The present article discusses how events outside a subject's skin and not accessible to another subject but to an experimenter may contribute to experimental analyses of private events. Of 16 undergraduates, 8, referred to as instructors, first learned conditional discriminations (i.e., B1C1, B2C2, B3C3, and B4C4) in a standard matching-to-sample (MTS) task with the stimuli Bs as the samples and the stimuli Cs as the correct comparisons. Then the other 8 subjects, learners, were exposed to modified MTS trials in which responses of the learners were reinforced or punished not by the experimenter but by the instructors. Conditional discriminations to be established were A1C1, A2C2, A3C3, and A4C4, in which the sample stimuli As were presented simultaneously with the stimuli Bs so that the instructors could not see the As but only the Bs. For 2 of the 8 pairs, the learners learned the AC conditional discriminations from the instructors who were not accessible to the stimuli As. Functionally, private events have been defined by their accessibility rather than their structure (e.g., Skinner, 1953). In this context, therefore, the stimuli As may be characterized as a kind of private events within the present 2 pairs of instructors and learners.

Private events generally have been defined structurally as events that occur within the skin of a person (Anderson, Hawkins, & Scotti, 1997) and functionally as events that are directly accessible to one person (Skinner, 1953, p. 257; Taylor & O'Reilly, 1997). Privacy is undoubtedly an essential thesis of radical behaviorism. Private events have received a great deal of attention in mainstream psychology and their treatment differentiates radical behaviorism from methodological behaviorism and other philosophical approaches in psychology (Anderson, Hawkins,
Freeman, & Scotti, 2000). Methodological behaviorism defines psychology as the study of behaviors that are observable by others (e.g., Guthrie & Horton, 1946, p. 7), whereas cognitive behaviorism allows the study of events unobservable by others as intervening variables (Bandura, 1977; Mahoney, 1977). Taking a different approach, radical behaviorism accepts the study of events that are observable only to a person experiencing them as stimuli or responses (Skinner, 1974, pp. 10-23).

In spite of the conceptual significance, private events have received relatively little empirical attention. Several investigators have attributed this to the technical issue and have attempted to develop procedures manipulating the private events (e.g., Taylor & O'Reilly, 1997). However, it may be the conceptual contradictions across researchers or the inherent conceptual dilemma that has impeded experimental analyses. For example, most behavior analysts have regarded that private events can be measured by self-observation (e.g., Critchfield, Tucker, & Vuchinich, 1998; Skinner, 1974, p. 18), whereas some have criticized that such a first-person observation is nonscientific (e.g., Lamal, 1998; Zuriff, 1985, p. 28). The functional definition of private events (Skinner, 1953, p. 257) also seems to cause their experimental analyses to be logically difficult. According to this definition, private events are accessible only to the one person experiencing them. This means that private events can not be measured until a single observer learns to report them. In a classic work, Skinner (1945) suggested four primary ways in which a verbal community with no access to a private stimulus may generate verbal behavior in response to it. One of them, for example, is that a person's report of a private stimulus (e.g., pain) is established by the reinforcement from his/her verbal community who infer the private stimulus from collateral overt responses (e.g., hand to jaw, facial expressions, or groans) to the stimulus. This interpretation may be highly plausible, but it is difficult to demonstrate empirically. How can we show the learning process of conditional discrimination with the lack of records of the conditional stimuli presented? Any private events, by definition, can not be recorded until the report is established.

The above problems may be solved by employing two different viewpoints in terms of private events. The first of these considers private events outside the skin. According to the functional definition, if events are directly accessible only to one person, the events are private even though they are outside that person's skin. For example, suppose that two men are playing cards. If only the man "X" can see a card (e.g., the ace of hearts) in his hand, and if the other man "Y" can not see it, the card may be a private stimulus although it is not inside X's skin. Whether this idea can be accepted or not will be discussed later. However, if events outside a person's skin and directly accessible only to that person are also private, the interobserver agreement required by Lamal (1998) and Zuriff (1985, p. 28) can be readily achieved.

Employing "private events outside the skin," however, may not be sufficient to solve all the problems in terms of the experimental analysis.
For example, an event outside the skin can not be defined as private if it is actually accessible to others. As Lamal (1998) noted, if accessible to others they are measured by others, and therefore no longer private. If inaccessible to others, by contrast, they are private and therefore not measured by others. This dilemma may be resolved if conditional accessibility is applied for the functional definition of the events, which is the second point of view the present article suggests. For example, suppose that three men are playing cards, where one is the experimenter and the other two are the subjects (Subjects X and Y). If Subject X can see a card (the ace of hearts) given by the experimenter and Subject Y can not see it, and if the privacy of the card is assessed only between Subjects X and Y, the card may be regarded as a private stimulus for Subject Y, although it is not private for the experimenter.

Investigators, who hypothesize some differences in learning processes between events inside and outside the skin, those who prefer structural definitions, or those who are strongly interested in the events under the skin, may not regard events outside the skin as private. Even though they are not accepted as private events, however, the events outside the skin are worth investigating in the context of research in privacy. For example, Skinner (1953, p. 257) and most behavior analysts (e.g., Anderson et al., 2000) view that private behaviors operate by the same principles as overt behaviors. However, this hypothesis has been criticized for the reason that there is no supporting evidence (Zuriff, 1984). If experiments indicate that events outside the skin but inaccessible to others follow the same principles as the usual "overt" behaviors, they may be grounds for convincing us of this substantial hypothesis on private events.

The following experiment was conducted to illustrate how the present ideas could be used in the context of the experimental analysis of private events. One of the most important issues regarding private events may be how humans learn to report those events. As described, Skinner's (1945) interpretations have still not been demonstrated experimentally. The present experiment attempted to examine one of Skinner's interpretations, in which a person's report of a private stimulus is established by reinforcement from his/her verbal community who infer the private stimulus from collateral overt responses to the stimulus.

Half of the human subjects, referred to as instructors, were exposed individually to standard matching-to-sample (MTS) trials to establish conditional discriminations between B1 and C1, B2 and C2, B3 and C3, and B4 and C4, with the first stimulus as the sample and the second stimulus as the correct comparison. The other half of the subjects, learners, were exposed to modified MTS trials in which responses of the learners were reinforced not by the experimenter but by the instructors. Conditional discriminations to be established were between A1 and C1, A2 and C2, A3 and C3, and A4 and C4, all of which were novel for both instructors and learners. However, the stimuli B1, B2, B3, and B4, which had already been familiar to the instructors, were presented simultaneously with the sample stimuli A1, A2, A3, and A4, respectively. In these modified MTS
trials, the instructors could see those sample-correlated stimuli (Bs) and the comparisons (Cs) but not the samples (As). Thus, the sample stimuli As and the sample-correlated stimuli Bs were analogous respectively to private stimuli and their collateral overt responses in Skinner's (1945) interpretation. The present experiment examined whether the learners' reports (Cs) of their own stimuli (As) would be established by differential reinforcement from their verbal community (the instructors) who could only access the collateral stimuli (Bs) from the learners.

Method

Subjects

Undergraduates, 7 male and 9 female, recruited from educational psychology classes at Osaka Kyoiku University served as subjects. They were 18 to 21 years old, and none had experience with operant conditioning experiments. Japanese was the native language of each subject, and all instructions were given in Japanese. Half of the 16 subjects were randomly assigned as instructors, and the other half as learners. Each pair of instructor and learner together participated in a 90-min session.

Setting and Materials

Stimuli. Figure 1 shows the stimuli used. Four Japanese two-letter nonsense syllables, pronounced respectively as fu-ho (A1), nu-mu (A2), se-a (A3), and ya-u (A4) from left to right, were used as sample stimuli for learners, whereas four geometric figures, square (B1), circle (B2), triangle (B3), and diamond (B4), were samples for instructors. The syllable was approximately 23 mm wide and 10 mm high, and the figure was approximately 20 mm by 20 mm. Each of these stimuli was printed with black on a 40-mm by 40-mm white paper on a 90-mm wide and 62-mm high black cardboard. Comparison stimuli consisted of six-color cards, green (C1), red (C2), yellow (C3), blue (C4), purple (C5), and white (C6), each of which measured 40 mm by 40 mm printed also on the 90-mm wide and 62-mm high black cardboard.

Figure 1. Stimuli used in the experiment. Stimuli in the top row were Japanese two-letter nonsense syllables pronounced as fu-ho, nu-mu, se-a, and ya-u from left to right. The bottom six letters represent colors, green, red, yellow, blue, purple, and white, from left to right. For descriptive purposes, each stimulus was assigned a number in the text from 1 through 6 from left to right, and a letter from A through C from top to bottom.
Two types of cards for sample stimuli were prepared. In the first type, one stimulus (syllable or figure) was printed on one side of the card and no stimuli were shown in the black background on the other side. The second type of card, by contrast, had a syllable on one side of the card and a figure on the other side. Pairs of stimuli printed on each side of these cards, respectively, were fu-ho and square, nu-mu and circle, se-a and triangle, and ya-u and diamond (Figure 1).

Responses, reinforcers, and punishers. Twenty-mm diameter colored poker chips were used as products for matching responses, reinforcers, or punishers. One white poker chip was used as the response product for both the instructor and the learner. Eighty yellow chips were reinforcers for the instructors. Eighty blue and 80 red poker chips, respectively, were reinforcers and punishers for the learners.

Setting. The experimental room was 3.08 m wide, 5.95 m deep, and 3.00 m high, including a 1.70-m wide, 2.20-m deep, and 2.17-m high cubicle. Trials were generally conducted on a table outside the cubicle. The cubicle had a desk and a chair, and it was generally used as a waiting room when the subjects were trained or tested individually (the exceptions will be described later). A ventilating fan and air conditioner masked noises, and windowless walls shielded the view of the subject from outside the cubicle to inside, and vice versa. The instructor and the learner, respectively, sat to the right and left of the experimenter around the table so that the learner was opposite the instructor. All events were manipulated and recorded manually. In every trial the experimenter handed the instructor or the learner (the recipient was determined by experimental conditions) a sample stimulus, and located the comparison stimuli in the center of the table. The recipient of the sample stimulus responded by putting a white poker chip on a comparison stimulus. Poker chips as reinforcers or punishers were delivered into a 110-mm diameter and 65-mm high translucent polypropylene cup in front of each subject.

Procedure

Table 1 shows the sequence of conditions. To determine that conditional discriminations to be learned were not established prior to the experiment, MTS test trials were first implemented individually, in which reinforcers were not delivered until the end of the final trial. Second, conditional discriminations between the geometric figures and the colors were established for the instructors by differential reinforcement from the experimenter. Third, conditional discriminations between the nonsense syllables and the colors were established for the learners by reinforcement and punishment from the instructors who had no access to the syllables. Finally, posttests examined whether the performances of the learners achieved during the training were not artifacts of the possible extraexperimental variables.

Instructor training. The instructor was trained individually with the experimenter, whereas the learner stayed in the cubicle (the third
Table 1

Sequence of Conditions, and Sample Stimuli, Recipients of Sample Stimuli, Persons with Recipient, and Settings in Each Condition

<table>
<thead>
<tr>
<th>Sequence of conditions</th>
<th>Sample stimuli</th>
<th>Recipient</th>
<th>Persons with recipient</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pretest</td>
<td>Syllables</td>
<td>Instructor</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>2. Pretest</td>
<td>Figures</td>
<td>Instructor</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>3. Training</td>
<td>Figures</td>
<td>Instructor</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>4. Pretest</td>
<td>Syllables</td>
<td>Learner</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>5. Pretest</td>
<td>Figures</td>
<td>Learner</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>6. Training</td>
<td>Syllables</td>
<td>Learner</td>
<td>Experimenter &amp; Instructor</td>
<td>Table</td>
</tr>
<tr>
<td>7. Posttest</td>
<td>Syllables</td>
<td>Learner</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>8. Posttest</td>
<td>Figures</td>
<td>Learner</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>9. Posttest</td>
<td>Syllables</td>
<td>Learner</td>
<td>No one</td>
<td>Cubicle</td>
</tr>
<tr>
<td>10. Posttest</td>
<td>Figures</td>
<td>Learner</td>
<td>No one</td>
<td>Cubicle</td>
</tr>
<tr>
<td>11. Posttest</td>
<td>Syllables</td>
<td>Instructor</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>12. Posttest</td>
<td>Figures</td>
<td>Instructor</td>
<td>Experimenter</td>
<td>Table</td>
</tr>
<tr>
<td>13. Posttest</td>
<td>Syllables</td>
<td>Instructor</td>
<td>No one</td>
<td>Cubicle</td>
</tr>
<tr>
<td>14. Posttest</td>
<td>Figures</td>
<td>Instructor</td>
<td>No one</td>
<td>Cubicle</td>
</tr>
</tbody>
</table>

condition of Table 1). Prior to trials, the instructor was instructed to look at a geometric figure and select one of three colored cards. The instructor also was told that a yellow chip changeable for 5 yen at the end of the experiment was given after every correct choice.

Each trial began when the experimenter handed the instructor a card with one of the four geometric figures printed on one side and with black on the other side. Then the experimenter arranged the three colored cards as comparison stimuli on the table horizontally to the instructor. The comparison stimuli were green, yellow, and purple when the sample stimulus was the square or the triangle, whereas the comparisons were red, blue, and white when the sample was the circle or the diamond. When the instructor put a white poker chip on a comparison stimulus, and if the response was correct, the experimenter put a yellow poker chip into the instructor’s cup. The correct combinations between the sample and comparison stimuli were square and green, triangle and yellow, circle and red, and diamond and blue (Figure 1). Regardless of the correctness of the response, the experimenter recorded that response, returned the white response chip to the instructor, removed the sample and comparison stimuli, and handed the next sample stimulus to the instructor.

Sample stimuli were presented in a random sequence, with the restriction that each of all four sample stimuli appeared once in every block of four trials. Positions of the comparison stimuli varied randomly across trials, with the restriction that each of six possible positions was used with the same sample stimulus once in every six 4-trial blocks. This MTS training lasted until the mastery criterion was met that all four trials were correct for two consecutive trial blocks.

Learner training. The learner was trained with the instructor (the sixth condition of Table 1). Until that time, the instructor mastered conditional
discriminations between the geometric figures and the colors. First, the following instructions were given to the learner:

I will hand you a card printed with a geometric figure on the obverse and a nonsense syllable on the reverse. Please keep that card so that your partner can not see the syllable but only the figure. Then I will set three cards on the table. Your task is to look at the syllable carefully and select one of the three cards on the desk by putting the white chip on it.

Then the instructor was instructed as follows:

Your task is to look at the figure on the card in your partner's hand carefully and put a blue chip into his/her cup if you judged that his/her choice was correct. If you judged that his/her choice was incorrect, please put a red chip into his/her cup. After you complete this task four times, I will give you as many yellow chips as you make correct judgments. If you make an incorrect judgment, you are required to learn the correct choices again. So, please try to judge as accurately as you can.

Finally, the learner was told that a blue chip was worth 5 yen, but every five red chips voided a blue chip.

A trial was run as follows. First, the experimenter handed the learner a card printed with a nonsense syllable on one side and a figure on the other showing only the syllable side to the learner. Second, the experimenter arranged three colored comparison cards on the table, as identical to the instructor training condition. Third, the learner put the white poker chip on a comparison stimulus. Fourth, the instructor put a blue or a red chip into the learner's cup. The correct relations between the nonsense syllables and colors were fu-ho and green, se-a and yellow, nu-mu and red, and ya-u and blue (Figure 1). Finally, the experimenter recorded the responses, returned the white chip to the learner, withdrew the sample and comparison stimuli, and handed the next sample stimulus to the learner.

At the end of each four-trial block, the experimenter put the same number of yellow poker chips into the instructor's cup as his/her correct judgments. If the instructor misjudged even one trial within the block, the experimenter suspended this training. After the learner was escorted into the cubicle, the instructor was reexposed to the training of conditional discriminations between the figures and the colors. This reexposure lasted until the mastery criterion as described above was met again. Thereafter, the learner training resumed. The learner training lasted until the learner's responses were 100% correct for two consecutive trial blocks.

Testing with the experimenter. MTS test trials were implemented for each subject (instructor or learner) at the table outside the cubicle with the experimenter, while the partner (learner or instructor) stayed in the cubicle (Conditions 1, 2, 4, 5, 7, 8, 11, and 12 of Table 1). Each test consisted of eight trials in which one of the two types of stimuli (nonsense syllables
or geometric figures) was presented as samples. With the exceptions for posttests for 1 instructor (described in Results), each subject of the pairs was exposed to eight trials in each type of samples prior to and following the training conditions. The procedure was identical to that of the instructor training condition with the following exceptions. First, the subject was told that chips equal to the number of correct trials were given only after every eight trials. Second, the experimenter presented all six colored cards as comparison stimuli. Positions of comparison stimuli varied randomly across trials, with the restriction that the stimuli did not appear in the same position on two consecutive trials. Third, at the end of the eighth trial, the experimenter put the same number of colored chips into the subject's cup as there had been correct trials.

Testing without the experimenter. To determine whether each subject's performances established during the training were not affected by visual contact with the experimenter, posttests were conducted also in the cubicle, while the partner stayed at the table (Conditions 9, 10, 13, and 14 of Table 1). The experimenter put the four cards with only the nonsense syllables or the geometric figures on top of one another randomly on the desk in front of the subject, then randomly piled the six colored cards at the left side of the sample (syllable or figure) cards. The subjects were asked to sort these cards into groups of correct pairs when the experimenter was absent from the cubicle. Leaving the subject in the cubicle, the experimenter went out and closed the door. When the subject opened the door and signaled the trial was completed, the experimenter returned to the cubicle, recorded the pairs of cards sorted, and withdrew all the cards. The subject was not given any feedback and was told that the payment for correct sorting would be made at the end of the experiment. Each of the instructors and learners was exposed to this kind of posttest once, with each type of sample stimuli.

Postexperiment procedure. Upon completion of the experiment, the subjects were asked if they knew their partner or had talked to him/her. Thereafter, they were debriefed, and paid for their performance (5 yen per reinforcer, approximately .04 U.S. dollars). The overall earnings ranged from 135 to 240 yen for each learner, and from 235 to 405 yen for each instructor.

Results

Pretests

Even though the consequences did not depend on every single response, the pretest accuracy for some cases was somewhat high. Correct responses were 75.0% and 62.5%, respectively, for Learner 2 and Instructor 5 when the nonsense syllables were presented as sample stimuli. The present research concerned whether the learners could learn conditional discriminations between the syllables and the colors from instructors who could not access the syllables. Instances of accurate choices between the syllables and the colors prior to the training, therefore, might impede the assessment of the results in light of the
Figure 2. Percentage of correct responses of each pair of subjects in the tests. Data for the instructor and the learner of each pair are shown, respectively, on the left and right sides of each panel. Labels PRE and POST identify the pretests and posttests, respectively. Labels TAB and CUB, respectively, identify the posttests conducted on the table with the experimenter and in the cubicle without the experimenter. Filled bars depict responses when nonsense syllables were samples (AC conditional discriminations), and open bars depict responses when geometric figures were samples (BC conditional discriminations).

research question. Thus, the data from two pairs, Instructor 2 and Learner 2, and Instructor 5 and Learner 5, were excluded from further analyses because each of the pairs had a subject who showed accurate choices. Figure 2 shows the percentage of correct responses during the pretests for the remaining subjects.

Training Conditions
Figure 3 shows the percentage of correct responses for each trial block of the training conditions. When a reinforcer followed every correct response, responses for all instructors met the mastery criterion within 10 trial blocks. Except for Instructors 3 and 7, all instructors delivered consequences (reinforcers or punishers) accurately for every response of their partners (learners) during the learner training condition. Both Instructors 3 and 7 delivered an inaccurate consequence during the first trial block. Following reexposure to the instructor training condition, however, they also delivered consequences accurately for every response of their partners. With an accurate consequence following every response, responses for all learners met the mastery criterion within eight trial blocks.
Figure 3. Percentage of correct responses in each four-trial block for each pair of subjects during the training conditions. A number shown to the right of each panel specifies the pair of subjects. Labels I and L identify the instructor training condition and the learner training condition, respectively. Open triangles represent responses for instructors. Filled circles represent responses for learners.

Posttests

Figure 2 also shows the performances for the posttests. When nonsense syllables were presented, responses on the posttest were 100% correct for all learners, irrespective of the presence or absence of the experimenter. These results indicate that performances of the learners were not affected by (a) the presence of the instructors and the experimenter nor by (b) geometric figures paired with the nonsense syllables. The performances for each learner when geometric figures were presented as samples will not be described because they were not within the scope of the present experiment.

When nonsense syllables were presented, choices in front of the experimenter were 75% correct for Instructors 1 and 4. Except for these subjects, the accuracy was extremely low, 12.5% for Instructor 8 and 0% for Instructors 3, 6, and 7 (Figure 2). In the posttest in the cubicle without the experimenter, sorting of the cards was 50, 75, and 100% correct for Instructors 8, 3, and 4, respectively. By contrast, the accuracy for the other instructors was low, 25% for Instructor 1 and 0% for Instructors 6 and 7. These results indicate that, at least for 2 (Instructors 6 and 7) of the 6 instructors, there was no obvious evidence of conditional discriminations between the syllables and the colors, suggesting that their partners (learners) learned the syllable-color conditional discriminations from them although they did not access the stimulus combinations.
When the geometric figures were presented, responses on the posttest conducted on the table in front of the experimenter were 100% correct for all instructors except for Instructor 8 (Figure 2). In contrast, Instructor 8 responded incorrectly in two trials of the second trial block of the original posttest. Previously, 2 pilot subjects also showed incorrect responses in the test of trained conditional discriminations but responded perfectly to the postexperiment questions. These unsystematic observations suggest that subjects may make incorrect answers even though they could respond correctly. Thus, for Instructor 8, the posttests on the table were repeated to determine whether she could ever respond inaccurately. She showed 100% accuracy on the second posttest when the figures were presented as samples. On the posttest with the figures, conducted in the cubicle without the experimenter, all instructors sorted the cards 100% accurately, suggesting that conditional discriminations between the geometric figures and the colors for the instructors were established and maintained throughout the experiment.

Demographic and Verbal Data
Instructor 1 and Learners 1, 3, and 8 were male, and the others were female. In answering the postexperiment questions, subjects in four of the six pairs said they neither knew who their partner was nor talked to him/her. In Pairs 1 and 4, by contrast, they had spoken to each other before the experiment. Subject 8, who made errors at the original posttest of trained conditional discriminations, said, "I intentionally selected previously incorrect cards because I suspected that the correct combinations might have changed."

Discussion
For a demonstration of how the present ideas could be used in the context of the experimental analysis of private events, an experiment was conducted examining Skinner's (1945) interpretation of the manner in which humans learn to report private events. Skinner argued that responses to private stimuli might be established by reinforcement from other persons who inferred the private stimuli from collateral overt responses to the stimuli. Analogous to Skinner's interpretation, at least 2 subjects (learners) in the present experiment learned to report stimuli (nonsense syllables) by reinforcement from other persons (instructors) who were accessible not to the reported stimuli but to the collateral overt stimuli (geometric figures).

The present results that the expected performances were obtained from only 2 of 8 pairs may give a somewhat weak impression. However, this weakness does not discourage the implications of the present study. The present article focuses not on demonstrating a well-controlled experiment but on describing a novel and probably promising methodological framework. The weak results could be due to the procedural immaturity that is commonly associated with such initial
attempts. The present experiment may be a pilot study (Sidman, 1960, p. 220) but poses problems future investigations would solve for the refinement of this innovative method.

Limitations of the Present Experiment and Future Directions

The first limitation of the present experiment relates to the untrained but high accuracy for some cases in the tests. Choices between nonsense syllables and colors were surprisingly accurate for 2 of the 16 subjects (Learner 2 and Instructor 5) in the pretests, and for 4 of 6 instructors (Instructors 1, 3, 4, and 8) at least in one (on the table or in the cubicle) of the posttests (Figure 2). The possibility of subject contamination (Horne & Lowe, 1993) may have to be considered. Because the correct stimulus combinations were identical for all subjects, if later subjects were given previous notice about the correct alternatives from the former subjects, their performances might be more accurate. However, this explanation seems unlikely. At the end of the experiment, each subject reported that he/she had not had any information about the study and was asked not to speak to anyone about what he/she experienced and heard in the laboratory. The present pairs of subjects were numbered in the order of their participation. Thus, if the subject contamination occurred, pairs with larger numbers would have tended to show more accurate pretest performances, but such a trend was not found. The untrained accurate performances rather may be due to the relatively small number of test trials. Fewer trials can increase the risk of adventitious higher accuracy. Unstable performances in the posttests between those on the table and in the cubicle for Instructors 1 and 3 also may be explained by the few test trials. However, this procedural feature would not make our conclusion an overestimation. Consistently perfect accuracy across tests is difficult to explain by chance, and such cases are found only when trained conditional discriminations were tested. Thus, the small number of test trials may have made the assessment of the untrained performances more strict selectively and drawn the modest conclusion that only 2 of 8 pairs demonstrated the predicted results.

The second limitation relates to the correlation between events accessible and inaccessible to the other person. For establishing accurate reports, geometric figures corresponded perfectly with nonsense syllables. However, such a one-to-one correspondence may be exceptional outside the laboratory. Skinner (1945) noted that reports of private events often become inaccurate because the verbal community lacks access to the events tends to reinforce the reports nondifferentially. Future experiments using inaccessible stimuli modestly correlating with the collateral accessible responses will contribute to establishing a more sophisticated laboratory analogue of private events.

The final possible limitation of the present experiment relates to the novelty of the results. One may suspect that the present results indicate only the well-known behavioral phenomena that people can learn conditional discrimination by differential reinforcement. This criticism may
be correct when we focus only on the behavior of the learners. However, the learners are not the only subjects of the present experiment, the instructors are also. It should be noted that the present experiment reminds us of the considerably important roles of social variables on private events. Because of the definitive property (Skinner, 1953, p. 257), one of social variables, accessibility to others, should become one of the necessary conditions of private events. Thus, it may be said that private events can function depending on some social variables. The present experiment treated private events in a social context, and it demonstrates that at least 2 subjects learned the name of each stimulus from other subjects who did not have access to the stimulus. The stimulus may have not been what most behavior analysts have regarded as private. Even so, the present results are the first case in which such a social interaction was reported in the literature of the experimental analysis of private events.

References


