RESEARCH ARTICLE





Board Certified Behavior Analysts and Psychotropic Medications: Slipshod Training, Inconsistent Involvement, and Reason for Hope

Anita Li¹ · Alan Poling^{1,2}

Published online: 23 February 2018 © Association for Behavior Analysis International 2018

Abstract

People with autism spectrum disorder often receive psychotropic medications and two drugs, risperidone and aripiprazole, are approved for treating "irritability" in this population. A number of authors have suggested that behavior analysts can contribute to the prudent use of such drugs, but little is known regarding Board Certified Behavior Analysts' involvement in practices relevant to the use of psychotropic drugs. We e-mailed Board Certified Behavior Analysts an anonymous web-based survey regarding such practices. A majority of respondents work with individuals with autism spectrum disorder who take at least one psychotropic medication but respondents' training relevant to psychotropic medications is inconsistent. Many report that their training is inadequate, they do not regularly work as part of interdisciplinary teams concerned with medication, and behavior-analytic interventions are not typically evaluated before drugs are prescribed. Nonetheless, the majority of respondents reported that medications sometimes produce beneficial effects. Those involved in training behavior analysts should consider the competencies needed for graduates to work effectively as members of teams concerned with the optimal use of medications and how to foster and assess those competencies. Behavior analysts should also work to develop and implement strategies that foster collaboration with psychiatrists and other physicians.

- Psychotropic drugs are often prescribed for people with autism, and both risperidone and aripiprazole are approved for reducing "irritability," which comprises self-injury, aggression, tantrums, and other challenging responses.
- Respondents are not consistently involved in monitoring the effects of psychotropic drugs, which are often administered prior to evaluating an alternative, less restrictive, intervention.
- Respondents are not trained consistently with respect to matters relevant to psychotropic drugs, and many apparently are not trained adequately.
- People involved in training behavior analysts should consider the competencies needed for graduates to work effectively as members of teams concerned with the optimal use of medications and how to foster and assess those competencies.
- Behavior analysts should also work to develop and implement strategies that foster collaboration with psychiatrists and other physicians.

Keywords Autism · Psychotropic medication · Survey · Medication monitoring

Psychotropic drugs are commonly prescribed in attempts to reduce challenging behaviors in people with autism spectrum disorder (ASD). Although prevalence rates differ substantially across studies (Poling, Ehrhardt, & Li, 2017), most report that

Alan Poling alan.poling@wmich.edu

¹ Western Michigan University, Kalamazoo, MI, USA

approximately 40–50% of sampled individuals were receiving or had received at least one psychotropic medication (e.g., Goin-Kochel, Myers, & Mackintosh, 2007; Logan et al., 2015; Sheehan et al., 2015; Williams et al., 2012). No medication is currently approved by the United States Food and Drug Administration (FDA) for treating the defining behavioral features (i.e., "core symptoms") of autism, but two drugs, risperidone (Risperdal[®]) and aripiprazole (Abilify[®]), are FDA-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,

² Department of Psychology, Western Michigan University, Kalamazoo, MI 49008, USA

self-injury, aggression directed towards others, and property destruction. The Aberrant Behavior Checklist (Aman, Singh, Stewart, & Field, 1985), a symptom checklist that is completed by a caregiver, is a widely used measure of "irritability." The "Community" version of the checklist, comprising 58 items, is used in most studies.

The widespread use of psychotropic medications, in both people with ASD and in other populations, is relevant to the discipline of applied behavior analysis (ABA) in at least three ways (Weeden, Ehrhardt, & Poling, 2010a). First, some behavior analysts are highly critical of the use of psychotropic drugs (e.g., Flora, 2007), while others are more accepting (e.g., Thompson, 2007). Second, the research methods characteristic of ABA, including the use of small-N, within-subject designs and direct, repeated measures of target behaviors, functional assessment of target behaviors, and social validation are of clear value in clinical psychopharmacology (for reviews see Poling, Ehrhardt, Wood, & Bowerman, 2010; Poling et al., 2017; van Haaren & Weeden, 2013), although they are not generally accepted by the FDA or the medical profession. Third, the strategies that applied behavior analysts use in the everyday evaluation of their interventions (which are similar to those used in their research, albeit less rigorous) are often appropriate for the everyday evaluation of psychotropic medications (Poling & Ehrhardt, 1999; Poling et al., 2010).

Clearly, behavior analysts can be valuable members of treatment and research teams concerned with the effects of psychotropic medications in people with ASD or other clinical conditions. Both Brodhead (2015) and Newhouse-Oisten, Peck, Conway, and Frieder (2017) recently proposed strategies to ensure that interdisciplinary teams which include behavior analysts function effectively. Unfortunately, neither these nor other authors who have argued that behavior analysts can play a valuable use in the appropriate use of psychotropic drugs, including us (e.g., Poling et al., 2017; Weeden et al., 2010a), have considered the specific skills that behavior analysts need to participate meaningfully in treatment teams, the best way to establish those skills, and the ubiquity of such skills in BCBA practitioners. These topics are highly worthy of discussion, and some of the questions in the survey we conducted are relevant to them. The purpose of our survey was to obtain information regarding the role that practitioners who serve clients with ASD actually play in evaluating drug effects, the role they believe they should play in assessing drug effects, and their background regarding psychotropic medications.

Methods

An electronic survey was sent via the Behavior Analyst Certification Board e-mail campaign to Board Certified Behavior Analysts of all levels (BCaBA, BCBA, BCBA-D). The e-mail list contained 17,780 names. Of them, 2842 received the survey, and 253 (8.9%) completed it. These data were provided by the BACB e-mail service. The reported data are based on the responses of the 253 people who completed the survey. Data were summarized for all respondents who completed the last question of the survey; not all questions were completed by all respondents, but all questions were completed by 90.12% of respondents. The remaining respondents completed all of the Likert-scale questions and their data are included for these questions.

We prepared a brief questionnaire, hosted by Qualtrics, comprising 7 demographic questions and 21 content questions. Questions and choice options are shown in Tables 1, 2, 3, and 4. Content questions focused on the practitioner's training and knowledge regarding psychotropic drugs, how they were involved in evaluating the effects of psychotropic medications, and how they viewed the role of behavior analysts in evaluating medications. Eleven items were five-choice Likert-scale questions, with "always" and "never" as endpoints. Eight other items were forced-choice questions with five options.

Three items asked open-ended questions as follow-ups to specific answer choices. A thematic analysis was used to isolate major recurring themes in the responses to those questions. 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,

Table 1 Respondent characteristics \$\$\$	Characteristic	Percentage		
	Gender			
	Female	76.36		
	Male	22.09		
	Other/prefer not to say	1.55		
	Highest degree earned			
	Bachelors	2.33		
	Masters	78.68		
	Doctorate	18.99		
	Current certification level			
	BCaBA	3.92		
	BCBA	80.39		
	BCBA-D	15.69		
	Location			
	The USA	89.19		
	Outside of the USA	10.81		
	Years of experience			
	0-5 years	26.74		
	6-10 years	29.07		
	11-15 years	20.16		
	16-20 years	8.53		
	Over 20 years	15.50		

Table 2Clients'demographics questions

Responses	Percentage		
Do you provide services for diagnosed with ASD?	people		
Yes	95.74		
No	4.26		
Age groups serviced			
0-5 years	72.16		
6-13 years	86.27		
14-18 years	71.76		
19-26 years	53.33		
27-54 years	30.20		
55+ years	20.78		
Primary work setting			
Public or private school	50.59		
Center or clinic	38.82		
In-home	56.86		
Hospital	3.92		
Residential facility	21.96		
College or university	5.49		
Other	5.49		
What percentage of your cli currently taking psychotr medications?	ents are opic		
0%	2.51		
1–25%	26.36		
26–50%	23.85		
51-75%	20.50		
76–100%	18.83		
Do not know	7.95		

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 82 of the 407 written responses (20.1%), selected at random. The ratings of the two individuals agreed for 90.24% of the responses (74 of 82). The two raters reached a consensus regarding the eight responses that were initially evaluated differently and the consensus rating is reported.

Results

Demographic information for respondents appears in Table 1 and information for clients served by respondents appears in Table 2. The majority of respondents were female BCBAs holding a master's degree and residing in the USA. Most respondents primarily provided services to individuals diagnosed with ASD (95.74%) in in-home settings (56.86%), public or private schools (50.59%), and centers or clinics (38.82%). Most respondents provided services to clients aged 0 to 5 (72.16%), 6

 Table 3
 Respondents' training and knowledge regarding medications questions

Responses	Percentage
What training did you receive regarding the uses and effec psychotropic medication?	ts of
Self-study	52.84
Workshop	27.51
Class (in my degree program)	37.55
Class (outside my degree program)	20.09
Other	20.52
None	13.54
How adequate is your knowledge of uses and effects of ps medications that your clients receive?	ychotropic
Extremely adequate	15.42
Somewhat adequate	42.73
Neither adequate nor inadequate	17.18
Somewhat inadequate	16.74
Extremely inadequate	7.93
Source of information provided to prescribing physicians r behavioral effects of psychotropic medication	regarding
Anecdotal observation	34.75
Direct measures of target response	74.58
Checklist or rating scales	18.22
Self-report by client	13.14
Self-report by parents, teachers, or other care-providers	40.25
School or institutional records	15.25
Other	2.56
I do not provide such information	19.07
How do determine what adverse effects to track?	
Based on parent concern	71.10
Based on client concern	28.44
Based on direct observations	73.39
Based on physician input	39.45
Based on published research articles	22.02
Based on internet or textbooks	14.68
Based on side effects reported on drug package labels	44.50
Other	10.09

to 13 years (86.27%), 14 to 18 (71.76%), and 19 to 26 years (53.33%). (Note that totals can sum to more than 100% because respondents can serve more than one age group).

Although our initial plan was to statistically analyze data as a function of respondent characteristics (e.g., degree held, level of certification, age of clients, years of experience), there were too few respondents in many categories to make such an analysis meaningful. The problem of small Ns within data cells was exacerbated because some questions permitted multiple response options (e.g., a respondent could work with two or more age groups or receive training in multiple ways), which substantially increased the number of respondent categories that must be considered. Finally, there is disagreement

Table 4 Current practices and opinions regarding psychotropic medications questions

Question	Always (%)	Very often (%)	Sometimes (%)	Rarely (%)	Never (%)
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?	21.10	39.66	29.54	8.02	1.69
How often do you know the intended effects of the psychotropic medication your clients are receiving?	27.31	33.61	28.57	7.98	2.52
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?	5.88	14.29	8.82	31.09	39.92
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?	17.72	27.85	26.58	16.46	11.39
How often are behavioral data reflecting the intended effects of psychotropic medications used by the prescribing physician in making treatment decisions regarding your clients?	7.59	18.57	15.61	38.40	19.83
How often are you involved in measuring possible adverse effects (i.e., side effects) of the psychotropic medications that your clients receive?	7.30	13.73	35.62	24.46	18.88
How often are you involved in socially validating the goals, procedures, and results of psychotropic medication treatments arranged for your clients?	6.41	13.68	20.94	28.63	30.34
How often are your clients served by an interdisciplinary team that includes you and deals with issues directly related to the use of psychotropic medications?	11.01	22.47	18.94	28.19	19.38
When your clients receive psychotropic medications, how often do they derive significant therapeutic benefit from those drugs?	0.45	22.07	64.86	10.36	2.25
How often should a behavior-analytic intervention be evaluated prior to using a psychotropic medication to address a behavioral issue (e.g., temper tantrums, short attention span)?	50.89	43.30	5.80	0.00	0.00
When your clients are considered, how often is a behavior-analytic intervention evaluated prior to using a psychotropic medication to address a behavioral issue (e.g., temper tantrums, short attention span)?	10.27	29.02	29.46	25.45	5.80

among statisticians as to how ordinal data, like those obtained with our Likert-scale questions, should be statistically analyzed, and some contest that parametric statistics are inappropriate (e.g., Agresti, 2010; Allen & Seaman, 2007). Given these considerations, few comparisons of findings across respondent categories, or statistical analyses, are reported.

When asked "what percentage of your clients are currently taking psychotropic medications," 2.51% of respondents indicated 0% of current clients and 7.95% indicated that they did not know. A similar percentage of respondents indicated that 1-25% (26.36%), 26–50 (23.85%), 51–75% (20.50%), and 76–100% (18.83%) of their clients are currently taking psychotropic medications.

Responses to questions concerning respondents' training and knowledge regarding psychotropic medications shown in Table 3. Approximately half (52.84%) of the respondents indicated their training regarding psychotropic medication was primarily through self-study or through a class (57.64% when classes within and outside degree programs are combined), and 13.54% reported having no relevant training. A majority of respondents (58.15%) indicated that their knowledge of the uses and effects of psychotropic medications was somewhat or completely adequate. A slightly lower percentage of BCBAs (55.56%) than BCBA-Ds (78.79%) reported that their knowledge was somewhat or completely adequate; chi-square analysis indicated that this difference was not significant at the p < .05 level (×² = 1.75, p = 0.19). Only 7.93% of respondents rated their knowledge as extremely inadequate.

The most frequently reported sources of information given to prescribing physicians regarding the behavioral effects of medication were direct measures of behavior (74.58%) and anecdotal information provided by caretakers or other professionals (34.75%). Behavior analysts selected adverse effects to track based on parent concerns (71.10%), direct observations of potentially adverse effects (73.39%), and effects reported on drug package labels (44.50%).

Table 4 summarizes responses to question concerned with current practices and opinions regarding psychotropic medications. Most (60.76%) of the respondents always or very often know the specific psychotropic medications their clients are taking and when drugs or doses are changed; only 9.71% rarely or never do so. Moreover, most (70.92% of) respondents know the intended effects of the medication their clients receive. Nonetheless, only 20.17% of them always or very often work directly with the prescribing physician to develop strategies for measuring the intended effects. A substantially larger percentage (45.57%) work directly with people other than the prescribing physician to develop such measures.

According to over half of the respondents (58.23%), behavioral data reflecting the intended effects of psychotropic medications are rarely or never used by the prescribing physician in making treatment decisions. About a quarter of respondents (26.16%) reported, however, that the prescribing physician always or very often uses such data. A substantially higher percentage of BCBAs (59.59%) that BCBA-Ds (39.39%) reported that physicians rarely or never used such data; chi-square analysis revealed that this difference was not significant at the 0.05 level ($\times^2 = 1.75$, p = 0.19). There was a smaller difference in the percentage of BCBAs (25.91%) and BCBA-Ds (36.36%) who reported that they always or very often do so, and this difference was not statistically significant at the .05 level ($\times^2 = 1.15$, p = 0.28). When asked "how often are you involved in measuring possible adverse effects of medications," 26.03% of respondents indicated "always" or "very often." A slightly larger percentage of respondents (33.48%) indicated that their clients were always or very often served by an interdisciplinary team of which the behavior analyst is a member and issues related to psychotropic drugs are directly addressed.

Most respondents (64.86%) reported that their clients sometimes derive significant benefit from psychotropic drugs. Few indicated that their clients always (0.45%) or never (2.25%) do so. A large majority of respondents (94.19%) indicated that a behavior-analytic intervention should be evaluated prior to using a drug to address a behavioral issue. But only 39.29% indicated that such an intervention was always or very often evaluated prior to medication use.

When asked "could you play a larger and more valuable role in ensuring psychotropic drugs are used to maximally benefit your client," 81.45% of respondents answered "yes." Respondents who answered "yes" were invited to answer an open-ended question that asked "what would allow you to play a larger and more valuable role?" A total of 168 people wrote a response. Of them, 30 were BCBA-Ds and 128 were BCBAs. The thematic analysis yielded three major themes in responses to this and the other two open-ended questions. One theme generally related to the importance of data, the second to the importance of collaboration, and the third to the appropriate training of behavior analysts. Overall, 55.35% of respondents who answered "yes" when asked if they could play a larger role indicated that increased opportunities to collaborate (typically with physicians) would allow them to do so. Sixty percent of BCBA-D respondents and 57.03% of BCBA respondents did so. Slightly fewer, 42.86%, reported that collecting and using better measurement systems (typically involving direct observations of behavior) would suffice, and substantially fewer, 20.83%, noted that better training would be sufficient. (Note that percentages can sum to over 100% because two or more themes could be evident in a single answer).

In all, 91.06% of participants indicated that behavior analysts should be routinely involved in monitoring of drug effects on their clients. Respondents who so indicated were invited to answer an open-ended question that read "why should [behavior analysts] be involved?" A total of 200 responses were provided. The majority of responses (73%) indicated that the primary value of involving behavior analysts was their skill in collecting data and behavioral observations. Substantially fewer, 27%, indicated that collaboration between behavior analysts and physicians was necessary for drugs to be used effectively.

Respondents were asked, "is it outside the realm of the competency of applied behavior analysts, and hence ethically inappropriate, for them to be involved in evaluating medication effects." Most (69.40%) of the respondents answered "no." Only 6.03% answered "yes," and 18.10% answered "other." The 38 respondents who answered "other" were asked to "please describe [the reason for their response]." The most common answer, provided by 57.89% of respondents, was that behavior analysts should be involved in collecting data relevant to clinical decision making, but not in making treatment decisions. Similarly, 50% emphasized that behavior analysts should simply consult with other people.

Discussion

Before discussing the results of this survey, it is important to emphasize that they are limited in three regards. First, the present data are self-reported, with the potential weaknesses inherent to such data (Barlow & Hersen, 1984, pp. 132-134). Second, the sample is rather small and may not be representative of the population of interest (i.e., all BCBAs). For instance, 7.5% of all certified behavior analysts are BCBA-Ds and 9.5% are BCaBAs (BACB, 2012). BCBA-Ds accounted for 15.69% of our respondents and BCaBAs for 3.92%. Third, the response rate is low. According to the organization that emailed the survey, 2842 BCBAs received the survey. Only 253 completed it, and it cannot be assumed that these individuals are representative of the population of BCBAs. It is, for example, possible that respondents are especially interested in the survey's subject matter (i.e., psychotropic medications) and hence different from most BCBAs (Martella, Nelson, & Marchand-Martella, 1999). Although this possibility cannot be ruled out, it is interesting that the return rate in the present study is similar to that obtained in prior published studies that used the same or a very similar recruitment strategy and dealt with other topics (382 responses in DiGennaro Reed & Henley, 2015; 284 responses in Dixon, Reed, & Smith,

2013; 205 responses in Roscoe, Phillips, Kelly, Farber, & Dube, 2015). On-line surveys yield relatively low response rates (Van Horn, Green, & Martinussen, 2008) due to a variety of factors, such as e-mails not being received or being automatically marked as spam (Dillman, 2000). The extent to which these factors influenced the response rate in the present survey is unknown, but it does appear prudent for future researchers to use an alternative strategy.

Although there is substantial variability in respondents' answers to most of the questions, there is sufficient consistency to support five points. One is that nearly all of the respondents provide services for clients with ASD who receive psychotropic medications, although the reported percentage of medicated clients differed widely across clients. These findings are unsurprising given that the overall prevalence of psychotropic drug use in this population is relatively high (e.g., Goin-Kochel et al., 2007; Logan et al., 2015; Sheehan et al., 2015; Williams et al., 2012), but differed from 19.5 to 65% in published studies (Poling et al., 2017).

A second point is that respondents gained information about psychotropic medications in a number of ways, and fewer than 40% did so by taking a class as part of their degree program. Interestingly, there was very little difference in the percentage of BCBAs (38.73%) and BCBA-Ds (32.35%) who gained information by taking a class. Chi-square analysis revealed that this difference was not significant at the p < .05 level ($\times^2 = 1.23$, p = 0.27). A slight majority of respondents indicated that their knowledge of the uses and effects of psychotropic medications was somewhat or extremely adequate, but neither the present data nor any other data provide evidence of whether or not behavior analysts typically have the competencies necessary to serve effectively on interdisciplinary teams concerned with psychotropic medications. In fact, those competencies have, to our knowledge, not even been specified. The Behavior Analysis Certification Board Task List (2012) makes no mention of psychotropic drugs or any other topic uniquely related to clinical psychopharmacology and it appears that many, probably most, BCBA training programs largely ignore the subject. The lack of systematic, required training is clearly evident in the answers of our respondents, who reported that they were trained in a variety of ways, most often through self-study. Unsurprisingly, only six in ten reported that their knowledge of psychotropic drugs was somewhat or completely adequate.

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, which will require modification of current educational and assessment strategies. Interestingly, 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, so there may be some enthusiasm for broadening the scope of behavior analysts' training (Blydenburg & Diller, 2016).

If behavior analysis is to fulfill its promise as a contributor to the rational, effective use of psychotropic drugs, then those involved in training and certification must think carefully about how students should be trained and assessed and how they can more readily serve on interdisciplinary teams. One possibility is to combine training in a behavior analysis program with conventional medical education. It might, for instance, be tenable to have students jointly educated in a physician's assistant or nurse practitioner program and in a behavior analysis program. Grant funding should be available to establish such a model program, which might well serve as an initial and invaluable bridge between medicine and our discipline. Specifically training behavior analyst students to work productively as members of inter- and multidisciplinary teams that include medical doctors is also likely to bear fruit.

Third, a majority of respondents indicated that their clients sometimes derive significant benefit from psychotropic medications. This outcome is consistent with research findings, summarized in several reviews (e.g., Elbe & Lalani, 2012; Mohiuddin & Ghaziuddin, 2013; Siegel & Beaulieu, 2012), indicating that antipsychotic medications often reduce undesired behaviors in people with autism and, although the evidence is less strong, other drugs classes also can produce beneficial effects.

Of course, behavior-analytic interventions are also often effective in reducing undesired behaviors in people with autism, as well as in increasing desired responding (National Professional Development Center on Autism Spectrum Disorder, 2017; Wong et al., 2015). Direct comparisons of behavior-analytic and pharmacological treatments are very rare. For example, no study has directly compared the effects of risperidone and a behavior-analytic treatment on irritability (Weeden et al., 2010a).

It is the case, however, that risperidone can produce a range of adverse effects and this is true of all psychotropic medications (e.g., McQuire, Hassiotis, Harrison, & Pilling, 2015). Most behavior-analytic intervention rarely if ever produces significant side effects, although there are clear exceptions. Putting those exceptions aside, behavioranalytic interventions can accurately be viewed as less restrictive interventions than psychotropic drugs. One of the fundamental precepts of bioethics is "first, do no harm" (in Latin, "primum non noiere"). With this precept in mind, the fourth noteworthy point supported by our findings is that only four in ten respondents reported a behavioranalytic intervention was always or very often evaluated in their clients prior to medication use. In contrast, nine in ten indicated that this should occur.

Physicians, of course, are not in the business of arranging behavior-analytic interventions. Rather, they are trained to use psychotropic drugs to deal with behavioral challenges, and in so doing, they are operating within the ethical and legal boundaries of their discipline and are offering what is often the only tenable treatment option given their training and the limited time they have to spend with individual clients. It is natural and appropriate for a physician who is asked to help in improving someone's behavior to prescribe a psychotropic drug, regardless of whether or not that person is diagnosed with autism. In so doing, they are using tools that are both

familiar and arguably the best at their disposal. Unfortunately, the empirical justification for using those tools is often weak. For example, people with ASD sometimes receive risperidone in combination with another drug with the goal of reducing undesired behavior, but a recent review of the literature finds that there is a dearth of published studies to support this practice (Li, MacNeill, Curiel, & Poling, 2017). Moreover, even when there is compelling evidence that a drug is generally, not all treated individuals respond favorably to it. This is, for example, true with respect to the effects of risperidone on irritability (e.g., Elbe & Lalani, 2012; McCracken et al., 2002). Regardless of whether an intervention is or is not evidence-based, or is or is not pharmacological, sound clinical practice comprises three components (Poling, 1994). First, the goals of the treatment must be clear and in the client's best interest. Second, the effects of effects of the treatment must be assessed in a manner that is adequate to determine whether those goals are attained. Third, decisions regarding continuation and modification of treatment must be based on its actual effects.

Behavior analysts are, of course, committed to this model of clinical practice and trained to be expert in its use. For that reason, as many respondents pointed out and several authors have suggested (e.g., Newhouse-Oisten et al., 2017; Valdovinos, Nelson, Kuhle, & Dierks, 2009; Weeden, Ehrhardt, & Poling, 2010b), they could potentially plan a valuable role in interdisciplinary teams committed to the best possible use of psychotropic medications. Unfortunately, few respondents function as members of such teams. This is the fifth point supported by the present findings.

It appears that cost is one reason why interdisciplinary teams that include a behavior analyst are not typically in place when psychotropic drugs are prescribed for people with autism. Who would pay for such teams? Professional prerogatives and precedents are another. Only properly licensed professional can administer psychotropic drugs, and for the most part those individuals are physicians. Historically, behavior analysts and physicians have not worked together. There are, however, some exceptions, and a few respondents indicated that they were a part of them. Describing the success of such joint efforts at conferences attended by physicians, and in journals regularly read by physicians, is another potential strategy for increasing interdisciplinary teaming.

Compliance with Ethical Standards

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

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest The authors declare that they have no conflict of interest.

References

- Agresti, A. (2010). Analysis of ordinal categorical data. Noboken, NJ: Wiley.
- Allen, I. E., & Seaman, C. (2007). Likert scales and data analysis. *Quality Progress*, 40(7), 64–65.
- Aman, M. G., Singh, N. N., Stewart, A. W., & Field, C. J. (1985). The aberrant behavior checklist: a behavior rating scale for assessment of treatment effects. *American Journal of Mental Deficiency*, 89, 485–491.
- Barlow, D. H., & Hersen, M. (1984). *Single case experimental designs*. New York: Pergamon Press.
- Behavior Analysis Certification Board. (2012). Fourth edition task list. Downloaded from http://bacb.com/wp-content/uploads/2016/03/ 160101-BCBA-BCaBAtask-list-fourth-edition-english.pdf
- Blydenburg, D. A., & Diller, J. W. (2016). Evaluating components of behavior-analytic training programs. *Behavior Analysis in Practice*, 9, 179–183.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3, 77–101.
- Brodhead, M. T. (2015). Maintaining professional relationships in an interdisciplinary setting: strategies for navigating the nonbehavioral treatment recommendations for individuals with autism. *Behavior Analysis in Practice*, 8(1), 70–79.
- DiGennaro Reed, F. D., & Henley, A. J. (2015). A survey of staff training and performance management practices: the good, the bad, and the ugly. *Behavior Analysis in Practice*, 8(1), 16–26.
- Dillman, D. A. (2000). Mail and internet surveys: the tailored design method. New York: John Wiley.
- Dixon, M. R., Reed, D., & Smith, T. (2013). From the eyes of the front line: BCBAs evaluate BAP. *Behavior Analysis in Practice*, 6(1), 4–14.
- Elbe, D., & Lalani, Z. (2012). Review of the pharmacotherapy of irritability of autism. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, *21*(2), 130–146.
- Flora, R. (2007). Taking America off drugs: why behavior therapy is more effective for treating ADHD, OCD, depression and other psychological problems. Albany, NY: State University of New York Press.
- Goin-Kochel, R. P., Myers, B. J., & Mackintosh, V. H. (2007). Parental reports on the use of treatments and therapies for children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 1(3), 195–209.
- Li, A., MacNeill, B., Curiel, H., & Poling, A. D. (2017). Prescribing risperidone or aripiprazole with other psychotropic drugs: a literature review. *Experimental and Clinical Psychopharmacology*, 25(5), 434–439.
- Logan, S. L., Carpenter, L., Leslie, R. S., Garrett-Mayer, E., Hunt, K. J., Charles, J., & Nicholas, J. S. (2015). Aberrant behaviors and cooccurring conditions as predictors of psychotropic polypharmacy

among children with autism spectrum disorders. *Journal of Child* and Adolescent Psychopharmacology, 25(4), 323–336.

- Martella, R. C., Nelson, R., & Marchand-Martella, N. E. (1999). *Research methods: learning to become a critical research consumer*. Needham Heights, MA: Allyn & Bacon.
- McCracken, J. T., McGough, J., Shah, B., Cronin, P., Hong, D., et al. (2002). Risperidone in children with autism and serious behavioral problems. *New England Journal of Medicine*, 347, 314–321.
- McQuire, C., Hassiotis, A., Harrison, B., & Pilling, S. (2015). Pharmacological interventions for challenging behaviour in children with intellectual disorders: a systematic review and meta-analysis. *BMC Psychiatry*, 15, 303.
- Mohiuddin, S., & Ghaziuddin, M. (2013). Psychopharmacology of autism spectrum disorders: a selective review. Autism, 17(6), 645–654.
- National Professional Development Center on Autism Spectrum Disorder. (2017). *Evidence-based practices*. Accessed June 8, 2017 at http://autismpdc.fpg.unc.edu/evidence-based-practices.
- Newhouse-Oisten, M. K., Peck, M. K., Conway, A. A., & Frieder, J. E. (2017). Ethical considerations for interdisciplinary collaboration with prescribing professionals. *Behavior Analysis in Practice*, 10(2), 145–153.
- Poling, A. (1994). Pharmacological treatment of behavioral problems in people with mental retardation: some ethical considerations. In L. J. Hayes, G. J. Hayes, S. C. Moore, & P. M. Ghezzi (Eds.), *Ethical issues in developmental disabilities* (pp. 149–177). Reno, NV: Context Press.
- Poling, A., & Ehrhardt, K. (1999). Applied behavior analysis, social validation, and the psychopharmacology of mental retardation. *Mental Retardation and Developmental Disabilities Research Reviews*, 5, 342–347.
- Poling, A., Ehrhardt, K., & Li, A. (2017). Psychotropic medications as treatments for people with autism spectrum disorders. In J. Matson (Ed.), *Handbook of treatments of autism Spectrum disorder*. New York: Springer.
- Poling, A., Ehrhardt, K., Wood, A., & Bowerman, R. (2010). Psychopharmacology and behavior analysis in autism treatment. In E. A. Mayville & J. A. Mulick (Eds.), *Behavioral foundations of effective autism treatment* (pp. 257–275). New York: Sloan.
- Roscoe, E. M., Phillips, K. M., Kelly, M. A., Farber, R., & Dube, W. (2015). A statewide survey assessing practitioners' use and perceived utility of functional assessment. *Journal of Applied Behavior Analysis*, 48(4), 830–844.
- Sheehan, R., Hassiotis, A., Walters, K., Osborn, D., Strydom, A., & Horsfall, L. (2015). Mental illness, challenging behaviour, and psychotropic drug prescribing in people with intellectual disability: UK population based cohort study. *British Medical Journal*, 351, 1–9.

- Siegel, M., & Beaulieu, A. A. (2012). Psychotropic medications in children with autism spectrum disorders: a systematic review and synthesis for evidence-based practice. *Journal of Autism and Developmental Disorders*, 42(8), 1592–1605.
- Strauss, A. L., & Corbin, J. M. (1990). *Basics of qualitative research*. Newbury Park, CA: Sage.
- Thompson, T. (2007). Making sense of autism. Baltimore, MD: Brookes.
- U. S. Food and Drug Administration/Center for Drug Evaluation and Research. (2006). FDA approves the first drug to treat irritability associated with autism, Risperdal. FDA News.
- U. S. Food and Drug Administration/Center for Drug Evaluation and Research. (2009). Aripiprazole clinical addendum. Washington, DC: Otsuka Pharmaceutical Co, Ltd..
- Valdovinos, M. G., Nelson, S. M., Kuhle, J. L., & Dierks, A. M. (2009). Using analog functional analysis to measure variation in problem behavior rate and function after psychotropic medications changes: a clinical demonstration. *Journal of Mental Health Research in Intellectual Disabilities*, 2, 279–293.
- Van Haaren, F., & Weeden, M. (2013). Some guidelines for conducting research in applied behavioral pharmacology. *Journal of Applied Behavior Analysis*, 46, 498–506.
- Van Horn, P. S., Green, K. E., & Martinussen, M. (2008). Survey response rates and survey administration in counseling and clinical psychology: a meta-analysis. *Educational and Psychological Measurement*, 69(3), 389–403.
- Weeden, M., Ehrhardt, K., & Poling, A. (2010a). Conspicuous by their absence: studies comparing and combining risperidone and applied behavior analysis to reduce challenging behavior in children with autism. *Research in Autism Spectrum Disorders*, 3, 905–912.
- Weeden, M., Ehrhardt, K., & Poling, A. (2010b). Psychotropic drug treatments for people with autism and other developmental disabilities: a primer for practicing behavior analysts. *Behavior Analysis in Practice*, 3, 4–12.
- Williams, P. G., Woods, C., Stevenson, M., Davis, D. W., Radmacher, P., & Smith, M. (2012). Psychotropic medication use in children with autism in the Kentucky Medicaid population. *Clinical Pediatrics*, 51, 923–927.
- Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fetttig, A., Kucharczyk, S., Brock, M. E., Playnick, J. B., Fleury, V. P., & Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: a comprehensive review. *Journal of Autism and Developmental Disorders*, 45, 1951–1966.