Skype™ as an Observation Tool in Functional Analysis

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Problem

A 14 year-old male, who was enrolled in one of our special education non-public schools, displayed severe aggressive behaviors, including assaulting staff members and destroying valuable property. He was functioning at a pre-academic level and displayed only rudimentary verbal skills.

Our initial observations revealed that his problem behavior episodes were characterized by an escalation cycle (e.g., Colvin, 2004), which began with grunting, growling, showing his teeth, snarling, shaking, and minor property destruction (e.g., tearing papers) that reliably predicted he would engage in more severe property destruction and become assaultive. The student was exceptionally strong and was observed on more than one occasion to lift a large horseshoe-shaped table to the ceiling of the classroom.

We also observed that his problem behavior was more frequent in the presence of certain staff members and virtually nonexistent in the presence of others. This differentiated responding suggested that his problem behavior functioned to escape the presence of certain staff members. However, because the severity of his problem behavior frequently brought the attention of numerous staff members who might be needed to perform an emergency intervention, we were unable to rule out attention as a controlling consequence. Also, because problem behavior inevitably interrupted lessons or transition between lessons, we were not able to rule out task avoidance as the controlling consequence.

Functional Analysis

In our attempt to clarify the controlling function of our student's problem behavior, we conducted a Functional Analysis (e.g., Iwata, Dorsey, Slifer, Bauman, & Richman, 1994) according to a multi-element design that included four conditions as follows: a "task avoidance" condition, an "attention" condition, an "ignore" condition, and a "social escape" condition. A partial reversal design (ABA) was also implemented for this last condition.

Conditions were run in random order with the restriction that the same condition could not be run more than two times in succession. Each function was tested in an assigned, specific classroom unique to the condition being run in order to facilitate discrimination among conditions. Each session was conducted by one

of the student's teachers. No other students or staff members were in the room during sessions. Sessions were conducted for five minutes each.

Because the student's problem behavior escalation was highly predictable, we were able to perform the proscribed contingency for each condition at the onset of the earliest topography in his escalation cycle, typically grunting or growling. Our strategy was to preclude, if at all possible, the severest forms of his problem behavior.

Finally, all sessions were videotaped so that they could be reviewed later to evaluate how well the proscribed treatment was performed by the teacher and to provide for inter-observer reliability of the student's problem behavior.

"Task avoidance" condition.-- During the task avoidance condition, the teacher and student were seated across a table from each other. The teacher, who was chosen from those staff members in whose presence the student seldom displayed problem behavior, instructed the student to perform a variety of pre-academic and nonacademic tasks that we had reason to believe were difficult for him. Tasks were presented at a minimum rate of 1 every 15 seconds. At the onset of problem behavior, the teacher was to withdraw the task, making no comment or expression. For tasks that involved materials, the teacher was to take the materials and turn away from the student. If no materials were involved, the teacher was merely to turn away. Five seconds after problem behavior ceased, the teacher was to re-orient to the student and give a different instruction.

"Attention" condition.—During the attention condition, the teacher and the student sat across the table from each other and the student was told, "Here are some things for you to do, I have some work to do." The teacher, who was different from the teacher in the Task Avoidance condition but was also one of the teachers in whose presence the student seldom displayed problem behavior, engaged in her own computer work. As a result, the student was permitted to engage in a variety of activities that we had reason to believe were not especially valued by him but they were not tasks he was likely to avoid either. In this condition, the teacher was to ignore the student unless and until he emitted problem behavior. If ever he did emit the problem behavior, the teacher was to make a statement of concern (e.g., "Why are you grunting like that?" "Why are you doing that?" "Are you okay?" "You seem upset"). If the student responded to the teacher's statement with another instance of problem behavior, the teacher was to make yet another, but different disapproval statement. This scenario was to continue until problem behavior either ceased or became sufficiently severe so that the session needed to be terminated.

"Social Escape" Condition.—During the social escape condition, the student was brought into the room and invited to engage in an activity that we had

reason to believe was of moderate value to him. The teacher who brought him to the room then left and a few seconds later, a teacher, who was among those in whose presence the student had displayed problem behavior, entered the classroom and spoke to him (saying, e.g., "Hello," "How are you?" "What are you up to?") at a minimum rate of one statement every 15 seconds, thereby attending to him non-contingently. At the onset of problem behavior, the teacher was to leave the classroom, making no comment or expression. When the student's behavior returned to comparative calm, the teacher was to wait five seconds, re-enter the classroom, and begin another trial by addressing him in ways similar to the previous trial.

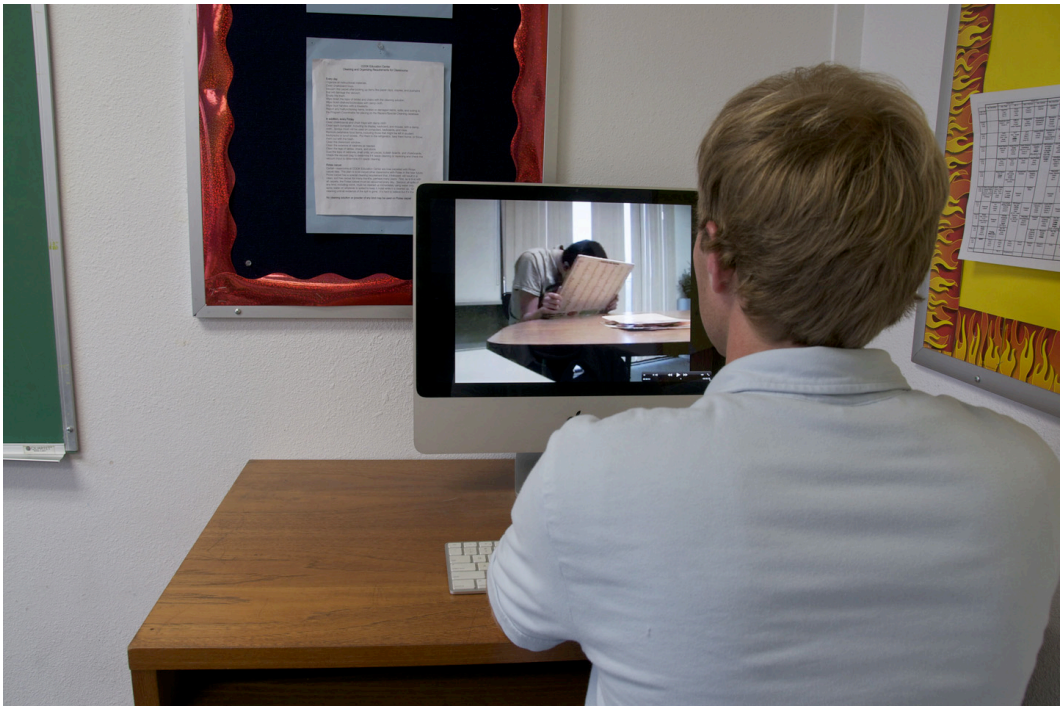
As mentioned above, the Social Escape condition was run in a partial reversal design. During the first three Social Escape sessions, the teacher was an individual we had reason to believe was not preferred by the student. The student had not been known to approach this teacher and he had assaulted her previously. During the subsequent three Social Escape sessions, the teacher was believed to be preferred. The student had no history of assaulting this person and he had been observed to reliably approach this person for instruction. Following 3 sessions with a preferred staff member, three more sessions with the non-preferred staff member were to be conducted (ABA design).

Observation problem.--The Social Escape condition presented us with a double observation problem. First, we needed to observe the student in case his problem behavior escalated to the point that emergency measures were necessitated and second, we needed to observe him so that we could determine when it was appropriate to start the next trial of the session. Having a second person in the room ran the risk of overriding or masking the contingency. Viewing the student through the classroom window had a different problem. Because the window permits two-way viewing, the person observing could easily be seen by the student. Fortunately, all of our classrooms have computers and nearly all of them have built-in cameras. The possibility occurred to us that we could use the computer's camera to observe the student but we needed a way for the image to be transmitted in real time to a viewer in an adjoining room. The use of Skype™, the Internet's audio/video communication application, then occurred to us.

Skype™ as a solution.--To implement audio/video viewing of the student by way of Skype™, we set up the computer in the room with the student so that the camera was able to capture his image wherever he was in the room. We booted Skype™ on that machine and "called" the machine in the adjoining, observation room. We then minimized the viewing window (clicked the video display option off for that machine) and we also turned off the computer's audio. Then we removed the mouse and keyboard, so the student had no way to operate the machine. Because computers are such an ordinary feature in this student's

school, we had no reason to believe that he would turn it off or pull its electrical plug. Also, the topography of the student's problem behaviors did not include destroying classroom computers. What he saw is displayed in the image below.

The computer in the observation room was set up to display the Skype™ image on the full screen and the audio was turned up so that we could easily hear his grumblings. What we saw is displayed in the image below.



"Ignore" Condition.—For the "Ignore" condition, the student was brought to the room and invited to engage in an activity we had reason to believe was at least of moderate value to him. The teacher then left saying that she would return in a little while. The student was alone in the classroom for the remainder of the session and he was observed via Skype™ as described above. This condition was implemented as a control, because our previous observations suggested that without any task demands or individuals in the environment, aggressive behavior involving severe property destruction would not occur.

Results of Functional Analysis

Figure 1 shows the results of the Functional Analysis as a rate of problem behavior responding per minute. Notice that, although we intended to conduct three final sessions with the non-preferred teacher, we only conducted one session. The reason is that the student's problem behavior became ever more intense and the teacher's safety dictated that additional sessions were unwarranted.

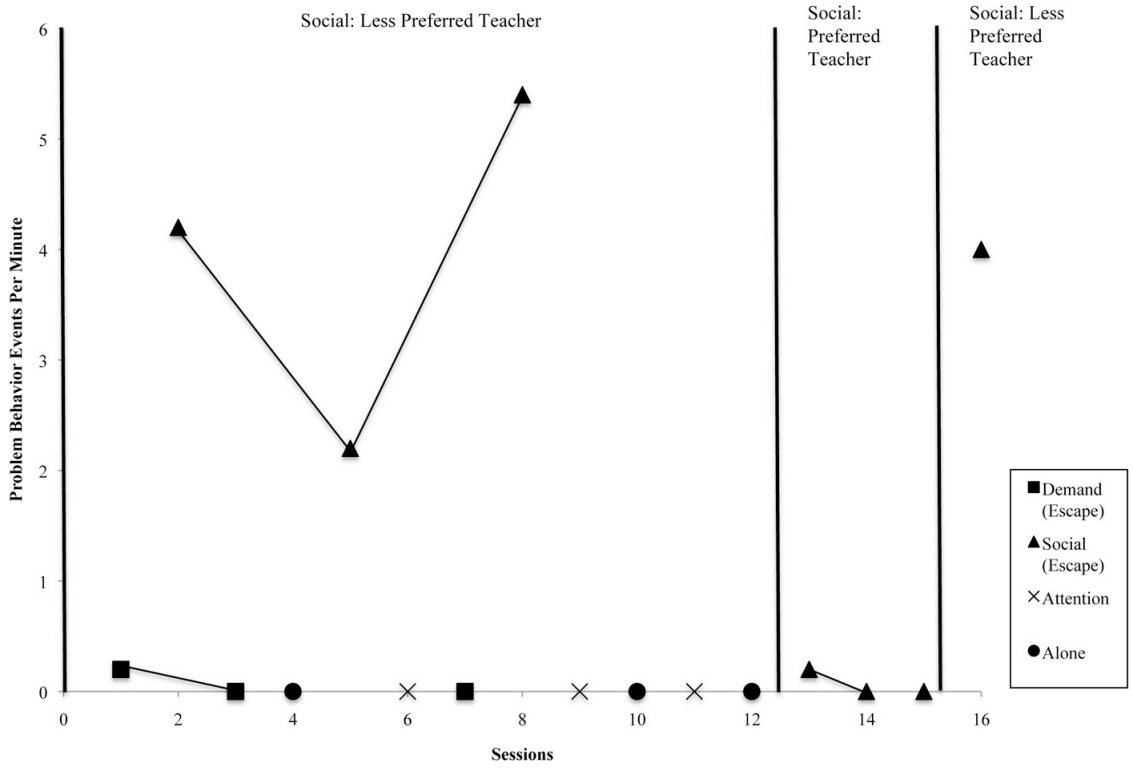


Fig. 1. Problem behavior responses per minute across sessions

We observed essentially no evidence to support several hypotheses, including that problem behavior serves to gain attention, to avoid or escape tasks, or is

automatically or internally reinforcing. It is always possible that the sessions were not long enough or were not numerous enough for the contingency to take effect. However, it is clear that the contingency defined by 'non-preferred teacher leaves once problem behavior occurs' took no time at all to be effective. It was made clear to us that certain teachers, even though they would interact with the student in a friendly manner, were a negative establishing operation and their leaving reinforced problem behavior. This permitted us to develop a Behavior Intervention Plan that has proved effective and about which we shall report in a future document. Unfortunately, we had no information that permitted us to predict who would be preferred and, more importantly, why.

Discussion

SkypeTM proved to be a tremendously useful tool in solving our observation problems. We have used it several times since to great advantage in conducting Functional Analyses and, more recently, to facilitate coaching and feedback of our teachers and paraprofessionals.

Prevalence of computers and Internet access.--According to Gray, Thomas, and Lewis in their U.S. Department of Education report (2010), "Ninety-seven percent of teachers had one or more computers located in the classroom every day...(and) Internet access was available for 93 percent of the computers located in the classroom every day…" The implication is that many others can successfully observe students in controlled settings as well as teaching staff in lessons in order to create more effective educational programs. Moreover, because of the prevalence of computer equipment and Internet access, schools may not need to acquire video equipment to conduct observations, which represents a modest cost savings.

Privacy concerns must be addressed.--At the same time, we are not naïve to the potential for observation of private activities and recognize fully the need to respect individual privacy. In no sense do we advocate the use of surveillance equipment of any type, including computer cameras and SkypeTM for privacy invasion. Parents of our students and our teachers are aware and approve of our efforts to improve our educational programming through video recording and playback.

Another relevant matter is that the student's confidentiality could be breached if someone were to hack into the SkypeTM transmission, but this would be an illegal act on their part and, with respect to confidentiality, we believe that it would be no different than if a burglar were to break into our locked room and open our locked file cabinet for the purpose of locating the student's Individualized Education Plan, which identifies the student's name and handicapping condition. It is difficult to imagine why someone would go to the trouble of accessing such information and, in any event, our use of SkypeTM for

the purposes described in this document is in no sense a “broadcasting over the Internet” in the manner that our website is broadcast over the Internet, so we believe that the risk of breaching confidentiality is, for all intents and purposes, nonexistant.

Positive aspects.—Setting up of the computers to capture video and audio and transmit it via SkypeTM takes a couple of minutes once the user knows the steps, so the ease of set-up and operation is a strong positive attribute. Another is that, because computers are in all of our classrooms, observation reactivity is greatly reduced by comparison to an observer in the room, a video camera newly placed in the room, or viewing through the two-way windows in our classrooms.

Another value in using SkypeTM to transmit the audio and video is that the observer can make decisions in real time. In the event that, during the Functional Analysis, the student required emergency intervention to prevent severe problem behavior, we were able to respond as quickly or even faster than we would have been able to respond in typical instructional conditions. In addition, the Social Avoidance condition demanded that we were able to determine when the next trial could start. That problem proved to be easily solved using SkypeTM.

Limitations to SkypeTM.—SkypeTM is not without some limitations. It is possible, for instance, that an Internet connection error occurs, in which case the audio and video will be lost until the connection is restored. Also, unless there is a high-speed Internet connection, it is unlikely that the video signal will transmit with clarity. It may even be interrupted or fail from time to time even though the audio portion remains intact.

Lastly, as good a solution as SkypeTM is for transmitting the audio/video signal, it does not make a permanent product for retrospective analysis. We regularly use the video record to determine treatment fidelity and observer reliability associated with the target behavior, so a permanent record is necessary. Fortunately, applications exist that will make a permanent record of both the audio and video stream. We use QuicktimeTM.

References

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