Using private blog sites to collect interobserver agreement and treatment integrity data

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ABSTRACT

Single subject research places an emphasis on extended data collection for interobserver agreement and treatment integrity; however, distributed research teams make this effort difficult. If researchers live too far apart, the opportunity to collectively take data on interobserver agreement and treatment integrity poses a challenge. In this study, private blog sites were utilized to minimize travel distance and distributed research team variables during data collection practices. The use of private blog sites as a technological modality allowed video to be feasibly reviewed throughout the study (i.e., researchers viewed a video from home as opposed to, driving lengthy distances) while offering a superior option in contrast to traditional in vivo practices.

KEYWORDS: interobserver agreement, treatment integrity, behavioral interventions, data collection, research teams, technology

INTEROBSERVER AGREEMENT (IOA) AND treatment integrity are essential components of single subject research. Interobserver agreement refers to the extent that two independent observers are consistent in their reporting of behavioral measurements (Cooper, Heron, & Heward, 2007); while treatment integrity is defined as the degree to which an intervention is implemented as planned (Armstrong, Ehrhardt, Cool, & Poling, 1997) and is essentially a reliability measure of the independent variable (Lane, Bocian, MacMillan, & Gresham, 2004). Behavioral research is vulnerable to violations of treatment integrity (Salend, 1984) with low integrity levels indicating that the treatment being implemented is different or inconsistent from the original intention (Gresham, 2005). Low integrity levels have been noted to decrease intervention effects (Fiske, 2008), thus, justifying the importance of evaluating treatment integrity in educational and residential treatment settings, where many behavior analysts are employed. Further, Vollmer and colleagues (2008) have articulated that failure to reliably collect IOA and treatment integrity measures can be a hazardous practice considering that critical decisions are made for clients based off of reported data. Accuracy in IOA and treatment integrity data is imperative in effort to maximize the decision making process during behavioral treatment (Vollmer et al., 2008).

While single subject research places an emphasis on extended data collection for IOA (i.e., with suggestions of collecting IOA for a range of 25–33% of all sessions) and treatment integrity (i.e., with suggestions indicating these measurements should occur at least as often as those devoted to IOA; Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000; Kennedy, 2005; McIntyre, Gresham, DiGennaro, & Reed, 2007); numerous variables may hinder efforts to collect such data in *practice*. For instance, distributed research teams (i.e., researchers separated by geography) may not always have the flexibility, time, or resources to be present throughout the data collection process. If researchers live too far apart and have travel distance as an impending variable, the opportunity to collectively take data on IOA and treatment integrity is challenging. In addition, research teams may struggle with scheduling conflicts and having staff available on-site for in vivo data collection.

When considering the data collection process for researchers, reactivity issues (i.e., the practitioner being observed is aware of the observer's presence; Craig, 2010; Kazdin, 2001) can potentially inflate the traditional levels of practitioner integrity (Fiske, 2008). Direct observation is one of the most frequently reported methods of treatment integrity measurement; however, direct observation is time consuming (Gresham, 1989) and considering the concern with reactivity, can display an unrepresentative depiction of practitioner behavior. By contrast, video cameras can be a continuous presence in the classroom, reducing reactivity for both students and teachers. Additionally, every data collection session can be videotaped without the teacher knowing which sessions will be used to assess IOA and treatment integrity. Thus, inconspicuous observations via video records and private blog sites may serve to reduce reactivity while promoting accuracy in the measurement of treatment integrity.

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Table 1. Treatment integrity questions and percentages

Treatment integrity questions	Average percent of treatment integrity for Cole	Average percent of treatment integrity for Rachael
1) Did the practitioner give the participant a choice of two preferred items at the onset of the activity?	100%	100%
2) Did the practitioner preview the work tasks in a "First__then" format?	95%	95%
3) Did the practitioner keep the token economy in clear view throughout the entire session?	100%	95%
4) Did the practitioner keep the visual timer within clear view throughout the session?	100%	100%
5) When the timer was exhausted, did the practitioner immediately (within three seconds) give defined praise accompanied with the token?	100%	86%
6) If the participant displayed a target behavior, did the practitioner immediately reset the timer?	84%	86%
7) If the participant displayed high rates of the target behavior, did the practitioner turn the timer in effort to temporarily remove the intervention?	100%	95%

In effort to strengthen opportunities for IOA and treatment integrity data collection, technological advances (i.e., asynchronous collaborative technologies; Cemile Serce et al., 2011) offer additional modalities beyond that of traditional observation practices. To minimize travel, scheduling, and reactivity concerns while encouraging distributed research team participation, private blog sites (i.e., ones accessible only to individuals specifically invited to view them) may be integrated into data collection practices. Technology offers a superior alternative to obtrusive data collection practices and has the potential to be more cost and time effective than in vivo observation. The use of private blog sites can increase the number of sessions in which researchers can assess IOA and treatment integrity, resulting in more reliable measures overall. The current study evaluated the role of private blog sites in supporting data collection practices during a differential reinforcement of other behaviors (DRO) treatment package. The rationale for using private blogs was that distance barriers and time conflicts would be minimized (Burnett, 2003); therefore supporting IOA and treatment integrity data collection.

» METHOD

Participants

Two children with an autism diagnosis were identified from a sample of students in a public school classroom for students with multiple disabilities. Participants were identified according to the following criteria: (a) a professional diagnosis of autism based upon the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000), (b) attendance in the classroom for students with multiple disabilities, (c) a current age between eight and nine, (d) and exhibited target behaviors that disrupted or halted the learning process for themselves or others in the classroom setting. Cole was a nine-year-old boy whose target behaviors included inappropriate vocalizations (e.g., "Ba! Ba!"), hair picking, and inappropriate breathing (i.e., blowing from mouth up into his nose or breathing into a cupped hand). Rachael was an eight-year-old girl whose target behaviors included inappropriate vocalizations (e.g., whistling, guttural sounds), hand movements (i.e., up and down, side to side, cupped, or whole hand movement), and scratching classroom materials (i.e., fingers sweep across a surface with the palm facing upwards). For both children, behaviors created social stigmas and impeded their integration with peers (e.g., Cole had gastrointestinal issues and thrush which resulted in a potent smelling breath and for Rachael, service providers in the school had expressed frustration when she harmed their classroom materials via scratching).

Two classroom educational assistants implemented the intervention. One assistant had eighteen years of experience working with students with disabilities and the other had four years of experience. The lead researcher was a doctoral candidate and the research assistant was a graduate student. Both were attending a local university for special education coursework.

Procedure

Treatment integrity sessions. Each child participated in three experimental conditions: baseline, a DRO treatment package, and maintenance. The lead researcher and research assistant were responsible for treatment integrity and IOA data collection throughout all experimental conditions. Prior to beginning the study and once per week throughout, treatment integrity training sessions were provided to classroom staff by the lead researcher. Training sessions included: (a) development and review of operational definitions for each target behavior; (b) discussion and role play of target behaviors; (c) observation and data collection via digital video recordings; and (d) positive and corrective feedback on specific treatment integrity questions (DiGennaro, Martens, & Kleinmann, 2007). The educational assistants viewed video recordings together once per week with the lead researcher and research assistant. During this time, each educational assistant would identify yes or no on the treatment integrity sheet. If components of intervention implementation were below 100%, researchers would provide descriptive feedback with suggestions for how to improve the intervention.

Digital video recording. At the same time as treatment integrity practices, digital video recording with a Canon© ZR950 took place for interobserver agreement training purposes. To begin, the lead researcher and research assistant (i.e., researchers) defined the video recording area by affixing masking tape to the floor as location markers for the student and camera placement, thus assuring consistency in viewing angle and video area. To ensure that researchers gathered data from the exact same video segment, educational assistants were instructed to begin a timer and say

the word "Go" to indicate the beginning of the session. Each ten minute observation period was concluded with an auditory beep and the classroom staff's instruction "Stop." This ensured that observations began and ended at the same time.

Digital video recording occurred once per day for both participants. The lead researcher used iMovie©, Apple's video editing software to create ten minute video clips and posted the clips to private and free Google© blog sites (i.e., each participant had a personal site). Consent for the video recording was obtained from educational assistants and the parents of the participants. Individual blogs were created using www.blogger.com and privacy was assured by setting the blog so only invited users (e.g., classroom staff, researchers, and parents) had access to the blog. Invited users were required to create a password prior to obtaining access. The researchers could then log into the private blog sites at a convenient time and independently review the digital video to record the behavioral frequencies. Interobserver agreement was determined by simple agreement (e.g.: small number of occurrences ÷ large number of occurrences × 100 = %) throughout training, baseline, intervention, and maintenance conditions. Baseline data collection began after the researchers had obtained at least 95% agreement during training across all behaviors for each participant.

Basic rotation schedule. Sessions were recorded daily using the video camera. The constant presence of the camera allowed staff and students to habituate to its presence, thereby reducing the likelihood of reactivity. Further, researchers set a basic rotation schedule to ensure that IOA data was collected on Monday, Wednesday, Friday, and then Tuesday and Thursday of the following week. By contrast, treatment integrity data was collected on an opposing rotation schedule (e.g., Tuesday and Thursday of the first week and continually alternating). By applying the basic rotation schedule, data was collected on IOA and treatment integrity on an every other day cycle.

» RESULTS

Interobserver agreement

During the baseline condition, IOA was assessed for 64% of sessions for both Cole and Rachael. During the intervention condition, IOA was assessed for 84% of the sessions for Cole and 70% of the sessions for Rachael. During the maintenance condition, IOA was assessed 66% of the sessions for Cole and 100% of the sessions for Rachael. Observer's records were compared and mean agreement for Cole was 92% during baseline, 96% during intervention, and 93% during maintenance. For Rachael, observer's records were compared and mean agreement was 94% during baseline, 96% during intervention, and 89% during maintenance. During the maintenance phase for Rachael, slight deviations in recordings took place (i.e., the lead researcher recorded three occurrences of inappropriate vocalizations while the research assistant recorded two occurrences of inappropriate vocalizations), which resulted in a deflation in agreement scores. In addition, simple agreement calculations were applied throughout this study. In future applications, a more rigorous method for calculating agreement should be used (e.g., interval-by-interval or exact agreement; Vollmer et al., 2008).

Treatment integrity

In regards to treatment integrity, 44% of observation sessions were evaluated for Cole and 52% of observation sessions for Rachael. Although a basic rotation schedule was used, private blog sites allowed for increased access to video recordings; therefore, increasing the percentage of sessions measured for IOA and treatment integrity. By contrast, a limitation occurred when the research assistant's computer crashed, resulting in a lower percentage of treatment integrity observation sessions for Cole. Although 21st century technology presents an advantage to direct observation practices, technological reliability can present an entirely different problem.

Data collection

In the present study, private blog sites facilitated IOA data collection for greater than the 20 to 33 percent range that is generally recommended (Kennedy, 2005) and also, enabled data collection on treatment integrity. The use of the private blog sites made it feasible for researchers who were distributed geographically to access the data, resulting in increased feedback to staff members and improved precision of treatment implementation. The digital video also made it possible for observers to view clips at their leisure, and as many times as necessary in order to collect accurate information.

Behavioral interventions in school facilities can be maximized when behaviors are well defined and when training and support are provided to classroom staff members (Steege, Davin, & Hathaway, 2001). The convenience and accessibility of digital video on private blog sites allowed for performance feedback to be delivered weekly to classroom staff. This addresses suggestions from previous work that indicates that weekly feedback meetings are important to help maintain adherence in intervention protocols (Eikeseth, 2001). High levels of treatment integrity have been found to facilitate better intervention outcomes than low levels of treatment integrity (Rhymer, Evans-Hampton, McCurdy, & Watson, 2002). In fact, skills can be mastered more quickly when treatment is implemented with increased integrity (Wilder, Atwell, & Wine, 2006).

» DISCUSSION

Ethics and privacy

When considering the use of blog sites to post video of students and clients, researchers and practitioners must be cognizant of obtaining informed consent and also, of maintaining privacy throughout the process. Parents and caregivers should be provided with a consent form explaining the purpose, risks, and benefits of the video and specification that the video will only be viewed by classroom staff and the research team. Permissions must be obtained from the family prior to moving forward with the video and blogging process. In addition, research team members should hold a briefing on ethical practices and how to consistently maintain confidentiality. The meeting should conclude with research team members signing a non-disclosure agreement indicating that video recorded and viewed will not be discussed and that names will be withheld. This visibility from the onset ensures that the family and research team alike, have a solid understanding of the intent of the video and also, that all parties are clear on the expectations for ensuring strong standards of privacy.

Technology

Process of blogging. When beginning the process of blogging, the lead researcher is most frequently delineated the responsibility of blog administrator which includes setting up the blog and distributing invitations to potential members on the site. The blog administrator must ensure that the blog is on a private setting and by invitation only. After electronic invitations have been sent from the blog site to individual email addresses, members create a password and use the password for log in. When put to a private setting, the site will remain secure to members while inaccessible to others that have not been invited.

After the blog site is established, one or two research team members are typically responsible for visiting the location and video recording. With the ease of recent technologies such as smart phones and iPads©, taking video is simplistic and can be effortlessly stored by emailing to oneself and then saving the file to a flash drive. Research team members can then begin posting video directly to the blog site by uploading the video file. The blog administrator should remain the person responsible for accepting new video posts on the blog to ensure that the posts are relevant and of high quality. This blog administrator should consistently maintain control over the ethical nature of the blog.

Convenience. Posting digital video records onto private blog sites maintains security of video while producing permanent products that can be accessed at any time and from any place for data collection purposes. Communication tools such as blog sites avoid the need for researchers to be present for data collection to occur; rather, researchers can post information to team members whenever they are available (Cemile Serce et al., 2011). Past research has suggested that data monitoring should be parsimonious (Vollmer et al., 2008) and with this in mind, collaborative technologies such as blog sites facilitate the simplicity and efficiency by which researchers view and monitor data. An additional consideration is that digital video is both easily managed and avoids problems associated with video tapes (i.e., video tape can stretch and jeopardize the accuracy of data). Using digital video both eliminates this potential for error and permits distal data recording.

Advantages and future directions. Video blogs have become a normalized alternative to the conventional days of working around research team member schedules and then driving lengthy distances to a meeting location. Technology offers an advantage that saves on time while simultaneously producing a real time video product that can be viewed effortlessly. In terms of future directions, research should evaluate the use of video blogs as a technological training tool for families. In this study, parents anecdotally reported being more at ease with applying intervention procedures as a result of viewing daily video of their child. Researchers should assess the use of video blogs for families who need support and modeling in the application of evidence-based practices. This continuity in service delivery from a school or clinical location to the home setting could substantially expedite student progress when all parties are working together. More and more, the use of video is playing a critical role in supporting collaborative efforts to facilitate student progress (Pearson, Chambers, & Hall, 2003).

This exploratory study suggests that the use of 21st century technology (i.e., private blog sites) can be easily used to enable data collection by geographically separated researchers and by researchers with scheduling conflicts. Future research should replicate the effectiveness of this technological modality as well as address potential differential results of in vivo data collection and that from digital video. This study shows that having access to digital video supported the ease of data collection while allowing for systematic evaluation of IOA and treatment integrity during a behavioral intervention. Technological advances present an improvement from current practice in that, researchers can stay home to access their work as opposed to driving lengthy distances and working around scheduling challenges. Using digital video via private blog sites offers a practical and time saving venue in which research can be easily accessed and viewed without sacrificing accuracy of the data. ∎

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