

ON THE MEASUREMENT OF TIME ALLOCATION ON
MULTIPLE VARIABLE-INTERVAL SCHEDULES

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Six pigeons were trained on a modified multiple-schedule procedure. In a three-key chamber, the center key was lighted red or green, depending upon which component schedule was in effect. A response on this key transferred this color to each of two side keys, and responses on one of those keys produced reinforcers according to the component schedule. After 2 s, the side-key lights were extinguished, the center key was reilluminated, and a further center-key response was required to give access, as before, to the component schedules. Components alternated every 3 min. This limited-access procedure allowed both times spent switched into the side keys and time spent not switched in to be measured in the two components. Component reinforcer rates were varied over eight experimental conditions. Both component response rate and component time allocation were increasing functions of relative component reinforcer rate, and these functions were not significantly different. This finding implies that *local* response rates (responses divided by time switched in) were unaffected by changing component reinforcer rates on multiple schedules. Because a similar result was recently obtained for concurrent schedules, models of multiple and concurrent-schedule performance may need to consider only the time allocation of behavior emitted at equal tempo in the component schedules.

Key words: multiple schedules, time allocation, response allocation, generalized matching, response rates, pecking, pigeons

Time allocation between the components of multiple variable-interval (VI) schedules was investigated by Bouzas and Baum (1976) and by White (1978). Both of these experiments were concerned with showing that behavioral contrast could be measured in terms of time allocation. In such experiments, behavioral contrast would be seen as an increase in the time allocated to one component of a multiple schedule when the reinforcer rate in the other component was decreased. Despite using slightly different procedures, both experiments found behavioral contrast in time-allocation measures. Bouzas and Baum reinforced pigeons' standing on a platform using equal reinforcer rates in both 30-s components. They then changed one component to extinction, and the time spent standing on the platform in the unchanged component increased. White used rats and arranged a manipulandum and a liquid dipper at each end

of an experimental chamber with a pivoted floor. The components of the multiple schedule alternated between the two ends of the chamber, and White measured the time during which the floor at the appropriate end was depressed. In White's first experiment, responses on the manipulanda could produce reinforcers according to VI schedules. In his second experiment, responses were not required and reinforcers were delivered on variable-time schedules. White found behavioral contrast of time allocation in both experiments. These results show that time allocation to the components of multiple schedules is a function of component reinforcer rates, but they do not show what that function is.

The present experiment was designed to investigate the *relation* between time allocation and component reinforcer rates in multiple VI VI schedules. But to do this, we must first decide whether Bouzas and Baum's (1976) or White's (1978) technique is sufficiently precise to be used in the measurement of a quantitative relation, rather than for their designed role of capturing a qualitative, directional, change. Let us first accept Herrnstein's (1970, 1974) assumption that, in each component, some time (say, T_{er} in a red component and

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T_{eg} in a green component) is spent emitting the class of behavior (B_{er} , B_{eg}) complementary to (i.e., other than) those defined by the experimenter (B_r , B_g , here pecks). If this is the case, we must ask whether the response categories of pecking (B) and not pecking (B_c) map precisely onto the time-allocation measures T and T_c , for example, in the procedure used by Bouzas and Baum (1976). The answer is that they most likely do not, because complementary responses (e.g., preening) may occur while the subject is standing on the platform, thereby inflating the measure T and deflating the measure T_c . Bouzas and Baum noted this problem, and were forced to use very low component reinforcer rates so that the time spent on the platform in each component was not always close to the duration of the component. A similar failure of time measures to accurately map onto the response classes also occurs in White's (1978) procedure.

Aldiss and Davison (1985) noted similar problems in the measurement of time allocation in concurrent VI VI schedules. In concurrent schedules, the measurement of time allocation by interchangeover time takes no account of time spent emitting behavior patterns that are complementary to the defined class(es). Hence, time-allocation ratios as conventionally measured are unbiased measures if, and only if, the time spent not responding when in the presence of a schedule is proportional to the time spent responding on that schedule (Taylor & Davison, 1983). To overcome this problem, Aldiss and Davison measured four categories of time allocation—namely, time spent responding and time spent not responding on each of two concurrent schedules. They found that local response rates (number of responses emitted divided by time spent responding) were always equal between the two schedules, as predicted by Taylor and Davison (cf. Pliskoff, Cicerone, & Nelson, 1978).

The procedure used by Aldiss and Davison (1985) was a limited-access procedure. Briefly, responses on one of two switching keys produced 3-s periods during which responses on a main key could be reinforced. They showed that such brief-access times produced equal response- and time-allocation ratios with respect to the concurrent schedules, whereas

longer access times progressively constrained time-allocation ratios, making them less extreme than corresponding response-allocation ratios. The present experiment used a similar limited-access procedure in multiple VI VI schedules. The component currently in effect was signaled by a colored light on a switching key. In the main part of the experiment, one response on this key produced, for 2 s, a similar colored light on each of two other keys. Pecks on one of these (depending on which color was present) occasionally produced reinforcers. In this procedure (and in procedures using longer access times), component reinforcer rates were systematically varied, and both time spent switched into the schedules (side keys on) and not switched in were measured in both components. Numbers of responses emitted in both components were also collected.

It is well established that the relation between component response rates and component reinforcer rates in multiple schedules may be described by the generalized matching law (Charman & Davison, 1982; Lobb & Davison, 1977; McSweeney, Farmer, Dougan, & Whipple, 1986). Thus, with the measures defined as above,

$$\log \left[\frac{B_r / (T_r + T_{er})}{B_g / (T_g + T_{eg})} \right] = a \log \left[\frac{R_r / (T_r + T_{er})}{R_g / (T_g + T_{eg})} \right] + \log c,$$

where R_r and R_g are the numbers of reinforcers obtained in the red and green components. The component durations are $T_r + T_{er}$ and $T_g + T_{eg}$. If these are equal, as in the present experiment, the above relation simplifies to:

$$\log \left(\frac{B_r}{B_g} \right) = a \log \left(\frac{R_r}{R_g} \right) + \log c. \quad (1)$$

The parameter a in the above equations is known as sensitivity to reinforcement (Lobb & Davison, 1975) and it measures the rate of change of the log behavior ratio with respect to changes in the log reinforcer ratio. $\log c$ is a parameter which measures any bias toward responding more frequently in one or the other component, and which is assumed to remain constant as (in this case) component reinforcer

rates are varied. An equivalent relation for time allocation could use T_r and T_g , the time spent switched into each component, as dependent variables in Equation 1.

If the local tempos (Baum & Rachlin, 1969) of responding on two, unequal, multiple-schedule components were the same, then as access time was decreased, the relation between log response-allocation ratios and log reinforcer-rate ratios would become similar to the relation between log time-allocation ratios and log component reinforcer-rate ratios. But such a result is not forced by the limited-access procedure. For instance, if local tempos of multiple-schedule responding were directly related to component reinforcer rates, time-allocation sensitivity to component reinforcer rates would always be smaller than response-allocation sensitivity. Aldiss and Davison (1985) found that on concurrent VI VI schedules, local tempos in short (3-s) access times were equal. Thus, the purpose of the present experiment was to use the limited-access procedure to measure time allocation in multiple schedules, and to determine whether a short access time produced equal response- and time-allocation sensitivities to component reinforcer rates.

METHOD

Subjects

Six homing pigeons, numbered 191 to 196, were deprived to $80\% \pm 15$ g of their free-feeding body weights. Water and grit were always available in their home cages, and supplementary feed of mixed grain was given immediately after the daily training sessions to maintain their body weights. The subjects were those previously used by Charman and Davison (1983).

Apparatus

The apparatus was the same as that used by Charman and Davison (1983). The sound-attenuating experimental chamber, in which noise was masked by an exhaust fan, was situated remote from solid-state control equipment. The three keys were translucent, 2 cm in diameter, 9 cm apart, and 24 cm from the grid floor. Each key could be transilluminated by colored lights, and no further illumination

was provided in the chamber. A hopper, containing wheat, was situated below the center key and 9 cm from the grid floor. During reinforcer delivery, the keys were darkened for 3 s, the hopper was raised, and the wheat was illuminated.

Procedure

The center key alternated between red and green every 3 min exclusive of reinforcement time, whether or not the key had been pecked. Only pecks on lit keys exceeding about 0.1 N were counted. A peck on the center key when it was illuminated had only one effect: to transfer that stimulus from the center key to both side keys. When both side keys were lit red, pecks on the left key were reinforced on a VI schedule, while pecks on the right key were without scheduled consequences (extinction). Similarly, if both side keys were green, pecks on the right key were reinforced on a VI schedule, and pecks on the left key were without consequence. After a peck on the center key, the stimuli remained on the side keys for only 2 s in the major part of this experiment. When that time expired, the side keys were darkened, and the stimulus accompanying the component currently in effect was redisplayed on the center key and remained there until that key was again pecked.

The procedure of lighting both side keys during access to the multiple-schedule components was arranged so that the discriminability of the stimuli signaling the components could be measured (see Charman & Davison, 1983). Because it was established by Charman and Davison, and also found here, that these birds very seldom pecked the extinction keys, only those pecks emitted on the left key in the red component and on the right key in the green component were considered in the data analyses.

Training continued on each experimental condition (Table 1) until all birds had met a defined stability criterion. The initial criterion required that the median relative number of red-to-green side-key responses emitted over five sessions not be more than .05 different from the median of the five sessions immediately preceding these. This computation was carried out daily; when all birds had met the criterion five (not necessarily consecutive)

Table 1

Sequence of experimental conditions and number of sessions of training under each condition. Schedule values are given in seconds. The component duration in red and green was 3 min, and the access duration was 2 s.

Condition	VI schedules		Sessions
	Red	Green	
1*	60	60	22
2	34	240	21
3	240	34	15
4	32	480	24
5	EXT	30	21
6	30	EXT	25
7	480	32	23
8*	960	31	23

* Other conditions, using different access durations, were arranged prior to these conditions.

times, the experimental contingencies were changed for all birds.

Each VI schedule comprised intervals taken in irregular order from the first 12 terms of an arithmetic progression in which the smallest interval was one twelfth the mean interval.

Sessions were conducted 7 days a week. Each 3-min component was presented seven times in each session, and sessions began and ended in blackout.

The data collected were the numbers of pecks on the lit side keys (B_r and B_g), numbers of reinforcers produced by pecking the side keys in each component (R_r and R_g), the time during which the side keys were lit in each component (T_r and T_g), and the time during which the center key was lit in each component (T_{cr} and T_{cg}). Component response rates are thus $B_r/(T_r + T_{cr})$ and $B_g/(T_g + T_{cg})$; we use the term "component" to define the time base as the total duration of the component. Local response rates are B_r/T_r and B_g/T_g . Reinforcer time was not included in time-allocation data.

The sequence of experimental conditions is shown in Table 1. A constant overall reinforcer rate of approximately 1 per minute was arranged, and component reinforcer ratios were varied over eight conditions with the side-key access duration kept at 2 s. Data from series of conditions using 5-s and 7.5-s access durations, obtained under conditions that otherwise were identical to those described above, were also obtained for comparison purposes.

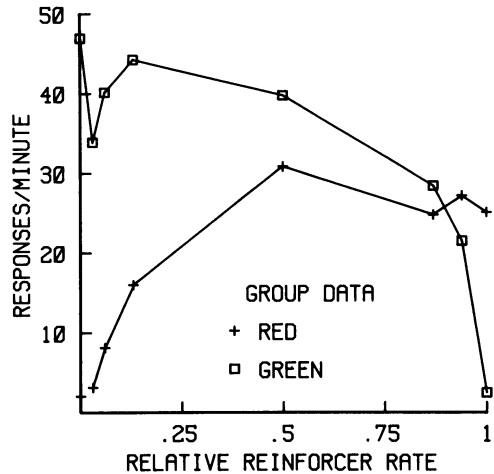


Fig. 1. Side-key responses per minute in each component of the multiple schedule as a function of the relative rate of reinforcers delivered in the red component. The data have been averaged over the final five sessions of each condition and across the 6 birds.

RESULTS

The numbers of responses emitted, the cumulative times spent switched into the side-keys condition during each component, and the numbers of reinforcers obtained, each averaged over the last five sessions of each experimental condition, are shown in the Appendix. Both the distribution of responses between components, and the times spent switched into the schedules during each component, were affected by the distribution of reinforcers between the components. Informal observation throughout the experiment indicated that the birds responded at high rates on the side keys as soon as they had produced these keys.

We shall focus first on the relation between component response and reinforcer rates obtained using the limited-access procedure, to assess whether this procedure provided data similar to those obtained from the standard multiple-schedules procedure. Figure 1 shows the number of responses per minute emitted on the appropriate key in each component, as a function of the relative red-component reinforcer rate. These data were averaged across the 6 subjects. As the relative red-component reinforcer rate was increased, the red-com-

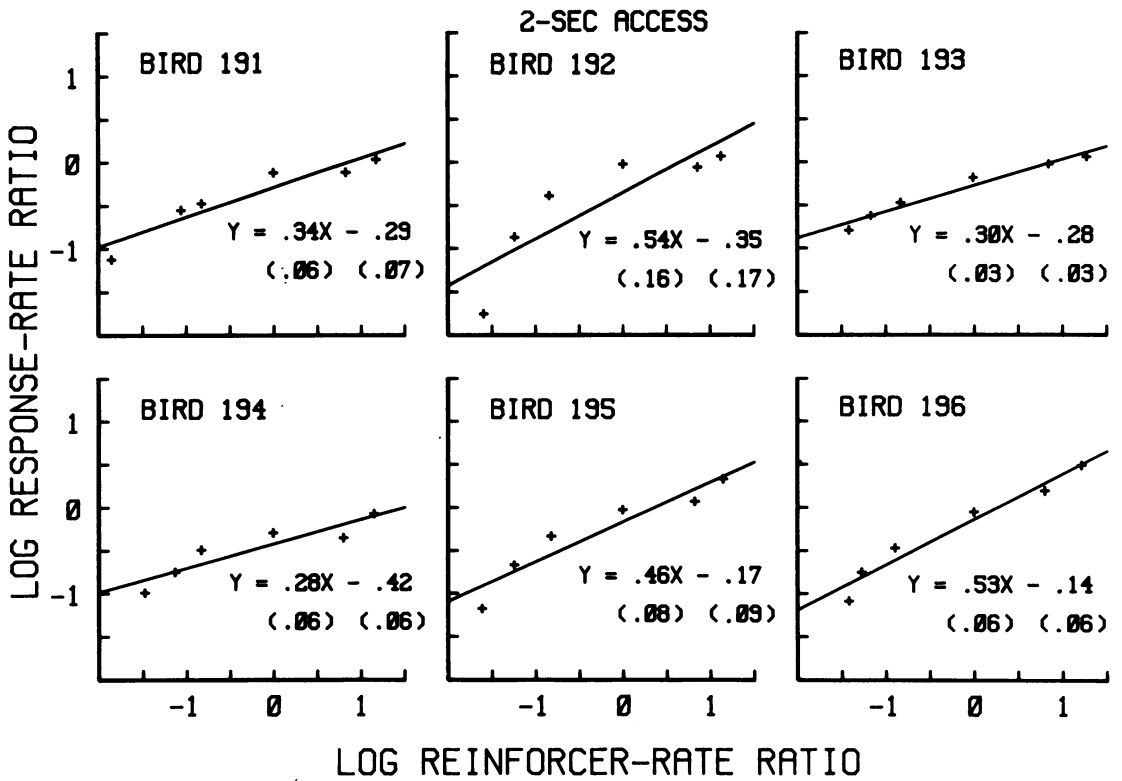


Fig. 2. The logarithm of the ratio of the response rates in the two components as a function of the logarithm of the ratio of the obtained reinforcer rates in the red and green components. Side-key access time was 2 s. The data were averaged over the last five sessions of each condition. The straight lines were fitted by the method of least squares. The equations of these lines are shown on each graph, and the standard deviations of the parameter estimates are shown in parentheses.

ponent response rate increased, and the green-component response rate decreased. Thus, these data conformed to the usual pattern of response-rate changes with reinforcer-rate changes in multiple VI VI schedules (Charman & Davison, 1982; Lander & Irwin, 1968; Lobb & Davison, 1977). It is, however, evident that green-component response rates were generally higher than red-component rates.

The bias toward responding in the green component is more systematically displayed in Figure 2 in which, following Equation 1, log component response-rate ratios are shown as a function of log component reinforcer rates for each bird. (Note that Conditions 5 and 6, in which extinction was arranged in one component, cannot be shown on this figure.) Straight lines were fitted to the data using least squares linear regression, and the equa-

tions of these lines are shown on each graph. The straight lines generally fitted well, except for Bird 192. There is some evidence in Figure 2 that, for all subjects, Condition 8 produced data that were abnormally low. (Because of the design of the experiment, the data should have been symmetrical about the origin [0, 0] of the graphs.) The reason may be the intervening exposure to other access durations between Condition 7 and Condition 8. The slopes of the fitted lines are estimates of a in Equation 1, and they ranged from 0.28 to 0.54, with a mean of 0.41. These values are well within the usual range of sensitivity values for multiple VI VI schedule performance, and the mean value is close to the mean sensitivity found in previous research (about 0.45; Charman & Davison, 1982; McSweeney et al., 1986). The intercepts of the fitted lines

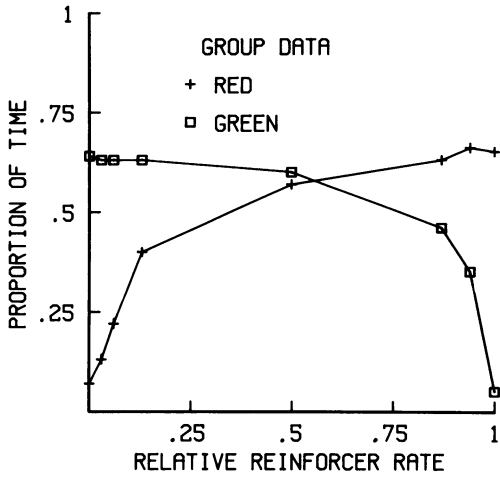


Fig. 3. The proportion of time spent switched into each component as a function of the relative rate of reinforcers delivered in the red component. The data were averaged over the last five sessions of each condition and over the 6 birds.

are estimates of bias. These were negative for all subjects, confirming the bias toward responding in green seen in Figure 1. The reason for this bias is unknown, but it could have resulted from minor differences between the response forces or topography required for operating the left and right keys. Overall, Figures 1 and 2 show that multiple-schedule performance in the limited-access procedure was not noticeably different from performance in conventional (single-key) procedures.

Figure 3 shows the proportion of the component time spent with the side keys switched on in each component, averaged over the 6 subjects, as a function of the relative red-component reinforcer rate. As was found for response measures, the proportions of time spent responding were an increasing function of the relative frequency of component reinforcers. Also, but unlike the response measures (cf. Figure 1), the proportions crossed when the

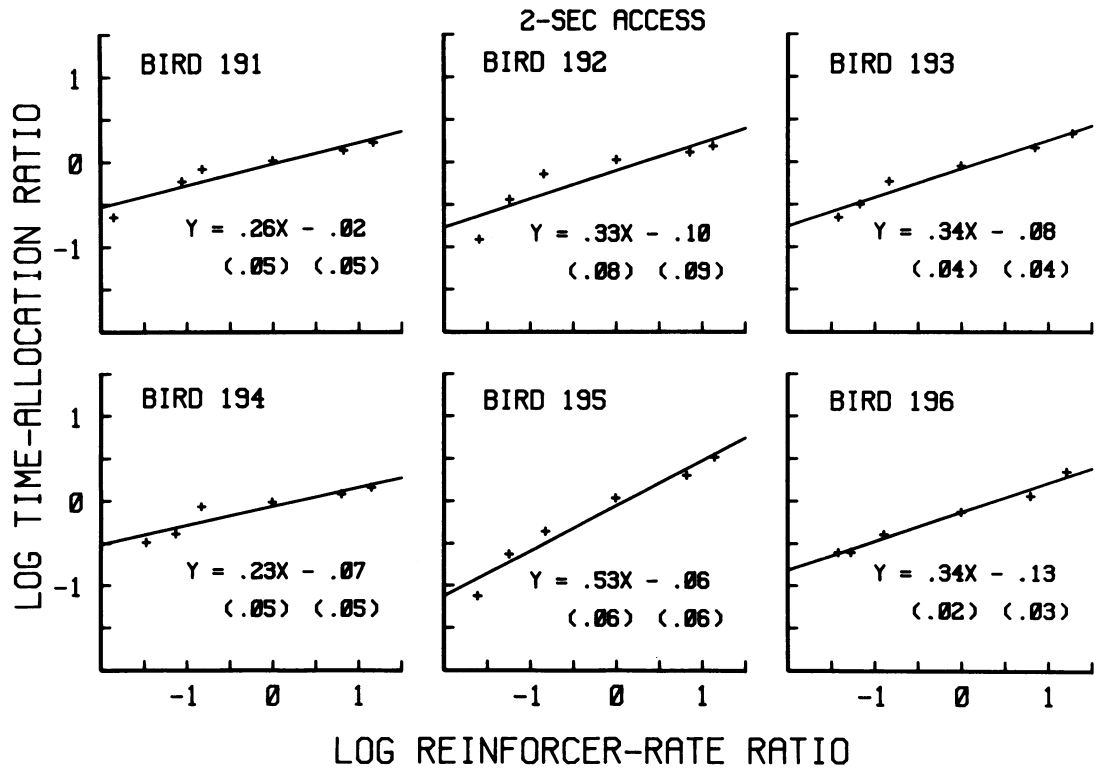


Fig. 4. The logarithm of the ratio of the times spent switched into the schedules in the two components as a function of the logarithm of the ratio of the obtained reinforcer rates in the two components. Side-key access time was 2 s. The data were averaged over the last five sessions of each condition. The straight lines were fitted by the method of least squares. The equations of these lines are shown on each graph, and the standard deviations of the parameter estimates are shown in parentheses.

Table 2

Results of linear-regression analyses of the relation between each of three behavioral measures (log component response-rate ratios, log time-allocation ratios, and log local response-rate ratios) and log component reinforcer-rate ratios according to the duration of access arranged. The component response rate is the number of responses in a component divided by the component duration; the local response rate is the number of responses in a component divided by the time spent switched into the side keys in that component.

Bird	2-s Access		5-s Access		7.5-s Access	
	a(SD)	log c(SD)	a(SD)	log c(SD)	a(SD)	log c(SD)
Log component response-rate ratios						
191	.34(.06)	-.29(.07)	.23(.04)	.02(.04)	.23(.05)	.01(.05)
192	.54(.16)	-.35(.17)	.70(.09)	-.22(.09)	.37(.09)	-.14(.10)
193	.30(.03)	-.28(.03)	.63(.07)	-.15(.08)	.47(.02)	-.16(.03)
194	.28(.06)	-.42(.06)	.38(.05)	-.21(.05)	.30(.05)	-.26(.05)
195	.46(.08)	-.17(.09)	.71(.07)	-.31(.07)	.62(.07)	-.07(.07)
196	.53(.06)	-.14(.06)	.68(.06)	-.21(.07)	.67(.04)	-.06(.04)
Log time-allocation ratios						
191	.26(.05)	-.02(.05)	.13(.01)	.00(.01)	.13(.02)	.02(.02)
192	.33(.08)	-.10(.09)	.22(.03)	-.03(.03)	.14(.03)	-.05(.04)
193	.34(.04)	-.08(.04)	.32(.04)	-.10(.05)	.24(.03)	.00(.03)
194	.23(.05)	-.07(.05)	.11(.03)	-.03(.03)	.06(.01)	-.01(.01)
195	.53(.06)	-.06(.06)	.48(.04)	-.11(.05)	.41(.04)	.02(.04)
196	.34(.02)	-.13(.03)	.34(.08)	-.23(.09)	.16(.03)	-.04(.03)
Log local response-rate ratios						
191	.09(.03)	-.27(.04)	.10(.03)	.01(.03)	.10(.04)	-.01(.04)
192	.20(.08)	-.25(.09)	.46(.10)	-.18(.10)	.23(.08)	-.08(.09)
193	-.03(.02)	-.19(.02)	.31(.05)	-.06(.06)	.23(.03)	-.16(.03)
194	.06(.04)	-.36(.04)	.27(.05)	-.18(.05)	.24(.05)	-.25(.05)
195	-.07(.03)	-.11(.03)	.23(.03)	-.20(.04)	.21(.06)	-.08(.06)
196	.18(.06)	-.01(.06)	.34(.03)	.02(.03)	.51(.06)	-.02(.06)

schedules were equal, implying little bias toward spending time in one component or the other. Figure 4 shows log time-allocation ratios (i.e., time spent with the two side keys lit) as a function of the log ratio of the component reinforcer rates. The standard deviations of the parameter estimates were small for all except Bird 192, indicating generally good fits of the straight lines to the data. The slopes of the fitted lines (*a* in Equation 1) ranged from 0.23 to 0.53, with a mean of 0.34. The slopes of the lines fitted to the time-allocation data were not significantly different (sign test, Ferguson, 1971; $p > .05$) from those for the response-rate data (Figure 2; Table 2). The intercepts of the fitted lines were, as in the response-rate analysis (Figure 2), all negative, indicating a bias toward switching into the green component. However, the values of the intercepts were all smaller than those for the response-rate analysis (a significant difference: $p < .05$ on a sign test).

DISCUSSION

This experiment found no differences between the ways in which pigeons responded on conventional multiple schedules and on the limited-access procedure used here. Component response rates were an increasing function of relative component reinforcer rates (Figure 1), and the sensitivity of component behavior ratios to component reinforcer ratios was very similar to that conventionally obtained (Figure 2; Charman & Davison, 1982; McSweeney et al., 1986). Given this finding, the limited-access procedure should be an acceptable way of measuring time allocation in multiple schedules.

As with component response rates, the time spent switched into the sides keys in each component was a direct function of the relative component reinforcer rate (Figure 3). We were surprised that the asymptotic proportion of time spent switched into a VI 30-s component

was only about .66 when extinction was arranged in the other component, but this result showed that the present procedure does not have the problems with ceiling effects on time-allocation measures evident in Bouzas and Baum's (1976) procedure. The absolute proportion of time allocated in each component is presumably a function of the switching requirement as well as of the component reinforcer rate. Thus, if five responses on the center key had been required for access into the components, a smaller proportion of each component would have been spent with the side keys on. This would result from both the increased work required to produce the side keys, and the fact that emitting the requirement would itself take up more of the component time. Evidently, because switching takes up some of the component time, the limited-access procedure cannot perfectly map behavioral categories onto time-allocation measures. Switching time should be small, however, with the single-response center-key requirement used here. These considerations suggest that the data shown in Figure 3 may not be accurate *absolute* measures of time allocated to responding and not responding. But they should be reasonably accurate measures of time-allocation ratios.

Log time-allocation ratios as a function of log component reinforcer-rate ratios were shown in Figure 4. Apart from the difference in the degree of bias toward the green-key component, sensitivity (*a*) measures were not reliably different from component response-rate sensitivities. This result indicates that, with 2-s access durations, time is allocated between the components of multiple schedules in the same manner as responses are allocated. It also implies that local response rates (responses per time switched in) remained equal in the two components as the component reinforcer rates were varied. Analyses of local response-rate ratios shown in Table 2 showed this implication to be correct. The equality of local rates was also obtained by Aldiss and Davison (1985) for concurrent schedules, and it provides a strong invariance across the two procedures. This invariance is useful in that it means that response allocation and (limited-access) time allocation are isomorphic measures in the two procedures and that, in a relativistic analysis at least, different models

for response and time allocation are unnecessary. Although such an isomorphism was originally suggested for concurrent-schedule performance (e.g., Catania, 1966), subsequent research (e.g., Baum, 1979; Pliskoff et al., 1978; Taylor & Davison, 1983; Wearden & Burgess, 1982) called it into question. Aldiss and Davison's research reinstated the isomorphism for concurrent schedules by more accurately measuring time spent responding, and the present research has demonstrated a similar isomorphism for multiple schedules.

The invariance of local response rates in multiple and concurrent schedules, however, is of little further use in building models of concurrent- or multiple-schedule performance. Both response- and time-allocation sensitivities to changes in reinforcer rates are greater in concurrent than in multiple schedules, and the present results do not help explain this. If, as appears likely from the present results, pigeons respond at equal local tempos in both multiple and concurrent schedules, we require a model of time allocation in concurrent schedules and, under constraint, in multiple schedules.

Further results with the same procedure, but using access times of 5 and 7.5 s, are shown in Table 2. Neither the sensitivity of response allocation to component reinforcer rates nor the bias toward the green component evident in the 2-s access response data changed significantly with increasing access duration (nonparametric trend test, Ferguson, 1971; $p > .05$). Thus, the limited-access procedure did not, in general, affect the distribution of responses between components. However, as access duration was increased, sensitivity of time allocation fell monotonically for each subject (mean sensitivity values were: 2-s access, 0.34; 5-s access, 0.27; 7.5-s access, 0.19), and the asymptotic proportion of time spent switched into each component increased to about .85. The sensitivity of local response-rate ratios generally increased with access duration (Table 2), and were consistently greater than zero for both the 5-s and the 7.5-s access durations. Thus, the increasing constraint on the differential allocation of time to each component had the same effect as that reported by Aldiss and Davison (1985) for concurrent VI VI schedules.

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APPENDIX

Raw data for each subject averaged over the last five sessions of each experimental condition. Session duration was 42 min exclusive of reinforcement time.

Con- di- tion	Responses		Reinforcers		Minutes switched into		Con- di- tion	Responses		Reinforcers		Minutes switched into	
	Red	Green	Red	Green	Red	Green		Red	Green	Red	Green	Red	Green
Bird 191							Bird 194						
1	622	816	21.6	21.6	13.89	13.31	1	353	697	21.0	21.6	13.40	13.90
2	587	767	36.0	5.4	15.36	11.12	2	243	549	33.8	5.4	14.36	11.92
3	397	1,179	5.6	37.2	11.32	13.77	3	205	637	5.2	35.8	10.88	12.82
4	799	732	41.4	2.8	16.08	9.43	4	344	405	39.0	2.8	13.61	9.48
5	57	1,249	0.0	43.6	1.55	13.99	5	48	762	0.0	42.4	2.01	12.61
6	684	33	48.8	0.0	16.01	0.73	6	310	180	46.8	0.0	15.11	3.07
7	303	1,077	3.4	38.8	7.75	13.19	7	106	598	3.0	41.2	5.57	13.75
8	60	802	0.6	43.0	3.11	13.86	8	76	747	1.4	42.4	4.48	13.89
Bird 192							Bird 195						
1	1,288	1,363	21.6	21.6	13.35	12.69	1	405	432	20.8	21.2	10.65	9.91
2	769	881	35.8	5.0	14.14	10.89	2	308	262	33.0	5.0	12.76	6.40
3	544	1,323	5.2	36.4	9.34	13.12	3	205	444	5.4	36.0	4.68	10.74
4	689	587	37.2	2.8	13.09	8.57	4	366	172	38.8	2.8	14.25	4.36
5	38	1,447	0.0	45.2	0.78	13.23	5	9	581	0.0	43.2	0.73	11.88
6	215	2	34.4	0.0	10.87	0.09	6	509	9	48.2	0.0	14.86	1.10
7	182	1,359	2.2	38.4	4.46	12.32	7	84	390	2.2	39.0	2.80	11.91
8	13	741	1.0	39.6	1.47	12.07	8	22	338	1.0	41.4	0.87	11.70
Bird 193							Bird 196						
1	872	1,330	21.8	22.2	12.59	14.19	1	439	493	20.8	21.0	10.01	13.51
2	825	883	36.4	5.2	14.50	9.97	2	441	282	35.0	5.6	9.85	8.56
3	486	1,442	5.4	37.0	8.98	15.30	3	210	616	4.6	36.4	5.90	14.67
4	752	664	41.4	2.2	14.70	6.85	4	501	163	39.0	2.4	11.58	5.21
5	88	1,384	0.0	45.4	1.41	15.09	5	18	583	0.0	43.6	2.00	15.19
6	953	59	51.4	0.0	15.32	0.81	6	560	29	46.8	0.0	12.06	1.18
7	236	999	2.8	41.4	4.39	13.86	7	131	737	2.2	41.6	3.91	15.64
8	185	1,146	1.6	42.0	3.25	14.68	8	49	603	1.6	42.4	3.76	15.15