

## RESEARCH ARTICLE

# An individualized approach to teaching adults with autism to successfully navigate job interviews via remote instruction

SungWoo Kahng<sup>1</sup>  | Courtney Butler<sup>2</sup>  | Faris R. Kronfli<sup>3</sup>  |  
Christeen Zaki-Scarpa<sup>2</sup> | Brianna Boragi<sup>2</sup> | Joseph Scott<sup>4</sup>

<sup>1</sup>Department of Applied Psychology, Rutgers University, New Brunswick, NJ, United States

<sup>2</sup>Rutgers Center for Adult Autism Services, Rutgers University, New Brunswick, NJ, United States

<sup>3</sup>Department of Psychology, University of Florida, Gainesville, FL, United States

<sup>4</sup>Rutgers Career Exploration and Success Office, Rutgers University, New Brunswick, NJ, United States

## Correspondence

SungWoo Kahng, Department of Applied Psychology, Nelson Biology Laboratories, Rm D315, 604 Allison Rd, Piscataway, NJ 08854, United States.

Email: [s.kahng@rutgers.edu](mailto:s.kahng@rutgers.edu)

## Funding information

State of New Jersey Department of Health

Editor in Chief: John Borrero

Handling Editor: Florence DiGennaro Reed

## Abstract

Adults with autism spectrum disorder (ASD) experience challenges securing employment, which may partially explain overall underemployment or unemployment in this population. One of the first steps to obtaining employment is participating in a job interview. However, social communication deficits may interfere with an individual with ASD's participation in a job interview. The current study evaluated the use of behavioral skills training delivered via remote instruction to teach interview skills to seven adults with ASD. Results showed overall improvement during interviews as well as posttraining tests with a career development expert. These data suggest that an individualized approach to teaching may be an effective strategy to help adults with ASD successfully navigate job interviews.

## KEYWORDS

autism spectrum disorder, behavioral skills training, college students, employment, job interview, remote instruction

One transition that might occur after high school or college for some individuals with autism spectrum disorder (ASD) is seeking employment. Finding employment is critical for several reasons, such as monetary compensation, which facilitates financial independence (Roux et al., 2013). Many jobs may also provide a rich source of social reinforcement and opportunities to develop relationships with others (Scott et al., 2019).

Despite the importance of employment, adults with ASD have a lower likelihood of being employed compared with individuals with other disabilities and may experience challenges finding and maintaining employment regardless of their intellectual and vocational abilities (Taylor & Seltzer, 2010; Wehman, Schall, Carr, et al., 2014; Wehman, Schall, McDonough, et al., 2014). Roux et al. (2013) found that approximately half (53.4%) of the young adults with ASD surveyed reported having

worked for pay outside the home since leaving high school. This percentage is considerably lower than young adults with other disabilities, such as emotional disorders (88.2%), learning disorders (89.8%), and speech/language impairments (88.2%). Roux et al. (2017) examined data from the National Core Indicators' Adult Consumer Survey evaluating 3,520 working-age adults with ASD who were receiving services for developmental disabilities. The results indicated that only 14% of the adults surveyed reported having had paid employment in the community. These data reflect the fact that securing and maintaining employment may be difficult for adults with ASD.

Black et al. (2019) found that adequate preparation was one critical factor in successfully obtaining employment. Without instruction, the job interview process can be a barrier to securing employment. In a survey of individuals with ASD, their family members, employers, and service

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2023 The Authors. *Journal of Applied Behavior Analysis* published by Wiley Periodicals LLC on behalf of Society for the Experimental Analysis of Behavior (SEAB).

providers, Black et al. (2020) reported that most respondents found the interview process to be challenging. Given that social communication deficits are a core symptom of ASD (American Psychiatric Association, 2022), individuals with ASD may be at risk for difficulties during traditional job interviews, which typically require social competence.

Although job interviews are one of the first steps to obtaining employment, there has been limited research on teaching adults with ASD to successfully navigate job interviews. Strickland et al. (2013) evaluated a web-based curriculum to teach interviewing skills. Their JobTIPS curriculum consisted of video modeling, and their results showed that participants improved their job interviewing skills. Morgan et al. (2014) developed and evaluated the interview skills curriculum using a 12-week group-delivered format with young adults with ASD. Their results showed that the manualized intervention increased social and pragmatic behaviors. Although these studies demonstrated improvements in job interviewing skills, the interventions were manualized and lacked accommodations to the individualized needs of adults with ASD.

Behavioral skills training (BST; Miltenberger et al., 2017) is an individualized approach to teaching, which includes instruction, modeling, rehearsal, and feedback. BST can be used to successfully teach job interview skills such as asking and answering questions. Stocco et al. (2017) taught appropriate interview skills using BST to five neurotypical college students with a history of difficulty obtaining employment. Behaviors of interest included vocal responses, such as answers to questions and questions asked, as well as nonvocal responses, such as smiling and posture. Following BST, all participants asked more appropriate questions, provided more appropriate answers, and smiled more; however, brief booster sessions were required for three participants.

Roberts et al. (2021) extended the work of Stocco et al. (2017) by evaluating the use of BST to teach interview skills to three students with ASD who were attending a community transition program. The study evaluated appropriately answering 10 common interview questions, asking appropriate questions, and displaying appropriate body language. For two of the participants, BST was effective at teaching appropriate interview skills, but one participant required additional textual cues and an embedded reinforcement system to meet mastery. These results are promising because improved interview skills may provide individuals with the skills necessary to secure employment and increase their financial independence.

Despite the growing literature focused on teaching interview skills to typically developing individuals (Wirantana et al., 2020), these skills have not been well studied with adults with ASD. Furthermore, there are generally far fewer behavior-analytic services for adults with ASD despite the increased prevalence of ASD. The lack of support programs is especially problematic for individuals with ASD who will be seeking employment

opportunities and may lack the required skills to successfully complete employment interviews.

One way to reach the growing population of adults in need of behavior-analytic support is via remote instruction (e.g., web-based video calls). There is ample research to suggest that remote instruction is an effective and cost-efficient method for providing services to those without brick-and-mortar clinics in their location (Rispoli & Machalicek, 2020; Schieltz & Wacker, 2020). These models lend themselves well to improving interview skills because many interviews are conducted using video calls (Chapman & Rowe, 2001), and they allow for frequent and consistent therapy because there are fewer obstacles that might hinder participation (e.g., transportation). The purpose of the current investigation was to use BST delivered via remote instruction to teach young adults with ASD to successfully complete job interviews.

## METHOD

### Participants and setting

The participants were seven currently enrolled undergraduate students and one recent graduate of a large public university, and all were diagnosed with ASD. The training<sup>1</sup> opportunity was presented to 27 students in a university-based support program and one recent graduate of the support program who was affiliated with a similar university-based program for adults with ASD. Of the 28 individuals presented with the opportunity, seven volunteered to participate. All participants volunteered to participate in this study because of their interest in improving their interview skills. No one was excluded from this study if they expressed an interest in participation.

Zane was a 21-year-old man with 2 years until his expected graduation. Evan was a 25-year-old man with 1 year until his expected graduation. Kim was a 23-year-old woman expected to graduate the same semester the project began. Eric and Steve were 21-year-old men with 1 year until their expected graduation. Jill was a 20-year-old woman with 1 year until her expected graduation. Sam was a 28-year-old man who had graduated from the program 2 years prior. Ian was a 23-year-old man expected to graduate the same semester the project began. Ian withdrew from the study; therefore, his data are not included in this study.

Most participants had some job experience, but only one participant was actively employed at the time of the study. Zane had previously worked at a laundromat for approximately 2 years, Evan and Steve had worked at a university student center for approximately 1.5 years, and Kim had worked at a fast-food restaurant for

<sup>1</sup>The term "training" will be used to describe the independent variable in this study to remain consistent with prior descriptions of procedures used to prepare applicants for potential employment.

**TABLE 1** Scores, operational definitions, and examples for answering questions

Score	Operational definition	Example
0	Did not respond to the question or responded but did not answer the question.	In response to “What are your strengths,” the participant responded with, “I don’t know.”
1	Responded to the question but did not answer all parts of the question or responded but provided a vague answer.	In response to “What are your strengths,” the participant responded with, “I have a lot of strengths” or “My strengths make me a good candidate.”
2	Completely answered the question, but the response did not directly relate to the position for which the participant was interviewing.	In response to “What are your strengths?” the participant may have responded, “I am very caring, kind, and friendly.”
3	Completely answered the question and related their response to the job for which they are applying.	In response to “What are your strengths,” the participant responded with, “I am proficient in JAVA, and I have completed many programming courses. I hope to learn more if given the opportunity to work with this company.”

approximately 1.5 years. Eric had worked on home improvement projects for one summer, and Sam had worked at a university-based technology shop for 3 years. During the time of the study Sam was working at a fulfillment warehouse. Jill had never been employed.

## Response measurement

All sessions were conducted and recorded using WebEx or Zoom, two secure online video conferencing programs supplied by the university. Data were collected during the interview or from the video recording of the interview. The primary dependent variable was correct responses to the interviewer’s questions (answering questions and asking questions), which were scored using a 0 to 3 scale to demonstrate the quality and appropriateness of the responses (see Table 1). The remote interview made it difficult to score nonvocal responses; therefore, we did not measure these behaviors. It is important to note that none of the participants had a specific job for which they planned on applying upon completion of this study. Therefore, to meet the criteria for a score of 3, they were instructed to answer questions as if they were interviewing for a position related to their academic major.

Each interview consisted of six questions. The first and last questions were held constant across all

**TABLE 2** Scores, operational definitions, and examples for asking questions

Score	Operational definition	Example
0	Did not ask a question or said they do not have any questions.	“I don’t have any questions.”
1	Asked a question, but it did not relate to the position for which the participant was interviewing or was information that should be known before the interview.	“Have you been reading about COVID-19?” or “What does this company do?”
2	Asked a question that showed interest in the job for reasons other than the qualities of the company or program.	“How much do you pay?”
3	Asked a question that would unlikely be known before the interview and would suggest long-term interest in the company or program.	“Do you offer the opportunity for continued education?”

interview sets, as these were the questions found to be most commonly asked by interviewers as suggested by the career development expert. Question 1 was always “Tell me about yourself,” the next four questions always varied, and Question 6 was always “Do you have any questions?” The scores and operational definitions were adapted from Stocco et al. (2017). Operational definitions for answering questions are presented in Table 1. Operational definitions for asking questions are presented in Table 2. We also collected data on time expenditure, which included the duration of all mock interviews and training components. Interview duration was measured at the onset of the first question asked and stopped after the last question was answered. The interviewer was instructed to continue to ask, “Do you have any more questions?” as the final question until the interviewee stated that they did not. When there were no further questions, the interviewer stated, “Thank you” or a similar ending statement, and the interview was terminated. Training duration was measured when the instructor began vocal instruction and ended once the training was complete and no questions remained, similar to the interview.

## Interobserver agreement and treatment integrity

A second observer independently collected data for a mean of 56.8% of sessions (range, 30.8%–90.5%) in each phase. We calculated interobserver agreement using exact agreement for each interview question then averaged agreements across all sessions for the participant. That is, both data

collectors must have scored a 0, 1, 2, or 3 to count as an agreement. The number of questions with exact agreement was divided by the total number of questions, and the quotient was multiplied by 100. Interobserver agreement averaged 93.9% (range, 66.7%–100%), 88.3% (range, 66.7%–100%), 88.9% (range, 66.7%–100%), 92.9% (range, 83.3%–100%), 87.5% (range, 66.7%–100%), 91.7% (range, 83.3%–100%), 90.7% (range, 83.3%–100%) for Zane, Evan, Kim, Eric, Steve, Jill, and Sam, respectively.

Treatment integrity was calculated during training and interviews. Correct experimenter behavior during the training included reviewing the PowerPoint presentation, providing feedback on the participant's previous interview, allowing the participant opportunities to ask questions, providing immediate feedback following the participant's response to each question, and correctly implementing the error correction procedure. Correct experimenter behavior during the interview included asking the correct questions and providing a neutral response (e.g., "Okay, next question") contingent on the participant's response. Treatment integrity was measured for a mean of 38.6% (range, 33.3%–50%) of training sessions and averaged 97.5% (range, 90.5%–100%). Treatment integrity was measured for a mean of 44.5% (range, 28.6%–62.5%) of interview sessions and averaged 85.5% (range, 84.3%–100%).

## Experimental design and procedures

A nonconcurrent multiple baseline design across participants (Watson & Workman, 1981) was implemented to evaluate the effects of the various interview training sessions. Pre- and posttraining tests were also conducted with each participant.

For each interview, including the pre- and posttraining tests, a set of six questions was presented to the participant. As noted, each set of questions was structured similarly with the first and last questions remaining constant throughout the study and four novel questions in between. The novel questions were always different so that participants did not memorize answers and so they could practice answering novel questions. Questions 2 through 5 were grouped into four categories: job-specific, participant-specific, team-related, and work-performance questions. The sets of questions were structured consistently across participants during all interviews (e.g., question set 1 was presented during session 1 across participants, question set 2 was presented during session 2, and so on).

Contingent on the participant's response, the interviewer responded with general praise (e.g., "Okay, great. Let us move on."). For the final question, the interviewer responded by thanking the participant in a neutral tone for asking the question but did not provide an answer. The interviewer then asked the participant if they had any other questions (e.g., "Thank you for your question, do you have any others?"). The interviewers in the

current study provided general responses to the participants' questions to maintain consistency in procedures and because the interviewers were not subject matter experts in the participants' field of study. The experimenters periodically debriefed the participants after the interviews to remind them that the interviews were for training purposes and that in an actual interview, the actual interviewer would answer any questions they may pose.

We implemented variations of BST to teach interview skills across five conditions. We progressed from least intensive training (i.e., group training) to most intensive training (i.e., error correction training) to identify the most efficient (i.e., less time, fewer personnel hours) and individualized method of instruction.

Individual interviews were conducted immediately after each training. Except for the pre- and posttraining tests, the experimenter, who was unfamiliar to the participant, served as the interviewer during interviews. The interviewer remained constant during interviews with each participant throughout the study.

If the participant demonstrated mastery (three sessions at or above 83.3% [i.e., a score of 15 out of a possible 18 using the 0 to 3 scale]) during interviews in a specific training condition, we moved on to the posttraining test. The progressive approach to training allowed the researchers to determine the most efficient and individualized method of training for each participant. The criteria to move to the next level of training were (a) three consecutive sessions below 83.3% or (b) five total sessions without mastering the skills. Additionally, if responding was on an increasing trend, we continued sessions. It is important to note that one procedural integrity error occurred for Zane in which he progressed to the subsequent training phase before it was possible to evaluate mastery within his current phase. This error did not affect Zane's results, as it required an additional 10 sessions to reach mastery.

## Pretraining test

A senior staff person from the university's Career Exploration and Success Office conducted the pretraining interviews. The staff person was asked to begin the interview as they typically would and converse with the participants, but to not initiate small talk. The purpose of this was that some of the participants (a) reported feeling uncomfortable engaging in small talk and (b) were enrolled in a concurrent research project that focused primarily on improving small talk.

## Baseline

During baseline, each participant completed three to six initial interviews with the experimenters serving as the interviewers. Each participant was assigned the same



experimenter to conduct all their interviews across the study (excluding the pre- and posttraining tests). The participants were asked six questions and received no programmed consequences based on their performance. All baseline sessions were conducted in one day for each participant.

## Training

### *Group training*

We conducted group training of interview skills because that is the common method of teaching these skills. The first group training was simultaneously conducted with three participants (Zane, Evan, and Kim) in a virtual conference room via WebEx. The second group training was simultaneously conducted with four participants (Eric, Steve, Jill, and Sam) in a virtual conference room via Zoom. All participants were asked to have their cameras on and to mute themselves during the training but were encouraged to actively participate and unmute themselves to ask questions or to type questions in the WebEx or Zoom chat box as the training occurred. All questions asked by the participants were recorded and used to guide training for specific areas of concern for each participant. The instructor, who was also the instructor in all subsequent training, was a doctoral-level behavior analyst who was unfamiliar to the participants. The instructor used PowerPoint, and group training lasted approximately 35 min. Training included explanations on the importance of interviewing skills as well as instructions on appropriate and inappropriate aspects of an interview through text and pictures.

Instructions and modeling were also provided through two embedded videos depicting one appropriate interview (about 2 min) and one inappropriate interview (about 1.5 min) developed by the instructor. Videos depicted nonvocal behaviors such as posture, eye contact, orientation, and smiling, which were all reviewed during instruction. General body language, such as hand gestures and stereotypic motor behaviors (e.g., rocking in chair), were also demonstrated in the videos and reviewed during instruction but not analyzed for the current study. Behaviors related to the dependent variables of the current study included responses to questions and questions asked to the interviewer. Questions asked during the video included, "Tell me about yourself," "What are your greatest strengths?" "What work experience do you have?" and "Do you have any questions?" The first and last questions were always asked during interviews and therefore were included in the training. The other two questions were part of the sets of questions asked but were chosen because they required specific responses from participants, eliminating the possibility of the participants repeating the appropriate response demonstrated in the video. Example responses were created based on the operational definitions presented in Tables 1 and 2. Videos were shown

in full to the participants and, if needed, could be paused to review component aspects of the interview. Although nonvocal responses were not measured for the current study, the behaviors were present in both videos to demonstrate appropriate and inappropriate nonvocal behavior in an interview. Each participant completed one interview within 3 to 6 days after the group training. Only one group training was provided due to time constraints and repetition of the information in subsequent training. If the participant did not master the skill after the first interview after group training, they moved to the next phase of training.

### *Individualized training*

We only conducted this condition with our first three participants, Zane, Evan, and Kim. We did not conduct individualized training with Eric, Steve, Jill, and Sam because of Zane's, Evan's, and Kim's poor responses to the individualized training, the time expenditure, and the complaints about repetitive treatment methods.

During all training phases, the interviewer was constant for each participant throughout the study. Instruction consisted of presenting an abridged version of the PowerPoint presentation used in the initial group training individually to each participant, allowing for more personal interactions with the instructor. Individual sessions took 5–10 min to present depending on the participant. The presentation of the PowerPoint served as an instructional reminder of all appropriate vocal and nonvocal skills to demonstrate during an interview. Participants had the opportunity to ask questions and clarify statements. Feedback on their performance was not provided during this phase.

### *Individualized training with delayed feedback*

This phase was similar to the previous phase except that after the abridged PowerPoint was reviewed, a recording of the participant's most recent interview was shown to the participant. The instructor and the participant reviewed the recording together and the instructor provided feedback on the participant's responses. On average, the delay from the interview to the feedback was 1–4 days, and no more than 11 days elapsed between the two.

The feedback provided was based on the scores for each participant's previous interview. The feedback consisted of encouraging praise and constructive feedback. If a participant scored a 0 or 1, the experimenter provided constructive feedback and spent more time reviewing the content of the response. Encouraging praise was provided for a score of 0 or 1, but the feedback was primarily constructive (e.g., "I like that you told them your name, but it is important to elaborate on your major, college involvement and successes, and career goals."). If the participant scored a 2 on the interview, the experimenter continued to provide feedback, but placed more emphasis

on the encouragement for correct responses (e.g., “That was a great way to explain who you are as a student, but it would be helpful to tie your academic interest to your interest in this job.”). If the participant scored a 3, the experimenter suggested that the answer was good and emphasized the aspects of the answer that matched our operational definitions (e.g., “That was a perfect answer. You talked about yourself as a student, tied in your career goals, and provided some anecdotal information about yourself.”).

#### *Individualized training with immediate feedback*

This condition was similar to the previous condition except that immediate feedback was also provided after each question was answered. The feedback provided was the same as that described in the previous condition.

#### *Error correction*

This condition was similar to the previous condition except participants were provided up to three opportunities to answer the same question if they scored below a 3. For example, if a participant scored a 2 on a question, the instructor provided feedback (e.g., “That was a great way to explain who you are as a student, but it would be helpful to tie your academic interest to your interest in this job.”) and the question was repeated. This continued until either the participant scored a 3 or three error corrections occurred.

#### Posttraining test

Posttraining interviews were identical to the pretraining interviews (i.e., the same questions were asked) and conducted by the senior staff person from the university’s Career Exploration and Success Office within one week of the last interview conducted with experimenters.

#### Social validity evaluation

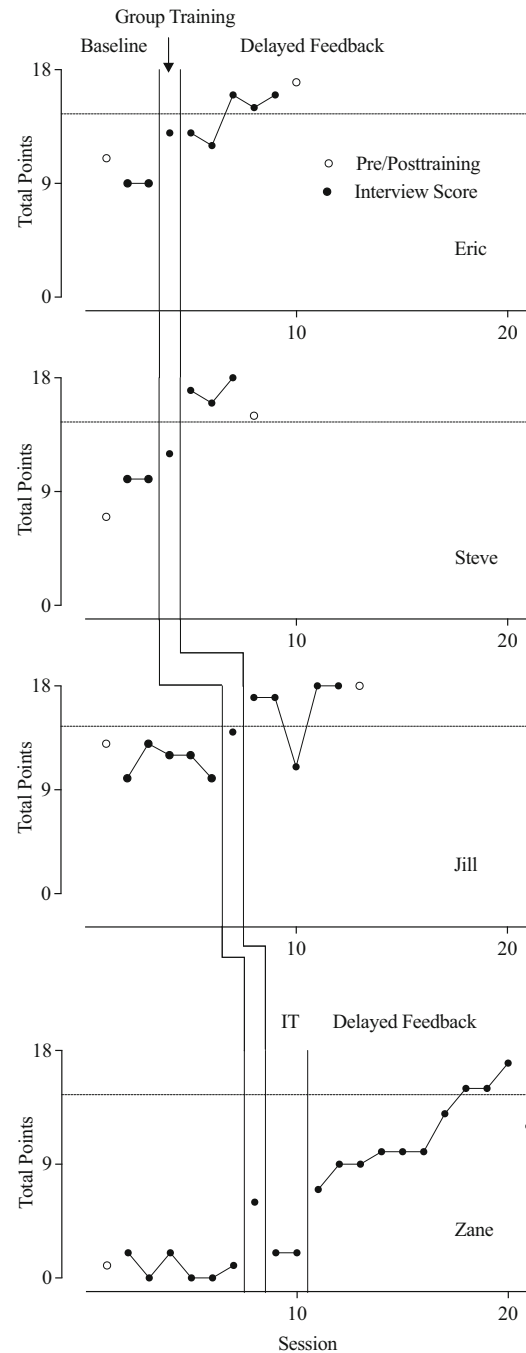
To measure the satisfaction and appropriateness of the training, the participants completed a social validity questionnaire, which was administered after each interview. The survey was developed by the authors and coincided with the primary dependent variables of the study. The survey was not anonymous, as the participant responses were integrated into the individualized feedback during the training. Participants were given a link to the Qualtrics evaluation, an online survey tool. The evaluation consisted of five, 7-point Likert-type questions and two open-ended questions referencing their performance in an interview (see Table 4). The participants were informed that their responses were not anonymous and their responses would be used to inform future trainings.

## RESULTS

Figure 1 shows total points scored for participants who met mastery during the delayed feedback condition.<sup>2</sup> Eric scored 9 out of 18 points during baseline and improved slightly after the group training. Eric’s score for the first delayed feedback session was the same as it was for group training, then it slightly decreased during the delayed feedback condition, followed by a rapid increase in responding, which remained high until mastery was met, and continued during the posttraining test. From the pre- to posttraining test, Eric’s responses improved from 11 to 17 points. Steve showed similar levels of responding during baseline with a score of 10 out of 18 points; his performance improved slightly after the group training. An immediate increase occurred during the delayed feedback condition, which was maintained during the posttraining test. From the pre- to posttraining tests, Steve’s responses improved from 7 to 15. Jill’s responding was higher relative to the other participants during baseline and group training. Jill’s responses during baseline ranged from 10 to 13 points out of a possible score of 18. Her post-group training score equaled 14. Jill did not meet mastery until we implemented the delayed feedback condition; her performance maintained during the posttraining test. From the pre- to posttraining tests, Jill’s responding improved from 13 to 18. Zane’s responses during interviews ranged from 0 to 2 points out of 18 during baseline. His responses improved following the group training, but the scores decreased during the individualized training condition. Following individualized training with delayed feedback, Zane’s responses increased and continued on an increasing trend until meeting the mastery criterion. From the pre- to posttraining tests, Zane’s responding improved from 1 to 12 points.

Figure 2 shows scores across all phases of the study for participants who met mastery during the immediate feedback or error correction conditions. During baseline, Evan’s scores ranged between 5 and 9 points out of 18. A similar pattern was observed during group training, individualized training, and the inclusion of delayed feedback. Once the individualized training with immediate feedback was implemented, we observed an immediate increase in responding and mastery was achieved. Evan’s responding improved from 11 during the pretraining test to 14 during the posttraining test. Kim’s scores during baseline ranged from 5 to 9 points out of 18. We observed gradual improvements in responding during interviews across the group training, individualized training, individualized training with delayed feedback, and individualized training with immediate feedback conditions. However, she did not achieve mastery. Therefore, we introduced the error correction condition, which resulted in additional increases in responding, and Kim’s

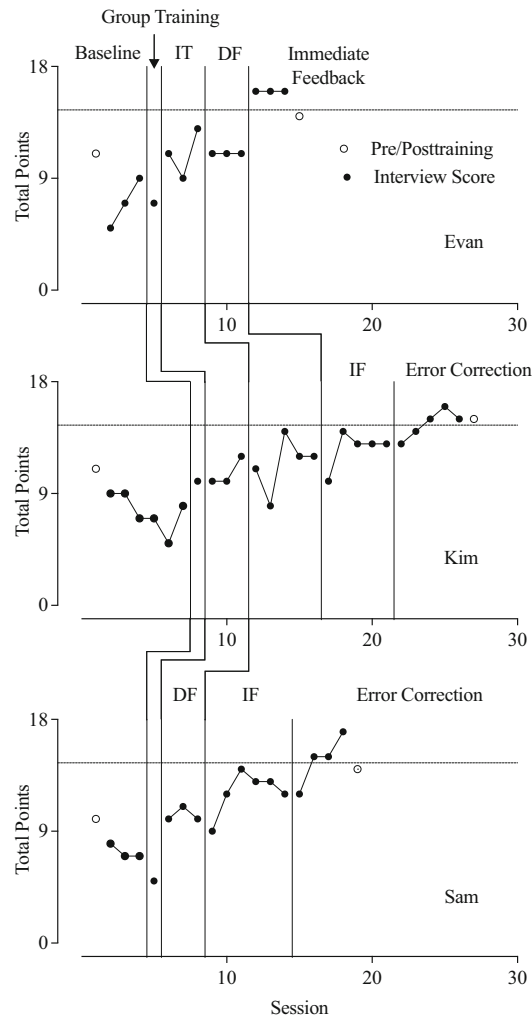
<sup>2</sup>Individual scores across all questions for each participant can be found in the online Supporting Information.



**FIGURE 1** Total points earned across participants who met mastery during the delayed feedback condition. IT = individualized training. The dashed horizontal line depicts mastery criteria.

responding eventually reached the mastery criterion. Kim required error correction (i.e., scored less than a 3) on a mean of four questions per session with a total of 27 error correction trials (range, 1–3). Furthermore, her responding improved from 11 points during the pretraining test to 15 points during the posttraining test. Sam's scores during baseline ranged from 9 to 10 points out of 18, with a decrease following the group training. During the delayed feedback condition, responding increased to levels similar to baseline.

Providing immediate feedback resulted in an increase that remained stable but below the mastery criterion. The error correction condition produced an increase in responding that met the mastery criterion; however, responding did not maintain at these high levels during the posttraining test. Sam required error correction on an average of 2.5 questions per session with a total of 16 error correction trials (range, 1–3). Sam's responding from the pre- to posttraining test improved from 10 to 14 points.



**FIGURE 2** Total points earned across participants who met mastery during the immediate feedback or error correction conditions. IT = individualized training; DF = delayed feedback; IF = immediate feedback. The dashed horizontal line depicts mastery criteria.

Table 3 shows the mean score and the number of questions per category for baseline and treatment. Overall, participants scored higher during their final treatment phase for most question categories.

### Social validity questionnaire

Table 4 shows the results of the social validity questionnaire. Each column shows the scores from the initial questionnaire and final questionnaire. Overall, all participants reported that their performance improved across sessions for all questions apart from the question, “How would you rate your behavior in an interview?” Zane and Kim rated their behavior during the interview lower during the last questionnaire relative to the first questionnaire.

The final two questions on the social validity questionnaire were open ended, asking about aspects of the interview that the participants thought they did well in and areas they thought they could improve upon. Initial

responses to these questions were not related to our primary dependent variables, rather non-vocal-verbal behaviors (i.e., posture, smiling, eye contact). The final responses for these two questions indicated that participants felt more confident in their asking and answering questions (e.g., “I’m beginning to answer the questions, and asking questions that help to learn more about the job.”) and wanted to improve aspects we continued to work on during training (e.g., “I feel like I could use a bit of improvement in tying my answers into the job I’m applying for.”).

### Time expenditure

Given that one goal of this study was to determine the overall efficiency of training for each individual, we calculated the time the participants spent in each phase (e.g., baseline, individualized training, and individualized training with delayed feedback) as well as the total duration of the study (Table 5). Participants progressed



**TABLE 3** Mean score per question category and number of questions per category in parenthesis

Question categories	Condition	Zane	Evan	Kim	Eric	Steve	Jill	Sam
Tell me about yourself	Baseline	0 (6)	2 (3)	1.2 (6)	1.5 (2)	2 (2)	1.6 (5)	1.3 (3)
	Treatment	3 (3)	3 (3)	3 (3)	3 (3)	2.7 (3)	2.7 (3)	3 (3)
Job specific	Baseline	0.3 (8)	1 (5)	1.8 (8)	2 (5)	1.8 (5)	2.2 (5)	1.2 (5)
	Treatment	2 (1)	2.5 (2)	2 (1)	2.5 (4)	3 (3)	2.7 (3)	2.7 (3)
Participant specific	Baseline	0 (8)	1.5 (2)	1.1 (8)	2 (1)	2 (1)	1.8 (7)	2 (2)
	Treatment	2.5 (6)	2.8 (5)	2.3 (6)	2 (4)	2.8 (6)	2.8 (5)	2.3 (4)
Work performance	Baseline	0.3 (6)	1.8 (4)	1.7 (6)	1 (2)	2.5 (2)	2.4 (5)	1.5 (4)
	Treatment	2.5 (4)	2.3 (3)	2 (3)	2.7 (3)	3 (2)	2 (3)	2 (2)
Team related	Baseline	0.5 (2)	1 (1)	1 (2)	N/A (0)	N/A (0)	2 (2)	1 (1)
	Treatment	2 (1)	2 (2)	3 (2)	3 (1)	2 (1)	3 (1)	2.7 (3)
Do you have any questions?	Baseline	0 (6)	0 (3)	0.2 (6)	0.5 (2)	0 (2)	1.6 (5)	0 (3)
	Treatment	3 (3)	3 (3)	3 (3)	3 (3)	3 (3)	2.7 (3)	3 (3)

Note. N/A = not applicable. Treatment mean is based on the last three sessions in which the mastery criteria were met.

**TABLE 4** Comparison of responses for the social validity questionnaire

Question categories	Zane		Evan		Kim		Eric		Steve		Jill		Sam	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
How would you rate your interview performance? (1-poor; 7-perfect)	1	6	2	3	5	6	5	N/A	5	6	5	6	7	N/A
How would you rate your behavior in an interview? (1-not at all distracting; 7-extremely distracting)	5	2	3	4	4	2	5	N/A	3	7	2	3	7	N/A
How would you rate the quality of your answers during an interview? (1-low quality; 7-high quality)	2	7	2	3	4	6	5	N/A	5	6	6	6	7	N/A
How would you rate the quality of the questions you asked during an interview? (1-low quality; 7-high quality)	1	7	1	2	4	6	6	N/A	2	5	2	5	7	N/A
How prepared do you feel for an actual interview? (1-not at all; 7-extremely)	2	6	1	2	3	6	5	N/A	4	5	6	7	7	N/A

Note. N/A represents the absence of a questionnaire. Scores in the left column indicate the responses during baseline on the social validity questionnaire, and scores in the right column indicate responses after mastery.

**TABLE 5** Time expenditure to complete each phase across participants

Procedure	Zane	Evan	Kim	Eric	Steve	Jill	Sam
Pretraining test	4	7	7	12	3	14	4
Baseline	10 (6)	16 (3)	21 (6)	9 (2)	6 (2)	48 (5)	5 (3)
Group training	38 (1)	38 (1)	39 (1)	39 (1)	36 (1)	39 (1)	35 (1)
Individualized training	49 (2)	74 (3)	78 (3)	N/A	N/A	N/A	N/A
Individualized training with delayed feedback	185 (10)	71 (3)	117 (5)	N/A	27 (3)	54 (5)	68 (3)
Individualized training with immediate feedback	N/A	91 (3)	102 (5)	N/A	N/A	N/A	131 (6)
Error correction	N/A	N/A	72 (5)	N/A	N/A	N/A	133 (4)
Posttraining test	3	5	6	7	4	16	4
Total duration	289	302	442	129 <sup>a</sup>	76	171	380

Note. Total duration in minutes rounded to the nearest minute and number of sessions in parenthesis. Total time during each phase includes training and interviews.

<sup>a</sup>Two training sessions were not recorded and therefore not included in the total duration.

through each phase based on the number of sessions it took for them to meet the mastery criterion. Therefore, duration was variable across participants and phases. Time expenditures totaled 289, 302, and 442 min for

Zane, Evan, and Kim, respectively. Time expenditures totaled at least 129 min for Eric. However, we did not record two trainings, so we could not accurately calculate the total time expenditure. Time expenditures totaled

76, 171, and 380 min for Steve, Jill, and Sam, respectively. The most time was spent providing feedback and training while the least amount of time was spent conducting interviews.

## DISCUSSION

The results of this study demonstrated the efficacy of BST delivered via remote instruction for teaching adults with ASD to successfully participate in job interviews. Prior to participating in this study, our participants had minimal experience with job interviews. Using a sequence of least-to-most intensive training, we taught seven out of eight participants to successfully participate in interviews. Additionally, all individuals improved their performance during posttraining tests where interviews were conducted by a novel expert in career development.

Stocco et al. (2017) and Roberts et al. (2021) used BST to teach college-aged students to successfully complete job interviews. Our study extends those findings by demonstrating the efficacy of individualized training for college students with ASD in a remote learning environment. The focus on individuals with ASD is important because the core symptoms of ASD (i.e., social communication deficits and restricted, repetitive interests; American Psychiatric Association, 2022) may result in difficulties during job interviews, possibly decreasing the likelihood of obtaining meaningful employment.

Procedurally, our BST implementation differed from that of Stocco et al. (2017) in that we tested for skill acquisition immediately during the training session. That is, we conducted training before and provided feedback during each interview session. We subsequently conducted post-training tests without any training or feedback from a career development expert. This modification allowed us to be more efficient in our training and evaluation. However, it is unclear whether the outcome would have been different had we conducted training first and then implemented a longer posttraining test. Thus, future studies should consider comparing this procedural modification to more traditional methods of evaluating BST.

Our study differs from previous research on teaching young adults to interview for jobs (e.g., Morgan et al., 2014; Strickland et al., 2013) in that we used an individualized approach, which consisted of BST delivered via remote instruction. Our goal was to develop the most efficient and individualized instructional method that required minimal staffing and time. Therefore, we initiated training in a group format. However, none of our participants mastered interview skills following group training. This finding is important to note given that an efficient and common method of teaching interview skills is in a group format. The outcomes of the current study suggest that the group format may not be an effective method of teaching interview skills to college students with ASD.

Following group training, we progressed through a series of individualized training strategies moving from less intensive to more intensive. Our participants reached mastery at various stages of treatment suggesting that an individualized approach, rather than a “cookie cutter” approach, may be important in teaching job interviewing skills. We discontinued the individualized training after the first four participants based on their response to that treatment condition, time expenditure, and comments throughout the sessions. This phase of instruction consisted of the PowerPoint presentation used in the initial group training but was presented individually to each participant. To achieve our goal of developing the most efficient and effective instructional model for college students, we removed this phase to streamline the feedback portion of BST.

Although all participants required individualized performance feedback, future research may evaluate the use of group training with active responding in presenting each skill domain. Also, given the well-documented effects of immediate feedback, this procedure may be a useful first step for training if resources allow. However, there are times when the resources do not allow for immediate feedback. For example, future research may evaluate the effectiveness of recording the interview and providing feedback later when immediate feedback may not be possible. When resources are not available for direct or delayed feedback, researchers may also wish to evaluate participant-provided feedback on their own performance with review from a staff member later. Thus, future research should evaluate the efficacy of delayed feedback or the efficacy of rotating delayed and immediate feedback across group members with the experimenter.

Remotely delivered training entails training and interviews conducted while the participants were in their home. Although this may be a convenient method of instruction, there may have been extraneous variables that competed with the participant’s attention to the questions or feedback. For instance, Kim explained that she had difficulty finding a quiet area in her home and that her family would occasionally interrupt her with brief comments directed at her. These potential distractors may have been partially responsible for the extensive training that was required for Kim to meet the mastery criterion. Therefore, it would be beneficial for future researchers to evaluate the environment in which training and interviews occur.

Although some job interviews are now conducted remotely, others are still conducted in person. Given the COVID-19 pandemic, it was not possible for us to test generalization to in-person interviews. Therefore, future studies should evaluate how well remote instruction generalizes to in-person interviews.

One participant, Evan, commented throughout the training (and initial phases of the interviews) that he would behave differently (e.g., responding appropriately) if this was an actual interview, suggesting faulty stimulus

control between appropriate responding and the environmental stimuli. Although some of these behaviors were minor and unlikely to occur during an interview (e.g., “If this was a real interview, I would say ...”), other behaviors that occurred may be likely to compromise a potential job opportunity (e.g., answering a phone call, attending to a pet nearby). It is possible that, like Kim, the context in which the training and interview occurred influenced Evan’s behavior. We did not instruct participants to complete the training or interview in a specific location. Rather, we asked them to find a location that would not be distracting to themselves or the interviewer and to participate in the interview as if it were an actual interview. Future research might wish to address this using a renewal paradigm (e.g., Ibañez et al., 2019; Liddon et al., 2018) during which baseline interviews could be conducted in the home (Context A), training in a controlled environment (Context B), and posttraining interviews in the home (Context A). This approach would allow researchers to identify if the context in which training and interviews are conducted may play a role in responding. Doing so is especially important because many interviews tend to occur using remote technology (LeBlanc et al., 2020) and the interview may not occur in a novel setting.

We assessed generalization by having a novel career development expert conduct pre- and posttraining interviews (i.e., pre- and posttraining tests). All participants who completed those probes improved their performance from pre- to posttraining interviews. Kim, Eric, Steve, and Jill met our mastery criterion during the posttraining test, and Evan’s and Sam’s responding was close to the mastery criterion. Reasons for not meeting mastery criterion during posttraining tests can vary across participants. For example, there may be limited opportunities for immediate feedback, poor confidence in their interview skills, or failure to generalize to novel individuals. Zane, for example, might require either more success with delayed feedback or exposure to immediate feedback to become more fluent in responding at a score of 3. All participants were only exposed to one interviewer during training sessions, which may have contributed to the lower scores with the career development expert. Future studies may also wish to collect data from blind observers to assess additional meaningful improvements in the interview skills.

The results of the social validity questionnaire warrant discussion. The social validity questionnaire involved asking participants to rate their interview performance and the quality of their answers. In addition to improvements in interviewing skills, the intervention also resulted in improvements in social validity such as self-reported increases in confidence during the interview process and the approval of the training they received during the study. All participants reported improved performance across all sessions for all questions except for one question. Zane and Kim rated their behavior lower for

the question “How would you rate your behavior in an interview?” after the training took place. This decrease in scores likely occurred due to the continued training required to improve their interviewing skills. That is, participants may have rated their behavior lower because they did not master the skill. Furthermore, although we attempted to provide ample praise throughout the study, Evan continued to rate his behavior on the social validity questionnaire lower than the rest of the participants, despite improvements in his behavior. The final two questions were open ended and asked about aspects of the interview they thought they did well and areas they thought they could improve. When asked a closed-ended question, neurotypical individuals tend to continue to elaborate beyond a yes or no; however, individuals with ASD often respond with a yes or no without further elaboration (Hood et al., 2021). This was not the case for this study. All participants, apart from Evan, responded to the open-ended questions with full sentences or lists to answer the questions. Evan answered the first open-ended question with full sentences or lists of aspects he thought he did well with. When asked the second question about areas to improve, Evan routinely stated “everything else.”

Appropriate interview behavior consists of several components (e.g., attire, grooming, small talk, eye contact). Although we had initially planned on incorporating multiple behaviors beyond direct responses to the interview questions during data collection, we determined these behaviors might require additional interventions, which would consume our limited time and resources. Therefore, future research should include teaching a combination of these behaviors to better resemble what might be encountered during an interview. This may also allow for generalization of responses across interviewers and contexts.

Another point to consider is that the interviewer delivered only neutral feedback such as “Okay” and “Got it” following each response during interviews. We did this to control for the amount and type of feedback delivered during BST. However, in an actual interview, the interviewer is likely to provide feedback, request clarifications, ask supplemental questions, and perhaps engage in a back-and-forth conversation. Similarly, the individualized training with immediate feedback and error correction phases both included feedback embedded within the mock interview to provide additional support. Although the interviewers were instructed to provide praise throughout the feedback, even on answers that were scored as a 0 or 1, it is important to consider the influence that feedback may have on subsequent responses. Errors or feedback on particular errors may be more distressing and thus more difficult to recover from. Future research should examine the effects of feedback delivered during interviews (Rosales & Whitlow, 2019).

A limitation to our study may be the repetitive and lengthy nature of training, which was the primary reason Ian withdrew from the study. For those participants who

completed the study, it took between 76–448 min to reach mastery. To reduce some of the repetition and time, we removed the individualized training for some participants. Future studies may examine ways of simplifying training to reduce the duration and repetition. For example, future studies could consider skipping group training and proceeding directly to the individual training with feedback. Alternatively, future training could incorporate more visual aids such as graphs of a participant's performance as additional feedback to demonstrate and highlight their status and progress. Due to the time required to complete the current procedures, another limitation of our study was the lack of probe interviews without the use of training. The current study conducted probe sessions only after the group training, but not during subsequent interviews. To determine if the participants can engage in the trained responses without the use of BST, future studies may be interested in collecting more probe data during mock interviews without training. Another limitation of our study was that we relied on rating the participant's responses to the interviewer's questions. We presented those data as total points, which may have obscured individual differences between interviewer questions. When we examined the data for each question, we observed increases in individual question ratings across all participants in their final treatment phases (see online Supporting Information).

In conclusion, the findings of the current study provide preliminary support for the use of an individualized approach to training. We demonstrated that BST delivered via remote instruction can be used to effectively teach adults diagnosed with ASD to successfully navigate job interviews. By improving interviewing skills, individuals can increase the likelihood of successfully obtaining meaningful employment.

## ACKNOWLEDGMENTS

We would like to thank staff from the Rutgers Center for Adult Autism Services for their assistance with this project.

## FUNDING INFORMATION

This study was funded, in part, by a grant from the New Jersey Governor's Council for Medical Research and Treatment of Autism.


## CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

## ETHICS APPROVAL

The study was approved by the university institutional review board. All participants consented to participation.

## ORCID

SungWoo Kahng  <https://orcid.org/0000-0002-6031-5026>

Courtney Butler  <https://orcid.org/0000-0002-4974-9771>  
Faris R. Kronfli  <https://orcid.org/0000-0001-9301-2083>

## REFERENCES

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Black, M. H., Mahdi, S., Milbourn, B., Scott, M., Gerber, A., Esposito, C., Falkmer, M., Lerner, M. D., Halladay, A., Ström, E., D'Angelo, A., Falkmer, T., Bölte, S., & Girdler, S. (2020). Multi-informant international perspectives on the facilitators and barriers to employment for autistic adults. *Autism Research, 13*(7), 1195–1214. <https://doi.org/10.1002/aur.2288>
- Black, M. H., Mahdi, S., Milbourn, B., Thompson, C., D'Angelo, A., Ström, E., Falkmer, M., Falkmer, T., Lerner, M., Halladay, A., Gerber, A., Esposito, C., Girdler, S., & Bölte, S. (2019). Perspectives of key stakeholders on employment of autistic adults across the United States, Australia, and Sweden. *Autism Research, 12*(11), 1648–1662. <https://doi.org/10.1002/aur.2167>
- Chapman, D. S., & Rowe, P. M. (2001). The impact of videoconference technology, interview structure, and interviewer gender on interviewer evaluations in the employment interview: A field experiment. *Journal of Occupational and Organizational Psychology, 74*(3), 279–298. <https://doi.org/10.1348/096317901167361>
- Hood, S. A., Beauchesne, B. M., Fahmie, T. A., & Go, A. (2021). Descriptive assessment of conversational skills: Towards benchmarks for young adults with social deficits. *Journal of Applied Behavior Analysis, 53*(3), 1075–1094. <https://doi.org/10.1002/jaba.831>
- Ibañez, V. F., Piazza, C. C., & Peterson, K. M. (2019). A translational evaluation of renewal of inappropriate mealtime behavior. *Journal of Applied Behavior Analysis, 52*(4), 1005–1020. <https://doi.org/10.1002/jaba.647>
- LeBlanc, L. A., Lerman, D. C., & Normand, M. P. (2020). Behavior analytic contributions to public health and telehealth. *Journal of Applied Behavior Analysis, 53*(3), 1208–1218. <https://doi.org/10.1002/jaba.749>
- Liddon, C. J., Kelley, M. E., Rey, C. N., Liggett, A. P., & Ribeiro, A. (2018). A translational analysis of ABA and ABC renewal of operant behavior. *Journal of Applied Behavior Analysis, 51*(4), 819–830. <https://doi.org/10.1002/jaba.496>
- Miltenberger, R. G., Zerger, H. M., Novotny, M., & Livingston, C. P. (2017). Behavioral skills training to promote social behavior of individuals with autism. In J. Leaf (Ed.), *The handbook of social skills and autism spectrum disorder: Assessment, curricula, and intervention* (pp. 688–728). Springer. [https://doi.org/10.1007/978-3-319-62995-7\\_19](https://doi.org/10.1007/978-3-319-62995-7_19)
- Morgan, L., Leatzow, A., Clark, S., & Siller, M. (2014). Interview skills for adults with autism spectrum disorder: A pilot randomized controlled trial. *Journal of Autism and Developmental Disorders, 44*(9), 2290–2300. <https://doi.org/10.1007/s10803-014-2100-3>
- Rispoli, M., & Machalicek, W. (2020). Advances in telehealth and behavioral assessment and intervention in education: Introduction to the special issue. *Journal of Behavioral Education, 29*(2), 189–194. <https://doi.org/10.1007/s10864-020-09383-5>
- Roberts, K., DeQuinzio, J. A., Taylor, B. A., & Petroski, J. (2021). Using behavioral skills training to teach interview skills to young adults with autism. *Journal of Behavioral Education, 30*(4), 664–683. <https://doi.org/10.1007/s10864-020-09389-z>
- Rosales, R., & Whitlow, H. (2019). A component analysis of job interview training for young adults with autism spectrum disorder. *Behavioral Interventions, 34*(2), 147–162. <https://doi.org/10.1002/bin.1658>
- Roux, A. M., Rast, J. E., Anderson, K. A., & Shattuck, P. T. (2017). *National autism indicators report: Developmental disability services and outcomes in adulthood*. Life Course Outcomes Research



- Program, A. J. Drexel Autism Institute, Drexel University. <https://drexel.edu/autismoutcomes/publications-and-reports/publications/National-Autism-Indicators-Report-Developmental-Disability-Services-and-Outcomes-in-Adulthood/>
- Roux, A. M., Shattuck, P. T., Cooper, B. P., Anderson, K. A., Wagner, M., & Narendorf, S. C. (2013). Postsecondary employment experiences among young adults with an autism spectrum disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52(9), 931–939. <https://doi.org/10.1016/j.jaac.2013.05.019>
- Schieltz, K. M., & Wacker, D. P. (2020). Functional assessment and function-based treatment delivered via telehealth: A brief summary. *Journal of Applied Behavior Analysis*, 53(3), 1242–1258. <https://doi.org/10.1002/jaba.742>
- Scott, M., Milbourn, B., Falkmer, M., Black, M., Bölte, S., Halladay, A., Lerner, M., Taylor, J. L., & Girdler, S. (2019). Factors impacting employment for people with autism spectrum disorder: A scoping review. *Autism*, 23(4), 869–901. <https://doi.org/10.1177/1362361318787789>
- Stocco, C. S., Thompson, R. H., Hart, J. M., & Soriano, H. L. (2017). Improving the interview skills of college students using behavioral skills training. *Journal of Applied Behavior Analysis*, 50(3), 495–510. <https://doi.org/10.1002/jaba.385>
- Strickland, D. C., Coles, C. D., & Southern, L. B. (2013). JobTIPS: A transition to employment program for individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 43(10), 2472–2483. <https://doi.org/10.1007/s10803-013-1800-4>
- Taylor, J. L., & Seltzer, M. M. (2010). Employment and post-secondary educational activities for young adults with autism spectrum disorders during the transition to adulthood. *Journal of Autism and Developmental Disorders*, 41(5), 566–574. <https://doi.org/10.1007/s10803-010-1070-3>
- Watson, P. J., & Workman, E. A. (1981). The non-concurrent multiple baseline across-individuals design: An extension of the traditional multiple baseline design. *Journal of Behavior Therapy and Experimental Psychiatry*, 12(3), 257–259. [https://doi.org/10.1016/0005-7916\(81\)90055-0](https://doi.org/10.1016/0005-7916(81)90055-0)
- Wehman, P., Schall, C., Carr, S., Targett, P., West, M., & Cifu, G. (2014). Transition from school to adulthood for youth with autism spectrum disorder: What we know and what we need to know. *Journal of Disability Policy Studies*, 25(1), 30–40. <https://doi.org/10.1177/1044207313518071>
- Wehman, P., Schall, C., McDonough, J., Kregel, J., Brooke, V., Molinelli, A., Ham, W., Graham, C. W., Erin Riehle, J., Collins, H. T., & Thiss, W. (2014). Competitive employment for youth with autism spectrum disorders: Early results from a randomized clinical trial. *Journal of Autism and Developmental Disorders*, 44(3), 487–500. <https://doi.org/10.1007/s10803-013-1892-x>
- Wirantana, V., Stocco, C. S., & Kohn, C. S. (2020). The implementation and adoptability of behavioral skills training in a university career center. *Behavioral Interventions*, 35(1), 84–98. <https://doi.org/10.1002/bin.1692>

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Kahng, S., Butler, C., Kronfli, F. R., Zaki-Scarpa, C., Boragi, B., & Scott, J. (2023). An individualized approach to teaching adults with autism to successfully navigate job interviews via remote instruction. *Journal of Applied Behavior Analysis*, 56(2), 352–364. <https://doi.org/10.1002/jaba.977>