Using Covert Audio Coaching to Teach "Small Talk" to a College Student with Intellectual and Developmental Disabilities

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Abstract

Individuals with intellectual and developmental disabilities (IDD) frequently have challenges engaging in social situations and with their communication skills due to lack of availability and safe opportunities to practice these skills. The ability to successfully engage in "small talk," or simple social conversational exchanges, can be beneficial in educational, professional, and social environments. Covert audio coaching (CAC) has been used to teach skills to individuals with IDD, but few studies have investigated CAC to teach social skills. In this study, a withdrawal design was used to examine the impact of CAC to teach a young woman with IDD to engage in small talk with a confederate on a university campus. Results demonstrated a functional relation between CAC and the student's on-topic small talk conversational exchanges. Implications and future research are discussed.

Keywords: developmental disabilities, intellectual disability, covert audio coaching, small talk, social skills

Plain Language Summary

- The ability to successfully engage in "small talk," or simple social conversational exchanges, can be helpful in many different environments.
- In this study, we wanted to learn if we could use an iPhone and Airpods to secretly coach a college student with autism and an intellectual disability to make small talk with someone else at the college.
- We found that Delia had a hard time making small talk without the Airpod coaching.

- When we used the Airpods to coach Delia she had a much easier time making small talk.
- When we withdrew the Airpod coaching, Delia had a big drop in her ability to make small talk.
- Once we reintroduced the coaching, she made a quick improvement and was able to make small talk easily once again.
- Making small talk is something people are expected to do at work, school, and in the community, however, we don't have many ways to teach people who struggle with small talk how to be better at it.
- Using Airpods to coach seems to be an effective and a discreet way to improve the skill of making small talk.
- This is just the first study looking at using Airpod coaching to improve making small talk and more people need to research this so we can see if it really is a powerful way to teach people how to make small talk.

Individuals with intellectual and developmental disabilities (IDD) frequently experience difficulty with social-communication skills (Center for Disease Control and Prevention, 2019). These difficulties present a number of challenges, including problems making and maintaining relationships, obtaining and maintaining employment, and meaningfully participating in community activities. These challenges inhibit social relationships. Although this can be detrimental to anybody with IDD, it is particularly problematic as children mature, and their interactions shift from caregivers to peers (Mason et al., 2019).

Researchers have demonstrated that small talk affects different social variables that, in turn, affect a multitude of human interactions (Coupland, 2003; Drew & Chilton, 2014; Holmes & Fillary, 2000; Kyllonen, 2013). Small talk serves as a reciprocal mode of social interactions within a conversation (Coupland, 2014). The social conversation skills that serve as building blocks of small talk are integral to social exchanges that build positive interpersonal relationships and can be seen in a variety of settings such as "…teaching, a job interview, a jural interrogation, a football game, a task in a workshop, and a dinner party" (Coupland, 2003, p. 2). Employers have reported that the failure to meet the unwritten social rules of the workplace is one of the primary reasons individuals with autism and IDD lose their jobs (Chadsey, 2007). Regardless of the setting, the topics discussed during small talk drive the social interaction. Unfortunately, many people with IDD have challenges remaining on-topic during conversation (Gilson & Carter, 2016), further isolating them from positive social relationships. Accordingly, researchers and practitioners have begun to develop interventions aimed at improving these skills among adolescents and young adults with IDD.

Many individuals with IDD have a very difficult time engaging in appropriate small talk at their place of employment (Holmes & Fillary, 2000; Lu et al., 2019). Employees with IDD often overshare inappropriate information (e.g., intimacy and family issues), have difficulty remaining on-topic, and socially engage with a limited number of other employees (Holmes & Fillary, 2000; Lu et al., 2019). Accordingly, researchers have recently aimed to develop meaningful interventions to improve social-communication skills for this population of learners (Mason et al., 2012; Pennington et al., 2021; Smith et al., 2019).

One potential intervention that could be effective in teaching social-communication skills is covert audio coaching (CAC). Researchers have demonstrated CAC to be an effective coaching strategy (Bennett et al., 2010; Bennett et al., 2013; Mason et al., 2019), but only recently has it been investigated as a social-communication intervention (Joseph et al., 2021).

Interventionists using CAC provide coaching statements through remote means to individuals learning new skills (Randolph & Brady, 2018). These coaching statements are delivered from a distance, by a coach speaking into a wireless device that sends the information to an individual wearing an earpiece (or a bug-in-ear). Some CAC researchers such as Bennett et al. (2010) typically define coaching statements to include guidance (e.g., "Remember to say 'Hi' to customers"), praise (e.g., "You sorted those groceries perfectly"), and correction (e.g., "Say, 'goodbye' to that customer"). The initial CAC research explored using CAC to enhance professionals' skills (Randolph & Brady, 2018); CAC investigations only recently expanded to investigate the impact of the intervention on employment skills and daily living activities of people with IDD (Bennett et al., 2010).

Bennett et al. (2010) were among the first to explore CAC on job performance skills in adults with IDD. This team of researchers used a multiple baseline design across three participants to determine the effect of CAC on job performance skills. After participants received coaching feedback contingent on work performance, their job skills increased and were maintained for several weeks following intervention. In a follow-up study, Bennett et al. (2013) reported similar results when coaching individuals with autism to make photocopies. This study used a multiple-baseline design across three participants to determine the effects of CAC on the skill of making photocopies. Bennett and colleagues found CAC to be effective to teach this skill. Gilson and Carter (2016) extended the CAC investigations to adults with IDD at work. This study used a multiple-probe design across three participants to determine the effects of CAC on the skill of making photocopies. These researchers reported increases in participants' social skills, with no decrease in work task production while socializing. More recently, Mason et al. (2019) used a multiple-baseline design across four participants to determine the effects of CAC in conjunction with online modules to teach adolescents with autism to ask questions. Chezan et al. (2020) also used a multiple-baseline design across participants to investigate combining behavior skills training with CAC to teach three young adults with autism and IDD to engage in conversations with coworkers. All of the aforementioned studies found CAC to have a positive impact on skill acquisition.

Although these studies demonstrated promising results for CAC, only three studies examined the impact of this intervention on participants' social skills (i.e., Chezan et al., 2020; Gilson & Carter, 2016; Mason et al., 2019). We aimed to expand the current CAC literature in several ways with this preliminary study. This study replicates the use of the CAC intervention to teach social skills to a college student with IDD. We also endeavored to extend the literature by using CAC to increase the use of the particular social-conversational skill of small talk. For this initial study we addressed the following research question: Does CAC increase the number of on-topic social exchanges in conversations between a college student with IDD and a confederate?

Method

Participant

The participant in this study was Delia, a 20-year-old White female enrolled in an inclusive postsecondary education (IPSE) program at a university in the southeastern United States. Delia had been a student in the program for two semesters at the time the study took place. Delia was diagnosed with both autism and an intellectual disability according to her most recent psychological evaluation. Her most recent full-scale IQ score was a 60 on the *Wechsler Adult Intelligence Scale* (Wechsler, 2008).

Prior to the study, the researchers had interacted with Delia in both a classroom and on-campus internship setting and were familiar with her communication style and needs. Delia was able to communicate in complete sentences, but typically did not engage with faculty or with other students unless someone else initiated the interaction. When she did interact with others, she had difficulty remaining on topic and often used rehearsed phrases (e.g., "So, how's your day?"), and she repeated these phrases multiple times throughout the social interaction. Delia had no previous work experience aside from an unpaid, part-time, on-campus internship. Her instructor recommended her for this study as a preliminary effort to prepare her for community employment upon graduation from the IPSE program.

Setting and Materials

This study took place in a college classroom with a one-way mirror on a university campus. Delia and the confederate sat in the classroom, while the data collector(s) and coach sat in an adjacent room, behind the mirror, unseen by the participant. No other students or staff were in the classroom. Both rooms were wired for sound so the coach and data collector could hear the conversation between Delia and the confederate.

The materials used were the coach's personal smartphone, which connected to the Apple AirPods used by the participant and the confederate. The primary data collector's personal smartphone was used to play a prerecorded interval system for the data collector(s) to adhere to while collecting data. The university's institutional review board approved the study prior to obtaining verbal and written assent from Delia, and consent from her guardian.

Dependent Variable and Data Collection

Social-communication skills were identified as a primary need for Delia by her college instructors, job coach, and family. The dependent variable was Delia's (a) *prompted on-topic* small talk exchanges with the confederate, (b) *unprompted on-topic* exchanges with the confederate, and (c) *off-topic* conversation exchanges. Data collectors recorded any occurrence of *participant talk and coaching prompts* within a 10-second interval. Participant talk was coded as either *on-topic* or *off-topic*. We adopted definitions from the professional literature and created examples that linked the definitions to the college context (Chezan et al., 2020; Coupland, 2003; Joseph et al., 2021). *On-topic talk* was

defined as: conversation follows the topic (or is related to the topic) provided by the coach (e.g., topics were based on superordinate categories [e.g., sports] and could include subordinate categories [e.g., the regional professional football team]). *Off-topic talk* was defined as: conversation unrelated to the content of the topic (conversation outside the superordinate or subordinate categories) provided by the coach, including repetitive topics idiosyncratic to the participant (e.g., coach prompts a topic about sports, but Delia talks about dinosaurs and anime). *Coaching prompts* were marked as either an occurrence or non-occurrence within each interval.

Data were collected during a 6-minute period, using a partial interval recording system. A 6-minute interval audio recording was created and played from a data collector's phone to prompt data collectors when to collect data for each interval. The data collectors followed the standard interval recording procedure to record any occurrence of any of the codes during each interval (Kennedy, 2005).

The coach, confederate, and at least one data collector were present for each session with Delia. All research team members were affiliated with the college of Education as either faculty or staff in the IPSE program, and all had advanced degrees in special education. The coach was an instructor in the IPSE program and someone the participant knew well. The confederate was a faculty member Delia had seen previously at College events prior to interacting with him in the study, but she was not familiar with him. The data collectors had no direct interaction with Delia. Because they observed from a separate room, Delia seldom saw the data collectors except in passing. Prior to running this study, the coach, data collectors, and two confederates practiced for about 60 minutes total across two days. During these practice sessions, the coach practiced providing the appropriate coaching statements based on the confederate behavior. The data collectors also practiced coding comments simultaneously and collecting fidelity data on the coach. The training session ended once the data collectors had 100% agreement and the coach was providing coaching prompts with 100% fidelity.

Interobserver Agreement and Treatment Fidelity

Interobserver agreement (IOA) was collected for 33% of the sessions. Point by point, total agreement for all *participant talk* and *coaching prompts* averaged 90% across all conditions (range = 79–98%). Agreement on *participant talk* averaged 91% (range = 84–97%), and agreement on *coaching prompts* averaged 94% (range = 83–100 %).

We also collected treatment fidelity data during 20% of baseline and intervention sessions using a seven-step checklist. Fidelity data were collected about once a week throughout the study. The fidelity checklist measured if the coach (a) selected a topic and backup topic, (b) told the confederate the topic, (c) gave AirPods to the confederate and participant, (d) completed a soundcheck, (e) told the participant the topic to start the session, (f) provided verbal praise after the session, and (g) prompted throughout the session as required. The coach implemented the intervention with 100% fidelity.

Experimental Design

A withdrawal design was used to determine the impact of CAC on the participant's engagement in small talk conversations (Kennedy, 2005). Systematically removing the intervention and returning to baseline procedures, and then reintroducing the intervention and seeing an abrupt increase in the skills multiple times demonstrates a functional relation between the intervention and targeted skill (Gast & Spriggs, 2014; Kennedy, 2005).

Experimental Procedures

Baseline

There were two baseline phases, and procedures were identical in both. During baseline, the confederate and Delia sat in the room at a small conference table. Both wore Apple AirPods. The coach and data collector(s) remained on the other side of the one-way mirror. The coach introduced a conversation topic to Delia via the AirPods, but said nothing else until the end of the session. At the end of the session, the coach thanked Delia for her time and asked her to continue with her daily schedule. No other instruction was provided. The confederate was instructed not to initiate conversation at all, but to respond to Delia if she initiated. Baseline sessions occurred until two or three data points established either a decreasing trend or a stable low rate of unprompted, on-topic small talk exchanges.

Intervention

There were two intervention phases, and procedures were identical in both. The independent variable was CAC (Bennett et al., 2010; Bennett et al., 2013; Randolph & Brady, 2018). Sessions took place for six minutes, once a day, five days a week, for about three weeks. The coach introduced a conversation topic and a backup topic to the confederate prior to the session so the confederate would be prepared to engage with Delia. Conversation topics were chosen from themes relating to her college experience and leisure activities, such as taking courses at the university, attending clubs and activities on campus, listening to music, and eating at restaurants. All conversation topics were printed on separate slips of paper, gathered into a hat, and one topic was randomly selected before each session. This topic became the conversation starter given to Delia, along with a request to speak about it with the confederate.

During all intervention sessions, the confederate was instructed never to prompt Delia, and to minimize the number of questions directed to her; this was done to prevent the confederate from accidentally leading or dominating the conversation. Identical to baseline, the confederate and Delia both wore Apple AirPods and sat in the observation room with the coach and data collector(s) located—unseen—on the other side of the one-way mirror. All coaching statements were given to Delia using an Apple iPhone. The coach began each session with a suggestion that Delia talk about a specific topic (the selected conversation topics; e.g., the university football game). Subsequently, the coach provided a coaching prompt using an adaptation of a least-to-most prompting system (Gil et al., 2019) if one of these three situations occurred:

1. If 10 seconds transpired without any conversation from Delia, the coach would provide an indirect coaching prompt to Delia related to the topic (e.g., *"Delia, say something about football"*);
2. After an initial coaching prompt, if an additional 10 seconds transpired without Delia initiating any conversation, the coach provided a direct coaching prompt to Delia related to the topic (e.g., *"Delia, tell him about your favorite football team"*); or
3. If Delia was off-topic, the coach prompted her to return to the topic at the first natural break in the conversation (e.g., *"Delia, remember you are talking about football"*).

The reinforcement system used in the intervention was limited to the feedback delivered by the confederate. That is, the confederate was adept at responding to each on-topic conversation exchange that Delia delivered, a naturally occurring reinforcer that staff had previously observed as effective for her. Therefore, no other extraneous reinforcers were applied for initiating small talk conversations. However, at the end of each session, the coach thanked Delia for her time, provided general verbal praise for her participation, and asked her to resume her scheduled activities.

Data Analysis

Data were analyzed using visual inspection procedures. Researchers calculated central tendency measures and determined data ranges, trend, and variability for the participant. This helped determine decisions regarding condition changes (Kratochwill et al., 2013). Tau-*U* was then calculated to establish an effect size. Tau-*U* is an overlap index that measures the degree of overlap between adjacent conditions. The smaller the overlap between conditions, the stronger the effect. An effect of 65% or lower would be considered a weak effect, an effect between 66% and 92% would be classified as a medium effect, and an effect of 93% or higher would be classified as a strong effect (Rakap, 2015). Researchers used the Tau-*U* web-based calculator as a post-hoc analysis to determine the numerical value of overlap (Vannest et al., 2016).

Results

The results of the CAC intervention are shown in Figure 1. Percent of intervals with on-topic conversation is presented on the *y*-axis. Frequency of coaching prompts is presented on the *z*-axis. Sessions are presented on the *x*-axis.

Baseline 1

During Baseline 1, Delia's on-topic conversations remained low, with a decreasing trend. During her first baseline session, Delia's small talk was on-topic only 8% of the time. By her third baseline session, Delia was not on-topic at all. During the initial baseline, the median of the on-topic conversation was 3%, and the data were variable. Using the 80%-25% rule for the stability envelope (Gast & Spriggs, 2014) only 33% of the data fell within the window, thus baseline must be considered variable.

Intervention 1

Upon the introduction of the intervention, Delia's on-topic conversation increased substantially. She had an abrupt absolute level shift, with her on-topic conversation jumping from 0% in the last baseline session to 67% after the first intervention session. Additionally, there was an ascending trend throughout this phase. Delia's five CAC sessions demonstrated slight variability, ranging from 61–86% on-topic, (Mdn = 75%), with 100% of the data within the stability envelope. Delia required three to five prompts per session to remain on-topic.

Baseline 2

When baseline conditions were reintroduced, Delia's behavior dropped from 78% during the last intervention session to 58% during the first return-to-baseline session for on-topic conversation. This represented a substantial decrease in terms of absolute level shift. Delia's on-topic conversation dropped substantially (Mdn = 29%), and the variability of the data increased, with no data within the stability envelope. Her behavior sharply decelerated to 0% on-topic during the second baseline session. Due to this drastic decrease, the researchers implemented the second intervention condition after only two baseline data points. This quick return-to-intervention was due, in part, to an ethical judgement made by the researchers to not withhold a seemingly effective intervention as observed during the first intervention phase.

Intervention 2

When the second intervention condition was reintroduced, Delia showed an even greater increase in on-topic conversation than during the first intervention condition. She demonstrated an immediate, and substantial, absolute level shift from the last data point during Baseline 2 to the first data point in Intervention 2. For her five sessions in this condition, Delia's data increased substantially (Mdn = 83%), with 100% of the data points within the stability envelope. Her performance remained stable throughout Intervention 2, with a zero-celerating trend during the last three sessions. This performance required 1-10 coaching prompts (average of five prompts) per session to remain on-topic.

Effect Size

Results of the post hoc Tau-*U* analysis, after being corrected for baseline, indicated that Delia's Tau-*U* score was 1.2 between the first baseline to intervention contrast, and 1.1 for the second baseline to intervention contrast. These data indicate that the CAC intervention was very effective based on standards by Rakap (2015).

Discussion

The purpose of this study was to determine the effect of CAC on on-topic, small talk conversational exchanges between a college student with IDD and a confederate. Results demonstrated a functional relation between the CAC intervention and Delia's on-topic

conversations. This is one of first known investigations to evaluate a functional relation between CAC and conversational exchanges. Increasing small talk, along with other social-communication skills, can positively affect an individual's quality of life. The ability to increase the engagement between an individual with IDD and his or her peers, coworkers, and supervisors in community and employment settings is a goal of educators and caregivers, and the current data represent one of the first attempts at understanding how CAC might contribute to the development of this skill set.

Although this study used CAC procedures on a university campus, other researchers have demonstrated that this intervention can be implemented in community settings to teach a variety of skills. The technology used to deliver the CAC intervention in this study, an Apple iPhone and AirPods, are widely available, making this intervention practitioner-friendly. Practitioners can use this technology to practice social-communication skills in commonly frequented community environments such as malls, retail stores, parks, and other social arenas. Providing the intervention covertly, and with universally used technology, can help to reduce potential stigma surrounding behavioral interventions.

Like all studies, however, there are limitations. First, a smartphone and Bluetooth headphones may be cost-prohibitive for some college students. Second, it is clear that participant interest plays some role in social-communication engagement, and if Delia had not been interested in a particular topic she may have been less likely to be willing to engage in conversation with the confederate. In our study, no formal preference assessment was completed with Delia regarding preferred conversation topics, although we did include many topics that we had heard Delia discuss previously. Future researchers may want to include a formal means to determine preferred conversation topics. Third, Baseline 2 only had two data points prior to implementing Intervention 2. Although some may view this as a limitation, we argue that ethically we needed to intervene after such a drastic deceleration of conversational skills was exhibited upon the introduction of baseline procedures. Although the lack of conversational skills in this safe environment is not harmful, we made the decision to reintroduce the intervention based on our ethical judgement of how far and how fast the data decelerated.

A fourth limitation is that this study was conducted in a clinical context with an adult rather than in a natural environment with peers. Future research should focus on training in natural environments, such as a classroom, community setting, or employment setting, and with college student peers or coworkers rather than with an adult. Future researchers also should collect formal data from participants and other stakeholders to determine the social validity of this intervention. Our social validity assessment was added after the study was conducted. Although we did not plan to administer a social validity survey, we did follow up Delia's intervention some time afterwards to collect a more objective measure—a normative sample of remote small talk among other college students who do not have IDD (Joseph et al., 2021). In a sample of seven college classmates in education and rehabilitation, using the same observation codes and data collection system, the college students in this norm group averaged slightly more than 61% of the intervals in on-topic small talk during unstructured observation periods. By contrast, Delia's on-topic small talk was below 10% of the intervals on four of her five combined baseline days. Then, when taught to maintain a conversational focus, she surpassed the norm group's

performance; her average on-topic small talk was 79% during the combined intervention sessions. An increasing number of behavioral researchers (Barton et al., 2018; Strain et al., 2012) advocate for normative comparisons and other objective measures of social validity, and Delia's performance to the comparison group suggests that planned assessments will provide important data.

As our initial foray into this area, this study included one participant, and therefore, replication of this study is obviously needed to understand the external validity of the results. This study is one of just a handful of studies that have used CAC to teach conversation skills, and it is the only known study that has used to CAC to teach the particular skill of on-topic small talk conversations. We designed the study to determine the effectiveness of the intervention to teach this skill with this population prior to determining generalization or maintenance needs. Therefore, we did not include generalization or maintenance assessments; thus, the current data do not tell us if the participant's behavior will be emitted under different circumstances from the intervention, or whether her improvements will be maintained over time. Nevertheless, as a proof-of-concept study, we think these data have the potential to lead to other research questions in this area and potentially guide current practice. Clearly, additional research is needed to address other aspects of learning. Future researchers should program for generalization and maintenance measures to determine the true potential of this intervention.

Covert audio coaching is a discreet method to coach individuals with IDD to increase targeted social-communication skills. By addressing this deficit covertly, individuals with IDD can practice their skills through a socially-valid intervention (Gilson & Carter, 2016). Social-communication, such as small talk, is a skill needed in employment settings, job interviews, and office buildings, as well as community settings like doctors' offices and restaurants. These findings are promising, and additional research will determine the impact of CAC in natural environments.

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Figure 1

Delia's On-topic Conversation