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# The Effects of the Use of Task Clarification and Self-Monitoring in the Form of Feedback to Increase On-Time Billing in Behavior Analysts

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The Effects of the Use of Task Clarification and Self-Monitoring in the Form of Feedback to  
Increase On-Time Billing in Behavior Analysts

by

Christopher Sugiarto

A thesis proposal submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science in Applied Behavior Analysis  
Department of Child and Family Studies  
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## **ABSTRACT**

The implications of untimely billing in an independent contractor model can be costly for both the contractor and the employer in terms of unpaid work hours and total income loss. Beyond these issues, both Medicaid and the Behavior Analysis Certification Board discuss the possible ethical dilemmas created by delayed billing. Due to the importance of the billing process, several studies have evaluated increasing job performance and on-time billing for a variety of professions using treatment packages including self-monitoring, task clarification, and feedback. However, prior to this study, none have evaluated self-management, in the form of self-generated feedback on increasing the percentage of on-time billing for Board Certified Behavior Analysts in the independent contractor environment. Therefore, the purpose of this study was to determine if self-generated feedback would be sufficient in increasing on-time billing or if an additional reinforcement component would be required to increase and maintain the percentage of on-time billing above 90%. Results indicated that self-management alone was not an effective intervention for consistently increasing on-time billing. Self-management plus reinforcement did appear to improve on-time billing but responding remained variable.

## **CHAPTER ONE:**

### **INTRODUCTION**

The independent contractor model used within the field of applied behavior analysis allows for companies to lower costs by removing some of the more traditional employee/employer exchanges such as employee insurance, workers' union access, disciplinary procedures, etc. The independent contractor model tends to be a less formal relationship than typical models. Independent contractors cannot be terminated in the same way as a typical employee, they are not owed overtime or benefits as mandated by the federal or state government, and they fall under a different tax classification.

Despite the potential advantages of using this model, the environment may lack antecedent manipulations for maximizing worker productivity (Pandey, Diller, & Miller, 2016). Further, this model might lack contingencies for shaping worker behavior such as discipline systems or offering bonuses or other monetary incentives. Finally, according to Sanguino (personal communication, October 20, 2017) competing contingencies may exist such as other jobs/contracts, personal obligations, or other distractions that would not ordinarily occur in a typical workplace environment.

Considering the lack of contingencies mentioned above, undocumented, or late billing documentation could be more prevalent in an independent contractor environment. Billing involves a variety of discrete tasks such as inputting session notes, data entry, data interpretation, training, etc. The task of billing could be considered a secondary behavior for a contractor and thus might be given minimal oversight. The independent contractor position could be likened to

other jobs or professions in which individuals are working alone without direct supervision (Olson & Austin, 2001). Incomplete and/or inaccurate billing may lead to lost revenue or income variability for both the contractor and the contracting company.

It is also important to consider the ethical implications of late and/or inaccurate billing. For behavior analysts, the BACB code and Medicaid guided the ethical standards of billing. Medicaid specifically states through Rule 65G-4.009 (Design, implementation and monitoring of behavior analysis services, rule: 65G-4.009, 2012) the documentation requirements for claims, service logs, reports, etc. Additionally, section 3.7 # 2 states that billing should only be for services authorized and directly related to the recipient's goals. Section 3.8 points out that improperly documented or inappropriately billed hours may require the payee to recoup funds to the payer. BACB ethical code numbers 2.10, 2.11, and 2.13 deal with documentation standards, records/data, and accuracy in billing reports (Behavior Analyst Certification Board, 2014) and therefore behavior analysts should follow the ethical standards related to billing.

Behavior analysts who chose to practice as independent contractors serve as providers who contract with companies that create and maintain the infrastructure to provide services to consumers (Design, implementation and monitoring of behavior analysis services, rule: 65G-4.009, 2012). One challenge faced within this model is implementing appropriate contingencies for following through with ancillary demands, such as billing (Bloom, Liang, Roberts, & Ying, 2014). When an analyst fails to bill for their services within the pay period, recalling information from work sessions could be more difficult and less accurate. In addition, this may lead to an increase in the total amount of time spent inputting billing information. These hours are not billable (Design, implementation and monitoring of behavior analysis services, rule: 65G-4.009, 2012) which decreases income for both the company and analyst. Despite ancillary tasks being



necessary to receive payment, for some companies, it is possible for the analyst to delay the completion of required paperwork without consequences other than a respective delay in payment. Few studies have explored the use of treatment packages to address similar issues related to billing (Clayton & Hayes, 2004; Hybza, Stokes, Hayman, & Schatzberg, 2013).

Organizational behavior management (OBM) is a branch of Applied Behavior Analysis (ABA) that uses behavior analytic principles and research to increase productivity in the work place (Gil & Carter, 2016; Prue & Fairbank, 1981). OBM interventions in work place settings often include some combination of task clarification (Durgin, Cox, Weetjens, & Poling, 2014; Reetz, Whiting, & Dixon, 2016), self-monitoring (Gaetani, Johnson, & Austin, 1983; Hickman & Geller, 2005), feedback (Austin, Weatherly, & Gravina, 2005; Clayton & Hayes, 2004) in various forms, and goal-setting (Cunningham & Austin, 2007). Often seen in a custom treatment package (Olson & Austin, 2001; Slowiak, Madden, & Mathews, 2006) these interventions lead to successful outcomes in areas of safety, compliance, and skill (Olson & Austin, 2001; Reetz et al., 2016; Slowiak et al., 2006). Packages have been customized for a wide variety of settings including classrooms (Coddling, Livanis, Pace, & Vaca, 2008; Duncan, Dufrene, Sterling, & Tingstrom, 2013), medical care facilities (Alavosius & Sulzer-Azaroff, 1990; Cunningham & Austin, 2007), restaurants (Austin et al., 2005; Reetz et al., 2016), and within general labor work spaces (Durgin et al., 2014; Rose & Ludwig, 2009).

Palmer and Johnson (2013) evaluated the utility of using a treatment package that included task clarification and group graphic feedback to reduce the number of early clock-in stamps by employees. The intervention was not only successful but also found to be easy and efficient for the company to implement (e.g, required few resources, saved revenue). In a similar study employing a treatment package, Hickman and Geller (2015) evaluated the use of self-

management, performance feedback, and goal-setting to decrease unsafe truck driving behavior. Although the results of this study were promising it should be known there were flaws in the study design. Specifically, the study did not assess treatment components individually and therefore the effect of each component and which components were necessary was unclear. Further, the study did not prevent the participants from providing peer pressure to each other which may have lead to an increase in desired responding unrelated to the independent variable.

In a third study, Rose and Ludwig (2009) evaluated and found promising results for a treatment package including self-monitoring, task clarification, and performance feedback to increase pool cleaning behavior among lifeguards. They first used a preliminary task clarification which included an explanation and public posting of the expectations. The lifeguards were then required to self-monitor which included a task checklist that was later compared to a manager's assessment of their job completion. Finally, publicly-posted graphic feedback showing the lifeguards self-report scores was provided daily. Like other treatment package studies, the authors found this approach to be successful within its respective context. Although many OBM studies incorporate various treatment packages, combining the use of antecedent manipulations and feedback has been found to produce the most consistent effects on behavior change (Alvero, Bucklin, & Austin, 2008). Outside of these specific performance studies, researchers have also evaluated using treatment packages to increase on-time billing.

In Hybza et al. (2013), the authors addressed a need to increase the billed Medicaid hours of school psychologists. The purpose of the study was to investigate the effects of changing the billing requirements in a school district in Florida on the number of Medicaid dollars billed and the number of school psychologists billing. The intervention involved goal setting, prompting,

and feedback. The results indicated there was a successful increase in both dependent variables of Medicaid dollars billed and school psychologists billing.

In a similar study, Clayton and Hayes (2004) used performance feedback to increase the billable hours of social workers. By providing performance feedback for prior, present, and future performance, the authors expected increased productivity and development of the use of self-management skills to follow in the social workers. The authors set reporting the social worker's billable hours to their supervisor on time each week as the target behavior and labeled it compliance. For each individual, the consequences for not turning in hours at the end of the week were a written and verbal prompt. Once the prompts were delivered, the social workers either turned in their hours or an instance of noncompliance was marked. Although the study does not explicitly state the time frame between when the hours were due, when the supervisor provided the prompts, or when noncompliance was officially marked it seems likely these events occurred toward the end of the day they were due. The feedback provided to the social workers consisted of their cumulative hours turned in each week and how many hours were needed for future weeks to stay on track for each individual's end goal (future performance).

Results of the study suggest feedback alone was successful at increasing participants reporting their hours on-time (Clayton & Hayes, 2004). In addition, the authors noted the feedback component led to an ancillary result of staff self-management. With the presentation of the cumulative hours each week introducing what had been billed and what was needed to stay on track, the social workers managed their vacations, their working hours each week, and the scheduling of work-related activities. A limitation of this study was that although the authors report self-management was incorporated in the study, there is a lack of description available to the reader of what this encompassed.

Considering the importance of timely paperwork, as well as where the literature stands regarding behavior analytic principles applied to the practice of behavior analysis, this paper sought to investigate how performance feedback and self-monitoring might improve performance and compliance of behavior analysts specifically regarding on-time billing. No known study has evaluated using self-management to increase on-time billing for practicing behavior analysts in an independent contractor environment. Therefore, the research questions for this study were:

1. Will self-management, in the form of self-generated feedback, increase on-time billing of behavior analysis professionals in an independent contractor setting?
2. If needed, will self-management plus reinforcement increase on-time billing to criterion?

## **CHAPTER TWO:**

### **METHOD**

#### **Participants and Setting**

Three applied behavior analysis professionals employed at the same local behavior analysis services company in Florida were recruited for this study. Participants recruited were required to be Registered Behavior Technicians, Behavior Assistants, BCaBAs, BCBAs, or BCBA-Ds. Recruitment involved a general email sent out in mass to a region of professionals asking for participants who were interested in being part of a study that involved general productivity enhancement. Once participants contacted the author, questions about the participants were asked to ensure they met criteria. Additional criteria for participants involved submission of billing notes for clients within the appropriate billing period less than 50% of the time, an average of no less than three billable sessions per week based on the three most recent weeks, and had billed with the company for at least three months. Exclusion criteria was discussed with the potential participants to ensure there were no inconsistent schedules due to illness, personal conflicts, plans to leave the area or company within the next year, under investigation by the BACB, Medicaid, or for any other reason. If a potential participant reported that any of these existed then the participant was excluded from the study.

Leslie was a 38-year-old female Board Certified Behavior Analyst (BCBA) acting as a Lead Analyst with the company. During her participation in the study she was promoted to Regional Coordinator increasing her administrative duties. Leslie reported that she had trouble

being consistent with turning in her billing on-time and cited other responsibilities, personal and professional, as a reason for not completing billing on-time.

Anne was a 34-year-old BCBA working as an analyst with the company for 4 years. Anne billed approximately 10-15 hours with the company and also worked as a teleconsultant for a different company. Anne cited competing personal responsibilities such as her child as her primary reason for not turning in her billing on time. Additionally, Anne became pregnant sometime in October and reported consistent fatigue and nausea during the following 3 months (October-January).

April was 31-year-old Board Certified assistant Behavior Analyst (BCaBA) working as an Analyst with the company for 2 years. April also worked for an additional company as an analyst. April said her main barrier for not turning in her billing on time was she had a client she consistently saw late on the night billing was due (Thursdays) which did not allow for enough time to work on billing. April billed approximately 10-15 hours with her primary company and 15-20 hours with her other company of which this study did not track. To clarify, this study only concerned billing for one company rather than many.

## **Materials**

Materials included for this study were cell phones and computers for communication, pen and paper, SharePoint © system for submitting billing, participant chosen reinforcers, and Microsoft Excel template for subjects to log and graph their weekly billing compliance.

The SharePoint © system is a Microsoft online utility. Information is exchanged between various levels of management and contractors such as client demographic information, document templates, personnel files, billing submissions. This system is HIPPA compliant and includes encryption. The Outlook © email system was used for communication between the researcher and participants. This system is also HIPPA compliant and included appropriate encryption. Once an employee submits billing to the system it is immediately processed, ready for review, and the hours are added to the employee's hours worked. After the end of the billing cycle for that week (midnight every Thursday varying on holidays or due to technical issues) the analyst receives payment, via a direct deposit system they setup approximately two weeks later. The company paid workers weekly. Billing submitted by midnight on a Thursday would be directly deposited in designated bank accounts the next Friday. The company in which recruitment took place used the SharePoint © system for employee billing.

## **Target Behavior and Data Collection**

The target behavior for this study was the percentage of *on-time billing* per week (see Appendix A for data sheet). On-time billing was defined as submitting billing for services within the billing week of the service session via the SharePoint © online system. This percentage was calculated by taking the number of on-time billed sessions and dividing by the total number of billed sessions and multiplying by 100%. Each session contributed to the percentage for the

billing week (Friday-Thursday). This percentage was graphed as a single data point for that week.

Due to HIPAA constraints, the researcher and or research assistants received de-identified screen shots sent from participants' SharePoint © portals. These screen shots detailed billing information for that participant such as sessions worked, number of hours worked, and whether the billing was complete for that session. The participants de-identified this information by removing any client identifiers themselves and forwarded the screen shots to the researcher through an encrypted email. The researcher then looked at the screenshot(s) for that week and calculated the percentage of on-time billing using the formula described above.

### **Inter-observer Agreement (IOA)**

IOA was collected by a research assistant in the same manner as the primary researcher throughout both baseline and intervention phases. The research assistant received the data sheets (Appendix A) and screen shots from the participants and calculated the percent of on-time billing per week in the same manner described previously. The researcher compared the number of sessions billed on-time and the number of sessions billed as collected by two independent observers. The smaller number over the larger number for each was then multiplied by 100 percent to determine the agreement percentage. If at any point in time agreement fell below 90%, the research assistants were retrained. IOA was calculated for 30% or 3 out of 10 weeks for Leslie's baseline and was at 100%. For Leslie's self-management condition IOA was calculated for 32% of weeks and was 100%, and for the self-management and reinforcement phase IOA was calculated for 36% of weeks and scored at 80%. Anne's baseline IOA was calculated for 32% of weeks and was at 100%, for the self-management phase IOA was calculated for 30% of weeks and was 100%, and for the self-management and reinforcement phase IOA was calculated



for 23% of weeks and scored at 100%. April's baseline IOA was calculated for 36% of weeks and scored at 100%, for the self-management phase IOA was calculated for 40% of weeks and scored at 100%, and for the self-management and reinforcement phase IOA was calculated for 18% of weeks and scored at 100%.

## **Experimental Design**

The experimental design for this study was a non-concurrent multiple baseline across participants.

## **Procedures**

### *Baseline and participant training*

First, a manager e-mailed flyers to all employees at a state-wide behavior analysis services company. If a behavior analyst was interested, he or she then contacted the researcher. The researcher discussed inclusion and exclusion criteria and ensured the participant was eligible. The participant continued work as usual with typical billing habits, providing behavior analysis services, etc. Eligible participants signed the informed consent forms and were instructed how to provide the researcher with baseline data.

The researcher then coordinated meetings and trained participants using a training checklist (Appendix C). The meetings for two participants were video-recorded to calculate treatment integrity of the training session. This meeting was completed either in-person or remotely using Skype or a similar application. The researcher first reviewed the data collection task analysis with the participant using Behavioral Skills Training (BST) to ensure they understood the procedure for providing the researcher with the data. Then, the researcher

provided the task analysis of taking de-identified screen shots of their hours for the previous three weeks (see Appendix D for Mac and Windows instructions for taking screenshots).

After training, the participant sent weekly screen shots of their billing log for as many weeks prior to the start of the study as they could until they no longer fit participant criteria, ex; the retroactive data was collected as far back as they had enough clients described in the inclusion criteria. Leslie was unable to retrieve all of the retroactive baseline data due to the SharePoint © system's limitations. For this reason, there are a few gaps in between weeks during baseline. Leslie's baseline data consisted of 7 retrospective data points and 3 standard baseline data points. The participant with the least number of possible retrospective data points determined the number of data points to include for all participants, which was Leslie at 7 weeks. This constituted at least part of baseline for each participant. For April, baseline consisted of 18 total weeks with 7 being retrospectively collected and 11 collected as standard baseline. Anne's baseline collection consisted of 16 weeks of retrospective data collection and 18 weeks of standard baseline. The researcher graphed the percentage of on-time billing for each participant weekly. If the participant failed to provide a screenshot to the researcher by Sunday at 11:55 PM, she was prompted by the researcher to forward the data and screen shots. Baseline continued for at least three or more weeks from the last retroactive data points and then the intervention was implemented in a staggered fashion dependent upon the data for the previous participant.

### Task clarification and self-management plus feedback

Once baseline data indicated the participant was ready to move to the intervention phase, the researcher conducted a pre-intervention checklist (See Appendix D). The first item included a task clarification piece in which the billing laws of the state, company policy, and BACB ethical codes were discussed to ensure the participant understood billing expectation standards. The researcher also discussed any barriers to completing billing on time and sought solutions to common and/or recurring problems such as failing to schedule a time to complete billing before it was due. The researcher provided suggestions such as billing templates or a scheduling system. The researcher asked the participant to create or choose a schedule and follow a printed checklist provided by the researcher for the self-management portion of the study (see Appendix E). The researcher instructed the participant how to fill out the checklist and to submit a copy to the researcher. The participants used this sheet to calculate the number of billable hours worked for a given pay period and the expected dollar amount to be deposited in their bank accounts.

In the initial interview, participants were instructed to setup a self-generated prompt for each week to submit their billing for the current week before the deadline (Thursdays at 11:59pm). The preferences of the participant determined the specifics of this prompt. However, only one, Leslie, of the three created the self-generated prompt. April and Anne relied on a text or email from the researcher as a prompt, which was less consistent due to researcher inconsistently providing the prompt. The text message prompt was typically sent to April and Anne on Thursday between 9am and 8pm. The prompt was setup as a “meeting” using the shared scheduling system, Outlook. The researcher created a meeting and invited April and Anne to “attend” and they were to accept the meeting for it to be a recurring event on their schedule. This would send a reminder to both the researcher and the participant that billing was due on the date

of the participants' choosing. The date was initially Tuesday evening for Anne and Thursday evening for April. Neither of these participants "agreed" to this meeting and after a text message prompt from the researcher, the participants said they preferred a text message on Thursday evening from the researcher as they did not have notifications for the Outlook scheduling system setup on their phones. On Fridays, the participants were asked to (1) take screenshots of their billing logs for the previous week ensuring client information was omitted and (2) forward both the data sheet (Appendix E) and the respective screen shot to the data collectors. In addition to the self-generated feedback of their performance in the form of the self-checklist (Appendix E), the author or RAs prompted the participants to make an evaluative statement about their performance for the most recent week as well as their overall performance. If this alone did not increase on-time billing to 90% or higher, or the data showed a decreasing trend the reinforcement phase was implemented.

### Reinforcement

If the participant failed to remain at or above criterion for three consecutive data points in the self-management and feedback phase, the researcher moved the participant to a reinforcement phase. This phase consisted of the self-management and feedback with an additional reinforcement component. At the beginning of the phase, the participant was told: successfully reaching 90% of sessions billed on time will result in the opportunity to participate in a lottery to earn a gift card. Any time a participant achieved 90% on-time billing for a given week, he or she would become eligible to earn a gift card ranging in value from \$5-20. The gift card amount was determined using a random probability generator in Excel with a 75% chance of earning \$5, a 24% chance of earning \$10, and a 1% chance of earning \$20. Participants were

told which amount of money they received via text message each week. Leslie earned \$85 during 14 weeks of the second phase of intervention, Anne earned \$75 throughout 22 weeks of intervention, and April earned \$45 during 13 weeks of intervention. Anne received a total of 11 instances of 5\$, and 2 instances of 10\$, and 0 instances of 20\$. Leslie earned 7 instances of 5\$, 5 instances of 10\$, and 0 instances of 20\$ dollars. April earned 3 instances of 5\$, 3 instances of 10\$, and 0 instances of 20\$. After the first instance of 10\$, all participants had a week of 0% on-time billing. All monetary funds were delivered at the end of the study.

### **Social Validity**

Social validity data were collected to evaluate the feasibility and likeability of the intervention by all participants. Participants were asked seven questions using a 1 to 5 Likert-type scale (See attached Appendix F). Participants were asked whether they enjoyed the self-management intervention, if they believed the intervention helped them complete billing on time more often, and if they planned on using the intervention to help them turn their billing on time in the future. Additionally, the end of the survey included an open-ended question to the participants about suggestions or recommendations.

### **Treatment Integrity**

Treatment integrity data was collected during training sessions for two of the three participants. Training sessions were video recorded, however, one participant declined to be recorded and thus treatment integrity data was unable to be collected for this participant. To score treatment integrity, a secondary observer had a copy of the training checklist (Appendix C) and watched the videos of the training sessions. The observer marked whether each step occurred on the training checklist. Treatment integrity was calculated by taking the total number of steps completed correctly and then dividing by the total number of steps and finally

multiplying the quotient by 100%. This occurred for all training sessions for April and Anne and integrity data was 100% for all sessions.

## **CHAPTER THREE:**

### **RESULTS**

Figure 1 shows the results of the study for all participants. All participants displayed variable responding in baseline ranging from 0-100% on-time billing. The participants mean scores during baseline were at 45.8%. In the self-management phase, participants continued having low percentages of on-time billing or remained variable. The participants mean score during the first intervention phase was 16.3% which was a decrease from baseline levels. In the second intervention phase of self-management with reinforcement, participants continued variable responding but there did appear to be an overall increase in on-time billing compared to both baseline and the first intervention phase with a mean score of 63.5%.

Leslie's on-time billing remained variable across baseline and most of the self-management intervention. Leslie's mean on-time billing during baseline was 61% with a range of 6-100%. Toward the end of the first intervention phase, self-management, Leslie began to bill no sessions on time and the reinforcement component was added. During the self-management phase, Leslie's mean was 46.3% with a range of 0-100%. With the addition of reinforcement, Leslie showed an increase in the level of responding with some variability. Her mean during the second phase of intervention was 85% with a range of 0-100%.

Anne showed variability throughout all of baseline with a mean of 18.8% and a range between 0-75%. Toward the end of baseline, her variability continued but her level dropped to zero for 3 weeks. In the first phase of intervention Anne's mean was at 2.5% with a range of 0-

12.5%. Once reinforcement was added, Anne's variability returned but her level appeared to increase from baseline with a mean of 58.6% and a range between 0-100%.

April responded variably throughout baseline and her mean was at 57.5% with a range of 0-100%. In the first phase of self-management alone, she showed a drop in responding to 0% across all sessions. In the second phase of intervention with reinforcement her mean increased to 46.2% (range = 0-100%), which was an improvement from the first phase of intervention but not an improvement from baseline levels.

Figure 2 shows the graphic representation of the social validity results. Participants all gave the highest rating (strongly agree) for questions 1 (the intervention was not disruptive to daily/weekly routine), 2 (the intervention would be acceptable for use by my superior), and 4 (the intervention did not encourage me to behavior unethically related to my billing practices). The mean score of these questions was 5. Participants rated a mean of 4.33 for question 3 (the intervention prompted me to manage my time more efficiently). Participants rated a mean of 4.66 for questions 5 (I can see this intervention working on a variety of people and settings) and question 6 (Overall the intervention was helpful to me). Participants rated a mean of 4.33 for question 7 (For the reinforcement phase, this practice is sustainable for my employer). It should be noted that the social validity did not differentiate between conditions.



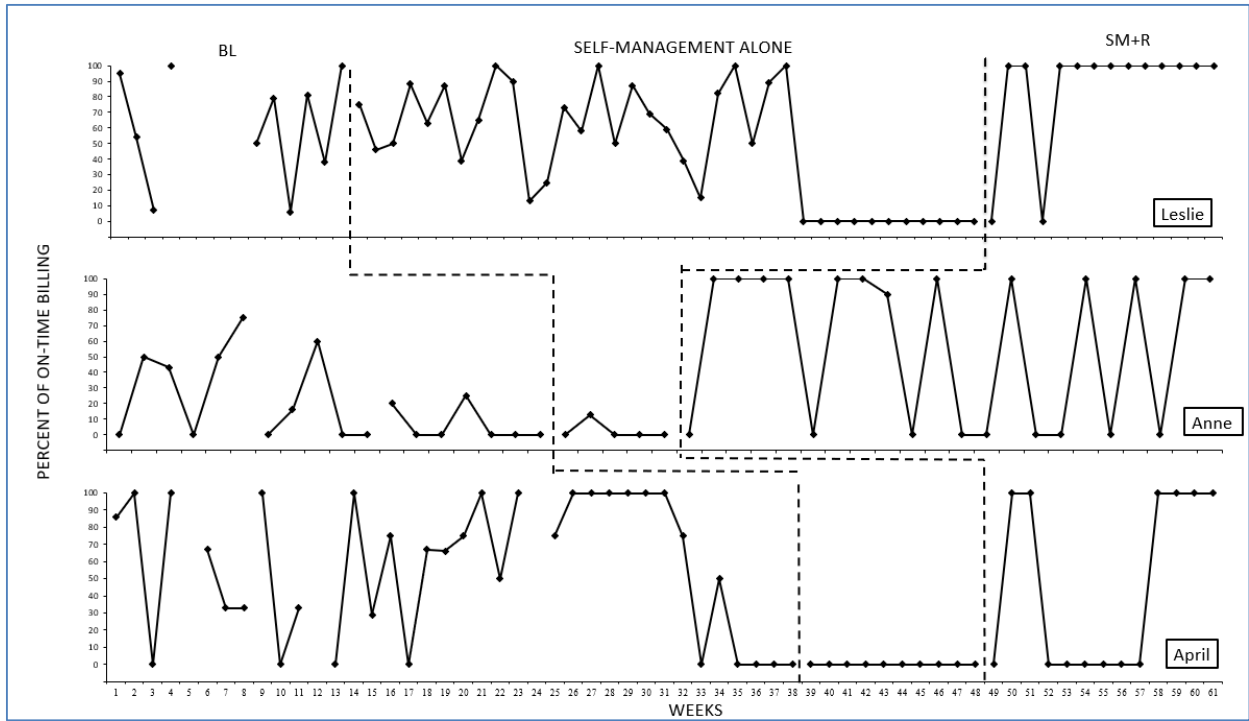


Figure 1. This figure displays the percentage of on-time billing for each participant across the three phases of the study.

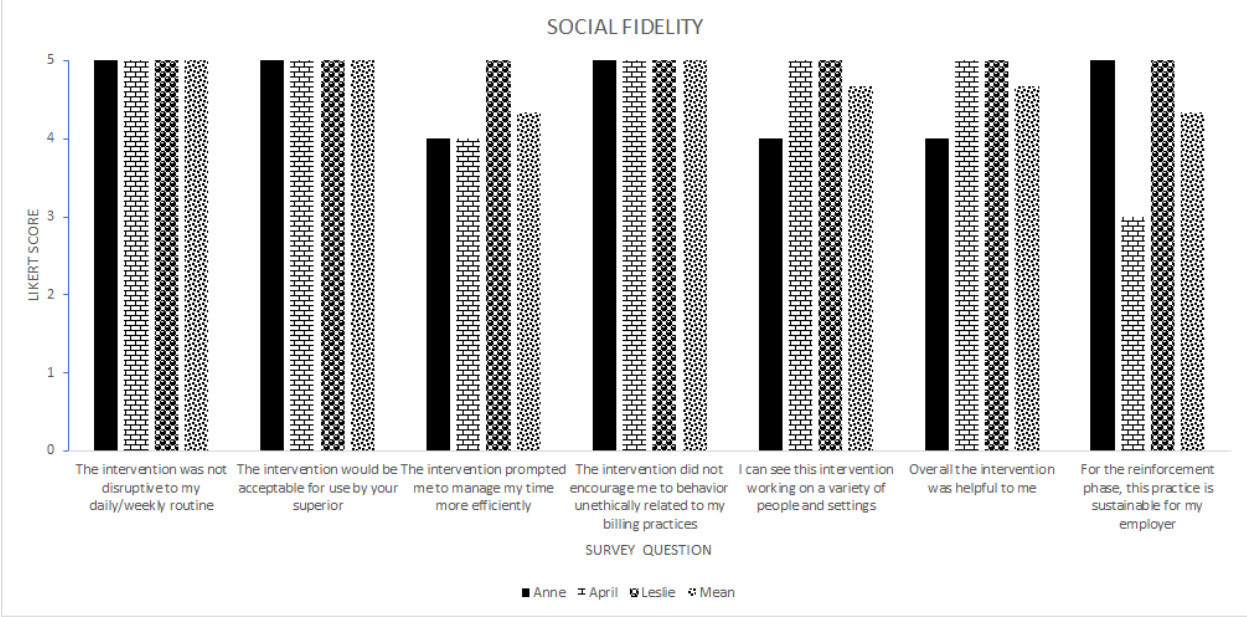


Figure 2. The scores for each of the social validity questions are represented for each participant and the mean across participants is displayed

## **CHAPTER FOUR:**

### **DISCUSSION**

The purpose of the present study was to determine the effects of self-management to increase the on-time billing of behavior analysis professionals. This study also added a reinforcement component to self-management to determine the combined effects of self-management plus reinforcement. The first intervention, self-management plus feedback did not appear to increase on-time billing for any of the participants. Although Leslie showed an increase in level it was not maintained throughout the phase and eventually returned to low levels. With the addition of reinforcement, both April and Anne showed variable responding but demonstrated an increase in level from the first intervention. For Leslie, the addition of reinforcement appeared to be more consistent, responding at 100% on-time billing with the exception of two data points.

Typically, self-management follows an established reinforcement protocol and fades the reinforcement component over time (Conrad, Johnson, Morrison, & Ditzian, 2016). However, for this study we were interested in determining if self-management would be helpful in improving on-time billing given the limited resources that companies may have to provide oversight and incentives for billing. Unfortunately, the lack of responding during the self-management intervention seemed to indicate it was not effective at increasing on-time billing. The addition of the reinforcement component appeared to achieve improved responding for two

participants from baseline. This might suggest that companies/future researchers determine how to make reinforcement more consistently produce desired responding before fading.

A variable that may have contributed to some sessions being billed on-time may have been supervisory sessions. All participants supervised registered behavior technicians (RBTs) and/or BCaBAs and BCBAs. Due to company policy, and an embedded feature of the SharePoint © system, for a supervisee to bill for a session while the supervisor was present, the supervisor must bill first. The participants may have been reminded by their supervisees to bill for those supervisory session which could be an additional variable that may have led to increases in on-time billing for some weeks.

While participants were instructed on how to use the self-management component of the intervention, often participants did not complete and turn in the self-management data sheet. This indicates that participants most likely did not consistently utilize the self-management sheet as it required several extra steps in addition to sending in the screen shots. Increasing the response effort of billing and reporting billing to the researcher may have contributed to a lack of responding and a lack of buy-in from the participants. Participants experienced no new consequences for turning in billing on-time during the self-management intervention. One might assume that getting paid would be a sufficient consequence for submitting billing on time regularly. However, participants may have been relying on other sources of income such as other jobs like Anne and April, income from a significant other, or turning in billing technically late but consistently enough that the delay did not affect finances.

One limitation of this study might have been that the researcher was an outside individual rather than someone acting in an official capacity such as a manager or supervisor. Therefore, participants had someone outside of their company paying attention to their billing and on a

different schedule than they were typically accustomed. This may be a variable that contributed to more on-time billing for some participants. This might be corrected in the future by having an existing manager execute the intervention under the guidance of the researcher. Further, a logistical limitation involved the screen shots of billing notes. In this study it was a HIPPA concern allowing the researcher to have direct access to the participants' billing logs. This forced the researcher to wait for the participants to create and send de-identified screen shots for checking the fidelity of the participants' billing. Had the fidelity of the participants' self-reported data been measured directly by a manager using the SharePoint © system and been recorded in real-time, the interventions may have shown less variability as immediate feedback could have been provided more systematically. Further, there may have been a social desirability effect on the responding of the participants. As the participants were behavior analysts, they were familiar with the process of writing/conducting a thesis and this may have produced a motivating operation that would not ordinarily be present. Additionally, there may not have been an establishing operation created for on-time billing as the participants were still receiving their money from late billing even though they were not receiving additional money for billing on-time.

To summarize, the use of self-management for the task of turning billing in on-time may need to be paired with additional behavior specific reinforcement for it to be effective. Further, exploring other reinforcement packages other than a lottery system might be an option for future research. One might use a reinforcement system that uses the percentage of on-time billing to receive a proportionally higher amount of money versus late billing which would receive a smaller percentage. In this system, a response cost would be created for submitting late billing. Preference assessments for the type of self-management tool might also be considered. The self-

management tool provided by the researcher was used by all participants and did not involve any customization from each participant although they were asked during initial training about specific barriers. Perhaps if the self-management form was individualized, participants may have been more likely to use the form and find it helpful for billing purposes. Future research might also examine how to develop billing methods that might involve less response effort on employees and systems that provide immediate feedback and additional reinforcement for on-time billing.

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**APPENDIX A:**  
**DV DATA SHEET**

**Participant** \_\_\_\_\_

**Instructions:** Use the Thursday of the pay period being collected as the “week of” date. The pay period starts on the following Friday. The number of billed hours for the week will be placed in column 2. The number of ON-TIME billed hours for the same week will be placed in column 3. The percent of sessions billed on time will be calculated by dividing the number of billed sessions by the number of billable sessions and multiplied by 100% to input the percentage in column 4.

<u>Date Collected/ Week of</u>	<u># of Billed Hours</u>	<u># on-time hours billed</u>	<u>Percent of On-Time Sessions</u>



**APPENDIX C:**

**TASK CLARIFICATION INTERVIEW CHECKLIST**

**Participant** \_\_\_\_\_

**Implementer** \_\_\_\_\_

**Instructions:** Complete this interview checklist with the participant at the completion of baseline immediately before the start of the intervention.

	<u>Discussed Barriers to on-time billing</u>	<u>Client Billing Templates</u>	<u>Scheduling System Discussed</u>	<u>Explanation of Law, BACB ethics, PBS Corp Rules</u>	<u>Prompt Schedule created</u>
<u>Sign and Date</u>					
<u>Record any anecdotal Information</u>					

**APPENDIX D:**  
**SCREEN SHOT TASK ANALYSIS**

At a Microsoft Windows 7 or higher:

1. Turn the computer on
2. Open respective web browser
3. Input to the company portal site in the URL browser
4. Log in with your respective information
5. Click on the “My hours” tab on the left hand side of the user interface
6. Scroll down and make sure the hours for which you are submitting are in view on your screen
7. Open the “easy capture manager” or simply hit the “prt sc” button on your keyboard
8. Click on the “capture screen button” on the easy capture manager window
9. Using the mouse or trackpad to move the cursor: click and hold the left mouse button on the point of your screen that is directly above and to the left of the area of the screen you wish to capture
10. Make sure client names and PPI are not included in the screen shot
11. Drag the cursor down and toward the right of the screen ensuring that you create a shaded box including all the information to the right of the client names and PPI
12. Release the left mouse button
13. A drop down menu will appear at the cursor upon release
14. Select “print” option

15. Under the print window if it is not already selected change the printer to “Save as PDF”
16. Open your encrypted email server and send an email to the researcher with the PDF attached

#### Mac

1. Turn the computer on
2. Open respective web browser
3. Input to the company portal site in the URL browser
4. Log in with your respective information
5. Click on the “My hours” tab on the left hand side of the user interface
6. Scroll down and make sure the hours for which you are submitting are in view on your screen
7. Press Shift-Command-4. The pointer changes to a crosshair. Click on the “capture screen button” on the easy capture manager window
8. Using the mouse or trackpad to move the cursor: click and hold the left mouse button on the point of your screen that is directly above and to the left of the area of the screen you wish to capture
9. Make sure client names and PPI are not included in the screen shot
10. Drag the cursor down and toward the right of the screen ensuring that you create a shaded box including all the information to the right of the client names and PPI
11. Release the mouse button
- 12.** Find the screenshot on your desktop or the location you may have already set to send all screenshots
- 13.** Open your encrypted email server and send an email to the researcher with the screenshot attachment

**APPENDIX E:**

**SELF-MANAGEMENT CHECKLIST**

**Participant** \_\_\_\_\_

**Instructions:** Please complete this data sheet throughout the pay-period. Scan or take a picture of this and forward to data collectors. Column 2 will be the time and day the participant planned to complete his or her billing. Column 3 will be filled as the hours worked for this pay period. The projected dollar amount of column 4 will be a rough calculation for the participant to show how much they are predicated to make from billing all hours for that pay period. The payment due date can be found on the Sharepoint system that indicates when the funds will be deposited in the account of the participant. The final column can be used to indicate how many sessions are left to be billed for that pay period.

<u>Pay Period</u>	<u>Indicate planned day and time for billing</u>	<u>Hours Worked this Week</u>	<u>Hours Billed</u>	<u>Projected Dollar Amount</u>	<u>Payment Due Date</u>	<u>Sessions not yet billed</u>

**APPENDIX F:**  
**SOCIAL VALIDITY**

**Instructions:** Complete this survey at the end of the study. Using the scale below, please circle the number that best represents your answer to the question.

*Scale 1= Strongly Disagree 2=Disagree 3= No opinion 4=Agree 5=Strongly Agree OR  
N/A=Not applicable*

The intervention was not disruptive to your daily/weekly routine	1 2 3 4 5 N/A
The intervention would be acceptable for use by your superior	1 2 3 4 5 N/A
The intervention prompted me to manage my time more efficiently	1 2 3 4 5 N/A
The intervention did not encourage me to behave unethically related to my billing practices	1 2 3 4 5 N/A
I can see this intervention working on a variety of people and settings	1 2 3 4 5 N/A
Overall the intervention was helpful to me	1 2 3 4 5 N/A
(For reinforcement phase) This practice is sustainable for my employer	1 2 3 4 5 N/A
Suggestions for improvement/other comments:	

**APPENDIX G:**

**RESEARCHER PROCEDURES**

**Participant** \_\_\_\_\_ **Implementer** \_\_\_\_\_ **2<sup>nd</sup>** \_\_\_\_\_

**Instructions:** Use this data sheet for implementers when reviewing the procedures with participants each week (Sun-Thur). Initial and date for each column.

<u>Pay Period</u>	<u>Weekly Prompt Provided?</u>	<u>Projected Hours</u>	<u>Screen Shot Collected</u>	<u>Accumulated Hours</u>	<u>Projected Dollar Amount calculated</u>	<u>Evaluative Statement Made (Ex. "Good job")</u>



**APPENDIX H:**

**VERIFYING HOURS DATA SHEET**

**Participant** \_\_\_\_\_

**Instructions:** Use this data sheet to ensure participant’s reported total hours are correct. The hours from the participant data sheet should be compared to the screen shots they have provided. Tabulate the hours from the screen shots in the observed billing report column. If there was a discrepancy, simply indicate yes or no.

<u>Week of</u>	<u>Participant Billing Report</u>	<u>Observed Billing Report</u>	<u>Discrepancy (Yes/no)</u>	<u>Initials</u>