

ACCEPTABILITY OF BEHAVIORAL INTERVENTIONS FOR AUTISM

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Caregivers' evaluation of evidence-based behavioral interventions may differ dependent upon the type of language used to describe the intervention. We administered a survey to 24 parents of children with autism to assess social validity measures of behavioral interventions described in one of three communication styles: technical, conversational, and conversational with intended outcome. Participants were presented with a description of two behavior-reduction and two behavior-acquisition interventions. Overall, interventions described in conversational with intended outcome style received the highest social validity ratings, while interventions described in the technical style received the lowest ratings. Moreover, behavior-acquisition interventions were rated significantly higher than behavior-reduction interventions when described in either conversational or conversational with intended outcome style. The current study supports the requirements of the Behavior Analyst Certification Board's Compliance Code that behavior analysts should inform the client/consumer of the treatment/interventions in an understandable language. Findings are also discussed in terms of verbal communities.

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ACCEPTABILITY OF BEHAVIORAL INTERVENTIONS FOR AUTISM

Introduction

Parents and caregivers of individuals with autism spectrum disorder (ASD) are often challenged with selecting an appropriate and effective intervention from a massive number of purported interventions for ASD. To assist parents and practitioners in making informed decisions, professional organizations, such as the National Autism Center, have categorized interventions according to evidence of effectiveness (National Autism Center, 2015). As a result, the National Standards Report identified 24 evidence-based interventions or procedures. These interventions aim to remediate the core features of ASD, deficits in social-communicative behavior and the presence of repetitive and restrictive behaviors (American Psychiatric Association, 2013), or associated features of ASD, such as behavior problems (Simonoff, Emily, et al. 2008).

However, identification of evidence-based procedures is only the first (albeit, critical) step in the intervention-selection process; the intervention must also be considered meaningful and acceptable by persons affected by the intervention. In other words, the intervention must also have social validity. Social validity assesses if the intervention being provided has importance and meaning in terms of what goals are targeted, how the treatment interventions are carried out, whether they are appropriate, and if the outcome of that treatment is beneficial and meaningful (Wolf, 1978). To assess social importance, social validity is often measured objectively by asking stakeholders to evaluate the intervention pre and/or post implementation (Schwartz & Baer, 1991). It should be noted that the client should be given as much input into this process as possible, and there are methods to assess client preference amongst treatment options, even with nonverbal individuals (Hanley, Piazza, Fisher, Contrucci, & Maglieri, 1997).

During the intervention-selection process, professionals often provide information about treatment options to parents, while parents provide information about their individual philosophies and values (Sanders & Kirby, 2012; Tincani, 2007). Together, parents and professionals make a collaborative decision on a treatment plan for the individual with ASD. However, the style of the language used by professionals to describe the intervention may influence others' perception of the intervention.

Witt, Moe, Gutkin, & Andrews (1984) examined 112 teachers' acceptability of typical classroom interventions to reduce problem behavior and categorized the descriptions as using either: (a) behavioral, (b) pragmatic, or (c) humanistic language. Teachers received a description of the intervention, a hypothetical child and his/her problem behavior, and a rationale for the intervention. For example, a child may be sent to time out for fighting to either "control a child's inappropriate behavior" (behavioral), because it was the "logical consequence" for fighting (pragmatic), or to help the child "learn to understand the reasons why he fights" (humanistic). Teachers rated each interventions' acceptability on the Intervention Rating Profile (IRP) and judged whether the intervention was in accordance to the conventional notions of what an intervention should be, whether it is acceptable to use it in the typical classroom, whether it presents undue risk to the child/children, whether it has any unwanted effects for non-target children, and whether a typical teacher has the skills to implement it. Findings indicated that interventions described in pragmatic language were more acceptable than those in behavioral and humanistic jargon, which did not differ from each other. These results indicate that use of jargon decreases teachers' ratings of intervention acceptability and effectiveness.

A limitation of this study is that the descriptor term of "behavioral" does not accurately reflect a behavioristic approach (Skinner, 1953, 1969). A behavior analytic intervention would

be developed after a contingency analysis of the antecedent and consequent stimuli surrounding the response. Rather, the authors describe a generic intervention (i.e. time out) that is prescribed without consideration to the surrounding environmental factors. Nonetheless, the results of Witt, Moe, Gutkin, & Andrews (1984) demonstrate that acceptability ratings vary as a function of language.

Rolider, Axelrod, & Van Houten (1998) conducted a similar study but focused on behavior analysts' and laypersons' ratings of behavior-analytic interventions aimed at reducing maladaptive behavior. They presented (a) a differential reinforcement of other behavior (DRO) with a reprimand, (b) differential reinforcement of incompatible behavior (DRI) with extinction, (c) token economy with response cost, and (d) momentary movement restraint procedural description in three different communication styles to laypersons; behavior analysts only read the technical descriptions. The first style of communication was technical; that is, there was heavy use of behavior-analytic terminology. The second style was conversational or in layman language, without technical terms. The third style was conversational but also included an expected outcome. After reading each description, participants answered our questions on a 5-point Likert scale. The questions were designed to evaluate the social validity of each intervention. More specifically, the questions addressed how well the participants understood the interventions, how comfortable they were with the interventions, how they perceived the interventions, and how much participation they thought the child would have in the intervention. The results indicated that the respondents rated the intervention as more acceptable and understandable when described in conversational language with expected outcome. When the same interventions were described in technical language, laypersons rated the interventions as less understandable and less compassionate. When interventions were described in technical

language, behavior analysts consistently provided higher ratings in comparison to laypersons. These findings highlight that while technical language may be understandable and acceptable to behavior analysts themselves, describing interventions in technical language can decrease a laypersons' understanding and acceptability of an intervention.

Rolider & Axelrod (2005) replicated the Rolider et al. (1998) study, aiming to address the limitations. The variation in their study was that they used a cross-cultural population, that is, their participants included 2 groups of Hebrew-speaking Israeli students. The participants of the first group had majored in psychology and education, whereas, the participants in the second group were Israeli citizens. None of the participants were familiar with behavior analysis terminology. The limitation that was addressed was that Rolider et al. (1998) used 40 participants, whereas, Rolider & Axelrod (2005) used 158 participants. Their results were similar to those of Rolider et al. (1998); that is, the general public rated the interventions as more understandable and acceptable when described in conversational style with a statement about expected outcome.

Much of the research examining individuals' acceptability of behavioral interventions has focused on behavior-reduction strategies; however, there has been considerably less focus on interventions designed to increase adaptive behaviors. It is important to evaluate how both categories of interventions are rated, particularly with parents who are more likely to vary their acceptability of interventions as a function of technical vs. non-technical language. Furthermore, given the rapid increase in the provision of skill-acquisition interventions for individuals with ASD in the United States, the current evaluation focused on assessing responses of parents of children with ASD. Thus, the purpose of this evaluation was to replicate and extend the research

on social validity by assessing parents' ratings of common evidence-based interventions for autism.

Methods

Participants

Parents of children with autism participated. We recruited participants by contacting local autism clinics and asking the clinic personnel to distribute an electronic invitation to their clients to participate in the survey. The invitation contained a brief description and a link to the survey. Clinics had the choice to accept or decline our request. In addition, we posted the invitation to five groups on Facebook related to autism or applied behavior analysis. Out of the 58 surveys that were opened, 24 complete responses were received during the 36-day period the survey remained open.

Survey

Prior to participating in the survey, participants were informed of the purpose of the study, the benefits and risks of participation, and procedures to maintain the confidentiality of their responses. Participants then provided their informed consent to participate in the study. The first part of the survey requested general information about the background of the participants, including participants' knowledge of behavior analysis, if their child engaged in maladaptive behavior, and what type of therapy their child was receiving, if any.

We based the structure of the survey on the Rolider & Axelrod (2005) survey, in that participants read a description of an intervention in a communication style categorized as either technical, conversational, or conversational plus intended outcome style. Participants read descriptions of two behavior-reduction interventions followed by two behavior-acquisition

interventions. Interventions used in the survey were categorized as evidence-based behavioral interventions for children, adolescents, and young adults under the age of 22 years by the National Standards Project, and (National Standards Project, Phase 2, 2015). The full survey is provided in the appendix.

Participants were randomly assigned to three groups. Each group was presented with descriptions of the four behavioral interventions in one of three communication styles - technical, conversational, or conversational with expected outcome. In technical jargon, the description of the intervention was in behavior-analytic terminology, with which the general public and professionals from other fields may have little familiarity, if any at all. In conversational style, the interventions were described in lay language, with which the general public and professionals would be familiar. In conversational with expected outcome, the interventions were described in lay language and a statement about the outcome that was expected from the intervention was added.

Behavior-reduction interventions were described as aimed at reducing the occurrence of aggression for a young child with autism. The described interventions were: (a) differential reinforcement of other behavior (DRO) plus social reprimand and (b) functional communication training (FCT). The content for the DRO + reprimand intervention was nearly identical to that described in the Rolider & Axelrod (2005) survey. We elected to use FCT due to its robust evidence in the literature.

The two skill-acquisition interventions were: (a) discrete trial intervention and (b) shaping. Discrete-trial intervention was described as designed to increase the child's use of the

word, “ball.” The shaping intervention was described as trying to increase a desired (unspecified) behavior.

Each description of the intervention was followed by six questions that the participants were requested to rate on a five-level Likert scale with a rating of 5 denoting the most favorable ratings and 1 denoting the least favorable. Of the six items, the first four questions were duplicated from Rolider & Axelrod (2005). The first question evaluated the participants’ understanding of how the intervention will be implemented. Question 2 evaluated the participants’ level of comfort and acceptance with the intervention. The third question asked participants to rate the intervention on a continuum from cold/mechanical to caring and compassionate. Question 4 referred to the level of participation of the client in the treatment intervention. Level of participation includes degree of involvement, opportunity to make choices, and level of control. In question 5, the participants were asked to rate their willingness to use the intervention for their child as a means of treatment. The final question asked the participants to rate how beneficial they think the intervention would be. We included the two additional questions as they assess additional aspects of social validity.

Results

We depict participants’ average rating of behavioral interventions as a function of communication style in Figure 1. We calculated the average ratings by summing the participants’ ratings on each question for all four interventions and dividing the result by the number of ratings obtained. Figure 1 shows that the participants’ ratings were highest when interventions were described using a conversational plus intended outcome communication style, with an

average rating of 4.3 ($SD = 0.1$). Conversational style received the next highest rating ($M = 3.5$, $SD = 0.4$), and the technical style received the lowest rating ($M = 3.0$, $SD = 0.2$).

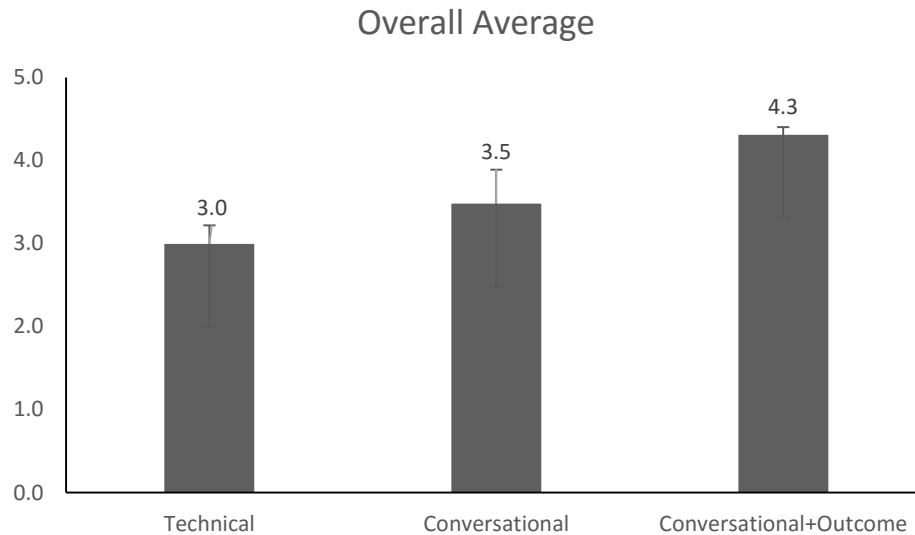


Figure 1. The overall average of the participants' ratings of interventions described in three communication styles.

As reported in Table 1, there was a statistically significant difference between communication styles as determined by one-way ANOVA ($F(2,15) = 34.62$, $p < .0001$). A Tukey post hoc test revealed that all three groups differed significantly. $P < .05$ for the technical vs conversational comparison, and $p < .01$ for both the technical vs conversational plus outcome comparison and the conversational vs conversational-plus-outcome comparison.

Table 1

Analysis of Variance of the Six Questions for the Interventions Described in Three Communication Styles.

Source	df	SS	MS	F	p
Between groups	2	5.27	2.63	34.62	<.0001
Within groups	15	1.14	0.07		
Total	17	6.41			

To examine how different aspects of social validity varied as a function of communication style, we summed the participants' ratings for each social-validity question and divided by the total number of ratings. Figures 2 -7 display the average rating for each survey question across the three communication styles. As seen in Figure 2, participants' understanding of behavioral interventions was highest for the conversational + outcome style ($M = 4.4$, $SD = 0.4$), followed by conversational ($M = 4.3$, $SD = 0.3$), then technical ($M = 3.4$, $SD = 0.8$). Participants' comfort towards the interventions followed a similar pattern (see Figure 3), with the conversational + outcome communication style ($M = 4.3$, $SD = 0.6$) receiving the highest rating, followed by conversational ($M = 3.4$, $SD = 0.6$), and technical style being the lowest ($M = 3.0$, $SD = 0.8$). The perception towards the interventions in terms of being cold/mechanical or caring and compassionate (see Figure 4) was also the highest for conversational + outcome style ($M = 4.3$, $SD = 0.6$), followed by conversational style ($M = 3.5$, $SD = 0.4$) and then technical style ($M = 2.8$, $SD = 0.7$). As Figure 5 depicts, the participants rated the level of participation to be highest when the interventions were described in conversational + outcome style ($M = 4.4$, $SD = 0.4$), followed by conversational style ($M = 3.4$, $SD = 0.9$), and it was rated lowest when

described in technical communication style ($M = 3.0$, $SD = 0.7$). Participants' willingness to use the interventions (see Figure 6) followed a similar pattern, with it being the highest for conversational + outcome style ($M = 4.2$, $SD = 0.6$), followed by conversational style ($M = 3.2$, $SD = 0.6$), then technical style ($M = 2.8$, $SD = 0.8$). The participants rated the interventions to be most beneficial (see Figure 7) when described in conversational + outcome style ($M = 4.3$, $SD = 0.4$), followed by conversational style ($M = 3.1$, $SD = 0.8$), then technical style ($M = 3.0$, $SD = 1.1$). Thus, interventions received the highest social validity ratings across all measures when described in the conversational-plus-outcome communication style.

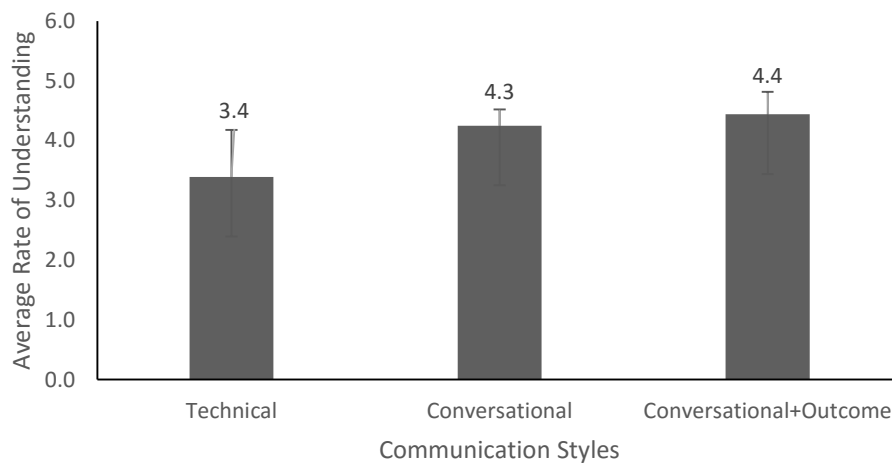


Figure 2. Participants' ratings of the level of understanding of the interventions described in three communication styles.

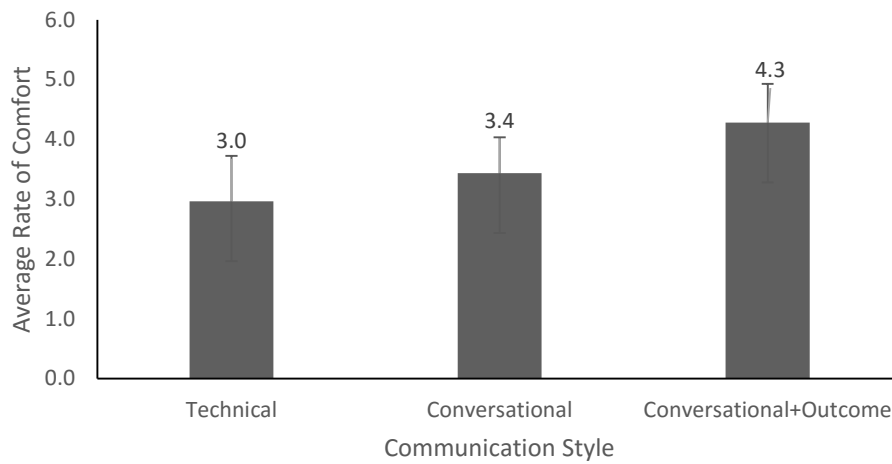


Figure 3. Participants' ratings of the level of comfort in the interventions described in three communication styles.

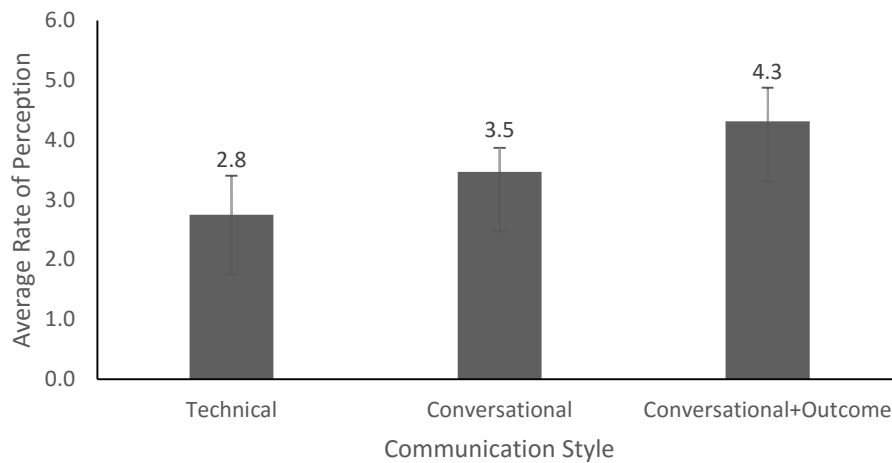


Figure 4. Participants' ratings of their perception towards the interventions described in three communication styles.

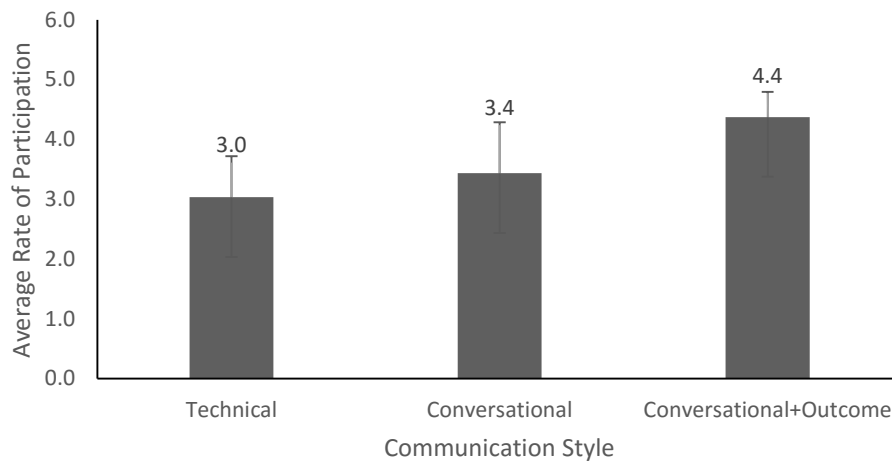


Figure 5. Participants' ratings of the level of participation in the interventions described in three communication styles.

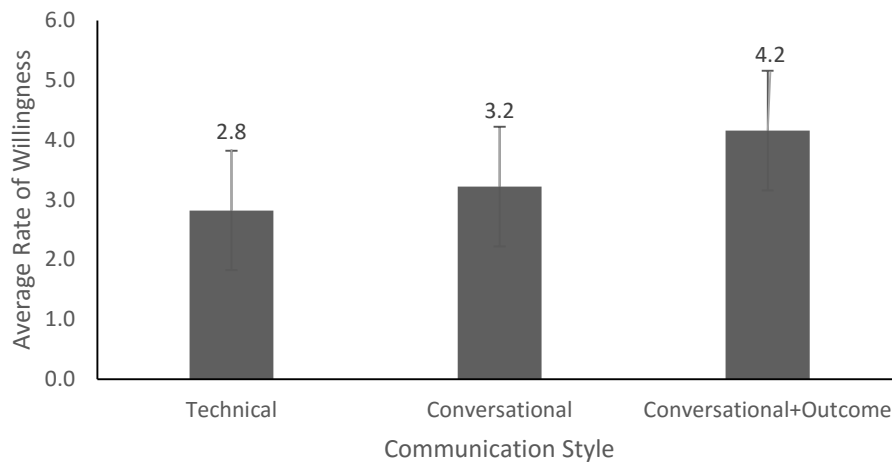


Figure 6. Participants' ratings of the level of willingness to use the interventions described in three communication styles.

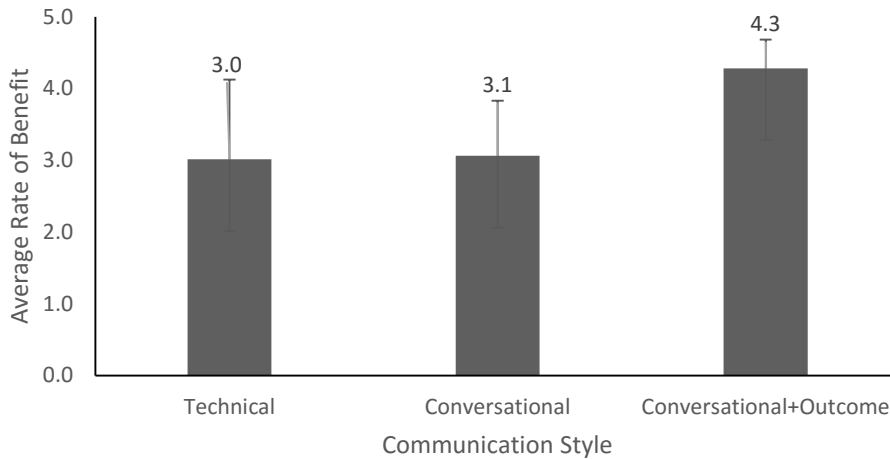


Figure 7. Participants' ratings of how beneficial they think the interventions are as described in three communication styles.

We examined how the average social validity rating varied dependent upon communication style for each intervention. We summed participants' responses for each intervention and divided by the total number of ratings. Figure 8 shows that DRO + reprimand was rated highest ($M = 3.7$, $SD = 0.2$) when described in conversational + outcome style, followed by conversational style ($M = 2.8$, $SD = 0.8$), then technical style ($M = 2.4$, $SD = 0.6$). A similar pattern can be seen for functional communication response (see Figure 9), in which it is highest for conversational+ outcome style ($M = 4.3$, $SD = 0.4$), followed by conversational style ($M = 3.5$, $SD = 0.6$), and lowest being the technical style ($M = 3.2$, $SD = 0.2$). Figure 10 shows a slightly different pattern for discrete trial teaching, the conversational + outcome style was rated highest ($M = 4.7$, $SD = 0.1$), followed by technical style ($M = 4.0$, $SD = 0.4$), closely followed by the conversational style ($M = 3.9$, $SD = 0.4$). Shaping was rated highest (see Figure 11) when described in conversational + outcome style ($M = 4.6$, $SD = 0.2$), followed by conversational style ($M = 3.7$, $SD = 0.2$), then technical style ($M = 2.5$, $SD = 0.2$). Each measure

of social validity received the highest ratings when described in the conversational-plus-outcome communication style.

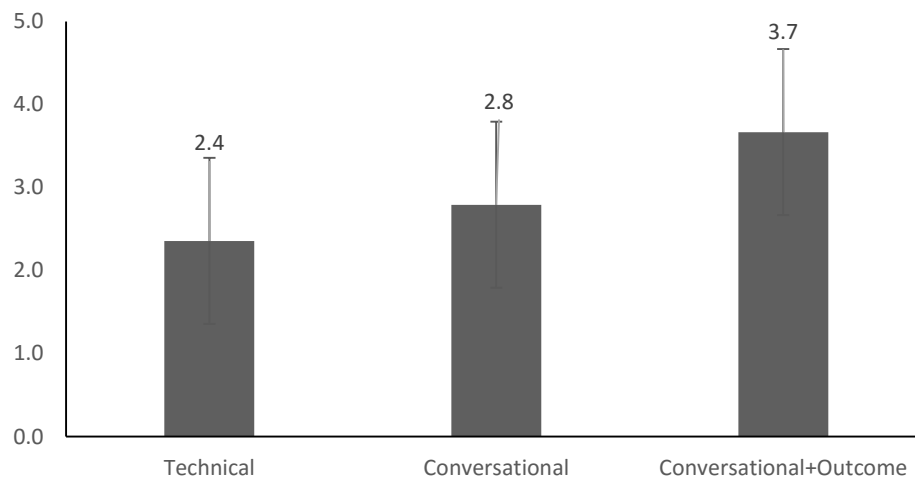


Figure 8. Participants' ratings of differential reinforcement of other behavior and reprimand as described in three communication styles.

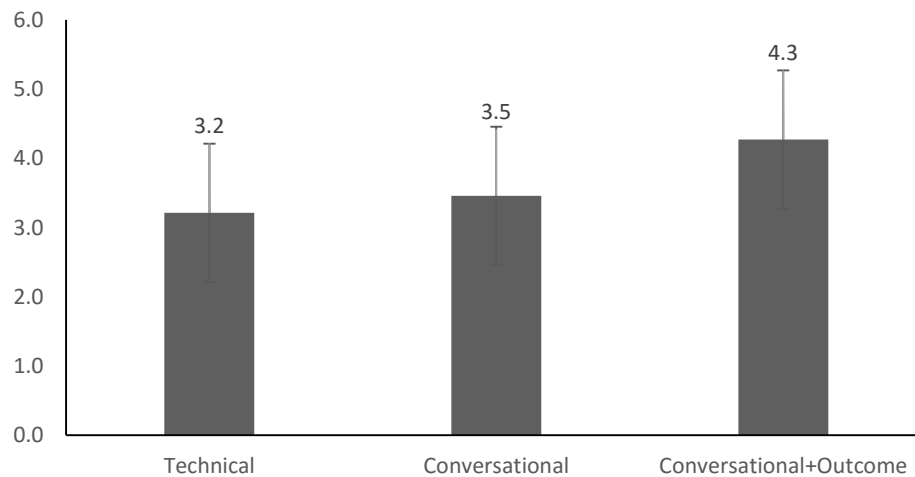


Figure 9. Participants' ratings of functional communication response as described in three communication styles.

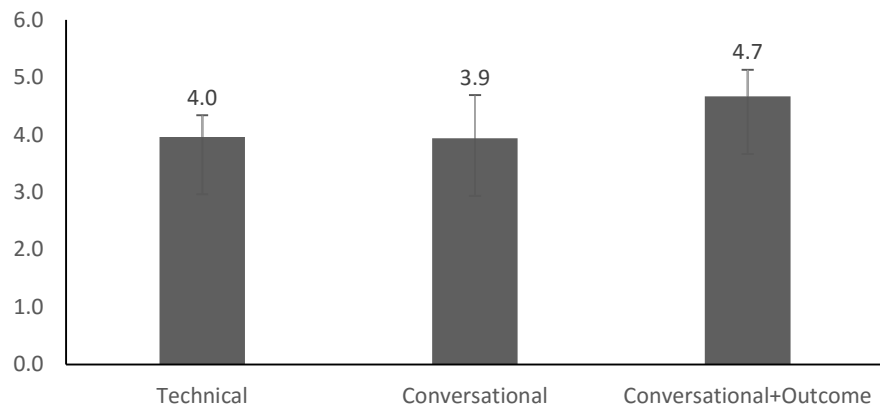


Figure 10. Participants' ratings of discrete trial intervention as described in three communication styles.

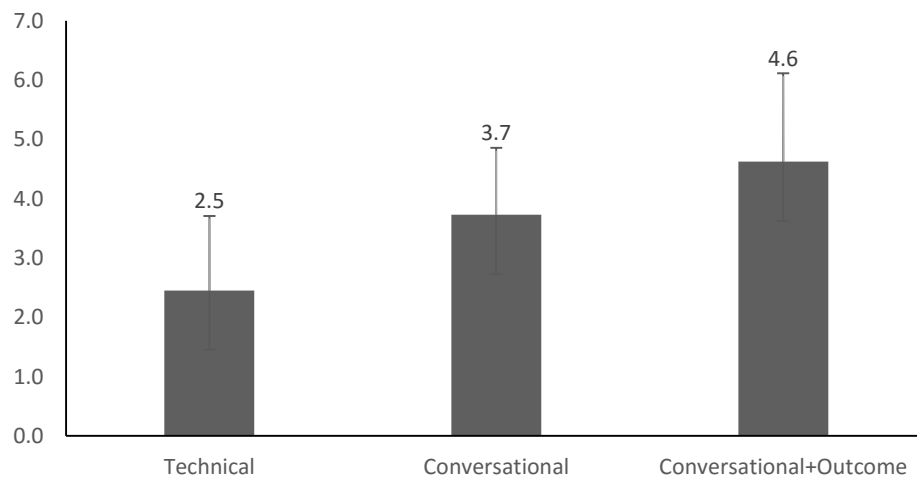


Figure 11. Participants' ratings of shaping as described in three communication styles.

Figures 12 – 17 depict the average rating each question received by specific intervention. The average rating was calculated by summing the participants' ratings per specific question for each intervention and dividing by the total number of ratings. Figure 12 depicts the participant's reported level of understanding for each of the four interventions. Except for differential reinforcement of other behavior plus reprimand, all the other interventions have the highest mean rating for the conversational + intended outcome description and the lowest for the technical description. Functional communication response ($M = 4.8$, $SD = 0.5$) and discrete trial intervention ($M = 4.8$, $SD = 0.5$) have the highest mean rating when described in conversational + outcome style. Shaping received the lowest mean rating ($M = 2.3$, $SD = 1.3$) when described in technical style. The conversational description received a rating of 4.3 ($SD = 0.7$) for differential reinforcement of other behavior and reprimand, which is higher than the other two styles. The conversational with intended outcome received a rating of 4.0 ($SD = 1.3$) and the technical style received an average rating of 3.6 ($SD = 0.5$). A similar pattern can be seen in Figure 13, which depicts the ratings for the level of comfort towards each of the four interventions. Discrete trial intervention ($M = 4.8$, $SD = 0.7$) and shaping ($M = 4.8$, $SD = 0.7$) received the highest mean rating when described in conversational + outcome style. Differential reinforcement of other behavior + reprimand received the lowest rating ($M = 2.1$, $SD = 0.9$) when described in technical style. Figure 14 represents the average for the participants' perception towards the intervention being cold/mechanical or caring and compassionate for each of the four interventions. Shaping received the highest rating ($M = 4.8$, $SD = 0.5$) when described in conversational + outcome style and differential reinforcement or other behavior + reprimand received the lowest rating ($M = 2.0$, $SD = 0.6$) when described in technical style. A similar pattern was noted in participants' rating for level of participation in the intervention (see Figure 15). Discrete trial intervention (M

= 4.6, $SD = 0.7$) and shaping ($M = 4.6$, $SD = 0.7$) was highest for conversational + outcome and shaping was the lowest for technical style ($M = 2.7$, $SD = 0.8$). Figure 16 shows the mean ratings for willingness to use the four interventions. For functional communication response and discrete trial intervention, the technical style received a rating of 3.1 ($SD = 0.7$) and 3.9 ($SD = 1.2$) respectively, which is higher than that for the conversational style with ratings of 3.0 ($SD = 1.4$) for functional communication response and mean rating of 3.6 ($SD = 1.5$) for discrete trial intervention. The conversational with intended outcome style received the highest ratings for all four of the interventions with the highest being 4.8 ($SD = 0.5$) for shaping. Figure 17 depicts the participants' mean ratings for how beneficial they think the four interventions are. The same pattern can be seen as with most other questions, that is conversational with intended outcome style has received the highest rating and technical style has received the lowest rating, except for functional communication response, in which the technical style received a rating of 2.9 ($SD = 0.9$), which is slightly higher than conversational style ($M = 2.8$, $SD = 1.3$). Functional communication response was rated highest ($M = 4.0$, $SD = 1.6$) when described in conversational + outcome style, whereas, differential reinforcement of other behavior + reprimand was lowest ($M = 2.1$, $SD = 0.7$) when described in technical style.

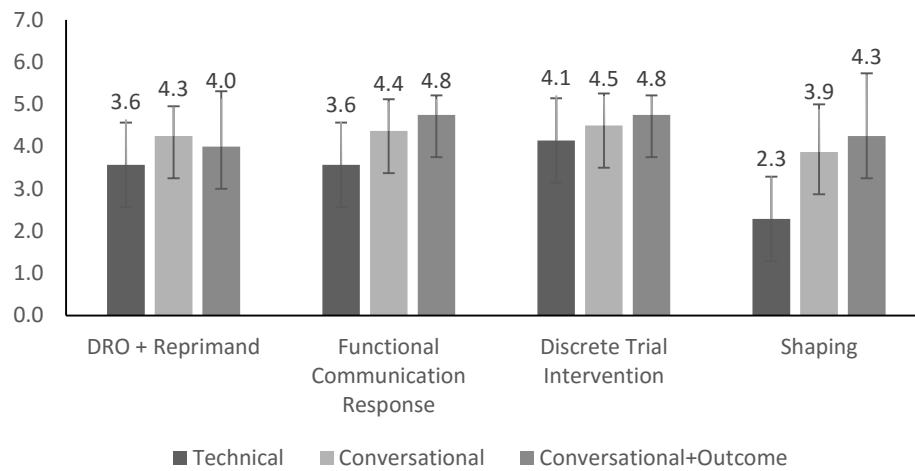


Figure 12. Participants' ratings of the level of understanding of the four interventions described in three communication styles.

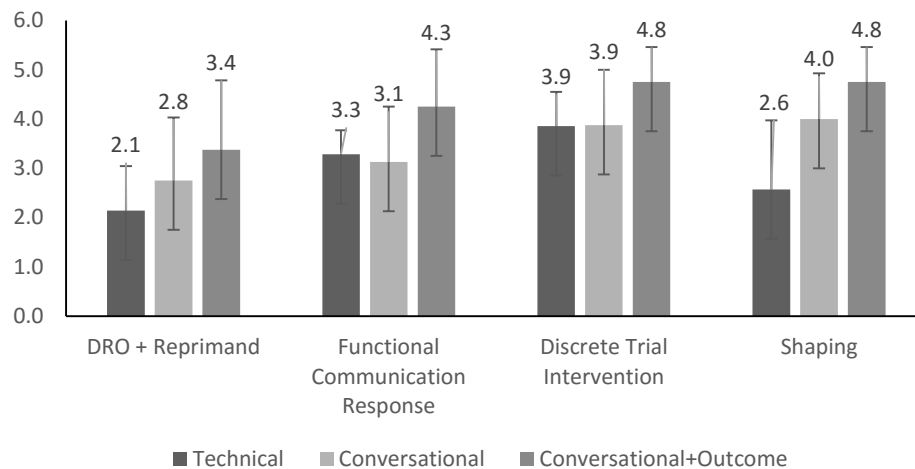


Figure 13. Participants' ratings of the level of comfort towards the four interventions described in three communication styles.

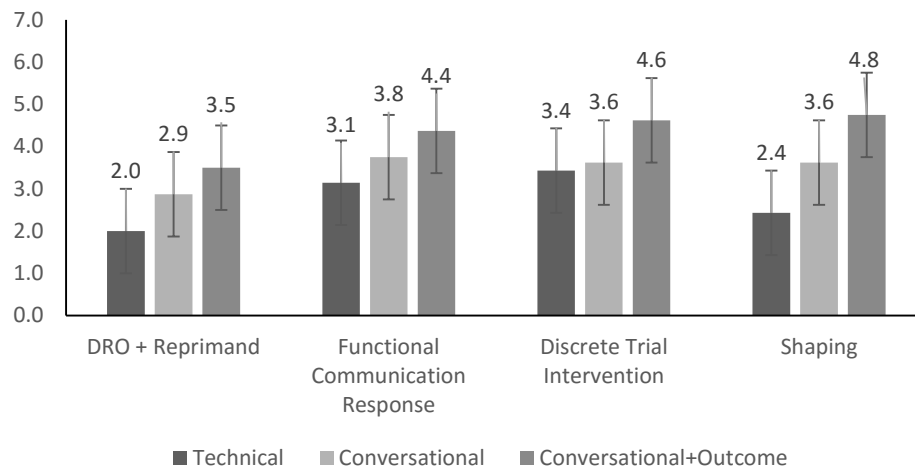


Figure 14. Participants' ratings of perception towards the four interventions described in three communication styles.

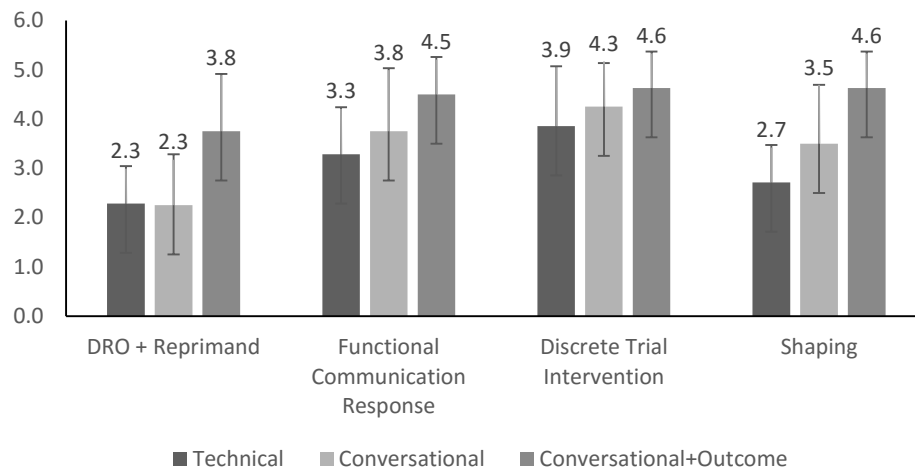


Figure 15. Participants' ratings of the level of participation of the four interventions described in three communication styles.

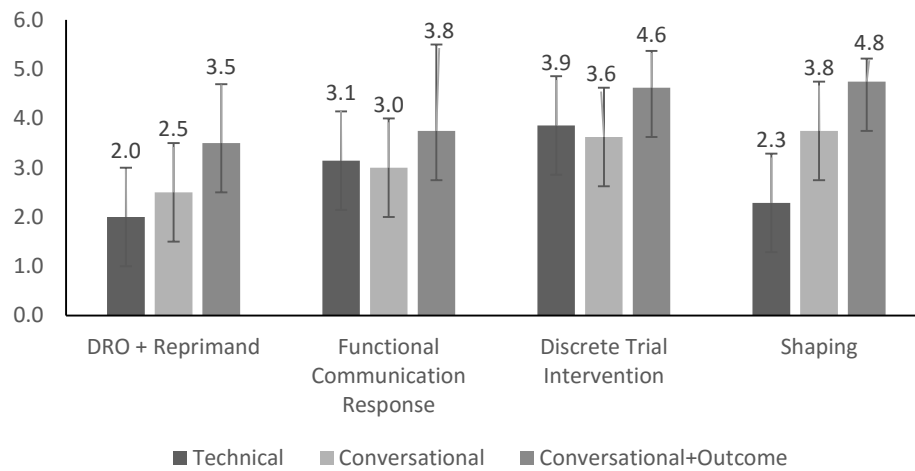


Figure 16. Participants' ratings of their willingness to use the four interventions described in three communication styles.

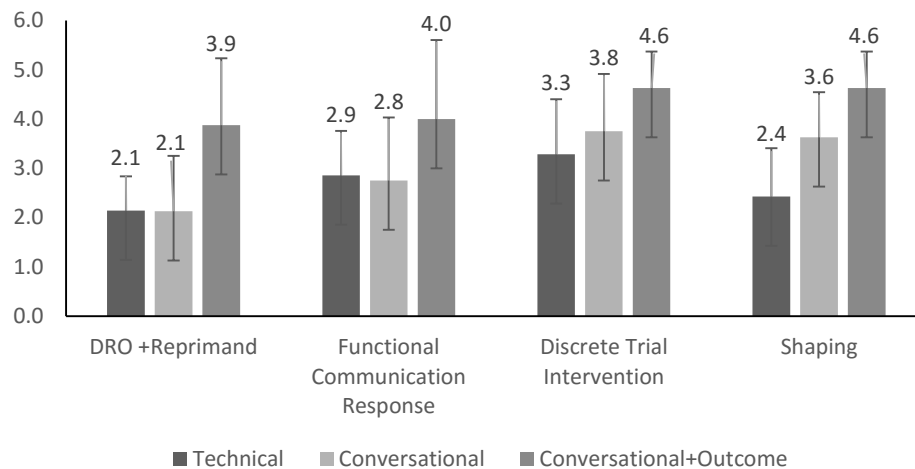


Figure 17. Participants' ratings of how beneficial they think the four interventions are as described in three communication styles.

As displayed in Table 2, the overall ratings for behavior-reduction procedures ($M = 3.3$, $SD = 0.7$) are significantly different from ratings for skill-acquisition procedures ($M = 3.8$, $SD = 0.6$) at P value of 0.023 at the .05 level of significance. However, when interventions were described using a technical style, the average behavior-reduction interventions received ratings that are not significantly different from those for ($M = 2.8$, $SD = 0.4$) behavior-acquisition interventions ($M = 3.2$, $SD = 0.2$), see Table 3. For the conversational style, the P value of 0.017 depicts a significant difference between behavior-reduction ($M = 3.1$, $SD = 0.6$) and behavior-acquisition ($M = 3.8$, $SD = 0.2$) interventions, (see Table 4). This is similar to the results of conversational + outcome style, where the difference between behavior-reduction ($M = 4.0$, $SD = 0.3$) and behavior-acquisition ($M = 4.6$, $SD = 0.1$) interventions is significant at P value of 0.005 (see Table 5). These results indicate that there was an overall significant difference between the ratings of behavior-reduction and skill-acquisition interventions.

Table 2

Paired Samples t-Test of the Mean Ratings of Behavior Reduction and Behavior Acquisition Interventions

	Intervention Type						95% CI for Mean Difference		
	Behavior Reduction			Behavior Acquisition					
	M	SD	n	M	SD	n			
Communication Styles	3.3	0.6	3	3.9	0.7	3	-0.946, -0.187	6.42*	2

*p < .05.

Table 3

Paired Samples t-Test of the Ratings of Behavior Reduction and Behavior Acquisition Interventions Described in Technical Style

	Intervention Type						95% CI for Mean Difference		
	Behavior Reduction			Behavior Acquisition					
	M	SD	n	M	SD	n		t	df
	Technical Style	2.8	0.4	6	3.2	0.2		6	-0.879, 0.079

*p < .05.

Table 4

Paired Samples t-Test of the Ratings of Behavior Reduction and Behavior Acquisition Interventions Described in Conversational Style

	Intervention Type						95% CI for Mean Difference		
	Behavior Reduction			Behavior Acquisition					
	M	SD	n	M	SD	n		t	df
Conversation Style	3.1	0.6	6	3.8	0.2	6	-1.218, -0.182	3.47*	5

*p < .05.

Table 5

Paired Samples t-Test of the Ratings of Behavior Reduction and Behavior Acquisition Interventions Described in Conversational with Intended Outcome Style

	Intervention Type						95% CI for Mean Difference		
	Behavior Reduction			Behavior Acquisition					
	M	SD	n	M	SD	n		t	df
	Conversation + Outcome Style	4	0.3	6	4.7	0.1		6	-1.061, -0.305

*p < .05.

Discussion

The current findings replicate those from previous research showing that laypersons are less likely to understand an intervention and consider it as less acceptable when interventions are described in technical language. Similar to Rolider & Axelrod (1998; 2005), participants rated interventions most favorably when described in a conversational style along with an intended outcome. The results extend the literature by revealing that parents rate behavior-reduction procedures as less favorable than skill-acquisition procedures, regardless of the language that is used to describe the intervention. Together, these results have direct implications for what type of language professionals should use when consulting with parents and how we evaluate social validity with parents.

One explanation for the current results is that there are cultural differences between the verbal communities of parents and behavior analysts. These two groups are likely to respond differently when presented with these behavior analytic terminology given their different, respective histories with these type of verbal stimuli (Skinner, 1957). A behavior analyst is likely to have a rich history of reinforcement for speaking in behavior analytic terminology as well as for responding to behavior analytic terms. In fact, it is possible that this history may make it more likely that behavior analysts will speak in technical terms when speaking with parents, a response that has been heavily reinforced in other context. This may explain why the behavior analysts in the Rolider & Axelord (1998) evaluation rated interventions described in technical terms more favorably than parents. In contrast, the unfamiliarity of these technical terms may present an aversive situation to parents.

Therefore, behavior analysts should consider describing interventions in a conversational language and providing parents with an intended outcome of the intervention during pre-

intervention planning periods. Our results suggest that parents are more likely to understand an intervention, appreciate the compassion underlying behavioral interventions, and be more willing to implement an intervention with their child when the intervention is described in conversational language with an intended outcome. We caution that pre-treatment acceptability may not influence treatment fidelity, as previous research demonstrates there is not a direct relationship between the two (Noell et al, 2005). However, social validity is critical to assess in its own right for a number of reasons.

Adkins (1997) revisited Wolf's (1978) and Quine's (1981) conceptualizations of social validity and ethics and argued the importance of assessing the social validity of behavioral technology. Adkins recounted Einstein's assertions that "science can determine the means that will lead to the most effective ends, but that science cannot determine the appropriate ends to seek in the first place" (Adkins, p. 154). In other words, identification of evidence-based procedures is not sufficient; recipients of behavioral interventions must identify these as acceptable and important (Kennedy, 1992). The current study is a step forward in this direction, assessing how consumers (in this case, parents of children with autism), rate different evidence-based interventions.

A limitation of the current research is that the limited sample size may have affected the requirements for statistical analyses. We conducted an Analysis of Variance (ANOVA) to determine if there was a significant difference in participants' ratings of the interventions described in three different communication styles. Even though the results suggest that a significant difference did exist between the three communication styles, the data does not meet the full requirements for ANOVA as the standard deviation is very large. According to Sullivan (2011), the ANOVA would be acceptable if the largest standard deviation is less than half of the

lowest standard deviation, which in our case is did not happen. Miller (1986) suggests that when standard deviations are not equal, they affect the p value and this may lead to invalid outcomes. In addition, with such a small population, the external validity of our findings are limited. However, although our sample size is limited, our findings replicate the findings of previous research that identify social validity ratings vary as a function of language (Witt, Moe, Gutkins, Andrews, 1984; Rolider, VanHouten, & Axelrod, 1998; Rolider & Axelrod, 2005).

There are additional limitations to the current evaluation. We sought to replicate and extend the work of Rolider & Axelrod (2005) and replicated the structure of their survey. However, the number of elements in each treatment description varied across communication styles. The number of elements such as the rationale provided, a description of the environmental context, and the number of examples was not equated across communication styles. Thus, it is possible that parents were responding to some element of the descriptions other than communication style. Another limitation of the survey is that three of the four interventions were described with reference to a specific target behavior, whereas shaping was described in terms of increasing a desirable behavior, but an example was not provided. This represents a difference in the content of the descriptions of the procedures that may have affected how shaping was rated by the participants of the survey.

This survey extends the work of Rolider & Axelrod (2005) study by including English-speaking American residents as participants. It can be assumed that their perception and meaning of words used in the technical language of behavior analysis would differ from the Israeli participants in Rolider & Axelrod's study who, because of differences in culture and personal histories, may perceive the words much differently. For example, Rolider & Axelrod suggest that Israeli participants might be more likely to rate interventions with terms such as "extinction" less

favorable than participants from other cultures given the term's association with the Holocaust. The current results suggest that laypersons with other histories and cultural backgrounds also rate interventions as relatively unfavorable when they are described in technical terminology.

The results for differential reinforcement of other behavior plus reprimand in current study almost replicate those of the Rolider & Axelrod (2005) study; the most substantial difference is that understanding received a very slightly higher rating for conversational only style compared to conversational plus outcome style in the current study. By contrast, the conversational with intended outcome style received a slightly higher rating than conversational only style in the Rolider & Axelrod study. This is of importance because the description of differential reinforcement plus reprimand in current study was almost identical to that of the Rolider & Axelrod study. The findings from the two studies suggest that language used to describe interventions can affect the perception of interventions from different populations; American consumers of ABA based interventions (Parents of children with autism) and Hebrew speaking students (psychology or education major and non-psychology or education major).

The current evaluation also extends the previous research by including skill-acquisition procedures. Results show that behavior-reduction procedures are consistently rated less favorably than skill-acquisition procedures. T-tests reveal that this difference was statistically significant. One possible reason is that some behavior-reduction terms have pre-established cultural connotations. For example, the term "punishment" often has a negative association, such that many oppose its use, regardless of whether the procedures could have been effective and beneficial (Yulevich & Axelrod as cited in Rolider & Axelrod, 2005). Professionals should be aware that caregivers have less favorable opinions of behavior-reduction strategies, even when described as a strategy for reducing harmful behavior such as aggression towards others. Thus,

professionals should take extra care to involve parents throughout the treatment process for maladaptive behaviors to ensure that parents are comfortable and agreeable to the intervention plan.

The outcomes of this study suggest that behavior analysts should consider the acceptability of their work when communicating with consumers and with the general public. It is possible that by using consumer-friendly language (i.e. conversational with an intended outcome), behavioral science may become more broadly understood and more generally acceptable. This may also aid in the dissemination of behavioral science to a wider arena than has yet been achieved in the field of applied behavior analysis (Morris, 1985).

APPENDIX
PERMISSIONS AND SURVEY

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Acceptability of Behavioral Interventions for Autism

Student Investigator: Afshaan Fatema, University of North Texas (UNT) Department of Behavior Analysis. **Supervising Investigator:** Dr. Karen Toussaint.

Purpose of the Study: We are conducting a research study to learn more about parents' opinions about behavioral interventions for individuals with autism. The study will help us assess: : (a) how well they understand the described intervention, (b) how acceptable they find the intervention, (c) their perception on how compassionate the intervention is, and (d) if they would be willing to participate in the intervention. This will give us a better insight on how to communicate behavioral interventions with parents and those who are not familiar with Behavior Analysis terms.

Study Procedures: You are being asked to participate in a research study by completing a brief survey. Participants will read brief descriptions of different behavioral interventions and will be asked to respond to questions about each description. We anticipate that your involvement will require approximately 15 minutes.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: We hope to learn more about what type of language parents prefer when clinicians explain treatment methods for individuals with autism. This will be beneficial to the field of Behavior Analysis as it will help us know the most appropriate language to be used for communication with people from other fields and with those receiving services of Applied Behavior Analysis. This study is not expected to be of any direct benefit to you although you may find it satisfying to provide information about your experiences to researchers.

Compensation for Participants: Participants are eligible to enter into a drawing for a \$50.00 gift card to Amazon.com.

Procedures for Maintaining Confidentiality of Research Records: Confidentiality will be maintained to the degree possible given the technology and practices used by the online survey

company. Your participation in this online survey involves risks to confidentiality similar to a person's everyday use of the internet.

Questions about the Study: If you have any questions about the study, you may contact Karen Toussaint at Karen.toussaint@unt.edu

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-4643 with any questions regarding the rights of research subjects.

Research Participants' Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- The study has been explained to you and you were provided with an e-mail address if you have any questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

Q1 Do you have a child/children with a diagnosis of autism or autism spectrum disorder (ASD)?

- ☐ Yes
- ☐ No

Q2 Do you have any formal education in Behavior Analysis? (such as through enrollment in a university course?)

- ☐ Yes
- ☐ No

Q3 Which degree/diploma? How many credit hours?

Q4 Do you have any informal education in behavior analysis? (such as through workshops, parent training, etc.)

- ☐ Yes
- ☐ No

Q5 How comfortable/familiar are you with behavior analysis terminology and principles?

Q6 Does your child receive therapy?

- ☐ Yes
- ☐ No

Q7 If yes, then which

- ☐ Speech Therapy
- ☐ Behavioral Therapy
- ☐ Occupational Therapy
- ☐ Special educational service (provided through school system)

Q8 Does your child have any behavioral concerns?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

Q9 Does your child have any language concerns?

- ☐ Definitely yes
- ☐ Probably yes
- ☐ Might or might not
- ☐ Probably not
- ☐ Definitely not

Technical Style

1. Read the following description and answer the questions below.

Benny's displays aggression will be treated with a DRO 15 with a reprimand procedure. On a 15-min interval, in the absence of aggression, a behavior therapist will approach Benny and deliver descriptive praise (e.g., "Benny, you are demonstrating a good pace in your work assignment"). Contingent on episodes of aggression, staff will confront Benny, request eye contact, and deliver a firm social reprimand (e.g., "Benny! Look at me! Stop being aggressive immediately! Control yourself!").

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

1= Not at all 2 3= Somewhat Comfortable 4 5= Completely Comfortable

Please indicate your perception of this intervention on a continuum of being cold and mechanical to being caring and compassionate.

1= Cold/Mechanical 2 3= Neither 4 5= Caring/Compassionate

Based on the description provided, please indicate the level of participation you feel the treatment allows the individual. Participation includes degree of involvement, opportunity to make choices, and level of overall personal control.

1= No Participation 2 3= Somewhat Participation 4 5= Full Participation

Please indicate how willing you would be to use this treatment for your child.

1= Not Willing 2 3= Somewhat Willing 4 5= Completely Willing

Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

2. Read the following description and answer the questions below.

The behavior therapist will provide access to the functional reinforcer (e.g. attention) if Benny engages in the functional communication response. Reinforcement will be withheld for disruptive behavior.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

1= Not at all 2 3= Somewhat Comfortable 4 5= Completely Comfortable

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

3. Read the following description and answer the questions below.

The behavior therapist will present Benny with a common object (e.g. a ball) and provide the instruction, "What is this?" Once Benny correctly labels the object, the therapist will provide access to a reinforcer. Following this instructional trial, there is a brief inter-trial interval until the next instructional trial.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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Please indicate how willing you would be to use this treatment for your child.

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

4. Read the following description and answer the questions below.

The behavior therapist will differentially reinforce successive approximations of a terminal behavior for Benny.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

1= Not at all 2 3= Somewhat Comfortable 4 5= Completely Comfortable

Please indicate your perception of this intervention on a continuum of being cold and mechanical to being caring and compassionate.

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

Conversational Style

1. Read the following description and answer the questions below.

Whenever Benny has difficulty controlling his emotions and he becomes aggressive, we will assist him to overcome his difficulties in the following manner: First, we will ensure that Benny is provided with encouragement in an orderly manner. We will use a system that allows behavior analysts to acknowledge his success in controlling his emotions at an interval of at least every 15 minutes. Specifically, whenever Benny does not have difficulty with displaying aggression for at least 15 minutes, a behavior analyst will approach him and acknowledge his success. This high rate of encouragement is important when we first begin to work with Benny because learning emotional control is a very difficult task and we want to provide Benny with the support he deserves and requires in attaining his goals.

Despite our attempts to ensure Benny's success, there may be occasions where he has difficulty controlling his emotions. At these times he may display aggression. On the occasions that Benny displays outbursts of aggression, we will work through the difficult issue with Benny. We will confront Benny and let him know that this type of behavior is not acceptable. The therapist will firmly say to Benny, "Benny! Look at me! Stop being aggressive! Control yourself! This confrontation will be a difficult time in therapy both for Benny and his therapist, but it is an integral component of assisting him to reach his goals.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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Please indicate your perception of this intervention on a continuum of being cold and mechanical to being caring and compassionate.

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Please indicate how willing you would be to use this treatment for your child.

1= Not Willing 2 3= Somewhat Willing 4 5= Completely Willing

Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

2. Read the following description and answer the questions below.

The therapist will ask Benny to do something from his academic plan and will tell Benny that he can say NO if he does not want to do the work. If Benny says NO within 10 seconds, Benny will be praised and will receive 30 seconds break from work. This praise and break is to encourage the child to use appropriate ways of dealing with emotions when he does not want to work. If he does not say NO, the therapist will model how to say NO so that Benny can repeat after the therapist and receive praise and 30 seconds break from work.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

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Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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Please indicate how willing you would be to use this treatment for your child.

1= Not Willing 2 3= Somewhat Willing 4 5= Completely Willing

Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

3. Read the following description and answer the questions below.

The behavior therapist will present Benny with a common object (e.g. a ball) and provide the instruction, "What is this?" Once Benny and the therapist will be seated on a table. The therapist will gain Benny's attention and hold up a ball and ask Benny "what is this?" If Benny says, "ball," the therapist will give Benny an item that he had chosen earlier to play with and if Benny does not say anything or says something other than "ball," the therapist will repeat "what is this?" and then will say, "ball" and have Benny repeat "ball," and then will give Benny the chosen item to play with. If Benny still does not repeat "ball," the therapist will move on without giving Benny the chosen item. The reinforcement, in the form of a desired or chosen item makes learning and correctly answering stronger and it encourages learning new things.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

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Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

4. Read the following description and answer the questions below.

The therapist will provide Benny with praise and some item that he likes if he does something that is an approximation to the desired behavior. Once Benny is successfully doing one approximation, the therapist will provide praise and the desired item for the next approximation to the desired behavior and so on.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

Conversational with Intended Outcome Style

1. Read the following description and answer the questions below.

Whenever Benny has difficulty controlling his emotions and he becomes aggressive, we will assist him to overcome his difficulties in the following manner: First, we will ensure that Benny is provided with encouragement in an orderly manner. We will use a system that allows behavior analysts to acknowledge his success in controlling his emotions at an interval of at least every 15 minutes. Specifically, whenever Benny does not have difficulty with displaying aggression for at least 15 minutes, a behavior analyst will approach him and acknowledge his success. This high rate of encouragement is important when we first begin to work with Benny because learning emotional control is a very difficult task and we want to provide Benny with the support he deserves and requires in attaining his goals.

Despite our attempts to ensure Benny's success, there may be occasions where he has difficulty controlling his emotions. At these times he may display aggression. On the occasions that Benny displays outbursts of aggression, we will work through the difficult issue with Benny. We will confront Benny and let him know that this type of behavior is not acceptable. The therapist will firmly say to Benny, "Benny! Look at me! Stop being aggressive! Control yourself! This confrontation will be a difficult time in therapy both for Benny and his therapist, but it is an integral component of assisting him to reach his goals.

Benny displays serious problems in controlling his emotions and engages in severe outbursts of aggressive behavior. It is important to teach Benny to control his emotions and express himself in a controlled and effective manner so that he may remain in the community. If Benny is able to learn to overcome his difficulties and express himself in appropriate, alternative modes of communication, he will be able to maintain his job and relationship with his family. Benny often feels very depressed after he becomes aggressive and feels, hopeless about his inability to control his actions. His family and job are very important to him. Teaching Benny to overcome his emotional-behavioral difficulties will provide him with a strong sense of accomplishment, improve his self-esteem and substantially increase his life satisfaction.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

1= Not at all 2 3= Somewhat Comfortable 4 5= Completely Comfortable

Please indicate your perception of this intervention on a continuum of being cold and mechanical to being caring and compassionate.

1= Cold/Mechanical 2 3= Neither 4 5= Caring/Compassionate

Based on the description provided, please indicate the level of participation you feel the treatment allows the individual. Participation includes degree of involvement, opportunity to make choices, and level of overall personal control.

1= No Participation 2 3= Somewhat Participation 4 5= Full Participation

Please indicate how willing you would be to use this treatment for your child.

1= Not Willing 2 3= Somewhat Willing 4 5= Completely Willing

Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

2. Read the following description and answer the questions below.

The therapist will ask Benny to do something from his academic plan and will tell Benny that he can say NO if he does not want to do the work. If Benny says NO within 10 seconds, Benny will be praised and will receive 30 seconds break from work. This praise and break is to encourage Benny to use appropriate ways of dealing with emotions when he does not want to work. If he does not say NO, the therapist will model how to say NO so that Benny can repeat after the therapist and receive praise and 30 seconds break from work.

Inappropriate ways of communication can be very harmful. This is why teaching appropriate ways of communication and expressing what Benny wants or does not want is very important. Benny will be relieved from hurting himself if he knows how to express that he does not want to work at that time. He will not have to go through the pain and his caretakers will also be at ease knowing that Benny will not be hurt or in pain. Appropriate communication will also help Benny socialize in a better manner.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

3. Read the following description and answer the questions below.

The behavior therapist will present Benny with a common object (e.g. a ball) and provide the instruction, "What is this?" Once Benny and the therapist will be seated on a table. The therapist will gain the child's attention and hold up a ball and ask the child "what is this?" If the child says, "ball," the therapist will give the child an item that he had chosen earlier to play with and if the child does not say anything or says something other than "ball," the therapist will repeat "what is this?" and then will say, "ball" and have the child repeat "ball," and then will give the child the chosen item to play with. If the child still does not repeat "ball," the therapist will move on without giving the child the chosen item. The reinforcement, in the form of a desired or chosen item makes learning and correctly answering stronger and it encourages learning new things.

Learning to say "ball" when a ball is held up and asked what it is will help increase the child's vocabulary and he will know the names of different things. This will help in communication with others and to identify objects in his surroundings and know their names. It will also help him improve social relationships since communication will improve.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

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Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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Please indicate how beneficial you think this intervention will be in the treatment of the said problem behavior.

1= Not Beneficial 2 3= Somewhat Beneficial 4 5= Very Beneficial

4. Read the following description and answer the questions below.

The therapist will provide Benny with praise and some item that he likes if he does something that is an approximation to the desired behavior. Once Benny is successfully doing one approximation, the therapist will provide praise and the desired item for the next approximation to the desired behavior and so on.

This is a way to teach Benny something in smaller steps so that the child can learn to do more complex behaviors. These complex behaviors are important for day to day functionality and help Benny become more independent.

Please indicate the degree to which you feel you understand how the treatment will be implemented.

1= Not at all 2 3= General Understanding 4 5= Completely Understand

Please indicate how comfortable you are with the intervention, or how acceptable you feel this intervention is as a means of treatment.

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