout my academic career at Western, I have met wonderful people that I am honored to call colleagues as well as friends: Hugo Curiel, my lab mate and best collaborator, David Sottile and Harmony Risca, my empathizers, Rachel Burroughs, my sidekick, and Meredith Holland, my emotional support. This is no by means exhaustive as there are many others who exist in my community of social reinforcers. I could not have done this without all of you.

Anita Li
TABLE OF CONTENTS

ACKNOWLEDGEMENTS ......................................................................................... ii

LIST OF TABLES ........................................................................................................ iv

LIST OF FIGURES ........................................................................................................ v

INTRODUCTION ........................................................................................................... 1

Challenging Behavior ................................................................................................. 2

Scaling Methods of Assessment .................................................................................. 3

Operant Methods of Assessment ................................................................................ 4

Treatment and Interventions for Challenging Behavior .................................................. 5

Behavioral Interventions .............................................................................................. 5

Psychopharmaceutical Interventions ............................................................................. 6

Prevalence of Psychotropic Medication in Individuals with ASD .................................... 7

Purpose of Current Study .............................................................................................. 9

METHODS .................................................................................................................. 11

Participants .................................................................................................................. 11

Setting and Materials .................................................................................................. 12

Dependent Measures ................................................................................................... 14

Procedures and Design ............................................................................................... 15
### Table of Contents (Continued)

RESULTS .................................................................................................................. 16

DISCUSSION ............................................................................................................ 25

REFERENCES ......................................................................................................... 28

APPENDICES

A. HSIRB Approval Letter ......................................................................................... 36

B. Recruitment Script ................................................................................................ 38

C. CEU Approval Letter ............................................................................................ 40

D. CEU Certificate .................................................................................................... 42

E. Informed Consent Document ................................................................................ 44

F. Questions for Pre- and Posttest .......................................................................... 48

G. Screenshot of Training Module ............................................................................ 54

H. Screenshot of Sample Training Lesson ................................................................. 57

I. Participant Instructions ......................................................................................... 59

J. Demographics Questionnaire ............................................................................... 62

K. Qualitative Responses for Demographics Questionnaire .................................. 67
LIST OF TABLES

1. Participant Characteristics........................................................................................................ 12
2. Client Demographics Questions .................................................................................................. 13
3. Means and Standard Deviation of Pre and Posttest Scores............................................................... 17
4. Analysis of Covariation for Posttest Scores (Covariate: Pretest Scores)......................................... 19
5. Social Acceptability Questionnaire Results...................................................................................... 20
6. Participants’ Training and Knowledge Regarding Medications Questions ................................. 21
LIST OF FIGURES

1. Control Group Pretest and Posttest Scores by Individual .................................................. 18
2. Training Group Pretest and Posttest Scores by Individual..................................................... 18
INTRODUCTION

Autism spectrum disorder (ASD) is a developmental disability resulting in a range of deficits in social communication and restricted repetitive patterns of behavior (American Psychological Association, 2015). Prevalence rates dramatically rose from 1 in 150 children to 1 in 54 children over a 16-year period (Center for Disease Control, 2018). The etiology of ASD at the time is unknown, but researchers speculate that there is a strong genetic component although environmental factors such as teratogens may also play a role (Amaral, 2017). ASD symptoms typically emerge in early childhood, so optimally, caretakers and pediatricians are cognizant of delays in early childhood development to facilitate early identification. The gold standard instrument for diagnosing ASD is the Autism Diagnostic Observation Schedule – Second Edition (ADOS-2). The ADOS-2 is a semi-structured assessment that allows the examiner to detect issues in social behavior and communication. There are four modules in total that range in appropriateness for individuals exhibiting severe deficits in communication (lack of speech) to those who are vocally fluent. The modules also consider developmental appropriateness: modules 1 and 2 are situated towards young children and involve tangible activities and contexts, and modules 3 and 4 contain more conversational and daily living activities to assess adolescents and adults (Lord et al., 2012).

Currently, there are no substantive cure or prevention for ASD. Early identification and diagnosis are imperative to inform intervention and treatment of core symptoms. Due to the rising prevalence rates, a number of complementary and alternative treatment interventions have emerged, such as gluten and casein-free diets, chelation, and equine therapy. There is no substantial evidence that indicates these therapeutic practices benefit individuals with autism, and in fact, some may increase risk of harm (Singer & Ravi, 2015). The Center for Disease
Control (2018) recommends intervention techniques that are behaviorally oriented, such as applied behavior analysis (ABA) therapy, speech therapy, and occupational therapy, to develop communicative and social skills. Ideally, these skills are targeted in young children to ameliorate these deficits by the time they reach adolescence and adulthood. For individuals diagnosed later in life, these services are important to provide support and teach skills relevant to community, work, and educational settings. The consensus is that early detection facilitates early intervention. Intensive early behavioral intervention has been demonstrated to help young children diagnosed with ASD achieve typical and normative educational and intellectual functioning (Lovaas, 1987). Applied behavior analysis (ABA) therapy is an evidence-based treatment to treat symptoms of ASD (National Autism Center, 2015). Two major components of ABA therapy are objective measurement of behaviors and data-based treatment decisions (Behavior Analyst Certification Board, 2016). Behavior analysts constantly evaluate behavior to detect for clinical improvement, rather than rely on indirect measurements or anecdotal reports.

Individuals diagnosed with ASD may also receive supplemental services to behavioral therapy (Le Grice & McMenamin, 2002), such as dietary approaches, complementary and alternative medicines, and/or psychotropic medication.

**Challenging Behavior**

One barrier to treatment implementation and skill acquisition is the presence of challenging behavior. Challenging behaviors are typically any behaviors that are physically dangerous, interfere with one’s educational practices, and not socially acceptable (Jang et al., 2010). The presence of these behaviors can significantly impair the individual’s quality of life, resulting in restrictive placements and limiting their opportunities to participate in the community and educational opportunities, while also contributing to stress in the household.
environment (Matson et al., 2008). Although the presence of challenging behavior is not a core symptom of ASD, it is commonly exhibited by individuals diagnosed with ASD, particularly in higher severity cases and individuals who have co-morbid diagnoses of ASD and intellectual disability (ID) (Jang et al., 2010). Matson et al. (2008) examined a sample of 313 children and adolescents with ASD and found that 94.3% of the sample exhibited a form of challenging behavior. This finding was consistent with Jang et al. (2010) and implies that the prevalence of challenging behavior in individuals with ASD may be more common than previously believed. Individuals who exhibited severe ASD were more likely to exhibit self-injury, property destruction, and aggression. As such, challenging behaviors require assessment tools to inform intervention practices.

**Scaling Methods of Assessment**

Although challenging behavior is not considered a core symptom of ASD, diagnostic tools have emerged to provide detailed analyses of topographies such as self-injury and aggression to evaluate treatment outcomes and barriers. The Aberrant Behavior Checklist is a 58-item symptom checklist to be completed by caretakers and is scored on a four-point ordinal scale (where 0 is not a problem and 3 is severe). Raters are informed to consider relative frequency and normative standards into consideration when scoring. There is a total of five factors: 1) irritability, agitation, and crying, 2) lethargy, social withdrawal, 3) stereotypic behavior, 4) hyperactivity, noncompliance, and 5) inappropriate speech (Aman et al., 1985). It is expected that raters take 10-15 minutes to complete the form although rating times is likely to decrease in subsequent assessments. The ABC has traditionally been used to evaluate pharmacological intervention although recent research has also incorporated the ABC in examining psychometric characteristics, behavioral phenotypes, and effects of sleep disruption (Aman, 2013). The ABC
has established construct and concurrent validity with other standardized scales. Studies examining interrater reliability ranged from .50 to .60, and test-retest reliability ranged from .60 to .90.

Additionally, the Clinical Global Impressions scale (CGI) is often used to assess pharmacological efficacy in individuals with ASD although it does not directly address challenging behavior specifically. The CGI has shown to correlate with research drug efficacy scales and provides a psychiatric clinician-determined summary measure on psychopathology. The CGI is rated relative to the past seven days (or longer) of the individual’s presenting symptoms, and scoring guidelines range from an ordinal scale of 1 (normal, not ill at all) to 7 (extremely ill, pathology drastically interferes with many life functions, may be hospitalized) (Busner & Targum, 2007). Test-retest reliability for the GBI has ranged from 0.20 to 0.80 (Beneke & Rasmus, 1992).

The Behavior Problems Inventory (BPI) is a 52-item questionnaire that is categorized into self-injurious behavior, stereotyped behavior, and aggressive/destructive behavior that can be administered in a respondent-based or interviewer-respondent-based format. Each item is scored on two scales: a five-point frequency scale (0 = never, 1 = monthly, 2 = weekly, 3 = daily, 4 = hourly) and a four-point severity scale (where 0 is not a problem and 3 is severe) (Rojahn et al., 2001). Rojahn et al. (2001) reported test-retest reliability ranging from 0.60 to 0.70 and also found strong evidence of convergent validity of a shorten version consisting of 30 items (referred to as the short form).

**Operant Methods of Assessment**

Under the theoretical assumption that challenging behaviors as a result of the individual’s history of experience and environmental consequences, one method of assessment is to evaluate
the circumstances occurring prior and following the emergence of problem behavior. Functional behavior assessments (FBA) are a broad category of systematic information-gathering tools to determine a functional relation between behavior and environmental variables. Indirect forms of FBAs also comprise components such as unstructured interviews and/or rating forms. Based on informant-responses, the evaluator must create operational definitions for topographies of challenging behaviors and can follow up with either descriptive analysis and/or experimental analysis. Descriptive analyses include a direct-observation component that requires the interviewer to directly observe challenging behavior in the individuals’ natural context while recording environment events occurring prior and following the occurrence. Experimental analysis requires the evaluator to conduct systematic experimentation of environmental events to record the frequency of occurrence or non-occurrence of behavior (Lerman & Iwata, 1993).

**Treatment and Interventions for Challenging Behavior**

McGuire et al. (2016) identified contributing factors to challenging behaviors in individuals with ASD. These factors included current medical problems, difficulties in using functional communication, psychosocial stressors, maladaptive reinforcement patterns, and co-occurring psychiatric disorders. McGuire et al. (2016) recommends behavioral interventions for problem behavior resulting from difficulties in functional communication and maladaptive reinforcement patterns and to consider psychopharmacological interventions for cases of severe problem behavior, co-occurring psychiatric disorders, and after assessment and addressing of other contributing factors.

**Behavioral Interventions**

Behavioral interventions can be broadly categorized as either antecedent manipulations or consequential control. Antecedent manipulations are proactive strategies that reduce the
likelihood of challenging behavior emerging. Such strategies may include environmental enrichment, changes in instructional context, reduced demand requests, choice-making, and non-contingent attention. This contrasts with reinforcement-based or behavior-reduction strategies that rely on providing specified consequences in response to problem behavior to alter the functional relation between behavior and the environmental variables maintaining it.

Reinforcement-based procedures focus on increasing alternative, socially acceptable behaviors to displace the problem behavior (including picture exchange communication system, functional communication training, differential reinforcement). Behavior reduction strategies focus on reducing the future occurrence of problem behavior either by withholding the reinforcer for the behavior (extinction), withholding appetitive stimuli contingent on occurrence of the behavior (time-out, response cost), or presenting aversive stimuli contingent on occurrence of the behavior (overcorrection, restraint, contingent exercise). These are evidence-based practices supported by a substantial amount of research studies published indicating overall improvement and amelioration of challenging behavior (Brosnan & Healy, 2011; Wong et al., 2015). The effectiveness of behavioral interventions is largely dependent on the results of the FBA to inform intervention selection as well as social validity considerations in both practical implementation and acceptability to consumers.

Psychopharmaceutical Interventions

At this time, no medication is approved by the United States Food and Drug Administration (FDA) for treating the defining behavioral features of autism, but two drugs, risperidone (Risperdal) and aripiprazole (Abilify), are approved for treating “irritability” in children and adolescents diagnosed with ASD (United States Food and Drug Administration, 2006; 2009). “Irritability” is a shorthand label for several forms of challenging behavior,
including crying, self-injury, aggression directed towards others, and property destruction and is derived from the Aberrant Behavior Checklist (ABC) (Aman et al., 1985). Although risperidone and aripiprazole are the only drugs that are approved to treat irritability in this population, a wide range of medications are commonly prescribed in an effort to reduce challenging behaviors in people with ASD (Park et al., 2016). Some examples of off-label drug administration are N-acetylcysteine, clonidine, methylphenidate, valproic acid, and piracetam (McGuire et al, 2016; Wong et al., 2014). There is more evidence to support efficacy of atypical antipsychotic drugs such as risperidone and aripiprazole, but there is limited research on other atypical antipsychotic drugs such as ziprasidone, olanzapine, and clozapine (Bertelli et al., 2016).

Prevalence of Psychotropic Medication Use in Individuals with ASD

In a meta-analysis conducted by Park et al. (2016), it was reported that 1 in 6 children diagnosed with ASD were treated with at least one antipsychotic medication. Schubart et al. (2014) examined psychotropic drug use among Medicaid-enrolled children and adolescents with autism spectrum disorder in 41 states over a four-year period and found that 65% of children with autism were prescribed one or more psychotropic medications. Mandall et al. (2008) used Medicaid claims to examine the psychotropic medications prescribed for 60,641 children with ASD and reported 56% of them received at least one such medication.

Risperidone is one of the most commonly prescribed drugs in the ASD population (Hsia et al., 2014) and is classified as an atypical antipsychotic. Atypical antipsychotic drugs differ from typical antipsychotic drugs due to the reduced induction of extrapyramidal side effects (such as tardive dyskinesia) and lower levels of prolactin due to different affinities for dopamine receptors compared to typical antipsychotic drug mechanisms (Seeman, 2004). Although side effects involving the extrapyramidal system are reduced, atypical antipsychotics still pose a low
risk for affecting movement. Other common side effects include drowsiness and weight gain (McGuire et al., 2016).

The top three drugs prescribed in children with ASD in the United States were risperidone, aripiprazole, and clonidine. In adults over the age of 19, the top three drugs were ziprasidone, aripiprazole, and risperidone (Hsia et al., 2014). Ziprasidone is classified as an atypical antipsychotic medication although it has not been FDA approved to treat irritability in adults with ASD. It should be noted that clonidine is classified as an alpha-2 agonist, therapeutically intended to treat hyperactivity, and there is insufficient evidence to support its efficacy in individuals with ASD (Siegel & Beaulieu, 2012).

Antipsychotic medications are most commonly prescribed in children with ASD, followed by stimulants, antiepileptic/mood stabilizers, and antidepressants (Hsia et al., 2014). While there is emerging evidence for the prescribing of stimulants, there is insufficient evidence to support the latter drug classes (Siegel & Beaulieu, 2012).

Propportions of psychopharmaceutical interventions are increasing in subsequent years and individuals have a high likelihood of staying medicated over time, which also increases the likelihood of polypharmacy (Esbensen et al., 2009; Park et al., 2016). Polypharmacy is the simultaneous administration of multiple psychotropic medications. In a study of 33,565 children with autism spectrum disorder conducted by Spencer et al. (2013), 35% of the individuals were prescribed two or more psychotropic medications simultaneously. Very similar results were reported by Schubart et al. (2014): “approximately 30% were prescribed medications in more than one class with at least a 60-day overlap” (p. 634). As a third example, Mandall et al. (2008) review suggested that 20% of the sample they examined received three or more (data for two or more drugs were not reported).
Although polypharmacy is commonly used in the hope of improving the behavior of individuals with autism spectrum disorder, studies evaluating the effects of drug combinations in this population are scarce (Poling et al., 2017). Li et al. (2017) conducted a literature search of drug studies examining concurrent administration of risperidone and some other drug and found that only 13 such articles have examined the effects in clinical applications. The majority of drug combinations also did not support typical or conventional prescribing practices as reported by Hsia et al. (2014), and there were no studies evaluating the long-term effects of concurrent administration past six months. Long-term use of psychotropic medication can also result in undesirable and potentially threatening side effects (Valdovinos, 2019). In a 5-year longitudinal study, it was indicated that individuals with ASD may be prescribed up to 7 psychotropic medications simultaneously at a given time (Esbensen et al., 2010).

Best practice guidelines for medication prescription dictate the need for regular monitoring to ensure effectiveness and detection of adverse effects with emphases on discontinuation if the drug is ineffective or no longer required (Deegan & Drake, 2006). This reduces risk of unrestricted psychotropic drug administration and long-term negative side effects. However, Allen et al. (2007) report that the majority of children and adults with intellectual disabilities and who also exhibit challenging behaviors receives less than four psychiatric contacts a year. This coupled with the increased likelihood of receiving multiple psychotropic medications suggests that children and adults with ASD do not receive adequate monitoring of the therapeutic effects of psychopharmaceutical interventions.

Purpose of Current Study

A major concern when drugs are used to improve behavior in people with ASD is that their effects are rarely monitored adequately (Poling et al., 2017; Weeden et al., 2010). There is
also research to support multimodal treatment approaches have produced greater reductions in challenging behaviors (Valdovinos, 2019). Behavior analysts are well trained in collecting and interpreting behavioral data and often provide services for people with ASD. For these reasons, they are uniquely well situated to collect data reflecting the clinical effects of medications (Poling et al., 2017; Valdovinos, 2019; Weeden et al., 2010). Such data can provide invaluable guidance for physicians regarding the appropriate management of medications for their patients with ASD.

Li and Poling (2018) surveyed board-certified behavior analysts regarding such practices and found that 42% of respondents did not feel their knowledge of psychotropic medication was adequate and over half (55%) indicated their knowledge was acquired through self-study. Participants were also invited to answer an open-ended question, “what would allow you to play a larger and more valuable role [in monitoring psychotropic medication effects in your clients]?” One factor that emerged from the qualitative analysis of the responses is the availability and access to training on this topic.

Due to the limitations of synchronous live instruction due to scheduling and/or availability, asynchronous computer-based instruction would be an ideal format to increase availability of such training to working practitioners. Asynchronous instruction allows a learner to self-pace and provides flexibility to start the training on-demand. There has been increasing demand, learner acceptability, and positive responses to asynchronous instruction compared to synchronous methods (Buxton, 2014; Harris & DiPaolo, 1996). Behavior analysts have demonstrated the effectiveness of computer-based instruction in training undergraduate students to conduct visual analysis (Wolfe & Slocum, 2015) and implementing listener response programs (Geiger et al., 2018). Computer-based instruction have also been demonstrated to be
effective in training behavior technicians (Fisher et al., 2014) and parents of children with ASD (Heitzman-Powell et al., 2014). In both studies, the computer-based modality was effective and highly acceptable to trainees. These studies also incorporate components of active student responding in order to promote student engagement and learning. Active student responding involves observable student responses made in response to instructional antecedents (Heward, 1994). This provides the learner an opportunity to practice recall while receiving immediate feedback. There is considerable evidence to support the incorporation of active student responding in instructional materials (Barbetta et al., 1993; Jerome & Barbetta, 2005; Twyman & Heward, 2016). To our knowledge, there has not been an evaluation of computer-based instruction with active student responding on the topic of psychotropic medications geared towards practicing behavior analysts. The current study seeks to assess the utility of such training via learning outcomes and social acceptability ratings reported by behavior analytic practitioners.

**METHODS**

**Participants**

The study was approved by the Western Michigan University Human Subjects Institutional Review Board (Appendix A). Participants were recruited to participate in an online training focusing on the effects of psychotropic medication on individuals with autism spectrum disorder. A recruitment post was publicly shared on a social media website in a group targeting students and practitioners in applied behavior analysis (Appendix B). Additionally, three continuing education units were offered to board-certified participants as compensation for their time (Appendix C, D). Out of the 332 practitioners who expressed interest to the recruitment posting via signing up to participate, a total of 122 practitioners initiated the training between March and April 2020, and 74 practitioners completed the study in full.
Most participants were female practitioners certified at the Masters-level as Board Certified Behavior Analysts (BCBAs), working with clients 0-10 years old diagnosed with ASD in a center/clinic or in-home setting. Table 1 shows participant characteristics in greater detail, and additional client demographic information provided by participants are reported in Table 2. Two participants did not complete the demographic survey.

**Setting and Materials**

The training took place online and asynchronously on the participant’s computer. The training was created and hosted on the MoodleCloud Learning Management System (Appendix G). Instructional material for both the training and control conditions were based on a chapter written by Poling et al. (2017).

**Table 1**

*Participant Characteristics*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>93.06</td>
</tr>
<tr>
<td>Male</td>
<td>6.94</td>
</tr>
<tr>
<td>Other/Prefer not to say</td>
<td>0.00</td>
</tr>
<tr>
<td>Highest Degree Earned</td>
<td></td>
</tr>
<tr>
<td>Bachelors</td>
<td>1.39</td>
</tr>
<tr>
<td>Masters</td>
<td>86.11</td>
</tr>
<tr>
<td>Doctorate</td>
<td>12.50</td>
</tr>
<tr>
<td>Current Certification Level</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>5.56</td>
</tr>
</tbody>
</table>
Table 1 - continued

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RBT</td>
<td>1.39</td>
</tr>
<tr>
<td>BCaBA</td>
<td>2.78</td>
</tr>
<tr>
<td>BCBA</td>
<td>83.33</td>
</tr>
<tr>
<td>BCBA-D</td>
<td>6.94</td>
</tr>
</tbody>
</table>

Years of Experience

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>43.06</td>
</tr>
<tr>
<td>6-10 years</td>
<td>34.72</td>
</tr>
<tr>
<td>11-15 years</td>
<td>15.28</td>
</tr>
<tr>
<td>16-20 years</td>
<td>2.78</td>
</tr>
<tr>
<td>Over 20 years</td>
<td>4.17</td>
</tr>
</tbody>
</table>

Table 2

Client Demographics Questions

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you provide services for people diagnosed with ASD?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>97.22</td>
</tr>
<tr>
<td>No</td>
<td>2.78</td>
</tr>
<tr>
<td>Age Groups Serviced (Multi-Selection)</td>
<td></td>
</tr>
<tr>
<td>Elementary age (6-13 years)</td>
<td>91.67</td>
</tr>
<tr>
<td>High school age (14-18 years)</td>
<td>61.11</td>
</tr>
<tr>
<td>Young adult (19-26 years)</td>
<td>29.17</td>
</tr>
<tr>
<td>Adults (26-55 years)</td>
<td>16.67</td>
</tr>
</tbody>
</table>
Table 2 - continued

Seniors (55+ years) .................................................. 9.72

Primary Work Setting

Public or private school ............................................. 33.33
Center or clinic .......................................................... 29.17
In-home .................................................................. 22.22
Hospital .................................................................. 4.17
Residential facility ..................................................... 2.78
College or university .................................................. 1.39
Other ...................................................................... 6.94

What percentage of your clients are currently taking psychotropic medications?

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>4.17</td>
</tr>
<tr>
<td>1-25%</td>
<td>40.28</td>
</tr>
<tr>
<td>26-50%</td>
<td>22.22</td>
</tr>
<tr>
<td>51-75%</td>
<td>13.89</td>
</tr>
<tr>
<td>76-100%</td>
<td>9.72</td>
</tr>
<tr>
<td>Don’t know</td>
<td>9.72</td>
</tr>
</tbody>
</table>

Dependent Measures

The primary dependent measure was a 25-question exam that was administered pre- and post-training (Appendix F). There were 19 multiple-choice items and 6 multi-select items. Participants also completed an eight-item social acceptability questionnaire at the end of the
training. Participants provided responses on a 5-point Likert scale (1 = not at all; 5 = extremely agree).

Participants also were invited to complete a demographic questionnaire at the start of the training to replicate Li and Poling (2018)’s survey to behavior analytic practitioners on psychotropic medications (Appendix J). The questionnaire consisted of 8 demographic questions, 12 content items related to their self-evaluation of their own training and knowledge on psychotropic medications, and 2 open-ended questions as follow-ups to specific answer choices. A thematic analysis was used to isolate qualitative themes and factors from the responses. A thematic analysis is a six-stage process which involves an initial reading of the responses, generating an initial coding hierarchy, preliminary coding, thematic construction, revision, and consolidation (Braun & Clarke, 2006; Strauss & Corbin, 1990). One person independently performed a thematic analysis of all responses, then a second person independently applied the thematic categories isolated by the first person to evaluate 23 of the 107 written responses (21.5%), selected at random. The ratings of the two individuals agreed for 87% of the responses (20 of 23).

Procedures and Design

The study used a randomized control-group pretest-posttest design. After the participant provided informed consent digitally (Appendix E), they were then enrolled in the course. An e-mail containing account credentials and instructions on accessing the course was sent to the participant (Appendix I). Each participant was randomly assigned to the training condition (n=37) or the control condition (n=37). The course was limited to 50 users at a time, so participants were informed that they had a seven-day window to complete the training. Participants who never logged into training were unenrolled from the course at the seventh day.
Participants who had logged in but did not complete the course by the sixth day were e-mailed that the deadline for the training submission was due the following day.

The training contained an informed consent page, demographics questionnaire, pretest page, content modules, posttest page, social acceptability questionnaire, and a CEU certificate request form. The content modules opened when the participant completed the pretest. The posttest opened after the content modules were completed, and completion of the posttest opened the social acceptability questionnaire and CEU certificate request form.

The content of the training contained four self-paced modules: (1) Prevalence of Pharmacological Interventions, (2) Behavioral Mechanisms of Drug Action, (3) Limitations of Published Research, and (4) Everyday Medication Monitoring. Each module contained two to three lessons (Appendix H). There were 40 active student responding opportunities throughout the lessons, and participants advanced to the next lesson if they answered correctly on the active student response questions or failed to correctly answer three consecutive times.

The control course was identical to the training course with exception of the content modules. Participants read a chapter by Poling et al. (2017) instead of completing content modules with active responding opportunities. In both courses, participants could not re-access pretest, content modules, or chapter readings after each module was completed.

**RESULTS**

The current study evaluated the effectiveness and acceptability of an asynchronous training on psychotropic medication for behavior analytic practitioners. Pretest scores in the control group averaged a score of 39.7% (range: 20%-54.5%) while pretest scores in the training group averaged 46.7% (range: 22.2%-65.2%). Posttest means were 66.8% (range: 39.0%-86.4%)
and 77.7% (range: 48.0%-95.0%) for the control and training group, respectively (Table 3).

Individual pretest and posttest scores are depicted in Figures 1 and 2.

Table 3

*Means and Standard Deviation of Pre and Posttest Scores*

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th></th>
<th>Training</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Pre-Test</td>
<td>39.7%</td>
<td>1.9</td>
<td>46.7%</td>
<td>2.8</td>
</tr>
<tr>
<td>Post-Test</td>
<td>66.8%</td>
<td>3.0</td>
<td>77.7%</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Figure 1

*Control Group Pretest and Posttest Scores by Individual*

![Graph showing pretest and posttest scores for control group participants.]

Figure 2

*Training Group Pretest and Posttest Scores by Individual*

![Graph showing pretest and posttest scores for training group participants.]

Questions correct
Participants

Pretest
Posttest
An analysis of covariance (ANCOVA) was conducted in SPSS to evaluate posttest score differences across training and control groups, with pretest scores as the covariate. Table 4 shows the source table for the results of the ANCOVA. The obtained difference in posttest scores was statistically significant across training and control groups, $F(1, 71) = 10.28, p = 0.002$). The partial Eta Squared value of 0.13 indicates a small effect when compared with Cohen’s guidelines.

**Table 4**

*Analysis of Covariation for Posttest Scores (Covariate: Pretest Scores)*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III</th>
<th>df</th>
<th>Mean</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Observed Powera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Squares</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>42.207</td>
<td>1</td>
<td>42.207</td>
<td>5.827</td>
<td>0.018</td>
<td>0.076</td>
<td>0.663</td>
</tr>
<tr>
<td>Group</td>
<td>74.479</td>
<td>1</td>
<td>74.479</td>
<td>10.282</td>
<td>0.002</td>
<td>0.127</td>
<td>0.886</td>
</tr>
<tr>
<td>Error</td>
<td>514.3</td>
<td>71</td>
<td>7.243</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* a computed using alpha = 0.05.

On the social acceptability questionnaire, the training group reported an overall score of 4.52 (SD = 0.67) across all items (SD = 0.67) whereas the control group reported an overall acceptability score of 4.44 (SD = 0.72). Table 5 lists individual item responses for both training and control groups.

Participants primarily self-evaluated their adequacy of knowledge regarding psychotropic medications and behavioral pharmacology as somewhat inadequate (33.33%) and their knowledge of specific medication uses and effects pertaining to their clients as somewhat adequate (31.94%). The most common method of obtaining training regarding psychotropic
medication was via self-study (40.28%) although no training was indicated as the second most common response, as shown in Table 6.

Table 5

Social Acceptability Questionnaire Results

<table>
<thead>
<tr>
<th></th>
<th>Training</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>1. I learned something new from this training.</td>
<td>4.71</td>
<td>0.46</td>
</tr>
<tr>
<td>2. The training communicated the content clearly.</td>
<td>4.68</td>
<td>0.47</td>
</tr>
<tr>
<td>3. There was sufficient time to cover the training information.</td>
<td>4.82</td>
<td>0.38</td>
</tr>
<tr>
<td>4. The training was valuable to me as a practitioner.</td>
<td>4.65</td>
<td>0.48</td>
</tr>
<tr>
<td>5. I enjoyed this instructional method to learn new information.</td>
<td>4.06</td>
<td>1.06</td>
</tr>
<tr>
<td>6. I felt successful during most of the lessons.</td>
<td>4.34</td>
<td>0.64</td>
</tr>
<tr>
<td>7. It would’ve been valuable to have this training as part of my formal coursework.</td>
<td>4.43</td>
<td>0.65</td>
</tr>
<tr>
<td>8. I would’ve enjoyed completing this training as part of my formal coursework.</td>
<td>4.46</td>
<td>0.66</td>
</tr>
</tbody>
</table>
## Table 6

*Participants’ Training and Knowledge Regarding Medications Questions*

<table>
<thead>
<tr>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>What training did you receive regarding the uses and effects of psychotropic medication?</td>
<td></td>
</tr>
<tr>
<td>Self-study</td>
<td>40.28</td>
</tr>
<tr>
<td>Workshop</td>
<td>18.06</td>
</tr>
<tr>
<td>Class (in my degree program)</td>
<td>22.22</td>
</tr>
<tr>
<td>Class (outside my degree program)</td>
<td>18.06</td>
</tr>
<tr>
<td>Other</td>
<td>16.67</td>
</tr>
<tr>
<td>None</td>
<td>29.17</td>
</tr>
<tr>
<td>How adequate is your knowledge of uses and effects of psychotropic medications that your clients receive?</td>
<td></td>
</tr>
<tr>
<td>Extremely adequate</td>
<td>5.56</td>
</tr>
<tr>
<td>Somewhat adequate</td>
<td>31.94</td>
</tr>
<tr>
<td>Neither adequate nor inadequate</td>
<td>19.44</td>
</tr>
<tr>
<td>Somewhat inadequate</td>
<td>25.00</td>
</tr>
<tr>
<td>Extremely inadequate</td>
<td>16.67</td>
</tr>
<tr>
<td>How adequate is your knowledge of uses and effects of psychotropic medications and behavioral pharmacology in general?</td>
<td></td>
</tr>
<tr>
<td>Extremely adequate</td>
<td>4.17</td>
</tr>
<tr>
<td>Somewhat adequate</td>
<td>25.00</td>
</tr>
<tr>
<td>Neither adequate nor inadequate</td>
<td>20.83</td>
</tr>
</tbody>
</table>
Table 6 - continued

<table>
<thead>
<tr>
<th>Somewhat inadequate</th>
<th>33.33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely inadequate</td>
<td>16.67</td>
</tr>
</tbody>
</table>

Source of information provided to prescribing physicians regarding behavioral effects of psychotropic medication

<table>
<thead>
<tr>
<th>Anecdotal observation</th>
<th>36.11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct measures of target response</td>
<td>50.00</td>
</tr>
<tr>
<td>Checklist or rating scales</td>
<td>19.44</td>
</tr>
<tr>
<td>Self-report by client</td>
<td>15.28</td>
</tr>
<tr>
<td>Self-report by parents, teachers, or other care-providers</td>
<td>29.17</td>
</tr>
<tr>
<td>School or institutional records</td>
<td>11.11</td>
</tr>
<tr>
<td>Other</td>
<td>34.72</td>
</tr>
<tr>
<td>I don’t provide such information</td>
<td>37.50</td>
</tr>
</tbody>
</table>

How do determine what adverse effects to track?

<table>
<thead>
<tr>
<th>Based on parent concern</th>
<th>79.17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on client concern</td>
<td>30.56</td>
</tr>
<tr>
<td>Based on direct observations</td>
<td>75.00</td>
</tr>
<tr>
<td>Based on physician input</td>
<td>29.17</td>
</tr>
<tr>
<td>Based on published research articles</td>
<td>19.44</td>
</tr>
<tr>
<td>Based on internet or textbooks</td>
<td>5.56</td>
</tr>
<tr>
<td>Based on side effects reported on drug package labels</td>
<td>25.00</td>
</tr>
<tr>
<td>Other</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Sources of information provided to the physician were largely some direct measure of a target response (50.00%) tracked based on either parent concern (79.17%) or based on the practitioner’s direct observation (75.00%). Table 7 indicates practitioners sometimes are aware of adjustments made to their clients’ medications and sometimes work with the prescribing physicians. 38.89% of participants reported that their data are sometimes used by the prescribing physician in making treatment decisions while 34.72% of participants report that their data are rarely used. Most participants (80.56%) indicated they could play a larger and more valuable role in ensuring their clients are used to maximally benefit their clients, and most participants (72.22%) felt that competency in evaluating the effects of psychotropic medications should be part of the BACB task list. A total of 51 participants provided responses to the open-response question of “why should competency in medication monitoring be part of the task list?” The thematic analysis yielded three major themes to this. Over half of the responses (56.86%) were related to maximizing client benefit and therapeutic services. Other responses were related to facilitating collaboration with other healthcare professionals (17.64%) and general preparedness as a practitioner working with a variety of psychiatric diagnoses (31.34%). When asked what would allow practitioners to play a larger and valuable role, 56 participants provided a response. 44.64% indicated that increased opportunities to collaborate (typically with physicians) would allow them to do so. Slightly fewer, 35.71%, reported that better training would be sufficient, and 30.36% noted that collecting and using better measurement systems (typically involving direct observations of behavior) would suffice. Note that percentages can sum to over 100% because two or more themes could be evident in a single answer. Qualitative responses are provided in Appendix K.
Table 7

*Current Practices Regarding Psychotropic Medications Questions*

<table>
<thead>
<tr>
<th>Question</th>
<th>Always</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you know the specific psychotropic medications your clients are receiving and when adjustments are made to the drugs or drug doses they receive?</td>
<td>22.22%</td>
<td>51.39%</td>
<td>19.44%</td>
<td>5.56%</td>
</tr>
<tr>
<td>How often do you know the intended effects of the psychotropic medication your clients are receiving?</td>
<td>11.11%</td>
<td>58.33%</td>
<td>19.44%</td>
<td>9.72%</td>
</tr>
<tr>
<td>How often do you work directly with the prescribing physicians to develop strategies for measuring the intended effects of the psychotropic medication your clients are receiving?</td>
<td>11.11%</td>
<td>37.50%</td>
<td>20.83%</td>
<td>29.17%</td>
</tr>
<tr>
<td>How often do you work directly with people other than the prescribing physicians (e.g., clients, parents, teachers) to develop strategies for measuring the intended effects of the psychotropic medication your clients are receiving?</td>
<td>8.33%</td>
<td>8.33%</td>
<td>33.33%</td>
<td>48.61%</td>
</tr>
<tr>
<td>How often are behavioral data reflecting the intended effects of psychotropic medications used by the prescribing physician in making treatment decisions regarding your clients?</td>
<td>6.94%</td>
<td>38.89%</td>
<td>34.72%</td>
<td>16.67%</td>
</tr>
</tbody>
</table>
DISCUSSION

The current study evaluated the effectiveness and acceptability of an asynchronous training on psychotropic medication for behavior analytic practitioners. The results suggest that the online training with required responding was more effective than reading a chapter. While both modalities were largely acceptable to practitioners, the online training had a slightly higher acceptability rating (4.52) than the control group (4.44). Both groups reported similarly (4.06; 4.08) for the social acceptability item “I enjoyed this instructional method to learn new information.” A likely explanation for this is that the online training module was primarily text-based with the addition of required active student responses. While there is research to support the effectiveness of text-based instruction compared to videos (Breimer et al., 2012; Lang, 2016), students may still prefer video-based instruction (Lloyd & Robertson, 2012). Future investigators can compare the effectiveness and acceptability of text-based versus video-based instruction on this topic.

Some items from the practitioner survey were consistent with Li and Poling (2018)’s results, such as the majority of behavior analytic practitioners work with individuals diagnosed with ASD and indicate they could play a larger role when it comes to ensuring psychotropic medications are maximally benefitting their clients. Practitioners also self-evaluated their knowledge of psychotropic medication as somewhat inadequate, and qualitative responses continue to indicate the importance of collaboration, utilizing objective measurement systems, and access to training. However, compared to Li & Poling (2018)’s results, it is heartening to see that a larger proportion of practitioners (37.50%) indicate that they sometimes work with the prescribing physician compared to the 2018 survey response of 8.82%.
Based on the statistics of individuals with ASD on psychotropic medication (Esbensen et al., 2010; Mandell et al., 2008; Park et al., 2016), there is no doubt that behavior analysts working with these populations will encounter a client prescribed a psychotropic medication to treat challenging behavior. Due to the lack of research on simultaneous psychotropic medication administration and off-label administration of pharmacological agents (Li et al., 2017; Siegal & Beaulieu, 2012; Spencer et al. 2013), behavior analytics practitioners can provide substantial evaluative data towards prescribers’ decision making and monitoring of therapeutic effects due to their specialization and training in direct observation and data collection with operationally defined behavioral targets. As noted in Li & Poling (2018), behavior analysts are not likely to be a required member of an interdisciplinary team regarding decision-making of a client’s psychotropic medication regimen. One possible interpretation is that healthcare professionals may feel it would be outside of the scope of the behavior analyst as they are not licensed to prescribe or administer drugs. Appropriate training and/or formal coursework may ameliorate these concerns and attitudes.

Nonetheless, it is established that overprescribing or failure to alter medications is related to lack of prescriber contact and medication reviews (Allen et al. 2007; Deegan & Drake, 2006; Nishtala et al., 2008). Due to the high level of contact that a behavior analyst has with individuals receiving ABA services, behavior analysts are uniquely qualified to assist with providing objective and appropriate data for prescribers to enhance medication monitoring. For these reasons, involvement in interdisciplinary collaboration have been encouraged (Li & Poling, 2018; Newhouse-Oisten et al., 2017; Valdovinos, 2019; Weeden et al., 2010).

One limitation to the study was the attrition rate. Of the 122 practitioners who started the training, only 60.65% completed the study in full. It should also be noted that about 300
individuals signed up to participate in the study within the first two days of recruitment; however, due to the limitations of the learning management system, only 50 users could be enrolled at a time. Therefore, interested users beyond the first 50 individuals had to wait anywhere from one to three weeks prior to starting the study. This study also took place during March 2020, in the midst of the COVID-19 pandemic. Shelter-in-place orders began taking place as early as mid-March, which could be another factor contributing to attrition, due to the disruption to typical work and home environments.

If behavior analysts are to regularly be involved in ensuring that medications are used to produce maximal benefit in their clients, then it is essential that they be appropriately trained. Results of a recent survey of behavior analysis course sequence coordinators indicate that many believe there is too little coverage of basic-science topics, such as behavioral pharmacology (Blydenburg & Diller, 2016), and based on the initial interest of practitioners signing up to complete the study, there does appear to be great enthusiasm for broadening the scope of behavior analysts’ training. While practitioners should seek out additional training areas to increase their own competency and knowledge for the sake of their clients’ benefit, it is also imperative that such resources are available to practitioners. The creation of a free asynchronous training on the topic of psychotropic medications is one step towards enhancing professional and practice development to enhance therapeutic outcomes in individuals receiving ABA.
REFERENCES


Appendix A

HSIRB Approval Letter
Date: February 25, 2020

To: Alan Poling, Principal Investigator
Anita Li, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: IRB Project Number 20-02-50

This letter will serve as confirmation that your research project titled “Training Practitioners on Effects of Psychotropic Medications via a Web-Based Platform” has been approved under the exempt category of review by the Western Michigan University Institutional Review Board (IRB). The conditions and duration of this approval are specified in the policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may only be conducted exactly in the form it was approved. You must seek specific board approval for any changes to this project (e.g., add an investigator, increase number of subjects beyond the number stated in your application, etc.). Failure to obtain approval for changes will result in a protocol deviation.

In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the IRB for consultation.

The Board wishes you success in the pursuit of your research goals.

A status report is required on or prior to (no more than 30 days) February 24, 2021 and each year thereafter until closing of the study. The IRB will send a request.

When this study closes, submit the required Final Report found at https://wmich.edu/research/forms.

Note: All research data must be kept in a secure location on the WMU campus for at least three (3) years after the study closes.
Appendix B

Recruitment Script
Hello!

I am seeking both certified and non-certified individuals who are interested in gaining more knowledge in regarding psychotropic medication and individuals with autism spectrum disorder. For my dissertation, I am creating an online web-based training involving psychotropic medication and its effects in individuals with autism spectrum disorder (ASD). Completion of this training is completely online and involves self-paced instruction. Participants who complete the training in full will receive up to 3.0 free continuing education units towards their BACB credential. Participation in this study is expected to take 2-3 hours, but all components of the training are self-paced. If you are interested, please go to this link [http://www.anitli.net/dissertation](http://www.anitli.net/dissertation) to review the informed consent document. If you agree, it will provide instructions on how to create an account for the training. If you have any questions or comments, please e-mail Anita at anitli.research@gmail.com. Thank you!
Appendix C

CEU Approval Letter
February 24, 2020

Human Subjects Review Committee
Western Michigan University
Kalamazoo, MI 49008

Re: ACE Type 2 Provider

To whom it may concern:

I am writing to indicate my agreement to provide Type 2 ACE Continuing Education credits to certified behavior analysts who completed Anita Li’s project entitled, “Training Practitioners on the Effects of Psychotropic Medications via a Web-Based Platform.” I am in support of this project and data gathering for subsequent publication of the results.

If you have any other questions, please reach me at 407-508-6482.

Sincerely,

Joshua K. Pritchard, BCBA-D
Appendix D

CEU Certificate
Facta-Ri Holdings, LLC
ACE Provider Number: OP-18-2821

Certificate of Completion

This certificate is awarded to Student Name for completing the online training “Psychotropic Medications as Treatments for People with Autism Spectrum Disorders” taught by Anita Li, MS, BCBA on Date and earned 3.0 Learning CEUs.

Joshua K. Pritchard, Ph.D., BCBA-D
Appendix E

Informed Consent Document
Western Michigan University
Department of Psychology

Principal Investigator: Al Poling, Ph.D.
Student Investigator: Anita Li, M.S.
Title of Study: Training Practitioners on Effects of Psychotropic Medications via a Web-Based Platform

STUDY SUMMARY: This consent form is part of an informed consent process for a research study and it will provide information that will help you decide whether you want to take part in this study. Participation in this study is completely voluntary. The purpose of the research is to determine self-paced online training enhances the learning and acceptability to practitioners. If you take part in the research, you will be asked to complete an online training that comprises text-based, self-paced instruction. Your time in the study will take approximately three hours that can be completed in a single session. Possible risk and costs to you for taking part in the study may be eye strain from looking at the computer or discomfort while remaining seated for up to three hours. Direct benefits to you from participating may include enhanced knowledge regarding psychiatric medication that may complement your clinical practice. Your alternative to taking part in the research study is not to take part in it.

You are invited to participate in this research project titled "Training Practitioners on Effects of Psychotropic Medications via a Web-Based Platform." The project is supervised by Dr. Alan Poling and will serve as Anita Li’s dissertation project. The following information in this consent form will provide more detail about the research study. Please ask any questions if you need more clarification and to assist you in deciding if you wish to participate in the research study via e-mail. You are not giving up any of your legal rights by agreeing to take part in this research or by agreeing to this consent form.

What are we trying to find out in this study?
The purpose of this study is to determine whether or not a self-paced online training enhances the learning and social acceptability of this modality to practitioners working with individuals who are taking psychotropic medications or with a general interest in applied behavioral pharmacology.

Who can participate in this study?
Any certified behavior analytic practitioner or interested student in behavior analytic coursework that is 18 years or older can participate in this survey.

Where will this study take place?
This study will take place online.

What is the time commitment for participating in this study?
If you choose to participate, you will complete an anticipated three hour training that is a one-time only commitment. The training is self-paced and may be completed within 7 days of the start of the training.
What will you be asked to do if you choose to participate in this study?
You will be asked to answer questions related to pharmacology on a pre-test, complete training modules using text instruction with knowledge checks, and answer questions on a post-test upon completion of the modules. You will also be asked questions regarding your experiences and satisfaction regarding the training after the post-test.

What information is being measured during the study?
We will collect data related to basic demographics (such as age, sex, education), percent correct on the pre-test, instruction, and post-test in addition to your responses on the social acceptability scale.

What are the risks of participating in this study and how will these risks be minimized?
The risks of participating in this study is you may experience eye strain from looking at the computer screen, and you may feel discomfort for sitting at the computer. You are allowed to take a break at any time, and you can also terminate and stop the study at any point to minimize these risks.

What are the benefits of participating in this study?
Potential benefits to you from participating may include enhanced knowledge regarding psychiatric medication that may complement your clinical practice.

Are there any costs associated with participating in this study?
There is no cost to you as a participant other than a time commitment, which may be divided in smaller sessions within a week’s timeframe.

Is there any compensation for participating in this study?
There is no cash compensation awarded for participating in this study; however, certified individuals will be awarded up to 3.0 Learning continuing education units (CEU) towards your behavior analytic certification renewal without any added cost.

Who will have access to the information collected during this study?
All of the information collected from you is confidential. That means that your name will not appear on any papers or files on which information for the study is recorded with exception of a continuing education unit (CEU) certificate, which will be e-mailed to you upon completion of the training. All other forms will be retained for at least three years in a locked file in the principal investigator’s office after the close of the study. The data may be used in conference presentations or manuscripts for publication in peer-reviewed journals, but your identity will not be reported.

What will happen to my information or biospecimens collected for this research after the study is over?
The information collected about you for this research will not be used by or distributed to investigators for other research.

What if you want to stop participating in this study?
You can choose to stop participating in the study at any time for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation from the researchers. You will experience NO consequences either academically or personally if you choose to withdraw from this study from the researchers.

The investigator can also decide to stop your participation in the study without your consent.

Should you have any questions prior to or during the study, you can contact Al Poling at 269-387-4483 or alan.poling@wmich.edu or Anita Li at 954-701-6851 or anita.li@wmich.edu. You may also contact the Chair, Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This consent document has been approved for use for one year by the Western Michigan University Institutional Review Board (WMU IRB) on February 25, 2020. Do not participate after February 24, 2021.

------------------------------------------------------------------------------------------------------------------

Participating in this training online indicates your consent for use of the answers you supply.
Appendix F

Questions for Pre- and Posttest
1. Which FDA approved drugs are used for treating “irritability” in children and adolescents with ASD?
A. Risperdal
B. Abilify
C. Vyvanse
D. Paxil
E. none of the above

2. What factor may have contributed to the increasing prevalence of ASD diagnoses?
A. broadening of the diagnostic category
B. biological and environmental interactions
C. increased vaccination schedules and requirement
D. decreased public awareness
E. epigenetics

3. People diagnosed with ASD also may meet criteria for the following disorders:
A. Attention deficit/hyperactivity disorder
B. Oppositional defiant disorder
C. Intellectual disability
D. A and C
E. all of the above

4. What are the core characteristics of autism spectrum disorders?
A. restricted, repetitive movements
B. deficits in social communication and interaction
C. presence of challenging behavior, such as aggression
D. A and C
E. all of the above

5. The majority of research on individuals with ASD and psychotropic medications focus primarily on:
A. children and adolescents
B. adults
C. adolescents and adults
D. children
E. adolescents

6. What is the Aberrant Behavior Checklist typically used for?
A. examine severity of challenging behavior
B. assess psychiatric effects in individuals with ASD
C. assess crisis and treatment plans for individuals with developmental disabilities
D. provide indirect functional assessment data to caregivers regarding challenging behaviors
E. assess the topographies of aberrant behaviors
7. Which of the following is a subscale derived from the Aberrant Behavior Checklist?
A. Maladaptive behaviors
B. Self-injury
C. Aggression
D. Irritability, agitation, and crying
E. All of the above

8. Irritability entails:
A. crying
B. self-injury
C. aggression
D. social withdrawal
E. agitation

9. What type of drug class does Risperdal fall under?
A. atypical antipsychotic
B. typical antipsychotic
C. stimulant
D. anxiolytic
E. depressant

10. Risperdal is approved to treat what symptoms in individuals with autism spectrum disorders?
A. aggression
B. self-injury
C. irritability
D. temper tantrums
E. crying

11. What is one con of using the ABC checklist?
A. extremely time consuming
B. the client may change behavior if they know they are being watched
C. the caregiver may commit observer bias
D. ABC checklists are not always covered by insurance
E. provides data that are based on rater’s subjective opinions and memories

12. According to the CDC, what is currently the likelihood that a child will be diagnosed with ASD?
A. 1 in 150
B. 1 in 3
C. 1 in 68
D. 1 in 25
E. 1 in 42
13. Approximately ____% of sampled individuals with autism spectrum disorders were receiving at least one or more psychotropic medications.
   A. 40-50%
   B. 20-30%
   C. 50-60%
   D. 60-70%
   E. 30-40%

14. What is a factor contributing to increased pharmacological treatment?
   A. adaptive behavior
   B. lower levels of social competence
   C. individuals in school-based settings
   D. families with a lower socioeconomic status
   E. families without experience in behavioral treatment

15. Polypharmacy is considered the simultaneous administration of ___ medications.
   A. 2 or more
   B. 3 or more
   C. 4 or more
   D. 3 or more of the same drug class
   E. 4 or more, regardless of drug class

16. What are contributing factors to the prevalence of utilizing psychotropic medications as a treatment for challenging behavior?
   A. reduced response effort for the families
   B. funders typically reimburse for pharmacological treatment
   C. it is complimentary to intensive behavioral treatments
   D. there are established guidelines in doing so
   E. some drugs are supported by the FDA

17. Select the subscales of the Aberrant Behavior Checklist.
   A. irritability, agitation, crying
   B. social withdrawal
   C. stereotypic behavior
   D. hyperactivity and noncompliance
   E. inappropriate speech

18. Behavioral mechanisms of drug action typically involve:
   A. respondent conditioning
   B. operant conditioning
   C. neurochemical action
   D. biological processes
   E. environmental changes

19. What can be said about current medication that reduces the core symptoms of ASD?
   A. certain medication can be used short-term
B. long-term use of psychotropic drugs can result in psychological dependence
C. no medication that substantially reduces the symptoms of ASD is currently available
D. psychotropic medication has been effectively approved by the FDA
E. the prevalence of using psychotropic medications to treat challenging behaviors is decreasing.

20. What can be said about the use of secretin in regard to treating young people with ASD?
A. there is no evidence to support it
B. it has shown mild improvements in individuals with ASD
C. secretin is a very cost-effective form of treatment
D. many pharmaceutical studies show that irritability can be cured by secretin
E. there is promising pre-clinical trials to indicate effectiveness

21. Which antipsychotic drug(s) appears to best reduce challenging behaviors in children with ASD?
A. Adderal
B. Abilify
C. Thorazine
D. Rispeidone
E. None of the above

22. Select the side effects of antipsychotic medication.
A. sedation
B. weight gain
C. metabolic changes
D. motor disturbances
E. fever

23. In one study examining the role of atypical antipsychotics and its impact in functional analysis, it was determined that individuals on medication saw a reduction in:
A. attention-seeking behavior
B. escape-maintained behavior
C. automatically maintained behavior
D. multiple functions of behavior
E. overall target response rates
24. What is the role of using psychotropic medications in a dual diagnosed individual with ASD and some other psychiatric condition?
A. It is a necessity to treat both ASD and another psychiatric condition from the biological standpoint.
B. Psychiatric conditions may be addressed via underlying neurochemical mechanisms of action.
C. There has been evidence to demonstrate that treatment for the co-morbid psychiatric condition has improved symptoms of ASD.
D. Using psychotropic medications in general ignores the behavioral mechanisms of actions and therefore anticipated to have low efficacy.
E. It is generally not justified as many comorbid diagnoses as a product of misinterpreting the ASD diagnosis.

25. What is the most accurate statement summarizing the research of psychotropic medication usage in individuals with ASD?
A. There are a handful of longitudinal studies that examine drug efficacy but not adverse effects.
B. There has been more studies on individuals with ASD past young adulthood than early childhood.
C. There are several established guidelines provided substantial empirical evidence for specified drug combinations in individuals with ASD.
D. There are few studies comparing drug treatments and behavioral interventions.
E. There is no evidence basis to support the use of psychotropic medication in individuals with ASD.
Appendix G

Screenshot of Training Module
Introduction
Welcome! Thank you for your interest in participating in this research project. Your participation will consist of filling out demographics, a pre-test, 4 training modules (with 2-3 individual lessons in each), a social acceptability survey, a post-test, and an optional CEU request form. Each component will automatically appear as you advance and complete the training. It is expected to take no more than 3 hours. If you do not complete the training within 7 days, we will assume that you are no longer interested in participation and unenroll you from the course. If you encounter any issues, please e-mail anrili.research@gmail.com.

Informed Consent
This is a copy of the informed consent document for this project. You are able to re-visit and re-read and/or print this document at any point of the training.

Demographics
Please complete this survey regarding demographic information, education level, and experiences with psychotropic medication in your clinical practice. It is 16 questions and is estimated to take no more than 15 minutes.

Pre-Test
Welcome! Please begin by taking this knowledge test to assess your level of familiarity with the content.

Prevalence of Pharmacological Interventions
Restricted Not available unless: The activity Pre-Test is marked complete

- Introduction
- Drug Treatment as Evidence-Based Practice
- Irritability: Creation and Treatment of a Make-Believe Disease

Behavioral Mechanisms of Drug Action
Restricted Not available unless: The activity Irritability: Creation and Treatment of a Make-Believe Disease is marked complete

- Behavioral Mechanisms of Drug Action
- ASD and Co-morbidity: Dual Diagnoses

Limitations of Published Research
Restricted Not available unless: The activity ASD and Co-morbidity: Dual Diagnoses is marked complete

- Limitations of Published Research
- Research Findings
Everyday Medication Monitoring

Restricted: Not available unless: The activity Research Findings is marked complete

- Everyday Medication Monitoring
- Conclusion

Conclusion

Restricted: Not available unless: The activity Conclusion is marked complete

- Social Acceptability Survey
  Restricted: Not available unless: The activity Conclusion is marked complete

- Post-Test
  Restricted: Not available unless: The activity Social Acceptability Survey is marked complete

Thank you for completing the training! Please finish the course by taking this knowledge test to assess your level of familiarity with the content.

- CEU Certificate Request
  Restricted: Not available unless:
  - The activity Social Acceptability Survey is marked complete
  - The activity Post-Test is marked complete

If you possess a BCaBA, BCBA, or BCBA-D credential, please enter your name matching the BACB’s registry and e-mail address for a CEU certificate to be e-mailed to you. If you are completing this training and do not want or need CEUs, please do not complete this form.
Appendix H

Screenshot of Sample Training Lesson
Behavioral Mechanisms of Drug Action

What do psychotropic drugs do?

What psychotropic drugs actually do is to perturb neurochemical processes. These perturbations sometimes influence an individual’s sensitivity to environmental events, and in such cases it is possible to specify the drug’s behavioral mechanism of action. In contrast to neurochemical mechanisms of drug action, which relate to the effects of drugs in the brain, behavioral mechanisms of action refer to the stimulus functions of drugs in the context of operant and classical conditioning and to the effects of the drugs on the capacity of other stimuli to control behavior.

The stimulus properties of drugs involve their ability to serve as conditional stimuli, unconditional stimuli, discriminative stimuli, positive reinforcers (conditioned or unconditioned), and negative reinforcers (conditioned or unconditioned). Drugs also can serve as motivational operations, increasing or decreasing the reinforcing or punishing effects of certain other stimuli. In addition, they can alter sensitivity to particular dimensions of reinforcement (e.g., amount, probability, delay), influence sensory acuity (hence discrimination), and elicit responses incompatible with required operators. Finally, drugs and their effects can be described in statements (rules) that alter behavior through rule governance. These and other behavioral mechanisms of drug action are described elsewhere (Poling & Byrne, 2000).
Appendix I

Participant Instructions
1. Log onto the website with your provided username and password (behavior).

2. Read the MoodleCloud policy. Click Next at the bottom.

3. Read the MoodleCloud Cookies policy. Click Next at the bottom.

4. Check boxes for MoodleCloud policy and MoodleCloud cookie policy. Click Next.

5. You can go through the Dashboard tour by clicking Next (or clicking End Tour if you feel comfortable with the platform).

6. Under your Dashboard, you will see the enrolled course:

7. Please begin by filling out the Demographics and the Pre-test.

8. The lessons below will open automatically as you complete and advance through the training. If you are experiencing issues in the lessons, please e-mail anitli.research@gmail.com. Once
you’ve completed all items in the Conclusion section, a CEU request form will be available for you to provide your contact information so we can e-mail a CEU certificate to you.
Appendix J

Demographics Questionnaire
Gender:
- Male
- Female
- Other/prefer not to say

Degree level:
- H.S./G.E.D.
- B.S./B.A.
- M.A/M.S./M.Ed
- Ph.D

Select your certification level:
- RBT
- BCaBA
- BCBA
- BCBA-D

Select how long you have been providing ABA services.
- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- Over 20 years

Do you provide services for people with autism spectrum disorder (ASD)?
- Yes
- No (other)

Please check off the age groups that you work with.
- Early childhood (0-5 years)
- Elementary age (6-13 years)
- High school age (14-18 years)
- Young adult (19-26 years)
- Adults (26-55 years)
- Seniors (55+ years)

Select the setting that best describes the setting in which you provide services:
- Public or private school
- Center or clinic
- In-home
- Hospital
- Residential facility
- College or university
What percentage of your clients are currently taking psychotropic medications? Psychotropic drugs are prescription drugs intended to improve mood, cognitive status, or overt behavior.

- 0%
- 1-25%
- 26%-50%
- 51-75%
- 76-100%
- Don’t know

How often do you know the specific psychotropic medications your clients are receiving and when adjustments are made to the drugs or drug doses they receive?

- Always
- Sometimes
- Rarely
- Never

How often do you know the intended effects of the psychotropic medication your clients are receiving?

- Always
- Sometimes
- Rarely
- Never

How often do you work directly with the prescribing physicians to develop strategies for measuring the intended effects of the psychotropic medication your clients are receiving?

- Always
- Sometimes
- Rarely
- Never

How often do you work directly with people other than the prescribing physicians (e.g., clients, parents, teachers) to develop strategies for measuring the intended effects of the psychotropic medication your clients are receiving?

- Always
- Sometimes
- Rarely
- Never
How adequate is your knowledge of uses and effects of psychotropic medications and behavioral pharmacology in general?
- Extremely adequate
- Somewhat adequate
- Neither adequate nor inadequate
- Somewhat inadequate
- Extremely inadequate

How adequate is your knowledge of uses and effects of psychotropic medications that your clients receive?
- Extremely adequate
- Somewhat adequate
- Neither adequate nor inadequate
- Somewhat inadequate
- Extremely inadequate

What training did you receive regarding the uses and effects of psychotropic medication?
- Self-study
- Workshop
- Class (in my degree program)
- Class (outside my degree program)
- Other
- None

How often are behavioral data reflecting the intended effects of psychotropic medications used by the prescribing physician in making treatment decisions regarding your clients?
- Always
- Sometimes
- Rarely
- Never

If you provide information to the prescribing physician relevant to the behavioral effects of psychotropic medications that your clients receive, what is the source of the information? Please check all that apply.
Select one or more:
- Your anecdotal observations
- Direct measures of target responses
- Checklists or rating scales
- Self-reports by clients
- Self-reports by parents, teachers, or other care-providers
- School or other institutional records (e.g., grades, absences, suspensions)
- Other
- I don’t provide such information.
How do you determine what adverse effects to track? Please select all that apply.
Select one or more:
- a. Based on parent concern
- b. Based on client concern
- c. Based on direct observations
- d. Based on physician warning
- e. Based on research or literature
- f. Based on internet or textbooks
- g. Based on reported side effects of drug labels

Should competency in evaluating the effects of psychotropic medications be part of the BACB task list?
- a. Yes
- b. No

If your answer was “yes,” why?

Could you play a larger and more valuable role in ensuring that psychotropic drugs are used to maximally benefit your clients?
- a. Yes
- b. No

If your answer was “yes,” what would allow you to play a larger and more valuable role?
Appendix K

Qualitative Responses for Demographics Questionnaire
If your answer was “yes,” [that competency in evaluating the effects of psychotropic medications be part of the BACB task list], why?

1. Many individuals I service in the ABA field have additional diagnoses such as ADD, ADHD, or mood disorders. Behavior analysts should be versed in understanding the effects medication can have on behavior and on tracking these side effects in order to determine the best, most comprehensive treatment moving forward. Additionally, in speaking with professionals such as psychologists, psychiatrists, and medical doctors, behavior analysts should be able to speak to the efficacy of specific psychotropics and their impact on the individual clients.

2. Many of the individuals which whom we work with are continually adding, subtracting, increasing or decreasing doses of medications. Some parents want to work with us collaboratively, thu documenting changes, while others make us blind to changes.

3. I feel that it is very important for BCBAs to know how medications taken by their clients can effect client behavior to help parents and drs make better decisions regarding prescribing certain medications.

4. Psychotropic medications are not uncommon in many of the populations that behavior analysts work with. Knowing how to evaluate the effects of these medications will not only be useful to the behavior analyst, but to provide information to caregivers and doctors the client sees.
5. I find that this area gets overlooked a lot and I have found having to actively find answers about just my clients taking the medication as at times, parents/agencies do not focus on this. If it is a part of the task list, then it will be taken more seriously.

6. I work closely with a psychologist and rely on him for a lot of info but I feel underprepared to look or have med discussions.

7. I think BCBA’s should at least be trained that Medication is a variable to be evaluated and tracked. It's helpful for psychiatrists to have a direct measure to utilize when evaluating the effectiveness of a medication. It's also helpful for the treatment team to better understand what might be occurring with a patient, during a medication changes. This is especially critical in patients with ASD, where medications are often used to treat "mood" or "impulsivity", which are much more challenging to measure. However, I also understand that most BCBA's are not used to working in close daily or weekly consult with a psychiatrist, and they would likely be practicing outside their scope, if they engaged in more then presentation of behavior data.

8. I think if it is just analyzing data and establishing phase change lines to determine but it may be difficult for some analysts to stay within their scope of practice.

9. “-To improve rapport and collaboration with psychiatrists and treating physicians

- To improve rapport and collaboration with nursing teams

- To better understand medical treatment protocols for clusters of observed behavioural symptoms
-To have a better grasp on what medications are meant to treat what elements of a behavioural presentation, thereby improving data collection procedures "

10. There are many co-occurring diagnoses that we see in working with individuals with ASD. Even if a BCBA were only to use their certification to work with only those with ASD we still look to understanding the effects of other co-occurring diagnoses. If we spend an entire semester learning about other diagnoses and how it impacts ASD within programs then why would we not also spend the time to learn about the medications they are potentially prescribed that could aid or create other maladaptive behaviors?

11. It can be a part of the curriculum only if an in-depth module is created on psychopharmacology, its' effect, side-effects, etc. Currently this is more in the realm of psychology besides psychiatry. There are multiple facets to developing competency in evaluating its' effects, and it would be helpful to have that knowledge.

12. Psychotropic medications have influences on behavior and the brain, which need to be taken into account when providing behavior analytic services. Co-morbidity rates are very high as well and the whole person must be considered, not just the Autism diagnosis.

13. A considerable amount of clients use psychotropic medications so this is an important variable that we as behavior analysts need to consider.

14. With so many clients on them, we should at least know what to look for.
15. "Maybe a small area of the task list. just the basic drugs and their effects can be studied along with the generic name. Need not go too much into chemical compositions of drugs. 

New drugs are always being developed. "

16. I think it's helpful when medications alter the effect of behaviors for a behaviorist to be aware and part of the regimen.

17. As I do not have a background in this topic, I feel it is crucial as many of my clients are on medication. I feel this can be very helpful for us as clinicians to understand.

18. It is part of some programs, and should be required. It is part of treating this population regardless of how involved you are so you should know.

19. It goes hand in hand with what we do but it's also out of our expertise. we should have some knowledge

20. Psychotropic medication is often part of the intervention package for individuals with autism who display intense problem behaviors.

21. It is important to note as many of our clients use them.

22. Anecdotally, the vast majority of my cases have included students on psychotropic medication(s).

23. Since working with the adult population it has become very apparent that the task list can be quite confining and there is a lot more I need to know to ensure I am doing the best job I can. Need to know more about medication, disability theory etc.
24. Psychotropic medications are commonly prescribed to the individuals I work with. This effects their behavior. It should be a requirement to have some background on the effects, side effects, and uses for these medicines.

25. Because in the field most clients are taking medications and being aware of what the medications are used to treat and how they might impact our clients behavior is important.

26. I feel it is important to have a foundation of knowledge about psychotropic medication so we know how they might affect our clients behavior and what information to pass along to the physician.

27. An important component of changing behavior

28. Important to support clients

29. Since I work with young children and heavily focus on their verbal behavior, I typically don’t work with clients who takes medication. However, I feel that we (meaning my cohorts who completed the BCBA coursework with me) are not prepared to work with clients who take medication. Rarely are we prepared and educated, and that is concerning as it may hinder our abilities to provide the best services to our clients.

30. There are a large number of children with autism being prescribed medications. We should be familiar with all aspects as we treat as well and understand side effects and how this can alter our treatment and data collection.

31. As majority of the clinical population will be prescribed psychotropic medication at some point in their life span, a basic knowledge about these medications should be part of the training, akin to the training received by psychologists.
32. Psychotropic drugs are widely used and are a factor a behavior analyst needs to consider when developing programs. We should have some knowledge about the different groups of drugs and their effects.

33. Many children are prescribed medications and may experience side effects that influence their behavior.

34. So many of our clients are on these meds we should have a basic understanding of how they work.

35. "Because psychotropics would seem to impact the majority of clients accessing behavior analytic services (ie. DD and autism). Service providers would do well to have basic information that can support effective decision making in treatment."

I think it should be a consideration for the BACB to develop supplemental tracks to address areas of specialization (DD& autism, education, geriatrics, OBM, sustainability, animal behavior) as people working in these sub areas grow."

36. Medications have a real impact on behavior and much of this population are taking medication

37. So we can better understand how these medications might effect treatment and behaviors.

38. I feel that psychotropic medications can play a significant role in the behaviors of individuals. As such, we should be able to evaluate the effects of psychotropic medications on the behaviors of our clients.
39. Many of our clients are taking medications and it would be beneficial to have information about the drugs and their effects.

40. BCBAs, BCaBAs, and RBTs frequently work with individuals who are prescribed psychotropic medications. Medications are an important environmental variable to take into account when evaluating goals and treatments.

41. Since many clients diagnosed with Autism are taking medication, this should at least be addressed to some extent through the coursework.

42. Since so many of our clients are prescribed it, I believe it would be best to know how it can affect their behavior.

43. Psychotropic medications are a setting event that should be considered when creating and implementing all treatment plans.

44. Understanding the side effects of psychotropic medications will help us assess motivation, putative reinforcers and performance better.

45. It SHOULD be a part of coursework as it directly impacts behavior, which is what our entire plan revolves around.

46. Medication directly effects how people behave.

47. Yes because medication has an effect on behavior and it is important to know which intervention/variables are having a positive or negative effect.

48. The effects of medications on behavior needs to be taken into consideration if one is considering a behavior analytic treatment.

49. It would help to take other factors into consideration when looking at behaviors and confounding variables.
50. A high amount of individuals who receive ABA services also take psychotropic medications, and understanding the effects of the medications would allow BCBAs to determine if the medication is having the desired effect or to assist in tracking if adverse effects are occurring.

51. Many of the individuals that BCBAs work with are prescribed psychotropic medication. In order to fully understand behavior, we must look at all variables. This includes medications.

If your answer was “yes,” what would allow you to play a larger and more valuable role?

1. Direct communication with prescribing practitioner, rather than through the parents.

2. More opportunities to collaborate with a prescribing physician. They're hard to get a hold of and collaborate with. I would love to share client data trends to inform that physician's decision making.

3. Currently, my role is consultative oversight. So I could be more directly involved. However, when I was working directly with clients, I would request that a baseline be taken for behaviors targeted, side effects expected (that could be determined behaviorally), and for a rating scale to be completed by parents and at least one blinded individual (teacher, day care provider, etc) to evaluate effects on both. I would evaluate the data and graph it and provide it to the prescriber and behavior team with parent permission. This was done when I was informed in advance of the doctor visit and purpose (reduce aggression, reduce anxiety, SIB, attention, etc).
4. Provide data to inform prescribing physicians on efficacy of psychotropic medications in reduction of challenging behavior.

5. More collaboration with physicians, and better communication.

6. More information, and more opportunity to collaborate with physicians.

7. Understanding what action steps I can take to gain a seat at the table beyond simply asking the parent or guardian to be included in the discussion.

8. If I could collaborate with physicians who prescribe the medications by showing them direct data of problem behaviors when they prescribe medications.

9. Knowing if/when medications are taken on a daily basis and referring back to notes.

10. It would be nice to work with the client’s prescribing physician to track if the medications are benefiting our clients.

11. Better communication with medical professionals.

12. A partnership with the prescribing doctor would be more beneficial. Currently, at my clinic, there is no partnership and kids are prescribed medication without insight from their BCBA.

13. I would continue to ask parents about drugs being used and any changes.

14. Coordination with the doctor and parent, along with data.

15. I worked in a school as a teacher and behaviorist. We would meet once every two weeks with a multidisciplinary team which included speech behavior psychiatrist and psychologist and the directors. As we would discuss our current students the psychiatrist would inform us of any medication changes and we would inform him of
any behavior any changes I found it super helpful to learn some of the effects of these medications on our students.

16. Helping psychiatrists, doctors, and other prescribers to determine the effects of medications on behavior through use of quantitative measures.

17. it would help us work better with physicians and medical practitioners

18. working in collaboration with the prescribing doctor to ensure data is being collected for the intended effects of the behaviors.

19. We collect, graph and show our psych ALL behavior data and is it very valuable. She has become part of our practice which has helped with filling the gap of "inaccurate parent/school reports" such as "he has been out of control at home" but behavior decreased x amount at the clinic... this is nice to show parents, that it is a behavioral thing and med increase is not needed vs in the past, where they would just keep increasing meds.

20. "* Since we record data, continuously, we are in a position to comment about the effects (increase, decrease or no change) a medication makes.

- This might be helpful in saving time, money, effort if something is not working out.
- It will be such a huge game changer if the physician and the ABA specialist could work together. It could also mean that ABA specialists are looked upon with more respect and dignity, which is a great thing for our community.
- Both these professions can learn from each other as well. "
21. First of all knowing when my clients are taking medication and when changes are made. Secondly, knowing the intended effects of the medication as well as the side effects to determine if they are working properly and to the maximum benefit for the clients.

22. Supplying information from the school or home to the physician making medicinal decisions

23. Collaboration with provider

24. The level of input I have on any certain case, is really dependent on the Psychiatrists understanding of behavior, autism and the overall data. In addition, the type of working relationship I have with the Psychiatrist also effects their willingness to discuss their medication plan. I think if I had an additional certification in behavior and psychotropic medication or something to that degree, I would be more respected.

25. better understanding how they work and more collaboration

26. Tracking the behavior(s) associated with the targeted medical affects, as well as the possible side effects, could be very valuable to a client's overall health and wellbeing as well as their ABA programming.

27. Tracking different conditions

28. BCBAs often oversee many problem behaviors that clients may be receiving drugs. As BCBAs we a data driven and take data on theses behaviors. This data could be used to asses the effects of the medications.

29. Being able to use behavior data and support the use of certain medications.
30. By collecting objective data, we are able to provide data needed to understand the effect, side-effect, or no-effect of the medication and its correct dose.

31. It would be beneficial to analyze data to determine increase, decrease, or a display of new behavior with the addition, subtraction or change in meds. Often, it is mentioned on the graph that there is a med change and that is often it.

32. I feel that I could analyze the possible effects of psychotropic medications on the behaviors of my clients. Additionally, we could provide data on the effects of psychotropic medication on the behavior of my clients.

33. Knowing when medications are changing even from a different brand to a different dosage allows us to put in a phase change line in data we may have already been tracking to aid as a tool for parents or other clinicians.

34. By measuring the intended effects and tracking possible side effects of the drugs being given.

35. Ensuring data is taken on when medication is delivered and at what time.

36. Include dosage taken on behavioral data

37. Measurement

38. I think the best role I can play is sharing the behavior data to help identify correlations alongside the psych or doctor who prescribes it.

39. Take data on medication effects.

40. I would be able to directly measure and report on specific behaviors which are the ultimate desired result of the prescribed medication. Data analysis and data collection
systems would be designed by the BCBA (me) and would allow for the most beneficial assessment of the medication.

41. Training- I have received none. I would like to know what is out there, benefits/risks of different medications

42. Identifying the effects of the medication on the client could help determine if certain medications are creating more issues or hindering progress with side effects.

43. Getting information from the doctor and parents to learn the intended benefit and being able to assist in that.

44. More knowledge and experience with clients who take psychotropic medication.

45. I am not entirely sure; perhaps more education and/or credentials.

46. We can always learn and do better. Learning more about psychotropic medications and tracking more specific data would be beneficial.

47. Certifications and mandatory trainings on the positive effects and side effects of such medications.

48. Being better versed in psychotropic medications by better understanding their uses, side effects, and intended outcomes.

49. If I had more knowledge on their medication and changes and had information to give parents, caregivers, or doctors. I could provide data to support medication changes or effects.

50. More knowledge of risks, side effects, etc.
51. Better understanding of the medications, intended purposes and possible side effects could help establish a more cohesive relationship between families, doctors, private therapists, and the school team.

52. I want to have enough info that I can have an educated conversation with and know what to look for in terms of side effects.

53. Becoming better educated on psychotropic drugs.

54. With a greater knowledge base of behavioural pharmacology, I would be more confident in identifying how medication is meant to target behavioural symptoms. I would play a more active role in reducing the use of "as needed" or PRN medication and presenting lesser intrusive interventions as a replacement. This is a current focus of my work: identifying the effectiveness of PRN usage in order to help reduce the frequency and replace with improved antecedent strategies.

55. If I had more knowledge it would allow me to have those conversations with the psychiatrist. I think it would help an MDT approach.

56. Insurance guidelines allowing data on side effects and not just problematic behavior and limited replacement behaviors/skills