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Effects of textual prompts and feedback on social niceties of adolescents with autism spectrum disorder in a simulated workplace

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Previous research demonstrates the efficacy of behavioral skills training with a textual prompt to establish greetings and conversational skills. This study examined the efficacy of a brief intervention of textual prompts with performance feedback for increasing social niceties of adolescents and young adults with autism spectrum disorder in a simulated workplace. Target social niceties included "Do you have a minute?" when a participant initiated an interaction and "Thank you for your time" when a participant ended the interaction. Results revealed this intervention was effective for 7 of 9 participants. This study expands upon previous studies by showing the efficacy of a resource-efficient training on acquisition and generalization of social niceties by people with autism spectrum disorder.

Key words: autism spectrum disorder, performance feedback, simulated workplace, social skills, textual prompt

Past research demonstrates that Autism Spectrum Disorder (ASD) is associated with difficulties finding and continuing employment due to unique behavior patterns (Hendricks, 2010) and difficulty responding to social cues (Hillier, Fish, Cloppert, & Beversdorf, 2007). Many people with ASD do not have jobs (Shattuck et al., 2012). However, people with ASD may become successful in employment by acquiring additional social skills (Benz, Yovanoff, & Doren, 1997; Burt, Fuller, & Lewis, 1991; Park & Gaylord-Ross, 1989; Schall, Wehman, & McDonough, 2012; Wehman et al., 2014). Previous studies have described efficacious social skills training for adolescents and young adults with ASD that could be extended to the workplace (Gantman, Kapp, Orenski, & Laugeson, 2012; Hillier et al., 2007; Mesibov, 1984).

Greetings and interstaff casual communication are essential to employment success (Snell & Brown, 2011). However, people with ASD may have difficulty acquiring these skills. For example, previous studies suggest that some people with ASD struggle to master the appropriate use of phrases such as "excuse me, please" (Matson, Sevin, Box, Francis, & Sevin, 1993; Morgan & Salzberg, 1992), "thank you," and "you're welcome" (Matson, Sevin, Fridley, & Love, 1990; Stowitschek, McConaughy, Peatross, Salzberg, & Lignugaris/Kraft, 1988). They may also struggle to master complimenting others and offering assistance (Hwang & Hughes, 2000; Ruble & Dalrymple, 1996). Morgan and Salzberg (1992) referred to these behaviors as "social amenities," though "social niceties" may be a more conventional phrase to denote responses that have a polite effect within certain verbal communities.

Social niceties can be conceptualized as autoclitics (Skinner, 1957) because they are verbal behavior that accompanies other verbal operants (e.g., mands) and they function to modify the effect of the speaker's behavior on the listener. Previous researchers have investigated methods of teaching social niceties to

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individuals with ASD, including the use of textual prompts (e.g., Sarokoff, Taylor, & Poulson, 2001; Thiemann & Goldstein, 2004). For example, Matson et al. (1993) taught "excuse me" and "thank you" to children with ASD by providing textual prompts. Teaching social niceties may help young adults with ASD to communicate smoothly in the workplace.

The workplace presents challenges for job coaches to reinforce social niceties without interrupting participants' interactions. For example, a trainer teaching his client with ASD to ask, "Do you have a minute?" before consulting on a work task cannot provide immediate feedback on the appropriate initiation without disrupting the conversation between the person with ASD and his colleague. Delayed performance feedback may be helpful in this circumstance. Performance feedback provides descriptive information to people about their past performance (Balcazar, Hopkins, & Suarez, 1985) and it may produce behavior change when delivered after a series of targeted behaviors (Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012; Leblanc, Ricciardi, & Luiselli, 2005; Reinke, Lewis-Palmer, & Martin, 2007). For example, Leblanc et al. (2005) used performance feedback to teach 10 discrete-trial instructional skills to three teachers. Investigators provided the performance feedback after a session was over rather than after the participant emitted each targeted skill. In spite of this delay in feedback, all participants acquired the target skills. Delayed performance feedback is a promising technique for job coaches to increase participants' use of social niceties without interrupting their social interactions.

Researchers have also utilized behavioral skills training to teach social niceties to people with ASD. For example, Nuernberger, Ringdahl, Vargo, Crumpecker, and Gunnarsson (2013) taught vocal and nonvocal social skills including greeting skills to young adults with ASD using behavioral skills training with textual prompts and performance feedback. Kornacki, Ringdahl, Sjostrom, and Nuernberger (2013) used behavioral skills training followed by in vivo training with delayed feedback to teach conversational skills including greetings and closing statements. Hood, Luczynski, and Mitteer (2017) taught individuals with ASD greeting and conversational skills using behavioral skills training with textual prompts and performance feedback. All participants in these studies acquired the target greetings.

Hood et al. (2017), in particular, described a training package with promise for teaching social skills in a work setting because participants acquired greeting skills immediately when the textual prompt was introduced. Moreover, Hood et al. conducted only one session per week for 1.5 or 2 hours with two participants and two sessions per week for 30 min with one participant. Grob, Lerman, Langlinais, and Villante (2019) also taught job-related social skills and social niceties, such as responding appropriately to feedback and knocking on a door, by using behavioral skills training with a stimulus prompt which consisted of a sheet of paper with sample responses. Furthermore, they examined the generalization of social skills and social niceties to a different simulated workplace. Because these textual prompts may serve a similar function to instructions and modeling for the vocal behavior of participants who can read, the combination of textual prompts with delayed feedback may be a resource-efficient and promising technique for teaching people with ASD social niceties in the workplace, and it may be effective to generalize to different settings.

Some previous studies have used simulated work environments as the context for training young adults and adolescents with ASD (e.g., Lattimore, Parsons, & Reid, 2006; Lattimore, Parsons, & Reid, 2008). Simulated work environments may promote generalization of skills from the training setting to naturalistic work settings by embedding stimuli, people, and other elements that are also present in a typical workplace. Stokes and Baer (1977) refer to this method for promoting generalization as "programming common stimuli." Furthermore, Stokes and Baer

described the potential importance of "training sufficient exemplars" when programming for generalization. Training sufficient exemplars requires trainers to incorporate various people, activities, and materials throughout training. For example, Marzullo-Kerth, Reeve, Reeve, & Townsend (2011) used various stimuli to teach sharing responses such as "would you like to try this?" to children with ASD, and the participants generalized acquired sharing responses to stimuli not used in training. It may be especially important for investigators to program for generalization of workplace social skills so that people with ASD can develop a repertoire of social niceties well before they secure their first paid job.

The purpose of this study was to examine the efficacy of textual prompts and delayed performance feedback on acquisition of social niceties by adolescents and adults with ASD. Furthermore, we assessed the effects of training on generalization of social niceties across various coworkers and bosses in the simulated work environment.

METHOD

Participants and Setting

Nine Japanese adolescents and young adults with ASD participated in this study. All participants lived in Japan and their primary language was Japanese. Table 1 displays background information for each participant. Of the nine participants, eight were males and one was female. Their ages ranged from 15 to 21 years, and the average age was 18 years old. All the participants had been diagnosed with ASD by a doctor who did not participate in the study. According to the caregivers' reports, none of the participants was diagnosed with a cognitive impairment. To recruit participants, authors advertised their research on workplace social skills on the website of a nonprofit organization run by parents of people with ASD. Participants were required to satisfy the following four conditions: First, they were required to have a diagnosis of ASD. Second, they had to be at least 15 years old. Third, their parents had to report a history of reciprocal conversational skills. Finally, parents had to report participants' readiness to perform simple work such as assembling envelopes or binding a document for more than 30 min. Informed consent was obtained from individual participants included in the study.

Table 1
Participant Demographic Information

Name	Male/female	Age	Status
Masaru	Male	21	Employed full time
Shingo	Male	21	Student
Naohiko	Male	18	Student
Tomohiko	Male	16	Student
Yoshifumi	Male	18	Student
Kazufumi	Male	19	Unemployed
Kayoko	Female	18	Student
Toshihide	Male	17	Student
Tetsuro	Male	15	Student

According to caregivers' reports, all the participants who met the four inclusion criteria could speak more than three sentences and could take turns speaking for at least a 10-min conversation. They could emit mands as well as a variety of tacts of common items such as animals, vehicles, foods, cartoons, and clothes. Participants did not comment on things such as politics and emotions. All participants could answer simple social questions (e.g., What is your name? What is your favorite food?). It was important for the participants to acquire these verbal behaviors because the intervention in this study was conducted in interactions with others. According to reports from parents, all participants started conversations without a formal initiation such as saying, "excuse me" or "hi." Furthermore, they departed from conversations without saying "thank you" or politely ending the conversation in some other way. Although all words are translated into English for this publication, all participants always spoke Japanese and all sessions and interactions were in Japanese.

All the sessions in this study were conducted in a 16 m × 7.5 m private room in a public facility. Only participants, actors, and trainers were present in the room. Each session lasted 15 min. Two to three sessions were conducted per visit and visits took place on 1-2 days every other week. The simulated workplace included four long desks that faced each other. Each desk had two to three chairs. Investigators placed one desk away from the other desks to serve as the boss' desk. On each desk for workers was a packet of unassembled envelopes, a manual that explained how to assemble an envelope, glue, a pencil, an eraser, a pair of scissors, and a memo pad. We selected the work of assembling an envelope because teachers and caregivers of each participant predicted they could engage in the task for at least 30 min.

Materials

Table 1 displays an example of the textual prompt sheet employed in this study translated into English (see the Supplemental Materials document for the original Japanese). We developed three textual prompt sheets, one for each scenario that required social niceties: consulting with others, delivering information to others, and borrowing tools to use for work. Each textual prompt included descriptions of discriminative stimuli and responses scheduled for reinforcement, including two social niceties per scenario (i.e., an initiation and a closing statement). In addition, the sheet included a blank square next to notations of each response in the scenario. The size of the paper was 15 cm × 21 cm, and a 12-point Gothic font was used.

Data Collection and Interobserver Agreement

The dependent variable was the percentage of social niceties (i.e., initiating and closing the interaction) correctly emitted in one session (i.e., three work scenarios). We defined correct responses according to parameters of respectful workplace interactions which are particularly necessary to work in cooperation with others in Japanese culture. The first social nicety was saying "Do you have a minute?" to initiate the interaction before making additional requests. The response had to occur within 5 s after the participant approached an actor within about 1.5 m, but before the participant made additional statements or requests. If the participant emitted the response after 5 s passed or from too great a distance, the response was incorrect. If the participant did not approach or did not emit the vocal initiation at all, data collectors recorded an incorrect response. Furthermore, if the participant made his or her additional work-related statements or requests before the boss or the colleague responded to the social nicety, data collectors recorded an incorrect response. The second social nicety was saying, "Thank you for your time" to end the interaction. The data collector scored a correct response when the participant responded before departing from the interaction (i.e., within 5 s after the actor responded to the participant's request but still standing within about 1.5 m).

Responses with a similar function to the correct responses above were also recorded as correct responses. For example, "Do you have a sec?" and "Is this a good time for you to talk?" were considered to have similar effects as "Do you have a minute?" In addition, "Thank you for the help" and "I'm sorry I interrupted you" are examples that were considered functionally equivalent to "Thank you for your time." Impolite initiations or closing statements such as knocking on the desk or stating, "Stop your business and listen!" were recorded as incorrect responses.

The trainers recorded a circle for correct responses or a triangle for incorrect responses on their own copy of the textual prompt that was out of view from participants. The reason for using geometric shapes such as a circle and a triangle was because a circle means positive and a triangle means negative in Japan; this

scoring system was the appropriate way to show performance feedback to participants during training. Trainers scored correct and incorrect responses throughout each session for purposes of delivering feedback. However, data in Figure 1 were independently scored from video footage by a trained data collector. Although most data scored from video by trained observers and data scored in situ by trainers were consistent, there were two exceptions. During the sixth session for Kayoko and the seventh session for Cesar, the trainer recorded a response in one trial as an incorrect response for the social initiation ("Do you have a minute?") and provided corrective feedback, although the observer who reviewed the video footage scored correct responses for those opportunities. Specifically, the trainer scored performance in the affected sessions as 50% correct and the observer scored the same performance 75% correct.

Interobserver agreement (IOA) was collected from video footage by three trained observers. Secondary observers independently scored the dependent variables during a subset of response opportunities from 50% of sessions in each phase of the study. For each of the sessions sampled for IOA, we randomly selected two opportunities to score one initiation and its closing response per participant. Nine people with ASD participated in this study, thus, the total number of opportunities assessed for IOA was 18 per session. The number of opportunities for each social nicety was the same in each session, thus, data were collected on 252 opportunities sampled from 50% of all sessions. In brief, IOA was scored for 25% of opportunities per participant for half of all sessions distributed across each phase of the study. An agreement was defined as all three observers independently scoring the same performance on the same opportunity. We calculated IOA by dividing the total number of agreements by the number of agreements plus disagreements and multiplying by 100. The mean IOA for "Do you have a minute?" was 97%, and percentage agreement for each observer was 94%, 97%, and 100%. The mean IOA results for each participant were: for Masaru, 97% (range, 92-100%); for Shingo, 92% (range, 85-100%); for Naohiko, 100%; for Tomohiko, 100%; for Yoshifumi, 100%; for Kazufumi, 97% (range, 92-100%); for Kayoko, 94% (range, 92-100%); for Toshihide, 97% (range, 92-100%); for Tetsuro, 94% (range, 92-100%). The mean IOA for "Thank you for your time" was 94%, and percentage agreement for each observer was 84%, 98%, and 100%. The mean IOA results for each participant were: for Masaru, 100%; for Shingo, 92% (range, 78-100%); for Naohiko, 95% (range, 85-100%); for Tomohiko, 92% (range, 85-100%); for Yoshifumi, 92% (range, 78-100%); for Kazufumi, 92% (range, 78-100%); for Kayoko, 95% (range, 85-100%); for Toshihide, 97% (range, 92-100%); for Tetsuro, 90% (range, 78-100%).

Procedure

Design. This study employed a multiple baseline design across participants to examine the efficacy of textual prompts and delayed performance feedback on acquisition of social niceties in a simulated workplace. The total number of sessions in this study was determined before commencing data collection. Therefore, the criterion for the transition from one phase to next phase was predetermined for each group of three participants. To illustrate, Masaru, Shingo, and Naohiko were assigned to move from the baseline to training after three sessions. They were assigned to move to post-training after the ninth session for Masaru, the 10th session for Shingo, and the 11th session for Naohiko.

General procedure. All interactions between the participants and the trainer and the actor were conducted in Japanese throughout all sessions. In addition, all sessions were conducted in Japan. All participants attended this study in the same room simultaneously. Each of the

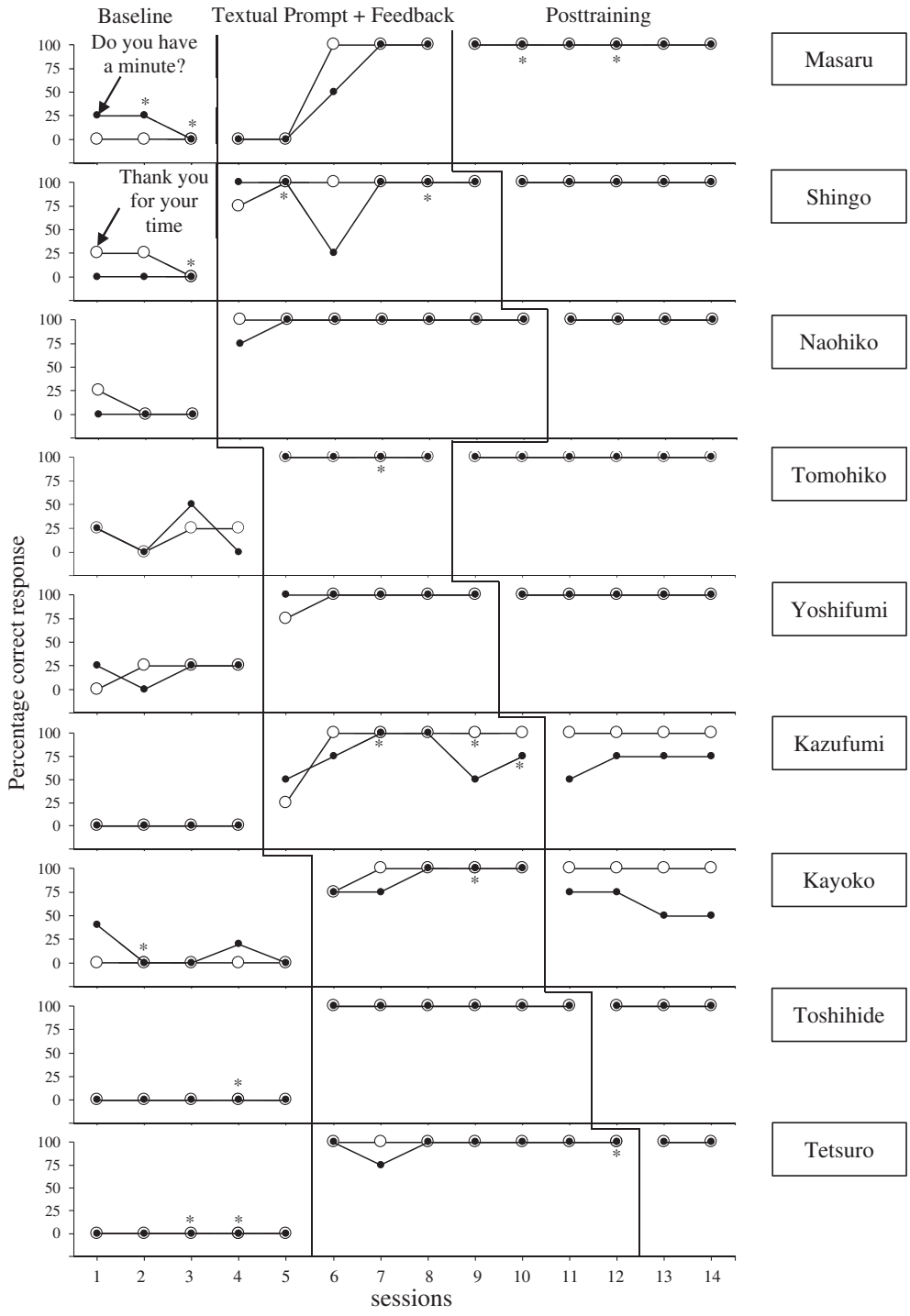

Figure 1. Percentage correct responses of each social nicety. The asterisk denotes sessions in which the experimenter interrupted a participant's attempt to prompt the social niceties of another participant or to provide feedback on the performance of another participant.

nine participants was required to sit in a chair. Before each session started, an experimenter read the following script (translated to English here, see Supplemental Materials for the original Japanese) to participants: *Please imagine that you are here at a real workplace. Also, please look over the desk. There is a packet of unassembled envelopes, a manual, glue, a pencil, an eraser, a pair of scissors, and a memo pad. If something is missing, please tell me. From now on, you will assemble the envelopes using these materials. Please read the manual to find out how to assemble them. If you do not understand the content of the manual, please ask the trainer nearby. This work will continue for about 15 minutes. When the work is over, I will tell you "the work is over!" This work also involves some actors, not just you. The actors play as your boss or your colleagues. They occasionally ask you to do some work. When you are asked to perform a job, please perform to the best of your ability. Finally, if you become tired or experience any discomfort, please tell the trainer nearby. You can rest at any time. The explanation is over. Now, please start working*.

The participants and three actors who played the role of colleagues sat face-to-face at the four long desks. The actor who played the role of the boss sat at the long desk positioned away from the other desks. The actor who played the role of the boss and the actors who played colleagues differed between sessions. All participants and colleagues assembled the envelopes by applying paste to the designated section of the paper and then folding it into an envelope shape. If a participant stopped assembling envelopes for 1 min, a trainer standing nearby vocally prompted the participant to resume their work.

Three trainers were present in the simulated workplace to measure participants' responses and to provide prompts and feedback. Each trainer was assigned to observe and to interact with three of nine participants. The trainer assignments varied from session to session. During assessment or training trials, the trainer usually stood out of sight of the participant so that he or she could not watch the trainer score performance. However, the trainers moved to a visible position when they presented the textual prompt or performance feedback to a participant.

Social niceties were assessed in three different work scenarios in this study. Each work scenario included one or two opportunities to emit each of the social niceties. The work scenarios were: consult with others, deliver information about the task to others, and borrow tools to use for work. Materials for each work scenario differed per session, but all materials and scenarios that we assessed during baseline were also assessed at posttraining. Each work scenario occurred once per session and authors measured performance of initiating and closing responses on four occasions, respectively, over the course of three scenarios. The consult-with-others scenario included two trials of initiating interactions and two trials of closing statements to exit the interaction. The deliver-information-to-others scenario included one trial of initiating an interaction and one trial of a closing statement to exit the interaction. The borrow-tools-to-use-for-work scenario included one trial of initiating an interaction and one trial of a closing response.

In the consult-with-others scenario, the boss handed the participant a list or set of materials and instructed him or her to consult a specific colleague about which one to choose. The designated colleague was always an actor as opposed to another participant. In the delivering-information scenario, a colleague asked the participant to deliver information (e.g., a change in scheduled meeting time, a decrease in inventory) to the boss. In the borrowing-tools scenario, the boss asked the participant to work with a specific tool that was not currently available on the table (e.g., cutting out illustrations with a pair of scissors, stapling documents with a stapler). The boss also told the participant the name of a colleague who had the tool and that the participant

could find that colleague by looking at his or her name tag. The order of work tasks for each participant was predetermined by the first author.

Throughout this study, the boss and colleagues provided the same scripted responses to participants' correct and incorrect responses (e.g., delivering the requested items, acknowledging receipt of information, and so forth). The boss and colleagues did not stop the interaction with the participant if he or she made an incorrect response. The actors received instructions for each scenario before the session started. Actor instructions for the borrow-tools scenario were as follows. This actor instruction is translated to English here. See the Supplemental Materials document for the original Japanese instructions.

1. Please say, "Please come here, (the participant's name)."

2. When the participant comes, please ask the participant to work with a specific tool. The work is to cut out illustrations with a pair of scissors or stapling documents with a stapler. When you ask a participant to work, do not pass the scissor or the stapler. Instead, please inform the participant of the name of a colleague who has the tool. If the participant asks you to borrow the tool, please say, "I do not have the tool." If the participant asks the name of a colleague who had the tool, please inform the participant again.

3. When the participant says, "I am going to work," "I am going now," or "Thank you for trusting me with this work," please say, "Ok" without smiling.

If a participant walked away before completing the assigned task or if a participant did not respond to the assigned task at all, the boss and colleagues withheld further prompts and the trainers presented feedback immediately while the participant stood and received the feedback. Although there were a few situations in which a participant stopped interaction before completing the work task, participants in this study always completed some of the steps in the assigned task.

Because all participants were involved concurrently, it was plausible that participants would provide prompts and feedback to each other. When this occurred (e.g., a participant pointed, called another participant's name, or stood up and approached the participant who was interacting with an actor or the trainer), the trainer said, "Please go on with your work." Trainers gave this order before the participant provided prompts or feedback in almost every case. The mean number of trainer prompts was 1.1 per session (range, 0-3). Asterisks in Figure 1 denote the sessions in which trainers had to interrupt at least one participant attempt to provide prompts or feedback.

Baseline. The experimenter started each session by reading the general instructions that were previously described. After general instructions, actors presented the three work scenarios to each participant. The trainer for each group of three participants surreptitiously recorded performance and withheld the textual prompts and feedback throughout baseline. Each participant experienced the same order of work scenarios with the same materials. However, the order of work scenarios varied between participants. For example, the order of work scenarios for Masaru was to consult with others, to deliver information, and to borrow tools. The order of work scenarios for Shingo was to deliver information, to borrow tools, and to consult with others.

Training. Instructions to start the training session were similar to the instructions in baseline, but the following sentence was added: "*When you have finished a work scenario, the trainer may hand you a sheet. On the sheet, the quality of your work is written. If a circle is written, your work is excellent. If a triangle is written, improvement is necessary for that scenario. When you receive the sheet, please look at the sheet closely.*" Unlike baseline, the order of work scenarios per participant and the specific materials or instructions per scenario varied between sessions. Table 2 illustrates how training scenarios

Table 2
The Textual Prompt Sheet for Consulting with Others
"Consulting with others"

1. When you are asked to come to your boss, please go to your boss.
2. When you are left with some job to consult with the colleague, please say, "OK."
3. When you go to the colleague, please say, "Do you have a minute?"
4. Please consult about the job entrusted by your boss.
5. When the consultation is over and you leave the colleague, please say, "Thank you for your time."
6. Please go to your boss to tell the result of consultation.
7. When you speak to your boss, please say, "Do you have a minute?"
8. Please tell your boss the result of consultation.
9. When you leave the boss, please say, "Thank you for your time."

differed from the work scenarios assessed during baseline and posttraining.

After instructions, but before the actor called the participant to complete a specific work scenario, the trainer showed the participant the textual prompt sheet. The trainer told the participant to silently read the textual prompt sheet. For instance, the sheet displayed the following written instruction: "When you report something to the boss, please say, 'Do you have a minute?'" After the participant was done reading, the trainer instructed the participant to take the textual prompt sheet and to follow it during the next work scenario. The trainer then refrained from further interaction as the participant completed the next work scenario with the boss or the colleague. Trainers surreptitiously recorded the participant's performance in blank spaces provided beside each social nicety on their own copy of the textual prompt.

After the work scenario was complete or the participant stopped responding, the trainer gave the scored prompt sheet to the participant and said, "Please take a good look." Next, the trainer described the performance feedback. If the participant demonstrated correct social niceties, the trainer briefly praised the participant's behavior (e.g., "You are really doing a good job, you nicely followed the textual prompt"). If the participant demonstrated incorrect responses, the trainer provided corrective feedback while referring to the textual prompt and explaining how to perform the target social nicety. The trainer-scored textual prompt sheet and descriptive performance feedback were presented within 10 s after the participant finished his interaction with the actor.

Posttraining. Posttraining procedures were identical to baseline procedures, including a fixed order of work scenarios, absence of the textual prompt sheets, and withholding of performance feedback. Table 3 shows work scenario tasks and materials per condition throughout this study.

RESULTS

Figure 1 displays the percentage of correct responses of greeting and closing social niceties for all participants. During baseline, participants rarely or never performed the social niceties. The mean percentage of correct response for "Do you have a minute?" was 18% for Tomohiko and Yoshifumi, 16% for Masaru, 12% for Kayoko, and 0% for Shingo, Naohiko, Kazufumi, Toshihide, and Tetsuro. The mean percentage of correct response for "Thank you for your help" was 18% for Tomohiko and Yoshifumi, 16% for Shingo, 8% for Naohiko, and 0% for Masaru, Kazufumi, Kayoko, Toshihide, and Tetsuro.

During training, seven of nine participants demonstrated an immediate increase in use of social niceties while the two remaining participants either demonstrated a delayed or variable change in performance. The percentage of correct responses for both social niceties for Naohiko, Tomohiko, Yoshifumi, Toshihide, and Tetsuro increased to 100% immediately, and performance maintained at 100% throughout posttraining. The percentage of correct responses for Masaru and Kayoko gradually increased and stabilized at 100% during training, with Kayoko's performance of "Do you have a minute?" decreasing in posttraining. Although the percentage of correct "Do you

Table 3
Work Scenario Tasks and Materials per Condition

	Baseline / Posttraining	Training
Consulting with others	1. Consulting about which person to hire while looking at two resumes with a photo	1. Consulting about which box to use for product packaging while looking an actual product
	2. Consulting about where to entertain foreign customers while looking at a list of restaurants	2. Consulting about when to set the date for the farewell party for retirees while looking at their schedule
	3. Consulting about which mascot character to use while looking at character's photos	3. Consulting about which air conditioner to install at the workplace while looking at a catalog of air conditioners
Delivering information	1. Delivering the information that there was a call from a customer at 10 AM	1. Delivering the information that the visitor is expected to arrive at 14 PM
	2. Delivering the information that the water pipe repair is confirmed form November 10	2. Delivering the information that the meeting date was set for Friday afternoon
	3. Delivering the information that the order for products required for the work was complete	3. Delivering the information that the location of the next meeting is conference room 2
Borrowing tools	1. Borrowing a punching tool to form holes in documents	1. Borrowing scissors to cut out illustrations from paper
	2. Borrowing a stapler for binding documents	2. Borrowing tape to mount a label on an envelope
	3. Borrowing a pencil sharpener to sharpen many pencils	3. Borrowing a red pen to mark typographical error of a paper

have a minute?" for Kazufumi gradually increased during training, his percentage of correct "Thank you for your help" varied from 50% to 100% correct during training and submastery performance persisted through posttraining. The percentage of correct responses for both social niceties for Shingo increased to 100% immediately, but the percentage of correct "Do you have a minute?" temporarily decreased to 25% in the sixth session of training. In this session, Shingo made the mistake of gluing many envelopes in the wrong place and he had to redo the work. After that, he said, "I have to hurry" and assembled envelopes faster than usual. When confederates presented opportunities for social niceties, he responded by speaking fast and moving quickly. The need for Tetsuro to redo his table work in session six might have competed with his attending or other responses to the training trials.

In posttraining, all participants showed correct responses despite task materials that varied from training scenarios, the absence of textual prompts, and the absence of trainer feedback. Kayoko was the only participant who performed above baseline, but below training levels of accuracy on one social nicety during posttraining, "Do you have a minute?" (62% correct).

DISCUSSION

In the present study, we examined the efficacy of textual prompts and performance feedback on acquisition and generalization of two social niceties by adolescents and young adults with ASD. Nine participants acquired the social niceties "Do you have a minute?" and "Thank you for your time," though training produced variable performance for Kazufumi's initiations and less robust posttraining maintenance for Kayoko's closing responses. A previous study showed that the number of sessions for acquiring a social nicety can be greater than the number of sessions for acquiring other skills

(Morgan & Salzberg, 1992). However, the current study demonstrated that people with ASD acquired social niceties relatively quickly by employing the presentation of the textual prompts and performance feedback. Participants in this study acquired social niceties at a relatively low training intensity of 30-min sessions once every 2 weeks.

The results of Hood et al. (2017) are similar to our findings. Hood and colleagues used textual prompts to teach greeting skills such as handshaking and a salutation. They showed that individuals with ASD acquired greeting skills immediately when the textual prompt was introduced. Results of the current study demonstrate a functional relation between the treatment package of textual prompts plus performance feedback and participants' use of social niceties. Although it was possible that baseline responses by the boss and colleagues may have functioned as reinforcement or punishment, this seems unlikely because the percentage of correct responses remained low among participants who emitted some correct responses prior to training. It was also possible that participants acquired social niceties by observing other participants' responses because all participants simultaneously attended this study in the same room. Observational learning may have influenced the effects of this study. However, we consider that the possibility was low because the percentage of correct responding remained low for untrained groups during baseline.

The percentage of correct responses of Tomohiko, Toshihide, and Tetsuro increased immediately to 100% when the textual prompt was presented in training, and these participants' social niceties maintained when the intervention was removed. It is possible that Tomohiko, Toshihide, and Tetsuro acquired social niceties as rule-governed behaviors. Behavior is rule-governed when the rule is in place (e.g., "When you speak to your boss, please say 'Do you have a minute?'") and behavior changes before contacting consequences (Cooper, Heron, & Heward, 2007). There are previous studies in which participants with ASD acquired target behavior without reinforcement, immediately after the rule was introduced (Campbell & Tincani, 2011; Miguel, Yang, Finn, & Ahearn, 2009; Persicke, Tarbox, Ranick, & Clair, 2013). Other studies demonstrate that behavior change may occur faster after employing a rule than after employing contingencies (Lang et al., 2009; Tiger & Hanley, 2004). To examine the role of rule governance in the efficacy of the treatment package under study, future researchers should consider conducting direct assessments of participants' rule-governed behavior prior to intervention as well as measure behavior change in the presence of the textual prompt without performance feedback.

Although most participants' performance maintained in posttraining, Kayoko's percentage correct for "Do you have a minute?" decreased to 50% correct in the final sessions. The reason for this decline may be because we removed performance feedback for "Do you have a minute?" in posttraining and because bosses or colleagues nondifferentially assisted participants with their requests throughout the study. The mean percentage of correct responses for "Thank you for your time" did not decrease in the posttraining. We cannot clarify the difference between the two social niceties, but one possible reason is the delay in task completion due to emitting "Do you have a minute?" Kayoko, in particular, worked hastily to finish consulting with others as soon as possible. Saying "Do you have a minute?" slightly delayed her completion of the assigned work. In contrast, because the assigned work had already been finished when she was required to say "Thank you for your time," the social nicety did not delay the work. The presence or absence of the delay in the assigned work may have resulted in a difference in maintenance for Kayoko. To encourage emitting

social niceties that lead to work delays, it may be effective to change the consequences that follow. For example, Kayoko's performance might have maintained without prompts and feedback if the boss replied only when she said, "Do you have a minute?"

This study has at least three limitations. The first limitation was that we did not conduct a rigorous evaluation of generalizations across settings. This study showed the efficacy of training sufficient exemplars and programming common stimuli to support generalization across people and task materials. Future researchers should investigate the effects of additional task variations not presented in this study on generalization of social niceties to a wide variety of work activities. For example, future participants might be trained to use social niceties while sorting documents in a warehouse, entering data into a computer spreadsheet in an office, and taking inventory in a supermarket. Most notably, we did not measure generalization to a naturalistic work setting. Future researchers should measure effects of training in the simulated work environment on participants' work and social outcomes under natural conditions. For example, Grob et al. (2019) provided stimulus prompts (e.g., a problem-solving prompt to help participants assess whether they required a model to perform the assigned task) when the participant was required to emit targeted social skills and social niceties in a simulated workplace, to facilitate generalization of workplace social skills to a second simulated workplace environment. In their study, participants showed the generalization. The stimulus prompt with written responses of each targeted social skill (Grob et al. 2019) is similar to the textual prompt in our study. However, while the social niceties in their study were nonverbal responses such as knocking on a door and waiting for an invitation, the social niceties in our study were verbal responses. It is an important issue to examine whether generalization effect by the textual prompt and the stimulus prompt differ between nonverbal and verbal responses.

Closely related, social niceties in the workplace are influenced by more factors than social niceties in the simulation setting. For example, the boss or colleague was always available to interact with the participants in this study. Workplace social skills, by contrast, must eventually occur under convergent multiple control corresponding to multiple schedules of reinforcement. Convergent multiple control is the control of a single response by more than one variable such as nonverbal stimuli in the form of a potential listener's body posture, other audience variables, current motivating operations affecting the speaker, nonverbal contextual stimuli, emotional private events, verbal stimuli emitted by the other person, and so on (Michael, Palmer, & Sundberg, 2011). In brief, saying "Do you have a minute?" is appropriate if the boss is not busy, but it may not be inappropriate if the boss is very busy. Rodriguez, Levesque, Cohrs, and Niemeier (2017) asserted the importance of teaching people with ASD both when to engage in the skill and when to not engage.

Future studies should consider the social nicety as behavior controlled by multiple stimuli and program training trials on which that response is not scheduled for reinforcement. Investigators could also program abolishing operation trials on which the natural reinforcer for using a social nicety is not valuable. An example of an unreinforced (s-delta) trial may involve a busy boss who is engaged in a phone call when the participant arrives. An example of abolishing operation trial is the boss instructing the participant to borrow materials from a coworker that are already on the participant's desk.

A second limitation was that we did not conduct pre-experimental assessments to determine which social niceties to target. One way to more systematically select such social niceties is to observe participants' behavior in their daily

life (Beaulieu, Hanley, & Santiago, 2013; Peters & Thompson, 2015). As another method, Grob et al. (2019) assessed whether participants emitted job-related social skills in a series of work sessions (e.g., stocking items on shelves, filing papers, and sorting objects) before selecting target behaviors.

Because Japan is a high context culture (i.e., most of the information is inferred from the context of a message; Mukherjee & Ramos-Salazar, 2014), individuals in Japan prefer a relatively ambiguous or soft and polite communication style. Social niceties such as, "Do you have a minute?" and "Thank you for your time" are essential to the Japanese workplace. Examples of other social niceties or etiquette to target in future studies on workplace social skills in Japanese culture may include bowing during initial greetings, avoiding too much direct eye contact with others (Mukherjee & Ramos-Salazar, 2014), exchanging business cards (Polleri, 2017), and using Japanese politeness language (e.g., saying the word "*desu*" or "*masu*" at the end of sentences to elders, changing a verb to special honorific words when Japanese people are talking to someone older than them; Takeda, 2016).

After selecting assessment-informed workplace social skills, future research should collect data on the social acceptability and validity of the targeted behaviors. To evaluate social acceptability and validity, participants' behaviors may be assessed by presenting video samples of performance before and after the intervention (Buffington, Krantz, McClannahan, & Poulson, 1998) and collecting questionnaires from the teacher or parents (Crozier & Tincani, 2007). Researchers should measure the social acceptability of various goals, procedures, and outcomes related to teaching social niceties.

Future studies should evaluate modifications to this treatment package for participants whose performance does not maintain, similar to Kayoko. For example, it may be effective to include the description of "You will be rated highly if you emit the statement" in the textual prompt when a participant does not acquire a social nicety. Refining wording of the textual prompt may contribute the development of resource-efficient training.

In this study, we introduced textual prompts and the performance feedback to teach and to facilitate generalization of two social niceties for individuals with ASD. In particular, we showed this procedure was efficient because some of participants could acquire social niceties immediately after the training started. Although we selected two social niceties related to employment as dependent variables, future researchers should extend the procedure in this study to other social niceties to promote smooth interpersonal relationships for people with ASD in various social settings.

REFERENCES

Balcazar, F., Hopkins, B. L., & Suarez, Y. (1985). A critical, objective review of performance feedback. *Journal of Organizational Behavior Management*, *7*(3-4), 65–89. http://doi.org/10.1300/J075v07n03_05.

Beaulieu, L., Hanley, G. P., & Santiago, J. L. (2013). Improving the conversation skills of a college student with peer-mediated behavior skills training. *The Analysis of Verbal Behavior*, *30*, 48–52. http://doi.org/10.1007/s40616-013-0001-8.

Benz, M. R., Yovanoff, P., & Doren, B. (1997). School-to-work components that predict postschool success for students with and without disabilities. *Exceptional Children*, *63*, 151–165. http://doi.org/10.1177/001440299706300201.

Buffington, D. M., Krantz, P. J., McClannahan, L. E., & Poulson, C. L. (1998). Procedures for teaching appropriate gestural communication skills to children with autism. *Journal of Autism and Developmental Disorders*, *28*, 535–545. http://doi.org/10.1023/A:1026056229214.

Burt, D. B., Fuller, S. P., & Lewis, K. R. (1991). Brief report: Competitive employment of adults with autism. *Journal of Autism and Developmental Disorders*, *21*, 237–242. http://doi.org/10.1007/BF02284763.

Campbell, A., & Tincani, M. (2011). The power card strategy: Strength-based intervention to increase direction following of children with autism spectrum disorder. *Journal of Positive Behavior Interventions*, *13*,

240–249. http://doi.org/10.1177/109830071140 0608.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.

Crozier, S., & Tincani, M. (2007). Effects of social stories on prosocial behavior of preschool children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *37*, 1803–1814. http://doi.org/10.1007/s10803-006-0315-7.

Gantman, A., Kapp, S. K., Orenski, K., & Laugeson, E. A. (2012). Social skills training for young adults with high-functioning autism spectrum disorders: A randomized controlled pilot study. *Journal of Autism and Developmental Disorders*, *42*, 1094–1103. http://doi.org/10.1007/s10803-011-1350-6.

Grob, C. M., Lerman, D. C., Langlinais, C. A., & Villante, N. K. (2019). Assessing and teaching job-related social skills to adults with autism spectrum disorder. *Journal of Applied Behavior Analysis*, *52*, 150–172. http://doi.org/10.1002/jaba.503.

Hendricks, D. (2010). Employment and adults with autism spectrum disorders: Challenges and strategies for success. *Journal of Vocational Rehabilitation*, *32*, 125–134. http://doi.org/10.3233/JVR-2010-0502.

Hillier, A., Fish, T., Cloppert, P., & Beversdorf, D. Q. (2007). Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum. *Focus on Autism and Other Developmental Disabilities*, *22*, 107–115. http://doi.org/10.1177/10883576070220020201.

Hood, S. A., Luczynski, K. C., & Mitteer, D. R. (2017). Toward meaningful outcomes in teaching conversation and greeting skills with individuals with autism spectrum disorder. *Journal of Applied Behavior Analysis*, *50*, 459–486. http://doi.org/10.1002/jaba.388.

Hwang, B., & Hughes, C. (2000). The effects of social interactive training on early social communicative skills of children with autism. *Journal of Autism and Developmental Disorders*, *30*, 331–343. http://doi.org/10.1023/A:1005579317085.

Kornacki, L. T., Ringdahl, J. E., Sjostrom, A., & Nuernberger, J. E. (2013). A component analysis of a behavioral skills training package used to teach conversation skills to young adults with autism spectrum and other developmental disorders. *Research in Autism Spectrum Disorders*, *7*, 1370–1376. http://doi.org/10.1016/j.rasd.2013.07.012.

Lang, R., Shogren, K. A., Machalicek, W., Rispoli, M., O'Reilly, M., Baker, S., & Regester, A. (2009). Video self-modeling to teach classroom rules to two students with Asperger's. *Research in Autism Spectrum Disorders*, *3*, 483–488. http://doi.org/10.1016/j.rasd.2008.10.001.

Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2006). Enhancing job-site training of supported workers with autism: A reemphasis on simulation. *Journal of Applied Behavior Analysis*, *39*, 91–102. http://doi.org/10.1901/jaba.2006.154-04.

Lattimore, L. P., Parsons, M. B., & Reid, D. H. (2008). Simulation training of community job skills for adults with autism: A further analysis. *Behavior Analysis in Practice*, *1*, 24–29. http://doi.org/10.1007/BF03391717.

Laugeson, E. A., Frankel, F., Gantman, A., Dillon, A. R., & Mogil, C. (2012). Evidence-based social skills training for adolescents with autism spectrum disorders: The UCLA PEERS program. *Journal of Autism and Developmental Disorders*, *42*, 1025–1036. http://doi.org/10.1007/s10803-011-1339-1.

Leblanc, M. P., Ricciardi, J. N., & Luiselli, J. K. (2005). Improving discrete trial instruction by paraprofessional staff through an abbreviated performance feedback intervention. *Education and Treatment of Children*, *28*(1), 76–82. Retrieved from. http://www.jstor.org/stable/42899829.

Marzullo-Kerth, D., Reeve, S. A., Reeve, K. F., & Townsend, D. B. (2011). Using multiple-exemplar training to teach a generalized repertoire of sharing to children with autism. *Journal of Applied Behavior Analysis*, *44*(2), 279–294. https://doi.org/10.1901/jaba.2011.44-279.

Matson, J. L., Sevin, J. A., Box, M. L., Francis, K. L., & Sevin, B. M. (1993). An evaluation of two methods for increasing self-initiated verbalizations in autistic children. *Journal of Applied Behavior Analysis*, *26*, 389–398. http://doi.org/10.1901/jaba.1993.26-389.

Matson, J. L., Sevin, J. A., Fridley, D., & Love, S. R. (1990). Increasing spontaneous language in three autistic children. *Journal of Applied Behavior Analysis*, *23*, 227–233. http://doi.org/10.1901/jaba.1990.23-227.

Mesibov, G. B. (1984). Social skills training with verbal autistic adolescents and adults: A program model. *Journal of Autism and Developmental Disorders*, *14*, 395–404. http://doi.org/10.1007/BF02409830.

Michael, J., Palmer, D. C., & Sundberg, M. L. (2011). The multiple control of verbal behavior. *The Analysis of Verbal Behavior*, *27*, 3–22. https://doi.org/10.1007/BF03393089.

Miguel, C. F., Yang, H. G., Finn, H. E., & Ahearn, W. H. (2009). Establishing derived textual control in activity schedules with children with autism. *Journal of Applied Behavior Analysis*, *42*, 703–709. http://doi.org/10.1901/jaba.2009.42-703.

Morgan, R. L., & Salzberg, C. L. (1992). Effects of video-assisted training on employment-related social skills of adults with severe mental retardation. *Journal of Applied Behavior Analysis*, *25*, 365–383. http://doi.org/10.1901/jaba.1992.25-365.

Mukherjee, S., & Ramos-Salazar, L. (2014). "Excuse us, your manners are missing!" The role of business etiquette in today's era of cross-cultural communication.

TSM Business Review, *2*(1), 18–28. http://doi.org/10.23837/tbr/2014/v2/n1/112854.

Nuernberger, J. E., Ringdahl, J. E., Vargo, K. K., Crumpecker, A. C., & Gunnarsson, K. F. (2013). Using a behavioral skills training package to teach conversation skills to young adults with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *7*, 411–417. http://doi.org/10.1016/j.rasd.2012.09.004.

Park, H. S., & Gaylord-Ross, R. (1989). A problem-solving approach to social skills training in employment settings with mentally retarded youth. *Journal of Applied Behavior Analysis*, *22*, 373–380. http://doi.org/10.1901/jaba.1989.22-373.

Persicke, A., Tarbox, J., Ranick, J., & Clair, M. S. (2013). Teaching children with autism to detect and respond to sarcasm. *Research in Autism Spectrum Disorders*, *7*, 193–198. http://doi.org/10.1016/j.rasd.2012.08.005.

Peters, L. C., & Thompson, R. H. (2015). Teaching children with autism to respond to conversation partners' interests. *Journal of Applied Behavior Analysis*, *48*, 544–562. http://doi.org/10.1002/jaba.235.

Polleri, M. (2017). Exchange business cards in Japan: Oh! So you are an …. *Anthropology Today*, *33*(3), 23–24. http://doi.org/10.1111/1467-8322.12351.

Reinke, W. M., Lewis-Palmer, T., & Martin, E. (2007). The effect of visual performance feedback on teacher use of behavior-specific praise. *Behavior Modification*, *31*, 247–263. http://doi.org/10.1177/0145445506288967.

Rodriguez, N. M., Levesque, M. A., Cohrs, V. L., & Niemeier, J. J. (2017). Teaching children with autism to request help with difficult tasks. *Journal of Applied Behavior Analysis*, *50*, 717–732. http://doi.org/10.1002/jaba.420.

Ruble, L. A., & Dalrymple, N. J. (1996). An alternative view of outcome in autism. *Focus on Autism and Other Developmental Disabilities*, *11*, 3–14. http://doi.org/10.1177/108835769601100102.

Sarokoff, R. A., Taylor, B. A., & Poulson, C. L. (2001). Teaching children with autism to engage in conversational exchanges: Script fading with embedded textual stimuli. *Journal of Applied Behavior Analysis*, *34*, 81–84. http://doi.org/10.1901/jaba.2001.34-81.

Schall, C., Wehman, P., & McDonough, J. L. (2012). Transition from school to work for students with autism spectrum disorders: Understanding the process and achieving better outcomes. *Pediatric Clinics of North America*, *59*, 189–202. http://doi.org/10.1016/j.pcl.2011.10.009.

Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics*, *129*, 1042–1049. http://doi.org/10.1542/peds.2011-2864.

Skinner, B. F. (1957). *Verbal behavior*. Englewood Cliffs, NJ: Prentice Hall.

Snell, M., & Brown, F. (2011). *Instruction of students with severe disabilities* (7th ed.). Upper Saddle River, NJ: Pearson.

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, *10*, 349–367. http://doi.org/10.1901/jaba.1977.10-349.

Stowitschek, J. J., McConaughy, E. K., Peatross, D., Salzberg, C. L., & Lignugaris/Kraft, B. (1988). Effects of group incidental training on the use of social amenities by adults with mental retardation in work settings. *Education and Training in Mental Retardation*, *23*, 202-212. Retrieved from http://www.jstor.org/stable/23878503

Takeda, I. (2016). Report: Project-based learning with 21st century skills for the Japanese language classroom. *Journal of Integrated Creative Studies*, *2*, 1-7. https://doi.org/10.14989/225153

Thiemann, K. S., & Goldstein, H. (2004). Effects of peer training and written text cueing on social communication of school-age children with pervasive developmental disorder. *Journal of Speech, Language, and Hearing Research*, *47*(1), 126–144. https://doi.org/10.1044/1092-4388(2004/012.

Tiger, J. H., & Hanley, G. P. (2004). Developing stimulus control of preschooler mands: An analysis of schedule-correlated and contingency-specifying stimuli. *Journal of Applied Behavior Analysis*, *37*, 517–521. http://doi.org/10.1901/jaba.2004.37-517.

Wehman, P. H., Schall, C. M., McDonough, J., Kregel, J., Brooke, V., Molinelli, A., … 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*, 487–500. http://doi.org/10.1007/s10803-013-1892-x.

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