EVALUATING SELF-SET GOALS AND PERFORMANCE FEEDBACK TO INCREASE TRIALS COMPLETED BY REGISTERED BEHAVIOR TECHNICIANS

_____

A Thesis

Presented to

The Faculty of the Department of Language, Literacy, and Special Populations

Sam Houston State University

_____

In Partial Fulfillment

of the Requirements for the Degree of

Master of Arts

_____

by

Jordan M. Kulaga

May, 2017

EVALUATING SELF-SET GOALS AND PERFORMANCE FEEDBACK TO INCREASE TRIALS COMPLETED BY REGISTERED BEHAVIOR TECHNICIANS

by

Jordan M. Kulaga

_____

APPROVED:

William Calderhead, PhD
Thesis Director

Kristina Vargo, PhD
Committee Member

Philip Swicegood, EdD
Committee Member

Stacey Edmonson, EdD
Dean, College of Education

ABSTRACT

Kulaga, Jordan M., *Evaluating self-set goals and performance feedback to increase trials completed by Registered Behavior Technicians*. Master of Arts (Special Education), May, 2017, Sam Houston State University, Huntsville, Texas.

In 2014, the Centers for Disease Control and Prevention reported that 1 in 68 children are diagnosed with autism spectrum disorder, many of whom will be enrolled in ABA therapy at some point in their lives. The Behavior Analyst Certification Board developed the Registered Behavior Technician credential in 2014 to establish training standards for the paraprofessionals who implement ABA treatment plans. Previous research has shown that goal-setting and performance feedback are often successful at effecting behavior change at the organizational level, but little research has been done on the effects of goal-setting and feedback for work-related tasks at the individual level. The present study used self-set goals and graphic feedback to increase efficiency of discrete-trial training provided by RBTs. Results indicated that the participants' delivery of discrete trials per hour did increase upon intervention, though only two of the four met the final mastery criterion.

KEY WORDS: Behavior technicians, Discrete-trial teaching, Goal-setting, Feedback, Sam Houston State University, Graduate school, Texas

ACKNOWLEDGEMENTS

We would like to thank Nora Garcia, Lindsay Nguyen, Katherine Moore, Brena Howard, and Rachel Champagne for their tireless efforts in making this project possible. We couldn't have done it without all of you. We would also like to thank the front office staff at 290 and Katy for tolerating the many interruptions and scheduling requests over the course of the study with such unflappable grace.

TABLE OF CONTENTS

Page

LIST OF FIGURES

Figure **Page**

CHAPTER I

There is a robust research literature on the use of goal-setting and performance feedback. In their review of the organizational literature from 1985-1998, Alvero, Bucklin, and Austin (2001) found that on its own, feedback does not always result in increased performance, but is most effective when combined with other procedures such as goal-setting. This is reflected in the myriad of articles published utilizing feedback plus public posting (Anderson, Crowell, Domen, & Howard, 1988; Anderson, Crowell, Hantula, & Siroky, 1988) or feedback plus goal-setting (Downing & Geller, 2012; Loewy & Bailey, 2007; Ludwig & Goomas, 2009; Jessup & Stahelski, 1999; Ralis & O'Brien, 1986; Wilk & Redmon, 1998).

Goal-setting and performance feedback have also been evaluated in the single-subject literature, mostly in the context of increasing health-related behaviors such as physical activity for obese individuals (Donaldson & Normand, 2009), athletes' skill execution (Brobst & Ward, 2002; Ward & Carnes, 2002), and weekly running distance (Wack, Crosland, & Miltenberger, 2014). Several of these studies utilized standardized goals based on predetermined criteria such as percentages of baseline performance (Brobst & Ward, 2002; Loewy & Bailey, 2007; Ludwig & Goomas, 2009), but others obtained high levels of success with participant-set goals (Downing & Geller, 2012; Jessup & Stahelski, 1999; Singh et al., 2011; Wack et al., 2014; Ward & Carnes, 2002).

In 2014, the Behavior Analyst Certification Board (BACB) began offering a high school level credential for those who provide direct ABA services (BACB, 2013). Individuals who wish to become Registered Behavior Technicians (RBTs) are required to complete a 40-hour training course, complete a Competency Assessment administered by

a Board Certified Behavior Analyst (BCBA) or Board Certified assistant Behavior Analyst (BCaBA), and attain a passing score on the RBT Exam developed by the BACB. Per the registry on the BACB's website, there are currently over 1500 RBTs in Texas alone, and that number is growing every day. An Indeed.com job search for "behavior technician" in the state of Texas alone yields almost 900 current job postings (Retrieved from http://www.indeed.com on February 2, 2017). There is no doubt that increasing the quality of therapy provided by RBTs can have far-reaching effects for the field and the population they serve, and this research seeks to bridge the gap in the literature by evaluating the effectiveness of goal-setting and feedback as it relates to the work performance of RBTs.

CHAPTER II

Participants, Setting, and Materials

Participants were 4 adults who were employed as Registered Behavior Technicians (RBTs) at a day treatment clinic providing ABA services to children with developmental disabilities, primarily autism. All RBTs who worked at the clinic were informed of this study and given an opportunity to participate in the research. Of the 9 individuals who expressed an interest in participating, 2 were excluded because they were part-time employees and 2 were excluded because they were already performing at the mastery level and did not require intervention. Criteria for participants was to hold an RBT credential, average less than 25 trials per hour over the course of one week, and consent to participate in this research. Five participants started baseline data collection, but 1 dropped out of the study prior to intervention. The four remaining participants completed the study.

Naomi was a 25-year-old female who had been a behavior technician for 1 year. Victoria was a 22-year-old female who had been a behavior technician for 4 months. Nicole was a 29-year-old female who had been a behavior technician for 7 months. Sanae was a 25-year-old female who had been a behavior technician for 7 months.

All sessions were conducted in therapy rooms at an outpatient clinic in southeast Texas providing one-to-one ABA services for children with autism. Rooms were of varying size and included the work materials and stations for 1 to 4 clients, along with a variety of toys and leisure items. Data were collected on Apple iPads using the Catalyst data collection app offered by DataFinch Technologies (Version 4.12.1). Materials also included computer-printed data sheets for IOA measurements, and Excel spreadsheets

with participant performance visually displayed in graphic format for feedback purposes. Graphs shown to the participants were the same as those seen in Figures 1-4.

Sessions were conducted in 2-hour blocks, from 10:00 a.m. to 12:00 p.m. Monday through Friday, except for days when the participant was not scheduled to arrive at work until noon. On those days, sessions were conducted from 1:00 p.m. to 3:00 p.m. in the afternoon. Clients were chosen from a list of options provided by the researcher to the scheduling team at the clinic and randomly assigned to a therapist each day. Clients were excluded from the study if they engaged in a significant amount of problem behavior on a regular basis, or had such difficulties attending that attempting to engage in a high rate of trials per hour would be unconducive to their learning.

Design

A changing criterion design, as established by Hartmann & Hall (1976), was used to assess the effects of the intervention on participant behavior.

Response Definitions

Targeted behavior was the rate of discrete trials completed per session. When using the Catalyst data collection app, the behavior technician was provided with a selection of possible scores for the trial, including *+, -, approximate, partial prompt, full prompt,* etc., based on the type of program being conducted. The therapist scored the trial based on the prompt level required for the client to engage in the correct response. The data were stored online and could be accessed via a computer to calculate how many trials were conducted in each session.

Due to the rapid nature of a discrete trial, it is common to for a trial to be completed in less than one minute. The preferred rate of acquisition trial presentation at

the clinic was 40 trials per hour. This allowed for some time to be spent writing session notes, taking the client to the restroom, or engaging in various other job-related tasks. For this reason, we chose 40 trials per hour as the terminal criteria for program mastery.

Data Collection, Inter-Observer Agreement (IOA), Procedural Integrity, and Accuracy

Data were collected on Apple iPads using the Catalyst data collection app offered by DataFinch Technologies (Version 4.12.1). Inter-observer agreement was collected by having two observers view the "Trial Counts by User" report on Catalyst and document how many trials were recorded during a session. IOA was calculated by adding the total number of agreements by the number of agreements plus disagreements and multiplying by 100. IOA was taken for 30% of Naomi's sessions, 34% of Victoria's, 29% of Nicole's, and 38% of Sanae's sessions. Agreement was 100% for all participants.

Procedural integrity of the intervention was measured by having a colleague sign off on a checklist kept by the researcher that indicated whether the graphic and verbal feedback was provided each day, and whether the participant set a new goal on the first day of each new criterion level. Each day could have up to a total of 12 check marks (one for each participant for graphic feedback, verbal feedback, and goal-setting). Integrity was calculated by dividing the number of checkmarks divided by the total possible number of checkmarks and multiplied by 100 to obtain a percentage. Each participant's daily percentage was then averaged across the entire length of the study. Integrity was 100% for all participants across all sessions.

Accuracy checks of participants' data collection were taken to ensure the trials we were recording on Catalyst were being correctly scored during the session. Accuracy was

calculated by having an observer sit in on a session with a paper data sheet of the student's programs and record which trials the therapist conducted and how they were scored. The written data were then compared to the data on the Catalyst website. Percentages were calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. These data were taken during 25% of Naomi's sessions, 25% of Victoria's, 27% of Nicole's, and 25% of Sanae's sessions. Results were 97% for Naomi (range 87-100%), 94% for Victoria (range 81-100%), 94% for Nicole (range 75-100%), and 97% for Sanae (range 87-100%).

Procedures

Baseline. During baseline, technicians conducted therapy just as they did prior to the beginning of the study. No feedback was given related to the number of trials they had conducted, and no goals were set.

Goal-setting and performance feedback. Upon establishing a stable baseline, goal-setting and performance feedback were introduced. Each participant met with the researcher prior to beginning their shift on the first day of the intervention and established a goal they expected to be attainable based on their behavior during baseline. When determining what to set as the goal, the researcher would offer a suggestion of an attainable goal for the participant based of their performance, but the participant ultimately made the choice of what their goal would be for each level. Each day after the initial goal-setting, the participants met with the researcher to view the graph of their performance from the day before. Upon establishing stable responding in each condition, participants would set a new goal and continue meeting with the researcher each day to receive feedback.

Social Validity. All participants completed a social validity survey following their participation in the research (see Appendix). The questions used a Likert scale of 1 to 5 and asked participants to rate the acceptability of the intervention, whether they would recommend the use of goal-setting and performance feedback to other employers looking to increase productivity, and if they felt their behavior was influenced by the intervention.

CHAPTER III

Results can be found in Figures 1-4. During baseline, Naomi's average was 27.9 trials per hour. During the second to last phase of intervention, her average was 40.3 trials per hour. During the final phase of intervention, there were two days when she was assigned a client who she had previously worked with and achieved high rates of trials with, but he had difficulty attending on those days. Even including those two days, Naomi's average for the final intervention phase was 38.5 trials per hour, a significant increase over her baseline scores.

For Victoria, we were unable to begin intervention until further along in the study due to an increasing trend in her trial counts, and so we were unable to obtain more than one criterion phase. During baseline, Victoria averaged 18.1 trials per hour, with 72% of the data points falling below the 20 trials per hour mark. Once intervention began, only 36% of her data points fell below 20, with a total average of 26.6 trials per hour.

Nicole displayed variable rates of trials conducted during baseline, with a range of 27.5 trials per hour (18.0 to 45.5) and an average of 32.6 per hour. Once intervention began, her responding stabilized and she met criteria for all but one day of intervention. On that day, she was training a new staff member and so was unable to focus her entire attention on the session as she was expected to explain details about the student as well as answer questions posed by the trainee. During the final phase of intervention, Nicole's range was only 1.5 trials per hour (43.5 to 45.0), and her average was 44.4 trials per hour.

Sanae average 24.9 trials per hour in her baseline condition. She met criterion at least 3 times in each phase for 4 intervention phases, and her average for the final intervention phase was 48.2 trials per hour, a 94% increase from baseline levels.

Following intervention, when participants were administered the social validity survey, they overwhelmingly stated the intervention had been helpful in increasing their job performance (M: 4.5) and they would recommend the use of feedback and goal-setting to other employers (M: 4.8).

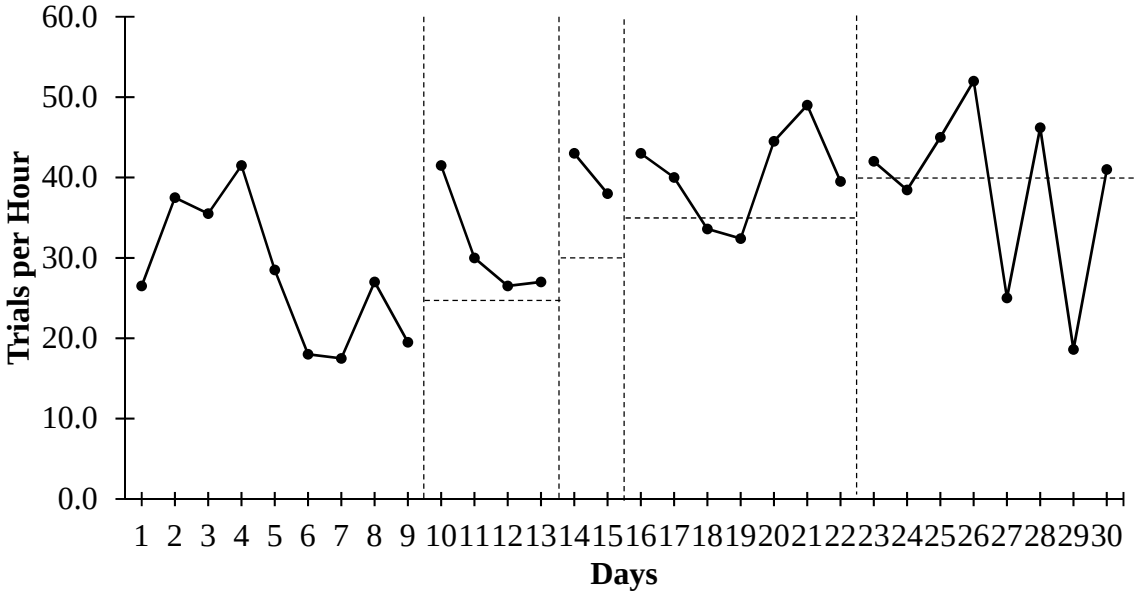

Figure 1. Average trials per hour for Naomi.

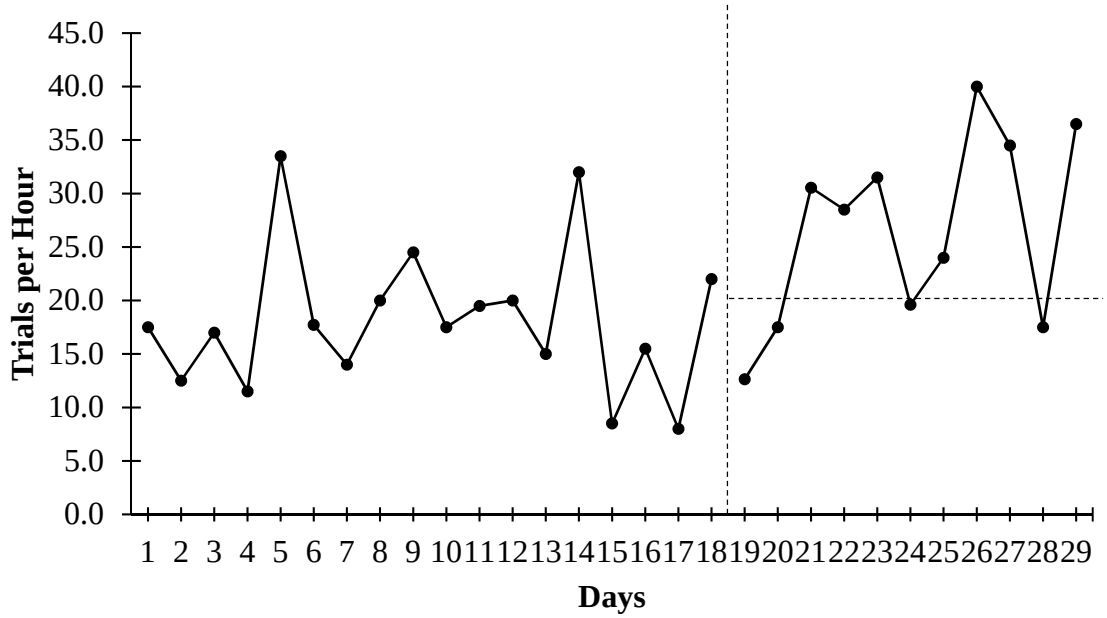

Figure 2. Average trials per hour for Victoria.

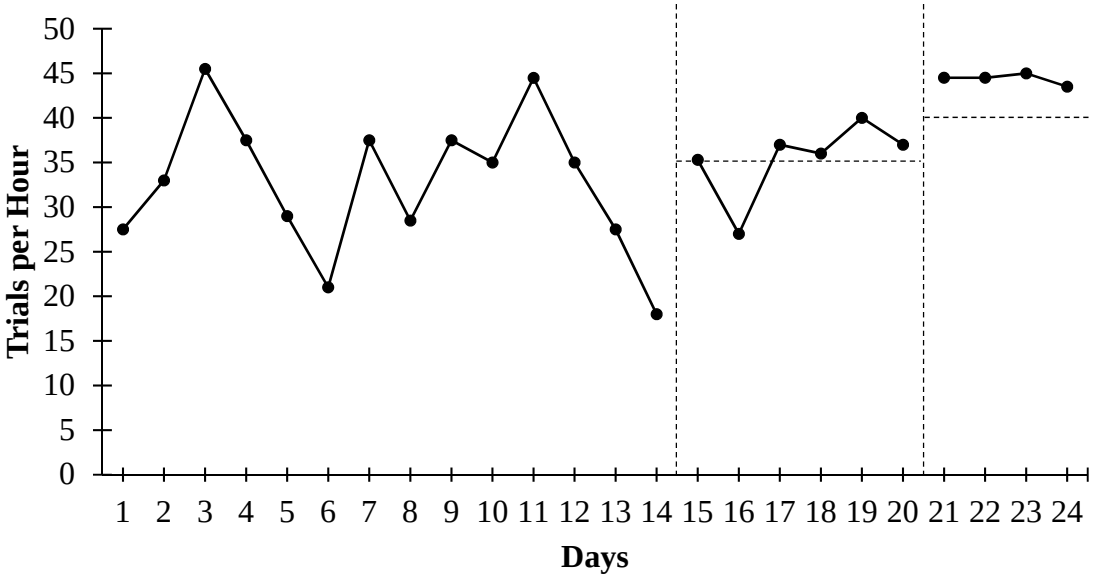

Figure 3. Average trials per hour for Nicole.

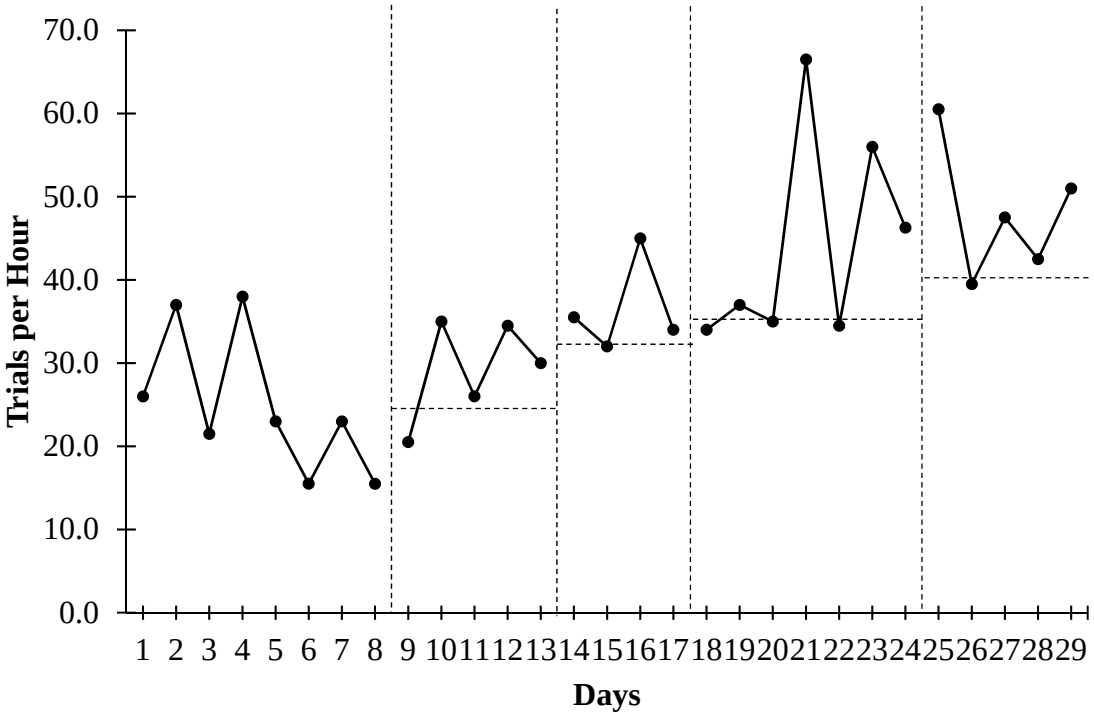

Figure 4. Average trials per hour for Sanae.

CHAPTER IV

Overall, the data indicate that goal-setting combined with graphic feedback was successful in increasing trial counts conducted by behavior technicians in a clinic setting. These findings are consistent with previous organizational research indicating that performance feedback is effective at increasing job performance when combined with goal-setting. It also corresponds with published studies in the single-subject literature where feedback and goal-setting have been successful in increasing athletic performance (Brobst & Ward, 2002; Wack et al., 2014; Ward & Carnes, 2002).

However, this study is not without limitations. Due to our focus on the therapists' behavior alone, we do not have any data to show that the increase in trials completed by the participants translated to any increase in the rate of skill acquisition by the clients with whom they were working. Future research can address this problem by taking data not only on the behavior of the therapists, but the clients as well.

Another limitation was the fact we were bound by the limits of our available data collection system (Catalyst), which has certain idiosyncrasies that had the potential to leave artifacts in the data. This can be addressed in the future by comparing various common data collection systems and utilizing the one which is most effective for a given topic.

A final limitation is one that will be inherent in any workplace-based research, and that is the daily challenges of maintaining experimental control. With staff members calling in sick or clients cancelling and new staff needing to be trained, it was often difficult to navigate the scheduling aspects of the study. We intentionally chose to randomize the clients used throughout the study to control for testing or maturation

effects, but perhaps it would be more effective and efficient to use only a single client for each therapist and control for those threats in another manner.

While further research is needed to expand upon and replicate these findings, we can see that goal-setting and feedback can be effective at increasing job performance at an individual level as well an organizational level. A combination of these two interventions can be a worthwhile option for employers who are seeking cost effective, efficient, and easy to implement solutions to improving employee performance.

REFERENCES

Alvero, A. M., Bucklin, B. R., & Austin, J. (2001). An objective review of the effectiveness and essential characteristics of performance feedback in organizational settings (1985-1998). *Journal of Organizational Behavior Management, 21*(1), 3-29.

Anderson, D. C., Crowell, C. R., Doman, M., & Howard, G. S. (1988). Performance posting, goal setting, and activity-contingent praise as applied to a university hockey team. *Journal of Applied Psychology, 73*(1), 87.

Anderson, D. C., Crowell, C. R., Hantula, D. A., & Siroky, L. M. (1988). Task clarification and individual performance posting for improving cleaning in a student-managed university bar. *Journal of Organizational Behavior Management, 9*(2), 73-90.

Behavior Analyst Certification Board. (2013) *BACB Newsletter – Special Issue on the RBT Credential*. Retrieved from http://bacb.com/wp-content/uploads/2015/07/BACB_Newsletter_12-13.pdf.

Brobst, B., & Ward, P. (2002). Effects of public posting, goal setting, and oral feedback on the skills of female soccer players. *Journal of Applied Behavior Analysis, 35*(3), 247-257.

DataFinch Technologies. (2016). [Data collection software]. Retrieved from http://www.datafinch.com.

Donaldson, J. M., & Normand, M. P. (2009). Using goal setting, self-monitoring, and feedback to increase calorie expenditure in obese adults. *Behavioral Interventions, 24*(2), 73-83.

Downing Jr, C. O., & Geller, E. S. (2012). A goal-setting and feedback intervention to increase ID-checking behavior: An assessment of social validity and behavioral impact. *Journal of Organizational Behavior Management, 32*(4), 297-306.

Fellner, D. J., & Sulzer-Azaroff, B. (1984). A behavioral analysis of goal setting. *Journal of Organizational Behavior Management, 6*(1), 33-51.

Hart, K. C., Graziano, P. A., Kent, K. M., Kuriyan, A., Garcia, A., Rodriguez, M., & Pelham, W. E. (2016). Early intervention for children with behavior problems in summer settings results from a pilot evaluation in Head Start preschools. *Journal of Early Intervention*, doi: 10.1177/1053815116645923.

Hartmann, D., & Hall, R. V. (1976). The changing criterion design. *Journal of Applied Behavior Analysis, 9*(4), 527-532. doi:10.1901/jaba.1976.9-527

Howard, J. S., Stanislaw, H., Green, G., Sparkman, C. R., & Cohen, H. G. (2014). Comparison of behavior analytic and eclectic early interventions for young children with autism after three years. *Research in Developmental Disabilities, 35*(12), 3326-3344.

Jessup, P. A., & Stahelski, A. J. (1999). The effects of a combined goal setting, feedback and incentive intervention on job performance in a manufacturing environment. *Journal of Organizational Behavior Management, 19*(3), 5-26.

Johnson, C. M., & Masotti, R. M. (1990). Suggestive selling by waitstaff in family-style restaurants: An experiment and multisetting observations. *Journal of Organizational Behavior Management, 11*(1), 35-54.

Loewy, S., & Bailey, J. (2007). The effects of graphic feedback, goal setting, and manager praise on customer service behaviors. *Journal of Organizational Behavior Management, 27*(3), 15-26.

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology, 55*(1), 3.

Ludwig, T. D., & Goomas, D. T. (2009). Real-time performance monitoring, goal-setting, and feedback for forklift drivers in a distribution centre. *Journal of Occupational & Organizational Psychology, 82*(2), 391-403.

Singh, N. N., Lancioni, G. E., Winton, A. S., Singh, A. N., Singh, J., & Singh, A. D. (2011). Effects of a mindfulness-based smoking cessation program for an adult with mild intellectual disability. *Research in Developmental Disabilities, 32*(3), 1180-1185.

Wack, S. R., Crosland, K. A., & Miltenberger, R. G. (2014). Using goal setting and feedback to increase weekly running distance. *Journal of Applied Behavior Analysis, 47*(1), 181-185.

Ward, P., & Carnes, M. (2002). Effects of posting self-set goals on collegiate football players' skill execution during practice and games. *Journal of Applied Behavior Analysis, 35*(1), 1-12.

Wilk, L. A., & Redmon, W. K. (1997). The effects of feedback and goal setting on the productivity and satisfaction of university admissions staff. *Journal of Organizational Behavior Management, 18*(1), 45-68.

APPENDIX

Please answer the following questions on a scale of 1 to 5, with 1 being “Not at all”, 3 being “Somewhat”, and 5 being “Extremely so”.

1. Do you feel your participation in this study increased your job performance at TDLC?

2. Do you believe the use of goal-setting influenced your performance at work?

3. Do you believe the use of feedback influenced your performance at work?

4. Would you recommend the use of goal-setting to employers looking to influence their employees’ work-related behavior?

5. Would you recommend the use of feedback to employers looking to influence their employees’ work-related behavior?

6. Would you rate the use of goal-setting and feedback as an acceptable intervention for employers looking to influence their employees’ work-related behaviors?

VITA

Education

M.A. in Special Education at Sam Houston State University – 2017
Thesis title: "Evaluating self-set goals and performance feedback to increase trials completed by Registered Behavior Technicians."
Web-Centric Alternative Certification Program for Texas Educators – 2015
BCaBA Course Sequence at University of North Texas – 2013
B.S. in Psychology (with minor in English) at Texas A&M University – 2011

Certifications

Board Certified assistant Behavior Analyst – February 2014 to February 2019
Texas Certified Educator – June 2015 to December 2020
Mathematics/Science; English/Language Arts & Reading (Grades 4-8)

Professional Experience

Lead Programmer at Tangible Difference Learning Center in Houston, TX
September 2016 to Present
Behavior Analyst at Positive Behavior Supports, Inc. in Houston, TX
May 2016 to September 2016
Student Teacher (5th Grade Mathematics) at Turlington Elementary in Waller Independent School District, Waller, TX
January 2015 to May 2015
ABA Therapist at Spectrum of Hope in Cypress, TX
May 2012 to December 2014
Recruiting Manager at Knight Transportation in Katy, TX
January 2012 to April 2012
Driver Manager at Knight Transportation in Katy, TX
August 2011 to January 2012
Student Bus Driver at Texas A&M in College Station, TX
October 2009 to May 2011

Presentations

Three-Minute Thesis at Sam Houston State University
March 2017

Research Interests

Staff development, community interventions, behavioral skills training, safety skills for children and adolescents, group contingencies, interventions with neurotypical adults

Professional Affiliations

Association for Behavior Analysis International (ABAI)
Texas Association for Behavior Analysis (TxABA)
Lone Star ABA (LSABA)