

Experimental examination on the effectiveness
procedure to teach social niceties in the workplace
for individuals with autism spectrum disorder

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兵庫教育大学大学院
連合学校教育学研究科
山本 真也

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1. General Introduction

1-1. The obstacles and the success factors to employment for individuals with ASD

Previous studies pointed many obstacles to employment for individuals with ASD. The studies have shown that autism spectrum disorders lead to difficulties in finding and continuing employment, due to lack of social skills, unique behavior patterns (Hendricks 2010), and difficulty in comprehending social cues (Hillier, Fish, Cloppert, and Beversdorf 2007). One of the factors is the difficulty of the interaction with others (Chen, Leader, Sung, & Leahy, 2015; Park & Gaylord-ross, 1989). Because of these difficulties, many people with autism do not have jobs (Shattuck, Narendorf, Cooper, Sterzing, Wagner, and Taylor 2012).

People with ASD may become successful in employment by acquiring additional social skills (Benz, Yovanoff, & Doren, 1997; Burt, Fuller, & Lewis, 1991; Park et al, 1989; Schall, Wehman, & McDonough, 2012; Wehman et al., 2014). Researchers proved that the interaction that influenced the employment included a greeting (Snell & Brown, 2011; Walsh, Holloway, & Lydon, 2018), a conversation (Morgan, Leatzow, Clark, & Siller, 2014), and saying “thank you” and “excuse me” (Hurtbutt & Chalmers, 2004; Kurtz & Jordan, 2008; Morgan & Salzberg, 1992). 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” (Morgan & Salzberg, 1992; Matson, Sevin, Box, Francis, & Sevin, 1993), “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). 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, & Laugeman, 2012; Hillier et al., 2007; Mesibov, 1984).

1-2. The difference between social niceties and social skills

Morgan and Salzberg (1992) used video-assisted training to teach children with ASD to say “excuse me, please” and “help.” The skill of saying “help” was acquired rapidly. However, the skill of saying “excuse me, please” was acquired comparatively slowly. So, Morgan et al (1992) referred to these behaviors as “social amenities.” They identified the social amenities as behaviors that makes a person comfortable. This study called them “social niceties” because social niceties may be a more conventional phrase to denote responses that have a polite effect within certain verbal communities. The social nicety is behaviors that facilitates an interpersonal relationship such as, “thank you,” “excuse me,” or “a moment of your time.” In addition, 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. The reason may be that social niceties were autoclitics. The autoclitics accompanies other verbal behaviors and clarify or alter the effect of verbal behavior upon the listener (Skinner, 1957).

In a while, many work skills and social skills related to employment function as the mand. As a specific example, Grob, Lerman, Langlinais, and Villante (2019) taught various job-related skills including asking for a task model and asking for help with

materials. These work skills were reinforced by specific stimuli such as getting how to work or the materials needed for work. In a while, Grob et al. also taught social niceties including saying “excuse me” and knocking on the supervisor’s door. These social niceties may increase the possibility that other verbal behaviors will be reinforced, but social niceties rarely accompany reinforcer such as a comment from the supervisor saying “your knocking is wonderful.” More effective intervention needs to be developed to acquire the social amenities that are difficult to acquire.

Morgan et al. (1992) pointed out that a reason for the difficulty in teaching the acquisition of social niceties is that the participants were receiving the reinforcement even if they did not emit the social amenity. For example, one participant was able to obtain a chocolate by saying “give me a chocolate” without the requisite of “excuse me.” Therefore, this behavior that benefits from the use of a normal social amenity to achieve smoother human relationships becomes difficult for the participant to acquire. The lack of a social amenity may not be problematic in the setting of requesting a chocolate, but it may be a significant problem in a vocational setting. In particular, adolescents and young adults with autism often face difficulties in securing employment due to their lack of ability to perform average social interactions (Benz, Yovanoff & Doren, 1997; Hendricks, 2010). Moreover, Burt, Fuller, and Lewis (1991) and Hillier, Fish, Cloppert, & Beversdorf (2007) confirm the importance of the acquisition of these skills for employment. Therefore, developing a better procedure to acquire social niceties is needed.

1-3. The importance of social niceties in Japan

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 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).

1-4. The effectiveness procedure for acquiring social niceties

Previous researchers have investigated methods of teaching social niceties to individuals with ASD, including the use of textual prompts (e.g., Thiemann & Goldstein, 2004; Sarokoff, Taylor, & Poulson, 2001). 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. Thiemann et al (2004) used written words and graphic cues to teach six skills including social niceties; securing attention and compliments. In addition, Miller and Thiemann-Bourque (2016) also used written words and graphic cues to teach social niceties such as cheering friends. Although the wording of the written words and graphic cues in each study was different, both cues included appropriate phrases or statements required in the scene.

The reason that the textual cues is effective may be that the prompt functioned as

a rule and social niceties established as a rule-governed behavior. The rule-governed behavior is behavior controlled by a rule shown a behavioral contingency. Unlike behaviors controlled by the direct contingency, behaviors controlled by the rule emit without contacting a behavioral contingency (Skinner, 2014). An example of the rule is “if you run out into the road where the traffic is intense, you are hit by a car.” This rule show “the road where the traffic is intense” as a discriminative stimulus, “you run out” as a response, and “you are hit by a car” as a consequent stimulus. Just being presented with the rule, most people will avoid doing the behavior that run out the road where the traffic is intense without having the experience of being hit by a car. This is the rule-governed behavior. As above, social niceties themselves such as greeting friends and saying "thank you" did not produce reinforcers such as edible items and praises. However, if social niceties established as the rule-governed behavior, participants are able to emit social niceties without reinforcers. Therefore, textual cues are considered effective for acquiring social niceties.

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). In addition, performance feedback has encompassed several components including (a) review of data, (b) praise for corrective implementation, (c) corrective feedback, (d) addressing questions or comments (Coddington, Feinberg, Dunn, & Pace, 2005). 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 non-vocal 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.

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 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, etc. well before they secure their first paid job.

Behavioral skills training (BST) have been used to promote the acquisition of social skills by people with autism. BST consist of four procedures: instruction, modeling, role-play, and feedback (Spence 2003). Nuernberger, Ringdahl, Vargo, Crumpecker, and Gunnarsson (2013) taught conversational skills to adults with ASD, including making comments related to certain topics by using BST. Leaf, Tsuji, Griggs, Edwards, Taubman, McEachin, Leaf, and Oppenheim-Leaf (2012) also taught children with ASD to apologize when they interrupted a conversation and how to use appropriate greetings in conversations by using BST. Although behavioral SST is effective for acquiring social skills, some studies have reported that behaviors acquired through behavioral SST did not

generalize in novel settings such as home, school, and regional areas. For example, Barry, Klinger, Lee, Palardy, Gilmore, and Bodin (2003) taught conversation skills to children with autism; however, those skills did not generalize. Chandler, Lubeck, and Fowler (1992) showed that a factor of this failure to generalize was the dissimilarity of stimuli between the training setting and the generalization setting. Based on this, a procedure with only behavioral SST may be insufficient to promote the acquisition of social skills. Spence (2003) likewise stated that a procedure with only behavioral SST may be not effective but added that behavioral SST plays an important role in procedures comprising multiple interventions. For example, Bergstrom, Najdowski, and Tarbox (2012) conducted an intervention comprising BST in a simulation setting to teach three children with autism how to request help from someone when they are lost. BST in a simulation training is an intervention whereby a training setting is made to look like a daily-life setting; it has shown the effectiveness of generalization (Bellini, Peters, Benner, & Hopf 2007). Bergstrom et al. (2012) presented prompts and feedback to participants' responses to role-play in a simulation setting. Consequently, all participants were able to request help when they were lost. Moreover, they generalized their acquired behavior in other settings. This result shows that BST in a simulation setting is effective for the acquisition and generalization of behaviors.

1-5. Resource-efficiency and time-efficiency

Burke, Anderson, Bowen, Howard, & Allen (2010) showed one of the reasons that there are few studies about the training to teach skills related to employment is costs too high to introduce for employer even if the intervention is very effective. While

intervention combining various procedures have showed the efficacy, the importance of resource-efficiency (Erath, Reed, Sundermeyer, Brand, Novak, & Harbison, 2019; Reed, Hyman, & Hirst, 2011) and time-efficiency (Cox, Virues-Ortega, Julio, & Martin, 2016; Horner, Carr, Halle, McGee, Odom, & Wolery, 2005) were pointed out. If we conducted a resource-saving or time-saving intervention, learners are able to acquire many behaviors in short time. In addition, as adolescents approach graduation and transition to post-secondary settings, the relevance of efficiency in instruction for skill acquisition increases as available time for adding new skills to the student's repertoire decreases (Alexander, Ayres, Smith, Shepley, Mataras, 2013). Therefore, it is desirable to use the resource-efficiency or time-efficiency intervention to teach individuals with ASD social niceties related to employment. In addition, it is necessary to examine the efficacy of each procedure alone to develop the resource-efficacy and time-efficacy intervention.

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 setting.

1-6. General purpose

From above, I set three general proposes in this study. The first purpose is to examine the efficacy of the textual prompt, the performance feedback, and the BST for acquisition of social niceties. The second purpose is to consider the most effective intervention combination of resources and time. Figure 1 shows the doctoral thesis structure.

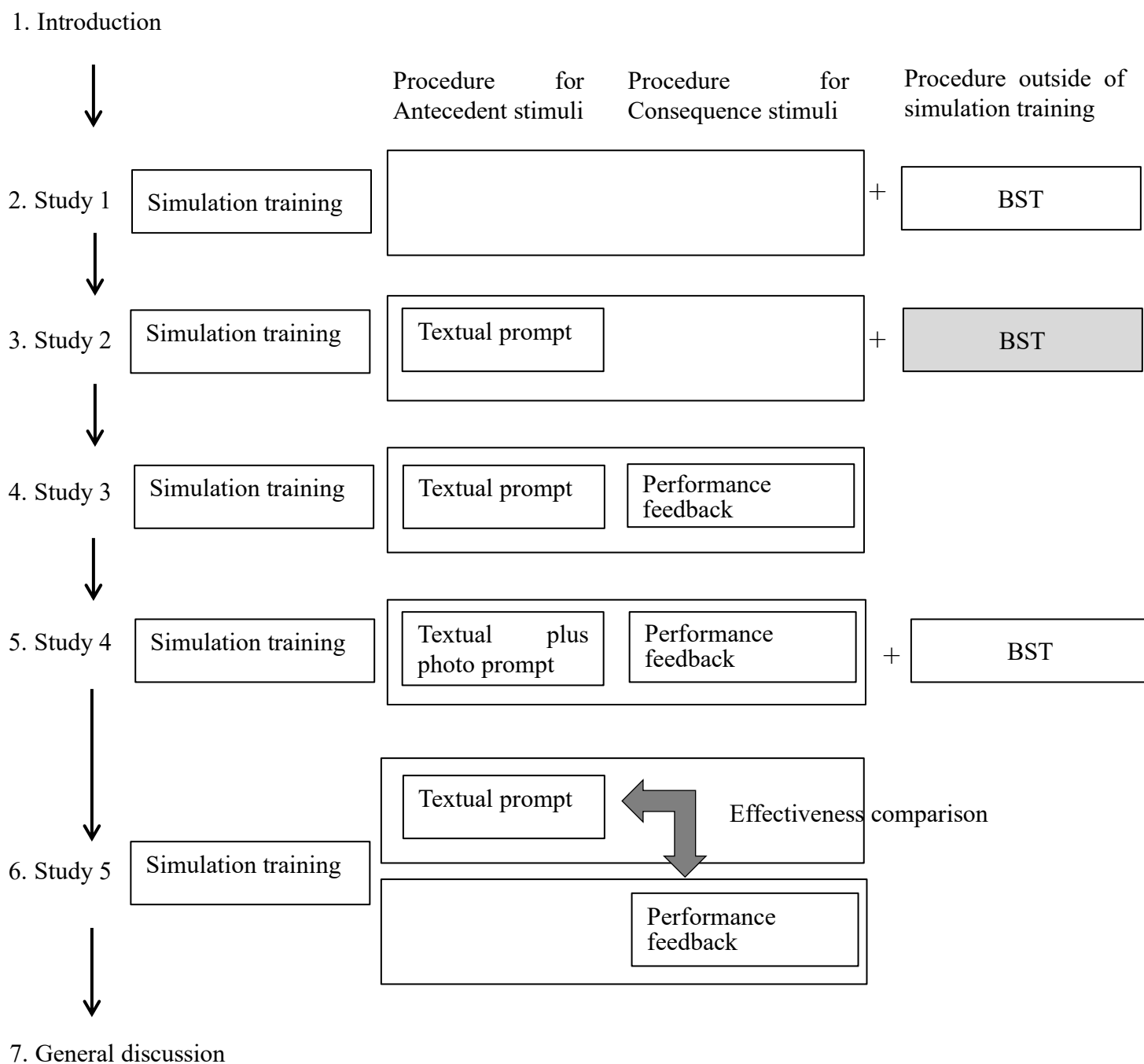


Figure 1. Doctoral thesis structure

The white square shows procedures providing to all participants in each study. The gray square shows procedures providing a part of participant in each study.

2. Study 1

Purpose

In this study, I taught four adolescents with ASD to social niceties and work skills for employment by using simulation training and the behavioral skills training (BST). Furthermore, I examined the efficacy of the simulation training and BST on the acquisition of social niceties work skills for employment.

Method

Participants and Setting

Four adults with autism spectrum disorders (ASD) attended in this study. No one have been diagnosed intellectual disorders. Although all participants were not working and did not belong to any school, they wanted to get a job. So, they decided to participate this study. Details of the participants were described below.

Hiroshi was a 21-years-old male. According to a staff who is in charge of his employment support, Hiroshi could work for at least 30 minutes. He talked with others smoothly. However, he had a habit of stretching the end of his utterances. In addition, when standing, his head and body were often tilted because the center of gravity of the body was only on one foot. Therefore, his boss and colleagues felt he was an indecent person.

Jin was a 27-years-old male. According to a staff who is in charge of his employment support, although he could work for at least 30 minutes, he often made mistakes at work. For example, he assembled the screws differently from the instructions presented by the boss. He spontaneously talked with others and he liked impersonating comedians.

Keiichi was a 22-years-old male. According to a staff who is in charge of his

employment support, he could work for at least 30 minutes. When he was presented ambiguous or complex instructions, he repeatedly asked for the instructions with an anxious look on his face. He made eye contact when talking to others while working, but he always spoke with a very low voice looking down during the break time.

Shohei was a 19-years-old male. According to a staff who is in charge of his employment support, he could follow instructions by others. However, when Shohei was provided unknown tasks for him, he did not ask questions about how he worked. In addition, he often says “I do not work because I can live without working.” He never talked with others spontaneously. When he talked to someone, he responded simple words (e.g. “ah,” “yes.” and “I don’t know.”)

This study was conducted in a room in the prefectural facility. Figure 1-1 and Figure 1-2 showed settings in this study.

This study continued for 7 weeks. The intervention was conducted one day per week for the first 4 weeks and two days per week for the next 3 weeks. Two sessions were conducted per day. Because we conducted the initial guidance on the first day and the closing guidance on the final day, only one session was conducted on the first and final day.

Three Actors, a trainer, and an observer participated in all sessions. One actor played as a boss and two actors played as colleagues in the simulation setting. The observer recorded responses by participant.

Data collection

In this study, the participants were taught social niceties as well as work skills, which is required to proceed with their work. This study measured three social niceties and

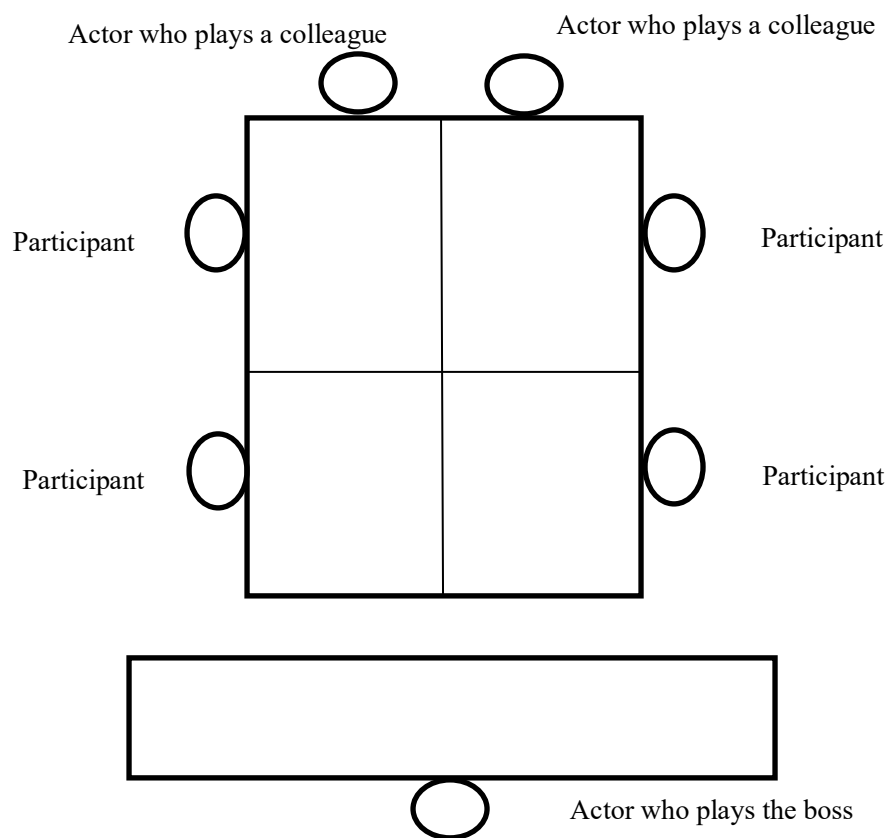


Figure 1-1 The setting of simulation training

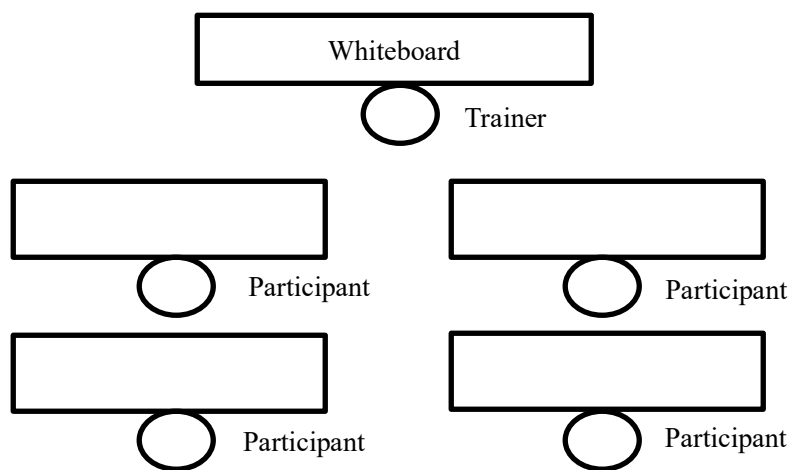


Figure 1-2 The setting of behavioral skills training

four work skills. The social niceties were followed; "greeting when entering or leaving the

room," "saying thank you when he was helped by someone," "correcting posture when he talked with his boss." The work skills followed; "taking notes when he was presented some tasks," "refusing when asked out-of-business requirements," "asking a question when asked a task without explaining way of working," "guiding customers." We decided these behaviors as targeted behaviors by a discussion between staff based on behavioral observation of participants.

Table 1-1 showed the evaluation criteria for each behavior. Three points were identified per behavior. Each point represented a response that constitutes each targeted behavior. We decided points in each session by evaluating how many responses the participant performed. When the participant performed all three responses, we recorded three points. When the participant performed two responses, we recorded two points. Trainers recorded the participant's responses in the simulation setting.

The participant was provided up to five opportunities to perform per target behavior in one session. However, some sessions did not provide all five opportunities because we wanted to make similar a workplace where do not know how many opportunities there are per day.

Procedure

Design. In this study, we conducted the behavioral skills training (BST) and simulation training. BST consisted of instruction, modeling, role-play, feedback. In the simulation training, we presented the participant with the opportunity to perform targeted behaviors in the simulation setting. This study consisted of three phases; the baseline (A), the simulation training (B), the simulation training and BST (C). In the baseline, I evaluated the

Table 1-1
Targeted behaviors and evaluation criteria in each situation

Targeted behavior	Evaluation criteria
Greeting when entering or leaving the room	<ol style="list-style-type: none"> 1. Making a stiff bow 2. Greeting 3. Speaking audibly
Saying thank you when he was helped by someone	<ol style="list-style-type: none"> 1. Thanking a person 2. Looking at a person in the eye 3. Making a stiff bow
Correcting posture when he talked with his boss	<ol style="list-style-type: none"> 1. Placing hands on both feet 2. Looking at a person 3. Straightening the spine
Taking notes when he was presented some tasks	<ol style="list-style-type: none"> 1. Obtaining permission for writing a memo 2. Writing a memo with accuracy 3. Repeating the content of an instruction
Refusing when asked out-of-business requirements	<ol style="list-style-type: none"> 1. Refusing something politely 2. Saying the reason why the business is not possible 3. Apologizing to actor
Asking a question when asked a task without explaining way of working	<ol style="list-style-type: none"> 1. Explaining things that the participant didn't know 2. Listening to the reply with looking at a person 3. Thanking a person after the participant listened to the reply
Guiding customers	<ol style="list-style-type: none"> 1. Asking a name and an affiliated company of a visitor 2. Obtaining permission for leading the client from a supervisor 3. Before the participant led the client, saying "I will show you"

performance of the participant before the intervention was introduced. In the simulation training, I examined the efficacy of the simulation training alone. In the simulation training

and BST, I examined the efficacy of the intervention combining simulation training and BST.

Baseline. 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 four participants was required to sit in a chair.

First, the trainer explained that the participant would be engaged in assembling connectors for 20 minutes. During the baseline, two actors played as colleagues. The colleagues also assembled connectors. Furthermore, one actor played as a boss. The boss presented the opportunity to participants. For example, the boss asked the participant to perform some tasks or invited to a drinking party after the participant finished to work. By the time constraints, the boss could not present opportunities to all targeted behaviors. The number of opportunities in one session for each participant was 3-6.

The simulation training. The procedure was the same as the baseline basically. However, the trainer provided feedback after a session was over. The trainer told the good points and improvements related to targeted behaviors. For example, he told “you greeted when entering the room very well, but you did not apologize when refusing an invitation from your boss. This is your improvement.”

The simulation training and BST. In each session in this phase, participants were received BST before the simulation training was started. The procedure of BST was followed.

The contents of BST in each session was greeting when entering or leaving the room (the 5th session), taking notes when he was presented some tasks (the 7th session), saying

thank you when he was helped by someone (the 9th session), refusing when asked out-of-business requirements (the 11th session), correcting posture when he talked with his boss (the 13th session), asking a question when asked a task without explaining way of working (the 15th session), and guiding customer (the 17th session). All participants were received these BST.

In BST, the trainer took participants to the worksheet and instructed according to the content written on the worksheet. The worksheet included three contents of the antecedent stimuli to emit targeted behavior, the consequence stimuli, precautions when performing the targeted behavior. The worksheet also included blank spaces. Participants were required to write in the blank spaces what they learned in the lecture. When the trainer asked, they were required to answer what wrote in the blank. After the instruction was finished, the trainer showed a model of the way of the targeted behavior. After that, the trainer required participants to perform targeted behavior as the trainer showed on the model. The trainer provided the feedback to the participant's performance. In brief, the trainer provided the praise when the participant performed targeted behavior correctly. For example, the trainer told the participant “Good job” or “you performed the behavior very well.” The trainer provided corrective feedback when the participant performed targeted behavior incorrectly or he did not perform it. For example, the trainer told “please say thank you after you receive an answer from others. Let use the skill in the next rehearsal.” The role-play and feedback repeated until the participant performed the targeted behavior correctly.

Informed consent

Before this study was started, I explained in writing and verbally about the purpose,

the method, the possibility to publish as a research paper. All participants agreed to these explanations.

Result

Figure 1-3 to 1-10 showed the points of targeted behaviors for each participant in each session. All participants showed a consistent trend. Their points did not increase in the baseline and the simulation training only. On the other hand, their points immediately increased in simulation training and BST. Exceptional cases were shown below.

Hiroshi showed three points to "taking notes when he was presented some tasks" and "saying thank you when he was helped by someone" but the trend of the points was unstable. In addition, the point of "correcting posture when he talked with his boss" was two in the 13th session immediately after the BST that taught the behavior was introduced. However, the point increased to three in the 14th session, and he continued to show three points until the intervention ended. Hiroshi was absent from the 10th session because of illness.

Jin showed three points for "saying thank you when he was helped by someone" in the 10th session. However, he decreased the points to two in the 18th session.

Keiichi showed two points for "taking notes when he has presented some tasks" in the 7th session and he increased the point to three in the 11th session. However, the point decreased to one in the 16th session and remained at one point until the intervention ended. In addition, he showed two points for "refusing when asked out-of-business requirements" in the 5th session regardless of

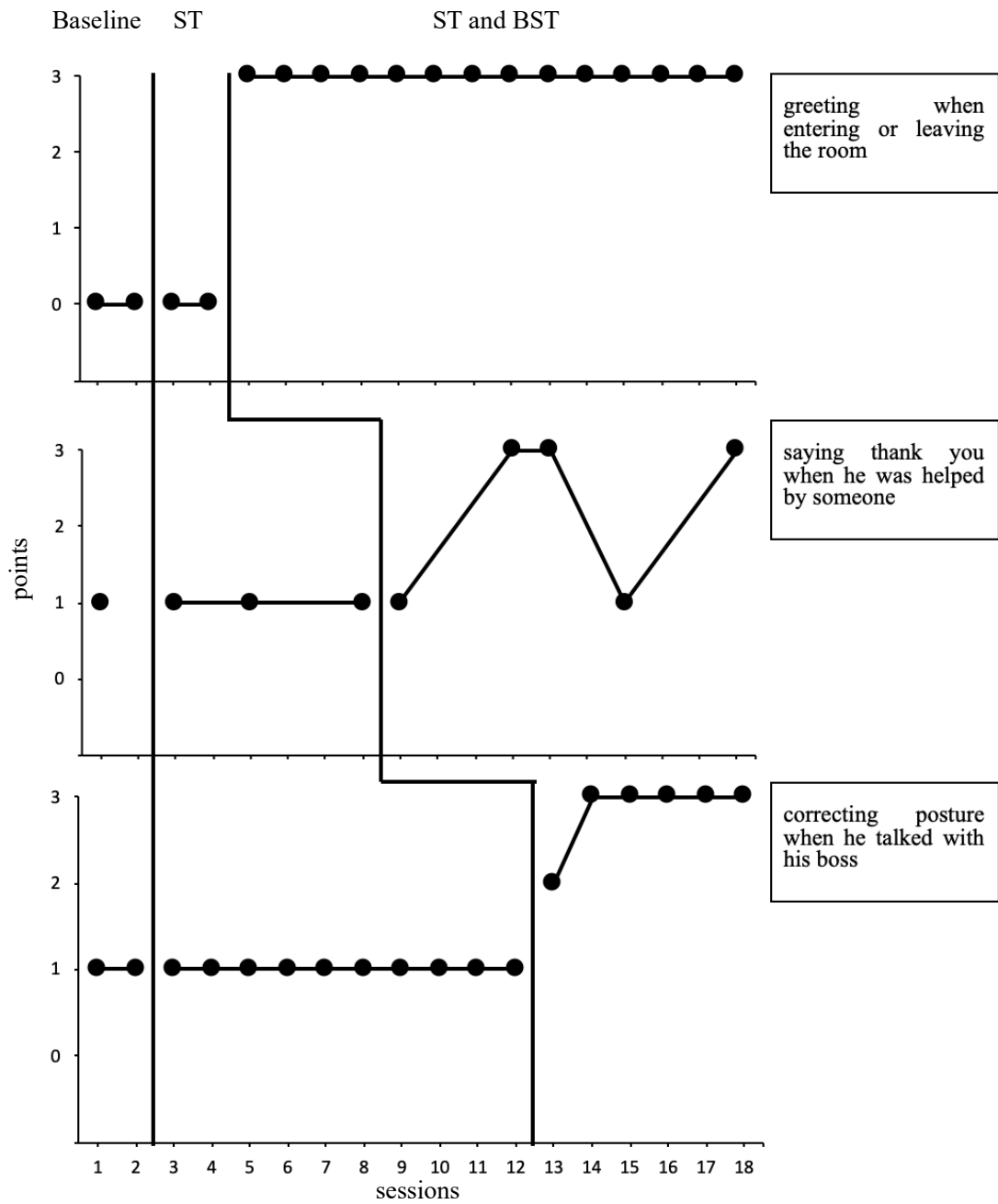


Figure 1-3. The points of each social nicety for Hiroshi. ST denotes the simulation training. BST denotes the behavioral skills training.

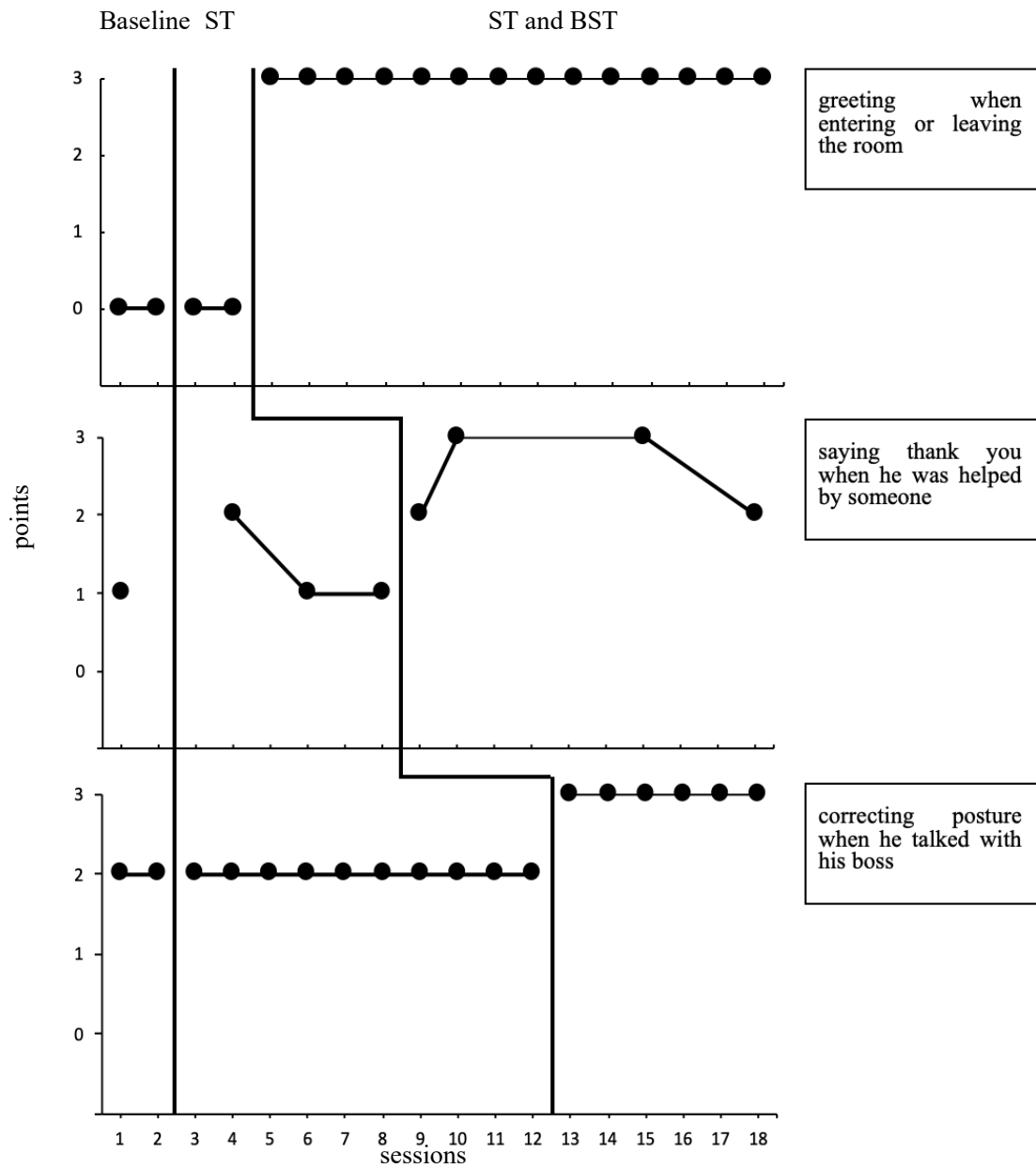


Figure 1-4. The points of each social nicety for Jin. ST denotes the simulation training. BST denotes the behavioral skills training.

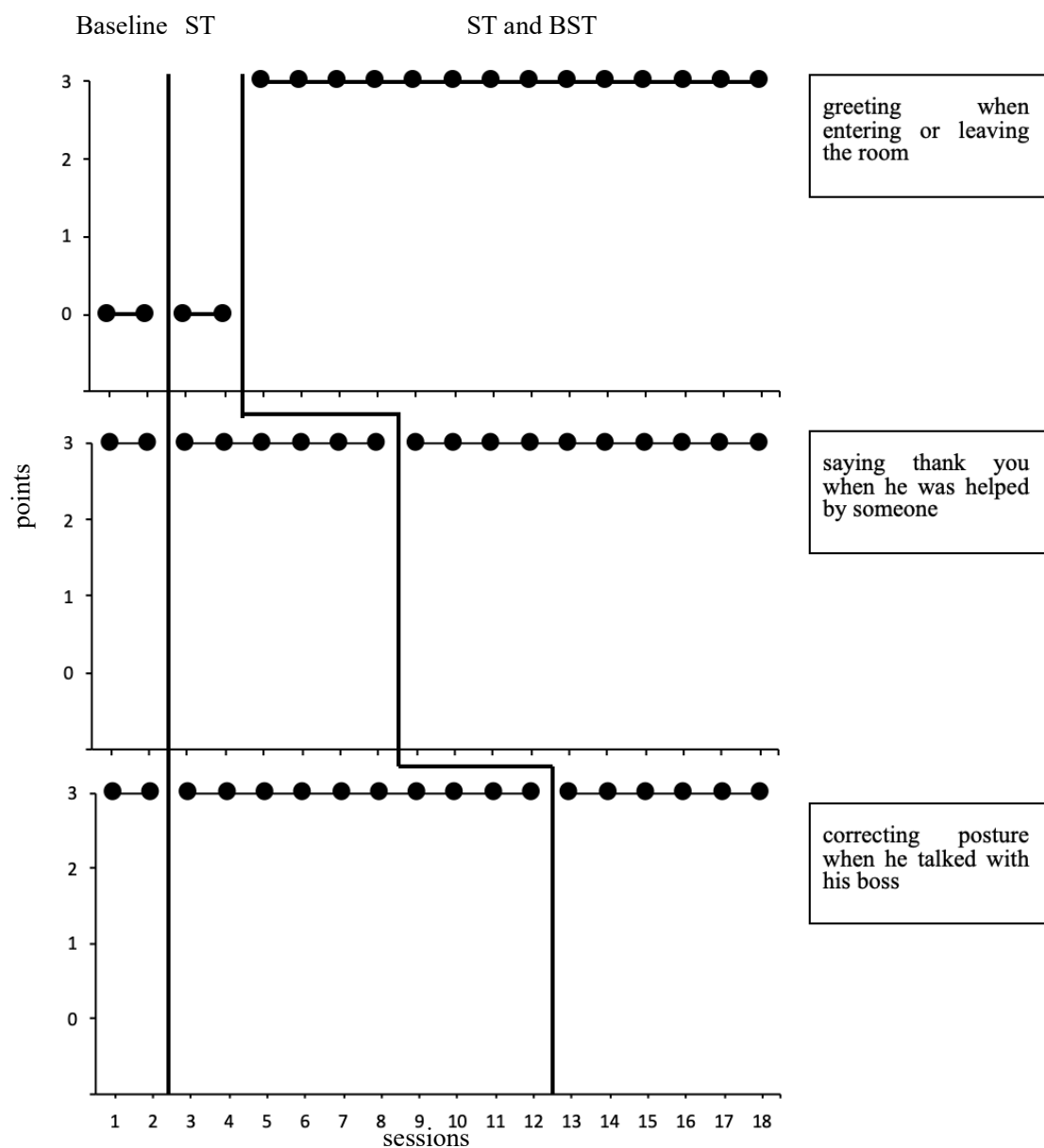


Figure 1-5. The points of each social nicety for Keiichi. ST denotes the simulation training. BST denotes the behavioral skills training.

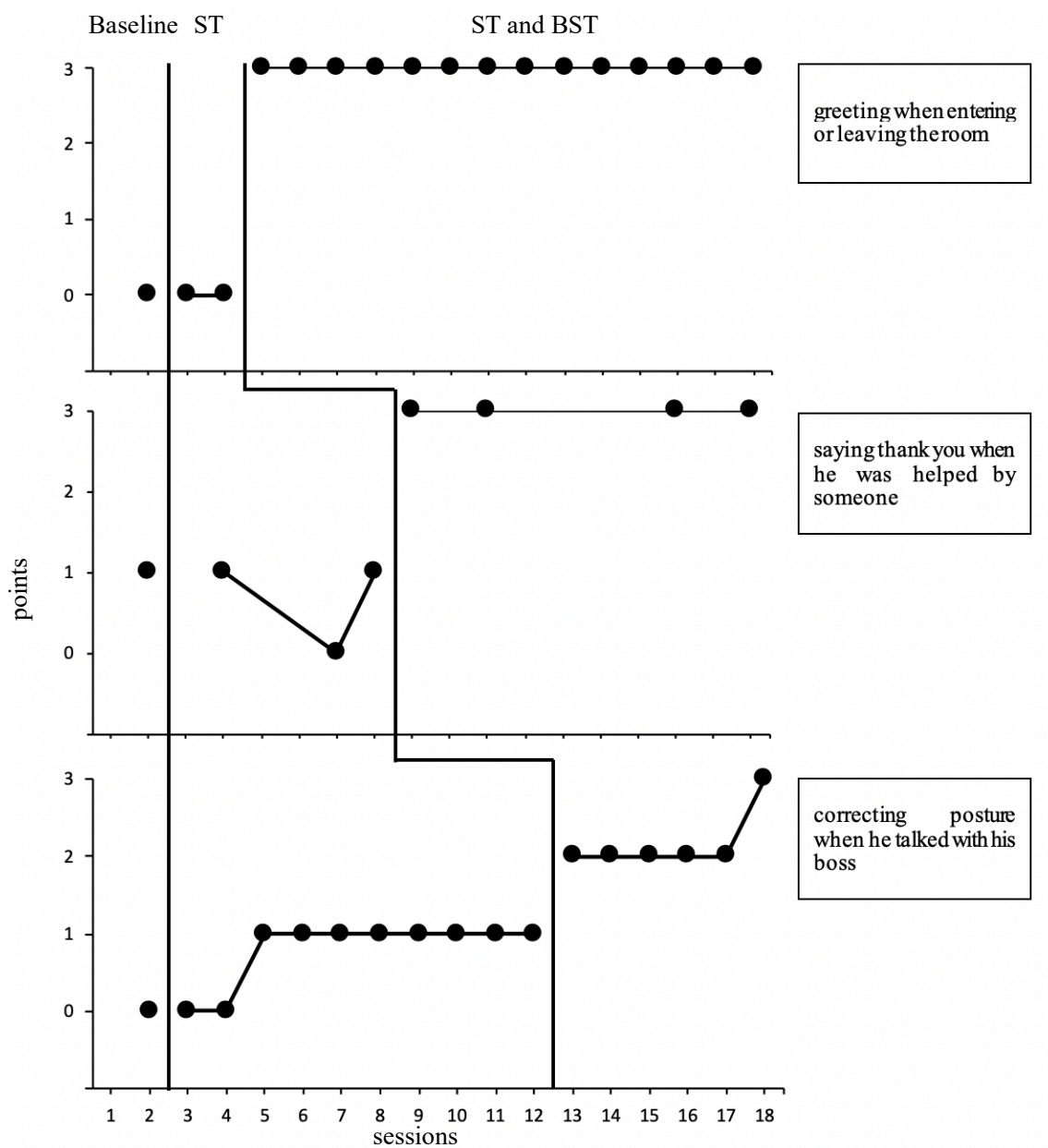


Figure 1-6. The points of each social nicety for Shohei. ST denotes the simulation training. BST denotes the behavioral skills training.

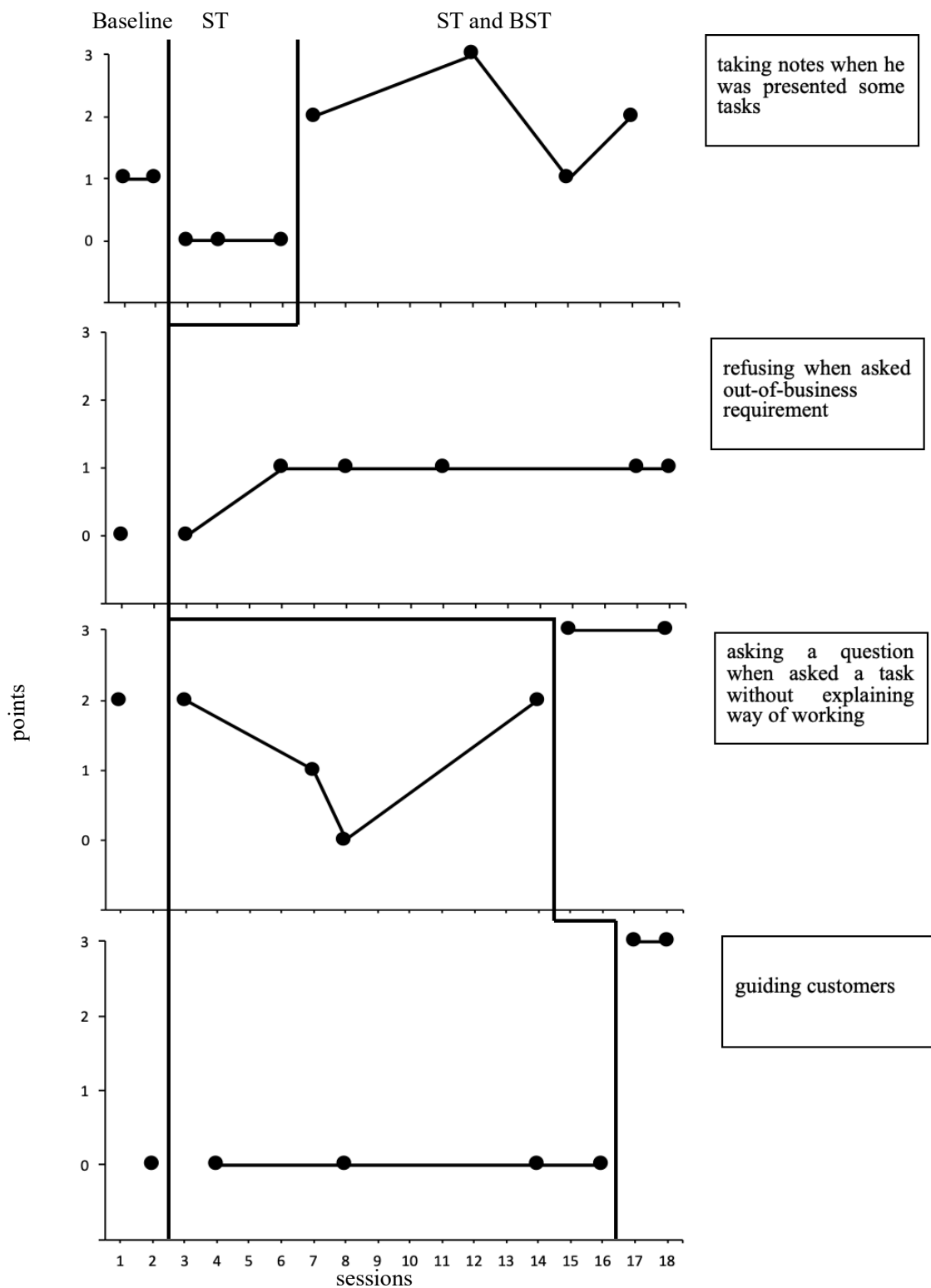


Figure 1-7. The points of each work skill for Hiroshi. ST denotes the simulation training. BST denotes the behavioral skills training.

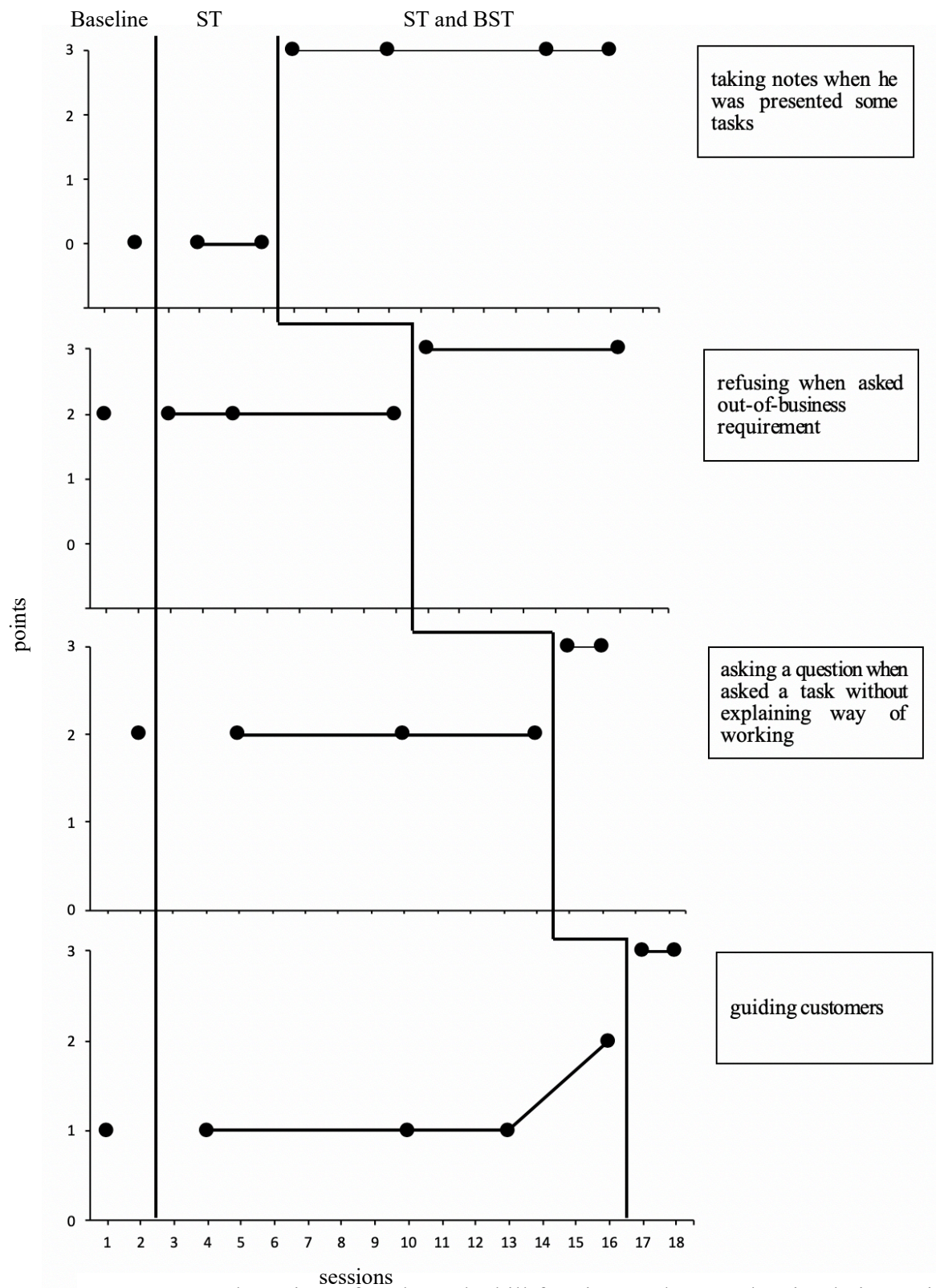


Figure 1-8. The points of each work skill for Jin. ST denotes the simulation training. BST denotes the behavioral skills training.

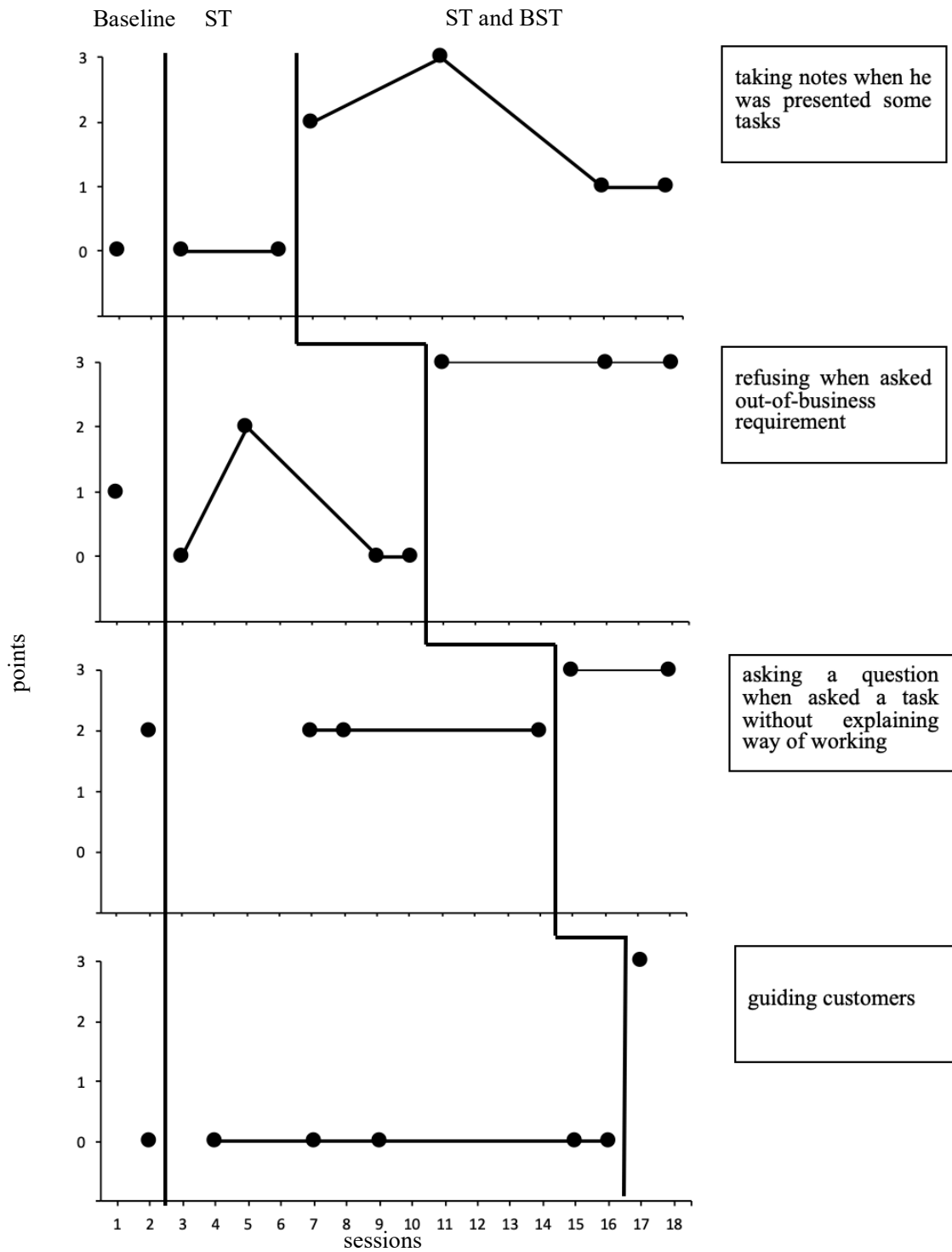


Figure 1-9. The points of each work skill for Keiichi. ST denotes the simulation training. BST denotes the behavioral skills training.

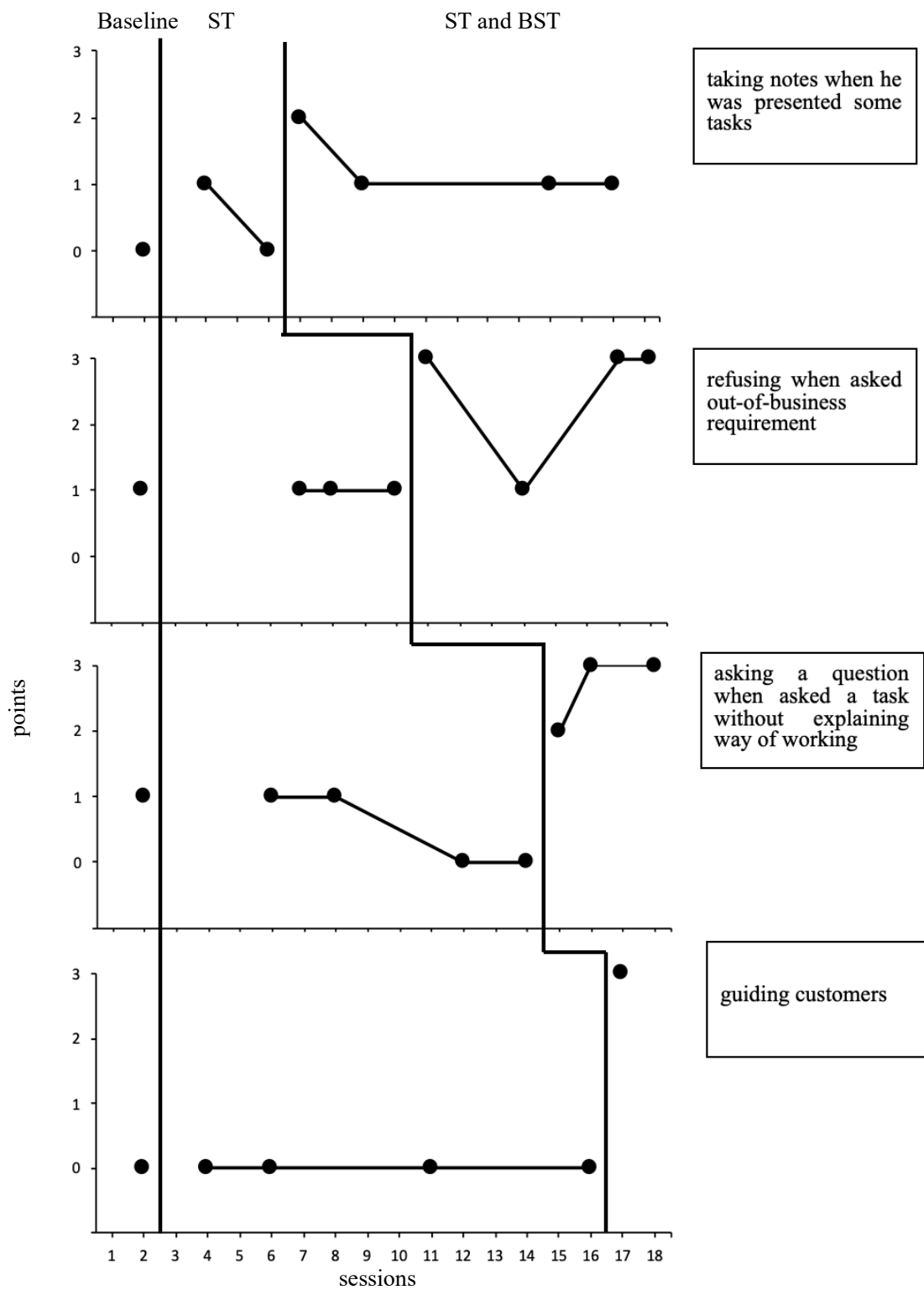


Figure 1-10. The points of each work skill for Shohei. ST denotes the simulation training. BST denotes the behavioral skills training.

BST was not introduced. However, the points did not maintain. The point decreased to zero in the 9th and 10th session. After the BST was introduced, the point increased to three immediately.

Shohei showed an inconsistent trend for "taking notes when he has presented some tasks." In brief, the point increased to two immediately after the BST was introduced, but the point decreased to one in the 9th session. Furthermore, the point did not increase until the intervention ended. The point for "refusing when asked out-of-business requirements" increased to three immediately after the BST was introduced, but the point decreased to zero in the 14th session. In this session, he did not look at the trainer and did not reply. However, the point increased to three in the 17th session. The points for "correcting posture when he talked with his boss" and "asking a question when asked a task without explaining the way of working, guiding customers" were two immediately after the BST was introduced, but both points increased three after a while.

Discussion

In this study, I conducted the simulation training and BST to teach social niceties and work skills for employment for adolescents with ASD. As a result, all participants showed a similar trend for almost targeted behaviors. Although the points did not change in the baseline and the simulation training only, the points increased after the BST was introduced. This result showed that combining BST with simulation training was essential to acquire social niceties and work skills. In addition, this result supported Gresham (1988) pointing out the importance of the combination of an intervention in the simulation setting and intervention in the controlled setting.

The simulation training and following feedback is usually effective procedure. However, the participants in this study did not acquire targeted behaviors. The factor of this result may be that all targeted behaviors are social niceties. The social niceties contribute to smoother relationship with others, but has little direct benefit to the participant. In brief, the consequence stimuli followed social niceties such as a simple reply by the boss did not function as reinforcers for participants. The feedback may have functioned as rule to promote performing social niceties in a next session, but the intervention using only the rule was not enough to acquire participants social niceties.

On other hand, the reason for the effectiveness of BST may have been repeated trials in a short time. In the simulation training, participants have received only one opportunity to perform targeted behavior in about 20 minutes. While, in the BST, participants were received many opportunities in a short time until he acquired the targeted behavior. As another reason, in the BST, it may have been effective to receive prompts and feedback immediately after performing targeted behavior rather than receiving them after a session was finished in the simulation training. Furthermore, the worksheet written a way of performing targeted behavior was used in the BST. Hayes, Brownstein, Zettle, Rosenfarb, and Korn (1986) showed that the rule-governed behavior is acquired earlier than the contingency-shaped behavior. The worksheet used in this study may have functioned as the rule.

It is possible that including a component of the BST in the simulation training improves the effectiveness of the simulation training. For example, if the trainer provided feedback to a participant immediately after he performed targeted behavior in the simulation training, the efficacy may be improved. However, including the component of the BST

increases the difference between daily living life and a simulation setting, and it may weaken a generalization effect that is an advantage of the simulation training. There are previous studies that did not show generalization effects (e.g. Domaracki & Lyon, 1992; this study provided prompts and feedback immediately after a participant performed targeted behavior). Therefore, future studies should examine the efficacy of the simulation training including the factors of the BST.

The limitations of this study were that participants did not acquire some targeted behaviors even after the BST was introduced. Three participants did not maintain the points for "taking notes when he was presented some tasks" even though they showed high points immediately after the BST was introduced. The reason was that there was not set the contingency to reinforce the response of taking notes in the simulation training. The response of "taking notes" seems to be reinforced by identifying meeting times and preparations later. However, I did not present opportunities to perform according to the contents written in the memo. So, the response did not be reinforced and the points decreased. From this result, the simulation training will need to include the natural contingency in future studies.

In this study, the BST was always introduced after participants experienced the simulation training. Therefore, the efficacy of the BST was premised on the introduction of the simulation training. Future studies should examine the efficacy of BST only.

The first study introduced the simulation training and following feedback. The feedback was presented considerably later after the participant emitted some responses. It is possible that the delayed feedback inhibited the effectiveness of the simulation training. If the feedback functions as the rule, the rule should present immediately before the participant

performed a targeted behavior. Therefore, the second study should introduce the textual prompt as the rule, and should examine the efficacy of the simulation training including the textual prompt.

3. Study 2

Purpose

Study 1 showed the efficacy of the combination of the simulation training and BST. While, Matson et al. (1993) taught children with ASD to speak the social niceties of “hello” and “thank you” by using cue cards and the time delay procedure. Taylor, Hughes, Hoch, and Coello (2004) used a pager prompt to teach seeking assistance including “excuse me” when participants got separated from adults. These procedures were effective. Particularly, Matson et al. (1993) emphasized that cue cards are an advantage as they serve as salient discriminative stimuli as children with ASD face difficulties in responding to complex social cues about social niceties. So, Study 2 examined the efficacy the simulation training with the textual prompt.

Method

Participants and Setting

Five adolescents with ASD were participated in this study. No one have diagnosed intellectual disorders. Shohei was 19-years-old male. He was in a special vocational school, and he was currently job hunting. He could respond cheerfully when anyone spoken or asked to him. However, he suddenly spoke about only a matter without calling someone when he spontaneously spoke to a person.

Rina was 25-years-old female. After graduating from college, she lived in her parent’s home. She displayed great enthusiasm for getting the job and she was currently job hunting, but she was unemployment. She could talk with someone happily. However, she suddenly spoke about only a matter without calling someone when she spontaneously spoke to a person.

Toshihiro was 17-year-old male. He was a student in a high school. He had not yet done job hunting and had not yet worked part-job. When anyone spoken him, he could speak with a smile. He could behave according to instructions, but he couldn't say "thank you" when he left near a person who directed him.

Hiromi was 23-years-old female. After graduating from college, she lived in her parent's home. When she was a student of collage, she was job hunting. But she didn't get a job. She could talk with someone smoothly. However, she was sometimes impolite; for example, she didn't say "sorry", "thank you", "excuse me".

Kayoko was 19-years-old female. She was in a special vocational school. She had not yet any work. When anyone spoken her, she could respond in a quiet voice. When she spontaneously spoke to a person, she left near a person without saying "thank you" as soon as business was over.

All of them could perform simple tasks such assembling an envelope. In addition, they could continue to work for a long hour. Furthermore, they were strongly motivated toward getting a job.

This study was conducted for five months. A session was 15 min long and one or two time per month. Intervention was conducted in 16m by 7.5m room. Only participants, actors, and trainers were present in the room. This room contained four long desks. These desks were located face to face each other. Two chairs were located near each one desk. A packet of envelopes which was not assemble, a manual which explains an assembling method of envelopes, a paste, a pencil, an eraser, a scissor, a memo pad was put on each table. This setting was simulated the workplace in Japanese.

Three Actors, five trainers, and five observers participated in all sessions. One actor played as a boss and two actors played as colleagues in the simulation setting. The trainers provided participant to a textual prompt. The observers recorded responses by participant.

Data collection

Targeted behaviors for Shohei, Rina, and Toshihiro was two social niceties and one work skill. One of the two social niceties was "saying excuse me when you talk a boss to report something". Another social nicety was "saying thank you when you left a boss." One vocational skill was "delivering information to a boss". Also, targeted behaviors for Hiromi and Kayoko were two social niceties and one work skill. The social nicety was responses to make smooth the relationship with others, and the work skill was a response to proceed their work. One of the two social nicety was "saying excuse me when you talk a colleague to consult". Another social nicety was "saying thank you when you left a colleague". One work skill was "Consulting with others." Antecedent stimuli and consequent stimuli of each target behaviors showed in Table 2-1. Participants were received each antecedent stimulus once per one session for each targeted behavior.

Data were collected on video recorder by trained observers. Observers recorded correct response if participants performed the targeted behavior correctly when they were received an antecedent stimulus. They recorded incorrect response if participants performed the targeted behavior incorrectly when they were received an antecedent stimulus.

Interobserver agreement data were collected by having a second observer simultaneously but independently record the target behavior during 50% of the sessions in all intervention. Reliability was calculated by dividing the total number of agreements by the number of

Table 2-1

Antecedent stimuli and consequence stimuli of targeted behaviors.

Participants	No.	Antecedent stimuli	Targeted behaviors	Consequence stimuli
Shohei, Rina, & Toshihiro	I	Being told to report a matter to a boss by a colleague.	Saying “excuse me” when you talk a boss to report something.	The boss replied, “sure.”
	II	The boss replied, “sure.”	Reporting on a matter to a boss.	The boss replied, “I understand”.
	III	The boss replied, “I understand”.	Saying “thank you” when you leave a boss.	The boss replied, “sure.”
Hiromi & Kayoko	I	Being told to consult with a colleague about a problem.	Saying ‘excuse me’ when you talk a colleague to consult.	The colleague replied, “sure.”
	II	The colleague replied, “sure.”	Explaining the contents of a consultation.	Finding a solution about a problem.
	III	Finding a solution about a problem.	Saying “thank you” when you leave a colleague.	The colleague replied, “sure.”

agreements plus disagreements and multiplying by 100%. Interobserver agreement was 95%.

Procedure

Pretest. 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 five participants was required to sit in a chair. Five trainers were present in the simulated workplace to measure participants’ responses and to provide prompts. Each trainer was assigned to observe and to interact with one of five 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.

Before the pretest, participants received an explanation of intervention from an experimenter. First, experimenter required participants to regard here as the workplace. In addition, an experimenter asked participants to assemble envelopes for 15 min, to do your best if someone is offered you something, and to rest whenever you feel tired or painful. Subsequently, an experimenter also informed that actors who performed a boss and colleagues also participated in intervention.

In the pretest, participants were required to assemble envelopes. Actors performed as a boss or colleagues presented an antecedent stimulus of a targeted behavior to participants. Concretely, Shohei, Rina, and Toshihiro was asked by a colleague to talk the boss to report something. Hiromi and Kayoko were asked by the boss to talk a colleague to consult about works. When the participant emitted some response, the actor presented consequence stimulus. Even if the participant performed the targeted behavior incorrectly, the actor did not present prompt and feedback. An antecedent stimulus was presented once or twice per 15 minutes.

Training. In the training, the procedure was basically same as the pretest. But there were two difference points compared to the pretest. First, unlike the pretest, trainers participated in the training. Before an actor presented an antecedent stimulus, the trainer handed over the textual prompt. Figure 2-1 showed the example of the textual prompt. The textual prompt included the way to perform the target behavior. For example, the textual prompt was written “1. saying excuse me when you talk a person to report something.” When the trainer handed over the textual prompt, the trainer asked participants to perform the targeted behavior while

1	When you approached others to report something, please say “excuse me.”
2	Please report what your colleague told you.
3	Please say “thank you” after you finished to report.

Figure 2-1. The example of the textual prompt.

looking at the textual prompt.

Posttest. The procedure of the posttest was same as the pretest.

Informed consent

Before the study commenced, the participants and their parents received an explanation of the purpose, procedure, and expected results verbally and in writing. In addition, we told them they could refuse to participate in the study if they felt any dissatisfaction. All the participants and their parents agreed and signed the informed consent form.

Result

Figure 2-2 and Table 2-1 shows the number of correct responses per trial. Shohei was never able to perform the correct responses on the social niceties in the pretest, but he correctly performed the response on the work skill. In training trials, the targeted behavior of the work skill was correctly emitted except for the fourth trial. Even with the textual prompt, he did not perform the targeted behaviors of the social niceties in the second trial. In the third training trial, he performed the correct response. However, he did not perform all of the targeted behaviors in the fourth trial that eliminated the textual prompt. Therefore, we relocated the textual prompt in the fifth and the sixth trials. Although the textual prompt was eliminated in the seventh trial, he did perform all of the targeted behaviors. As he did not say

“excuse me” when talking to a person to report something in the eighth trial, the textual prompt was relocated in the ninth trial. In the tenth trial and the posttest, he performed two targeted behaviors of “saying thank you when leaving a person” and “passing on a matter to a person.”

Rina was never able to perform the correct responses on the social niceties in the pretest, but she performed a work skill. As soon as the textual prompt was presented, she performed the correct responses. From the third trial that eliminated the textual prompt, she continuously performed all of targeted behaviors successfully. In the posttest, she showed a similar tendency. As an anecdotal report, parents reported that Rina got a job at a company after the eighth trial.

Toshihiro was never able to perform the correct responses on the social niceties in the pretest. On the other hand, he performed the correct response on the work skill. In the training trials, the targeted behavior for the vocational skill was emitted correctly except for in the sixth trial. When the textual prompt was introduced in the second trial, he performed the correct responses. However, he did not perform the targeted behaviors of the social niceties when the textual prompt was eliminated in the third trial. Therefore, the textual prompt was relocated in the fourth trial. He could perform the correct responses even when the textual prompt was eliminated from the fifth trial. In the posttest, he was able to perform all of the targeted behaviors.

Hiromi was never able to perform the correct responses on the social niceties in the pretest. However, she could perform a vocational skill. As soon as the textual prompt was

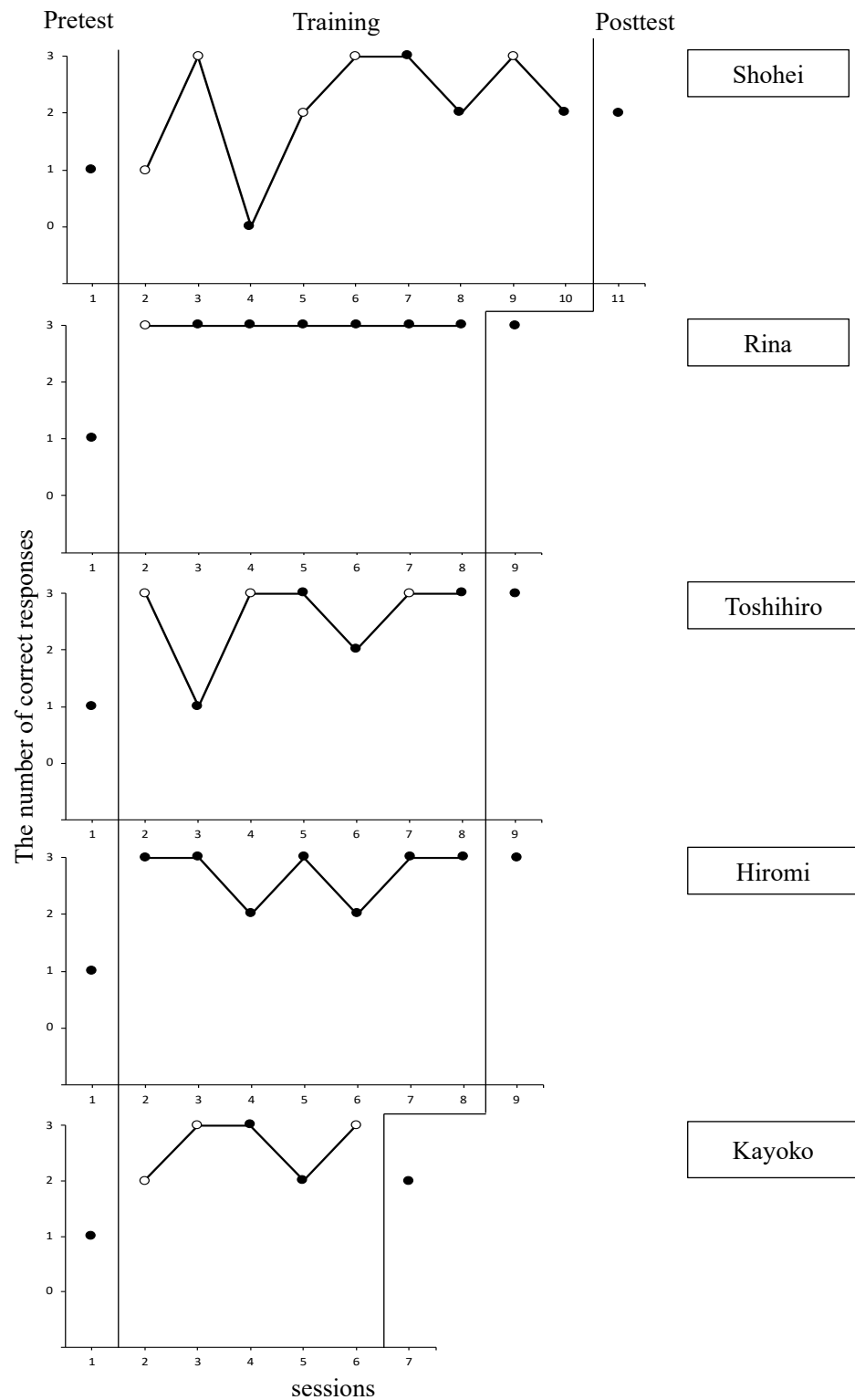


Figure 2-2. The number of correct responses. The black circle denotes the session with textual prompt. The white circle the session without textual prompt.

Table 2-2

The details of targeted behaviors in each session. The letter of “C” denotes a correct response and the letter of “I” denotes an incorrect response. The “I” “II”, and “III” correspond to that of Table 2-1.

		1	2	3	4	5	6	7	8	9	10	11
Shohei	I	I	I	C	I	I	C	C	I	C	I	I
	II	C	C	C	I	C	C	C	C	C	C	C
	III	I	I	C	I	C	C	C	C	C	C	C
Rina	I	I	C	C	C	C	C	C	C	C		
	II	C	C	C	C	C	C	C	C	C		
	III	I	C	C	C	C	C	C	C	C		
Toshihiro	I	I	C	I	C	C	C	C	C	C		
	II	C	C	C	C	C	I	C	C	C		
	III	I	C	I	C	C	C	C	C	C		
Hiromi	I	I	C	C	C	C	C	C	C	C		
	II	C	C	C	C	C	C	C	C	C		
	III	I	C	C	I	C	I	C	C	C		
Kayoko	I	I	C	C	C	C	C	C				
	II	C	C	C	C	C	C	C				
	III	I	I	C	C	I	C	I				

presented, she performed the correct responses. In the third trial that eliminated the textual prompt, she was still able to perform all of the targeted behaviors. However, she did not say “thank you” when leaving a person in the fourth trial. Therefore, the textual prompt was relocated in the fifth trial. Although she could perform all of the targeted behaviors in the fifth trial, she did not say “thank you” when leaving a person in the sixth trial that eliminated the textual prompt. Therefore, the textual prompt was relocated again in the seventh trial. After that, she could perform the correct responses in the seventh trial, and the textual prompt was eliminated in the eighth trial. Nevertheless, she could still perform all of targeted behaviors correctly in the eighth trial. In the posttest, she continued to perform targeted behaviors correctly. As an anecdotal report, parents reported that Hiromi got a job after the

ninth trial.

Kayoko was never able to perform the correct responses on the social niceties in the pretest. However, she could perform a work skill. Even when the textual prompt was located in the second trial, she performed only one social nicety of “saying excuse me when you talk to a person to consult” and a work skill. However, she was able to perform all of the targeted behaviors in the third trial. Even when the textual prompt was eliminated in the fourth trial, she continued to perform all of the targeted behaviors correctly. But, she did not perform one social nicety of “saying thank you when you leave to a colleague to consult” in the fifth trial. Therefore, the textual prompt was relocated in the sixth trial. She performed all of targeted behaviors again in the sixth trial. In the posttest, she performed one work skill and one social nicety of “saying excuse me when you talk to a person to consult,” but she did not perform one social nicety of “saying thank you when you left a person.”

Discussion

This study showed that using the textual prompt is useful for teaching these participants the acquisition of social niceties related to employment although there were some differences in effectiveness depending on the participant and the targeted behavior. The result extends prior studies that have used textual prompts. In particular, Rina, Toshihiro, and Hiromi were able to acquire all of the targeted behaviors in a small number of trials. The total number of sessions in this study for Rina, Toshihiro, and Hiromi was nine in contrast with Morgan et al. (1992) which required 45 sessions for the subjects to acquire the targeted social niceties.

Rina, Toshihiro, and Hiromi were able to perform the targeted behaviors

successfully immediately after the textual prompt were introduced despite the fact that their successful performing of the targeted behaviors was never reinforced. This may indicate that the textual prompt functioned as the rule (Galizio, 1979) and that acquired targeted behaviors were the rule-governed behavior. As the text described how to perform the targeted behaviors, participants could acquire a targeted behavior quickly by reading the description (Lang, Shogren, Mackalick, Rispoli, O'Reilly, Baker, & Regester, 2009). If participants are able to read letters, participants can immediately acquire social niceties by using the rule such as these textual prompts. In addition, this study's result showed that participants were able to acquire social niceties when the textual prompt were presented repeatedly even if they could not perform a social nicety by only one presentation of the textual prompt. Conversely, Shohei never acquired "saying excuse me when you talk to a person to report something," and Kayoko never acquired "saying thank you when you left a person."

There are possible two factors regarding unacquired skills. One is the matter of the transfer of stimulus control. It is possible that the discriminative stimulus of their unacquired targeted behaviors were not transferred from the texts of the textual prompt to the natural antecedent stimulus. In this study, the textual prompt was eliminated if participants performed correct responses for only one trial. The limited number of trials may be insufficient for the transfer of stimulus control. Future study is required to examine whether more trials promote the transfer of stimulus control for social niceties.

Another factor for the lack of acquiring behaviors is a matter of consequence stimuli. Unacquired behaviors of "saying excuse me when you talk to a person to report something" and "saying thank you when you left a person," were followed by light consequent stimuli. In

particular, both of the unacquired behaviors were followed a simply reply from a supervisor or colleague of “sure.” It is possible that the value of reinforcement of the consequence stimuli which is too simple was insufficient to promote acquisition of social niceties. On the other hand, Rina and Toshihiro did acquire “saying excuse me when you talk to a person to report something,” and Hiromi acquired “saying thank you when you left a person.” Differences in results between the participants may depend on their individual reinforcement history. But this study could not prove the relation between difference in result and individual reinforcement history. In the future, the reason why procedures are not effective should be examined when participants do not acquire targeted behaviors in training programs.

These results showed two implications. First, even if the BST was not introduced, some participants can acquire social niceties by using the textual prompt presented immediately before they perform social niceties. This may imply the rule is effective to teach social niceties, and the social niceties can be established as the rule-governed behavior. Second, however, the rule is not enough to teach social niceties to some individuals with ASD. Additional procedure is needed when individuals did not acquire social niceties. This study could not show the additional effective procedure.

Three limitations to the current study should be noted. First, the research design of this study was a pretest-training-posttest design due to time constraints. To prove the effectiveness of using visual prompts, more rigorous research designs such as a multiple baseline design (Kazdin & Kopel, 1975) should be used for future studies. Moreover, it is also an important research subject to develop a more efficient data collection method under such time constraints. Second, in this study, we only gathered episodes for measurement for

generalization. Future study was required to measure behavioral data in participant's daily life for more accurate confirmation of generalization. Third, all of participants in this study were not diagnosed with intellectual disorders. So, it is not clear whether the visual prompt used in this study is effective or not for persons with intellectual disorders. Many interventions have used the activity schedule that contained pictures about activities for persons with intellectual disorders (Oreilly, Sigahoos, Lancioni, Edrisinha, & Andrews, 2005; Spriggs, Gast, & Ayres, 2007). In contrast, this study used the visual prompt that contain only letters. Future study should consider whether the visual prompt used in this study is effective or not for persons with intellectual disorders.

While this study was able to show the effectiveness of using the textual stimulus to promote acquisition of social niceties, it was not able to successfully impart all of the targeted social niceties related employment to all of the participants, and prior studies of social niceties are limited. Therefore, continuous research will be required to develop more effective procedures.

This study showed the efficacy of the textual prompt to teach social niceties in the workplace to individuals with ASD. However, two participants did not acquire some targeted behavior. Therefore, the third study should examine the efficacy of an additional procedure. In particular, because the textual prompt is antecedent stimulus for social niceties, it is desirable to examine the efficacy of an intervention to consequence stimulus. So, I examine the efficacy of the performance feedback in the next study.

4. Study 3

Purpose

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.

Methods

Participants and Setting

Nine adolescents and young adults with ASD participated in this study. All participants were Japanese and lived in Japan. In addition, their primary language was Japanese. Table 3-1 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 were diagnosed with an intellectual disorder. 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 3-1
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 caregiver's report, 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 the interaction 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 were translated into English, all participants always spoke 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. The experimenter 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.

Material

Table 3-2 displays an example of the textual prompt sheet employed in this study translated into English. 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

Table 3-2
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.”	

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 trainers 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 3-1 were independently scored from video footage by a trained data collector. Although most data scored from video by trained data collector 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, authors 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 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 experimenter determined the total number of sessions in this study 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 tenth session for Shingo, and the eleventh 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 nine participants was required to sit in a chair. Before each session started, an experimenter read the following script 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 colleague 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 post-training. 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 experimenter.

Throughout this study, the boss and colleagues provided the same scripted responses to participant's 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 was translated from Japanese to English, and the original Japanese instruction was shown as the supplemental material.

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 3-1 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 3-3 illustrates how training scenarios differed from the work scenarios assessed during baseline and post-training.

After instructions, but before the actor called the participant to complete a specific

Table 3-3
Work Scenario Tasks and Materials per Condition

	Baseline / Post-Training	Training
Consulting with others	<ol style="list-style-type: none"> 1. Consulting about which person to hire while looking at two resumes with a photo 2. Consulting about where to entertain foreign customers while looking at a list of restaurants 3. Consulting about which mascot character to use while looking at character's photos 	<ol style="list-style-type: none"> 1. Consulting about which box to use for product packaging while looking an actual product 2. Consulting about when to set the date for the farewell party for retirees while looking at their schedule 3. Consulting about which air conditioner to install at the workplace while looking at a catalog of air conditioners
Delivering information	<ol style="list-style-type: none"> 1. Delivering the information that there was a call from a customer at 10AM 2. Delivering the information that the water pipe repair is confirmed form November 10 3. Delivering the information that the order for products required for the work was complete 	<ol style="list-style-type: none"> 1. Delivering the information that the visitor is expected to arrive at 14PM 2. Delivering the information that the meeting date was set for Friday afternoon 3. Delivering the information that the location of the next meeting is conference room 2
Borrowing tools	<ol style="list-style-type: none"> 1. Borrowing a punching tool to form holes in documents 2. Borrowing a stapler for binding documents 3. Borrowing a pencil sharpener to sharpen many pencils 	<ol style="list-style-type: none"> 1. Borrowing scissors to cut out illustrations from paper 2. Borrowing tape to mount a label on an envelope 3. Borrowing a red pen to mark typographical error of a paper

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.

Post-training. Post-training procedures were identical to baseline procedures, including a fixed order of work scenarios, absence of the textual prompt sheets, and withholding of performance feedback.

Informed consent

Before the study commenced, the participants and their parents received an

explanation of the purpose, procedure, and expected results verbally and in writing. In addition, we told them they could refuse to participate in the study if they felt any dissatisfaction. All the participants and their parents agreed and signed the informed consent form.

Results

Figure 3-1 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 post-training. 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 post-training. Although the percentage of correct “Do you 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 post-

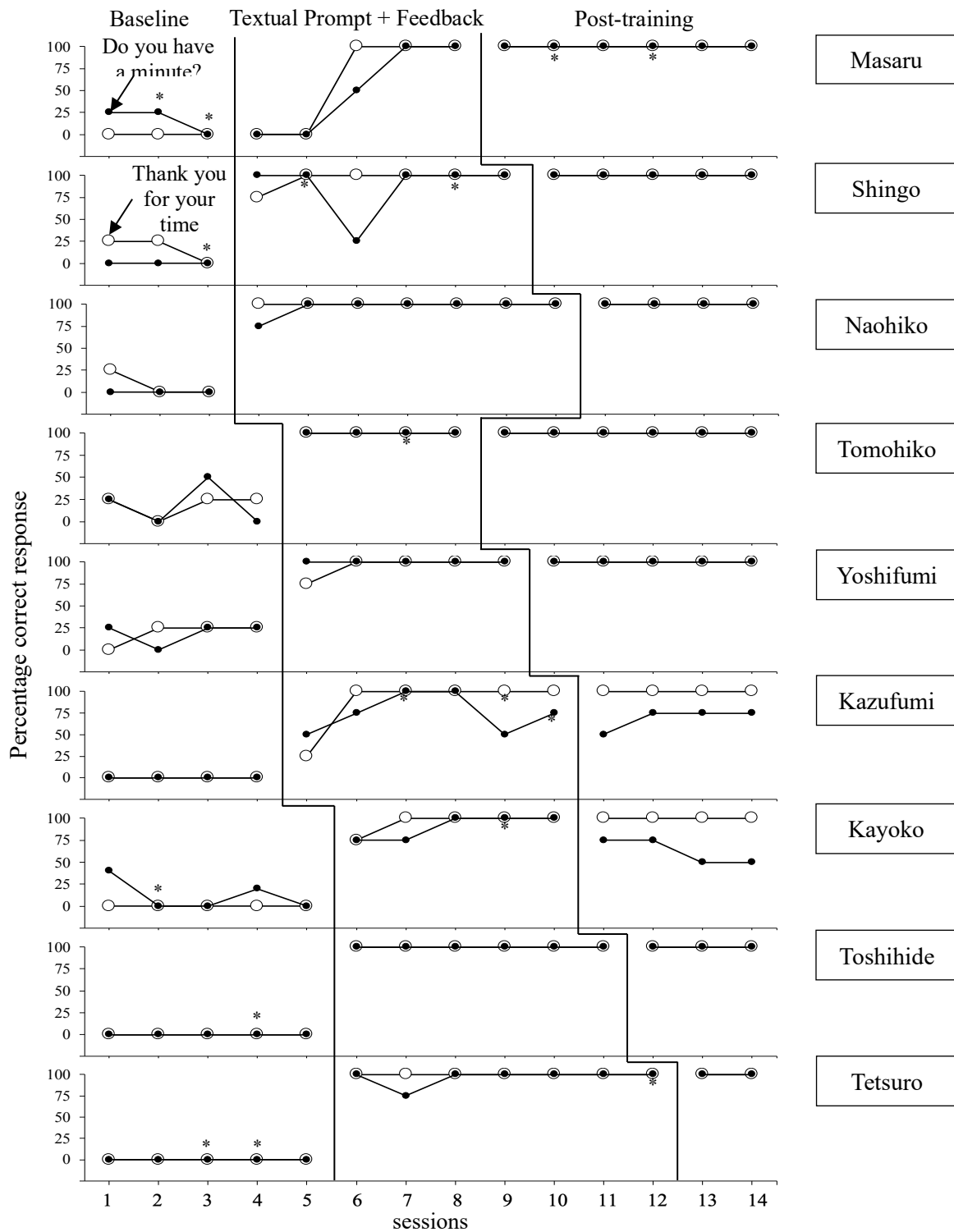


Figure 3-1. Percentage correct responses of each social nicety. The asterisk denotes sessions in which the experimenter interrupted a participant's attempt to prompt the social niceties of another participant or to provide feedback on the performance of another participant

training. 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 actors presented opportunities for social niceties, he responded by speaking fast and moving quickly. He redoing his table work in session six might have competed with his attending or other responses to the training trials.

In post-training, 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 post-training, “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 post-training 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 two 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 participant's 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 Cesar 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 post-training, 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 post-training and because bosses or colleagues non-differentially 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 post-training. 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 require a model to perform the assigned task) when the participant was required to emit targeted social skill and social nicety in 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 in Grob et al. written the responses of each targeted social skill 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 were 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, filling papers, and sorting objects) before selecting target behaviors.

As the third limitation, 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.

From the three studies, the intervention including the textual prompt and the performance feedback is effective to teach social niceties for almost individuals with ASD. However, I have used the textual prompt consisting only of letters. Because some individuals with ASD have difficulty responding to text stimuli, the textual prompt did not show the efficacy for such individuals. Therefore, the fourth study examines the efficacy of the textual prompt adjusted for an individual who did not acquire social niceties when presenting the textual prompt consisting only of letters.

5. Study 4

Purpose

The purpose of this study is to examine the effectiveness of the BST with the textual plus photo prompt for the acquisition of social niceties related to employment for an adolescent with ASD who did not acquire target behaviors by using the textual prompt and performance feedback.

Method

Participant

A 21-year-old man who has been diagnosed with ASD was participated in this study. He has not shown any intelligence delay. He could perform simple tasks according to instructions. But he has never worked in either full-time or part-time jobs. He demonstrated great eagerness to find employment after graduating from college. For this reason, his parents introduced this study to him, with which he wished to participate voluntarily.

The participant could talk with others, and he showed smile when someone talked to him. However, he never talked to others spontaneously. When the participant spoke to others, he told them about his business briefly. Although he could write letters, his handwriting was too messy to read. However, he could read his own handwriting.

Setting

All sessions in the pre-baseline, training 1, training 2, and post-baseline were conducted in a large room measuring 16 m by 7.5 m. Four narrow tables were placed face to face in this room. Two chairs were placed at each table. On each table, unassembled envelopes, a manual with a procedure for assembling envelopes, a stick paste, three pencils,

an eraser, a pair of scissors, and a memo pad were placed. This setting was made similar to typical workplaces in Japan.

The behavioral skills training (BST) was conducted in a different room measuring 7.7 m by 4 m. A narrow table, two chairs, and a whiteboard were placed in this room.

Three actors, a trainer, and an observer participated in all sessions. One actor played as a boss and two actors played as colleagues in the simulation setting. The trainer provided participant to a textual prompt, a textual plus photo prompt, and performance feedback in training 1 and training 2. The observer recorded responses by participant.

Material

In this study, participants were presented the textual prompt. Figure 4-1 is an example of a textual prompt. The textual prompt showed the way of performing the target behavior. The size of prompt was 15cm × 21cm, and the type of font was Gothic, and the size of font was 12. In addition, we used the textual plus photo prompt. Figure 4-2 is an example of a textual plus photo prompt. The textual plus photo prompt was used in only training 2. The textual plus photo prompt was made for each scenario. Three photos were placed vertically in the prompt. The above photo corresponded to first targeted behavior, the middle photo corresponded to second targeted behavior, the bottom photo corresponded to third targeted behavior. In each photo, people performing each targeted behavior were pictured. In the case of “exchanging business cards,” for “rising from his chair when someone presents a business card to him,” the prompt showed a drawing of a man who stood up and a woman who stood close to a man. For “presenting a business card positioned with readable letters,” it showed both a man’s and woman’s business card positioned with readable

Writing a memo.

① writing a memo about an instruction to do the job.
② repeating the content of an instruction.
③ working according to what is written in a memo.

Figure 4-1. An example of the textual prompt for “writing a memo” used in training 1.

letters. Finally, for “saying ‘I’m A. I’m looking forward to working with you’ when he exchanges business cards,” it showed the face of a man and the message “I’m A. I’m looking forward to working with you” in a balloon.

The textual prompt and the textual plus photo prompt included a blank square next to the name of the targeted behavior. The blank square was used to provide participants feedback.

Targeted behaviors

Three different scenarios related to employment were used to teach the participant target behaviors. These scenarios were “exchanging business cards,” “consulting with a colleague about business,” and “writing a memo about a job instruction and working according to what is written in a memo.” Each scenario included three target behaviors. Table 4-1 shows the target behaviors, antecedent stimuli, and consequence stimuli for each scenario. The target behaviors for “exchanging business cards” were “rising from his chair when someone presents a business card to him,” “presenting a business card positioned with readable letters,” and “saying ‘I’m A. I’m looking forward to working with you’ when he exchanges business cards.” The target behaviors for “consulting with a colleague” were

Exchanging a business cards

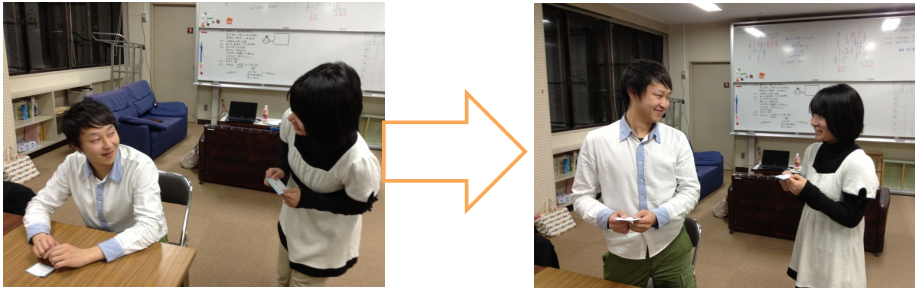
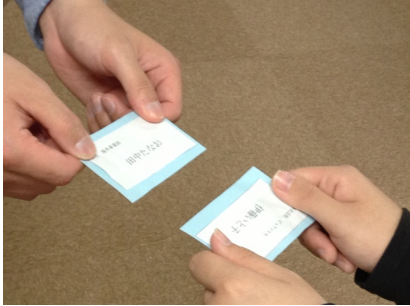

	
① If someone presents a business card, please rising from your chair.	
	
② Please present a business card positioned with readable letters.	
<div data-bbox="245 1161 711 1472" data-label="Text"><p>I'm (the participant's name). I'm looking forward to working with you.</p></div> 	
③ Please saying "I'm A. I'm looking forward to working with you."	

Figure 4-2. An example of the textual plus photo prompt for “exchanging business cards” used in training 2.

Table 4-1

Antecedent stimuli and target behaviors and consequence stimuli in each scenario.

Scenario	No.	Antecedent stimuli	Target behaviors	Consequence stimuli
Exchanging business cards	I	The visitor Presented a business card to the participant.	Rising from the participant's chair	The visitor said "I'm (visitor's name). May I give you my business card?"
	II	The visitor said "I'm (visitor's name). May I give you my business card?"	Presenting a business card with positioning readable letters.	The visitor held out a business card.
	III	The visitor held out a business card.	Saying 'I'm A. I'm looking forward to working with you' when he exchanged business cards.	The visitor said "I'm pleased to meet with you."
Consulting with a colleague	I	The participant approached a colleague.	Saying, "excuse me".	A colleague replied, "sure."
	II	A colleague replied, "sure."	Explaining the contents of a consultation.	The participant consulted with a colleague.
	III	The participant and a colleague finished the consultation.	Saying 'thank you' when the participant left a colleague.	A colleague replied, "sure."
Writing a memo	I	A boss instructed a complex task.	Writing a memo about an instruction to do the task.	The participant completed a memo.
	II	The participant completed a memo.	Repeating a content of an instruction	A boss replied, "OK."
	III	A boss replied, "OK."	Working according to what is written in a memo.	The participant accomplished a task.

"saying 'excuse me' when you wish to consult a colleague," "explaining the contents of a consultation," and "saying 'thank you' when you leave a colleague." The target behaviors for "writing a memo" were "writing a memo about a job instruction," "repeating the content of an instruction," and "working according to what is written in a memo." The Observer recorded whether the participant emitted targeted behavior correctly. If the participant emitted the targeted behavior when the actor presented the antecedent stimulus, the observer recorded it as correct response. If the participant emitted unrelated responses or did not emit any response for five seconds after the actor presented the antecedent stimulus, the observer recorded it as incorrect response.

Design

This study was conducted for five months. One session took about 15 minutes, and one or two sessions were conducted per month.

Figure 4-3 shows the research design of this study. This study used the ABCA design and ABA design. In the baseline (A), we measured the number of correct responses before the training was introduced. In training 1 (B), the participant was presented with a textual prompt and a performance feedback. If the participant did not correctly perform even one of the three target behaviors in a scenario during training 1, behavioral skills training (BST) was introduced to examine the effects of the BST. In this study, the participant was received the BST for the two scenarios of “consulting a person” and “writing a memo.” After the BST, the training 1 was reintroduced. If the number of correct responses increased in the training 1, the BST was considered effective. In a scenario of “exchanging business cards,” training 2 (C) was introduced. In training 2, the prompt stimulus were changed from a textual prompt to a textual plus photo prompt. In addition, the textual plus photo prompt was introduced if the BST did not display any effectiveness in “consulting a person” and “writing a memo.” Following this change, if the number of correct responses increased, the change of prompt stimuli was considered effective. Finally, in the post-training (D), the participant was provided the same procedure as in the baseline. If the participant demonstrated the target behavior in the post-training, the stimulus control was considered to transfer from each prompt stimulus to a stimulus in natural setting.

Procedure

General procedure in a simulation setting. All interactions between the participants and the trainer and the actor were conducted in Japanese throughout all sessions.

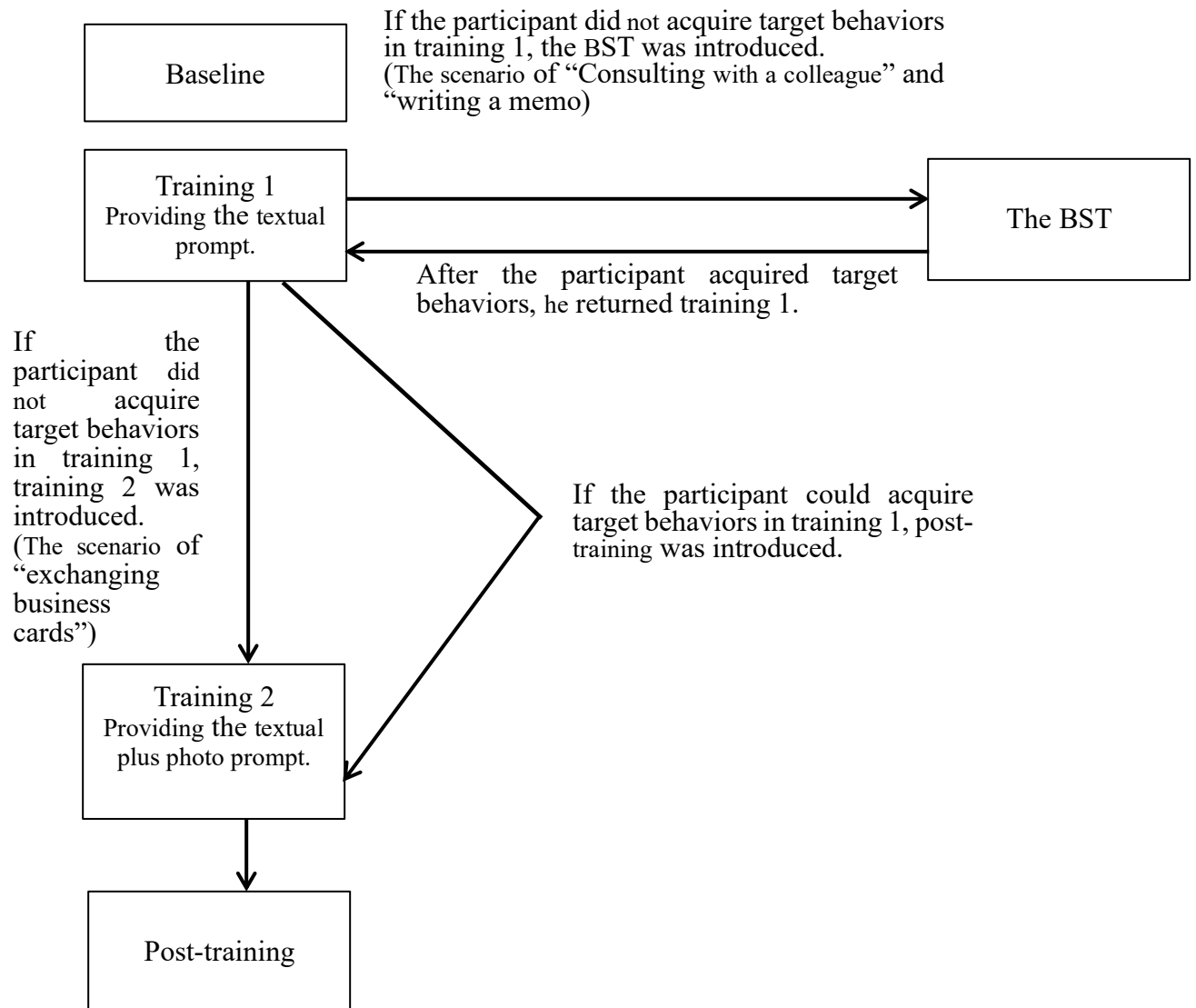


Figure 4-3. Research design of this study

In addition, all sessions were conducted in Japan. The participant was required to sit in a chair. A trainer was present in the simulated workplace to measure participants' responses and to provide prompts and feedback. 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.

Before the intervention started, the participant was given an explanation by an experimenter. First, the participant was asked to consider the training setting as a real workplace. Second, he was asked to assemble the envelopes for 15 minutes, and to perform to the best of his ability when someone came to communicate. Third, if the participant became tired or experienced any psychological suffering, they were allowed to rest at any time.

The actors who played the role of a boss or colleagues presented an antecedent stimulus of the target behavior while the participant assembled envelopes. For example, the boss asked the participant to consult with his colleague about business. When the participant made a response, the boss presented a consequence stimulus. The antecedent stimulus of each target behavior was presented once during one session. After all antecedent stimuli of three targeted behaviors were presented, the session ended.

Baseline. During the baseline, the trainer never presented prompts and performance feedback regardless of the participant performed a correct response or not.

Training 1. Before an actor presented an antecedent stimulus, a trainer showed the textual prompt. The trainer also told the participant to perform the target behaviors while referring to the textual prompt.

When the participant performed the target behaviors, the trainer gave him the performance feedback. If the participant demonstrated a correct response, the trainer filled the square with a circle. If the participant demonstrated an incorrect response, the trainer filled

the square with a triangle and explained to the participant how to perform the target behavior while handing over the textual prompt.

If the participant correctly performed all targeted behaviors in one scenario, the trainer did not present the textual prompt of the scenario in the next session, in order to examine the stimulus transfer from the textual prompt to stimuli in a natural setting.

Training 2. The training 2 was introduced if the participant did not acquire the target behaviors of training 1 or the BST. The basic procedure of training 2 was similar to that of training 1. However, the textual plus photo prompt was used in training 2.

Post-training. The procedure of the post-baseline was the same as that of the baseline.

BST. If the participant did not acquire the target behaviors in training 1, the BST was introduced. The BST included an instruction, a modeling, a role-play, and a feedback. In the instruction, a trainer presented a worksheet to the participant. The worksheet showed three important points. The first important point described the situation required to perform the target behavior. The second important point described the way to perform the target behavior. The third important point described the merit obtained through performing the target behavior. In addition, a trainer explained about the worksheet to the participant. In the modeling, the trainer showed a model of the targeted behavior. In the role-play and feedback, the trainers required the participant to perform according to the model. If the participant correctly performed the target behavior, the trainer praised him. If the participant performed the target behavior incorrectly, the trainer verbally explained his good points and improvements. The BST continued until the participant could correctly perform target

behaviors.

The BST did not conduct the scenario of "exchanging the business cards" due to time constraints. In brief, we conducted the training 2 to the scenario of "exchanging the business cards" without the BST.

Informed consent

Before the study commenced, the participants and their parents received an explanation of the purpose, procedure, and expected results verbally and in writing. In addition, we told them they could refuse to participate in the study if they felt any dissatisfaction. All the participants and their parents agreed and signed the informed consent form.

Result

Figure 4-4 and Table 4-2 showed the number of correct responses in each trial. In the baseline for "exchanging business cards," the participant never performed the target behaviors. When training 1 was introduced, the participant performed one or two of the target behaviors. However, he did not perform all target behaviors in the seventh trial even though he was presented the textual prompt. Therefore, training 2 was introduced in the eighth trial. After the textual and photo prompt was introduced, the participant immediately performed all target behaviors. In the post-training, he performed two of the target behaviors. In the baseline for "consulting with a colleague," the participant never performed the target behaviors. In trial 4, he also did not perform all the target behaviors even though the training 1 was introduced. Although he performed one target behavior correctly in trial 5, he did not perform the other two target behaviors. Concretely, he left the colleague while saying

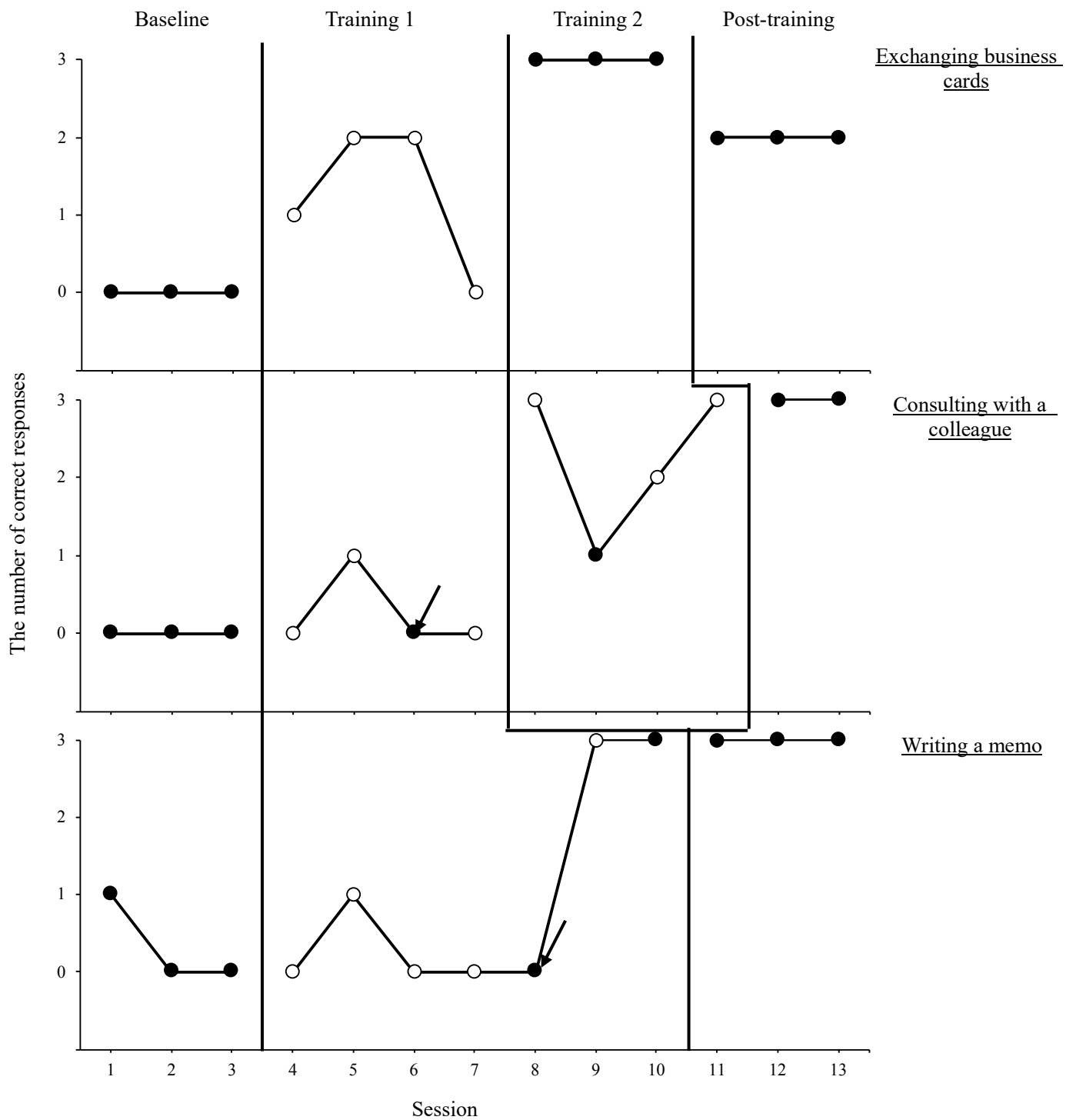


Figure 4-4. The number of correct responses in each social nicety. The arrows denote sessions that conducted the BST.

Table 4-2

The details of targeted behaviors in each session. The letter of “C” denotes a correct response and the letter of “I” denotes an incorrect response. The “I” “II”, and “III” correspond to that of Table 4-1.

Scenario	No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Exchanging business cards	I	I	I	I	C	C	C	I	C	C	C	C	C	C
	II	I	I	I	I	I	I	I	C	C	C	I	I	I
	III	I	I	I	I	C	C	I	C	C	C	C	C	C
Consulting with colleague	I	I	I	I	I	C	I	I	C	C	I	C	C	C
	II	I	I	I	I	I	I	I	C	I	C	C	C	C
	III	I	I	I	I	I	I	I	C	I	C	C	C	C
Writing memo	I	I	I	I	I	C	I	I	I	C	C	C	C	C
	II	C	I	I	I	I	I	I	I	C	C	C	C	C
	III	I	I	I	I	I	I	I	I	C	C	C	C	C

“thank you” after he muttered something to himself near the colleague without consulting him. Therefore, the BST was introduced. However, the participant did not perform the target behavior even after the BST. Therefore, training 2 was introduced. After the textual and photo prompt was introduced, he performed the target behaviors immediately. The number of correct responses decreased in the ninth trial, but they gradually increased from the 10th trial. In the post-training, the participant performed correct responses.

In the baseline for “writing a memo,” the participant performed only one target behavior, “repeating the content of an instruction.” But he never performed all the target behaviors in the second and third trials. Even though the training 1 was introduced, the participant did not perform any target behaviors, except in the fifth trial. Therefore, the BST was introduced. However, the participant did not perform the target behaviors in the eighth trial without the textual prompt. In the ninth trial with the textual prompt, he could perform the target behaviors. Subsequently, he continued to perform the target behaviors correctly

even when the textual prompt was removed. In the post-training, he performed all target behaviors.

Discussion

In this study, the participant acquired the target behaviors of “exchanging business cards” and “consulting with a colleague” by using the textual and photo prompt. In contrast, using only the textual prompt was ineffective for acquiring social niceties related to employment in this study. This result shows that suitable prompts for each participant need to produce a strong effect. In addition, the textual and photo prompt used in the training 2 was effective for “exchanging business cards” even though the BST was not introduced. This result indicates that the BST with the textual and photo prompt is sufficient to acquire social skills for “exchanging business cards,” even if the BST is not introduced. Furthermore, this result supports and expands the work of Bergstrom et al. (2012), which showed the effects of the BST in a simulation setting with prompts.

This study shows that the effects of the BST differ depending on the target behavior. In brief, the BST was effective for “writing a memo,” but ineffective for “consulting with a colleague.” For “writing a memo,” the participant did not perform the target behaviors even though BST was introduced. The participant could perform the target behaviors only after reintroduction of the textual prompt. It is possible that the BST contributed to the establishment of the relation between stimuli in the textual prompt and stimuli in a simulation setting, or that it contributed to his own behaviors rather than to the acquired target behaviors. In both cases, this may denote that the BST functions as a premise for the textual prompt to show effect. Spence (2003) stated that behavioral SST plays an important role in procedures

consisting of multiple interventions. This study may have revealed some of those important roles.

However, the BST was ineffective for “consulting with a colleague.” There is a possible explanation. It was difficult to respond to audible stimuli for the participant. Concretely, for “consulting with a colleague,” the participant had to perform target behaviors depending only on audible stimuli, in contrast to “writing a memo.” To solve this problem, using a memo may be effective. If the participant acquired the target behaviors of “writing a memo” before the training for “consulting with a colleague” was started, the participant may be able to use a memo to perform the target behaviors of "consulting with a colleague." Future research should examine that the influence of targeted behaviors of each scenario acquired earlier on the acquisition later targeted behaviors.

This study has a limitation. This study used the textual prompt for all participants before they received the BST and the textual plus photo prompt. In brief, the effectiveness of the BST and the textual plus photo prompt may have supposed the introduction of the textual prompt. Future research should include a condition introduced the textual plus photo prompt or the BST before the textual prompt is introduced to examine the influence of textual plus photo prompt and the BST.

The results of this study showed the effectiveness of the BST using appropriate prompts for the participant. This result means that the changing interventions may be effective for individuals with ASD not acquired by predetermined prompts. However, it was unclear which intervention have effectiveness to which social amenity because the participant showed different result in each social amenity. Future study is required to examine more

participants and social niceties to prove the effectiveness of the BST and the prompts.

This study showed the textual plus photo prompt can promote to acquire social niceties even if the participant did not acquire when he or she was received some intervention. Although I developed the intervention which can acquire almost all individuals with ASD, the resource-efficiency and time-efficiency should be examined. Fewer components of the intervention are more resource-efficiency and time-efficiency. Although the second study examined the efficacy of the textual prompt, any studies have not examined the efficacy of the performance feedback. Therefore, the fifth study compared the efficacy of the textual prompt and the efficacy of performance feedback.

6. Study 5

Purpose

My fourth study combined the textual prompt and performance feedback. However, if social niceties are able to be established as the rule-governed behavior, individuals with ASD may not need performance feedback to acquire social niceties. In addition, if social amenities are able to be established by introducing feedback only, individuals with ASD may not need the textual prompt. Therefore, this study examined the efficacy of textual prompt alone and the efficacy of performance feedback alone. For this purpose, we divided 10 individuals with ASD into two groups, and we introduced textual prompts to one group and performance feedback to the other group.

Methods

Participants and Setting

Ten adolescents and young adults with ASD participated in this study. Table 5-1 describes the background information for each participant. Of the ten participants, eight were males and two were female. Their ages ranged from 15 to 25, with an average of 18.6 years. All the participants had been diagnosed with ASD before they participated in this study. All of the participants had not been diagnosed with cognitive impairment. In order to recruit the participants, investigators placed an advertisement for their research on workplace social skills on the website of a nonprofit organization that was run by parents of people with ASD. We required that participants satisfied the following four conditions. First, they were required to be diagnosed with 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

Table 5-1
Participant Demographic Information

Name	Male/female	Age	Status
Kazutaka	Male	21	College student
Chihiro	Male	16	High school student
Satoshi	Male	16	High school student
Takao	Male	15	High school student
Len	Male	25	Part-time employment
Yoshitomo	Male	18	High school student
Joichi	Male	18	High school student
Hiromu	Female	22	Vocational school student
Mebae	Female	17	High school student
Naohide	Male	18	Vocational school student

readiness for participants to perform simple tasks such as assembling envelopes or typing on a computer for more than 30 min.

All participants could talk with others for more than 10 minutes. They emitted mand when he or she did not have the tools that need for work or was presented unknown stimuli. In addition, they emitted tact on everyday stimuli such as animals, food, and vehicles. They could talk about their past events and what want to do in the future. Furthermore, they could answer the questions. However, they always talked to the other without saying "excuse me" or "hi." In addition, they always left the other without saying polite statements such as "thank you" when they have finished saying what want to say in a conversation.

Participants were divided two groups. Each group was consisted of five participants. Kazutaka, Chihiro, Satoshi, Takao, and Len belonged the textual prompt group (TP group). Yoshitomo, Joichi, Hiromu, Mebae, and Naohide belonged the performance feedback group

(PF group). We consisted the TP group to examine the efficacy of textual prompt alone. So, we introduced only textual prompt to the TP group. In addition, we consisted the PF group to examine the efficacy of performance feedback alone. So, we introduced only performance feedback to the PF group.

All the sessions in this study were conducted in a 16 m × 7.5 m private room in a public facility. Only participants, actors, trainers, and first author existed in the room throughout this study. Each session continued for about 15 minutes. Two to three sessions were conducted per visit and visits took place on 1-2 days every other week. The room included four long desks, and these desks were placed face to face. Each desk had two to three chairs. Investigators placed one long desk away from the other desks to serve as the boss's desk. Bunch of newspapers, a manual written about how to make boxes by folding newspapers, a glue, a pencil, an eraser, scissors, a memo were placed on each desk for the participant. We selected the work of folding newspapers to make boxes as the work of this study because, based on the report by parents, it was thought that participants could perform in such a simple task. Throughout this study, an actor playing the boss, two actors playing colleagues, trainers for presenting textual prompt or performance feedback were existed in the room.

Material

Table 5-2 shows an example of the textual prompt sheet for the TP group. We made 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 was written behavior chain of each scenario and included descriptions on how

Table 5-2
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.”

to use social niceties. Table 5-3 shows an example of the performance feedback sheet for the PF group. The performance feedback sheet was same as the textual prompt sheet except for the sheet included a blank square next to notations of each response in the scenario. The size of both sheets 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 decided polite interaction skills related to work as correct response because such polite responses are

Table 5-3

The performance feedback 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.”	

very important for working with others in Japan. The first social nicety was the initiating statement of saying “Do you have a minute?” to initiate the interaction before making additional requests. We recorded it as a correct response when the participant responded within 5 seconds of approaching the actor within 1.5m and responded before the participant emitted additional remarks. If the participant emitted the social nicety after 5 seconds of approaching the actor and if he or she emitted it too far away from the actor, we recorded it as an incorrect response. In addition, if the participant did not approach the actor or made no remark, we recorded it as 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, we recorded an incorrect response. The second social nicety was the closing statement of saying “thank you for your time” for closing the interaction. We recorded it as 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).

The response with functions similar to the above social niceties was also recorded as a correct response. For example, the remarks of "do you have a little time?" and "is it time to talk now?" were seemed to have same function with "do you have a minute?" In addition, “Thank you for the help” and “I’m sorry I interrupted you” were considered functionally equivalent to “Thank you for your time.” The impolite response such as knocking on the boss's desk and impolite statement such as "stop your work and listen to me" was recorded as an incorrect response.

To provide feedback to the PF group of participants, trainers recorded a circle for correct responses or a triangle for incorrect responses on their own copy of the performance feedback sheet 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. In addition, figure 5-1 displays data recorded by trainers. To collect interobserver agreement, one trained observer independently recorded at the corner of the room where this study was conducted

during each session. The observer independently scored the dependent variables during a subset of response opportunities from 53% across all phases. For each of the sessions sampled for interobserver agreement (IOA), investigators randomly selected two opportunities to score one initiation and its closing response per participant. Because the number of participants was ten, the total number of opportunities assessed for IOA was 20 per session. In addition, the number of opportunities for each social nicety was same number per session. So, observers collected data for 160 opportunities. Investigators defined an agreement as the trainer and the observer independently scoring the same performance on the same opportunity. Interobserver agreement was calculated by dividing the total number of agreements by the number of agreements plus disagreements and multiplying that by 100%. The mean interobserver agreement for "do you have a minute?" was 98%. The mean IOA results for each participant were: for Kazutaka, 99%; for Chihiro, 97%; for Satoshi, 100%; for Takao, 99%; for Len, 98%; for Yoshitomi, 96%; for Joichi, 100%; for Hiromu, 97%; for Mebae, 96%; for Naohide, 97%. The mean IOA for "thank you for your time" was 98%. The mean IOA results for each participant were: for Kazutaka, 100%; for Chihiro, 98%; for Satoshi, 100%; for Takao, 95%; for Len, 100%; for Yoshitomi, 97%; for Joichi, 98%; for Hiromu, 98%; for Mebae, 98%; for Naohide, 95%.

Procedure

This study employed a multiple baseline design across participants to examine the efficacy of textual prompts or performance feedback on acquisition of social niceties in a simulated workplace. Investigators determined the total number of sessions in this study before commencing data collection. Therefore, the criterion for the transition from one

phase to next phase was predetermined for each group of two or one participants. The number of sessions in the baseline for Kazutaka, Chihiro, Yoshitomo, Joichi was three and the number of sessions in the post-training was five. The number of sessions of the baseline and the post-training for Satoshi and Hiromu was four. The number of sessions in the baseline for Takao, Len, Mebae, Naohide was five and the number of sessions in the post-training was three.

General Procedure. Participants attended this study in the same room simultaneously for each group. In brief, the TP group and the PF group were received the intervention in separate rooms. However, the procedures presented to the two groups were the same except during the training phase. When a session started, participants were required to sit a chair. After all participants sat a chair, the actor playing the boss read the follow script: *Please imagine that you are here at a real workplace. Also, please look over the desk. There is a newspaper, a manual, glue, a pencil, an eraser, a pair of scissors, and a memo pad. Please tell me if anything is missing. You will make boxes by folding newspapers from now. Please read the manual to make boxes. If you do not understand the manual, please ask nearby trainer. The work continued for about 20 minutes. When the work is over, I will tell you “the work is over!” Some people besides you will participate in the work. The actors play as your boss or your colleagues. They occasionally ask you to do some work. When you ask to do some work, please do your best. Finally, please tell nearby trainer if you feel tired or uncomfortable. You can rest anytime. The explanation is over. Please start the work.*

Participants and actors playing colleagues sat facing each other across the long desk. The actor playing the boss sat away from the participants and colleagues. The actor who

played the role of the boss and the actors who played colleague differed between sessions. All participants and colleagues made a box by folding newspapers properly. If a participant stopped making a box 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 the textual prompts or the performance feedback. One trainer was assigned to record one participant or two participants. The trainer assignment was varied across sessions. Throughout all sessions, the trainer usually stood outside a participant's sight so that the participant could not see the record by each trainer. However, the trainer moved to enter the participant's sight only when the trainer provided textual prompt or performance feedback.

The experimenter assessed social niceties in three different work scenarios in this study. Each work scenario included 1 or 2 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. Although materials used in each session were varied, all materials and scenarios used in the baseline were same as the materials and scenarios used in the post-training. Each work scenario occurred once per session, and the investigator measured initial and closing responses four times through three scenarios. The consult with others scenario included two trials of initiating and two trials of closing, the deliver information to others scenario included one trial of initiating and one trial of closing, and the borrow tools to use for work scenario included one trial of initiating and one trial of closing responses for a total of four trials per social nicety in each session. In the consulting with

others scenario, the boss passed the participant a list written some name of goods, and asked to consult with a colleague to choose one of these goods. 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.

Examples included cutting out illustrations with a pair of scissors or 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 same responses to participant's correct response and incorrect response. Even if the participant emitted an incorrect response, the boss and colleagues did not stop the interaction with the participant. Investigators provided the actors with instructions for each scenario before the session started. The actor's instruction for the borrowing tools scenario was follows:

- 1. Please say "(the name of participant), please come here."*
- 2. When the participant came, please ask the participant for a work that requires specific tools. 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 teach the name of 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 asked the name of colleague who has the tool, please teach it again.*

3. *If the participant says the statement such as “I will do the work now” or “thank you for trusting me,” please respond “OK” without a smile.*

If the participant did not react to the work or went somewhere before he or she performed the work perfectly, the trainer immediately provided the prompt to perform the work rather than the boss and colleagues provided the prompt. 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 who belonged each group attended in the same room, it was possible that the participants influenced 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 prompts by the trainers was 0.3 per session (range, 0-1).

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. In the baseline, the trainer recorded participant’s responses, but did not provide textual prompt and performance feedback. Each participant experienced the same order of work scenarios with the same materials; however, the order of works scenarios varied between participants. For example, the order of work scenarios for Kazutaka was to consult with others, to deliver information, and to borrow tools; the order of work scenarios for Yoshitomo was to deliver information, to borrow tools, and to consult with others.

Training (T.P. group). The instruction to begin the training session was almost

same as the baseline. However, the following text was added for TP group:

Before you begin the work scenario, the trainer will provide you a sheet. The sheet tells you what you need to do. Please work with referring the sheet when the boss asks you some work. After the work will finish, the trainer will go to you to pick up the sheet.

Unlike the baseline, the order of the work scenario for each participant and a specific tool and an instruction used each work scenario were differed per session. Table 5-4 illustrates how training scenarios differed from the work scenarios assessed during baseline and post-training.

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 recorded participant’s responses, but did not provide any feedback whether the response was correct or incorrect. When the participant finished the work scenario, the trainer immediately picked up the textual prompt.

Training (PF group). The instruction to begin the training session was almost same as the baseline. However, the following text was added for PF group: *After you finish the work scenario, the trainer will provide you a sheet. On the sheet, the quality of your work is written. If the circle was written in the sheet, it means your work is very good. If a triangle is written, improvement is necessary for that scenario. When you received the sheet, please look*

Table 5-4
Work Scenario Tasks and Materials per Condition

	Baseline / Post-Training	Training
Consulting with a colleague	4. Consulting about which person to hire while looking at two resumes with a photo	4. Consulting about which box to use for product packaging while looking at an actual product
	5. Consulting about which camera to buy for our company while looking at a catalog	5. Consulting about where to go on a company trip while looking at travel brochures
	6. Consulting about which mascot character to use while looking at character's photos	6. Consulting about which air conditioner to install at the workplace while looking at a catalog of air conditioners
Delivering information	4. Delivering the information that there was a call from a customer at 10AM	4. Delivering the information that the visitor is expected to arrive at 14PM
	5. Delivering the information that the water pipe repair is confirmed from November 10	5. Delivering the information that the meeting date was set for Friday afternoon
	6. Delivering the information that the colleague Taro is absent today	6. Delivering the information that the location of the next meeting is conference room 2
Borrowing tools	4. Borrowing a punching tool to form holes in documents	4. Borrowing scissors to cut out illustrations from paper
	5. Borrowing a stapler for binding documents	5. Borrowing tape to mount a label on an envelope
	6. Borrowing a pencil sharpener to sharpen many pencils	6. Borrowing a red pen to mark typographical error of a paper

at the sheet.

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 showed an incorrect response, the trainer provided the performance feedback sheet and the verbal corrective feedback to explain how to perform the targeted social nicety. The performance feedback sheet scored by the trainer was provided within 10 seconds after the interaction between the participant and the actor finished.

Post-training. The procedure of post-training was same as the baseline and the order in which the work scenarios were presented was also same as the baseline. In addition, the textual prompts and performance feedback were not presented.

Informed consent

Before the study commenced, the participants and their parents received an explanation of the purpose, procedure, and expected results verbally and in writing. In addition, we told them they could refuse to participate in the study if they felt any dissatisfaction. All the participants and their parents agreed and signed the informed consent form.

Results

Figure 5-1 showed the percentage of correct response for participants in the TP group. In the baseline, participants besides Takao did not emit social niceties. The percentage of correct response for Takao was 25% in the third session and the fifth session. The mean percentage of correct response for the initiating social nicety and the closing social nicety was

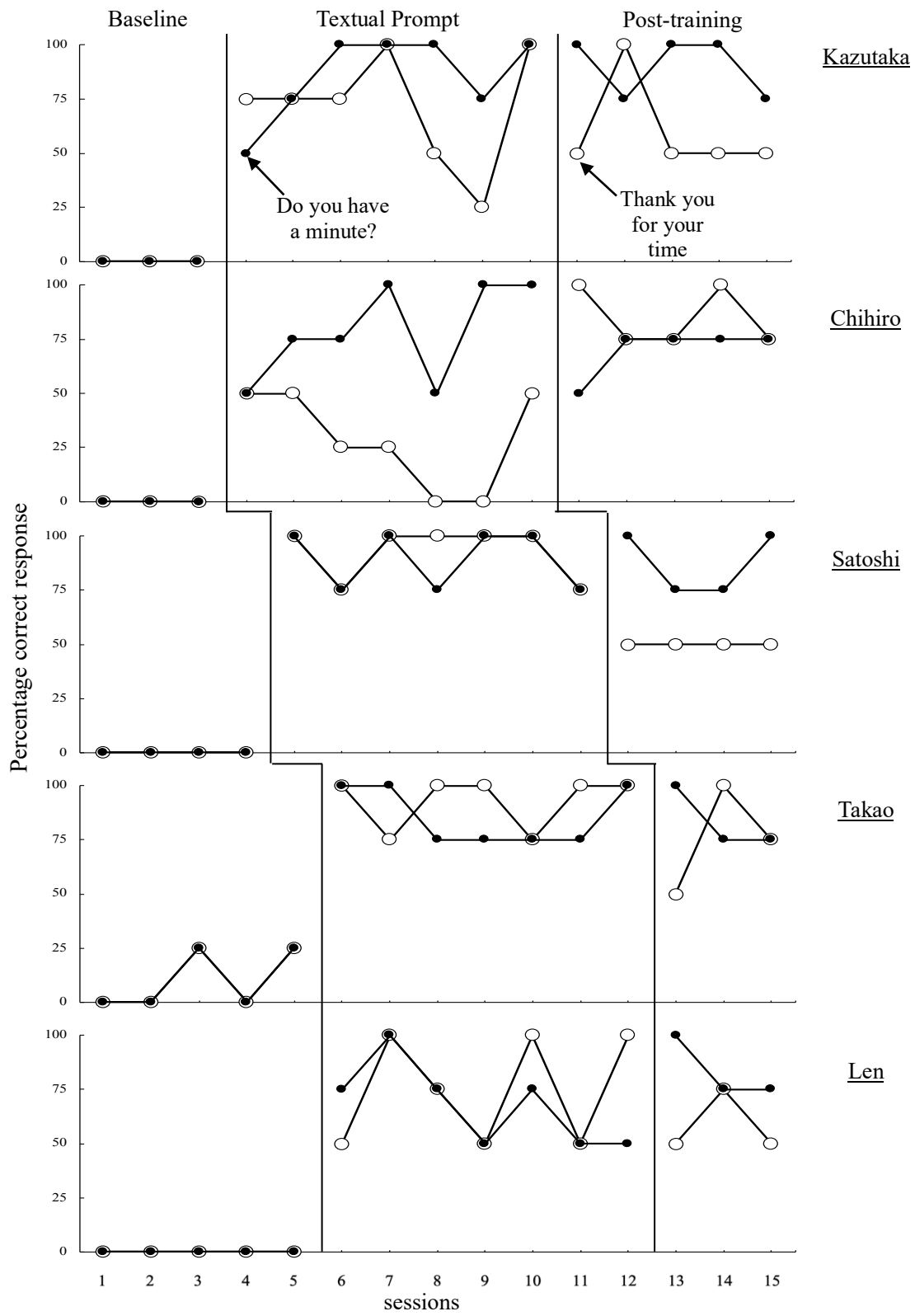


Figure 5-1. Percentage correct responses of each social nicety for TP group.

0% for Kazutaka, Chihiro, Satoshi, Len, and 20% for Takao in the baseline. Immediately after the textual prompt was introduced, the percentage for Satoshi and Takao was increased to 100%. Throughout the training, the percentage was stable and the range for both social niceties was 80-100%. Although the percentage for Kazutaka, Chihiro, and Len did not show 100% immediately after the training started, the percentage was higher than the baseline. However, the percentage for Kazutaka, Chihiro, and Len was unstable. In addition, the percentage for Kazutaka increased 100% for both social niceties in the final session in training phase, but the percentage of the initiating social nicety for Chihiro and the closing social nicety for Len were gradually decreased. Furthermore, the percentages were unstable in the post-training. In the post-training phase, the mean percentage of the initiating social nicety was 60% for Kazutaka, 85% for Chihiro, 50% for Satoshi, 75% for Takao, and 58% for Len. The mean percentage of the closing social nicety was 90% for Kazutaka, 70% for Chihiro, 84% for Satoshi, 83% for Takao and Len.

Figure 5-2 showed the percentage of correct response for participants in the P.F. group. In the baseline, Yoshitomo, Mebae, and Naohide never emitted both social niceties. The percentage of the initiating social nicety for Joichi was 25% in the first session, and the percentage of the closing social nicety for Hiromu was 25% in the second and third session. In the baseline, the mean percentage of the initiating social nicety was 0% for Yoshitomo, Mebae, Hiromu, and Naohide, and 8% for Joichi. The mean percentage of the closing social nicety was 0% for Yoshitomo, Joichi, Mebae, and Naohide, and 12% for Hiromu. After the training started, the percentage of both social niceties for all participants gradually increased. The percentage of both social niceties for Joichi, Hiromu, Mebae and Naohide increased to

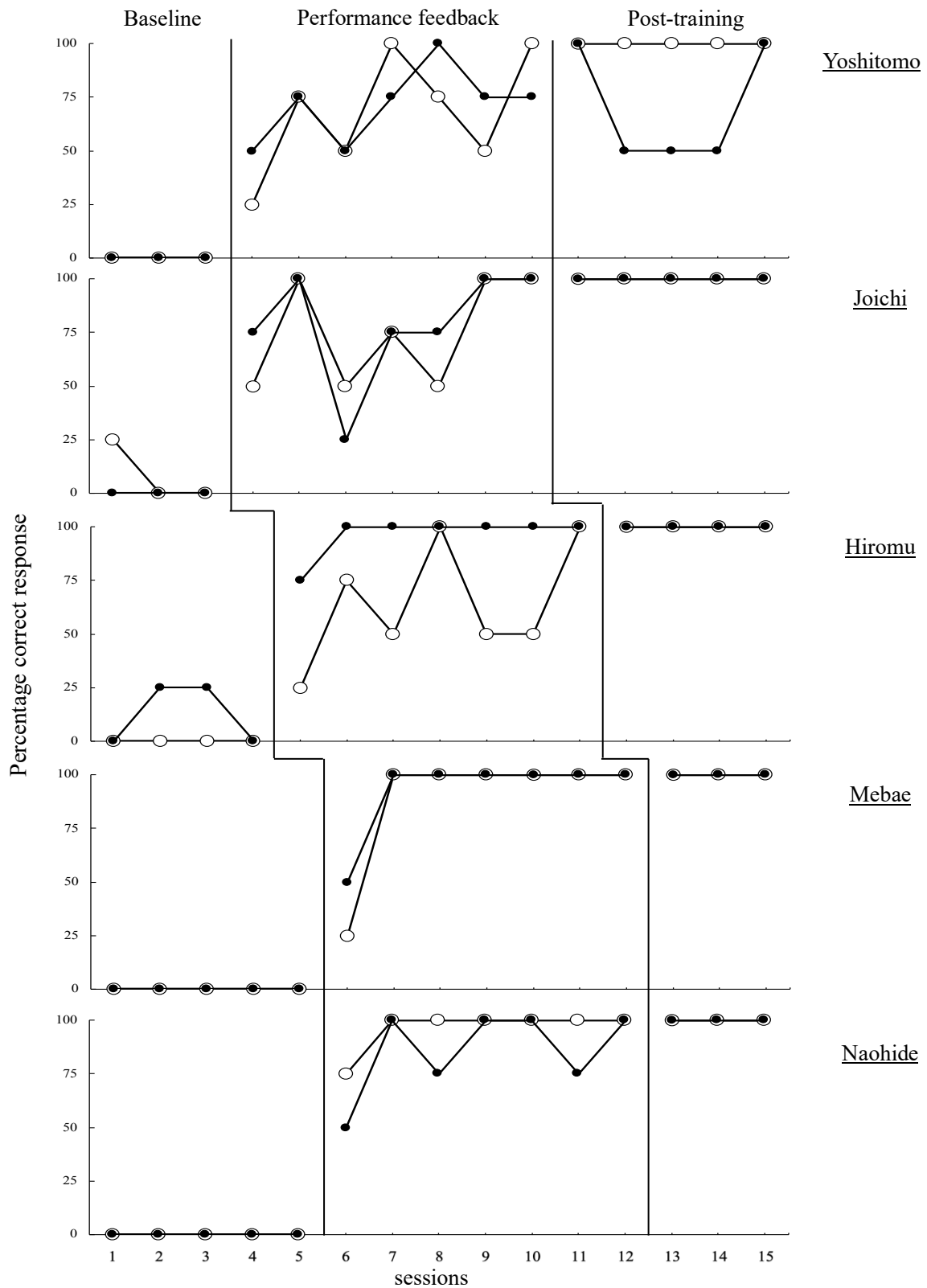


Figure 5-2. Percentage correct responses of each social nicety for PF group.

100% in the final session in the training phase. In the session, the percentage of the initiating social nicety and the closing social nicety for Yoshitomo was 100% and 75%. Throughout the post-training, the percentage of both social niceties for all participants except Yoshitomo was 100%. The percentage of the initiating social nicety for Yoshitomo was 100% throughout the post-training, but the percentage of the closing social nicety for Yoshitomo was 50% in the 12, 13, 14 session. In the post-training phase, the mean percentage of the initiating social nicety was 100% for all participants. The mean percentage of the closing social nicety was 70% for Yoshitomo, and 100% for Joichi, Hiromu, Mebae and Naohide.

Discussion

From the result, both the intervention with the textual prompt and the intervention with performance feedback showed a certain effect. The participants in P.F. group showed stable and high correct response percentage although the training and the post-training, but the participants in T.P. group showed unstable correct response percentage and the percentage in the post-training was low. Therefore, this study showed that the performance feedback was more effective to teach social niceties for ASD than the textual prompt. In this study, the textual prompt was presented as the antecedent stimulus before the participant emitted a response and the performance feedback was presented as the consequence stimulus after the participant emitted a response. Many previous studies have proved the importance of the reinforcer to acquire various behaviors. In this study, the performance feedback may have been functioned as the reinforcer. On the other hand, the social niceties in the T.P. group were the rule-governed behavior because participants in T.P. group were not provided programmed consequence feedbacks, and the consequence stimuli such as responses from

actors were same as the baseline. Whether humans emit the rule governed behavior depends on whether the rule-following establish. From the fact, we guess a reason why the percentage of correct responses for T.P. group was unstable and did not increase to 100% was because participants in T.P. group were not received feedback in the training. In brief, their rule-following behavior may have been extinct because whether participants follow the rule or not, the consequence stimuli from actors and trainers did not change. In addition, previous studies showed that humans are unlikely to follow rules that do not present consequence stimuli (Paláez, 2001). The textual prompt used in this study did not include the description about consequence stimuli. Therefore, participants may have not followed the rule of the textual prompt. From above, this study showed that it is desirable to include the feedback and the textual prompt including the description about consequence stimuli to teach individuals with ASD to social niceties.

The percentage of correct response for the P.F. group was stable in the training and the post-training. This result showed that the textual prompt is not always necessary to acquire social niceties. However, compared to the percentage of correct response in Yamamoto and Isawa (2019) using a combination of the textual prompt and performance feedback was increased immediately after the training started, the percentage in this study gradually increased. Because the difference between this study and Yamamoto et al. (2019) is only presence or absence of the textual prompt, the difference in acquisition speed of the social niceties seems to be due to the introduction of the textual prompt. Considering the textual prompt functioned as the rule, the result of this study is consistent with previous studies's finding that the intervention using the rule can quickly acquire responses (Tiger &

Hanley, 2004). From these facts, this study showed two implications for trainers and teachers. First, when trainers and teachers want to teach individuals with ASD to social niceties in a short time, it is most desirable to use a combination of the textual prompt and performance feedback. Second, when trainers and teachers want to conduct an intervention with less resources, the intervention using only the textual prompt can acquire social niceties to individuals with ASD.

In the training phase, the percentage of correct response for the closing social nicety increased for Chihiro, but the percentage for the initiating social nicety gradually decreased. When he talked to an actor in each work scenario, as soon as he said the initiating social nicety of "do you have a minute?," he emitted a statement about a work task (e.g. "do you have scissors?") without waiting for a reply to the initiating social nicety from the actor. This may mean that the initiating social nicety and the following statement about work task functioned as one response for Chihiro. The boss and colleagues provided consequence stimuli such as borrowed a material for the task or responded to consultation. Participants could be received these consequence stimuli whether they emitted the initiating social nicety or not. Furthermore, even if they emitted the initiating social nicety, they did not receive additional reinforcer. Therefore, he may have become to emit only the statement for work skills. On other hands, there were no statements following the closing social nicety because he only has to leave the actor when he have finished the closing social nicety. So, it was possible that the percentage of the closing social nicety did not decrease. From above, it was conceived that the reason for the difference between the percentage for the initiating and the closing social nicety for Chihiro was whether some verbal response existed after he emitted

the social nicety. However, it is unclear why only Chihiro showed such trend. Future studies should examine the efficacy of procedures such as presenting an obvious consequence stimulus from the actor to the performance of the social nicety for the participant who gradually lower the percentage of correct response. For example, a procedure is such that the boss responds only when the participant emitted the initiating social nicety.

The percentage for Kazutaka, Takao, and Len in the training and the post-training was almost the same. On the other hand, the percentage for Chihiro and Satoshi in the training and the post-training was different. Concretely, the percentage of the initiating social nicety decreased for Chihiro and increased for Satoshi. Although this study could not prove the factors influenced the difference between the training and the post-training, it is possible that the difference of reinforcers between the two phases influenced for Chihiro. In the training, following the rule functioned as a reinforcer of the initiating social nicety by the textual prompt functioned as the establish operation. However, the natural contingency stimuli in the simulated workplace may have functioned as reinforcers in the post-training because the textual prompt did not be presented in the post-training. In brief, the reinforcement value of the consequence stimuli following the initiating social nicety (e.g. reply from the boss, self-reinforcement) may have been low for Chihiro. So, it was conceived that the percentage of correct response for Chihiro decreased. On other hand, for Satoshi, it is possible that the textual prompt inhibited of emitting the social nicety because the difference between the training and the post-training was only the presence or absence of the textual prompt. When Satoshi was provided the textual prompt, he often asked questions the actor about work-related statements in the textual prompt that are important for performing the task

such as how to consult (e.g. "how do I say this part of this textual prompt?") While, he never asked question about statements for social nicety. Because the work-related statements in the textual prompt functioned as establish operation to perform the task smoothly, he may have emitted only work-related responses without emitting social niceties. Satoshi seems to have emitted social niceties in the post-training because he did not read the statements in the textual prompt in the phase. This problem was caused by using the listing-format textual prompt showing social niceties-related statements and work-related statements at same time. To solve this problem, using the textual prompt in which each response is described on a piece of paper and bound with a ring may be effective. When the ring bound textual prompt is used, the participant likely be able to perform all responses because he or she only read one response at a time. Future study is required to examine the difference of effectiveness between the styles of the textual prompt.

The participants in P.F. group showed the high percentage of correct response in both the training and the post-training and the trend was stable. In this study, we immediately removed performance feedback instead of the reduction that gradually thinning reinforcement schedule of performance feedback. Furthermore, the results of study showed the effectiveness of removing immediately of performance feedback.

The limitation of this study was that the total number of sessions was fixed before this study started. Although this study showed participants in P.F. group acquired social niceties more quickly and more accurately than participants in T.P. group, the results do not indicate that the percentage of correct response for T.P. group reached the peak. If participants in T.P. group were received more training, they may stably show higher

percentages. Future study should examine the number of sessions required to stably perform the social niceties.

This study evaluated the effectiveness of the textual prompt and the performance feedback to teach social niceties for individuals with ASD. As a result, I proved that the performance feedback is effective to teach social niceties for individuals with ASD. On other hand, the textual prompt was not as effective as the performance feedback. Future study is required to further develop intervention that is effective for acquisition of social niceties and resource-efficiency.

7. General discussion

In these studies, I developed the intervention to promote acquiring social niceties for individuals with ASD. The implications and limitations for each study were already showed. In general discussion, I describe the three points presented in the general purpose.

7-1. The efficacy of the textual prompt, the performance feedback, and the BST

In the first study, the BST was essential procedure to acquire social niceties because participants did not acquire them until the BST was introduced. However, in the following study, the BST was not essential and the simulation training including the textual prompt and the performance feedback was effective. I consider that the feedback in the first study was problematic, so the simulation training did not show efficacy and the BST was required. On other words, the delayed feedback using audible stimuli do not be effective to acquire social niceties. The most important finding in the first study is so, not the effectiveness of the BST.

In the second, third, fourth, and fifth study, the textual prompt and the performance feedback in the simulation training was effective for almost participants to acquire social niceties. Although both the feedback in the first study and the performance feedback in the following study were delayed consequence stimuli, the feedback in the first study did not show the efficacy and the performance feedback showed the efficacy. The difference of this result may have occurred by the difference of each stimulus. The feedback in the first study was audible, and the performance feedback in the other studies was visual. Visual stimuli remain during the participant watches it, but audible stimuli

disappear quickly. Therefore, I considered that such difference between each stimulus produced the difference of results.

The results in these studies mean the intervention combined with textual prompt and the performance feedback is effective to teach social niceties for individuals with ASD. In addition, participants of the PF group in the fifth study acquired by only the performance feedback. On the contrary, participants of the TP group did not acquire by only the textual prompt. This result means some individuals with ASD may be able to acquire the social niceties by the performance feedback. Furthermore, participants have acquired social niceties without the BST. In brief, the textual prompt and the performance feedback is necessary and sufficient to acquire social niceties for almost participants. However, one participant in the fourth study did not acquire when the textual prompt and the performance feedback were introduced. So, the BST is needed for individuals who do not acquire social niceties by using the textual prompt and the performance feedback.

From these facts, practitioner can set three steps to teach social niceties for individuals with ASD. The first step is the intervention with only the performance feedback. The second step is the intervention with the textual prompt and the performance feedback. The second step is introduced only when a participant does not acquire a social nicety by introducing the first step. The third step is the BST. The third step is introduced only when a participant does not acquire a social nicety by introducing the second step. These steps similar to multi-tiered systems of the positive behavior interventions and supports (PBIS). Horner and Sugai (2015) described the systems as follow. In the multi-tiered systems, all students experience Tier I (primary prevention) behavior support. This

level of support is not dependent on documented “need” or some formal assessment protocol. Tier I is proactive and designed to be administered before error patterns develop. Because all students receive Tier I supports, these practices must be highly efficient and logically integrated with all other elements of the environment. Tier II (secondary prevention) practices focus on moderate intensity supports that address the most common needs of students with ongoing problem behavior. Tier II supports are added to Tier I support and are designed for the 10–15 % of students who benefit from additional structure, more overt, and frequent antecedent prompts, a higher rate of positive recognition, and elevated training in both behavioral expectations and self-regulation skills (Crone, Hawken, & Horner, 2010; Sugai et al. 2014). Tier III (tertiary prevention) practices are characterized by individualized assessment, individualized support plan design, comprehensive support plan implementation, and the management of support by a team uniquely organized to meet the preferences and needs of individual student (Scott, Anderson, & Spaulding, 2008). The establishment of Tier III supports is an overt commitment by the system to include a full range of students in the school. So, this study supported the systems of PBIS. Future study was required to develop the multi-tiered systems for various behaviors.

7-2. The efficiency of the resource and the time

The number of training sessions in these studied was shorter than in previous studied. In addition, almost participants acquired social niceties. The number of sessions required to acquire a social nicety in previous studies were 5-39 (Morgan & Salzberg, 1992), 7-13 (Matson, Sevin, Box, Francis, & Sevin, 1993), and 6-26 (Matson, Sevin,

Fridley, & Love, 1990). The number of sessions required to acquire a social nicety the third study which combined with the textual prompt and the performance feedback was 2-5. One factor for this result seems to be that participants acquired social niceties as rule-governed behavior. Previous researches showed that intervention using rule promotes the rapid acquisition of targeted behaviors (Bergstrom, Najdowski, Alvarodo, & Tarbox, 2016; Persicke, Tarbox, Ranick, & Clair, 2013). For example, Tiger and Hanley (2004) examined whether the mand could be established as a rule-governed behavior. By introducing the rule, participants emitted mand even when a novel discriminative stimulus was provided. If a practitioner wants to acquire social niceties as soon as possible, the behavior should be established as a rule-governed behavior.

Targeted behaviors in this study were small. In the third and fourth study, I taught only two behaviors of "do you have a minute?" and "thank you for your time." The small amount of targeted behavior may have contributed to the speed of acquisition. The intervention to promote employment in some previous studies usually deal with a lot of targeted behaviors. For example, Barnett and Crippen (2014) introduced seven social skills, and Foxx, McMorro, and Mennemeier (1984) taught six social skills related employment. Limiting the number of these targeted behaviors may allow for the development of more resource-efficiency and time-efficiency intervention.

Although the high-intensity training (30-40 hours of ABA therapy each week) has conducted in foreign country (Greer, 1997; Lovaas, 1987; Sundberg & Michael, 2001), it is difficult to conduct many sessions on every day in Japan. Therefore, the studies for resource-efficiency and time-efficiency intervention are needed in Japan. I

consider that the intervention in this study can use in Japanese special support education school. Future study should develop more resource-efficiency and time-efficiency intervention. To do so, it is necessary to examine whether the same efficacy can be achieved by cutting out components of the interventions used in previous studies (e.g. Yamamoto & Isawa, 2020).

7-3. Limitations in this study

In this study, I examined the efficacy on limited social niceties. So, I do not know if the interventions in this study will have an effect on other social niceties. Future studies were required to examine whether the interventions in this study have effectiveness and to extend more efficiency intervention. Because the social nicety is autoclitic, the studies of autoclitic may be useful. Cengher, Ramazon, and Strohmeier (2019) used extinction to teach mand and autoclitic to female with ASD. They proved that the extinction is effective to induce autoclitic. Considering the simulated setting of workplace, if the participant does not use social nicety on his or her boss, extinction the response may be effective to increase social niceties. Not limited to the textual prompt and the performance feedback, the study of social nicety should be expanded by examining the effects of various procedures.

This study did not evaluate the social impact of social niceties acquired in the training. In brief, this study did not show how the acquisition of social niceties has changed participant's live. Future studies should conduct the questionnaire for parent and teacher acceptability of procedure results (Carlile, Debar, Reeve, Reeve, & Meyer, 2018) and observing changes in the relationship between the participants and the person around

them.

7-4. Conclusion

This study examined the efficacy of intervention in the simulated setting for acquisition of social niceties for individuals with ASD. For results, the intervention with the textual prompt and the performance feedback is the most effective. If the practitioner requires to intervene with fewer resources or time, the intervention with the performance feedback is the recommendation.

There are still many challenges in supporting the employment of people with autism. This study solved some challenges. In the future, approaches to various areas will continue to help individuals with ASD who want to work.

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