PART I: BACKGROUND

Title: Improving Thinking about Classical Conditioning

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Discipline or Field: Psychology

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Course Name: Introductory Psychology

Course Description: Introductory Psychology is a general course that offers an introduction to the field of psychology. The course is a general degree requirement for the social sciences, so the students who take the course include both majors and non majors. The lesson was conducted during a 50 minute class which included about 40 students in a small multimedia classroom.

Executive Summary:

This lesson was designed to introduce students to the basic procedures and processes of classical conditioning within the context of a single-semester course in Introduction to Psychology. We usually allocate one-week for the unit on Learning, which approximates a single 50-minute class on classical conditioning (the remaining two classes are devoted to operant conditioning and observational learning, respectively). Thus, the lesson incorporates both lecture and activity and was designed with a multi-media compatible classroom in mind.

After the introduction to the elements and procedure of classical conditioning, students complete a worksheet (see attached) designed to provide students with practice using the terminology of classical conditioning, understanding the ordering of elements in the procedure of classical conditioning, and applying their knowledge to a variety of different examples including a novel one that students create. The worksheet provides an opportunity to assess students' knowledge of classical conditioning from basic definitions of the elements of classical conditioning to the learning of a conditioned response through a variety of real-world examples.

Four assessments (peer observation of the lesson, grading of the activity worksheet, grading of relevant exam questions, and a student survey) indicated the lesson generally worked well. Both students and observers reported that the lesson was engaging and helped introduce an admittedly difficult topic. The lesson shows promise with several suggestions for improvement included.

PART II: THE LESSON

How to Teach the Classical Conditioning Lesson

Pre-lesson Preparations

The lesson was designed to introduce students to the basic procedures and processes of classical conditioning within the context of a single-semester course in Introduction to Psychology. We usually allocate one-week for the unit on Learning, which approximates a single 50-minute class on classical conditioning (the remaining two classes are devoted to operant conditioning and observational learning, respectively). Thus, the lesson incorporates both lecture and activity.

The lesson was designed with a multi-media compatible classroom in mind. We presented the video and diagrams for the lesson in PowerPoint, but overheads and a television with VCR or DVD would also work.

The instructor will need to make copies of the classical conditioning worksheets (see Appendices). Six exam questions were written to assess knowledge of the key components of the lesson. These exam questions were given within the context of the overall unit exam at the appropriate point in the semester.

In-Class Lesson Plan

The lesson begins with a "teaser" in order to motivate students' interest in the lesson topic. The teaser capitalizes on the scheduled time of the sections of the class, which occur around lunch. The teaser dovetails into the subsequent video on the history of classical conditioning. The lesson proceeds with a short video reconstructing the history of the discovery of the "conditioned reflex" by Ivan Pavlov. Past experience with this video clip by one of our team members suggested that students pick up the basics of classical conditioning better than traditional lecture formats. Nonetheless, the instructor follows up on this video by reviewing the elements and procedure of classical conditioning.

After the introduction to the elements and procedure of classical conditioning, students complete Worksheet 2 (see Appendices) designed to provide students with practice using the terminology of classical conditioning, understanding the ordering of elements in the procedure of classical conditioning, and applying their knowledge to a variety of different examples including a novel one that students create. The worksheet provides an opportunity to assess students' knowledge of classical conditioning from basic definitions of the elements of classical conditioning to the learning of a conditioned response through a variety of real-world examples.

Finally, the lesson closes with basic processes of classical conditioning including acquisition, extinction, and spontaneous recovery.

1. **Opening:** Everyday example of classical conditioning **(Approx. 5 min)**
    a. The opening is designed to prime student's interest before launching into the topic of classical conditioning.
    b. Students will be shown a food-based commercial in order to demonstrate that classical conditioning principles operate on a daily basis.
    c. The instructor will show a brief food commercial (either video or print ad) and ask the students, "How many of you are salivating right now?" The instructor will invite a few students to explain why they're salivating.

2. **Video:** Pavlov Film Clip **(Approx. 10 min)**
    a. The instructor will show a brief film clip of Ivan Pavlov's discovery of classical conditioning. The film clip provides a concise overview of the general principles of classical conditioning.
    b. Following the film clip, the instructor will show a slide diagramming the components of classical conditioning. The instructor will review the components of classical conditioning using the prototypical example provided by the Pavlov video clip.

3. **Activity:** Classical Conditioning Worksheet 1 **(Approx. 10 min)**

a. Students will be asked to complete a worksheet that requires the identification of the components of various classical conditioning examples as well as diagramming the procedure of classical conditioning. The worksheet is designed to provide scaffolding to the students so that gradually the students move from filling out the missing components of various classical conditioning examples to diagramming the entire procedure and components of later examples.
b. Students will be asked to work in pairs with neighbor. Each pair will be given one sheet in order to promote discussion between the students on the worksheet problems.

4. **Discussion:** Worksheet Overview **(Approx. 5 min)**
    a. Instructor will discuss last problem on worksheet with class.
    b. Instructor will pick up worksheets.

5. **Lecture:** Processes of Classical Conditioning **(Approx. 15 min)**
    a. Instructor will follow-up worksheet with lecture on acquisition, extinction, and spontaneous recovery

6. **Reminders (Approx. 5 min)**
    a. Students will be given Worksheet 2 to complete for the next class. The worksheet will require students to create a unique example of classical conditioning and to diagram and explain acquisition, extinction, and spontaneous recovery.

Post-class Analysis

The primary tool for analyzing students' thinking about classical conditioning is the Worksheet 1. The worksheet begins with a problem that is roughly equivalent to the example that students are presented with in the video of Pavlov's classic discovery of the "conditioned reflex." The worksheet proceeds to examples that share fewer surface similarities to the video example (see Worksheet 1 in the Appendices). Worksheet 2 culminates in a homework assignment that requires students to generate their own example of classical conditioning as well as demonstrate their knowledge of the basic processes of classical conditioning (acquisition, extinction, and spontaneous recovery). A 50-minute class for which the lesson was designed does not allow enough time to both introduce these concepts and have students do all the worksheet activities in class. However, the primary assignment of identifying the basic components and procedures of classical conditioning should be completed in class where students can work together to overcome difficulties with the lesson.

Instructors should analyze Worksheet 1 to locate problems that students have with identifying the components of classical conditioning. Instructors can follow-up during the next class period with explanations for particularly difficult problems (see the findings of the lesson study in Part III for an analysis of the difficulty of the problems on the worksheet). Worksheet 1 should be corrected and given back to students the next class period.

Instructors should also analyze Worksheet 2 for gaps in understanding of the processes of acquisition, extinction, and spontaneous recovery. The next class period can be used to correct misunderstandings.

Student Learning Goals

After completion of the classical conditioning lesson, introductory students should be able to

1. identify the basic components of classical conditioning in real-world examples;
2. map out the procedure for how a neutral stimulus becomes a conditioned stimulus through repeated pairing with an unconditioned stimulus;
3. and draw a graph of and explain the basic processes of acquisition, extinction, and spontaneous recovery.

Our previous experiences in teaching Introduction to Psychology led us to select classical conditioning as a focus of a lesson study because we had found it to be a difficult concept for students to grasp. Specifically, we have found that students often get bogged down by the terminology and acronyms associated with the components of classical conditioning (i.e., NS, CS, US, UR, and CR). In addition, we have found that students have difficulty transferring their knowledge of the components of classical conditioning from a textbook example of Pavlovian dogs salivating to real-world examples. Thus at a more overarching level, our ultimate goal with the worksheet activities was to increase students' awareness and appreciation of the extent of classical conditioning in their daily lives.

How the Classical Conditioning Lesson Works

We conducted two iterations of the lesson study. The first iteration occurred during the spring semester of 2006 and our main document of student learning was what is labeled Worksheet 1 in the Appendices. Based on the analysis of the worksheet, we noticed a couple of trends. First, we were surprised to see how well students completed the worksheet. However, we also discovered that students' performance was also affected by artifacts associated with how we drafted the worksheet (see the findings section in Part III for more details). We made changes to Worksheet 1 in order to correct for these artifacts. In addition, based on the feedback from Bill Cerbin, we created Worksheet 2 in order to assess students' learning of acquisition, extinction, and spontaneous recovery.

As mentioned previously, we designed the lesson activities to support students' ability to identify the components of classical conditioning in real-world examples. Worksheet 1 provides the framework for students to do so by building from an example similar to the one they are presented in lecture/video and then progressing to examples further removed from the prototypical example. Students complete the worksheet in pairs and are encouraged to work through any obstacles they face. Instructors should pay attention to the discussions between student pairs to informally measure progress on the task, as well as to be able to offer gentle support here and there without undermining the goal of the worksheet.

PART III: THE STUDY

Approach to Studying the Lesson

In studying the lesson, we collected data in several ways. Copies of all of the forms or exercises relevant to the study of our classical conditioning lesion are available in the Appendices.

The first set of data involved observation of the lesson by other qualified instructors. Two team members and one outside observer used the Observation Protocol. In addition to the observation instructors, the Protocol involved two primary features: a "timeline" observation protocol and a summative form. The "timeline" observation protocol was designed to be a functional and informative method for obtaining observational data during the teaching of the lesson; this form allows observers to comment on both the students' and the instructor's behaviors during each portion of the lesson (rather than on the lesson as a whole) as the form is specifically tailored to match the lesson plan. The summative form was adapted from previous lesson studies and was designed to provide a general evaluation of the lesson from the observers' standpoint; this component also explicitly makes the distinction between the "presentation" and the "participation" aspects of the lesson. Also, videotaping of the lesson was done for archival purposes.

Second, we collected the practice assignment worksheets that students completed during the lesson; this allowed us to see the types of mistakes that students made while working on classical conditioning problems.

Third, we asked students to complete an online survey (using D2L) in the two days following the lesson. In general, this brief survey included both quantitative and qualitative questions about the difficulty and viability of the lesson. More specifically, we designed our study survey to be congruous with our objectives and observation protocol. Therefore, questions that paralleled all elements of our summative aspect of the observation protocol were included; in the spirit of modern educational assessment, we wanted our students to become full co-evaluators of the lesson.

Finally, we identified the class exam questions relevant to our topic. This element was important because it allowed us to determine whether students were able to apply classical conditioning concepts to new and novel examples.

Findings of the Lesson Study

On the activity worksheet, the overall mean correct was about the same for the first and the second lesson. During the second lesson, students improved when completing the new food/flu question. However, fewer students completed the shampoo/romantic partner question correctly during the second lesson. Furthermore, very few students completed the novel example (question #6) or brought back the second part (less than half), which asks questions about acquisition, extinction, and spontaneous recovery.

Students did very well with exam questions that pertained to classical conditioning (56-90% correct). Students still seem to have some difficulty identifying the difference between the unconditioned response and the conditioned response. Seven students wrote the classical conditioning diagram on their exam to help them with answering the question.

Student feedback was very positive. Students indicated high levels of interest, engagement, and participation. Similarly, students indicated low levels of confusion, difficulty, and frustration. Students also reported that they were able to transfer the concepts to outside the classroom. The majority of students who responded to the open-ended question portion of the survey reported that the worksheet was very helpful.

Finally, peer observations indicated that the lesson moved very smoothly. Students appeared interested and engaged in most portions of the lesson. Perhaps not surprisingly, the lecture-oriented component of the lesson appeared less involving than the activity portion of the lesson. While the lesson worked well in general for an introduction to classical conditioning, the observers expressed some doubt about whether students achieved a

deep level of understanding about the topic; clearly a follow-up lesson and practice on applying classical conditioning would be warranted.

Discussion of the Lesson Study

Reflections on the Classical Conditioning Lesson

The findings of our lesson study for this final report largely parallel those from our first iteration. Specifically, the lesson provided an engaging introduction to practical applications of classical conditioning. Given the severe limitations placed on this lesson (50-minute class, the need to incorporate some lecturing, etc.), we feel that the lesson did meet some of the more basic objectives. Students appeared to experience a thought-provoking introduction to a difficult topic and seem to emerge with a solid, but admittedly basic, understanding.

We also note that our desire to obtain objective data for the sake of this lesson study may have impeded implementation of one important aspect of good teaching: prompt feedback. Specifically, we collected the students' activity worksheets as a measure of understanding before students were given answers to the problems. This lack of prompt feedback may have limited our ability to drive the main points home and solidify our students' knowledge of classical conditioning concepts. We would seek to improve this in future iterations of the classical conditioning lesson study.

In general, we believe that our teaching of classical conditioning has improved as a result of lesson study. Our examples and worksheet activities have become more focused and useful. We have been able to cull and integrate successful teaching strategies that each of us had heretofore used separately.

Lessons Learned while Conducting this Lesson Study

In terms of the content of this lesson study, our experiences have taught us an important and potentially insurmountable difficulty in teaching classical conditioning. While one of our stated goals was to structure the lesson such that students should be able to (almost spontaneously) provide truly novel examples of classical conditioning, many students did not succeed on this portion of the task. We have been left to reconsider the viability of this goal. Similarly, we recognize that we – as relative experts in the field – often have difficulty creating truly novel and accurate examples of classical conditioning on the spot.

Looking at the practice of lesson study in general, our experiences in our classes have also created some concerns about the ease of implementing lesson study. From the very beginning of our introduction to lesson study, it seemed that the methodology may work best for highly active classes that involve considerable group work and interaction. However, our classes (especially our Introductory classes used in this lesson study) often use "blended" methods, whereby any particular class may involve lecture, discussion, in-class activities, or some inseparable combination of many methods. For these cases, lesson study as a technique may be less applicable. To be sure, our lesson study approach worked well for the active portion of class; for the other portions, we found "traditional" methods quite useful (i.e., surveys, exams, etc.).

Similarly, these "blended" teaching methods may be somewhat idiosyncratic for each instructor. In other words, the simple practice of collaborating on the lesson may have produced a disadvantage as well. The style of teaching was noticeably different for the instructor and for the students. Specifically, the instructor who taught the lesson reported that she felt the need for structure and observation imposed by the lesson study may have, in fact, detracted from the quality of the lesson. For example, we planned a regimented lesson that included times for each lecture section and activity. However, this is not typically how the instructor usually runs her classes. This caused the instructor to be stiff and a little nervous about completing everything on time (which was better the second time). This is cause for some concern because students likely noticed a difference in teaching styles from other class days. This may be remedied by allowing the instructor more freedom with how to conduct the class after the lesson is generally outlined. Of course, conducting more lesson studies throughout the semester would also reduce this problem.

APPENDICES

Worksheet 1

CLASSICAL CONDITIONING LESSON: ACTIVITY WORKSHEET

Example: Dr. Pavlov presents a bell right before he feeds his dog. Complete the diagram.

Bell (NS) + Food (US) → Salivation (UR)

Bell (CS) → Salivation (CR)

1. Miranda notices that her cat scurries into the kitchen as soon as Miranda opens a can of cat food with an electric can opener. Complete the diagram.

_____ (NS) **+** _____(US) → _____(UR)

_____ (CS) → _____ (CR)

2. You eat a new food and then get sick because of a flu virus. However, you develop a dislike for the food and feel nauseated whenever you smell it. Fill in the diagram and complete the rest.

_____ ( ) **+** _____( ) → _____( )

_____ ( ) → _____ ( )

3. Every time someone flushes a toilet in the apartment building, the shower becomes very hot and causes the person to jump back. Over time, the person begins to jump back automatically after hearing the flush, before the water temperature changes. Complete the diagram.

4. Your romantic partner always uses the same shampoo. Soon, the smell of that shampoo makes you feel happy. Draw the diagram on your own.

5. You watch a commercial that shows a giant golden star and a picture of a big juicy hamburger. Draw the diagram on your own.

Worksheet 2

6. Now make your own *new* example not using any of the previous examples. Draw the diagram on your own.

7. You pair the NS and US for 5 trials. Draw a graph below that would demonstrate acquisition. Be sure to label each axis. Describe what is happening in this graph as if you were explaining it to a friend.

8. You present the CS alone for 5 trials. Draw a graph below that would demonstrate extinction. Be sure to label each axis. Describe what is happening in this graph as if you were explaining it to a friend.

9. After extinction, you take a 10 minute break, then present the CS alone for 1 trial. Add to the graph above to show spontaneous recovery.

CLASSICAL CONDITIONING LESSON: OBSERVATION INSTRUCTIONS

Overview of the Observation Phase

The purpose of having several instructors observe the class is to gather as much information about the process of the lesson as possible. Your primary task is to observe *how the students respond to the lesson and make some conclusions about how the LESSON worked.* In other words, the primary focus of your observation is student thinking and student behavior. Of somewhat less importance is what the instructor does because we have already planned the lesson in some detail and know what the instructor is supposed to do.

You will be observing between one and three pairs of students. Please *do not* make comments to or help your group. If students try to interact with you just remind them that you are an observer and not a participant in the lesson. (e.g., do not answer questions or clarify instructions, etc.)

General Focus of Your Observations

As a result of the whole lesson, students should be able to recognize and analyze basic features of classical conditioning in examples of animal and human behavior. Pay careful attention to (and record) the way students listen to, ask questions about, and describe the key concepts and terms in classical conditioning. We would like to get a good record of how they construe and make sense of the concepts regardless of whether their reasoning is well developed, incomplete, or tangled. Note any changes in their thinking, moments of insight or recognition, misconceptions, and difficulties they have.

Specific Focus of Your Observations

Many things take place during a lesson that can influence student learning and thinking. Please take detailed field notes of your group and whole class discussion. Note such things as:

- Student interest and engagement during the lesson (e.g., stay on task, evidence of boredom, evidence of enjoyment, etc.)
- Student difficulty or frustration during the lesson (e.g., confusion about instructions, difficulty with identifying concepts, frustration with ambiguity, etc.)
- Quality of interpersonal interaction during the lesson (e.g., dominating students, quiet students, level of participation, asking questions to clarify, etc.)
- Other aspects of the lesson that influence the quality of the experience.

Forms to Guide Your Observations

There are two forms to assist you in evaluating the lesson:

- "Observation Protocol": This form should be completed during the observation phase. It is for taking detailed field notes about your observations of the students' and the instructor's actions that reflect learning.
- "Summative Evaluation": This form should be completed after the observation phase. It is for providing your overall reactions to the lesson and its effectiveness.

CLASSICAL CONDITIONING LESSON: OBSERVATION PROTOCOL

Component of Lesson	Student Behaviors	Instructor Behaviors
Opening **Start Time:** _____		
Video **Start Time:** _____		

Activity **Start Time:** _____		

Discussion **Start Time:** _____		
Lecture **Start Time:** _____		
Remainders **Start Time:** _____		

CLASSICAL CONDITIONING LESSON: SUMMATIVE EVALUATION

Interest, Engagement, and Participation

Criteria	Rating for Presentation	Rating for Activity
Did students seem interested in the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:
Were students engaged during the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:
Did students participate during the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:

Difficulty, Confusion, and Frustration

Criteria	Rating for Presentation	Rating for Activity
Did students seem confused by the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:
Did students seem to be having difficulty with the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:
Were students exhibiting signs of frustration with the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:

Signs of Progress Toward Deeper Understanding

Criteria	Rating for Presentation	Rating for Activity
Were students able to recognize the applicability of key concepts during the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:
Were students able to use key terminology during the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:
Were students able to transfer the concepts and terms to novel situations during the lesson?	Definitely --- Somewhat --- Definitely Not Comments:	Definitely --- Somewhat --- Definitely Not Comments:

Overall Impressions of the Lesson

The stated goal of the lesson is that “as a result of the whole lesson, students should be able to recognize and analyze basic features of classical conditioning in examples of animal and human behavior.”

What aspects of the lesson worked well in achieving this goal?

What aspects of the lesson were not as effective in achieving this goal?

CLASSICAL CONDITIONING LESSON: STUDENT SURVEY

Specific Impressions of the Class

Please answer the following questions about the lecture and learning assignment we worked on in Monday's class.

	Disagree	Neutral	Agree	N/A
I was interested in the class.	○	○	○	○
I was engaged during the class.	○	○	○	○
I participated during the class.	○	○	○	○
I was confused by what we covered in class.	○	○	○	○
I had difficulty with what we covered in class.	○	○	○	○
I was frustrated with what we covered in class.	○	○	○	○
I was able to recognize the applicability of the concepts we covered in class.	○	○	○	○
I was able to use the terms during the class.	○	○	○	○
I was able to transfer the concepts and terms to novel situations during class.	○	○	○	○

Overall Impressions of the Class

My goal of the class on classical conditioning was to help you to recognize and analyze the basic features of classical conditioning in examples of animal and human behavior.

What aspects of the class worked well in achieving this goal?

What aspects of the class were not as effective in achieving this goal?

RESULTS:
ACTIVITY WORKSHEET

Table 1. Percent of questions answered correctly on the activity worksheet

Examples (CS, US)	First Lesson	Second Lesson
1. Can opener/cat food	100	96.9
2. New food/flu	37.5	56.3
3. Toilet flush/hot water	100	100
4. Shampoo/romantic partner	90.6	59.4
5. Golden star/hamburger	93.8	81.3
6. Novel example[a]	71.9	21.9
Overall Mean Correct	4.94	4.13

Note. N = 32.
[a]Only 50% of students completed the novel example for the second lesson compared with 90% for the first lesson.

RESULTS:
SUMMATIVE EVALUATION BY OBSERVERS

Interest, Engagement, and Participation

Criteria	Rating for Presentation	Rating for Activity
Did students seem interested in the lesson?	Definitely – 3 observers Somewhat – 0 observers Definitely Not – 0 observers	Definitely – 2 observers Somewhat – 1 observer Definitely Not – 0 observers
Were students engaged during the lesson?	Definitely – 0 observers Somewhat – 2 observers Definitely Not – 0 observers	Definitely – 2 observers Somewhat – 1 observers Definitely Not – 0 observers
Did students participate during the lesson?	Definitely – 1 observer Somewhat – 2 observers Definitely Not – 0 observers	Definitely – 2 observers Somewhat – 1 observer Definitely Not – 0 observers

Difficulty, Confusion, and Frustration

Criteria	Rating for Presentation	Rating for Activity
Did students seem confused by the lesson?	Definitely – 0 observers Somewhat – 1 observer Definitely Not – 2 observers	Definitely – 0 observers Somewhat – 2 observers Definitely Not – 1 observer
Did students seem to be having difficulty with the lesson?	Definitely – 0 observers Somewhat – 1 observer Definitely Not – 2 observers	Definitely – 0 observers Somewhat – 3 observers Definitely Not – 0 observers
Were students exhibiting signs of frustration with the lesson?	Definitely – 0 observers Somewhat – 0 observers Definitely Not – 3 observers	Definitely – 0 observers Somewhat – 0 observers Definitely Not – 3 observers

Signs of Progress Toward Deeper Understanding

Criteria	Rating for Presentation	Rating for Activity
Were students able to recognize the applicability of key concepts during the lesson?	Definitely – 1 observer Somewhat – 2 observers Definitely Not – 0 observers	Definitely – 2 observers Somewhat – 1 observer Definitely Not – 0 observers
Were students able to use key terminology during the lesson?	Definitely – 1 observer Somewhat – 2 observers Definitely Not – 0 observers	Definitely – 1 observer Somewhat – 2 observers Definitely Not – 0 observers
Were students able to transfer the concepts and terms to novel situations during the lesson?	Rated as N/A because it required looking at the worksheet responses	Rated as N/A because it required looking at the worksheet responses

RESULTS:
RELEVANT EXAM QUESTIONS

1. One Saturday, Lacey was sitting at home when the telephone rang. A local company was making promotional calls and told Lacey she had just won a $1000 gift certificate. She felt a rush of excitement at the thought of what she could do with $1000. Now Lacey finds that whenever she hears a telephone ring, she feels a surge of excitement. In this example, the rush of excitement that Lacey felt when she heard she had won the gift certificate is

a. the unconditioned response	40 (56%)
b. the conditioned response	27 (38%)
c. the unconditioned stimulus	2 (3%)
d. the conditioned stimulus	2 (3%)

2. Holly was dancing with her new boyfriend at an Elvis tribute. When the band started playing "Can't Help Falling in Love with You" her boyfriend gave her a long, passionate kiss, which Holly found very enjoyable. Now Holly finds that every time she hears "Can't Help Falling in Love with You" on the radio, she becomes a little flushed. In this example, the conditioned stimulus is

a. the long, passionate kiss	5 (7%)
b. the flushing she experiences when she hears the song on the radio	2 (3%)
c. the song, "Can't Help Falling in Love with You"	63 (88%)
d. the enjoyment she experienced after the kiss from her boyfriend	2 (3%)

3. Ken used to drool at the smell of peanut butter cookies as they baked, and he couldn't wait to sink his teeth into that first cookie. However, Ken's new roommate makes terrible peanut butter cookies, and the smell of them baking is no longer associated with a wonderful taste experience. Consequently, Ken finds that the smell of the cookies no longer makes him drool in anticipation. This illustrates the classical conditioning process known as

a. second-order conditioning	13 (18%)
b. avoidance	6 (8%)
c. extinction	52 (72%)
d. spontaneous recovery	1 (1%)

4. Mariah developed a fear of the water when she fell off a river raft last summer. This year she took swimming lessons and thought she had finally overcome her fear of water. She was eagerly looking forward to an upcoming rafting trip, however, as soon as she stepped onto the raft she was instantly terrified again. This illustrates the classical conditioning process known as

a. second-order conditioning	9 (13%)
b. spontaneous recovery	54 (75%)
c. extinction	0 (0%)
d. stimulus generalization	9 (13%)

5. When a conditioned response shows spontaneous recovery, the rejuvenated response typically

a. occurs before the conditioned stimulus	3 (4%)
b. changes to an unconditioned stimulus	5 (7%)
c. is weaker than the previously conditioned response	52 (72%)
d. is stronger than the previously conditioned response	12 (17%)

6. Stimulus generalization occurs when

a. an organism responds to new stimuli that are similar to the original conditioned stimulus	65 (90%)
b. there is a temporal association between two stimuli	2 (3%)
c. an organism fails to respond to stimuli that are similar to the original stimulus used in conditioning	5 (7%)
d. an unconditioned stimulus fails to elicit the unconditioned response	0 (0%)

RESULTS:
STUDENT SURVEY

Specific Impressions of the Class

Please answer the following questions about the lecture and learning assignment we worked on in Monday's class.

	Disagree	Neutral	Agree	N/A
I was interested in the class.	0%	12%	88%	0%
I was engaged during the class.	0%	27%	73%	0%
I participated during the class.	0%	23%	77%	0%
I was confused by what we covered in class.	88%	12%	0%	0%
I had difficulty with what we covered in class.	85%	15%	0%	0%
I was frustrated with what we covered in class.	88%	12%	0%	0%
I was able to recognize the applicability of the concepts we covered in class.	0%	27%	73%	0%
I was able to use the terms during the class.	8%	23%	69%	0%
I was able to transfer the concepts and terms to novel situations during class.	0%	31%	69%	0%

Note. N = 26.

Overall Impressions of the Class

My goal of the class on classical conditioning was to help you to recognize and analyze the basic features of classical conditioning in examples of animal and human behavior.

What aspects of the class worked well in achieving this goal?

Lecture/Powerpoint	9 responses
Dog example/Pavlov video	4 responses
Worksheet	14 responses
Everything	1 response

What aspects of the class were not as effective in achieving this goal?

Nothing	10 responses
Need more examples	1 response
Reference the book	1 response
Copying notes from the slide	1 response
Lack of time to go over worksheets in class	1 response
Worksheet does not give exactly what is needed for the test	1 response