*A NOTE ON SOME REINFORCING PROPERTIES OF
UNIVERSITY LECTURES¹*

KENNETH E. LLOYD, WARREN K. GARLINGTON, DOUGLAS LOWRY,
HELENE BURGESS, HARALD A. EULER, AND WILLIAM R. KNOWLTON

WASHINGTON STATE UNIVERSITY

Contingency management systems in university courses have sometimes assigned the role of reinforcing stimulus to lectures and demonstrations. Attending a lecture was made contingent upon having previously finished certain course assignments. The present paper investigated some variables that control student attendance at lectures. Attendance remained high throughout each course at those class meetings where quizzes contributing to course grades were given or where impending quizzes were discussed. Attendance at lectures over the reading assignments or over material unrelated to course quizzes rapidly declined. When students were given course credit for attending these lectures, or when the lectures included information for future quizzes, attendance increased. When attending these lectures was made contingent upon having completed certain assignments the prior week, no increase in assignment completion was noted and the attendance at the lectures decreased even further. All lectures were given during one class meeting each week. Attendance at the other class meetings during the week remained stable.

Class contingency management systems have been concerned with finding accessible reinforcing stimuli indigenous to the classroom itself (Addison and Homme, 1966; Bijou, 1970; Meacham and Wiesen, 1969; Osbourne, 1969; Schmidt and Ulrich, 1969). Teacher attention, recess, and games are examples of reinforcers at the disposal of the elementary school teacher. Similar reinforcing events would likewise be useful to university instructors. This paper reports an experimental analysis of some of the reinforcing properties associated with classroom lectures.

Some contingency management systems in university courses have assigned the role of reinforcing stimulus to lectures and demonstrations (McMichael and Corey, 1969). One author (Keller, 1968) gave seven lectures at intervals during the term. Only students who had completed a specified number of units of course

work were permitted to attend the lectures. There were no penalties for not attending and no additional reinforcers were promised for attending these lectures. Keller reported that ". . . each (lecture was) attended by perhaps half of the students entitled to be there." (Keller, 1968, p. 83).

The dependent variable in the present studies was attendance at class meetings. The independent variables were contingencies for attending. Three different contingencies were imposed in three different courses. First, students were sometimes given course credit for attending class. Second, students were sometimes given information relevant to a subsequent quiz during class meetings. Third, admission to a class meeting was made contingent upon having completed certain assignments.

METHOD

The courses were organized on a point system similar to that described in detail by Lloyd and Knutzen (1969). Completing each assignment

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earned a certain number of points. Students completed as many assignments as necessary to obtain the cumulative point total required for a given letter grade. Short answer essay quizzes worth 15 to 20 points were given each week. One week before each quiz, the student received a set of questions covering the next assignment. The quiz, given during one class period each week, consisted of questions selected from this study guide. Before a quiz, the class could discuss any of the questions on the study guide. In the first two courses, which met on Tuesdays (T) and Thursdays (R) for 75 min, this discussion occurred on the same day as the quiz. Thursday was quiz day. In the third course, which met on Mondays (M), Wednesdays (W), and Fridays (F) for 50 min, the discussions occurred on Wednesdays and the quizzes on Fridays. The attendance contingencies occurred on Tuesdays for the first two courses and on Mondays for the third course. Correctly answering approximately 90% of the items on the quizzes was necessary but not sufficient to pass the courses. In addition, other assignments had to be completed outside of class.

In Classes A and B, the Tuesday meetings consisted of lectures covering the material for that week's reading assignment. Class A, a third-year course entitled *Experimental Analysis of Behavior*, contained 70 students. Tuesday attendance was obtained during Weeks 2 to 7. No explicit contingencies for attending were in effect on Weeks 2 to 5 or on Week 7. The students received written notice that the instructor would lecture on Tuesdays. On Tuesday of Week 5, students were given a written notice that they would receive 20 points for attending the lecture on Week 6. A similar written notice during Week 6 informed them that no points would be given for attending the lecture on Week 7.

Class B, a third-year course entitled *Deviant Behavior*, contained 139 students. The instructor explained to the class that no contingencies for attending on Tuesdays were in effect during Weeks 2 to 9, Week 12, Week 13, or Week 15.

On Thursday of Week 9, the instructor announced aloud to the class that five of the 15 items on the quiz for Week 10 would come from the Week 10 lecture. On Thursday of Week 10, the class was told that one of 15 items on the Week 11 quiz would come from the Week 11 lecture and on Thursday of Week 12 they were told that three of the 15 items on the Week 13 quiz would come from the Week 13 lecture.

In Classes A and B, the contingencies for attending class were relevant to the course grade, that is, receiving points leading to a grade or information about a quiz. In contrast, the purpose of the manipulations in Class C was to assess the reinforcing effectiveness of the lectures themselves. Class C, a first-year *Introductory Psychology* course, contained 344 students. The 13 Monday class meetings consisted of nine lectures by six psychologists concerning their research, three films, and one tour of the psychology laboratories. The first three columns of Table 1 show dates, titles, and sources of the Monday events. Lectures and films were only coincidentally related to the reading assignments. As a partial control for differences in lecturers and topics, Lecturer #1 appeared in two experimental conditions and Lecturer #2 appeared in three experimental conditions. Each Friday, an announcement of the next Monday event was read in class and copies of the announcement were posted on departmental bulletin boards. At the Friday class meeting before an experimental condition was to be changed, a printed announcement of the change was given to the students and copies were posted on departmental bulletin boards.

The fourth column in Table 1 shows the experimental conditions. Attendance at the Monday events was open to all students during the Noncontingent Condition (Weeks 2 to 7 and Weeks 11 to 13). Only students who had obtained 35 or more points during the prior week could attend the Monday event during the Contingent Condition (Weeks 8 to 10). All students, regardless of their prior work, who at-

Table 1
Semester week, title, source, and experimental condition for each Monday event in Class C.

<i>Semester Week</i>	<i>Title</i>	<i>Source</i>	<i>Experimental Condition</i>
1	—	—	—
2	Autistic Children	Film #1	Noncontingent
3	Hypnosis	Lecturer #1	Noncontingent
4	Token Economies	Lecturer #2	Noncontingent
5	Conditioning	Film #2	Noncontingent
6	Desensitization	Lecturer #3	Noncontingent
7	Perception	Film #3	Noncontingent
8	Behavior of Sharks	Lecturer #4	Contingent
9	Programmed Courses	Lecturer #2	Contingent
10	Research Facilities	Laboratory Tour	Contingent
11	Ecology	Lecturer #5	Noncontingent
12	Psychic Phenomena	Lecturer #1	Noncontingent
13	Utopias	Lecturer #2	Noncontingent
14	Memory	Lecturer #6	20 points
15	—	—	—

tended the event on Monday of Week 14 received 20 points.

The point criterion for the Contingent Condition (Weeks 8 to 10) was based on student performance during the prior weeks. During Weeks 2 to 6, the median and modal points earned by all students was 22.5. To meet the criterion of 35 points during the Contingent Condition, students had to complete one of their other assignments outside of class, *e.g.*, write a 20-point abstract of a journal article.

RESULTS

In all three classes, attendance was taken independently by two assistants. Initial agreement among attendance takers exceeded 95% except when very few students attended class on Mondays in Course C. In all cases where disagreements occurred, a recount was immediately taken to eliminate the disagreement.

Figure 1 shows the per cent of enrolled students in attendance in all three classes. The data for Class A are at the left of Figure 1. Attendance at Thursday quizzes (R) remained stable. Attendance at Tuesday lectures (T) decreased during the noncontingent baseline period (Weeks 2 to 5) from 75% to 46%. At Week

6, when attending earned 20 points, 92% attended. When attendance was again noncontingent, it decreased to the level of Week 5.

The data for Class B are in the middle of Figure 1. Attendance at Thursday quizzes (R) remained stable. Attendance at Tuesday lectures (T) decreased during the noncontingent baseline period (Weeks 2 to 9) from 93% to 38%. At Week 10, when five questions not on the study guide were discussed in the lecture, attendance increased to 90%. At Weeks 11 and 13, when one and three questions, respectively, were discussed, attendance was 66% and 72%. During the reversals to the noncontingent condition (Weeks 12, 14, and 15) attendance decreased to the levels of the last three weeks of baseline (Weeks 7, 8, and 9). The introduction into the lectures of different amounts of material relevant to the next quiz resulted in increases in attendance that were proportional to the amount of relevant material.

The data for Class C are at the right of Figure 1. Attendance at the Monday (M) events decreased during baseline (Weeks 2 to 7) from 76% to 34%. During Weeks 8 to 10, when attendance was contingent upon having accumulated 35 points during the prior week (Weeks 7 to 9), attendance continued to decrease to 5%.

Fig. 1. The per cent of the enrolled students who attended class on the various days of the week are plotted for each semester week during which attendance was measured. In Classes A and B, at the left and middle of the figure, lectures were given on Tuesdays (T) and quizzes on Thursdays (R). In Class C (right side of figure) lectures occurred on Mondays (M) and quiz discussions occurred on Wednesdays (W). Students who attended class on days marked by arrows received course credit (Class A), information about a future quiz (Class B), or had to have completed certain assignments (Class C). The per cent of Class C students who completed enough assignments to have met the eligibility criterion for attending lectures during Weeks 8 to 10 (E) are shown in dashed lines.

Seventy different students attended at least one Monday event during Weeks 8 to 10. Only four of these were students who had not attended at least one Monday event during the prior three weeks (Weeks 5 to 7). During Weeks 11 to 13, when attendance was again open to all, the per cent of students coming to class remained low (5% to 10%). On Week 14, when students received 20 points for attending, 93% of them attended.

While Monday attendance was decreasing (Weeks 2 to 13), Wednesday attendance (W) for Class C remained stable between 79% and 94%. The lowest Wednesday attendance (63%) occurred at Week 14 when students received 20 points for attending on Monday. Attendance at Friday quizzes (not shown in Figure 1) varied between 75% and 90%.

The dashed lines in Figure 1 indicate the per cent of Class C students who had obtained 35 or more points each week. These were students who would have been eligible (E) to attend a Mon-

day event if the 35-point contingency had been in effect all semester. After Week 2, the eligibility curve remained stable at about 30% except for Week 7. The temporary increase in eligibility at Week 7, which was correlated with the announcement of the contingent condition, also coincided with the university requirement for submission of midterm grades to the registrar.

DISCUSSION

The decrease in baseline lecture attendance occurred when the same person gave all lectures (Classes A and B) and when different people gave different lectures (Class C). Neither the topic nor the lecturer seemed to be an important variable determining attendance. Several comparisons substantiate this conclusion. In Class C, when Lecturer #1 and #2 reappeared, attendance at their second and third appearances was more similar to that of adjacent weeks than to

that of their initial appearance. Lecturer #1 appeared at Weeks 3 and 12. He enjoys a university wide reputation as an excellent lecturer, yet attendance at his lectures dropped from 76% to 5%. Lecturer #2, the course instructor, appeared at Weeks 4, 9, and 13. He also conducted the Wednesday class meetings. Attendance at his Wednesday classes did not change while that for his Monday classes dropped from 47% to 8%. Finally, Lecturer #2 in Class C taught Class A. Lecturer #3 in Class C taught Class B. Attendance at their lectures in Class C (Weeks 4 and 6) was comparable to attendance at Weeks 4 and 6 in their own classes, A and B, respectively.

The results from Classes A and B and from Week 14 of Class C indicated that lecture attendance was related to contingencies relevant to the course, that is, receiving information that would appear on a quiz or points. The results of Class C indicated that attendance could not be maintained by the lectures alone when their context was unrelated to the course. There was no evidence that the Monday events reinforced either attendance or course work. In contrast to the low Monday attendance, the high Wednesday attendance in Class C suggested that coming to class was maintained by the relevant course content.

Attendance at lectures in university courses is generally high. In most cases, attendance at class lectures probably resembles the Class C Wednesday rather than the Class C Monday attendance data reported here. Most lectures are probably explicitly or implicitly related to some future behavior that will be required of the student as in Class B or Class C Wednesdays. Such a relationship was purposely avoided in Class C Monday events.

Keller (1968) reported that about one half of the eligible students attended his lectures. A comparison of the eligibility data from Class C

for Weeks 7, 8, and 9 with the attendance data for Weeks 8, 9, and 10, respectively, in Figure 1 indicated that less than one fourth of those eligible attended. It is not possible to identify the variables contributing to this difference but some procedural differences in the two courses can be noted. Keller gave only seven lectures compared to 13 in the present study. The number and spacing of lectures may be a contributing variable. Keller did not change the contingency for attending a lecture during the semester. When contingencies are changed within a semester, the sequential order of their occurrence may contribute to their effect. Future research will continue to seek to identify positive reinforcers related to activities on the university campus.

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