USING MULTIPLE EXEMPLAR VIDEO MODELING TO TEACH WORK-RELATED SOCIAL SKILLS TO YOUNG ADULTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES

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ABSTRACT

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Young adults with intellectual and developmental disabilities (IDD) have lower rates of employment compared to individuals without disabilities. These lower rates of employment are often attributed to poor work-related social skills, as the ability to interact socially in the workplace is essential in obtaining and keeping a job. This study used a multiple probe across behaviors design to evaluate the effectiveness of multiple exemplar training (MET) video modeling with video fading to teach social skills in the workplace to three individuals with an intellectual disability or autism spectrum disorder. All three participants demonstrated acquisition of work-related social skills through MET video modeling and successfully generalized those skills to their workplace environment; providing evidence that MET video modeling can be used to teach young adults with IDD work-related social skills. Future research should continue to evaluate the most effective methods for teaching work-related social skills, especially as they pertain to generalization and maintenance.

Keywords: work-related social skills, employment, video modeling, multiple-exemplar training, multiple probe design

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KEY TO SYMBOLS AND ABBREVIATIONS

ASD   Autism spectrum disorder

IDD   Intellectual and developmental disabilities

IOA   Interobserver Agreement

MET   Multiple exemplar training

Introduction

A common goal among vocational transition programs is to prepare individuals with intellectual and developmental disabilities (IDD) with the skills they need to obtain and maintain competitive employment. Employment promotes independence through financial stability and is associated with improved self-esteem, positive mental health, and higher quality of life (Hillier et al., 2011). Despite this common goal, many young adults with IDD continue to face barriers in finding and sustaining competitive employment (Gold et al., 2013). In 2016, individuals without disabilities comprised 68% of the workforce in competitive employment (Bureau of Labor and Statistics, 2016), while only 26.3% of individuals with an intellectual disability (Kraus et al., 2018) and 14% of individuals with autism spectrum disorder (ASD) were competitively employed (Roux et al., 2017). Of those individuals with IDD who do obtain employment, they are often underemployed, work fewer hours, and earn less than individuals without disabilities (Butterworth & Migliore, 2015; Hiersteiner et al., 2016). Thus, to improve employment outcomes for adults with IDD, it is vital that effective strategies are identified to provide individuals with the skills they need to be successful.

A deficit in social skills has been identified as one reason why individuals with IDD struggle with maintaining employment (Bucholz et al., 2008; Roux et al., 2017). According to Agran et al., (2016), *work-related* social skills are any social skill related to an individual getting a job and keeping that job. Social skills are crucial within the workplace (Phillips et al., 2014), as most jobs require individuals to use social skills throughout the day in order to understand or request clarification about job-related tasks and to communicate effectively with co-workers. Although social skills are important for all individuals to obtain and sustain a job, individuals with IDD are at a disadvantage because they often experience greater difficulties with social

skills when compared to those without disabilities. While social skills, much like language, generally come naturally to individuals without disabilities, those with IDD often need to be explicitly taught social skills (Duncan & Kinger, 2010; McCoy & Hermansen, 2007).

Currently, research focuses heavily on interventions to improve social skills in children with IDD (Alwell & Cobb, 2009). However, research to address these skills are lacking for young adults, who continue to struggle with persistent deficits in social skills (Bucholz et al., 2008), despite the fact that it has been identified as a need (Park et al., 2018a). Since positive perceptions of individuals with intellectual disability can be based solely on their social skills, regardless of the individual's ability to complete a work task (Butterworth & Strauch, 1994), it is critical that interventions targeting work-related social skills be developed and evaluated.

Video Modeling to Teach Social Skills

According to the National Professional Development Center on Autism Spectrum Disorders, video modeling is an evidence-based practice that has been used to teach individuals with IDD of all ages a variety of skills including social skills (Cox & AFIRM Team, 2018). While there are many delivery formats of video modeling, all depict an example of a person engaging in the target behavior being taught. Once the video is shown, the participant is given the opportunity to rehearse the target behavior (Bellini & Akullian, 2007). Video models are often more reliable than in vivo modeling because they allow for a video model to be created that exactly depicts the target behavior being taught, while also allowing for the same video to be used over several training sessions. Additionally, video modeling has been the most used evidence-based practice to teach vocational skills and has also been effective to teach a variety of skills to both adolescents and adults with ASD (Bellini & Peters, 2008).

Given these findings and qualities, video modeling may be an effective strategy to teach work-related social skills to adults with IDD. For example, videos could be filmed in the natural environment and developed to depict specific social skills that are necessary for individuals to display in a work setting and could then be used to teach the individual these skills. These strategies may be more reliable and efficient compared to relying on a job coach to teach or model the behavior at the worksite. The video model could also be available for the individual to review independently on the worksite when a job coach or support person is not present or available to help. Further, because vocational programs already have the tools necessary to record videos and provide this intervention, video modeling can be administered quickly and efficiently and does not require many trainers to be present. Finally, this strategy could be used with one individual, or with a group of students to practice their social skills in the classroom with the potential to transfer to the workplace.

Recently, Park et al. (2018b) used a multiple probe across behaviors design to evaluate the effectiveness of video modeling to teach social skills in the workplace to three individuals with intellectual disability. The authors taught each participant three behaviors-- offering assistance, responding appropriately to feedback, and requesting clarification-- in contrived work-related social scenarios within a school setting. Participants viewed a video model of one of the work-related social skills and were told, "Do what you saw in the video." The researcher then emitted the same vocal response and/or action from the scenario and a correct response was recorded if the participant responded within 5 s and their response matched the script they viewed in the video model. After the skills were mastered in training, four new scenarios per target skill were then used to assess for generalization and maintenance was assessed two weeks after the intervention was completed.

Park et al. (2018b) reported that each participant improved their accuracy in performing the target skills; yet, two participants required additional vocal prompting (e.g., error correction) during training sessions to acquire the skills. Further, all three participants failed to generalize the social skills when the researcher introduced novel scenarios (Park et al., 2018b). These findings indicate that although video modeling with error correction was an effective intervention to teach three specific work-related social skills, the skills failed to generalize to other scenarios. The limitations described in the study may account for the limited effects of the intervention. First, the scenarios used to teach the target skills were not directly related to the job setting in which the participants were currently working and the generalization probes were conducted in a school setting rather than in a work setting. Second, the video model was not systematically faded throughout the intervention. Third, few scenarios were used to depict opportunities to practice the social skill during the intervention condition. An approach to address these limitations may be to include specific scenarios the participant will experience at work, multiple exemplar training (MET), and video fading as an additional condition to promote generalization.

Multiple Exemplar Training to Promote Generalization

Generalization is potentially the most important variable to plan for when teaching social skills to individuals with IDD. Generalization is the ability of an individual to use the skills they have learned in training and to apply those skills across different people, contexts, materials, and settings following the teaching sessions (Stokes & Baer, 1977). Strategies to plan for generalization should be incorporated into the teaching intervention in order to increase the likelihood that the individual will be able to use the skills at a later time, in a different context, or with a different person. Unfortunately, a recent systematic literature review examined the effects

of video modeling for individuals with intellectual disability identified that less than half of the studies evaluated in the review included a generalization phase in their study (Park, et al., 2018a). Because work-related social skills are so important, it is vital that researchers pay close attention to the instructional strategies used during their intervention and to plan for generalization (Park et al., 2018b). To address this concern, instructional strategies, such as multiple exemplar training (MET), during the intervention phase could help promote generalization to new social scenarios.

MET has been used to teach a variety of skills and has been effective at increasing skill generalization (Gena et al., 1996; Horner et al., 1982; Horner et al., 1986; Reeve et al., 2007; Schrandt et al., 2009). Specifically, to increase the likelihood that individuals will perform skills across different settings, MET provides individuals the opportunity to practice skills within a variety of different conditions, response variations, and response topographies (Stokes & Baer, 1977) during the training session. Such variation in training could include the addition of multiple training stimuli, training multiple responses, and/or training across multiple settings.

MET could be incorporated into video modeling to enhance generalization of social skills in the work setting. Workplace conditions are often changing including the people with whom the individuals will work, the tools and procedures used to complete tasks, and the environment in which the tasks will be completed, making it important to plan for generalization. One solution to increasing generalization of work-related social skills is adding MET to a video modeling intervention. Specifically, MET could be incorporated by developing multiple videos depicting a variety of different scenarios, responses, stimuli, and settings that all address the same target social behavior.

Video Fading to Support Generalization

An additional strategy that may support generalization and increase maintenance of work-related social skills is the incorporation of a video fading component. Video fading is a procedure used to increase independence by systematically removing a video model as the prompt. The technique originally involved reducing the amount of time the individual was provided to watch the video by systematically removing scenes by deleting clips from the video (Sigafoose et al., 2007). Although it is not possible to delete clips from a social skills video (as the videos are quite short compared to vocational tasks), it may be possible to systematically fade the number of video examples an individual can view during each training session. As such, if a skill does not generalize following MET video modeling, video fading may be added to the training package to increase independence and maintenance of work-related social skills.

Current Study

This study was designed to extend the research by Park and colleagues (2018b) to assess the effects of MET video modeling and video fading to promote generalization of three work-related social behaviors to the natural work setting. Using multiple video model examples, fading the video model, and the inclusion generalization probes at the participants' work site were added to the procedures to enhance opportunities for skill generalization to the workplace environment. The research questions were as follows:

1. What are the effects of MET video modeling on the acquisition of social skills for three young adults with IDD?

2. Do the social skills generalize to the workplace following MET video modeling?

3. Does video fading improve generalization if skills do not initially generalize to the workplace following MET video modeling?

Method

Participants

Three participants were recruited from a school-to-work vocational training program that provides individuals with IDD the skills they need to obtain and maintain meaningful employment. The vocational training program was located on a university campus with one classroom and many internship sites located across the campus. Monday through Friday, participants attended one hour of classroom instruction in the morning, went to their respective internship sites for four hours, and then returned back to the classroom for an additional 30 min of instruction. Intervention sessions were conducted during classroom instruction time, and probes were conducted during both classroom instruction and internship work hours.

Participants were required to meet the following inclusion criteria: (a) between the ages of 18 to 26 years; (b) have a diagnosis of intellectual disability or ASD as indicated on their Individualized Education Plan (IEP); (c) display the ability to attend to a video model for 30 s and imitate the vocal response of the video model as assessed by the researcher prior to intervention; (d) be identified as having a need to participate in a work-related social skills training, as indicated by the classroom instructor; and (e) have the ability to vocally emit at least three words at a time (Park et al., 2018a). Students from the program who did not meet these criteria were not invited to participate in this study.

Phil was a 22 year old male diagnosed with ASD. During the study, Phil completed internship placements at the university bakery and culinary services. Bart was a 22 year old male with a diagnosis of intellectual disability, Down syndrome, and a hearing impairment. During the study, Bart completed internship placements at an animal care facility and commercial linen services. Morgan was a 20 year old female with a diagnosis of intellectual

disability. During the study, she completed internship placements at an office copy center and a university café.

Setting

Teaching sessions were conducted in an office located across the hallway from the vocational training program's classroom. The office was approximately 500 square feet, contained one table, four chairs, a video recorder, and the materials needed to complete the task(s) to be assessed or taught that session. Only the researcher and the participant were present in the office during teaching sessions. Generalization probes were conducted in the natural workplace environment where the participants were completing their internship placement. The workplace environment varied depending on the internship site placement, and included a cafeteria, a commercial linen service, and a small café at the university. At both linen services and the cafeteria, the probes were conducted in a separate office space and room with no other people present, whereas the probes at the small café were conducted in the lobby, where there were multiple people present.

Materials

Materials needed for this study included an iPad to create and display videos for the participant, iMovie® to edit the video models, and a video recorder to record sessions. Additional materials were required to assess performance of the work-related social skills, such as a table, chair, cash register, a cup or water bottle full of water, cleaning rags, cleaning spray, napkin place holder with salt and pepper, napkins, silverware with a holder, a daily written schedule, and two large boxes.

Dependent Variable

  Three work-related social skills were taught to each participant in the same order: *offering assistance*, *asking for more information*, and *asking for help*.

Offering Assistance

  When observing someone struggling with a task, making a mess, or carrying too many items, *offering assistance* was defined as the participant vocally emitting two or more words to offer to assist the person within 10 s of observing the person attempting to perform an action. For example, when the researcher picked up two large boxes and said "I have too many things to carry;" the participant would vocally offer to help with two or more words within 10 s. *Offering assistance* did not include the participant immediately trying to help without emitting a vocal response (e.g., engaging in helping behavior by picking up a box and saying nothing) or making a statement indicating the person needed help without actually assisting the individual such as, "you need help".

Asking for More Information

  When given a task with unclear instructions, with the necessary items out of sight to complete the task, or if too little information is given about break time, *asking for more information* was defined as the participant vocally *asking for more information* about the assigned task or break time within 10 s of the presented task or statement. For example, if instructions were provided to "clean this table, please," but the participant did not have all of the items needed to complete the task (e.g. the cleaning spray was strategically placed out of sight), a correct response included the participant vocally stating within 10s, "where is the spray?". *Asking for more information* did not include *asking for more information* unrelated to the task or emitting unspecific statements, such as saying, "what?" "I don't know," or "I can't".

Asking for Help

When presented with a task an individual is unable to complete independently, does not know how to complete, or presented with a task that needs to be completed urgently, *asking for help* was defined as the participant vocally asking for assistance with two or more words within 10 s of the verbal instructions to complete a task. For example, when instructed to make change (a task the participant did not know how to complete independently) the participant would state, "Can you help?" within 10 s of the verbal instruction. *Asking for help* did not include walking away from the task, stating "no" or "I can't," or directing another person to do the task instead.

Response Measurement

During training, the participant was presented with three trials to perform the targeted work-related social skill per session. A trial was scored as a correct response if the participant independently responded within 10 s of the researcher's initiation with at least a two word response related to the work-related social skill the participant observed in the video model. Incorrect responses were recorded if a participant made no response, an incorrect response (e.g. the participant said "can you help me?" when the target social skill was *offering assistance*), or if the participant responded more than 10 s after the researcher's initiation. Skill acquisition was evaluated by determining the percent of correct responses the participant performed in each session. Specifically, performance was calculated by dividing the number of trials performed correctly by the total number of trials presented (i.e. 3) for each work-related social skill per session.

Interobserver Agreement

Interobserver agreement (IOA) was calculated for 33% of sessions across all conditions by an independent coder. The coder was asked to view a video recording of the session and to

indicate whether the participant made a correct or incorrect response for each trial presented during the session. Point-by-point agreement, in which both the researcher and the coder divided the number of agreements by the total number of agreements and disagreements and multiplied the number by 100 was used to calculate IOA and to obtain a percentage of agreement (Ledford & Gast, 2018). The IOA percentage for data collected on participant responses was 100% for 33% of all sessions observed and calculated.

Experimental Design

A multiple probe design (Ledford & Gast, 2018) was used across behaviors and replicated across participants to evaluate the effectiveness of MET video modeling with video fading as a treatment package. In a multiple probe design, all three target behaviors are measured before the intervention condition, and after the participant reaches criterion for each target behavior. Mastered target behaviors were probed for maintenance after mastery criterion had been met on subsequent target behaviors. This design enabled the researcher to evaluate the performance and generalization of all three behaviors with less frequent measurement.

Procedures

Creation of Video Models

Three video models per behavior per participant (i.e., nine total videos for each participant) were created prior to the start of intervention. Videos were filmed at the participant's current internship site; each video depicted a different scenario related to one of the three targeted work-related social skills and included a different example of how to respond (see Table 1-3). For example, for the social skill *asking for help*, each video depicted a different scenario in which someone needed help with a different work task. One video model depicted the response, "Can you help me?", another depicted the response, "Will you help me?", and the

third depicted the response, "I need your help". Video models ranged from 9 seconds to 28 seconds in length and included only two people in the video; the researcher to facilitate the scenario and another individual to model a correct response.

Baseline

During a baseline session, the work-related social skill was assessed across three different scenarios for a total of 3 trials of the social skill per session. For each trial, the researcher acted out one of the scenarios depicted in the video models and then waited 10 s for the participant to respond. Overall, the participant had three opportunities to respond, corresponding to a score of 0%, 33%, 66%, or 100% for each target social skill for each baseline session. No video models were shown and no feedback was provided during baseline sessions.

The majority of baseline sessions were conducted in the classroom. To begin a baseline session, the classroom instructor told the participant to meet the researcher in the office across from the classroom. When the participant arrived at the office, the researcher began to act out a scenario for a specific target social skill. If the participant made an incorrect response or made no response within 10 s, the researcher moved to the second scenario for the same target social skill (this was considered trial two). If the participant made a correct response, no feedback was given, the scenario was completed, and the researcher moved on to the second scenario. Following the second trial, the researcher moved on to the final scenario for the first target behavior (trial three). Once all three scenarios for the first target social skill were completed, the researcher repeated the process for the second target social skill until the participant completed up to nine total trials across three target social skills (depending on the phase of intervention).

At least one baseline session per target social skill was conducted at the participant's internship site. To initiate a baseline session at the internship site, the participant's coworker or

supervisor instructed the participant to meet the researcher in a specified location. When the participant arrived at the specified location, the researcher immediately initiated the first trial of the first target social skill using the same scenarios as were conducted in the classroom.

MET Video Modeling

MET video modeling was introduced during the intervention phase. Intervention sessions were conducted five days per week as long as the vocational training program was open. Participants were taught one-on-one by the researcher. Each participant was taught one target social skill at a time in the same order: *offering assistance*, *asking for more information*, *asking for help*.

Sessions consisted of three trials. At the start of each session the participant was welcomed by the researcher and then instructed to "watch the video". The participant then viewed the first video model depicting one scenario of the target social skill. The researcher observed the participant to make sure their eyes were on the video and the participant was attending to the video for the entire duration of the video. After the participant watched the video model, the researcher immediately initiated rehearsal of the scenario by vocally emitting the discriminative stimulus that was portrayed in the video model. Immediately following the researcher's initiation of the trial, the participant had 10 s to respond. If the participant responded correctly, the trial was scored as correct and the researcher responded with a natural consequence to match the video model (e.g., "thank you for your help"). If the participant did not respond correctly, the trial was scored as incorrect and the researcher said, "you didn't follow what was on the video, let's try that again". The participant watched the video model again and had the opportunity to rehearse the skill once more.

This process was then repeated with a second video model depicting the second scenario of the target social skill, and then with the third video model depicting the third scenario of the target social skill. In total, the participant viewed and rehearsed three different examples of the target social skill within each intervention session. The order in which the three different videos were presented was alternated across the sessions by a random order generator. Participants continued MET video modeling intervention sessions until they scored 100% (three out of three correct responses) across two consecutive sessions.

Generalization

Once the participant met mastery criterion for the target social skill in the MET video modeling intervention phase, a generalization probe for that target social skill was conducted at the participant's current internship site assessing the same three social scenarios for the target social skill. Generalization probes were similar to those conducted at the internship site during baseline and the participant did not have access to a video model before any trial. If the participant responded correctly to all three trials, the participant progressed to training for the next target social skill. If the participant did not respond correctly across all 3 trials, the participant progressed to the video fading condition.

Video Fading

If the participant performed at a rate lower than 100% during the generalization probe following the MET video modeling intervention phase, they were moved to the video fading condition. During video fading, the number of times the participant was able to view the video model within a teaching session was systematically faded from three to zero. Specifically, during the first training session the participant viewed each video model one time before each trial of the session (i.e., the participant watched the video model for all three trials). If the

participant scored 100% during that session, then during the next session the participant was able to view the video model for only the first two out of the three trials (i.e., the participant viewed a video model for trial one and rehearsed the skill and then viewed the video model for trial two and rehearsed the skill; the researcher immediately started the scenario for trial three without the participant viewing the video model). Again, if the participant scored 100%, the participant was only able to view the video model for the first trial during the third session (i.e., the participant watched the video model prior to the first skill rehearsal and did not watch any video models for the last two trials prior to skill rehearsal). If during any fading condition the participant scored 33% or lower across two consecutive sessions, the participant was moved back to the previous fading condition (e.g., if in the two video model condition then the participant moved back to the three video model condition).

Once the participant completed two sessions without viewing video models with 100% accuracy, another generalization probe was conducted and the next target social skill was introduced in the MET video modeling intervention phase.

Maintenance

After each target social skill was mastered, all previously mastered target social skills were assessed for maintenance. Maintenance was conducted similar to baseline in the office across from the classroom. All behaviors were also assessed for maintenance with the same procedures used in baseline seven weeks post intervention.

Procedural Integrity

A checklist was created by the researcher in the form of a task analysis to assess procedural integrity (PI) of the MET video modeling sessions, the video fading condition, and the baseline, generalization, and maintenance probes. During baseline, maintenance, and

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generalization probes, PI was calculated to assess whether or not the researcher used the correct materials associated with the scenario and waited 10 s for the participant to respond. During MET video modeling and video fading, PI was calculated to assess whether or not the researcher completed all of the steps necessary for the specific session and used the correct materials associated with the scenarios being taught. PI was calculated for at least 33% of all sessions across all phases by a trained graduate student via a video recording of sessions. Following each PI assessment, the calculation was completed by dividing the number of correct steps of implementation by the total number of steps completed plus not completed and multiplied by 100 to yield a percentage (Ledford & Gast, 2018). The PI average was 97% across all observed sessions, including 87% for baseline sessions (range, 83% to 100%), 100% for intervention sessions, 100% for video fading sessions, and 100% for generalization sessions.

Social Validity

To assess the social validity of this study, job coaches who provided daily support to the interns at their internship site completed a pre-survey prior to intervention and a post-survey after the intervention was completed. The social validity survey asked the job coaches to rate the intern's social skills related to the three target social skills.

Additionally, a survey was created to ensure the social validity of the skills being taught. The internship site supervisors were asked to view the video models and rate the importance of the target social skill at their internship site. Specifically, the site supervisors were sent a Google form with all nine videos created at their internship site and were asked to rate the following statements: (1) the videos I just watched are filmed at my worksite building, (2) if similar scenarios happened at my worksite, I would want my employees to respond the same way, (3)

the three social skills portrayed in the videos are important to an employee's success at my worksite.

Data Analysis

Visual analysis was used to analyze a functional relation between the teaching of work-related social skills using MET video modeling and video fading and the participants' performance of the three work-related social skills. Data were continuously graphed following each session throughout the study across all study conditions. Demonstrations of effect were shown in the data by lower levels of correct responses within the baseline conditions, and an increase in level following the presentation of the intervention phase.

Results

Seven demonstrations of effect were demonstrated across three behaviors and participants using the multiple probe design. When the MET video modeling intervention was introduced, all participants increased their accuracy in responding to the target social skill, as seen from the increasing trend following each baseline condition. Percentage of correct responses across each behavior can be found in Figures 1-3 for each participant. The need for the video fading condition varied across behaviors and thus was not implemented for all behaviors for all participants.

Two of the three participants were not able to complete the study because all data collection was terminated when the university and vocational training program closed due to the COVID-19 pandemic on March 16, 2020. Overall, one participant completed the entirety of the intervention, including a 7-week post maintenance probe. Another participant progressed through two of the behaviors in the intervention phase, and the third participant only completed one behavior in the intervention phase.

Phil

Phil did not respond correctly during any trial across all behaviors during all baseline sessions prior to the MET video modeling intervention. Phil met mastery criterion for *offering assistance* within 5 MET video modeling sessions. He then responded correctly on 66% of the trials during the generalization probe at his internship site. Video fading was then implemented and Phil responded correctly across 100% of trials for 5 sessions. After the video fading condition, Phil responded correctly with 100% accuracy to the generalization probe at the internship site and progressed to the next target social skill. Phil continued to perform with

100% accuracy on *offering assistance* for each maintenance probe conducted when mastery was obtained for the other target social skills.

Phil met mastery criterion for *asking for more information* within 5 MET video modeling intervention sessions and then scored 100% on the generalization probe at his internship site. As such, Phil did not require video fading for *asking for more information* and was then introduced to the third and final behavior, *asking for help.* Phil met mastery criterion for *asking for help* within 4 MET video modeling intervention sessions and responded with 100% accuracy during the generalization probe at the internship site, indicating he did not require video fading for the third behavior. Phil received a 7-week maintenance probe and responded with 100% accuracy for two out of the three behaviors: *offering assistance* and *asking for more information*. For the third behavior, *asking for help*, he did not respond accurately to any of the three probes.

Morgan

Morgan did not perform the behavior of *offering assistance* during any of the three baseline probes. Once MET video modeling was introduced, Morgan met mastery criterion within 5 MET video modeling intervention sessions. During the generalization probe at the internship site, Morgan responded correctly for 2 out of 3 trials (66% accuracy), indicating the need for video fading. Morgan performed with 100% accuracy during all video fading sessions for *offering assistance* and completed this phase within 5 sessions. On the generalization probe immediately following video fading, Morgan again responded correctly on only 2 out of 3 trials. Intervention for the second behavior, *asking for more information*, was then introduced. During baseline, Morgan responded correctly during one trial for two out of seven sessions. She met mastery criterion within three sessions of MET video modeling and responded accurately on all 3 trials (100%) for the generalization probe at the internship site, indicating no need for video

fading. Morgan was unable to complete training for the third behavior, *asking for more information*, because her program was closed due to COVID-19 on March 16, 2020.

Bart

Bart did not perform any of the social skill behaviors during any baseline session prior to the MET video modeling intervention. Bart met mastery criterion for *offering assistance* within 4 MET video modeling intervention sessions and responded with 100% accuracy during the workplace generalization probe, thus indicating the video fading condition was not needed. Although he began intervention for the second behavior, *asking for more information*, Bart was not able to complete training for this behavior or for the final behavior because the vocational training program was closed due to COVID-19 on March 16, 2020.

Social Validity

Two job coaches completed the social validity surveys (Table 4-6). One job coach completed the survey for Bart, while the other completed it for Morgan, and both completed Phil's survey. Phil's pre- and post-survey was completed by two different job coaches because the job coach that supported him changed from one job coach to another throughout the course of the study. Overall, both job coaches rated the importance of the skill being taught for each participant at all internship sites from somewhat agree to strongly agree. It was indicated on Phil's survey that he never engaged in the target social skills prior to the intervention, but post intervention his engagement in target social skills were rated as rarely for the target social skill, *asking for more information* and sometimes for both target social skills *offering assistance* and *asking for help*. Morgan's engagement in target social skills were rated as very often for *asking for help* and *asking for more information* before and after the intervention and *offering assistance* was rated as rarely prior to implementation of the intervention, and very often post intervention.

Bart's target social skill rating for *asking for help* did not change from pre- to post-intervention. Prior to intervention, Bart's target social skill asking for more information was indicated as never, and post intervention was rarely. Bart's engagement in the target social skill for *offering assistance* was rated as rarely prior to intervention and never post intervention.

Additionally, all target social skills were assessed by the three supervisors. Supervisors watched all nine videos created for their internship site and rated the following statements with strongly agree: (1) the videos I just watched are filmed at my worksite building, (2) if similar scenarios happened at my worksite, I would want my employees to respond the same way, (3) the three social skills portrayed in the videos are important to an employee's success at my worksite.

Discussion

Employers often expect that new employees, regardless of disabilities, to enter the workforce with a social skill repertoire already established so the employee is able to focus on increasing performance solely related to completing job tasks (Butterworth & Strauch, 1994). Young adults with IDD, however, continue to lack the social skill repertoires needed to be successful in employment settings (Bucholz et al., 2008; Roux et al., 2017). To fill in the gap of the limited research that has been conducted to improve social skills in the workplace for individuals with IDD, the current study was conducted to evaluate the effectiveness of MET video modeling to teach work-related social skills, to examine whether the social skills would generalize across environments, and to determine whether a video fading condition would improve generalization. The findings provide evidence that young adults with IDD can be taught: work-related social skills using a MET video modeling intervention, they can generalize these skills to their workplace environment, and can maintain these skills over time. All three participants displayed an increasing trend in accurate responding upon introduction of the MET video modeling intervention condition. Video fading was required to enhance skill generalization for only one behavior for two of the three participants. These findings replicate previous research by Park and colleagues (2018b) and extend upon the research in a variety of ways.

First, the results indicate that incorporating MET into a video modeling intervention can be an effective strategy to teach work-related social skills to young adults with IDD and to improve generalization of the skills to the workplace. Still, the need for video fading indicates that it is important to strategically implement additional strategies based on the individual's specific learning needs. For example, although Bart was only able to receive training on one

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behavior, his performance indicates that video fading might not be a necessary component of the intervention package. For Phil and Morgan, on the other hand, video fading was needed for acquisition of the first behavior taught. This suggests that perhaps these two participants needed additional initial exposure to the intervention procedures first but were then able to apply the procedures more efficiently with later behaviors.

Second, findings suggest that MET video modeling could be easily implemented in a vocational training program. Benefits include cost effectiveness, ease of implementation, and time efficiency (Charlop-Christy et al., 2000). Each session took less than 5 min to conduct and required minimal preparation from the researcher. Most vocational training programs already have technology to film and show a video model to an individual, as well as a support person or job coach to implement the intervention. Job coaches could quickly film a coworker engaging in the work-related social skill the individual needs to acquire and the video model could be accessible even when the job coach is not available.

Third, results indicate that each participant progressed through the intervention at different rates and responded differently to the intervention. For example, Phil enjoyed participating in sessions everyday and he progressed through training quickly. It is likely that the intervention itself (i.e., watching the videos) was reinforcing to Phil and may have impacted his acquisition of the skills. Throughout many sessions, he would say, "I love this, can we do this every day?", "This is my favorite, I like to do this everyday," and "Can we do this next year?" Even after intervention ended for Phil, he often asked, "Can I watch the videos again?" Despite Phil's preference for the intervention and initial success, he responded incorrectly during the 7-week maintenance session to all scenarios related to the target social skill of *asking for help*. It is important to note, however, that he is in a vocational program that promotes independence and

his performance during this session could be explained by a high motivation to complete tasks on his own without *asking for help*.

Alternatively, Morgan did not enjoy participating in the intervention and often asked when it would be completed. Her performance of one of the social skills was also not as successful in the generalization setting, as she failed to respond correctly to the same scenario of *offering assistance* across two generalization probe sessions. Specifically, when someone could not remember how to complete a task, she immediately started engaging in the physical aspect of the helping behavior by setting up the napkins, salt, and pepper in the holder without vocally *offering assistance*. Thus, although Morgan learned an appropriate social skill in that she helped, she did not display the behavior that was being explicitly taught in this intervention. Future research should focus on the most functional work-related social skills related to an individual's success at the workplace. Further, Morgan's performance also varied slightly within the low level throughout baseline, as she responded correctly three times across three different baseline sessions. Her instructor noted that she sometimes emitted the social skills taught in the intervention prior to intervention, however, it was almost always during an inappropriate time or in an inappropriate manner. Following intervention, Morgan increased her accurate and appropriate responding in these social scenarios. Finally, although Morgan did not get to complete the intervention, based on her current progress, it is inferred that her responding would have increased in trend and generalized to the workplace following the MET video modeling intervention for the behavior, *asking for help*.

Finally, Bart had the most difficulty with the intervention, as he faced many barriers during training sessions. First, multiple sessions were unable to be conducted because he often arrived late to the classroom when returning from his internship site (this happened on at least 4

occasions). Additionally, throughout the study, it was never clear whether or not his hearing aids were working correctly. An audiologist visited his internship site to determine if they were working correctly, she confirmed that they were, but he was not responding to the classroom instructor even with the Bluetooth mic synced with his hearing aids. Before the start of session 14, Bart notified the researcher that his ear hurt from his hearing aid, so Bart wore headphones for that session. The low level responding shown for session 14 and 15 is likely due to malfunctioning of his hearing aid(s). While Bart did not get to finish the intervention, based on the data shown (providing his hearing aids were fully functioning), it is inferred that the increasing trend in the MET video modeling intervention phase would have continued to increase for the behavior, *asking for more information*.

Limitations and Future Research

While positive results were identified, there are still limitations to be considered for further research. To start, only one participant was able to complete the entirety of the study, while the other participants' participation was unexpectedly terminated due to the shutdown of the university and vocational training program to avoid the spread of COVID-19.

Second, two sessions of baseline were conducted prior to the MET video modeling condition, instead of three. The researcher counted the generalization probe conducted at the workplace as a baseline session. First, this was to respect the participants. During baseline, they felt they were being tricked by the researcher, so the researcher limited the exposure the participants had in baseline sessions by counting the generalization probe as a baseline session. Second, the researcher needed to assess the participant's ability to use the three social skills in the workplace prior to teaching. To avoid disrespecting participants during baseline sessions,

future research could conduct baseline sessions at the workplace in the individual's natural environment and ask coworkers or supervisors to run the probes.

Third, tasks were not always directly related to the participant's current internship site. For example, although one task asked participants to make change, no participant was actually allowed to handle money or use the cash register at their internship site, (due to university policies). Thus, although they worked in environments where other employees made change and handled money, this was not a task they were asked to perform while at work. Future research should ensure careful thought and attention for the process of developing scenarios and creating video models directly applicable to the participants' work tasks. Third, because of the nature of the tasks, not all scenarios depicted in the video models were the same length. For example, one scenario depicting *offering assistance* was one of the longest video models in duration and the physical act of the helping behavior was longer in duration than the vocal action. Bart was observed using self-talk while watching this specific video model, stating "oh, I see, you put it there," while the video model was depicting the physical act of setting up the napkin holder on the table. Thus, participants may have focused on the wrong aspects of this video model and missed the specific cue for the vocal behavior. Future studies should pay close attention to not only the duration of the video, but the duration of the target behavior displayed in the video.

Finally, although generalization probes took place at the participants' internship site, these generalization probes were conducted in a separate room from their normal workplace environment for two of the three participants. Although this was outside of the researcher's control, it would be preferable to have conducted the generalization probes where the participant generally worked. Additionally, because the generalization probes were conducted in the natural environment, there were often uncontrollable variables such as reverberated noise, and other

workplace distractions. Thus, it is possible that participants missed the discriminative stimulus indicating a response was expected. Finally, the generalization probes were facilitated by the researcher instead of a coworker or supervisor with whom the participant would naturally interact with throughout the day. Future research should consider including coworkers, supervisors, or job coaches to deliver the intervention phase and facilitate generalization probes. Planning for generalization across various individuals is an important step, due to the ever-changing workforce around us.

Conclusion

Social skills are essential to the success of individuals with IDD to obtain and maintain employment. Yet, little research has been conducted to evaluate effective strategies to teach these skills within this environment with this population. The current study was the first to use MET video modeling without other prompting strategies to teach work-related social skills to young adults with IDD. The results obtained yield important information for all special education teachers, especially vocational training program instructors. Additional further evaluation of these strategies are crucial to help lessen the gap of unemployed adults with IDD.

APPENDIX

Table 1

Scenarios for Target Social Skill: Offering Assistance

Antecedent	Definition	Scenario	Correct Response	Consequence
Making a mess	Participant vocally emitting two or more words to offer to assist the person within 10 s of observing the person attempting to perform an action.	Researcher spills water on the table and vocally emits "what a mess, this is going to take me so long to clean up!"	"Can I help?"	Researcher vocally thanks participant for helping.
Cannot remember how to complete a task	Participant vocally emitting two or more words to offer to assist the person within 10 s of observing the person attempting to perform an action.	The following items are present on the table: napkins, salt and pepper and the researcher says "I can't remember how to set these up on the table."	"Let me help"	Researcher vocally thanks participant for helping
Carrying too many items	Participant vocally emitting two or more words to offer to assist the person within 10 s of observing the person attempting to perform an action.	Researcher person picks up too many boxes at once and drops one or more of them and says "I have too many things to carry."	"I'll help you"	Researcher vocally thanks participant for helping.

Table 2

Social Scenarios for Target Social Skill: Asking for More Information

Antecedent	Definition	Scenario	Correct Response	Consequence
Unclear instructions	Participant vocally *asking for more information* about the assigned task or break time within 10 s of the presented task or statement	When presented with cleaning supplies, researcher says, "Go clean, please."	"Clean what?"	Researcher provides information to participant.
Item is missing	Participant vocally *asking for more information* about the assigned task or break time within 10 s of the presented task or statement	Researcher says, "Clean this table," with spray not visible.	"Where is the spray?"	Researcher provides information to participant.
Instructed to take a break early or later than their normal break time	Participant vocally *asking for more information* about the assigned task or break time within 10 s of the presented task or statement	Researcher presents daily task schedule and says "There are people out sick today and I need you to take your break early."	"What time?"	Researcher provides information to participant.

Table 3

Social Scenarios for Target Social Skill: Asking for Help

Antecedent	Definition	Scenario	Correct Response	Consequence
Instructed to complete task urgently	Participant vocally asking for assistance with two or more words within 10 s of the verbal instructions to complete a task	Unsorted silverware is present and the other person says "We don't have much time until lunch starts, sort this silver, you only have thirty seconds!"	"Will you help me?"	Researcher helps the participant complete the task.
Instructed to complete task they are unable to complete correctly on their own	Participant vocally asking for assistance with two or more words within 10 s of the verbal instructions to complete a task	Cash register is present, and the participant is instructed to make change. "My meal is $9.54, I need you to give me back my change."	"Can you help me?"	Researcher helps the participant complete the task.
Instructed to complete a task that requires 2 people to complete	Participant vocally asking for assistance with two or more words within 10 s of the verbal instructions to complete a task	Heavy table/chair/couch/cabinet is present and the other person says "I need you to move this table to the other side of the room."	"I need your help."	Researcher helps the participant complete the task.

Table 4

Skills Trainer Responses to Social Validity Survey for Phil

Survey Statements	Never	Rarely	Sometimes	Very often	Always
1. The intern asks a coworker or supervisor for help when they need it	Pre		Post		
2. The intern asks for more information when appropriate	Pre	Post			
3. The intern offers to help a coworker when appropriate	Pre		Post		

Survey Statements	Strongly Disagree	Somewhat disagree	Neutral	Somewhat Agree	Strongly Agree
4. Asking for help is an important social skill that the intern needs to work here					X
5. Asking for more information is an important skill that the intern needs to work here					X
6. Offering to help is an important social skill that the intern needs to work here					X

Note. The pre and post survey was completed by two different people due to the change of skills

trainers for Phil.

Table 5

Skills Trainer Responses to Social Validity Survey for Morgan

Survey Statements	Never	Rarely	Sometimes	Very often	Always
1. The intern asks a coworker or supervisor for help when they need it				Pre/Post	
2. The intern asks for more information when appropriate				Pre/Post	
3. The intern offers to help a coworker when appropriate		Pre		Post	

Survey Statements	Strongly Disagree	Somewhat disagree	Neutral	Somewhat Agree	Strongly Agree
4. Asking for help is an important social skill that the intern needs to work here				X	
5. Asking for more information is an important skill that the intern needs to work here				X	
6. Offering to help is an important social skill that the intern needs to work here					X

Table 6

Skills Trainer Responses to Social Validity Survey for Bart

Survey Statements	Never	Rarely	Sometimes	Very often	Always
1. The intern asks a coworker or supervisor for help when they need it		Pre/Post			
2. The intern asks for more information when appropriate	Pre	Post			
3. The intern offers to help a coworker when appropriate	Post	Pre			

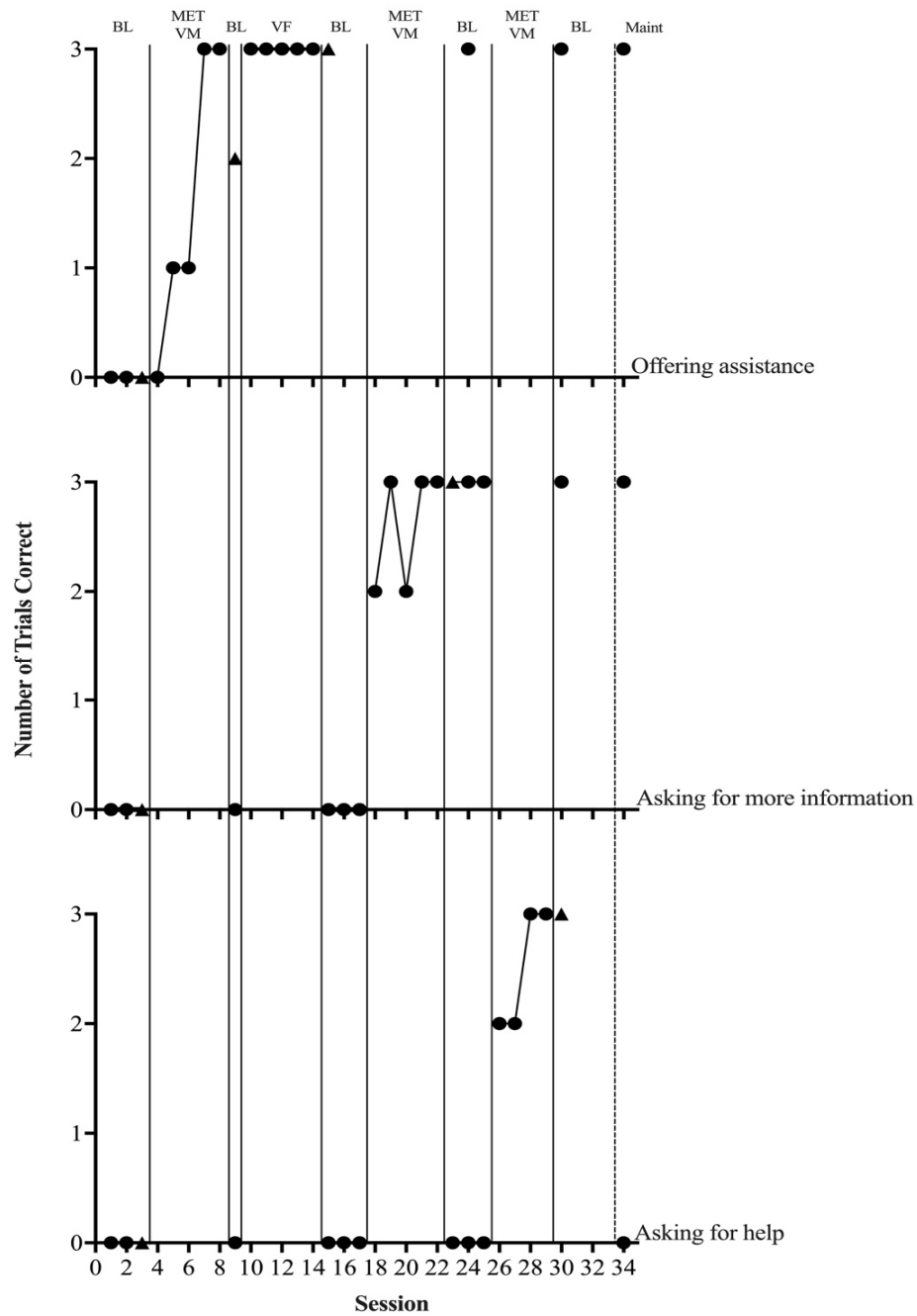| Survey Statements	Strongly Disagree	Somewhat disagree	Neutral	Somewhat Agree	Strongly Agree
4. Asking for help is an important social skill that the intern needs to work here					X
5. Asking for more information is an important skill that the intern needs to work here				X	
6. Offering to help is an important social skill that the intern needs to work here				X	

Figure 1. Number of correct responses out of three trials emitted by Phil across all conditions.

Baseline = (BL), Multiple-exemplar training video modeling = (MET VM) and video fading =

(VF) conditions. Triangles depict generalization probes at the workplace.
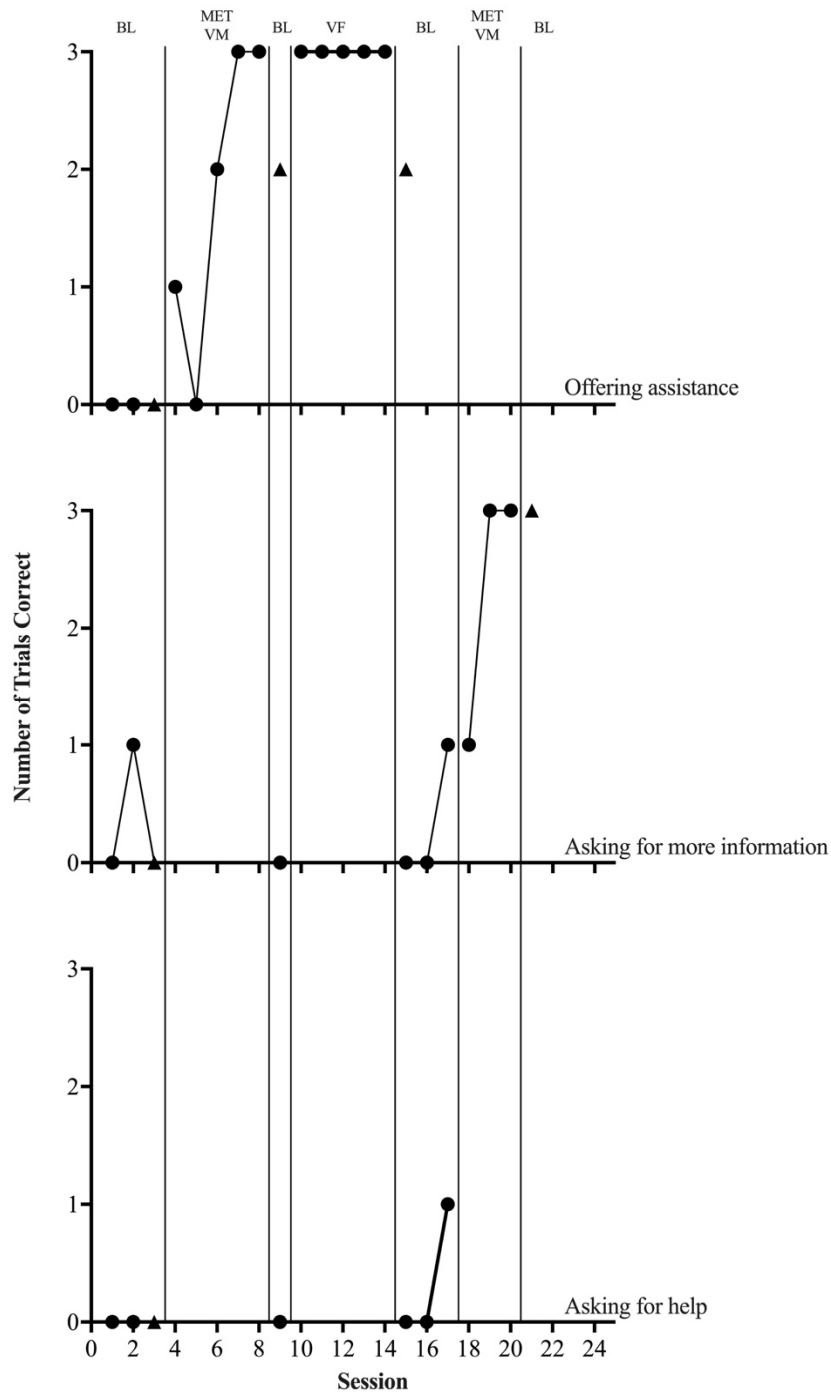
Figure 2. Number of correct responses out of three trials emitted by Morgan across all
conditions. Baseline = (BL), Multiple-exemplar training video modeling = (MET VM) and video
fading = (VF) conditions. Triangles depict generalization probes at the workplace.
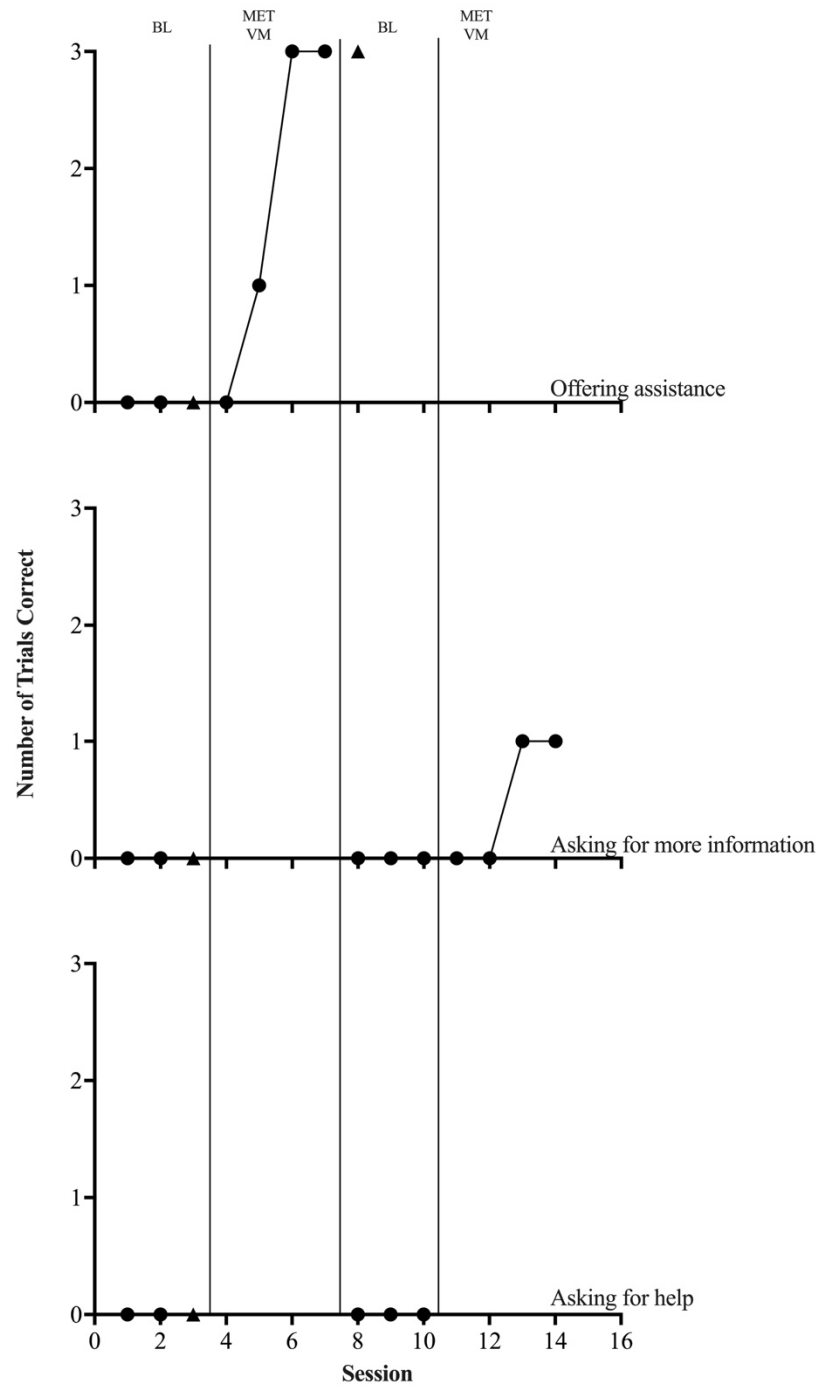
Figure 3. Number of correct responses out of three trials emitted by Bart across all conditions.

Baseline = (BL), Multiple-exemplar training video modeling = (MET VM) and video fading =

(VF) conditions. Triangles depict generalization probes at the workplace.

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